STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

VIA ELECTRONIC MAIL

October 1, 2019

Kristina Cottone
Real Estate Specialist
Smartlink, LLC
85 Rangeway Road, Building 3, Suite 102
Billerica, MA 01862

RE: **EM-AT&T-103-190916 –** AT&T Mobility, LLC notice of intent to modify an existing telecommunications facility located at 600 Connecticut Avenue, Norwalk, Connecticut.

Dear Ms. Cottone:

The Connecticut Siting Council (Council) received a notice of intent to modify the above-referenced facility on September 16, 2019. On September 20, 2019 the Council issued a letter (enclosed) stating that the request for exempt modification was incomplete and recommended that Smartlink, LLC provide documentation showing the original facility approval with conditions if any, and a passing (<100%) antenna mount analysis.

On September 23, 2019, the Council received a copy of its Decision and Order for Docket No. 45 and a Mount Analysis (MA) dated December 5, 2018 and prepared by Fullerton Engineering Consultants, Inc. The MA references the 2016 Connecticut State Building Code (CSBC); however, the State of Connecticut has adopted the 2018 CSBC effective October 1, 2018.

Therefore, the exempt modification request remains incomplete at this time. The Council recommends that Smartlink, LLC provide an updated Mount Analysis that comports with the current 2018 CSBC on or before October 31, 2019. If additional time is needed to gather the requested information, please submit a written request for an extension of time prior to October 31, 2019. **Please provide an electronic version and one hard copy of the requested information for the incomplete exempt modification to be rendered complete and processed. Please include the Council's exempt modification identification number referenced above with the submittal.**

This notice of incompletion shall have the effect of tolling the Federal Communications Commission (FCC) 60-day timeframe in accordance with Paragraph 217 of the FCC Wireless Infrastructure Report and Order issued on October 21, 2014 (FCC 14-153).

Thank you for your attention to this matter. Should you have any questions, please feel free to contact me at 860-827-2951.

Sincerely,

Melanie Bachman
Executive Director

MAB/IN/emr

c: The Honorable Harry W. Rilling, Mayor, City of Norwalk
Steven Kleppin, Director of Planning & Zoning, City of Norwalk

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VIA ELECTRONIC MAIL

September 20, 2019

Kristina Cottone
Real Estate Specialist
Smartlink, LLC
85 Rangeway Road, Building 3, Suite 102
Billerica, MA 01862

RE: **EM-AT&T-103-190916 –** AT&T Mobility, LLC notice of intent to modify an existing telecommunications facility located at 600 Connecticut Avenue, Norwalk, Connecticut.

Dear Ms. Cottone:

The Connecticut Siting Council (Council) received a notice of intent to modify the above-referenced facility on September 16, 2019.

According to Section 16-50j-71 of the Regulations of Connecticut State Agencies, "...any modification, as defined in Section 16-50j-2a of the Regulations of Connecticut State Agencies, to an existing tower site, except as specified in Sections 16-50j-72 and 16-50j-88 of the Regulations of Connecticut State Agencies, may have a substantial adverse environmental effect."

Staff has reviewed this exempt modification request for completeness and has identified the following deficiencies in the submittal:

1. The request lacks documentation of the original facility approval and any conditions of such approval; and
2. An Antenna Mount Analysis indicating the ability of the existing and proposed antenna mounts to support the proposed equipment loading has not been provided.

Therefore, the exempt modification request is incomplete at this time. The Council recommends that Smartlink, LLC provide documentation showing the original facility approval with conditions if any, and a passing (<100%) antenna mount analysis, on or before October 18, 2019. If additional time is needed to gather the requested information, please submit a written request for an extension of time prior to October 18, 2019. **Please provide an electronic version and one hard copy of the requested information for the incomplete exempt modification to be rendered complete and processed. Please include the Council's EM identification number referenced above with the submittal.**

This notice of incompletion shall have the effect of tolling the Federal Communications Commission (FCC) 60-day timeframe in accordance with Paragraph 217 of the FCC Wireless Infrastructure Report and Order issued on October 21, 2014 (FCC 14-153).

Thank you for your attention to this matter. Should you have any questions, please feel free to contact me at 860-827-2951.

Sincerely,

Melanie Bachman
Executive Director

MAB/IN/emr

c: The Honorable Harry W. Rilling, Mayor, City of Norwalk
Steven Kleppin, Director of Planning & Zo[illegible] Norwalk

FULLERTON
ENGINEERING · DESIGN

Fullerton Engineering Consultants, Inc.
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
Tel: 847.908.8400
www.fullertonengineering.com

December 5, 2018

RE:	**AT&T LTE 4C/5C/6C/7C/ RRH ADD**
Prepared For:	Smartlink / AT&T
Site Number:	CTL02108
FA Location:	10034974
Pace Number:	MRCTB025283/MRCTB025338/MRCTB025304/ MRCTB026716/MRCTB017068
Site Name:	NORWALK WEST-CT AVE.
Site Address:	613 Connecticut Avenue Norwalk, CT 06850

To Whom It May Concern,

This structural assessment is in regards to the adequacy of the existing low profile platform with handrails for the AT&T LTE 4C/5C/6C/7C/RRH ADD project. The purpose was to determine conformance of the existing antenna mounting structure under the 2016 Connecticut State Building Code and the industry standard ANSI/TIA-222-G (Structural Standards for Steel Antenna Towers and Antenna Supporting Structures). The antenna and the equipment supports were rated to the code requirement of 121 mph ultimate design wind speed, 110 mph (3-second gust) basic wind speed, and an ice thickness of 0.75in. In addition, the mount has been analyzed for various live loading conditions consisting of a 250-pound man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at mount pipe locations using a 3-second gust wind speed of 30 mph.

Based on collected information via a site visit dated 10/22/2018, technical data of the proposed equipment, structural calculations and engineering judgment, the existing low-profile platform with handrails is **adequate** to support the proposed installation for the above-referenced program. For installation details, see latest construction drawings prepared by Fullerton Engineering.

This PE certification completed by Fullerton Engineering Consultants 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 existing 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.

Respectfully,

Henry M. Bellagamba, P.E.

FULLERTON
ENGINEERING · DESIGN

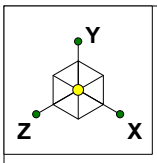
Fullerton Engineering Consultants, Inc.
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
Tel: 847.908.8400
www.fullertonengineering.com

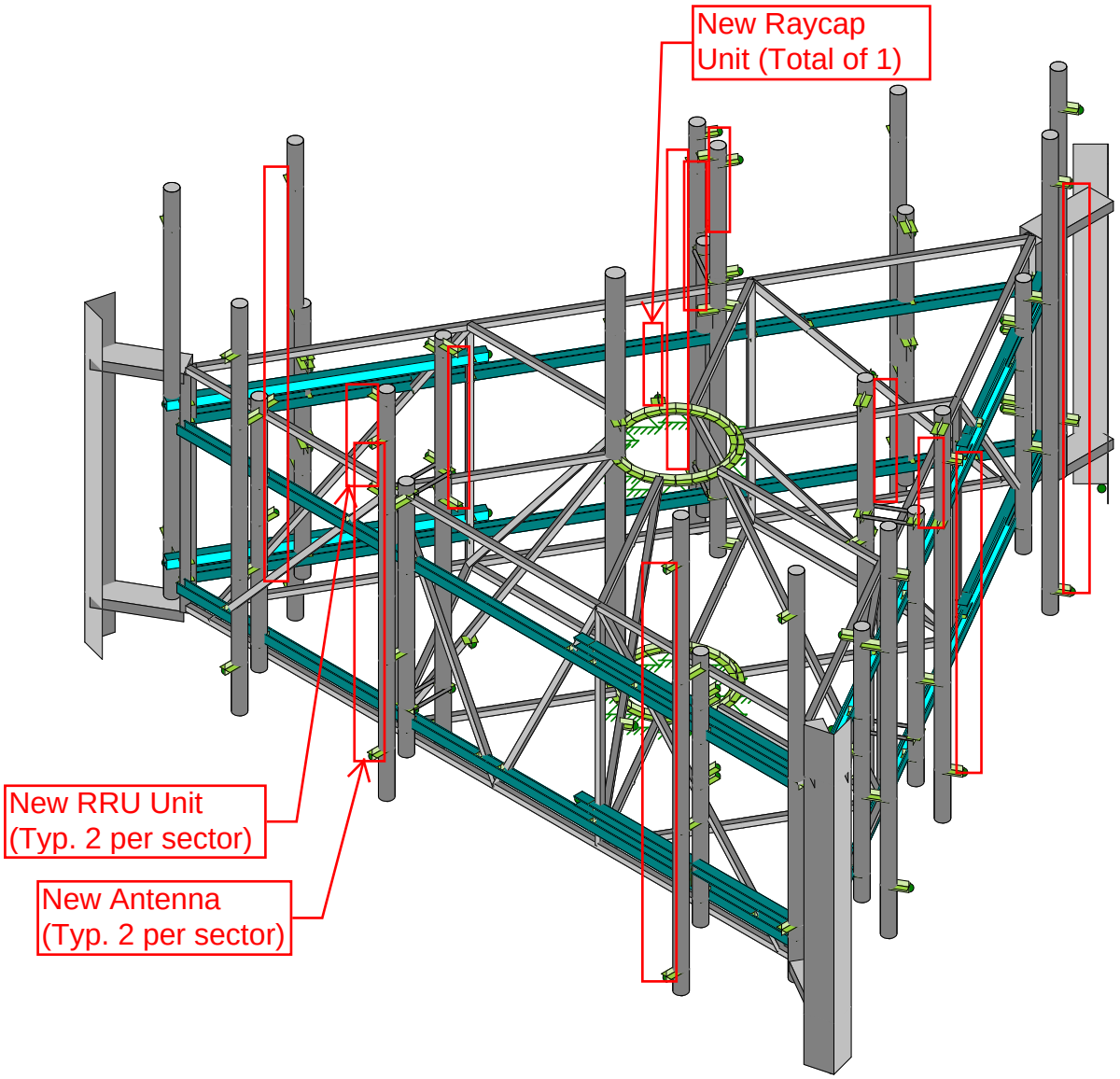
Site Number: **CTL02108**
Site Name: Norwalk West-Ct Ave.
Created By: RH
Checked By: BK
Date: 12/5/2018
Code: ANSI/TIA-222-G

Sectors	3
Ka	0.9

Base Structure Type	**Type**	Monopole	
Structure Height Above Grade (ft)	**Ht**	150.00	
RAD Center (ft)	**z**	135.00	
Windspeed no ice (mph, 3-sec gust)	**V**	110.00	see wind maps
Windspeed with ice (mph, 3-sec gust)	**Vi**	50.00	see wind maps
Windspeed for maintenance (mph, 3-sec gust)	**Vm**	30.00	Section 16.6
Ice Thickness	**ti**	0.75	see ice maps
Exposure Category (B/C/D)	**Exposure**	B	Section 2.6.5.1
Topographic Category (1,2,3,4)	**Topo**	1	Section 2.6.6.2
Structure Class (I,II,III)	**Class**	II	Table 2-1
Crest Height (or assume 5ft)	**C**	5.00	Section 2.6.6.4
Gust Effect Factor	**Gh**	0.85	Section 2.6.7.1
Design Ice Thickness	**tiz**	1.73	Section 2.6.8
Velocity Pressure for Maintenance	**qzm**	2.12	
Velocity Pressure With Ice	**qzi**	6.55	Section 2.6.9.6
Velocity Pressure No Ice	**qz**	31.68	Section 2.6.9.6

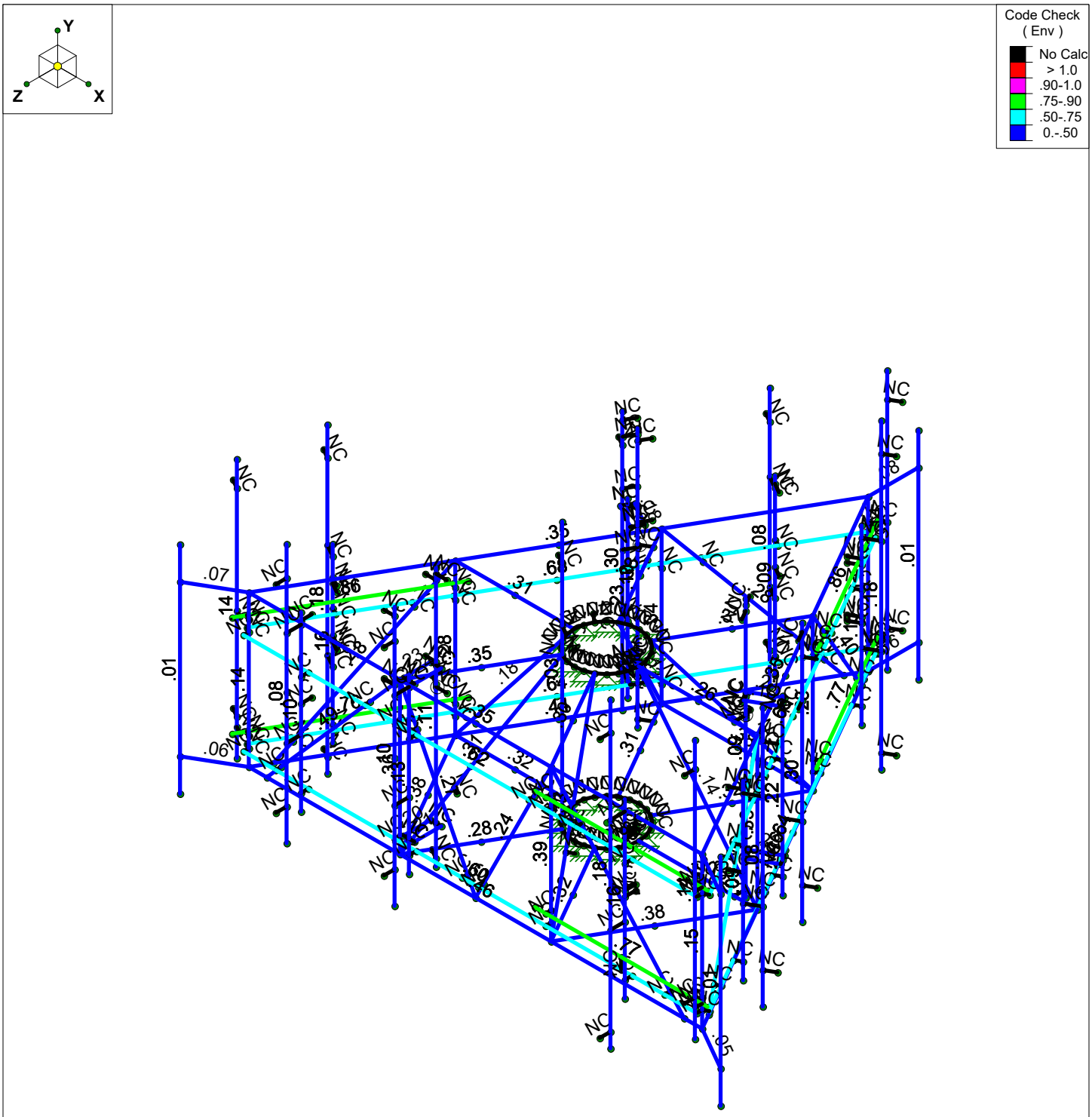
Appurtenance Properties								Loads (force per connection)							
Manufacturer	**Model**	**R/F**	**L**	**W**	**D**	**Weight**	**# Conn**	**Wt**	**Ice Wt**	**F no ice**	**S no ice**	**F ice**	**S ice**	**Fm**	**Sm**
Quintel	66512-2	Flat	72	12	9.6	111	2	55.5	85.7	99	82	26	23	7	6
Commscope	SBNHH-1D65A	Flat	55	11.9	7.1	43.5	2	21.8	53.8	71	47	20	14	5	3
Powerwave	7770	Flat	55	11	5	39	2	19.5	43.0	67	35	19	12	4	2
Ericsson	RRUS 32 B2	Flat	27.2	12.1	7	53	2	26.5	28.9	33	20	10	7	2	1
Ericsson	RRUS 4478 B14	Flat	16.5	13.4	7.7	59.5	2	29.8	22.5	22	13	7	5	1	1
Ericsson	RRUS-11	Flat	19.7	17	7.2	50	2	25.0	26.0	34	14	10	5	2	1
Ericsson	RRUS 32	Flat	27.2	12.1	7	60	2	30.0	28.9	33	20	10	7	2	1
Powerwave	LGP-21401	Flat	14.4	9.2	2.6	14.1	2	7.1	10.0	13	4	5	2	1	0
Raycap	DC6-48-60-18-8F	Round	24	9.7	9.7	32.8	1	32.8	63.9	27	27	9	9	2	2
						520.5									
	HSS1x1x8	Flat	126	1	1	0	10.5	0.0	6.6	4	4	4	4	0	0
	C3x6	Flat	42	3	1.6	0	3.500	0.0	10.8	10	6	4	3	1	1
	C5x6.7	Flat	14	5	1.8	0	1.167	0.0	14.9	12	5	5	3	1	1
	L5x5x5	Flat	60	5	5	0	5	0.0	18.6	16	16	5	5	1	1
	Unistrut	Flat	126	1.6	1.6	0	10.5	0.0	8.4	6	6	4	4	0	0
	Pipe 2.0	Round	72	2.4	2.4	0	6	0.0	8.7	6	6	2	2	0	0
	Pipe 2.0	Round	96	2.4	2.4	0	8	0.0	8.7	6	6	3	3	0	0
	Pipe 2.5	Round	96	2.9	2.9	0	8	0.0	9.8	7	7	3	3	0	0





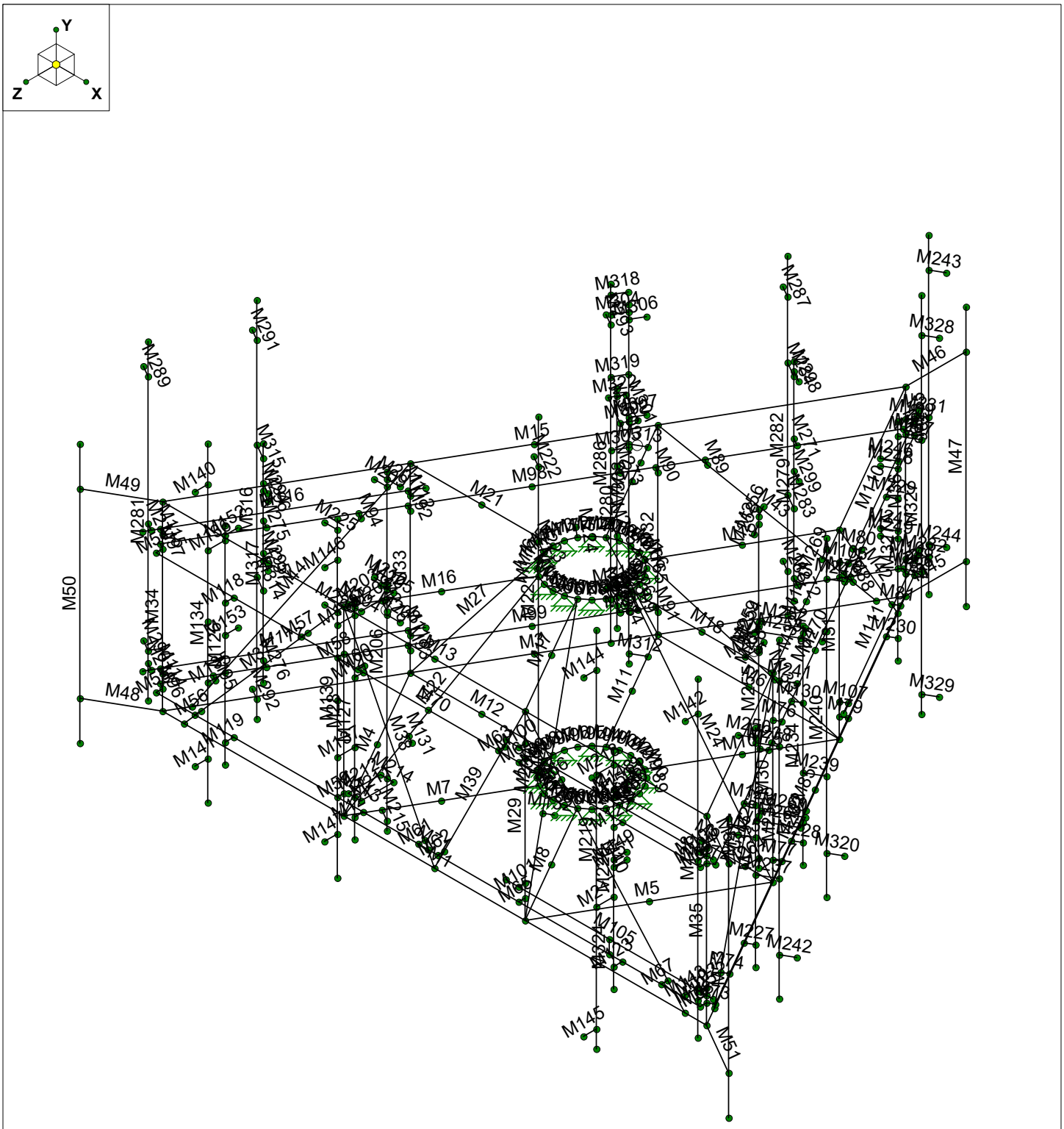
Envelope Only Solution

Fullerton Engineering Con...		SK - 1
RH	Mount Analysis	Dec 5, 2018 at 6:12 PM
CTL02108	3D Render	CTL02108 - Mount Analysis - Con...



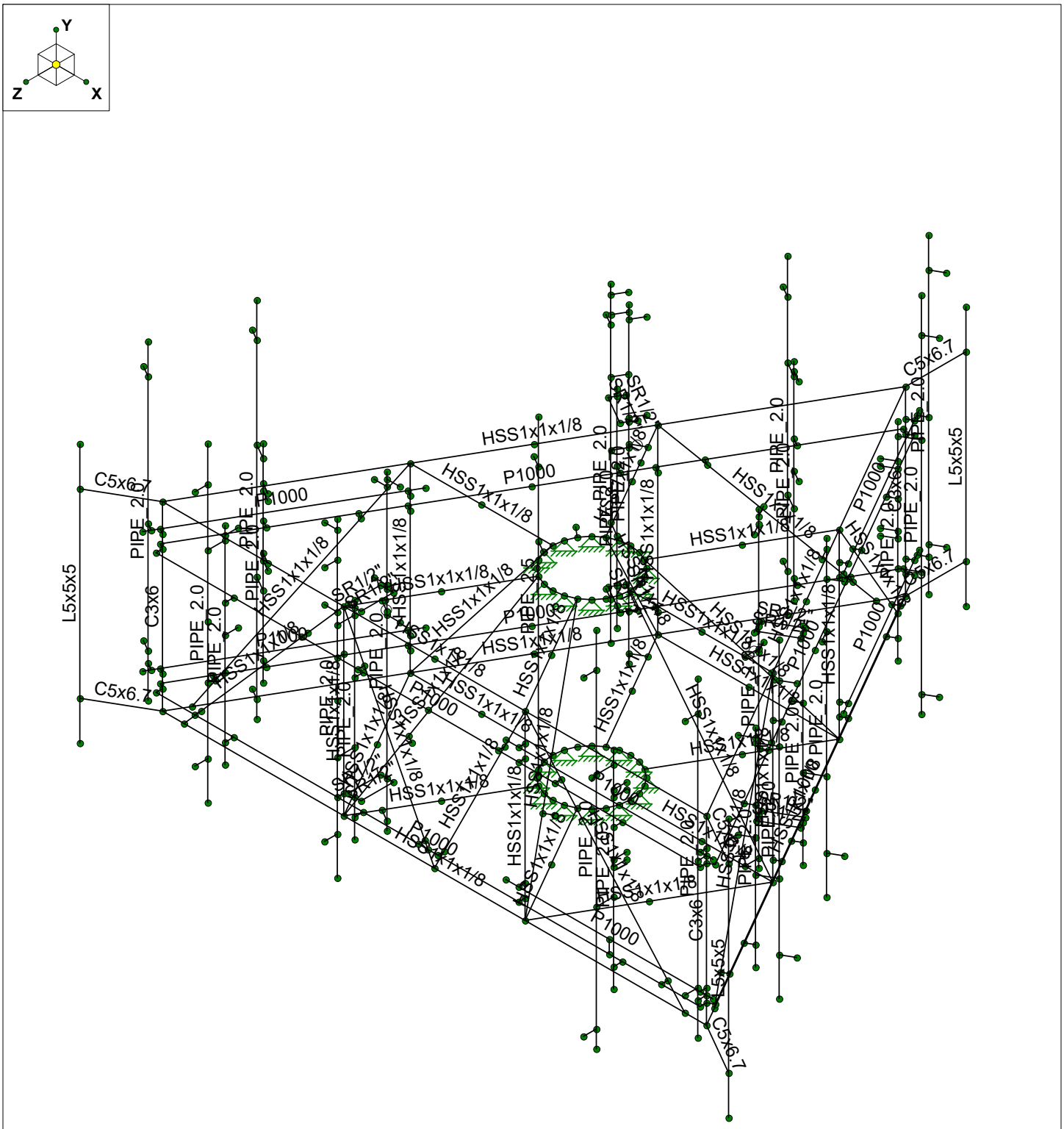
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Fullerton Engineering Con...		SK - 2
RH	Mount Analysis	Dec 5, 2018 at 6:13 PM
CTL02108	Unity Graphic	CTL02108 - Mount Analysis - Con...



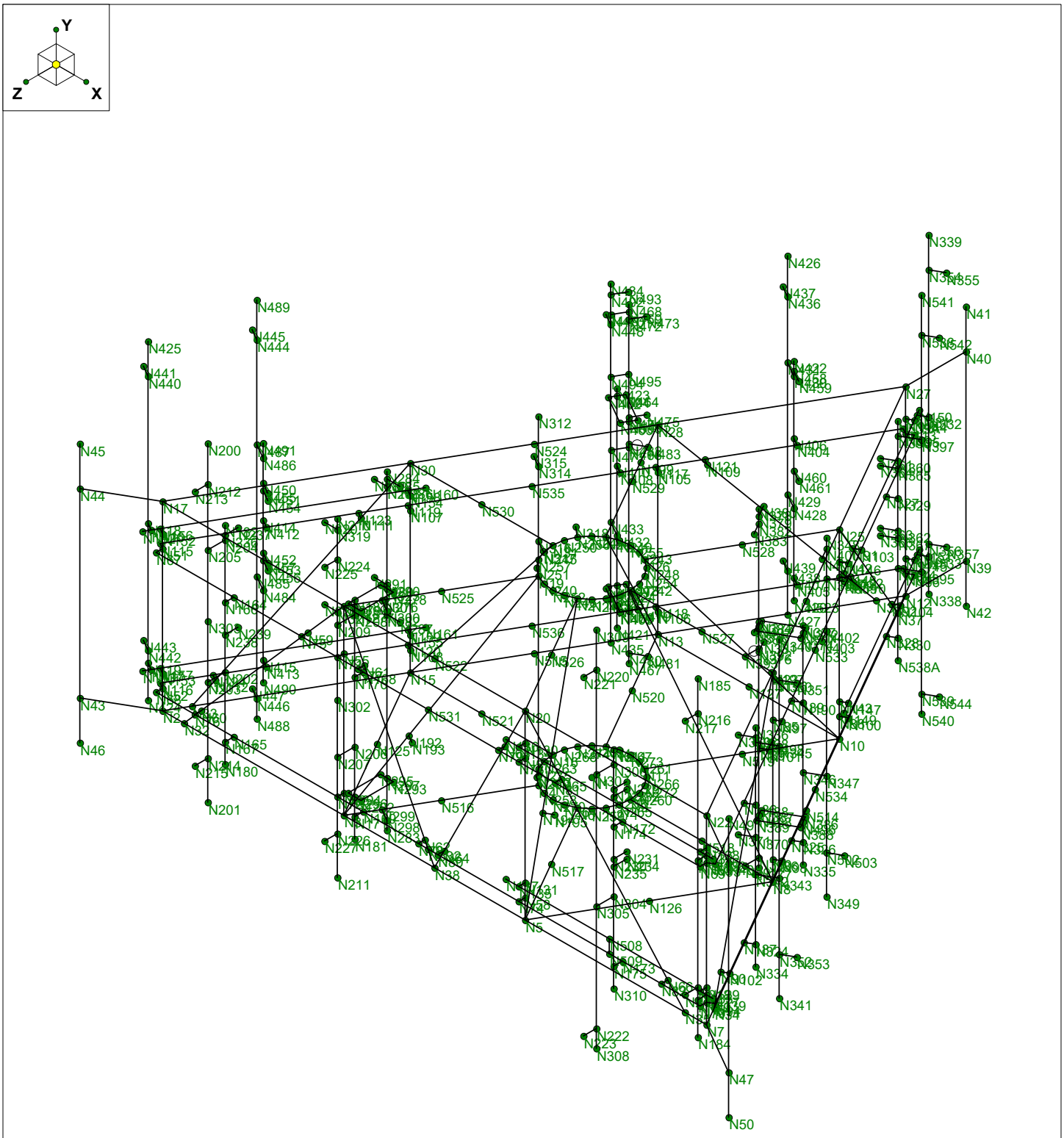
Envelope Only Solution

Fullerton Engineering Con...		SK - 3
RH	Mount Analysis	Dec 5, 2018 at 6:14 PM
CTL02108	Member Label	CTL02108 - Mount Analysis - Con...



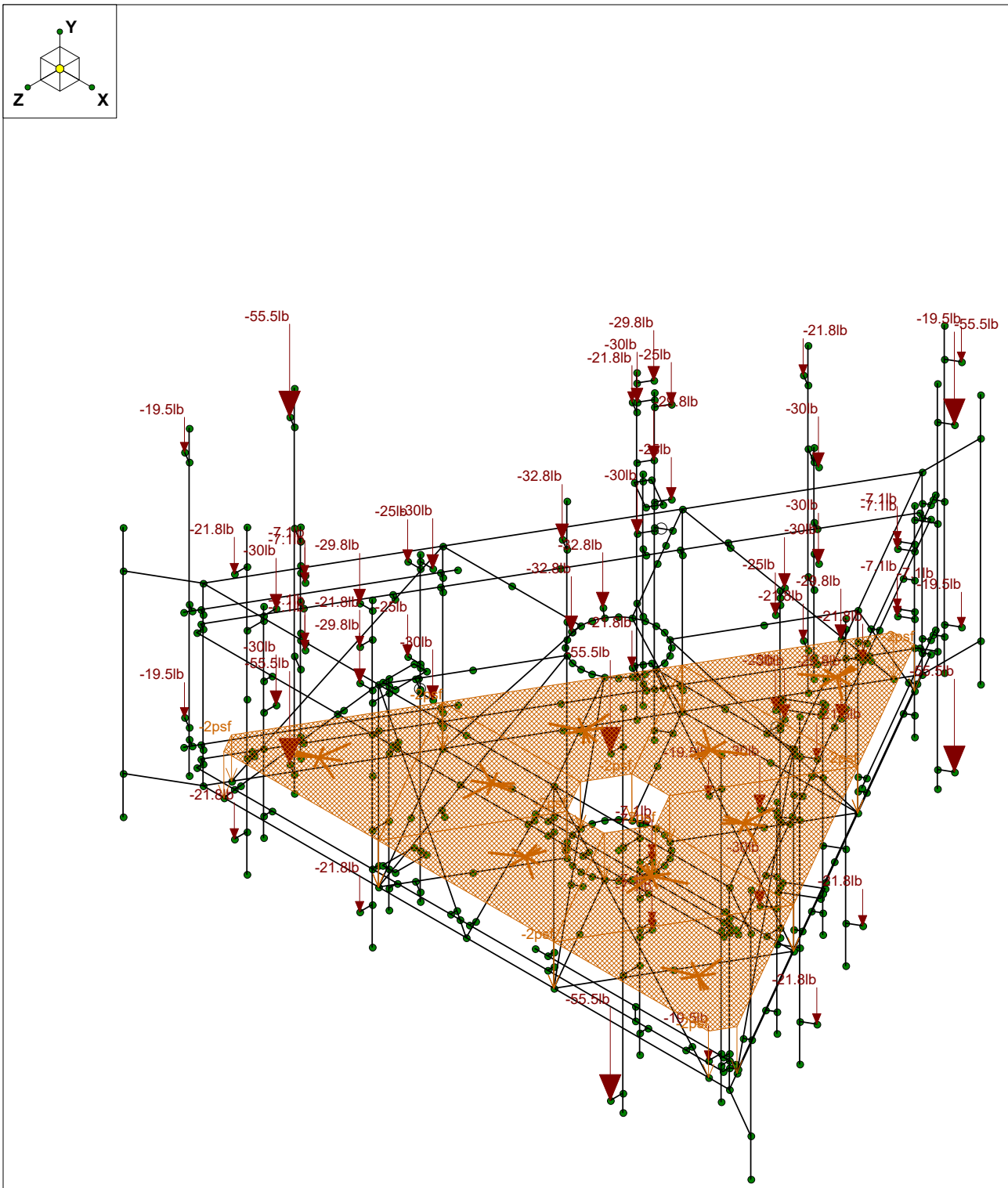
Envelope Only Solution

Fullerton Engineering Con...		SK - 4
RH	Mount Analysis	Dec 5, 2018 at 6:15 PM
CTL02108	Shape	CTL02108 - Mount Analysis - Con...



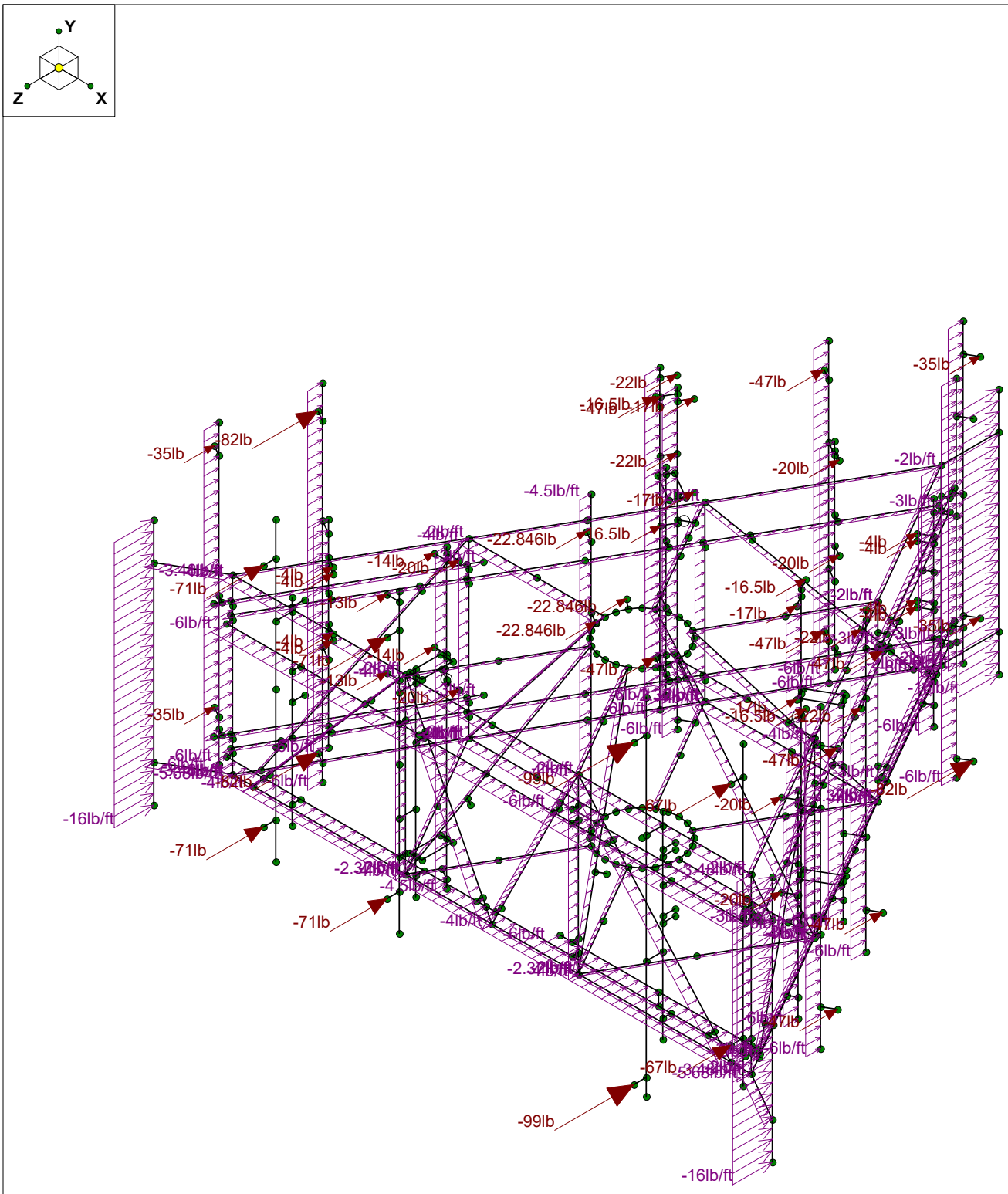
Envelope Only Solution

Fullerton Engineering Con...		SK - 5
RH	Mount Analysis	Dec 5, 2018 at 6:16 PM
CTL02108	Nodes	CTL02108 - Mount Analysis - Con...



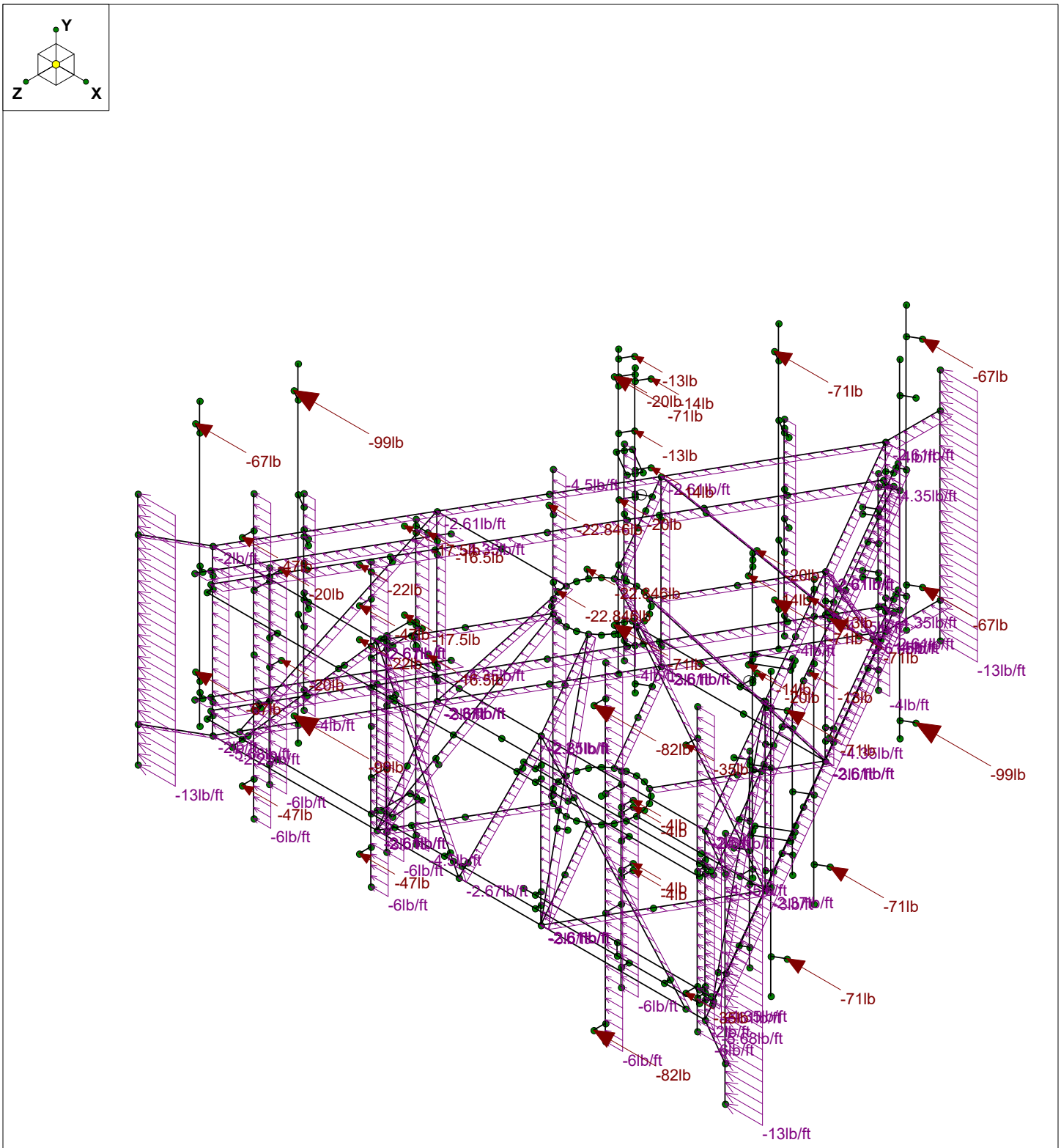
Loads: BLC 1, DL
Envelope Only Solution

Fullerton Engineering Con...		SK - 6
RH	Mount Analysis	Dec 5, 2018 at 6:17 PM
CTL02108	Dead Load	CTL02108 - Mount Analysis - Con...



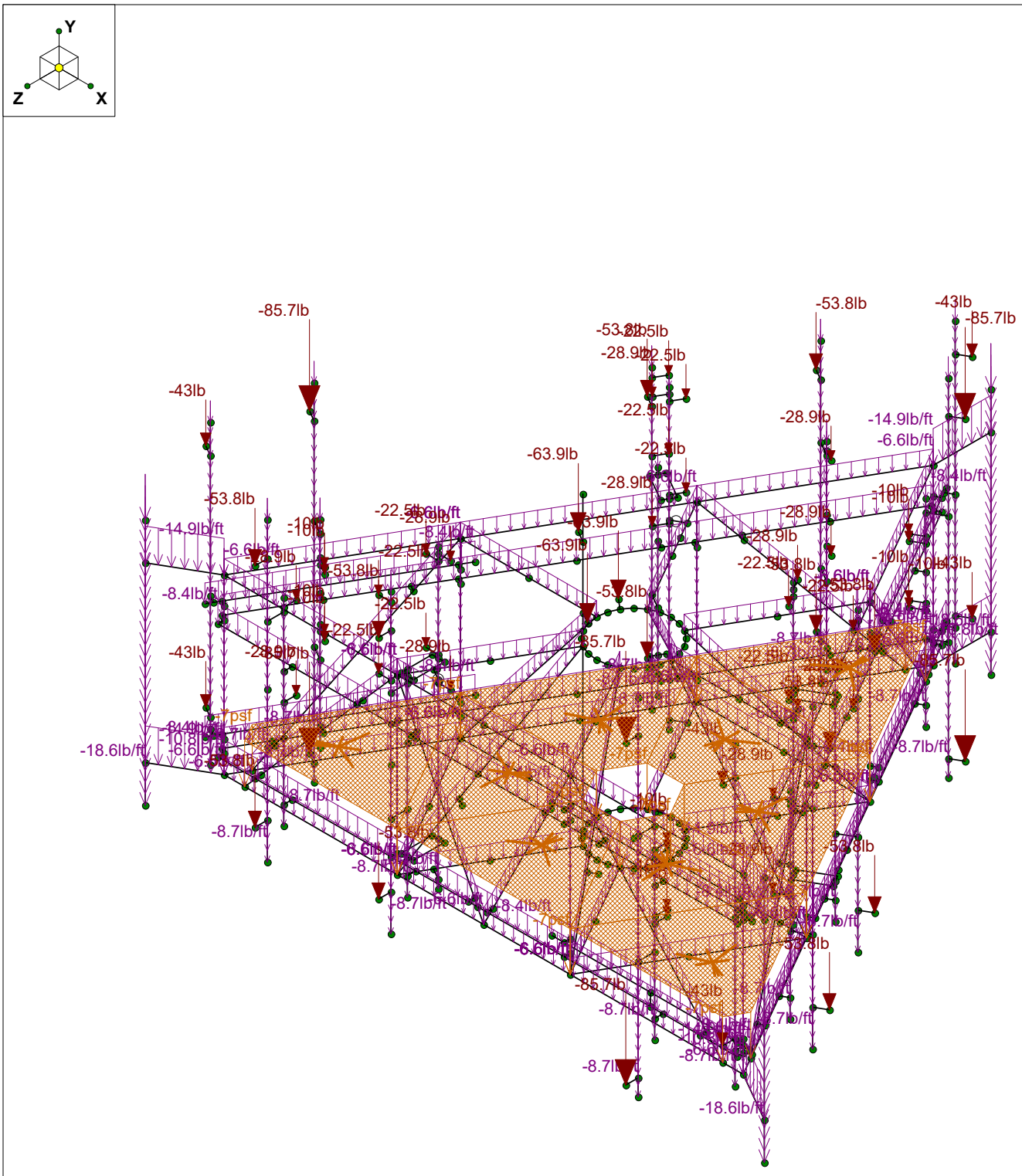
Loads: BLC 3, WL(0)
Envelope Only Solution

Fullerton Engineering Con...		SK - 7
RH	Mount Analysis	Dec 5, 2018 at 6:18 PM
CTL02108	Wind Load (Z-Direction)	CTL02108 - Mount Analysis - Con...



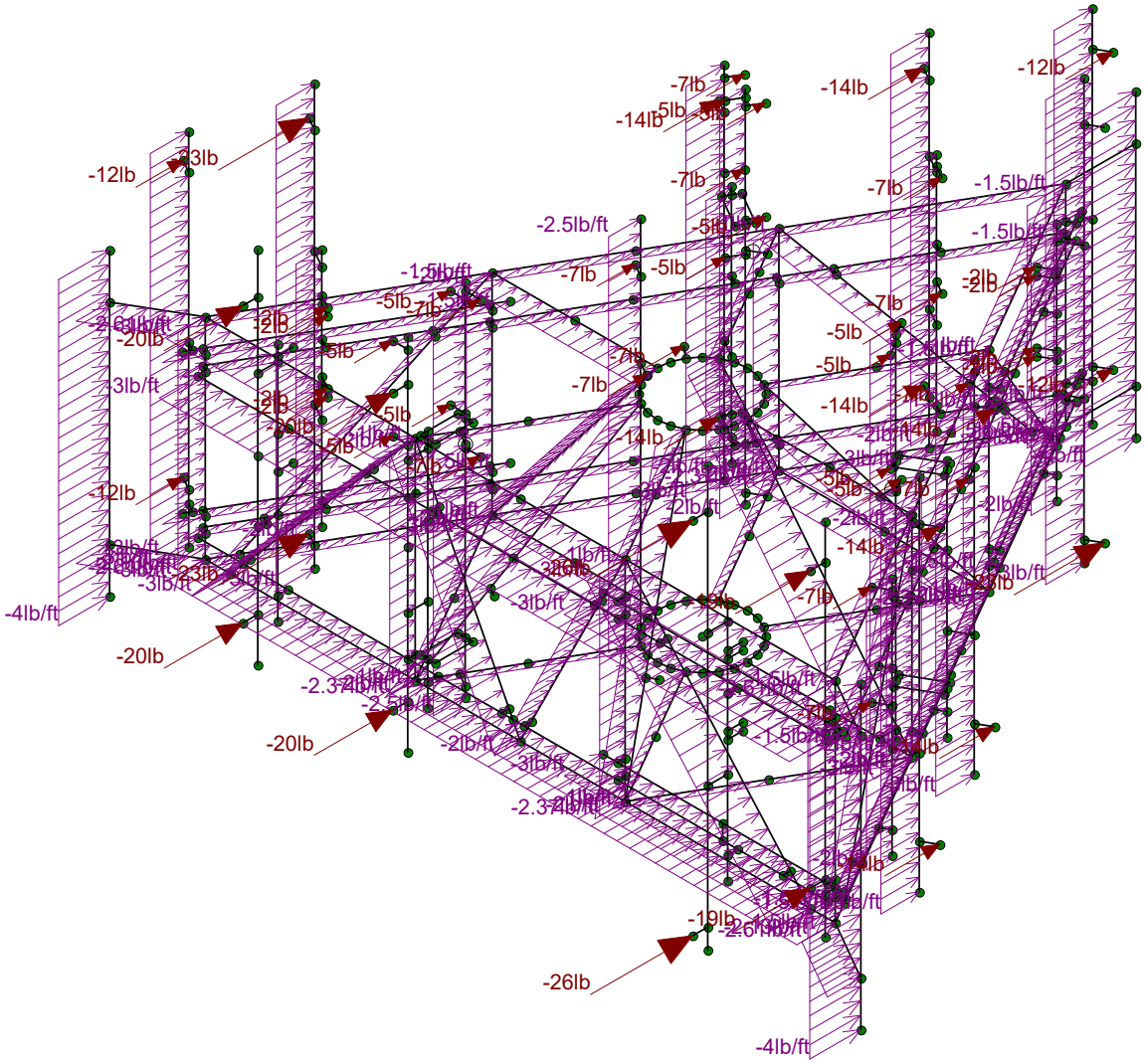
Loads: BLC 4, WL(90)
Envelope Only Solution

Fullerton Engineering Con...		SK - 8
RH	Mount Analysis	Dec 5, 2018 at 6:18 PM
CTL02108	Wind Load (X-Direction)	CTL02108 - Mount Analysis - Con...



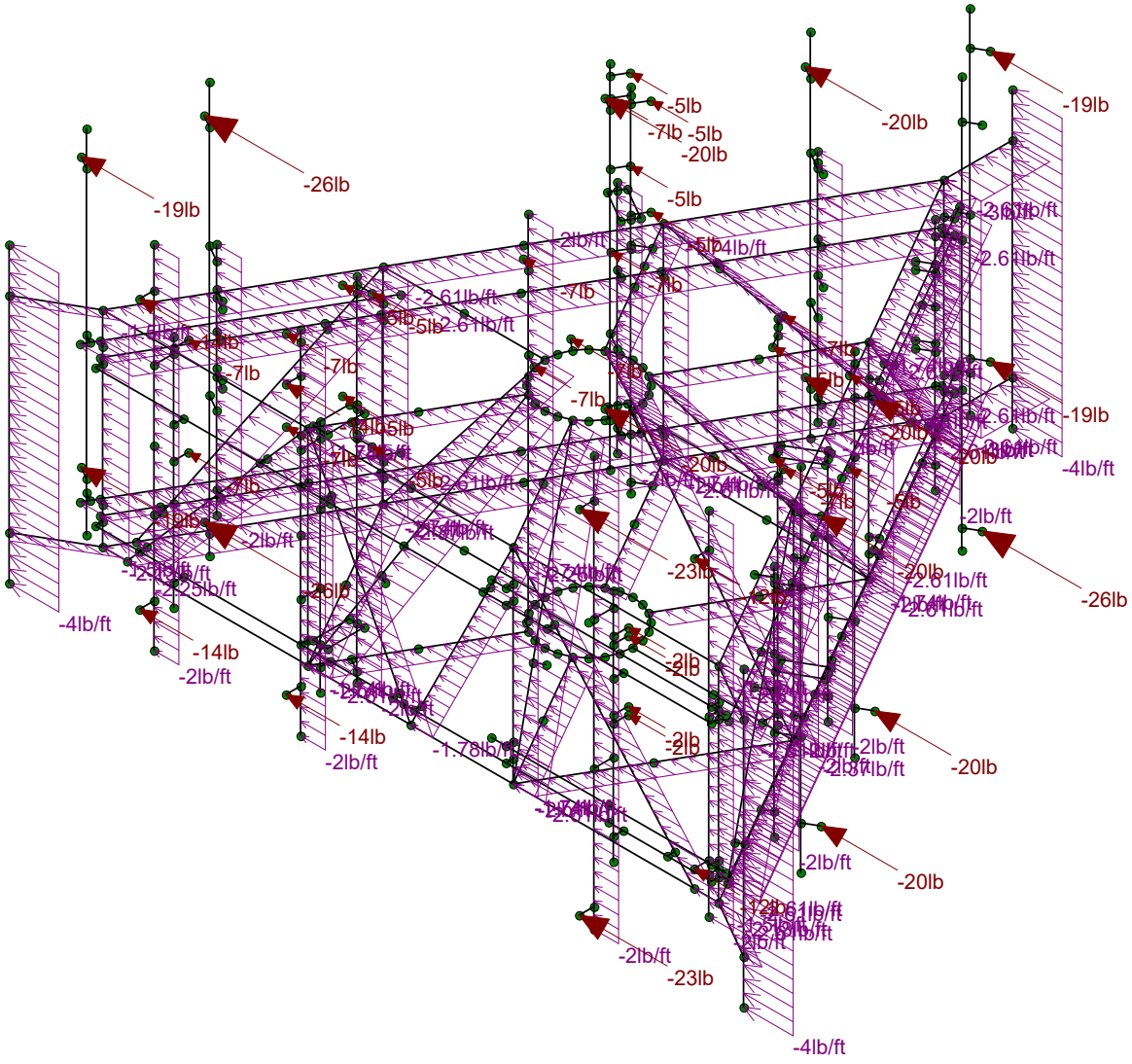
Loads: BLC 2, DLi
Envelope Only Solution

Fullerton Engineering Con...		SK - 9
RH	Mount Analysis	Dec 5, 2018 at 6:19 PM
CTL02108	Ice Load	CTL02108 - Mount Analysis - Con...



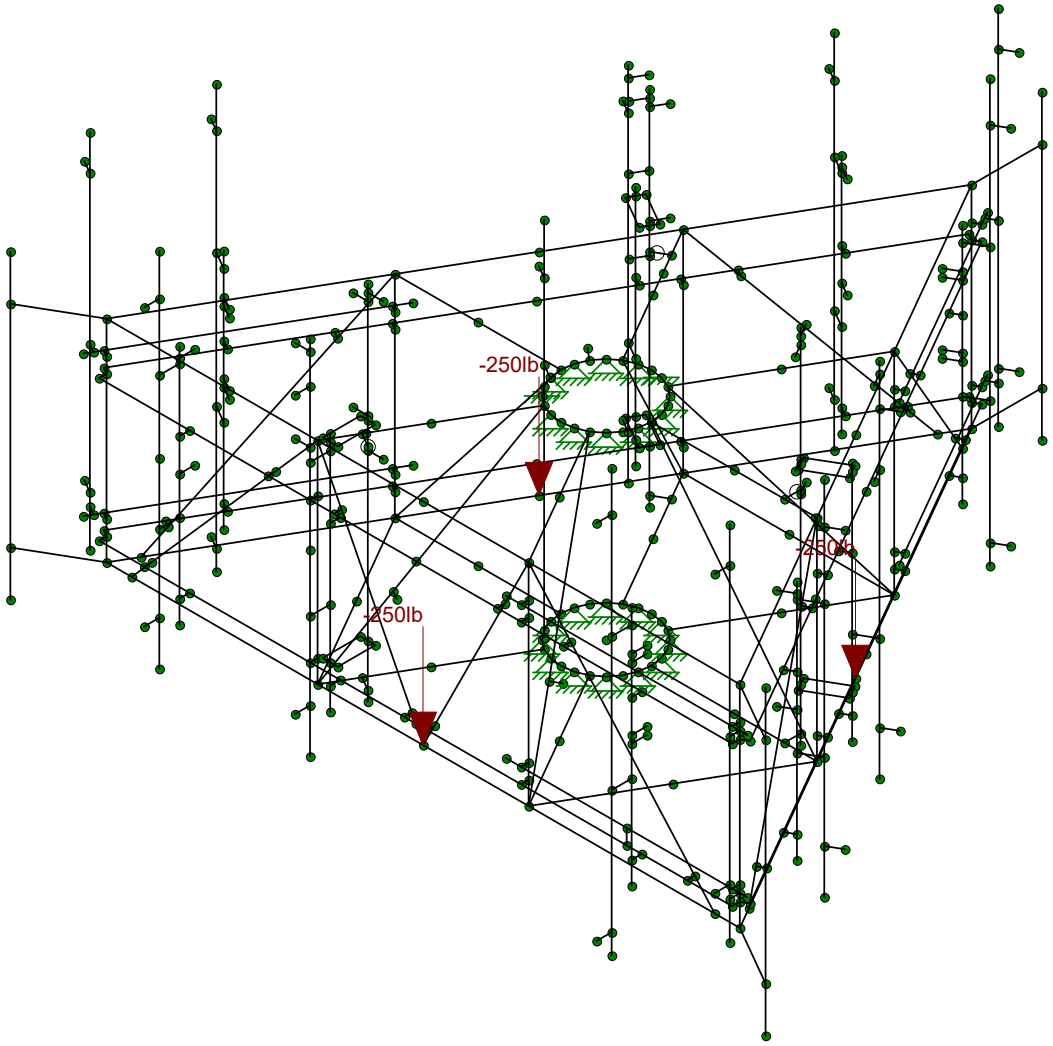
Loads: BLC 5, WL.i(0)
Envelope Only Solution

Fullerton Engineering Con...		SK - 10
RH	Mount Analysis	Dec 5, 2018 at 6:21 PM
CTL02108	Wind Load with Ice (Z-Direction)	CTL02108 - Mount Analysis - Con...



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

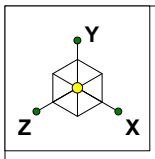
Fullerton Engineering Con...		SK - 11
RH	Mount Analysis	Dec 5, 2018 at 6:22 PM
CTL02108	Wind Load with Ice (X-Direction)	CTL02108 - Mount Analysis - Con...

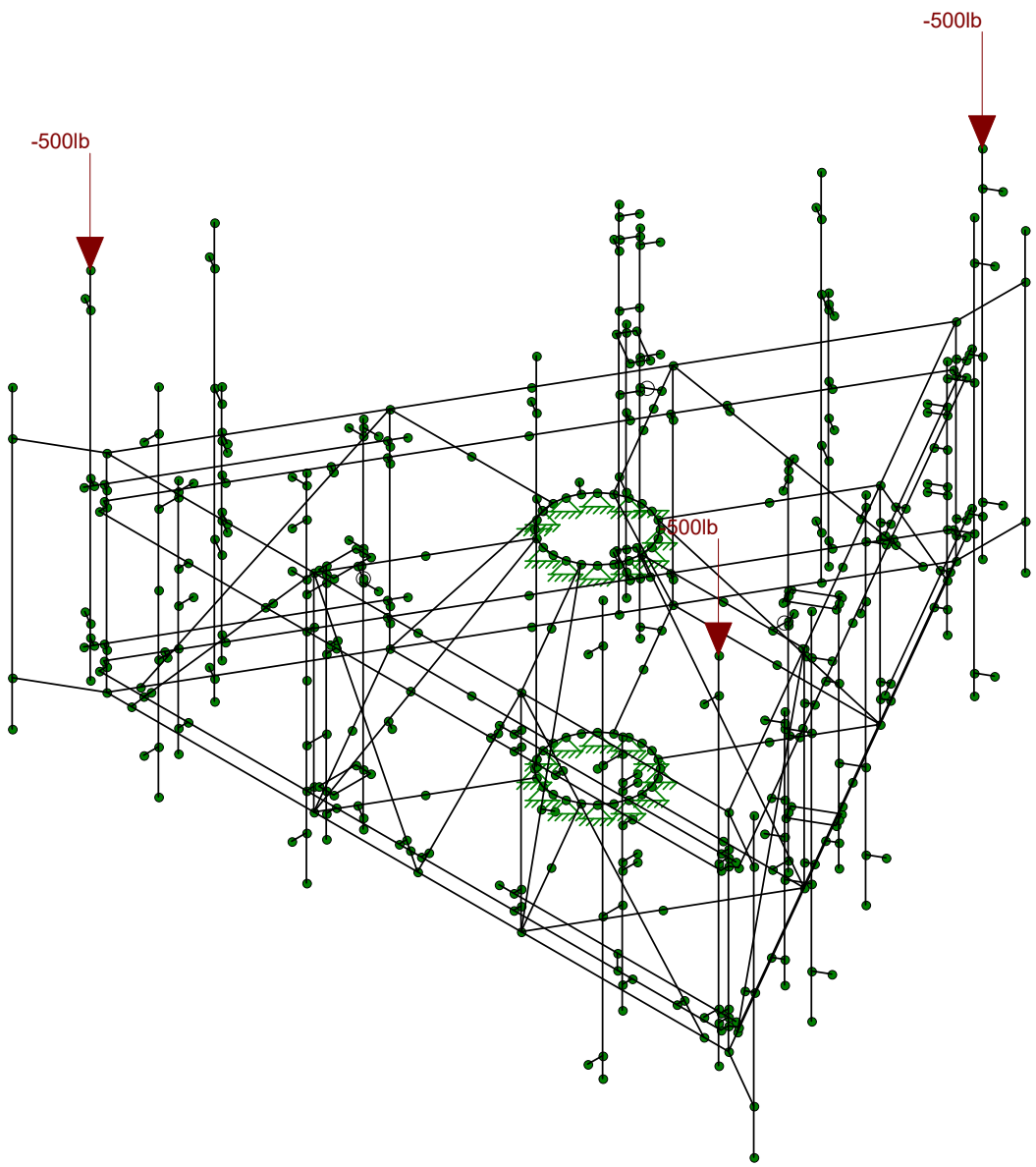


250 lb Live Loads are applied on each face horizontal and standoff members.
Only one is shown for clarification purposes but all are considered in the calculations.

Loads: BLC 10, LV1
Envelope Only Solution

Fullerton Engineering Con...		SK - 12
RH	Mount Analysis	Dec 5, 2018 at 6:22 PM
CTL02108	250 lb Live Load	CTL02108 - Mount Analysis - Con...





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

Loads: BLC 12, LM1
Envelope Only Solution

Fullerton Engineering Con...		SK - 13
RH	Mount Analysis	Dec 5, 2018 at 6:23 PM
CTL02108	500 lb Live Load	CTL02108 - Mount Analysis - Con...

(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)	12
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 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): LRFD
Cold Formed Steel Code	AISI S100-12: LRFD
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building

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

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(M...	Surface...
1	DL	None		-1		63			9	
2	DLi	None				63		89	9	
3	WL(0)	None				56		81		
4	WL(90)	None				50		66		
5	WL.i(0)	None				56		81		
6	WL.i(90)	None				50		67		
7	T	None								
8	WM(0)	None				45		51		
9	WM(90)	None				43		45		
10	LV1	None				3				
11	LV2	None				3				
12	LM1	None				3				
13	LM2	None				3				
14	LM3	None				3				
15	LM4	None				3				
16	LM5	None				3				
17	LM6	None				3				
18	LM7	None				3				
19	LM8	None				1				
20	LV3	None				3				
21	LV4	None				3				
22	LV5	None				3				
23	LV6	None				6				
24	LV7	None				3				
25	LV8	None								
26	BLC 1 Transient Area Loads	None						153		
27	BLC 2 Transient Area Loads	None						153		

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2*DL + 1.6 * WL(0)	Yes	Y		1	1.2	3	1.6																
2	1.2*DL + 1.6* WL(30)	Yes	Y		1	1.2	3	1.39	4	.8														
3	1.2*DL + 1.6* WL(60)	Yes	Y		1	1.2	3	.8	4	1.39														
4	1.2*DL + 1.6*WL(90)	Yes	Y		1	1.2	4	1.6																
5	1.2*DL + 1.6*WL(120)	Yes	Y		1	1.2	3	-.8	4	1.39														
6	1.2*DL +1.6*WL(150)	Yes	Y		1	1.2	3	-1.39	4	.8														
7	1.2*DL + 1.6 * WL(180)	Yes	Y		1	1.2	3	-1.6																
8	1.2*DL + 1.6* WL(210)	Yes	Y		1	1.2	3	-1.39	4	-.8														
9	1.2*DL + 1.6* WL(240)	Yes	Y		1	1.2	3	-.8	4	-1.39														
10	1.2*DL + 1.6*WL(270)	Yes	Y		1	1.2	4	-1.6																
11	1.2*DL + 1.6*WL(300)	Yes	Y		1	1.2	3	.8	4	-1.39														
12	1.2*DL +1.6*WL(330)	Yes	Y		1	1.2	3	1.39	4	-.8														
13	1.2*DL+1.0*DLi+1.0*WL.i(0)+1.0*T	Yes	Y		1	1.2	2	1	5	1	7	1												
14	1.2*DL+1.0*DLi+1.0*WL.i(30)+1.0...	Yes	Y		1	1.2	2	1	5	.866	6	.5	7											
15	1.2*DL+1.0*DLi+1.0*WL.i(60)+1.0...	Yes	Y		1	1.2	2	1	5	.5	6	.866	7											
16	1.2*DL+1.0*DLi+1.0*WL.i(90)+1.0...	Yes	Y		1	1.2	2	1	6	1	7	1												
17	1.2*DL+1.0*DLi+1.0*WL.i(120)+1....	Yes	Y		1	1.2	2	1	5	-.5	6	.866	7											
18	1.2*DL+1.0*DLi+1.0*WL.i(150)+1....	Yes	Y		1	1.2	2	1	5	-.866	6	.5	7											
19	1.2*DL+1.0*DLi+1.0*WL.i(180)+1....	Yes	Y		1	1.2	2	1	5	-1	7	1												
20	1.2*DL+1.0*DLi+1.0*WL.i(210)+1....	Yes	Y		1	1.2	2	1	5	-.866	6	-.5	7											
21	1.2*DL+1.0*DLi+1.0*WL.i(240)+1....	Yes	Y		1	1.2	2	1	5	-.5	6	-.866	7											
22	1.2*DL+1.0*DLi+1.0*WL.i(270)+1....	Yes	Y		1	1.2	2	1	6	-1	7	1												
23	1.2*DL+1.0*DLi+1.0*WL.i(300)+1....	Yes	Y		1	1.2	2	1	5	.5	6	-.866	7											
24	1.2*DL+1.0*DLi+1.0*WL.i(330)+1....	Yes	Y		1	1.2	2	1	5	.866	6	-.5	7											
25	0.9*DL+1.6*WL(0)	Yes	Y		1	.9	3	1.6																
26	0.9*DL+1.6*WL(30)	Yes	Y		1	.9	3	1.39	4	.8														
27	0.9*DL+1.6*WL(60)	Yes	Y		1	.9	3	.8	4	1.39														
28	0.9*DL+1.6*WL(90)	Yes	Y		1	.9	4	1.6																
29	0.9*DL+1.6*WL(120)	Yes	Y		1	.9	3	-.8	4	1.39														
30	0.9*DL+1.6*WL(150)	Yes	Y		1	.9	3	-1.39	4	.8														
31	0.9*DL+1.6*WL(180)	Yes	Y		1	.9	3	-1.6																
32	0.9*DL+1.6*WL(210)	Yes	Y		1	.9	3	-1.39	4	-.8														
33	0.9*DL+1.6*WL(240)	Yes	Y		1	.9	3	-.8	4	-1.39														
34	0.9*DL+1.6*WL(270)	Yes	Y		1	.9	4	-1.6																
35	0.9*DL+1.6*WL(300)	Yes	Y		1	.9	3	.8	4	-1.39														
36	0.9*DL+1.6*WL(330)	Yes	Y		1	.9	3	1.39	4	-.8														
37	1.2*DL+1.5*LV1	Yes	Y		1	1.2	10	1.5																
38	1.2*DL+1.5*LV2	Yes	Y		1	1.2	11	1.5																
39	1.2*DL+1.5*LM1+1.0*WM(0)	Yes	Y		1	1.2	12	1.5	8	1														
40	1.2*DL+1.5*LM1+1.0*WM(30)	Yes	Y		1	1.2	12	1.5	8	.866	9	.5												
41	1.2*DL+1.5*LM1+1.0*WM(60)	Yes	Y		1	1.2	12	1.5	8	.5	9	.866												
42	1.2*DL+1.5*LM1+1.0*WM(90)	Yes	Y		1	1.2	12	1.5	9	1														
43	1.2*DL+1.5*LM1+1.0*WM(120)	Yes	Y		1	1.2	12	1.5	8	-.5	9	.866												
44	1.2*DL+1.5*LM1+1.0*WM(150)	Yes	Y		1	1.2	12	1.5	8	-.866	9	.5												
45	1.2*DL+1.5*LM1+1.0*WM(180)	Yes	Y		1	1.2	12	1.5	8	-1														
46	1.2*DL+1.5*LM1+1.0*WM(210)	Yes	Y		1	1.2	12	1.5	8	-.866	9	-.5												
47	1.2*DL+1.5*LM1+1.0*WM(240)	Yes	Y		1	1.2	12	1.5	8	-.5	9	-.866												
48	1.2*DL+1.5*LM1+1.0*WM(270)	Yes	Y		1	1.2	12	1.5	9	-1														
49	1.2*DL+1.5*LM1+1.0*WM(300)	Yes	Y		1	1.2	12	1.5	8	.5	9	-.866												
50	1.2*DL+1.5*LM1+1.0*WM(330)	Yes	Y		1	1.2	12	1.5	8	.866	9	-.5												
51	1.2*DL+1.5*LM2+1.0*WM(0)	Yes	Y		1	1.2	13	1.5	8	1														
52	1.2*DL+1.5*LM2+1.0*WM(30)	Yes	Y		1	1.2	13	1.5	8	.866	9	.5												
53	1.2*DL+1.5*LM2+1.0*WM(60)	Yes	Y		1	1.2	13	1.5	8	.5	9	.866												
54	1.2*DL+1.5*LM2+1.0*WM(90)	Yes	Y		1	1.2	13	1.5	9	1														
55	1.2*DL+1.5*LM2+1.0*WM(120)	Yes	Y		1	1.2	13	1.5	8	-.5	9	.866												
56	1.2*DL+1.5*LM2+1.0*WM(150)	Yes	Y		1	1.2	13	1.5	8	-.866	9	.5												

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
57	1.2*DL+1.5*LM2+1.0*WM(180)	Yes	Y		1	1.2	13	1.5	8	-1														
58	1.2*DL+1.5*LM2+1.0*WM(210)	Yes	Y		1	1.2	13	1.5	8	-.866	9	-.5												
59	1.2*DL+1.5*LM2+1.0*WM(240)	Yes	Y		1	1.2	13	1.5	8	-.5	9	-.866												
60	1.2*DL+1.5*LM2+1.0*WM(270)	Yes	Y		1	1.2	13	1.5	9	-1														
61	1.2*DL+1.5*LM2+1.0*WM(300)	Yes	Y		1	1.2	13	1.5	8	.5	9	-.866												
62	1.2*DL+1.5*LM2+1.0*WM(330)	Yes	Y		1	1.2	13	1.5	8	.866	9	-.5												
63	1.2*DL+1.5*LM3+1.0*WM(0)	Yes	Y		1	1.2	14	1.5	8	1														
64	1.2*DL+1.5*LM3+1.0*WM(30)	Yes	Y		1	1.2	14	1.5	8	.866	9	.5												
65	1.2*DL+1.5*LM3+1.0*WM(60)	Yes	Y		1	1.2	14	1.5	8	.5	9	.866												
66	1.2*DL+1.5*LM3+1.0*WM(90)	Yes	Y		1	1.2	14	1.5	9	1														
67	1.2*DL+1.5*LM3+1.0*WM(120)	Yes	Y		1	1.2	14	1.5	8	-.5	9	.866												
68	1.2*DL+1.5*LM3+1.0*WM(150)	Yes	Y		1	1.2	14	1.5	8	-.866	9	.5												
69	1.2*DL+1.5*LM3+1.0*WM(180)	Yes	Y		1	1.2	14	1.5	8	-1														
70	1.2*DL+1.5*LM3+1.0*WM(210)	Yes	Y		1	1.2	14	1.5	8	-.866	9	-.5												
71	1.2*DL+1.5*LM3+1.0*WM(240)	Yes	Y		1	1.2	14	1.5	8	-.5	9	-.866												
72	1.2*DL+1.5*LM3+1.0*WM(270)	Yes	Y		1	1.2	14	1.5	9	-1														
73	1.2*DL+1.5*LM3+1.0*WM(300)	Yes	Y		1	1.2	14	1.5	8	.5	9	-.866												
74	1.2*DL+1.5*LM3+1.0*WM(330)	Yes	Y		1	1.2	14	1.5	8	.866	9	-.5												
75	1.2*DL+1.5*LM4+1.0*WM(0)	Yes	Y		1	1.2	15	1.5	8	1														
76	1.2*DL+1.5*LM4+1.0*WM(30)	Yes	Y		1	1.2	15	1.5	8	.866	9	.5												
77	1.2*DL+1.5*LM4+1.0*WM(60)	Yes	Y		1	1.2	15	1.5	8	.5	9	.866												
78	1.2*DL+1.5*LM4+1.0*WM(90)	Yes	Y		1	1.2	15	1.5	9	1														
79	1.2*DL+1.5*LM4+1.0*WM(120)	Yes	Y		1	1.2	15	1.5	8	-.5	9	.866												
80	1.2*DL+1.5*LM4+1.0*WM(150)	Yes	Y		1	1.2	15	1.5	8	-.866	9	.5												
81	1.2*DL+1.5*LM4+1.0*WM(180)	Yes	Y		1	1.2	15	1.5	8	-1														
82	1.2*DL+1.5*LM4+1.0*WM(210)	Yes	Y		1	1.2	15	1.5	8	-.866	9	-.5												
83	1.2*DL+1.5*LM4+1.0*WM(240)	Yes	Y		1	1.2	15	1.5	8	-.5	9	-.866												
84	1.2*DL+1.5*LM4+1.0*WM(270)	Yes	Y		1	1.2	15	1.5	9	-1														
85	1.2*DL+1.5*LM4+1.0*WM(300)	Yes	Y		1	1.2	15	1.5	8	.5	9	-.866												
86	1.2*DL+1.5*LM4+1.0*WM(330)	Yes	Y		1	1.2	15	1.5	8	.866	9	-.5												
87	1.2*DL+1.5*LM5+1.0*WM(0)	Yes	Y		1	1.2	16	1.5	8	1														
88	1.2*DL+1.5*LM5+1.0*WM(30)	Yes	Y		1	1.2	16	1.5	8	.866	9	.5												
89	1.2*DL+1.5*LM5+1.0*WM(60)	Yes	Y		1	1.2	16	1.5	8	.5	9	.866												
90	1.2*DL+1.5*LM5+1.0*WM(90)	Yes	Y		1	1.2	16	1.5	9	1														
91	1.2*DL+1.5*LM5+1.0*WM(120)	Yes	Y		1	1.2	16	1.5	8	-.5	9	.866												
92	1.2*DL+1.5*LM5+1.0*WM(150)	Yes	Y		1	1.2	16	1.5	8	-.866	9	.5												
93	1.2*DL+1.5*LM5+1.0*WM(180)	Yes	Y		1	1.2	16	1.5	8	-1														
94	1.2*DL+1.5*LM5+1.0*WM(210)	Yes	Y		1	1.2	16	1.5	8	-.866	9	-.5												
95	1.2*DL+1.5*LM5+1.0*WM(240)	Yes	Y		1	1.2	16	1.5	8	-.5	9	-.866												
96	1.2*DL+1.5*LM5+1.0*WM(270)	Yes	Y		1	1.2	16	1.5	9	-1														
97	1.2*DL+1.5*LM5+1.0*WM(300)	Yes	Y		1	1.2	16	1.5	8	.5	9	-.866												
98	1.2*DL+1.5*LM5+1.0*WM(330)	Yes	Y		1	1.2	16	1.5	8	.5	9	-.866												
99	1.2*DL+1.5*LM6+1.0*WM(30)	Yes	Y		1	1.2	17	1.5	8	.866	9	.5												
100	1.2*DL+1.5*LM6+1.0*WM(60)	Yes	Y		1	1.2	17	1.5	8	.5	9	.866												
101	1.2*DL+1.5*LM6+1.0*WM(90)	Yes	Y		1	1.2	17	1.5	9	1														
102	1.2*DL+1.5*LM6+1.0*WM(120)	Yes	Y		1	1.2	17	1.5	8	-.5	9	.866												
103	1.2*DL+1.5*LM6+1.0*WM(150)	Yes	Y		1	1.2	17	1.5	8	-.866	9	.5												
104	1.2*DL+1.5*LM6+1.0*WM(180)	Yes	Y		1	1.2	17	1.5	8	-1														
105	1.2*DL+1.5*LM6+1.0*WM(210)	Yes	Y		1	1.2	17	1.5	8	-.866	9	-.5												
106	1.2*DL+1.5*LM6+1.0*WM(240)	Yes	Y		1	1.2	17	1.5	8	-.5	9	-.866												
107	1.2*DL+1.5*LM6+1.0*WM(270)	Yes	Y		1	1.2	17	1.5	9	-1														
108	1.2*DL+1.5*LM6+1.0*WM(300)	Yes	Y		1	1.2	17	1.5	8	.5	9	-.866												
109	1.2*DL+1.5*LM6+1.0*WM(330)	Yes	Y		1	1.2	17	1.5	8	.5	9	-.866												
110	1.2*DL+1.5*LM7+1.0*WM(30)	Yes	Y		1	1.2	18	1.5	8	.866	9	.5												
111	1.2*DL+1.5*LM7+1.0*WM(60)	Yes	Y		1	1.2	18	1.5	8	.5	9	.866												
112	1.2*DL+1.5*LM7+1.0*WM(90)	Yes	Y		1	1.2	18	1.5	9	1														
113	1.2*DL+1.5*LM7+1.0*WM(120)	Yes	Y		1	1.2	18	1.5	8	-.5	9	.866												

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
114	1.2*DL+1.5*LM7+1.0*WM(150)	Yes	Y		1	1.2	18	1.5	8	-.866	9	.5												
115	1.2*DL+1.5*LM7+1.0*WM(180)	Yes	Y		1	1.2	18	1.5	8	-1														
116	1.2*DL+1.5*LM7+1.0*WM(210)	Yes	Y		1	1.2	18	1.5	8	-.866	9	-.5												
117	1.2*DL+1.5*LM7+1.0*WM(240)	Yes	Y		1	1.2	18	1.5	8	-.5	9	-.866												
118	1.2*DL+1.5*LM7+1.0*WM(270)	Yes	Y		1	1.2	18	1.5	9	-1														
119	1.2*DL+1.5*LM7+1.0*WM(300)	Yes	Y		1	1.2	18	1.5	8	.5	9	-.866												
120	1.2*DL+1.5*LM7+1.0*WM(330)	Yes	Y		1	1.2	18	1.5	8	.5	9	-.866												
121	1.2*DL+1.5*LM8+1.0*WM(30)	Yes	Y		1	1.2	19	1.5	8	.866	9	.5												
122	1.2*DL+1.5*LM8+1.0*WM(60)	Yes	Y		1	1.2	19	1.5	8	.5	9	.866												
123	1.2*DL+1.5*LM8+1.0*WM(90)	Yes	Y		1	1.2	19	1.5	9	1														
124	1.2*DL+1.5*LM8+1.0*WM(120)	Yes	Y		1	1.2	19	1.5	8	-.5	9	.866												
125	1.2*DL+1.5*LM8+1.0*WM(150)	Yes	Y		1	1.2	19	1.5	8	-.866	9	.5												
126	1.2*DL+1.5*LM8+1.0*WM(180)	Yes	Y		1	1.2	19	1.5	8	-1														
127	1.2*DL+1.5*LM8+1.0*WM(210)	Yes	Y		1	1.2	19	1.5	8	-.866	9	-.5												
128	1.2*DL+1.5*LM8+1.0*WM(240)	Yes	Y		1	1.2	19	1.5	8	-.5	9	-.866												
129	1.2*DL+1.5*LM8+1.0*WM(270)	Yes	Y		1	1.2	19	1.5	9	-1														
130	1.2*DL+1.5*LM8+1.0*WM(300)	Yes	Y		1	1.2	19	1.5	8	.5	9	-.866												
131	1.2*DL+1.5*LM8+1.0*WM(330)	Yes	Y		1	1.2	19	1.5	8	.5	9	-.866												
132	1.2*DL+1.5*LV3	Yes	Y		1	1.2	20	1.5																
133	1.2*DL+1.5*LV4	Yes	Y		1	1.2	21	1.5																
134	1.2*DL+1.5*LV5	Yes	Y		1	1.2	22	1.5																
135	1.2*DL+1.5*LV6	Yes	Y		1	1.2	23	1.5																
136	1.2*DL+1.5*LV7	Yes	Y		1	1.2	24	1.5																
137	1.2*DL+1.5*LV8	Yes	Y		1	1.2	25	1.5																

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N240	max	912.644	6	1012.194	5	539.537	36	0	1	0	1	0	1
2		min	-579.272	36	-454.728	35	-811.514	6	0	1	0	1	0	1
3	N241	max	218.246	25	1147.02	8	637.028	26	0	1	0	1	0	1
4		min	-257.314	7	-762.785	26	-1000.665	8	0	1	0	1	0	1
5	N242	max	304.947	29	1064.673	13	104.863	29	0	1	0	1	0	1
6		min	-903.556	23	-234.316	30	-311.477	23	0	1	0	1	0	1
7	N243	max	153.189	28	636.275	10	429.102	10	.096	135	.035	30	.136	135
8		min	-517.638	22	-394.869	28	-260.161	28	-.003	34	-.065	12	-.018	28
9	N244	max	215.926	3	1141.179	16	977.404	2	0	1	0	1	0	1
10		min	-115.936	33	-61.653	34	-457.023	32	0	1	0	1	0	1
11	N245	max	733.377	2	891.963	13	193.921	2	0	1	0	1	0	1
12		min	-389.58	32	-392.797	31	-103.358	32	0	1	0	1	0	1
13	N246	max	542.271	26	1054.882	9	494.025	27	0	1	0	1	0	1
14		min	-836.226	8	-670.936	27	-712.64	9	0	1	0	1	0	1
15	N247	max	704.015	30	1073.098	13	324.873	11	0	1	0	1	0	1
16		min	-1191.005	12	-416.425	31	-147.894	29	0	1	0	1	0	1
17	N248	max	48.436	78	521.5	135	585.302	11	0	1	0	1	0	1
18		min	-74.632	60	-237.626	28	-316.031	29	0	1	0	1	0	1
19	N249	max	749.671	15	1176.969	16	755.737	15	0	1	0	1	0	1
20		min	-336.894	33	-121.297	33	-331.742	33	0	1	0	1	0	1
21	N250	max	624.301	15	789.688	13	92.573	33	0	1	0	1	0	1
22		min	-239.158	32	-370.646	31	-278.968	15	0	1	0	1	0	1
23	N251	max	332.432	6	1207.885	5	773.613	36	.071	36	.122	6	.066	18
24		min	-238.997	36	-588.454	35	-1251.242	6	-.142	6	-.077	36	-.017	135
25	N258	max	41.997	28	186.016	38	355.46	22	0	1	0	1	0	1
26		min	-403.253	23	-161.007	132	-91.312	28	0	1	0	1	0	1
27	N259	max	100.066	7	279.254	132	419.186	16	0	1	0	1	0	1
28		min	-85.303	25	-107.688	38	-102.822	34	0	1	0	1	0	1

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
29	N260	max	1147.949	2	190.199	38	230.714	2	0	1	0	1	0	1
30		min	-818.122	32	-160.119	132	-124.92	32	0	1	0	1	0	1
31	N261	max	629.868	7	280.733	132	464.508	26	0	1	0	1	0	1
32		min	-503.823	26	-109.065	38	-531.639	8	0	1	0	1	0	1
33	N262	max	265.853	36	191.517	38	547.112	36	0	1	0	1	0	1
34		min	-341.005	6	-159.998	132	-912.199	6	0	1	0	1	0	1
35	N263	max	885.182	30	281.661	132	234.172	29	0	1	0	1	0	1
36		min	-1037.238	12	-107.193	38	-309.7	11	0	1	0	1	0	1
37	N264	max	327.073	15	271.66	132	311.596	4	0	1	0	1	0	1
38		min	-145.227	34	-108.883	38	-192.443	34	0	1	0	1	0	1
39	N265	max	1087.916	2	193.767	38	205.164	32	0	1	0	1	0	1
40		min	-753.12	32	-159.2	132	-319.859	2	0	1	0	1	0	1
41	N266	max	322.966	32	272.56	132	773.051	25	0	1	0	1	0	1
42		min	-323.41	2	-112.245	38	-921.014	7	0	1	0	1	0	1
43	N267	max	482.75	36	195.295	38	396.262	36	0	1	0	1	0	1
44		min	-766.236	6	-159.636	132	-657.479	6	0	1	0	1	0	1
45	N268	max	918.627	30	272.709	132	232.792	11	0	1	0	1	0	1
46		min	-1078.07	12	-112.063	38	-144.379	29	0	1	0	1	0	1
47	N269	max	72.268	36	191.984	38	578.849	22	0	1	0	1	0	1
48		min	-138.087	6	-160.647	132	12.632	27	0	1	0	1	0	1
49	Totals:	max	5154.786	28	9683.888	18	5854.973	25						
50		min	-5154.788	10	2559.137	36	-5854.981	7						

Envelope AISI S100-12: LRFD Cold Formed Steel Code Checks

	Member	Shape	Code Che...	Loc[in]	LC	Shear Check	Loc[in] ...		LC	phi*Pn[..	phi*T...	phi*M...	phi*M...	Cb	Cm...	Cm...	Eqn
1	M116	P1000	.864	46.5	47	.860	45	y	47	6344.4...	1327...	.442	.515	3.5...	.6	.85	C3.3...
2	M110	P1000	.863	46.5	42	.859	45	y	42	6344.4...	1327...	.442	.515	3.3...	.6	.85	C3.3...
3	M104	P1000	.859	46.5	50	.856	45	y	50	6344.4...	1327...	.442	.515	3.4...	.6	.85	C3.3...
4	M105	P1000	.771	46.5	45	.765	45	y	45	6344.4...	1327...	.442	.515	3.0...	.6	.85	C3.3...
5	M111	P1000	.765	46.5	48	.757	45	y	48	6344.4...	1327...	.442	.515	4.1...	.6	.85	C3.3...
6	M117	P1000	.764	46.5	41	.756	45	y	41	6344.4...	1327...	.442	.515	4.1...	.6	.85	C3.3...
7	M84	P1000	.684	126	56	.400	42	z	84	6382.9...	1327...	.262	.497	2.2...	.85	.76	C5.1...
8	M98	P1000	.681	126	55	.455	126	y	2	6382.9...	1327...	.262	.497	2.22	.85	.797	C5.1...
9	M99	P1000	.640	108.9...	60	.500	116....	z	61	6542.57	1327...	.442	.515	2.1...	.85	.687	C3.3...
10	M85	P1000	.640	108.9...	55	.499	116....	z	55	6542.57	1327...	.442	.515	2.2...	.85	.716	C3.3...
11	M70	P1000	.619	0	108	.570	47.25	z	84	6382.9...	1327...	.262	.497	2.1...	.85	.843	C5.1...
12	M71	P1000	.604	17.063	99	.472	9.188	z	102	6542.57	1327...	.442	.515	1.0...	.85	.625	C3.3...

Stress ratio <1. Members are adequate.

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Che...	Loc[in] ...		LC	phi*Pnc [..	phi*Pnt ...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M41	HSS1x1x1/8	.525	0	30	.101	0	y	12	4110.119	18133.2	.5	.5	4.384	H1-1a
2	M37	HSS1x1x1/8	.490	0	25	.096	0	y	7	4110.118	18133.2	.5	.5	4.33	H1-1a
3	M44	HSS1x1x1/8	.485	55.973	31	.092	55.973	y	1	4110.118	18133.2	.5	.5	3.926	H1-1a
4	M40	HSS1x1x1/8	.467	55.973	36	.093	55.973	y	6	4110.118	18133.2	.5	.5	4.345	H1-1a
5	M2	HSS1x1x1/8	.462	0	12	.278	3.938	y	12	17900.38	18133.2	.5	.5	1.503	H1-1b
6	M1	HSS1x1x1/8	.459	0	7	.273	122....	y	6	17900.381	18133.2	.5	.5	1.491	H1-1b
7	M3	HSS1x1x1/8	.437	126	1	.269	122....	y	1	17900.381	18133.2	.5	.5	2.205	H1-1b
8	M42	HSS1x1x1/8	.398	55.973	28	.068	50.143	y	54	4110.118	18133.2	.5	.5	4.185	H1-1a
9	M29	HSS1x1x1/8	.389	0	8	.073	4.813	y	56	7285.833	18133.2	.5	.5	2.921	H1-1a
10	M6	HSS1x1x1/8	.384	21	135	.051	42	y	135	7285.833	18133.2	.5	.5	1.758	H1-1b
11	M5	HSS1x1x1/8	.382	21	135	.051	42	y	135	7285.833	18133.2	.5	.5	1.766	H1-1b
12	M4	HSS1x1x1/8	.382	21	135	.052	42	y	135	7285.833	18133.2	.5	.5	1.763	H1-1b
13	M28	HSS1x1x1/8	.364	0	6	.055	0	y	6	7285.833	18133.2	.5	.5	3.772	H1-1a
14	M15	HSS1x1x1/8	.352	63	134	.050	84	y	134	14436.956	18133.2	.5	.5	2.244	H1-1b

Stress ratio <1. Members are adequate.

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Che	Loc[in]	...	LC	phi*Pnc [...	phi*Pnt ...	phi*Mn...	phi*Mn...	Cb	Eqn
15	M14	HSS1x1x1/8	.351	63	134	.050	84	y	134	14436.956	18133.2	.5	.5	2.248	H1-1b
16	M13	HSS1x1x1/8	.346	63	134	.050	84	y	134	14436.956	18133.2	.5	.5	2.251	H1-1b
17	M16	HSS1x1x1/8	.346	0	1	.096	0	y	88	10327.805	18133.2	.5	.5	3.526	H1-1b
18	M32	HSS1x1x1/8	.341	4.375	14	.101	0	y	37	7285.833	18133.2	.5	.5	3.845	H1-1a
19	M20	HSS1x1x1/8	.335	0	8	.089	0	y	96	10327.805	18133.2	.5	.5	3.598	H1-1b
20	M23	HSS1x1x1/8	.330	53.413	26	.011	53.413	z	11	4513.495	18133.2	.5	.5	1.723	H1-1a
21	M30	HSS1x1x1/8	.328	4.375	23	.100	0	y	37	7285.833	18133.2	.5	.5	4.033	H1-1a
22	M12	HSS1x1x1/8	.321	33	132	.061	33	y	132	10327.805	18133.2	.5	.5	1.857	H1-1b
23	M10	HSS1x1x1/8	.320	33	132	.061	33	y	132	10327.805	18133.2	.5	.5	1.856	H1-1b
24	M8	HSS1x1x1/8	.319	33	132	.061	33	y	132	10327.805	18133.2	.5	.5	1.862	H1-1b
25	M21	HSS1x1x1/8	.311	33	135	.061	33	y	135	10327.805	18133.2	.5	.5	1.853	H1-1b
26	M19	HSS1x1x1/8	.310	33	135	.061	33	y	135	10327.805	18133.2	.5	.5	1.853	H1-1b
27	M11	HSS1x1x1/8	.309	6.187	92	.138	0	y	89	10327.805	18133.2	.5	.5	3.135	H1-1b
28	M22	HSS1x1x1/8	.307	53.413	35	.010	53.413	z	4	4513.495	18133.2	.5	.5	1.948	H1-1a
29	M9	HSS1x1x1/8	.304	6.188	88	.137	0	y	97	10327.805	18133.2	.5	.5	3.154	H1-1b
30	M17	HSS1x1x1/8	.304	33	135	.058	33	y	135	10327.805	18133.2	.5	.5	1.872	H1-1b
31	M286	PIPE_2.0	.300	24.75	1	.031	24.75		11	20866.733	32130	1.872	1.872	1.469	H1-1b
32	M240	PIPE_2.0	.297	24.75	7	.034	24.75		1	20866.733	32130	1.872	1.872	1.285	H1-1b
33	M43	HSS1x1x1/8	.285	5.831	107	.074	0	y	4	4110.118	18133.2	.5	.5	3.422	H1-1b
34	M7	HSS1x1x1/8	.282	6.187	93	.127	0	y	92	10327.805	18133.2	.5	.5	3.197	H1-1b
35	M31	HSS1x1x1/8	.279	0	135	.143	0	y	7	7285.833	18133.2	.5	.5	4.625	H1-1b
36	M33	HSS1x1x1/8	.279	0	135	.122	4.813	y	1	7285.833	18133.2	.5	.5	4.613	H1-1b
37	M38	HSS1x1x1/8	.273	42.066	10	.033	0	y	4	5839.909	18133.2	.5	.5	3.812	H1-1a
38	M18	HSS1x1x1/8	.259	0	5	.091	0	y	92	10327.805	18133.2	.5	.5	3.717	H1-1b
39	M202	SR1/2"	.237	7.5	95	.028	7.5		97	5263.413	6361.725	.053	.053	2.271	H1-1b
40	M39	HSS1x1x1/8	.237	0	28	.029	5.381	z	7	5839.909	18133.2	.5	.5	1.608	H1-1a
41	M260	SR1/2"	.234	7.5	97	.019	7.5		9	5263.413	6361.725	.053	.053	2.255	H1-1b
42	M203	SR1/2"	.233	0	8	.026	7.5		97	5263.413	6361.725	.053	.053	2.216	H1-1b
43	M308	SR1/2"	.232	7.5	89	.022	7.5		1	5263.413	6361.725	.053	.053	2.255	H1-1b
44	M280	PIPE_2.0	.231	18.5	2	.079	18.5		6	26521.424	32130	1.872	1.872	1.714	H1-1b
45	M261	SR1/2"	.229	7.5	97	.019	7.5		2	5263.413	6361.725	.053	.053	2.254	H1-1b
46	M309	SR1/2"	.229	7.5	90	.021	7.5		1	5263.413	6361.725	.053	.053	2.255	H1-1b
47	M234	PIPE_2.0	.221	18.5	11	.089	18.5		2	26521.424	32130	1.872	1.872	1.95	H1-1b
48	M252	SR1/2"	.207	0	88	.043	7.5		2	5263.413	6361.725	.053	.053	2.252	H1-1b
49	M211	SR1/2"	.205	7.5	95	.013	7.5		92	5263.413	6361.725	.053	.053	2.265	H1-1b
50	M212	SR1/2"	.203	7.5	95	.013	7.5		93	5263.413	6361.725	.053	.053	2.265	H1-1b
51	M300	SR1/2"	.202	0	93	.047	7.5		6	5263.413	6361.725	.053	.053	2.253	H1-1b
52	M253	SR1/2"	.182	0	87	.040	7.5		2	5263.413	6361.725	.053	.053	2.247	H1-1b
53	M301	SR1/2"	.180	0	90	.044	7.5		6	5263.413	6361.725	.053	.053	2.244	H1-1b
54	M219	PIPE_2.0	.179	28	1	.036	55.125		10	17855.085	32130	1.872	1.872	2.594	H1-1b
55	M316	PIPE_2.0	.178	28	10	.037	55.125		12	17855.085	32130	1.872	1.872	1.832	H1-1b
56	M327	PIPE_2.0	.178	28	4	.037	28		26	17855.085	32130	1.872	1.872	2.606	H1-1b
57	M27	HSS1x1x1/8	.177	0	31	.009	53.413	y	135	4513.495	18133.2	.5	.5	1.863	H1-1b*
58	M317	PIPE_2.0	.159	32.5	12	.070	40		12	26521.424	32130	1.872	1.872	1.68	H1-1b
59	M220	PIPE_2.0	.155	32.5	4	.067	40		4	26521.424	32130	1.872	1.872	1.81	H1-1b
60	M327A	PIPE_2.0	.151	18.5	4	.066	18.5		7	26521.424	32130	1.872	1.872	2.933	H1-1b
61	M35	C3x6	.148	0	1	.094	32.813	y	6	37162.504	79200	1.572	6.525	1.61	H1-1b
62	M128	PIPE_2.0	.143	36	7	.027	10.5		7	20866.733	32130	1.872	1.872	3.147	H1-1b
63	M235	PIPE_2.0	.142	36	10	.034	35.25		5	20866.733	32130	1.872	1.872	1.51	H1-1b
64	M281	PIPE_2.0	.142	36	4	.024	7.5		6	20866.733	32130	1.872	1.872	1.549	H1-1b
65	M24	HSS1x1x1/8	.140	53.413	30	.013	53.413	z	7	4513.495	18133.2	.5	.5	2.49	H1-1b*
66	M34	C3x6	.137	0	1	.078	32.813	y	3	37162.504	79200	1.572	6.525	1.71	H1-1b
67	M127	PIPE_2.0	.127	32.5	4	.071	45		6	26521.424	32130	1.872	1.872	2.027	H1-1b
68	M25	HSS1x1x1/8	.124	53.413	28	.010	53.413	z	1	4513.495	18133.2	.5	.5	1.715	H1-1b*
69	M36	C3x6	.115	0	5	.064	7.438	z	4	37162.504	79200	1.572	6.525	1.627	H1-1b
70	M26	HSS1x1x1/8	.114	53.413	22	.008	53.413	y	22	4513.495	18133.2	.5	.5	2.145	H1-1b
71	M206	PIPE_2.0	.110	44.25	6	.082	44.25		7	20866.733	32130	1.872	1.872	1.615	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Che..	Loc[in] ...		LC	phi*Pnc [..	phi*Pnt ..	phi*Mn..	phi*Mn...	Cb	Eqn
72	M303	PIPE_2.0	.099	44.25	2	.060	44.25		2	20866.733	32130	1.872	1.872	2.054	H1-1b
73	M139	PIPE_2.0	.097	51	5	.030	51		9	20866.733	32130	1.872	1.872	1.554	H1-1b
74	M126	PIPE_2.0	.095	32.5	5	.043	32.5		10	26521.424	32130	1.872	1.872	2.091	H1-1b
75	M233	PIPE_2.0	.095	32.5	2	.047	32.5		2	26521.424	32130	1.872	1.872	1.871	H1-1b
76	M279	PIPE_2.0	.093	32.5	1	.049	32.5		6	26521.424	32130	1.872	1.872	1.475	H1-1b
77	M255	PIPE_2.0	.092	44.25	11	.054	44.25		11	20866.733	32130	1.872	1.872	2.035	H1-1b
78	M134	PIPE_2.0	.081	24	1	.021	24		4	20866.733	32130	1.872	1.872	2.454	H1-1b
79	M282	PIPE_2.0	.080	24	10	.024	24		5	20866.733	32130	1.872	1.872	1.827	H1-1b
80	M236	PIPE_2.0	.080	24	4	.024	24		3	20866.733	32130	1.872	1.872	1.781	H1-1b
81	M46	C5x6.7	.077	0	12	.022	7	z	11	83481.735	88650	2.227	13.313	1.907	H1-1b
82	M49	C5x6.7	.071	0	4	.020	7	z	3	83481.738	88650	2.227	13.313	1.699	H1-1b
83	M52	C5x6.7	.070	0	8	.020	7	z	7	83481.738	88650	2.227	13.313	1.741	H1-1b
84	M48	C5x6.7	.058	0	6	.019	7	z	6	83481.738	88650	2.227	13.313	1.651	H1-1b
85	M45	C5x6.7	.056	0	5	.019	7	z	4	83481.735	88650	2.227	13.313	1.624	H1-1b
86	M51	C5x6.7	.050	0	2	.016	7	z	1	83481.738	88650	2.227	13.313	1.649	H1-1b
87	M221	PIPE_2.5	.032	31.5	5	.006	24.75		12	37773.818	50715	3.596	3.596	2.476	H1-1b
88	M53	L5x5x5	.015	50.625	20	.006	9.375	y	1	76065.401	99468	6.383	12.944	1.255	H2-1
89	M47	L5x5x5	.015	50.625	24	.009	9.375	y	5	76065.401	99468	6.383	12.757	1.155	H2-1
90	M50	L5x5x5	.015	50.625	16	.005	9.375	y	8	76065.401	99468	6.383	12.743	1.148	H2-1

Stress ratio <1.0. Members are adequate.

CCI Site No. : CTL02108
CCI Site Name: Norwalk West-CT Ave
Prepared By: RH
Checked By: BK

Fullerton Engineering Consultants, Inc.
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
(847) 908-8400

Date: 12/5/2018

Mount-to-Tower Connection Calculations

Existing Platform is connected to the monopole via (12) 3/4" ϕ Bolts, grade A307 (conservatively assumed).

Maximum Reactions from Risa Mount Analysis Node "N251":

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
17	N248	max	48.436	78	521.501	135	585.3	11	0	1	0	1	0	1
18		min	-74.631	60	-237.628	28	-316.027	29	0	1	0	1	0	1
19	N249	max	749.682	15	1176.979	16	755.748	15	0	1	0	1	0	1
20		min	-336.88	33	-121.293	33	-331.725	33	0	1	0	1	0	1
21	N250	max	624.309	15	789.688	13	92.57	33	0	1	0	1	0	1
22		min	-239.14	32	-370.649	31	-278.972	15	0	1	0	1	0	1
23	N251	max	332.435	6	1207.877	5	773.629	36	.071	36	.122	6	.066	18
24		min	-239.001	36	-588.448	35	-1251.255	6	-.142	6	-.077	36	-.017	135
25	N258	max	42.007	28	186.016	38	355.45	22	0	1	0	1	0	1
26		min	-403.239	23	-161.007	132	-91.322	28	0	1	0	1	0	1
27	N259	max	100.074	7	279.254	132	419.195	16	0	1	0	1	0	1
28		min	-85.31	25	-107.688	38	-102.818	34	0	1	0	1	0	1
29	N260	max	1147.935	2	190.199	38	230.71	2	0	1	0	1	0	1
30		min	-818.105	32	-160.119	132	-124.913	32	0	1	0	1	0	1

$X := 332.435 lbf$ — *Maximum Reaction - X direction*

$Y := 1207.877 lbf$ — *Maximum Reaction - Y direction*

$Z := 1251.255 lbf$ — *Maximum Reaction - Z direction*

$P_t := Y$ $\quad P_t = 1207.88\,lbf$ — *Factored Tensile Force*

$P_v := \sqrt{X^2 + Z^2}$ $\quad P_v = 1294.66\,lbf$ — *Factored Shear Force*

$d_b := 0.75 in$ — *Diameter of rod*

$A_b := 0.25\pi \cdot d_b^{\,2}$ $\quad A_b = 0.44 \cdot in^2$ — *Area of rod*

$P_{t\_bolt} := P_t$ $\quad P_{t\_bolt} = 1207.88\,lbf$ — *Tension/Compression at rod*

$P_{v\_bolt} := P_v$ $\quad P_{v\_bolt} = 1294.66\,lbf$ — *Shear at rod*

CCI Site No. : CTL02108
CCI Site Name: Norwalk West-CT Ave
Prepared By: RH
Checked By: BK

Fullerton Engineering Consultants, Inc.
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
(847) 908-8400

Date: 12/5/2018

Tensile and Shear Strength of Threaded Rods

$F_{nt} := 45ksi$ — *Nominal tensile strength per AISC 360-10, Table J3.2*

$F_{nv} := 27ksi$ — *Nominal shear strength per AISC 360-10, Table J3.2*

$\phi_{bolt} := .75$ — *Resistance Factor (LRFD - AISC 360, Section J3-6)*

$R_{nt} := \phi_{bolt} \cdot F_{nt} \cdot A_b$ $\quad R_{nt} = 14.91 \cdot kip$ — *Design Nominal Tensile Strength (AISC 360, Section J3-1)*

$R_{nv} := \phi_{bolt} \cdot F_{nv} \cdot A_b$ $\quad R_{nv} = 8.95 \cdot kip$ — *Design Nominal Shear Strength (AISC 360, Section J3-1)*

$$\frac{P_{t\_bolt}}{R_{nt}} = 8.1 \cdot \%$$

$$\frac{P_{v\_bolt}}{R_{nv}} = 14.47 \cdot \%$$

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

September 3rd, 2019

Melanie A. Bachman Executive
Director Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re:	**Notice of Exempt Modification – Antenna and RRU Add**
Property Address:	**613 Connecticut Ave, Norwalk, Connecticut 06854**
Applicant:	**AT&T Mobility, LLC**

Dear Ms. Bachman:

On behalf of AT&T, please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16- 50j-72(b) (2).

AT&T currently maintains a wireless telecommunications facility consisting of nine (9) wireless telecommunication antennas at an antenna center line height of 153-feet on an existing 150-foot monopole, owned by Crown Castle at 3 Corporate Park Drive, Suite 101, Clifton Park, NY 12065. AT&T now intends to swap the existing position [2] antenna with one (1) proposed 6' Quintel QS66512-2 and add one (1) 4' Andrew SBNHH-1D65A to position [3] each sector, for a total of six (6) proposed antennas. In addition, AT&T is looking to install one (1) RRUS-E2 and one (1) RRUS-4478 B5 in position [4], one (1) RRUS-B14 4478 in position [3], and one (1) RRUS-32 B66 in position [2], each sector for a total of (12) new RRUS to be installed. Lastly, AT&T is proposing to add one (1) additional Raycap DC Surge Suppressor and two (2) DC Power Cables to their existing antenna array. The proposed Raycap DC Surge Suppressor, along with the (3) proposed RRUS-32 B66 and the (33) proposed RRUS-B14 4478 will be collar mounted immediately below the existing platform mount on a new proposed Collar Mount (Commscope P/N MC-RR1050-3). The remaining changes will take place on the existing antenna platform mount.

Attached is a summary of the planned modifications including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-5l0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to Steven Kleppin, Zoning and Planning, City of Norwalk, CT at 125 East Ave. Room #223, Norwalk, CT 06856 and Harry W. Rilling, Mayor, City of Norwalk, CT, at 125 East Ave. Norwalk, CT 06856. A copy of this letter is being sent to the property owner, Home Depot USA Inc. ATTN: Prop Tax Dept #6204, PO BOX 105842, Atlanta, GA 30348, and to the tower company, Crown Castle at 3 Corporate Park Drive, Suite 101, Clifton Park, NY 12065.

The following is a list of subsequent decisions by the Connecticut Siting Council:

- **EM-CING-051-103-135-035-050922** - New Cingular Wireless PCS, LLC. notice of intent to modify existing telecommunications facilities located at 281 Woodhouse Road, Fairfield; 3965 Congress Street, Fairfield; 600 Connecticut Ave., Norwalk; 1590 Newfield Ave, Stamford; and 126 Ledge Road, Darien, Connecticut.
- **EM-CING-103-111230** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 613 Connecticut Avenue, Norwalk, Connecticut.
- **EM-AT&T-103-160621** – AT&T notice of intent to modify an existing telecommunications facility located at 600 Connecticut Avenue, Norwalk, Connecticut
- **EM-AT&T-103a-180509** – AT&T notice of intent to modify an existing telecommunications facility located at 613 Connecticut Avenue, Norwalk, Connecticut
- **EM-AT&T-103-190606** – AT&T Mobility, LLC notice of intent to modify an existing telecommunications facility located at 613 Connecticut Avenue, Norwalk, Connecticut

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72(b) (2).

1. The proposed modifications will not result in an increase in the height of the existing tower. AT&T's replacement antennas will be installed at the 105-foot level of the 147-foot self-support tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above referenced telecommunications facility constitutes an exempt modification under R.C.S.A. §16-50j-72(b) (2).

Sincerely,

Kristina Cottone

CC w/enclosures:
Steven Kleppin – Director of Planning and Zoning, City of Norwalk, CT
Harry W. Rilling – Mayor, City of Norwalk, CT
Home Depot USA Inc. – Land Owner
Crown Castle – Tower Company

DOCKET NO. 45

AN APPLICATION SUBMITTED BY THE SOUTHERN NEW ENGLAND TELEPHONE COMPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN FAIRFIELD COUNTY.	:	CONNECTICUT SITING COUNCIL
	:	September 14, 1984

DECISION AND ORDER

Pursuant to the foregoing opinion, the Council hereby directs that a certificate of environmental compatibility and public need as required by section 16-50k of the General Statutes of Connecticut, revisions of 1958, revised to 1983, as amended, be issued to the Southern New England Telephone Company for the construction, operation, and maintenance of a telecommunications tower and associated equipment to provide cellular service at each of the following sites:

Kaechele Place, Bridgeport, Connecticut;
Connecticut Avenue, Norwalk, Connecticut;
Nells Rock Road, Shelton, Connecticut;
Newfield Avenue, Stamford, Connecticut; and
Bayberry Lane, (former Nike site), Westport, Connecticut.

The facilities shall be constructed, operated, and maintained as specified in the Council's record on this matter, and subject to the following conditions:

1. The towers shall be no taller than necessary to provide the proposed service, and in no event shall exceed

   a) 167' at the Bridgeport site,
   b) 167' at the Norwalk site,
   c) 189.5' at the Shelton site,
   d) 167' at the Stamford site,
   e) 117' at the Westport site;

2. A fence not lower than eight feet shall surround each tower and its associated equipment;

3. The applicant or its successor shall notify the Council if and when directional antennas or any other equipment is added to any of these facilities;

4. The applicant or its successor shall permit, in accordance with representations made by it during the proceeding, public or private entities to share space on the facilities, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing;
5. Unless necessary to comply with condition number six, below, no lights shall be installed on any of these towers;
6. The facilities shall be constructed in accordance with all applicable federal, state, and municipal laws and regulations;
7. The applicant shall submit a development and management plan (D&M) for the Bridgeport, Stamford, and Westport sites pursuant to sections 16-50j-85 through 16-50j-87 of the regulations of state agencies, except that irrelevant items in section 16-50j-86 need only be identified as such. The D&M plans shall include appropriate evergreen screening of the sites, erosion control measures, reseeding plans, and tree removal plans. The applicant shall consult with the Stamford Environmental Protection Board in the preparation of a drainage and erosion control plan for the Stamford tower. The applicant shall comply with the reporting requirements of section 16-50j-87 for all sites;
8. Construction activities shall take place during daylight working hours;
9. This decision and order shall be void and the towers and associated equipment approved herein shall be dismantled and

removed, or reapplication for any new use shall be made to the Connecticut Siting Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction;

10. This decision and order shall be void if all construction authorized is not completed within three years of the issuance of this decision.

Pursuant to section 16-50p of the General Statutes, we hereby direct that a copy of the opinion and decision and order be served on each person listed below. A notice of the issuance shall be published in the Bridgeport Post, the Norwalk Hour, the Stamford Advocate, and the Shelton Suburban News, and the Westport News.

The parties to this proceeding are

The Southern New England Telephone Company Room 314 227 Church Street New Haven, Connecticut 06506	(Applicant)
Attention: Mr. Peter J. Tyrrell Senior Attorney	(its attorney)
Rolnick Observatory 52 Sawyer Road Fairfield, Connecticut	represented by: Frederick H. Bump Director
Mr. Adam Norton 40 Highland Road Westport, Connecticut 06880	
Representative John Wayne Fox 13 Apple Tree Drive Stamford, Connecticut 06906	(service waived)
Mr. George C. Lenfest 4 Highland Road Westport, Connecticut	

Mr. William Seiden
First Selectman
Town of Westport
110 Myrtle Avenue
P.O. Box 549
Westport, Connecticut 06881

Mr. Arthur L. Schimel
174 Bayberry Lane
Westport, Connecticut

Mr. Seymour Bendremer
11 Apache Trail
Westport, Connecticut

Ms. Gladys Floch
32 Woody Lane
Westport, Connecticut

Ms. Helen S. Cohen
15 Highland Road
Westport, Connecticut
(service waived)

Mr. Jack Braverman
226 Bayberry Lane
Westport, Connecticut

Mr. Kevin Gavin
191 Bayberry Lane
Westport, Connecticut
(service waived)

Mr. A.B. Beiser
12 Highland Road
Westport, Connecticut

Mr. Edward V. Polusky
4 Hooper Road
Westport, Connecticut
(service waived)

Ms. Lois Schine
represented by:

Mary D. Mix, Esquire
830 Post Road - East
Suite 100
Westport, Connecticut 06880

Mr. Allen Witt
3 Apache Trail
Westport, Connecticut

Ms. Gayle Shiller
5 Apache Trail
Westport, Connecticut
(service waived)

Mrs. Ronnie Hammer
3 Hooper Road
Westport, Connecticut

Mr. Paul Rosenblatt (service waived)
7 Apache Trail
Westport, Connecticut

Mr. Henry J. Wolfson (service waived)
179 Bayberry Lane
Westport, Connecticut

Mr. Melvin H. Barr (service waived)
Planning Director
Town of Westport
110 Myrtle Avenue
P.O. Box 549
Westport, Connecticut 06881

Mr. Mark Infeld (service waived)
6 Apache Trail
Westport, Connecticut

Ms. Barbara Saipe (service waived)
Representative Town
Meeting Member
District #8
Town Hall
P.O. Box 549
Westport, Connecticut 06881

Ms. Peggy Goldenberg (service waived)
201 Bayberry Lane
Westport, Connecticut

Ms. Martha Hauhuth (service waived)
Board of Selectman
Town Hall
P.O. Box 549
Westport, Connecticut 06881

Ms. Meg Coffee
32 Otter Trail
Westport, Connecticut (service waived)

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut, this 14th day of September, 1984.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner John Downey Designee: Commissioner Peter G. Boucher	Absent
Commissioner Stanley Pac	Absent
Owen L. Clark	Yes
Fred J. Doocy	Yes
Mortimer A. Gelston	Yes
James G. Horsfall	Yes
Janet Sitty	Yes
Colin C. Tait	Absent

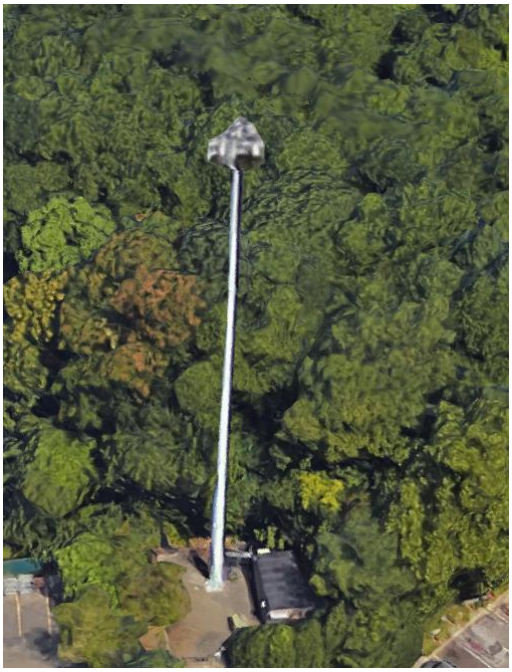
STATE OF CONNECTICUT)
: ss. New Britain, September 14, 1984
COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the decision and order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

Christopher S. Wood

Christopher S. Wood, Executive Director
Connecticut Siting Council



Smartlink on behalf of AT&T Mobility, LLC Site FA – 10034974 USID – 60395 Site ID – CT2108 (MRCTB017068-MRCTB025304-MRCTB025283-MRCTB025338-MRCTB026716) Site Name – Norwalk West-CT Ave

613 Connecticut Avenue
Norwalk, CT 06850

Latitude: N41-5-49.47
Longitude: W73-26-56.60
Structure Type: Monopole

Report generated date: April 12, 2019
Report by: Nick Kutzke
Customer Contact: Romina Kirchmaier

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Max Cumulative Simulated RFE Level on the Ground	<1% General Public Limit
Compliant per FCC Rules and Regulations?	Will Be Compliant
Compliant per AT&T Mobility, LLC's Policy?	No

The following documents were provided by the client and were utilized to create this report:

RFDS: 10034974_PM201_180531_CTL02108 - Carrier Jobs

CD's: 10034974_AE201_190311_CTL02108_Rev5 4-5-6-7-RRH Add Revised

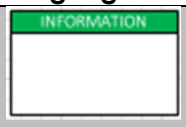
RF Powers Used: 10034974_PM201_180531_CTL02108 - Carrier Jobs

1.2 Fall Arrest Anchor Point Summary

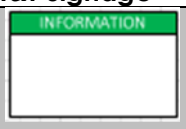
Fall Arrest Anchor & Parapet Info	Parapet Available (Y/N)	Parapet Height (inches)	Fall Arrest Anchor Available (Y/N)
Roof Safety Info	N	NA	N

1.3 Signage Summary

a. Existing AT&T Signage

AT&T Signage Locations									
	Information 1	Information 2	Notice	Notice 2	Caution	Caution 2	Warning	Warning 2	Barriers
Access Point(s)									
Alpha									
Beta									
Gamma									
Delta									
Epsilon									

b. Proposed AT&T Signage

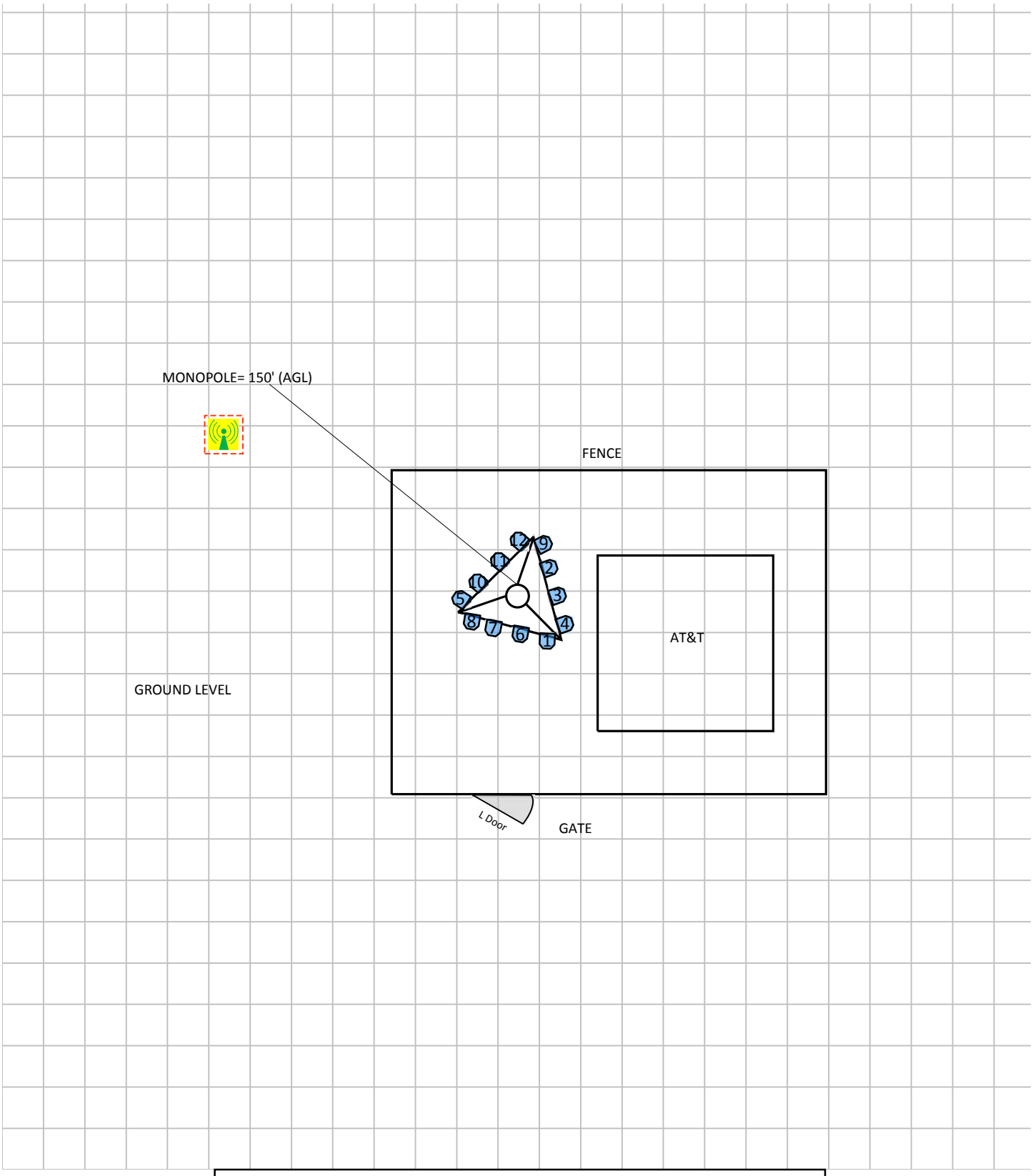
AT&T Signage Locations									
	Information 1	Information 2	Notice	Notice 2	Caution	Caution 2	Warning	Warning 2	Barriers
Access Point(s)						**1**			
Alpha									
Beta									
Gamma									
Delta									
Epsilon									

2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- RF Exposure Diagram – Side View

Site Scale Map For: Norwalk West-CT Ave



(Feet)

0 10.4 20.7

www.sitesafe.com
Site Name:Norwalk West-CT Ave
4/11/2019 12:40:37 PM

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Sign Legend

Caution 1 | Caution 2 | Notice 2 | Notice 1 | Warning | Warning 2 | Info 1 | Info 2 | RF Safety Plan

Barrier

Proposed Barriers/ Signs

3 Antenna Inventory

The following antenna inventory was obtained by the customer and was utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Technology	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Power	Power Type	Power Unit	Misc Loss	TX Count	Total ERP (Watts)	Ant Gain (dBd)	Z (AGL)	MDT	EDT
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	143	82	4.6	40	TPO	Watt	0	1	566.3	11.51	150.7'	0°	8°
2	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	2100	LTE	30	57	6	160	TPO	Watt	0	1	4787.6	14.76	150'	0°	4°
2	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	737	LTE	30	69	6	60	TPO	Watt	0	1	839.8	11.46	150'	0°	2°
2	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	1900	LTE	30	68	6	160	TPO	Watt	0	1	4169.8	14.16	150'	0°	4°
3	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	763	LTE	30	66	4.6	160	TPO	Watt	0	1	2153.4	11.29	150.7'	0°	2°
4	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	722	LTE	30	66	4.6	80	TPO	Watt	0	1	1076.7	11.29	150.7'	0°	3°
4	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	850	LTE	30	61	4.6	160	TPO	Watt	0	1	2244.5	11.47	150.7'	0°	2°
4	AT&T MOBILITY LLC	Andrew SBNHH-1D65A	Panel	2300	LTE	30	61	4.6	100	TPO	Watt	0	1	2691.5	14.3	150.7'	0°	3°
5	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	263	82	4.6	40	TPO	Watt	0	1	566.3	11.51	150.7'	0°	6°
6	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	2100	LTE	150	57	6	160	TPO	Watt	0	1	4787.6	14.76	150'	0°	6°
6	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	737	LTE	150	69	6	60	TPO	Watt	0	1	839.8	11.46	150'	0°	9°
6	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	1900	LTE	150	68	6	160	TPO	Watt	0	1	4169.8	14.16	150'	0°	6°
7	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	763	LTE	150	66	4.6	160	TPO	Watt	0	1	2153.4	11.29	150.7'	0°	9°
8	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	722	LTE	150	66	4.6	80	TPO	Watt	0	1	1076.7	11.29	150.7'	0°	3°
8	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	850	LTE	150	61	4.6	160	TPO	Watt	0	1	2244.5	11.47	150.7'	0°	9°
8	AT&T MOBILITY LLC	Andrew SBNHH-1D65A	Panel	2300	LTE	150	61	4.6	100	TPO	Watt	0	1	2691.5	14.3	150.7'	0°	3°
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	23	82	4.6	40	TPO	Watt	0	1	566.3	11.51	150.7'	0°	7°
10	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	2100	LTE	270	57	6	160	TPO	Watt	0	1	4787.6	14.76	150'	0°	2°
10	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	737	LTE	270	69	6	60	TPO	Watt	0	1	839.8	11.46	150'	0°	6°
10	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	1900	LTE	270	68	6	160	TPO	Watt	0	1	4169.8	14.16	150'	0°	2°
11	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	763	LTE	270	66	4.6	160	TPO	Watt	0	1	2153.4	11.29	150.7'	0°	6°
12	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	722	LTE	270	66	4.6	850	TPO	Watt	0	1	11439.8	11.29	150.7'	0°	3°
12	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	850	LTE	270	61	4.6	160	TPO	Watt	0	1	2244.5	11.47	150.7'	0°	6°

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Technology	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Power	Power Type	Power Unit	Misc Loss	TX Count	Total ERP (Watts)	Ant Gain (dBd)	Z (AGL)	MDT	EDT
12	AT&T MOBILITY LLC	Andrew SBNHH-1D65A	Panel	2300	LTE	270	61	4.6	100	TPO	Watt	0	1	2691.5	14.3	150.7'	0°	3°

NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height above the main site level unless otherwise indicated. The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline. Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

Note: The 2100, 722 and 850 MHz LTE technologies are being added to an existing antenna.

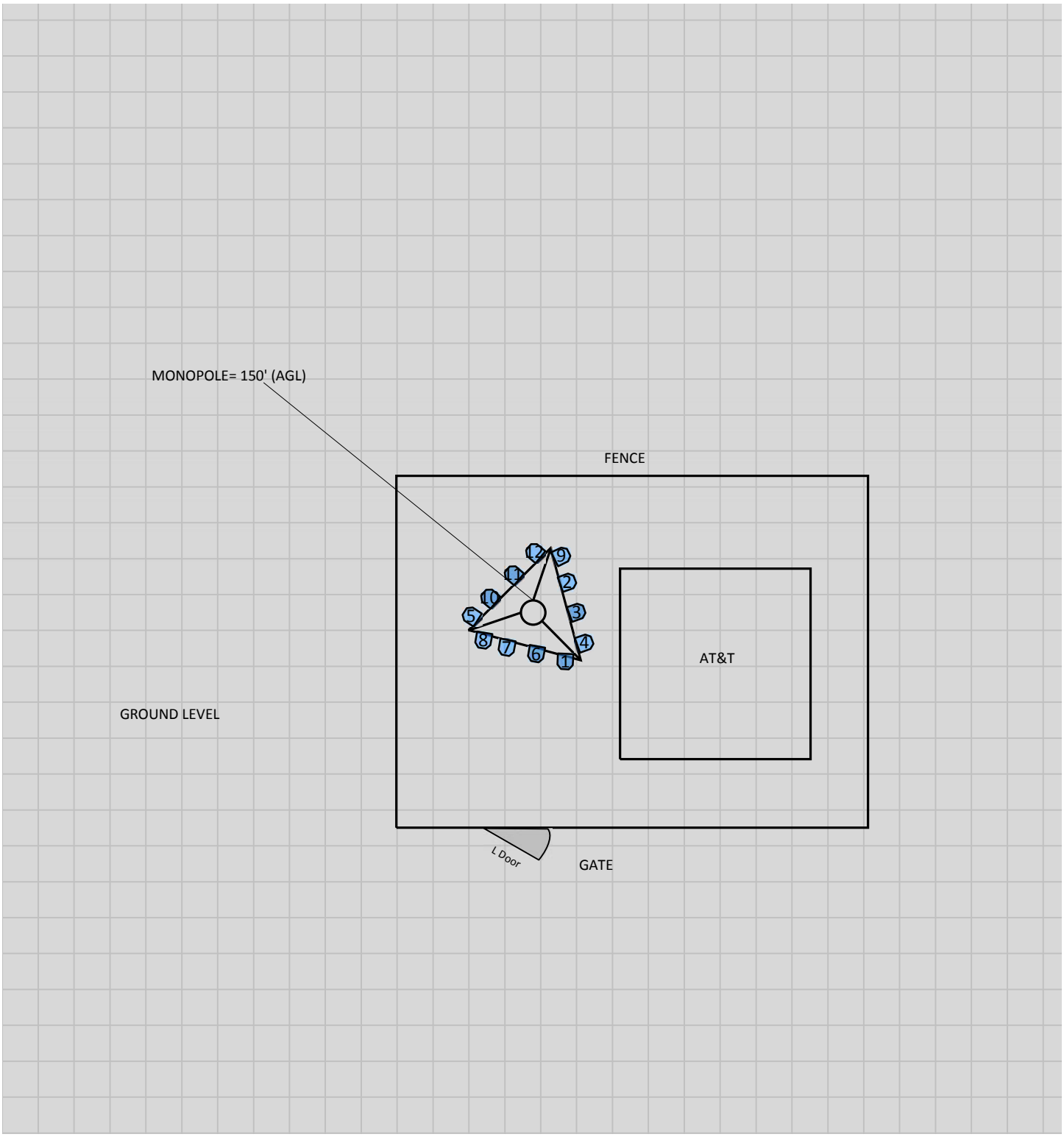
4 Emission Predictions

In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas. The total analyzed elevations in the below RF Exposure Simulations are listed below.

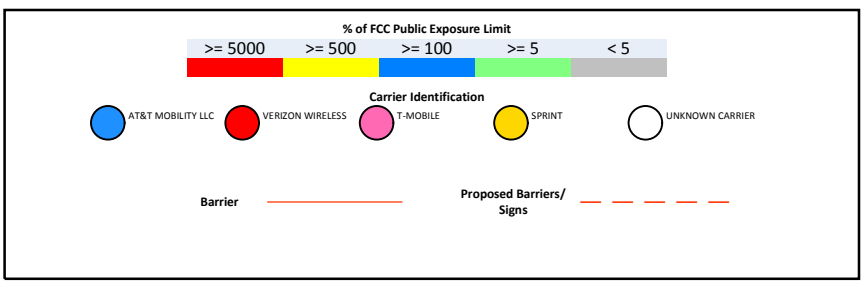
- GROUND = 0'

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: Norwalk West-CT Ave



% of FCC Public Exposure Limit
Spatial average 0' - 6'

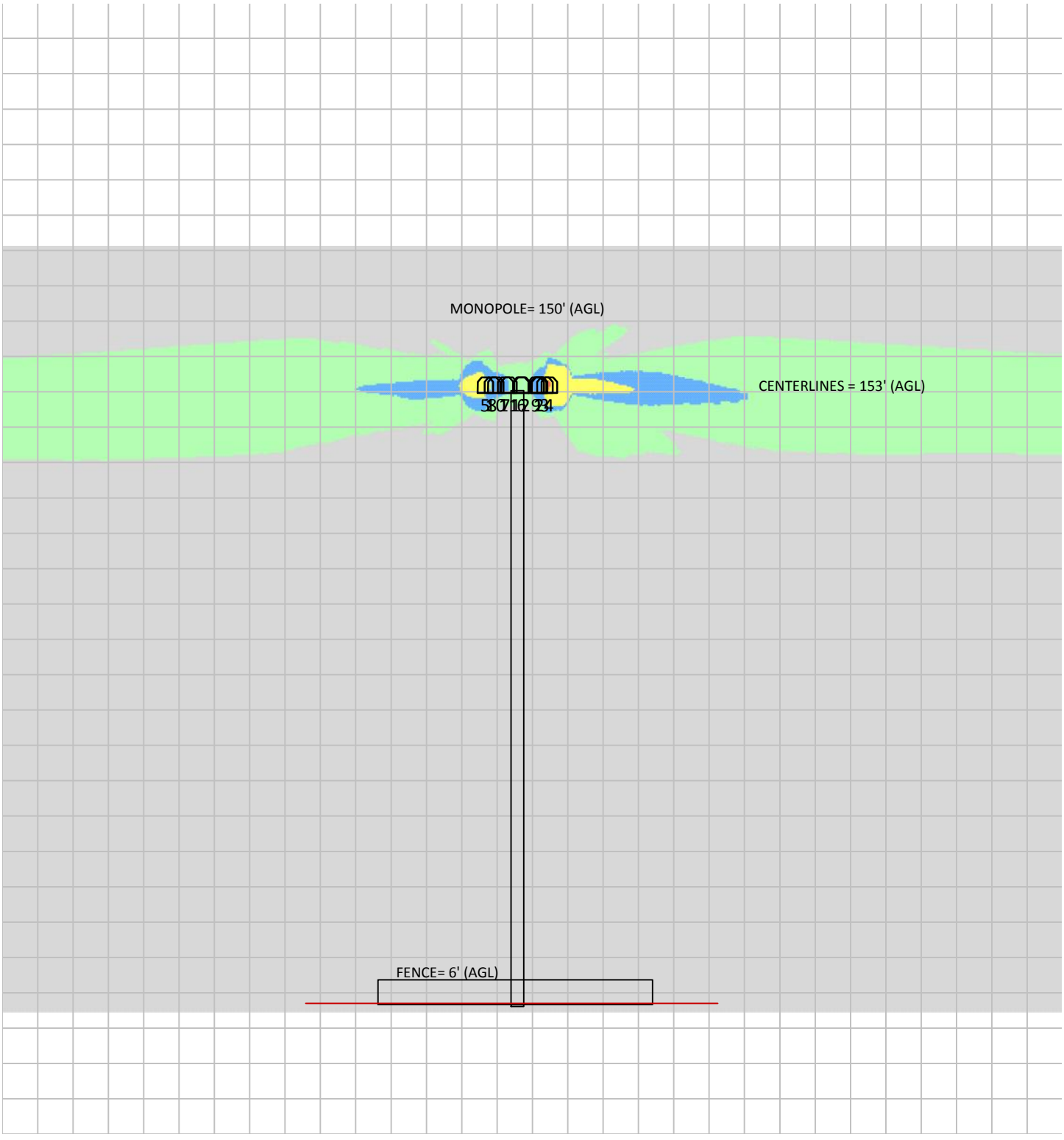


(Feet)
0 9.8 19.7

www.sitesafe.com
Site Name:Norwalk West-CT Ave
4/11/2019 12:42:52 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Norwalk West-CT Ave
Side View



% of FCC Public Exposure Limit

% of FCC Public Exposure Limit

>= 5000	>= 500	>= 100	>= 5	< 5

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Barrier

Proposed Barriers/ Signs

(Feet)

0 17.5 35

www.sitesafe.com
Site Name:Norwalk West-CT Ave
4/12/2019 7:28:52 AM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Single Level (0)

5 Site Compliance

5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility, LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

AT&T Mobility, LLC will be made compliant if the following changes are implemented:

Site Access Location

(1) Yellow Caution 2B sign(s) required.

Notes:

- Signage may already be in place. Sitesafe does not have record of any existing signage because there were no previous visits or data supplied regarding them. All remediation is based on a worst-case scenario.

6 Reviewer Certification

The reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Sitesafe, LLC., in Vienna, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Nick Kutzke.

April 12, 2019

Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.

Appendix B – Regulatory Background Information

FCC Rules and Regulations

In 1996, the Federal Communications Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

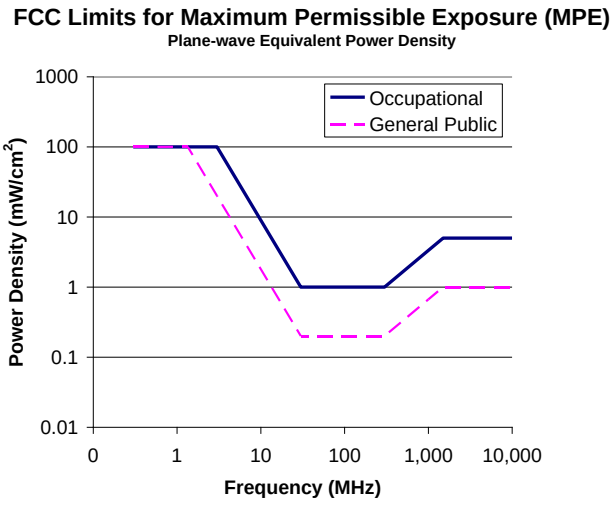
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –
- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Areas indicated as Gray are predicted to be below 5% of the MPE limits. Gray represents areas more than 20 times below the most conservative exposure limit.
- Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone.**
- Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers**.
- Yellow represents areas predicted to exceed Occupational MPE limits. Yellow areas should be accessible only to RF trained workers able to assess current exposure levels.
- Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

Appendix E – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The modeling is based on recommendations from the FCC's OET-65 bulletin with the following variances per AT&T guidance. Reflection has not been considered in the modeling, i.e. the reflection factor is 1.0. The near / far field boundary has been set to 1.5 times the aperture height of the antenna and modeling beyond that point is the lesser of the near field cylindrical model and the far field model taking into account the gain of the antenna.

The site has been modeled with these assumptions to show the maximum RF energy density. Areas modeled with exposure greater than 100% of the General Public MPE level may not actually occur, but are shown as a prediction that could be realized. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

Gain (of an antenna) – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

General Population/Uncontrolled Environment – Defined by the FCC, as an area where exposure to RF energy may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The maximum levels of RF exposure a person may be exposed to without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are aware of the

potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency (RF) – The frequencies of electromagnetic waves which are used for radio communications. Approximately 3 kHz to 300 GHz.

Radio Frequency Exposure (RFE) – The amount of RF power density that a person is or might be exposed to.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average power density an average sized human will be exposed to at a location.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

Appendix F – References

The following references can be followed for further information about RF Health and Safety.

Sitesafe, LLC.
http://www.sitesafe.com
FCC Radio Frequency Safety
http://www.fcc.gov/encyclopedia/radio-frequency-safety
National Council on Radiation Protection and Measurements (NCRP)
http://www.ncrponline.org
Institute of Electrical and Electronics Engineers, Inc., (IEEE)
http://www.ieee.org
American National Standards Institute (ANSI)
http://www.ansi.org
Environmental Protection Agency (EPA)
http://www.epa.gov/radtown/wireless-tech.html
National Institutes of Health (NIH)
http://www.niehs.nih.gov/health/topics/agents/emf/
Occupational Safety and Health Agency (OSHA)
http://www.osha.gov/SLTC/radiofrequencyradiation/
International Commission on Non-Ionizing Radiation Protection (ICNIRP)
http://www.icnirp.org
World Health Organization (WHO)
http://www.who.int/peh-emf/en/
National Cancer Institute
http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones
American Cancer Society (ACS)
http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?siteareа=PED
European Commission Scientific Committee on Emerging and Newly Identified Health Risks
http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_022.pdf
Fairfax County, Virginia Public School Survey
http://www.fcps.edu/fts/safety-security/RFEESurvey/
UK Health Protection Agency Advisory Group on Non-ionising Radiation
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368
Norwegian Institute of Public Health
http://www.fhi.no/dokumenter/545eea7147.pdf

600 CONNECTICUT AVE

Location	600 CONNECTICUT AVE	**Mblu**	5/ 69/ 61/ 0/
Acct#	22907	**Owner**	HOME DEPOT USA INC
Assessment	$26,703,250	**Appraisal**	$38,147,500
PID	22907	**Building Count**	2

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$19,132,950	$19,014,550	$38,147,500
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$13,393,060	$13,310,190	$26,703,250

Owner of Record

Owner	HOME DEPOT USA INC	**Sale Price**	$17,750,000
Co-Owner		**Certificate**	
Address	ATTN PROP TAX DEPT #6204 PO BOX 105842 ATLANTA, GA 30348-5842	**Book & Page**	3254/22
		Sale Date	09/06/1996
		Instrument	25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
HOME DEPOT USA INC	$17,750,000		3254/22	25	09/06/1996
BTS NORWALK LIMITED PRTNR	$17,750,000		3254/22		09/06/1996
HOBBS ENGINEERING COMPANY	$0		2237/206		08/08/1988
HOBBS INTERNATIONAL INC	$0		1357/237	07	06/24/1981
HOBBS EQUIPMENT COMPANY INC	$0		0/0		

Building Information

Building 1 : Section 1

Year Built:	1996
Living Area:	115,146
Replacement Cost:	$16,046,089

Building Percent Good: 86

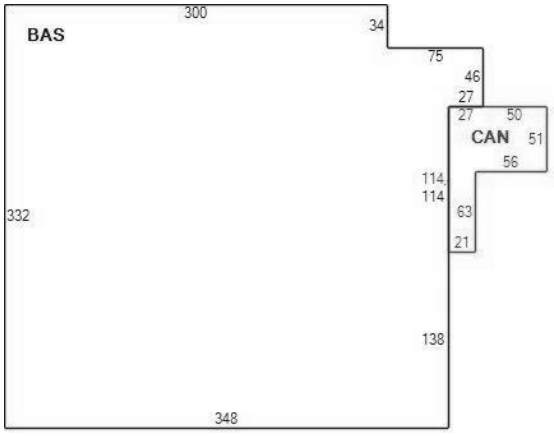
Replacement Cost Less Depreciation: $13,799,640

Building Attributes	
Field	**Description**
STYLE	Retail
MODEL	Commercial
Grade	A
Stories:	1.00
Occupancy	1.00
Exterior Wall 1	Precast Panel
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rolled Compos
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Forced Air
AC Percent	100
Heat Percent	100
Bldg Use	Commercial Improved
Total Rooms	0
Bedrooms	0
Full Baths	0
Half Baths	2
Extra Fixtures	2
FBM Area	
Heat/AC	Heat/AC Pkg
Frame	Steel
Plumbing	Average
Foundation	Slab
Partitions	Light
Wall Height	26.00
% Sprinkler	100.00

Building Photo

(http://images.vgsi.com/photos/NorwalkCTPhotos//00\00\67/32.

Building Layout



(ParcelSketch.ashx?pid=22907&bid=22907)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	115,146	115,146
CAN	Canopy	5,250	0
		120,396	115,146

Building 2 : Section 1

Year Built: 1996

Living Area: 172,328

Replacement Cost: $7,229,160

Building Percent Good: 86

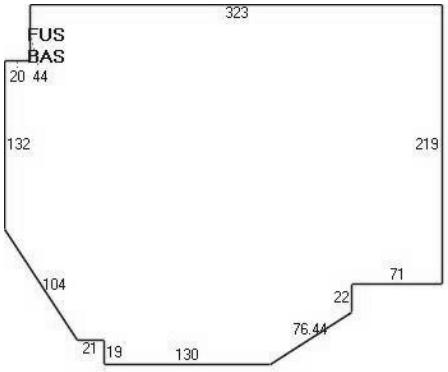
Replacement Cost Less Depreciation: $6,217,080

Building Attributes : Bldg 2 of 2	
Field	**Description**
STYLE	Parking Garage
MODEL	Commercial
Grade	C
Stories:	1.00
Occupancy	1.00
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Tar and Gravel
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	None
Heating Type	None
AC Percent	0
Heat Percent	100
Bldg Use	Commercial Improved
Total Rooms	0
Bedrooms	0
Full Baths	0
Half Baths	0
Extra Fixtures	0
FBM Area	
Heat/AC	None
Frame	Masonry
Plumbing	Average
Foundation	Poured Conc
Partitions	Average
Wall Height	8.00
% Sprinkler	0.00

Building Photo

(http://images.vgsi.com/photos/NorwalkCTPhotos//00\00\90/30.

Building Layout



(ParcelSketch.ashx?pid=22907&bid=50840)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	86,164	86,164
FUS	Finished Upper Story	86,164	86,164
		172,328	172,328

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**

ELV1	Commercial	2.00 STOP	$25,000	1
SPR	Sprinklers	115146.00 S.F.	$287,870	1

Land

Land Use

Use Code	201V
Description	Commercial Improved
Zone	B2
Neighborhood	C320

Land Line Valuation

Size (Acres)	9.75
Frontage	
Depth	
Assessed Value	$13,310,190
Appraised Value	$19,014,550

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
LT1	Light 1			7.00 UNITS	$5,030	1
PAV1	Paving Asph.			5000.00 S.F.	$6,500	1
FUEL	Fuel Cell	Ext	Energy Cell	200.00 KW	$64,800	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$19,132,950	$19,014,550	$38,147,500
2017	$13,900,880	$15,832,340	$29,733,220
2016	$13,900,880	$15,832,340	$29,733,220

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$13,393,060	$13,310,190	$26,703,250
2017	$9,730,620	$11,082,640	$20,813,260
2016	$9,730,620	$11,082,640	$20,813,260

Date: **June 28, 2019**

Cheryl Schultz
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL02108
	Carrier Site Name:	NORWALK WEST - CT Ave,
Crown Castle Designation:	**Crown Castle BU Number:**	841287
	Crown Castle Site Name:	NORWALK WEST- CT AVE
	Crown Castle JDE Job Number:	482696
	Crown Castle Work Order Number:	1760862
	Crown Castle Order Number:	424185 Rev. 3
Engineering Firm Designation:	**Crown Castle Project Number:**	1760862
Site Data:	**600 Connecticut Ave, NORWALK, Fairfield County, CT** **Latitude *41° 5' 49.45"*, Longitude *-73° 26' 56.61"*** **150 Foot - Monopole Tower**	

Dear Cheryl Schultz,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Proposed Equipment Configuration **Sufficient Capacity - 95.5%**

This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Ryan T. Conway / DLC

Respectfully submitted by:

Terry P. Styran, P.E.
Senior Project Engineer

7/1/2019

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by Valmont. The tower has been modified multiple times to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	120 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic Ss:	0.232
Seismic S1:	0.067
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
152.0	152.0	6	andrew	SBNHH-1D65A w/ Mount Pipe	12 6 4	1-5/8 3/4 3/8
		3	ericsson	RRUS 11 B12		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 32 B66		
		3	ericsson	RRUS 4478 B14		
		6	powerwave technologies	7020.00		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		3	quintel technology	QS66512-2 w/ Mount Pipe		
		3	raycap	DC6-48-60-18-8F		
		1	tower mounts	Platform Mount [LP 603-1]		
		1	tower mounts	Side Arm Mount [SO 102-3]		
		1	tower mounts	Side Arm Mount [SO 202-3]		

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	5344374	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FDH Engineering, Inc.	4710140	CCISITES
4-TOWER MANUFACTURER DRAWINGS	AT&T Technologies	5968178	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Group	5344563	CCISITES
4-POST-MODIFICATION INSPECTION	GPD Group	6044141	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.5.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are presented in Appendix C.

3.2) Assumptions

1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150 - 145	Pole	TP15.254x14.5x0.25	Pole	13.7	Pass
145 - 140	Pole	TP16.008x15.254x0.25	Pole	22.2	Pass
140 - 139.58	Pole	TP16.071x16.008x0.25	Pole	22.9	Pass
139.58 - 139.33	Pole + Reinf.	TP16.109x16.071x0.55	Reinf. 5 Tension Rupture	17.3	Pass
139.33 - 134.33	Pole + Reinf.	TP16.863x16.109x0.525	Reinf. 5 Tension Rupture	23.7	Pass
134.33 - 129.33	Pole + Reinf.	TP17.617x16.863x0.5125	Reinf. 5 Tension Rupture	29.9	Pass
129.33 - 124.33	Pole + Reinf.	TP18.371x17.617x0.5	Reinf. 5 Tension Rupture	35.9	Pass
124.33 - 119.33	Pole + Reinf.	TP19.125x18.371x0.4875	Reinf. 5 Tension Rupture	41.8	Pass
119.33 - 114.33	Pole + Reinf.	TP19.88x19.125x0.475	Reinf. 5 Tension Rupture	47.5	Pass
114.33 - 110	Pole + Reinf.	TP20.533x19.88x0.4625	Reinf. 5 Tension Rupture	52.3	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 109.75	Pole + Reinf.	TP20.571x20.533x0.5625	Reinf. 4 Tension Rupture	44.0	Pass
109.75 - 104.75	Pole + Reinf.	TP21.325x20.571x0.55	Reinf. 4 Tension Rupture	48.8	Pass
104.75 - 99.75	Pole + Reinf.	TP22.079x21.325x0.5375	Reinf. 4 Tension Rupture	53.5	Pass
99.75 - 94.75	Pole + Reinf.	TP22.833x22.079x0.525	Reinf. 4 Tension Rupture	58.1	Pass
94.75 - 89.75	Pole + Reinf.	TP23.587x22.833x0.5125	Reinf. 4 Tension Rupture	62.5	Pass
89.75 - 84.75	Pole + Reinf.	TP24.341x23.587x0.5	Reinf. 4 Tension Rupture	66.9	Pass
84.75 - 81.5	Pole + Reinf.	TP24.832x24.341x0.5	Reinf. 4 Tension Rupture	69.6	Pass
81.5 - 81.25	Pole + Reinf.	TP24.869x24.832x0.5	Reinf. 3 Tension Rupture	69.8	Pass
81.25 - 76.25	Pole + Reinf.	TP25.624x24.869x0.4875	Reinf. 3 Tension Rupture	74.0	Pass
76.25 - 71.25	Pole + Reinf.	TP26.378x25.624x0.475	Reinf. 3 Tension Rupture	78.0	Pass
71.25 - 70	Pole + Reinf.	TP27.17x26.378x0.475	Reinf. 3 Tension Rupture	78.9	Pass
70 - 65	Pole + Reinf.	TP26.82x26.066x0.5375	Reinf. 3 Tension Rupture	75.3	Pass
65 - 60	Pole + Reinf.	TP27.574x26.82x0.5313	Reinf. 3 Tension Rupture	78.6	Pass
60 - 55	Pole + Reinf.	TP28.329x27.574x0.525	Reinf. 3 Tension Rupture	81.7	Pass
55 - 51.25	Pole + Reinf.	TP28.894x28.329x0.5188	Reinf. 3 Tension Rupture	83.9	Pass
51.25 - 51	Pole + Reinf.	TP28.932x28.894x0.6	Reinf. 2 Tension Rupture	71.2	Pass
51 - 46	Pole + Reinf.	TP29.686x28.932x0.6	Reinf. 2 Tension Rupture	73.8	Pass
46 - 41	Pole + Reinf.	TP30.44x29.686x0.5875	Reinf. 2 Tension Rupture	76.3	Pass
41 - 36	Pole + Reinf.	TP31.194x30.44x0.575	Reinf. 2 Tension Rupture	78.8	Pass
36 - 31	Pole + Reinf.	TP31.948x31.194x0.575	Reinf. 2 Tension Rupture	81.2	Pass
31 - 30	Pole + Reinf.	TP32.552x31.948x0.575	Reinf. 2 Tension Rupture	81.6	Pass
30 - 26.25	Pole + Reinf.	TP32.04x31.474x0.6375	Reinf. 2 Tension Rupture	77.5	Pass
26.25 - 26	Pole + Reinf.	TP32.078x32.04x0.6375	Reinf. 1 Tension Rupture	77.6	Pass
26 - 21	Pole + Reinf.	TP32.832x32.078x0.625	Reinf. 1 Tension Rupture	79.5	Pass
21 - 16	Pole + Reinf.	TP33.586x32.832x0.625	Reinf. 1 Tension Rupture	81.3	Pass
16 - 11	Pole + Reinf.	TP34.341x33.586x0.6125	Reinf. 1 Tension Rupture	83.1	Pass
11 - 6	Pole + Reinf.	TP35.095x34.341x0.6125	Reinf. 1 Tension Rupture	84.7	Pass
6 - 1	Pole + Reinf.	TP35.849x35.095x0.6	Reinf. 1 Tension Rupture	86.3	Pass
1 - 0	Pole + Reinf.	TP36x35.849x0.6	Reinf. 1 Tension Rupture	86.6	Pass
				Summary	
			Pole	60.9	Pass
			Reinforcement	86.6	Pass
			Overall	86.6	Pass

Table 4 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Plate	110	74.7	Pass
1	Flange Bolts	110	95.5	Pass
1	Anchor Rods	0	71.4	Pass
1	Base Plate	0	59.1	Pass
1	Base Foundation Structure	0	58.9	Pass
1	Base Foundation Soil Interaction	0	56.1	Pass

Structure Rating (max from all components) =	95.5%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

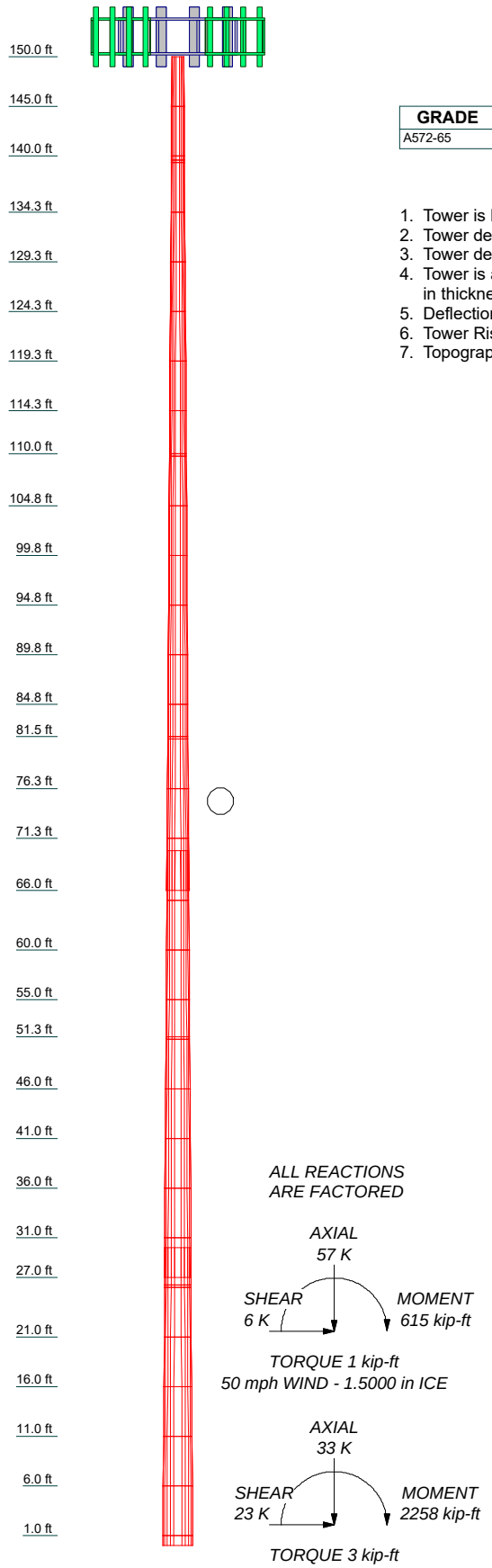
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Length (ft)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.33	5.000	5.00	5.00	5.00	5.00	5.00	5.25	5.00	5.000	5.00	5.00	5.00	5.00	5.00	5.75	5.00	5.000	5.00	5.00	5.00	5.00	5.00	5.00	5.000	5.00	5.00	5.00	5.00	1.00
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Thickness (in)	0.2500	0.2500	0.2500	0.2500	0.5260	0.5125	0.5000	0.4875	0.4750	0.4625	0.5500	0.5375	0.5250	0.5125	0.5000	0.4875	0.4750	0.4625	0.4875	0.4750	0.4750	0.5375	0.5313	0.5250	0.5188	0.6000	0.6000	0.5875	0.5750	0.5750	0.5750	0.6250	0.6250	0.6250	0.6125	0.6125	0.6000	0.6000	0.6000
Socket Length (ft)																					4.00								3.00										
Top Dia (in)	14.5000	15.2541	15.9083	16.5625	16.1065	16.8630	17.6172	18.3713	19.1254	19.8796	20.5205	21.3249	22.0791	22.8332	23.5874	24.3415	25.1000	25.8498	24.8804	25.6235	26.3777	27.1318	27.5745	28.3286	29.0827	29.8369	28.9316	29.6861	30.4402	31.1943	31.9485	32.7027	32.8320	32.8320	33.5863	34.3406	35.0949	35.8491	36.0000
Bot Dia (in)	15.2541	15.9083	16.5625	17.2167	16.8630	17.6172	18.3713	19.1254	19.8796	20.6338	21.3249	22.0791	22.8332	23.5874	24.3415	25.0957	25.8498	26.6040	25.6235	26.3777	27.1318	27.8860	28.3286	29.0827	29.8369	30.5910	29.6861	30.4402	31.1943	31.9485	32.7027	33.4568	33.5863	34.3406	35.0949	35.8491	36.6032	37.3574	37.5000
Grade	A572-65																																						
Weight (K)	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.5	0.4	0.0	0.6	0.6	0.6	0.6	0.6	0.4	0.0	0.6	0.6	0.7	0.7	0.7	0.8	0.6	0.0	0.9	0.9	0.9	0.9	0.7	0.8	1.1	1.0	1.1	1.1	1.1	1.1	0.2



ALL REACTIONS ARE FACTORED

TORQUE 1 kip-ft
50 mph WIND - 1.5000 in ICE

TORQUE 3 kip-ft
REACTIONS - 120 mph WIND

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft

CROWN CASTLE
The Pathway to Possible.

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX:

Job: ***BU# 841287***			
Project:			
Client: Crown Castle	Drawn by: DCampbell		App'd:
Code: TIA-222-H	Date: 06/28/19		Scale: NTS
Path: C:\Users\dcampbell\Desktop\841287 WO 1760862\QA - DLC\841287_Modified.er			Dwg No. E-1

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

1) Tower is located in Fairfield County, Connecticut.
2) Tower base elevation above sea level: 89.00 ft.
3) Basic wind speed of 120 mph.
4) Risk Category II.
5) Exposure Category B.
6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
7) Topographic Category: 1.
8) Crest Height: 0.00 ft.
9) Nominal ice thickness of 1.5000 in.
10) Ice thickness is considered to increase with height.
11) Ice density of 56 pcf.
12) A wind speed of 50 mph is used in combination with ice.
13) Temperature drop of 50 °F.
14) Deflections calculated using a wind speed of 60 mph.
15) A non-linear (P-delta) analysis was used.
16) Pressures are calculated at each section.
17) Stress ratio used in pole design is 1.05.
18) Tower analysis based on target reliabilities in accordance with Annex S.
19) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
20) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	150.00-145.00	5.00	0.00	12	14.5000	15.2541	0.2500	1.0000	A572-65 (65 ksi)
L2	145.00-140.00	5.00	0.00	12	15.2541	16.0083	0.2500	1.0000	A572-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	140.00-139.58	0.42	0.00	12	16.0083	16.0712	0.2500	1.0000	(65 ksi) A572-65 (65 ksi)
L4	139.58-139.33	0.25	0.00	12	16.0712	16.1089	0.5500	2.2000	A572-65 (65 ksi)
L5	139.33-134.33	5.00	0.00	12	16.1089	16.8630	0.5250	2.1000	A572-65 (65 ksi)
L6	134.33-129.33	5.00	0.00	12	16.8630	17.6172	0.5125	2.0500	A572-65 (65 ksi)
L7	129.33-124.33	5.00	0.00	12	17.6172	18.3713	0.5000	2.0000	A572-65 (65 ksi)
L8	124.33-119.33	5.00	0.00	12	18.3713	19.1254	0.4875	1.9500	A572-65 (65 ksi)
L9	119.33-114.33	5.00	0.00	12	19.1254	19.8796	0.4750	1.9000	A572-65 (65 ksi)
L10	114.33-110.00	4.33	0.00	12	19.8796	20.5331	0.4625	1.8500	A572-65 (65 ksi)
L11	110.00-109.75	0.25	0.00	12	20.5331	20.5708	0.5625	2.2500	A572-65 (65 ksi)
L12	109.75-104.75	5.00	0.00	12	20.5708	21.3249	0.5500	2.2000	A572-65 (65 ksi)
L13	104.75-99.75	5.00	0.00	12	21.3249	22.0791	0.5375	2.1500	A572-65 (65 ksi)
L14	99.75-94.75	5.00	0.00	12	22.0791	22.8332	0.5250	2.1000	A572-65 (65 ksi)
L15	94.75-89.75	5.00	0.00	12	22.8332	23.5874	0.5125	2.0500	A572-65 (65 ksi)
L16	89.75-84.75	5.00	0.00	12	23.5874	24.3415	0.5000	2.0000	A572-65 (65 ksi)
L17	84.75-81.50	3.25	0.00	12	24.3415	24.8317	0.5000	2.0000	A572-65 (65 ksi)
L18	81.50-81.25	0.25	0.00	12	24.8317	24.8694	0.5000	2.0000	A572-65 (65 ksi)
L19	81.25-76.25	5.00	0.00	12	24.8694	25.6235	0.4875	1.9500	A572-65 (65 ksi)
L20	76.25-71.25	5.00	0.00	12	25.6235	26.3777	0.4750	1.9000	A572-65 (65 ksi)
L21	71.25-66.00	5.25	4.00	12	26.3777	27.1695	0.4750	1.9000	A572-65 (65 ksi)
L22	66.00-65.00	5.00	0.00	12	26.0662	26.8203	0.5375	2.1500	A572-65 (65 ksi)
L23	65.00-60.00	5.00	0.00	12	26.8203	27.5745	0.5313	2.1250	A572-65 (65 ksi)
L24	60.00-55.00	5.00	0.00	12	27.5745	28.3286	0.5250	2.1000	A572-65 (65 ksi)
L25	55.00-51.25	3.75	0.00	12	28.3286	28.8942	0.5188	2.0750	A572-65 (65 ksi)
L26	51.25-51.00	0.25	0.00	12	28.8942	28.9319	0.6000	2.4000	A572-65 (65 ksi)
L27	51.00-46.00	5.00	0.00	12	28.9319	29.6861	0.6000	2.4000	A572-65 (65 ksi)
L28	46.00-41.00	5.00	0.00	12	29.6861	30.4402	0.5875	2.3500	A572-65 (65 ksi)
L29	41.00-36.00	5.00	0.00	12	30.4402	31.1943	0.5750	2.3000	A572-65 (65 ksi)
L30	36.00-31.00	5.00	0.00	12	31.1943	31.9485	0.5750	2.3000	A572-65 (65 ksi)
L31	31.00-27.00	4.00	3.00	12	31.9485	32.5518	0.5750	2.3000	A572-65 (65 ksi)
L32	27.00-26.25	3.75	0.00	12	31.4743	32.0400	0.6375	2.5500	A572-65 (65 ksi)
L33	26.25-26.00	0.25	0.00	12	32.0400	32.0777	0.6375	2.5500	A572-65 (65 ksi)
L34	26.00-21.00	5.00	0.00	12	32.0777	32.8320	0.6250	2.5000	A572-65 (65 ksi)
L35	21.00-16.00	5.00	0.00	12	32.8320	33.5863	0.6250	2.5000	A572-65 (65 ksi)
L36	16.00-11.00	5.00	0.00	12	33.5863	34.3406	0.6125	2.4500	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L37	11.00-6.00	5.00	0.00	12	34.3406	35.0949	0.6125	2.4500	A572-65 (65 ksi)
L38	6.00-1.00	5.00	0.00	12	35.0949	35.8491	0.6000	2.4000	A572-65 (65 ksi)
L39	1.00-0.00	1.00		12	35.8491	36.0000	0.6000	2.4000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	14.9233	11.4713	297.3216	5.1015	7.5110	39.5848	602.4541	5.6458	3.2160	12.864
	15.7041	12.0783	347.0683	5.3715	7.9016	43.9236	703.2545	5.9446	3.4181	13.672
L2	15.7041	12.0783	347.0683	5.3715	7.9016	43.9236	703.2545	5.9446	3.4181	13.672
	16.4848	12.6854	402.0757	5.6415	8.2923	48.4879	814.7144	6.2434	3.6202	14.481
L3	16.4848	12.6854	402.0757	5.6415	8.2923	48.4879	814.7144	6.2434	3.6202	14.481
	16.5499	12.7360	406.9093	5.6640	8.3249	48.8788	824.5086	6.2683	3.6371	14.548
L4	16.4441	27.4880	845.2358	5.5566	8.3249	101.5315	1712.6769	13.5288	2.8331	5.151
	16.4831	27.5548	851.4110	5.5701	8.3444	102.0338	1725.1895	13.5616	2.8432	5.169
L5	16.4919	26.3445	816.6344	5.5790	8.3444	97.8662	1654.7226	12.9660	2.9102	5.543
	17.2727	27.6194	941.0202	5.8490	8.7350	107.7293	1906.7621	13.5934	3.1123	5.928
L6	17.2771	26.9824	920.7250	5.8535	8.7350	105.4059	1865.6386	13.2799	3.1458	6.138
	18.0578	28.2270	1054.0918	6.1235	9.1257	115.5082	2135.8757	13.8924	3.3479	6.532
L7	18.0622	27.5586	1030.6385	6.1279	9.1257	112.9382	2088.3529	13.5635	3.3814	6.763
	18.8430	28.7728	1172.9500	6.3979	9.5163	123.2566	2376.7147	14.1611	3.5835	7.167
L8	18.8474	28.0731	1146.0276	6.4024	9.5163	120.4275	2322.1627	13.8167	3.6170	7.419
	19.6281	29.2569	1297.2069	6.6724	9.9070	130.9388	2628.4929	14.3993	3.8191	7.834
L9	19.6325	28.5258	1266.4900	6.6769	9.9070	127.8383	2566.2521	14.0395	3.8526	8.111
	20.4133	29.6793	1426.4190	6.9468	10.2976	138.5194	2890.3117	14.6072	4.0547	8.536
L10	20.4177	28.9169	1391.5675	6.9513	10.2976	135.1349	2819.6930	14.2320	4.0882	8.839
	21.0943	29.8901	1536.8611	7.1853	10.6361	144.4942	3114.0973	14.7110	4.2634	9.218
L11	21.0590	36.1717	1841.3557	7.1495	10.6361	173.1225	3731.0858	17.8026	3.9954	7.103
	21.0980	36.2400	1851.8055	7.1630	10.6557	173.7858	3752.2599	17.8362	4.0055	7.121
L12	21.1024	35.4568	1814.0499	7.1674	10.6557	170.2426	3675.7570	17.4508	4.0390	7.344
	21.8832	36.7924	2026.8614	7.4374	11.0463	183.4875	4106.9706	18.1081	4.2411	7.711
L13	21.8876	35.9779	1984.3739	7.4419	11.0463	179.6412	4020.8796	17.7072	4.2746	7.953
	22.6683	37.2831	2208.2738	7.7119	11.4370	193.0822	4474.5615	18.3496	4.4767	8.329
L14	22.6727	36.4372	2160.6756	7.7164	11.4370	188.9204	4378.1146	17.9333	4.5102	8.591
	23.4535	37.7120	2395.4971	7.9863	11.8276	202.5344	4853.9265	18.5607	4.7123	8.976
L15	23.4579	36.8348	2342.3946	7.9908	11.8276	198.0447	4746.3264	18.1289	4.7458	9.26
	24.2386	38.0793	2587.9297	8.2608	12.2182	211.8086	5243.8473	18.7415	4.9479	9.654
L16	24.2430	37.1706	2528.9149	8.2653	12.2182	206.9785	5124.2672	18.2943	4.9814	9.963
	25.0238	38.3848	2784.9149	8.5353	12.6089	220.8691	5642.9927	18.8918	5.1835	10.367
L17	25.0238	38.3848	2784.9149	8.5353	12.6089	220.8691	5642.9927	18.8918	5.1835	10.367
	25.5313	39.1740	2960.2471	8.7107	12.8628	230.1400	5998.2632	19.2803	5.3149	10.63
L18	25.5313	39.1740	2960.2471	8.7107	12.8628	230.1400	5998.2632	19.2803	5.3149	10.63
	25.5703	39.2347	2974.0310	8.7242	12.8823	230.8611	6026.1930	19.3101	5.3250	10.65
L19	25.5747	38.2735	2904.1445	8.7287	12.8823	225.4361	5884.5842	18.8370	5.3585	10.992
	26.3554	39.4573	3182.0427	8.9987	13.2730	239.7383	6447.6812	19.4197	5.5606	11.406
L20	26.3599	38.4647	3105.0797	9.0032	13.2730	233.9398	6291.7333	18.9311	5.5941	11.777
	27.1406	39.6181	3392.8790	9.2732	13.6636	248.3147	6874.8926	19.4988	5.7962	12.203
L21	27.1406	39.6181	3392.8790	9.2732	13.6636	248.3147	6874.8926	19.4988	5.7962	12.203
	27.9604	40.8292	3713.6486	9.5566	14.0738	263.8696	7524.8588	20.0949	6.0084	12.649
L22	27.4207	44.1838	3675.4111	9.1393	13.5023	272.2066	7447.3794	21.7459	5.5452	10.317
	27.5768	45.4890	4010.8530	9.4093	13.8929	288.6974	8127.0755	22.3883	5.7473	10.693
L23	27.5790	44.9708	3967.0439	9.4115	13.8929	285.5440	8038.3064	22.1332	5.7641	10.85
	28.3598	46.2608	4318.3324	9.6815	14.2836	302.3285	8750.1122	22.7682	5.9662	11.231
L24	28.3620	45.7271	4270.4880	9.6837	14.2836	298.9789	8653.1665	22.5055	5.9830	11.396
	29.1427	47.0020	4637.7231	9.9537	14.6742	316.0456	9397.2844	23.1330	6.1851	11.781
L25	29.1449	46.4529	4585.6031	9.9559	14.6742	312.4938	9291.6752	22.8627	6.2018	11.955
	29.7305	47.3977	4871.1223	10.1584	14.9672	325.4530	9870.2145	23.3277	6.3534	12.248
L26	29.7018	54.6644	5585.8101	10.1293	14.9672	373.2033	11318.3656	26.9042	6.1357	10.226
	29.7409	54.7373	5608.1721	10.1428	14.9867	374.2090	11363.6771	26.9400	6.1458	10.243

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L27	29.7409	54.7373	5608.1721	10.1428	14.9867	374.2090	11363.6771	26.9400	6.1458	10.243
	30.5216	56.1943	6068.0342	10.4128	15.3774	394.6078	12295.4823	27.6571	6.3479	10.58
L28	30.5260	55.0472	5949.2805	10.4173	15.3774	386.8851	12054.8551	27.0926	6.3814	10.862
	31.3068	56.4739	6423.9303	10.6873	15.7680	407.4023	13016.6244	27.7947	6.5835	11.206
L29	31.3112	55.2954	6295.1521	10.6917	15.7680	399.2352	12755.6848	27.2147	6.6170	11.508
	32.0919	56.6917	6784.1812	10.9617	16.1587	419.8477	13746.5903	27.9019	6.8191	11.859
L30	32.0919	56.6917	6784.1812	10.9617	16.1587	419.8477	13746.5903	27.9019	6.8191	11.859
	32.8727	58.0880	7297.9026	11.2317	16.5493	440.9791	14787.5292	28.5892	7.0212	12.211
L31	32.8727	58.0880	7297.9026	11.2317	16.5493	440.9791	14787.5292	28.5892	7.0212	12.211
	33.4973	59.2050	7727.0668	11.4477	16.8618	458.2578	15657.1323	29.1389	7.1829	12.492
L32	32.8283	63.3003	7682.9956	11.0396	16.3037	471.2426	15567.8320	31.1545	6.7266	10.552
	32.9454	64.4615	8113.6407	11.2421	16.5967	488.8697	16440.4357	31.7260	6.8782	10.789
L33	32.9454	64.4615	8113.6407	11.2421	16.5967	488.8697	16440.4357	31.7260	6.8782	10.789
	32.9844	64.5390	8142.9089	11.2556	16.6163	490.0564	16499.7412	31.7641	6.8883	10.805
L34	32.9888	63.2986	7992.7698	11.2601	16.6163	481.0207	16195.5185	31.1537	6.9218	11.075
	33.7697	64.8166	8581.7035	11.5301	17.0070	504.5987	17388.8580	31.9008	7.1240	11.398
L35	33.7697	64.8166	8581.7035	11.5301	17.0070	504.5987	17388.8580	31.9008	7.1240	11.398
	34.5506	66.3346	9198.8789	11.8001	17.3977	528.7410	18639.4226	32.6479	7.3261	11.722
L36	34.5550	65.0326	9025.1614	11.8046	17.3977	518.7559	18287.4239	32.0071	7.3596	12.016
	35.3359	66.5202	9658.7932	12.0747	17.7884	542.9820	19571.3336	32.7392	7.5618	12.346
L37	35.3359	66.5202	9658.7932	12.0747	17.7884	542.9820	19571.3336	32.7392	7.5618	12.346
	36.1168	68.0078	10321.4088	12.3447	18.1791	567.7611	20913.9724	33.4714	7.7639	12.676
L38	36.1212	66.6441	10121.7673	12.3492	18.1791	556.7792	20509.4448	32.8002	7.7974	12.996
	36.9021	68.1013	10800.3739	12.6192	18.5699	581.6078	21884.4857	33.5174	7.9996	13.333
L39	36.9021	68.1013	10800.3739	12.6192	18.5699	581.6078	21884.4857	33.5174	7.9996	13.333
	37.0583	68.3928	10939.6357	12.6732	18.6480	586.6385	22166.6677	33.6609	8.0400	13.4

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.00-145.00				1	1	1			
L2 145.00-140.00				1	1	1			
L3 140.00-139.58				1	1	1			
L4 139.58-139.33				1	1	0.887801			
L5 139.33-134.33				1	1	0.907703			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L6 134.33-129.33				1	1	0.909673			
L7 129.33-124.33				1	1	0.913516			
L8 124.33-119.33				1	1	0.91915			
L9 119.33-114.33				1	1	0.926523			
L10 114.33-110.00				1	1	0.937588			
L11 110.00-109.75				1	1	0.907889			
L12 109.75-104.75				1	1	0.910758			
L13 104.75-99.75				1	1	0.915055			
L14 99.75-94.75				1	1	0.920745			
L15 94.75-89.75				1	1	0.927808			
L16 89.75-84.75				1	1	0.936239			
L17 84.75-81.50				1	1	0.92745			
L18 81.50-81.25				1	1	0.926789			
L19 81.25-76.25				1	1	0.936947			
L20 76.25-71.25				1	1	0.948466			
L21 71.25-66.00				1	1	0.945416			
L22 66.00-65.00				1	1	0.950058			
L23 65.00-60.00				1	1	0.950611			
L24 60.00-55.00				1	1	0.951766			
L25 55.00-51.25				1	1	0.955828			
L26 51.25-51.00				1	1	0.939592			
L27 51.00-46.00				1	1	0.928734			
L28 46.00-41.00				1	1	0.937574			
L29 41.00-36.00				1	1	0.947356			
L30 36.00-31.00				1	1	0.937648			
L31 31.00-27.00				1	1	0.935762			
L32 27.00-26.25				1	1	0.944252			
L33 26.25-26.00				1	1	0.943825			
L34 26.00-21.00				1	1	0.953833			
L35 21.00-16.00				1	1	0.945736			
L36 16.00-11.00				1	1	0.95679			
L37 11.00-6.00				1	1	0.949253			
L38 6.00-1.00				1	1	0.961324			
L39 1.00-0.00				1	1	0.95989			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
152										
LDF7-50A(1-5/8)	B	No	Surface Ar (CaAa)	150.00 - 10.00	12	6	-0.500 -0.300	1.9800		0.82
WR-VG86ST-BRD(3/4")	B	No	Surface Ar (CaAa)	150.00 - 10.00	3	1	-0.290 -0.280	0.7950		0.58
FB-L98B-009-XXX(3/8")	B	No	Surface Ar (CaAa)	150.00 - 10.00	2	1	-0.300 -0.290	0.3937		0.06
MODS										
MP3-05	A	No	Surface Af (CaAa)	51.25 - 0.50	1	1	0.100 0.130	5.3300	14.8400	0.00
MP3-05	B	No	Surface Af (CaAa)	51.25 - 0.50	1	1	-0.130 -0.100	5.3300	14.8400	0.00
MP3-05	C	No	Surface Af (CaAa)	51.25 - 0.50	1	1	-0.300 -0.280	5.3300	14.8400	0.00
MP3-05	C	No	Surface Af (CaAa)	51.25 - 0.50	1	1	0.300 0.320	5.3300	14.8400	0.00
MP3-04	A	No	Surface Af (CaAa)	110.00 - 51.25	1	1	0.100 0.130	4.7800	12.7800	0.00
MP3-04	B	No	Surface Af (CaAa)	110.00 - 51.25	1	1	-0.130 -0.100	4.7800	12.7800	0.00
MP3-04	C	No	Surface Af (CaAa)	110.00 - 51.25	1	1	-0.300 -0.280	4.7800	12.7800	0.00
MP3-04	C	No	Surface Af (CaAa)	110.00 - 51.25	1	1	0.300 0.320	4.7800	12.7800	0.00
MP3-03	A	No	Surface Af (CaAa)	140.75 - 110.75	1	1	0.100 0.130	4.0600	11.2600	0.00
MP3-03	B	No	Surface Af (CaAa)	140.75 - 110.75	1	1	-0.130 -0.100	4.0600	11.2600	0.00
MP3-03	C	No	Surface Af (CaAa)	140.75 - 110.75	1	1	-0.300 -0.280	4.0600	11.2600	0.00
MP3-03	C	No	Surface Af (CaAa)	140.75 - 110.75	1	1	0.300 0.320	4.0600	11.2600	0.00
**										
**										
**										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
WR-VG86ST-BRD(3/4")	B	No	No	Inside Pole	150.00 - 10.00	3	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
LDF2-50(3/8")	B	No	No	Inside Pole	150.00 - 10.00	2	No Ice	0.00	0.08
							1/2" Ice	0.00	0.08
							1" Ice	0.00	0.08
							2" Ice	0.00	0.08
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**									
**									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-145.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	6.534	0.000	0.07
		C	0.000	0.000	0.000	0.000	0.00
L2	145.00-140.00	A	0.000	0.000	0.507	0.000	0.00
		B	0.000	0.000	7.042	0.000	0.07
		C	0.000	0.000	1.015	0.000	0.00
L3	140.00-139.58	A	0.000	0.000	0.282	0.000	0.00
		B	0.000	0.000	0.827	0.000	0.01
		C	0.000	0.000	0.564	0.000	0.00
L4	139.58-139.33	A	0.000	0.000	0.169	0.000	0.00
		B	0.000	0.000	0.496	0.000	0.00
		C	0.000	0.000	0.338	0.000	0.00
L5	139.33-134.33	A	0.000	0.000	3.383	0.000	0.00
		B	0.000	0.000	9.918	0.000	0.07
		C	0.000	0.000	6.767	0.000	0.00
L6	134.33-129.33	A	0.000	0.000	3.383	0.000	0.00
		B	0.000	0.000	9.918	0.000	0.07
		C	0.000	0.000	6.767	0.000	0.00
L7	129.33-124.33	A	0.000	0.000	3.383	0.000	0.00
		B	0.000	0.000	9.918	0.000	0.07
		C	0.000	0.000	6.767	0.000	0.00
L8	124.33-119.33	A	0.000	0.000	3.383	0.000	0.00
		B	0.000	0.000	9.918	0.000	0.07
		C	0.000	0.000	6.767	0.000	0.00
L9	119.33-114.33	A	0.000	0.000	3.383	0.000	0.00
		B	0.000	0.000	9.918	0.000	0.07
		C	0.000	0.000	6.767	0.000	0.00
L10	114.33-110.00	A	0.000	0.000	2.424	0.000	0.00
		B	0.000	0.000	8.087	0.000	0.06
		C	0.000	0.000	4.849	0.000	0.00
L11	110.00-109.75	A	0.000	0.000	0.199	0.000	0.00
		B	0.000	0.000	0.526	0.000	0.00
		C	0.000	0.000	0.398	0.000	0.00
L12	109.75-104.75	A	0.000	0.000	3.983	0.000	0.00
		B	0.000	0.000	10.518	0.000	0.07
		C	0.000	0.000	7.967	0.000	0.00
L13	104.75-99.75	A	0.000	0.000	3.983	0.000	0.00
		B	0.000	0.000	10.518	0.000	0.07
		C	0.000	0.000	7.967	0.000	0.00
L14	99.75-94.75	A	0.000	0.000	3.983	0.000	0.00
		B	0.000	0.000	10.518	0.000	0.07
		C	0.000	0.000	7.967	0.000	0.00
L15	94.75-89.75	A	0.000	0.000	3.983	0.000	0.00
		B	0.000	0.000	10.518	0.000	0.07
		C	0.000	0.000	7.967	0.000	0.00
L16	89.75-84.75	A	0.000	0.000	3.983	0.000	0.00
		B	0.000	0.000	10.518	0.000	0.07
		C	0.000	0.000	7.967	0.000	0.00
L17	84.75-81.50	A	0.000	0.000	2.589	0.000	0.00
		B	0.000	0.000	6.836	0.000	0.04
		C	0.000	0.000	5.178	0.000	0.00
L18	81.50-81.25	A	0.000	0.000	0.199	0.000	0.00
		B	0.000	0.000	0.526	0.000	0.00
		C	0.000	0.000	0.398	0.000	0.00
L19	81.25-76.25	A	0.000	0.000	3.983	0.000	0.00
		B	0.000	0.000	10.518	0.000	0.07
		C	0.000	0.000	7.967	0.000	0.00
L20	76.25-71.25	A	0.000	0.000	3.983	0.000	0.00
		B	0.000	0.000	10.518	0.000	0.07
		C	0.000	0.000	7.967	0.000	0.00
L21	71.25-66.00	A	0.000	0.000	4.183	0.000	0.00
		B	0.000	0.000	11.044	0.000	0.07
		C	0.000	0.000	8.365	0.000	0.00
L22	66.00-65.00	A	0.000	0.000	0.797	0.000	0.00
		B	0.000	0.000	2.104	0.000	0.01
		C	0.000	0.000	1.593	0.000	0.00
L23	65.00-60.00	A	0.000	0.000	3.983	0.000	0.00
		B	0.000	0.000	10.518	0.000	0.07

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	7.967	0.000	0.00
L24	60.00-55.00	A	0.000	0.000	3.983	0.000	0.00
		B	0.000	0.000	10.518	0.000	0.07
		C	0.000	0.000	7.967	0.000	0.00
L25	55.00-51.25	A	0.000	0.000	2.987	0.000	0.00
		B	0.000	0.000	7.888	0.000	0.05
		C	0.000	0.000	5.975	0.000	0.00
L26	51.25-51.00	A	0.000	0.000	0.222	0.000	0.00
		B	0.000	0.000	0.549	0.000	0.00
		C	0.000	0.000	0.444	0.000	0.00
L27	51.00-46.00	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	10.976	0.000	0.07
		C	0.000	0.000	8.883	0.000	0.00
L28	46.00-41.00	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	10.976	0.000	0.07
		C	0.000	0.000	8.883	0.000	0.00
L29	41.00-36.00	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	10.976	0.000	0.07
		C	0.000	0.000	8.883	0.000	0.00
L30	36.00-31.00	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	10.976	0.000	0.07
		C	0.000	0.000	8.883	0.000	0.00
L31	31.00-27.00	A	0.000	0.000	3.553	0.000	0.00
		B	0.000	0.000	8.781	0.000	0.05
		C	0.000	0.000	7.107	0.000	0.00
L32	27.00-26.25	A	0.000	0.000	0.666	0.000	0.00
		B	0.000	0.000	1.646	0.000	0.01
		C	0.000	0.000	1.333	0.000	0.00
L33	26.25-26.00	A	0.000	0.000	0.222	0.000	0.00
		B	0.000	0.000	0.549	0.000	0.00
		C	0.000	0.000	0.444	0.000	0.00
L34	26.00-21.00	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	10.976	0.000	0.07
		C	0.000	0.000	8.883	0.000	0.00
L35	21.00-16.00	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	10.976	0.000	0.07
		C	0.000	0.000	8.883	0.000	0.00
L36	16.00-11.00	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	10.976	0.000	0.07
		C	0.000	0.000	8.883	0.000	0.00
L37	11.00-6.00	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	5.749	0.000	0.01
		C	0.000	0.000	8.883	0.000	0.00
L38	6.00-1.00	A	0.000	0.000	4.442	0.000	0.00
		B	0.000	0.000	4.442	0.000	0.00
		C	0.000	0.000	8.883	0.000	0.00
L39	1.00-0.00	A	0.000	0.000	0.444	0.000	0.00
		B	0.000	0.000	0.444	0.000	0.00
		C	0.000	0.000	0.888	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-145.00	A	1.481	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	12.832	0.000	0.28
		C		0.000	0.000	0.000	0.000	0.00
L2	145.00-140.00	A	1.476	0.000	0.000	0.729	0.000	0.01
		B		0.000	0.000	13.545	0.000	0.29
		C		0.000	0.000	1.458	0.000	0.01
L3	140.00-139.58	A	1.473	0.000	0.000	0.405	0.000	0.00
		B		0.000	0.000	1.473	0.000	0.03
		C		0.000	0.000	0.810	0.000	0.01
L4	139.58-139.33	A	1.473	0.000	0.000	0.243	0.000	0.00
		B		0.000	0.000	0.883	0.000	0.02

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	0.486	0.000	0.00
L5	139.33-134.33	A	1.470	0.000	0.000	4.853	0.000	0.05
		B		0.000	0.000	17.650	0.000	0.33
		C		0.000	0.000	9.706	0.000	0.10
L6	134.33-129.33	A	1.464	0.000	0.000	4.848	0.000	0.05
		B		0.000	0.000	17.626	0.000	0.33
		C		0.000	0.000	9.695	0.000	0.10
L7	129.33-124.33	A	1.459	0.000	0.000	4.842	0.000	0.05
		B		0.000	0.000	17.602	0.000	0.33
		C		0.000	0.000	9.684	0.000	0.10
L8	124.33-119.33	A	1.453	0.000	0.000	4.836	0.000	0.05
		B		0.000	0.000	17.577	0.000	0.32
		C		0.000	0.000	9.672	0.000	0.09
L9	119.33-114.33	A	1.447	0.000	0.000	4.830	0.000	0.05
		B		0.000	0.000	17.552	0.000	0.32
		C		0.000	0.000	9.660	0.000	0.09
L10	114.33-110.00	A	1.441	0.000	0.000	3.457	0.000	0.03
		B		0.000	0.000	14.465	0.000	0.27
		C		0.000	0.000	6.914	0.000	0.07
L11	110.00-109.75	A	1.438	0.000	0.000	0.271	0.000	0.00
		B		0.000	0.000	0.906	0.000	0.02
		C		0.000	0.000	0.542	0.000	0.01
L12	109.75-104.75	A	1.434	0.000	0.000	5.418	0.000	0.05
		B		0.000	0.000	18.099	0.000	0.32
		C		0.000	0.000	10.836	0.000	0.10
L13	104.75-99.75	A	1.428	0.000	0.000	5.411	0.000	0.05
		B		0.000	0.000	18.070	0.000	0.32
		C		0.000	0.000	10.822	0.000	0.10
L14	99.75-94.75	A	1.421	0.000	0.000	5.404	0.000	0.05
		B		0.000	0.000	18.040	0.000	0.32
		C		0.000	0.000	10.808	0.000	0.10
L15	94.75-89.75	A	1.413	0.000	0.000	5.396	0.000	0.05
		B		0.000	0.000	18.008	0.000	0.32
		C		0.000	0.000	10.793	0.000	0.10
L16	89.75-84.75	A	1.405	0.000	0.000	5.389	0.000	0.05
		B		0.000	0.000	17.975	0.000	0.32
		C		0.000	0.000	10.777	0.000	0.10
L17	84.75-81.50	A	1.398	0.000	0.000	3.498	0.000	0.03
		B		0.000	0.000	11.665	0.000	0.21
		C		0.000	0.000	6.996	0.000	0.06
L18	81.50-81.25	A	1.395	0.000	0.000	0.269	0.000	0.00
		B		0.000	0.000	0.897	0.000	0.02
		C		0.000	0.000	0.538	0.000	0.00
L19	81.25-76.25	A	1.391	0.000	0.000	5.374	0.000	0.05
		B		0.000	0.000	17.914	0.000	0.31
		C		0.000	0.000	10.748	0.000	0.10
L20	76.25-71.25	A	1.382	0.000	0.000	5.365	0.000	0.05
		B		0.000	0.000	17.875	0.000	0.31
		C		0.000	0.000	10.730	0.000	0.10
L21	71.25-66.00	A	1.372	0.000	0.000	5.623	0.000	0.05
		B		0.000	0.000	18.725	0.000	0.33
		C		0.000	0.000	11.246	0.000	0.10
L22	66.00-65.00	A	1.365	0.000	0.000	1.071	0.000	0.01
		B		0.000	0.000	3.567	0.000	0.06
		C		0.000	0.000	2.142	0.000	0.02
L23	65.00-60.00	A	1.359	0.000	0.000	5.342	0.000	0.05
		B		0.000	0.000	17.779	0.000	0.31
		C		0.000	0.000	10.685	0.000	0.09
L24	60.00-55.00	A	1.348	0.000	0.000	5.331	0.000	0.05
		B		0.000	0.000	17.731	0.000	0.30
		C		0.000	0.000	10.662	0.000	0.09
L25	55.00-51.25	A	1.337	0.000	0.000	3.990	0.000	0.03
		B		0.000	0.000	13.264	0.000	0.23
		C		0.000	0.000	7.981	0.000	0.07
L26	51.25-51.00	A	1.332	0.000	0.000	0.289	0.000	0.00
		B		0.000	0.000	0.906	0.000	0.02
		C		0.000	0.000	0.577	0.000	0.01
L27	51.00-46.00	A	1.325	0.000	0.000	5.767	0.000	0.05
		B		0.000	0.000	18.092	0.000	0.30

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	11.533	0.000	0.10
L28	46.00-41.00	A	1.311	0.000	0.000	5.752	0.000	0.05
		B		0.000	0.000	18.031	0.000	0.30
		C		0.000	0.000	11.505	0.000	0.10
L29	41.00-36.00	A	1.295	0.000	0.000	5.736	0.000	0.05
		B		0.000	0.000	17.964	0.000	0.30
		C		0.000	0.000	11.473	0.000	0.10
L30	36.00-31.00	A	1.277	0.000	0.000	5.719	0.000	0.05
		B		0.000	0.000	17.888	0.000	0.29
		C		0.000	0.000	11.437	0.000	0.10
L31	31.00-27.00	A	1.259	0.000	0.000	4.560	0.000	0.04
		B		0.000	0.000	14.248	0.000	0.23
		C		0.000	0.000	9.120	0.000	0.08
L32	27.00-26.25	A	1.248	0.000	0.000	0.855	0.000	0.01
		B		0.000	0.000	2.672	0.000	0.04
		C		0.000	0.000	1.710	0.000	0.01
L33	26.25-26.00	A	1.246	0.000	0.000	0.284	0.000	0.00
		B		0.000	0.000	0.888	0.000	0.01
		C		0.000	0.000	0.569	0.000	0.00
L34	26.00-21.00	A	1.232	0.000	0.000	5.674	0.000	0.05
		B		0.000	0.000	17.699	0.000	0.28
		C		0.000	0.000	11.348	0.000	0.09
L35	21.00-16.00	A	1.203	0.000	0.000	5.645	0.000	0.05
		B		0.000	0.000	17.575	0.000	0.28
		C		0.000	0.000	11.290	0.000	0.09
L36	16.00-11.00	A	1.166	0.000	0.000	5.608	0.000	0.04
		B		0.000	0.000	17.416	0.000	0.27
		C		0.000	0.000	11.215	0.000	0.09
L37	11.00-6.00	A	1.113	0.000	0.000	5.555	0.000	0.04
		B		0.000	0.000	7.882	0.000	0.08
		C		0.000	0.000	11.110	0.000	0.08
L38	6.00-1.00	A	1.018	0.000	0.000	5.460	0.000	0.04
		B		0.000	0.000	5.460	0.000	0.04
		C		0.000	0.000	10.920	0.000	0.07
L39	1.00-0.00	A	0.839	0.000	0.000	0.528	0.000	0.00
		B		0.000	0.000	0.528	0.000	0.00
		C		0.000	0.000	1.056	0.000	0.01

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-145.00	1.0930	-4.7010	1.2248	-4.4696
L2	145.00-140.00	0.9445	-4.3368	1.1159	-4.2715
L3	140.00-139.58	0.4521	-2.8926	0.6636	-3.2521
L4	139.58-139.33	0.4536	-2.9029	0.6657	-3.2627
L5	139.33-134.33	0.4595	-2.9448	0.6764	-3.3184
L6	134.33-129.33	0.4705	-3.0237	0.6966	-3.4236
L7	129.33-124.33	0.4813	-3.1006	0.7164	-3.5270
L8	124.33-119.33	0.4918	-3.1757	0.7359	-3.6286
L9	119.33-114.33	0.5021	-3.2489	0.7549	-3.7285
L10	114.33-110.00	0.5688	-3.4483	0.8459	-3.9791
L11	110.00-109.75	0.4663	-3.2328	0.7332	-3.7579
L12	109.75-104.75	0.4711	-3.2699	0.7423	-3.8080
L13	104.75-99.75	0.4801	-3.3396	0.7594	-3.9023
L14	99.75-94.75	0.4890	-3.4079	0.7761	-3.9950
L15	94.75-89.75	0.4976	-3.4747	0.7925	-4.0862
L16	89.75-84.75	0.5061	-3.5401	0.8086	-4.1758
L17	84.75-81.50	0.5130	-3.5932	0.8216	-4.2487
L18	81.50-81.25	0.5159	-3.6155	0.8270	-4.2793
L19	81.25-76.25	0.5202	-3.6484	0.8351	-4.3247
L20	76.25-71.25	0.5282	-3.7102	0.8501	-4.4101
L21	71.25-66.00	0.5363	-3.7726	0.8652	-4.4963
L22	66.00-65.00	0.5361	-3.7714	0.8648	-4.4939

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L23	65.00-60.00	0.5408	-3.8072	0.8725	-4.5419
L24	60.00-55.00	0.5484	-3.8661	0.8865	-4.6232
L25	55.00-51.25	0.5550	-3.9167	0.8983	-4.6930
L26	51.25-51.00	0.5204	-3.8681	0.8636	-4.6420
L27	51.00-46.00	0.5241	-3.8985	0.8702	-4.6830
L28	46.00-41.00	0.5311	-3.9555	0.8824	-4.7595
L29	41.00-36.00	0.5379	-4.0115	0.8941	-4.8342
L30	36.00-31.00	0.5447	-4.0667	0.9051	-4.9070
L31	31.00-27.00	0.5507	-4.1155	0.9143	-4.9706
L32	27.00-26.25	0.5485	-4.0974	0.9097	-4.9444
L33	26.25-26.00	0.5491	-4.1028	0.9088	-4.9479
L34	26.00-21.00	0.5526	-4.1309	0.9136	-4.9835
L35	21.00-16.00	0.5591	-4.1840	0.9218	-5.0491
L36	16.00-11.00	0.5655	-4.2360	0.9280	-5.1099
L37	11.00-6.00	0.0411	-2.2725	0.1392	-2.6553
L38	6.00-1.00	-0.1152	-1.7044	-0.1243	-1.8377
L39	1.00-0.00	-0.0905	-1.3399	-0.0847	-1.2535

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	LDF7-50A(1-5/8)	145.00 - 150.00	1.0000	1.0000
L1	4	WR-VG86ST-BRD(3/4")	145.00 - 150.00	1.0000	1.0000
L1	6	FB-L98B-009-XXX(3/8")	145.00 - 150.00	1.0000	1.0000
L2	2	LDF7-50A(1-5/8)	140.00 - 145.00	1.0000	1.0000
L2	4	WR-VG86ST-BRD(3/4")	140.00 - 145.00	1.0000	1.0000
L2	6	FB-L98B-009-XXX(3/8")	140.00 - 145.00	1.0000	1.0000
L2	17	MP3-03	140.00 - 140.75	1.0000	1.0000
L2	18	MP3-03	140.00 - 140.75	1.0000	1.0000
L2	19	MP3-03	140.00 - 140.75	1.0000	1.0000
L2	20	MP3-03	140.00 - 140.75	1.0000	1.0000
L3	2	LDF7-50A(1-5/8)	139.58 - 140.00	1.0000	1.0000
L3	4	WR-VG86ST-BRD(3/4")	139.58 - 140.00	1.0000	1.0000
L3	6	FB-L98B-009-XXX(3/8")	139.58 - 140.00	1.0000	1.0000
L3	17	MP3-03	139.58 - 140.00	1.0000	1.0000
L3	18	MP3-03	139.58 - 140.00	1.0000	1.0000
L3	19	MP3-03	139.58 - 140.00	1.0000	1.0000
L3	20	MP3-03	139.58 - 140.00	1.0000	1.0000
L4	2	LDF7-50A(1-5/8)	139.33 - 139.58	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L4	4	WR-VG86ST-BRD(3/4")	139.33 - 139.58	1.0000	1.0000
L4	6	FB-L98B-009-XXX(3/8")	139.33 - 139.58	1.0000	1.0000
L4	17	MP3-03	139.33 - 139.58	1.0000	1.0000
L4	18	MP3-03	139.33 - 139.58	1.0000	1.0000
L4	19	MP3-03	139.33 - 139.58	1.0000	1.0000
L4	20	MP3-03	139.33 - 139.58	1.0000	1.0000
L5	2	LDF7-50A(1-5/8)	134.33 - 139.33	1.0000	1.0000
L5	4	WR-VG86ST-BRD(3/4")	134.33 - 139.33	1.0000	1.0000
L5	6	FB-L98B-009-XXX(3/8")	134.33 - 139.33	1.0000	1.0000
L5	17	MP3-03	134.33 - 139.33	1.0000	1.0000
L5	18	MP3-03	134.33 - 139.33	1.0000	1.0000
L5	19	MP3-03	134.33 - 139.33	1.0000	1.0000
L5	20	MP3-03	134.33 - 139.33	1.0000	1.0000
L6	2	LDF7-50A(1-5/8)	129.33 - 134.33	1.0000	1.0000
L6	4	WR-VG86ST-BRD(3/4")	129.33 - 134.33	1.0000	1.0000
L6	6	FB-L98B-009-XXX(3/8")	129.33 - 134.33	1.0000	1.0000
L6	17	MP3-03	129.33 - 134.33	1.0000	1.0000
L6	18	MP3-03	129.33 - 134.33	1.0000	1.0000
L6	19	MP3-03	129.33 - 134.33	1.0000	1.0000
L6	20	MP3-03	129.33 - 134.33	1.0000	1.0000
L7	2	LDF7-50A(1-5/8)	124.33 - 129.33	1.0000	1.0000
L7	4	WR-VG86ST-BRD(3/4")	124.33 - 129.33	1.0000	1.0000
L7	6	FB-L98B-009-XXX(3/8")	124.33 - 129.33	1.0000	1.0000
L7	17	MP3-03	124.33 - 129.33	1.0000	1.0000
L7	18	MP3-03	124.33 - 129.33	1.0000	1.0000
L7	19	MP3-03	124.33 - 129.33	1.0000	1.0000
L7	20	MP3-03	124.33 - 129.33	1.0000	1.0000
L8	2	LDF7-50A(1-5/8)	119.33 - 124.33	1.0000	1.0000
L8	4	WR-VG86ST-BRD(3/4")	119.33 - 124.33	1.0000	1.0000
L8	6	FB-L98B-009-XXX(3/8")	119.33 - 124.33	1.0000	1.0000
L8	17	MP3-03	119.33 - 124.33	1.0000	1.0000
L8	18	MP3-03	119.33 - 124.33	1.0000	1.0000
L8	19	MP3-03	119.33 - 124.33	1.0000	1.0000
L8	20	MP3-03	119.33 - 124.33	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L9	2	LDF7-50A(1-5/8)	114.33 - 119.33	1.0000	1.0000
L9	4	WR-VG86ST-BRD(3/4")	114.33 - 119.33	1.0000	1.0000
L9	6	FB-L98B-009-XXX(3/8")	114.33 - 119.33	1.0000	1.0000
L9	17	MP3-03	114.33 - 119.33	1.0000	1.0000
L9	18	MP3-03	114.33 - 119.33	1.0000	1.0000
L9	19	MP3-03	114.33 - 119.33	1.0000	1.0000
L9	20	MP3-03	114.33 - 119.33	1.0000	1.0000
L10	2	LDF7-50A(1-5/8)	110.00 - 114.33	1.0000	1.0000
L10	4	WR-VG86ST-BRD(3/4")	110.00 - 114.33	1.0000	1.0000
L10	6	FB-L98B-009-XXX(3/8")	110.00 - 114.33	1.0000	1.0000
L10	17	MP3-03	110.75 - 114.33	1.0000	1.0000
L10	18	MP3-03	110.75 - 114.33	1.0000	1.0000
L10	19	MP3-03	110.75 - 114.33	1.0000	1.0000
L10	20	MP3-03	110.75 - 114.33	1.0000	1.0000
L11	2	LDF7-50A(1-5/8)	109.75 - 110.00	1.0000	1.0000
L11	4	WR-VG86ST-BRD(3/4")	109.75 - 110.00	1.0000	1.0000
L11	6	FB-L98B-009-XXX(3/8")	109.75 - 110.00	1.0000	1.0000
L11	13	MP3-04	109.75 - 110.00	1.0000	1.0000
L11	14	MP3-04	109.75 - 110.00	1.0000	1.0000
L11	15	MP3-04	109.75 - 110.00	1.0000	1.0000
L11	16	MP3-04	109.75 - 110.00	1.0000	1.0000
L12	2	LDF7-50A(1-5/8)	104.75 - 109.75	1.0000	1.0000
L12	4	WR-VG86ST-BRD(3/4")	104.75 - 109.75	1.0000	1.0000
L12	6	FB-L98B-009-XXX(3/8")	104.75 - 109.75	1.0000	1.0000
L12	13	MP3-04	104.75 - 109.75	1.0000	1.0000
L12	14	MP3-04	104.75 - 109.75	1.0000	1.0000
L12	15	MP3-04	104.75 - 109.75	1.0000	1.0000
L12	16	MP3-04	104.75 - 109.75	1.0000	1.0000
L13	2	LDF7-50A(1-5/8)	99.75 - 104.75	1.0000	1.0000
L13	4	WR-VG86ST-BRD(3/4")	99.75 - 104.75	1.0000	1.0000
L13	6	FB-L98B-009-XXX(3/8")	99.75 - 104.75	1.0000	1.0000
L13	13	MP3-04	99.75 - 104.75	1.0000	1.0000
L13	14	MP3-04	99.75 - 104.75	1.0000	1.0000
L13	15	MP3-04	99.75 - 104.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L13	16	MP3-04	99.75 - 104.75	1.0000	1.0000
L14	2	LDF7-50A(1-5/8)	94.75 - 99.75	1.0000	1.0000
L14	4	WR-VG86ST-BRD(3/4")	94.75 - 99.75	1.0000	1.0000
L14	6	FB-L98B-009-XXX(3/8")	94.75 - 99.75	1.0000	1.0000
L14	13	MP3-04	94.75 - 99.75	1.0000	1.0000
L14	14	MP3-04	94.75 - 99.75	1.0000	1.0000
L14	15	MP3-04	94.75 - 99.75	1.0000	1.0000
L14	16	MP3-04	94.75 - 99.75	1.0000	1.0000
L15	2	LDF7-50A(1-5/8)	89.75 - 94.75	1.0000	1.0000
L15	4	WR-VG86ST-BRD(3/4")	89.75 - 94.75	1.0000	1.0000
L15	6	FB-L98B-009-XXX(3/8")	89.75 - 94.75	1.0000	1.0000
L15	13	MP3-04	89.75 - 94.75	1.0000	1.0000
L15	14	MP3-04	89.75 - 94.75	1.0000	1.0000
L15	15	MP3-04	89.75 - 94.75	1.0000	1.0000
L15	16	MP3-04	89.75 - 94.75	1.0000	1.0000
L16	2	LDF7-50A(1-5/8)	84.75 - 89.75	1.0000	1.0000
L16	4	WR-VG86ST-BRD(3/4")	84.75 - 89.75	1.0000	1.0000
L16	6	FB-L98B-009-XXX(3/8")	84.75 - 89.75	1.0000	1.0000
L16	13	MP3-04	84.75 - 89.75	1.0000	1.0000
L16	14	MP3-04	84.75 - 89.75	1.0000	1.0000
L16	15	MP3-04	84.75 - 89.75	1.0000	1.0000
L16	16	MP3-04	84.75 - 89.75	1.0000	1.0000
L17	2	LDF7-50A(1-5/8)	81.50 - 84.75	1.0000	1.0000
L17	4	WR-VG86ST-BRD(3/4")	81.50 - 84.75	1.0000	1.0000
L17	6	FB-L98B-009-XXX(3/8")	81.50 - 84.75	1.0000	1.0000
L17	13	MP3-04	81.50 - 84.75	1.0000	1.0000
L17	14	MP3-04	81.50 - 84.75	1.0000	1.0000
L17	15	MP3-04	81.50 - 84.75	1.0000	1.0000
L17	16	MP3-04	81.50 - 84.75	1.0000	1.0000
L18	2	LDF7-50A(1-5/8)	81.25 - 81.50	1.0000	1.0000
L18	4	WR-VG86ST-BRD(3/4")	81.25 - 81.50	1.0000	1.0000
L18	6	FB-L98B-009-XXX(3/8")	81.25 - 81.50	1.0000	1.0000
L18	13	MP3-04	81.25 - 81.50	1.0000	1.0000
L18	14	MP3-04	81.25 - 81.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L18	15	MP3-04	81.25 - 81.50	1.0000	1.0000
L18	16	MP3-04	81.25 - 81.50	1.0000	1.0000
L19	2	LDF7-50A(1-5/8)	76.25 - 81.25	1.0000	1.0000
L19	4	WR-VG86ST-BRD(3/4")	76.25 - 81.25	1.0000	1.0000
L19	6	FB-L98B-009-XXX(3/8")	76.25 - 81.25	1.0000	1.0000
L19	13	MP3-04	76.25 - 81.25	1.0000	1.0000
L19	14	MP3-04	76.25 - 81.25	1.0000	1.0000
L19	15	MP3-04	76.25 - 81.25	1.0000	1.0000
L19	16	MP3-04	76.25 - 81.25	1.0000	1.0000
L20	2	LDF7-50A(1-5/8)	71.25 - 76.25	1.0000	1.0000
L20	4	WR-VG86ST-BRD(3/4")	71.25 - 76.25	1.0000	1.0000
L20	6	FB-L98B-009-XXX(3/8")	71.25 - 76.25	1.0000	1.0000
L20	13	MP3-04	71.25 - 76.25	1.0000	1.0000
L20	14	MP3-04	71.25 - 76.25	1.0000	1.0000
L20	15	MP3-04	71.25 - 76.25	1.0000	1.0000
L20	16	MP3-04	71.25 - 76.25	1.0000	1.0000
L21	2	LDF7-50A(1-5/8)	66.00 - 71.25	1.0000	1.0000
L21	4	WR-VG86ST-BRD(3/4")	66.00 - 71.25	1.0000	1.0000
L21	6	FB-L98B-009-XXX(3/8")	66.00 - 71.25	1.0000	1.0000
L21	13	MP3-04	66.00 - 71.25	1.0000	1.0000
L21	14	MP3-04	66.00 - 71.25	1.0000	1.0000
L21	15	MP3-04	66.00 - 71.25	1.0000	1.0000
L21	16	MP3-04	66.00 - 71.25	1.0000	1.0000
L23	2	LDF7-50A(1-5/8)	60.00 - 65.00	1.0000	1.0000
L23	4	WR-VG86ST-BRD(3/4")	60.00 - 65.00	1.0000	1.0000
L23	6	FB-L98B-009-XXX(3/8")	60.00 - 65.00	1.0000	1.0000
L23	13	MP3-04	60.00 - 65.00	1.0000	1.0000
L23	14	MP3-04	60.00 - 65.00	1.0000	1.0000
L23	15	MP3-04	60.00 - 65.00	1.0000	1.0000
L23	16	MP3-04	60.00 - 65.00	1.0000	1.0000
L24	2	LDF7-50A(1-5/8)	55.00 - 60.00	1.0000	1.0000
L24	4	WR-VG86ST-BRD(3/4")	55.00 - 60.00	1.0000	1.0000
L24	6	FB-L98B-009-XXX(3/8")	55.00 - 60.00	1.0000	1.0000
L24	13	MP3-04	55.00 - 60.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L24	14	MP3-04	55.00 - 60.00	1.0000	1.0000
L24	15	MP3-04	55.00 - 60.00	1.0000	1.0000
L24	16	MP3-04	55.00 - 60.00	1.0000	1.0000
L25	2	LDF7-50A(1-5/8)	51.25 - 55.00	1.0000	1.0000
L25	4	WR-VG86ST-BRD(3/4")	51.25 - 55.00	1.0000	1.0000
L25	6	FB-L98B-009-XXX(3/8")	51.25 - 55.00	1.0000	1.0000
L25	13	MP3-04	51.25 - 55.00	1.0000	1.0000
L25	14	MP3-04	51.25 - 55.00	1.0000	1.0000
L25	15	MP3-04	51.25 - 55.00	1.0000	1.0000
L25	16	MP3-04	51.25 - 55.00	1.0000	1.0000
L26	2	LDF7-50A(1-5/8)	51.00 - 51.25	1.0000	1.0000
L26	4	WR-VG86ST-BRD(3/4")	51.00 - 51.25	1.0000	1.0000
L26	6	FB-L98B-009-XXX(3/8")	51.00 - 51.25	1.0000	1.0000
L26	9	MP3-05	51.00 - 51.25	1.0000	1.0000
L26	10	MP3-05	51.00 - 51.25	1.0000	1.0000
L26	11	MP3-05	51.00 - 51.25	1.0000	1.0000
L26	12	MP3-05	51.00 - 51.25	1.0000	1.0000
L27	2	LDF7-50A(1-5/8)	46.00 - 51.00	1.0000	1.0000
L27	4	WR-VG86ST-BRD(3/4")	46.00 - 51.00	1.0000	1.0000
L27	6	FB-L98B-009-XXX(3/8")	46.00 - 51.00	1.0000	1.0000
L27	9	MP3-05	46.00 - 51.00	1.0000	1.0000
L27	10	MP3-05	46.00 - 51.00	1.0000	1.0000
L27	11	MP3-05	46.00 - 51.00	1.0000	1.0000
L27	12	MP3-05	46.00 - 51.00	1.0000	1.0000
L28	2	LDF7-50A(1-5/8)	41.00 - 46.00	1.0000	1.0000
L28	4	WR-VG86ST-BRD(3/4")	41.00 - 46.00	1.0000	1.0000
L28	6	FB-L98B-009-XXX(3/8")	41.00 - 46.00	1.0000	1.0000
L28	9	MP3-05	41.00 - 46.00	1.0000	1.0000
L28	10	MP3-05	41.00 - 46.00	1.0000	1.0000
L28	11	MP3-05	41.00 - 46.00	1.0000	1.0000
L28	12	MP3-05	41.00 - 46.00	1.0000	1.0000
L29	2	LDF7-50A(1-5/8)	36.00 - 41.00	1.0000	1.0000
L29	4	WR-VG86ST-BRD(3/4")	36.00 - 41.00	1.0000	1.0000
L29	6	FB-L98B-009-XXX(3/8")	36.00 - 41.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L29	9	MP3-05	36.00 - 41.00	1.0000	1.0000
L29	10	MP3-05	36.00 - 41.00	1.0000	1.0000
L29	11	MP3-05	36.00 - 41.00	1.0000	1.0000
L29	12	MP3-05	36.00 - 41.00	1.0000	1.0000
L30	2	LDF7-50A(1-5/8)	31.00 - 36.00	1.0000	1.0000
L30	4	WR-VG86ST-BRD(3/4")	31.00 - 36.00	1.0000	1.0000
L30	6	FB-L98B-009-XXX(3/8")	31.00 - 36.00	1.0000	1.0000
L30	9	MP3-05	31.00 - 36.00	1.0000	1.0000
L30	10	MP3-05	31.00 - 36.00	1.0000	1.0000
L30	11	MP3-05	31.00 - 36.00	1.0000	1.0000
L30	12	MP3-05	31.00 - 36.00	1.0000	1.0000
L31	2	LDF7-50A(1-5/8)	27.00 - 31.00	1.0000	1.0000
L31	4	WR-VG86ST-BRD(3/4")	27.00 - 31.00	1.0000	1.0000
L31	6	FB-L98B-009-XXX(3/8")	27.00 - 31.00	1.0000	1.0000
L31	9	MP3-05	27.00 - 31.00	1.0000	1.0000
L31	10	MP3-05	27.00 - 31.00	1.0000	1.0000
L31	11	MP3-05	27.00 - 31.00	1.0000	1.0000
L31	12	MP3-05	27.00 - 31.00	1.0000	1.0000
L33	2	LDF7-50A(1-5/8)	26.00 - 26.25	1.0000	1.0000
L33	4	WR-VG86ST-BRD(3/4")	26.00 - 26.25	1.0000	1.0000
L33	6	FB-L98B-009-XXX(3/8")	26.00 - 26.25	1.0000	1.0000
L33	9	MP3-05	26.00 - 26.25	1.0000	1.0000
L33	10	MP3-05	26.00 - 26.25	1.0000	1.0000
L33	11	MP3-05	26.00 - 26.25	1.0000	1.0000
L33	12	MP3-05	26.00 - 26.25	1.0000	1.0000
L34	2	LDF7-50A(1-5/8)	21.00 - 26.00	1.0000	1.0000
L34	4	WR-VG86ST-BRD(3/4")	21.00 - 26.00	1.0000	1.0000
L34	6	FB-L98B-009-XXX(3/8")	21.00 - 26.00	1.0000	1.0000
L34	9	MP3-05	21.00 - 26.00	1.0000	1.0000
L34	10	MP3-05	21.00 - 26.00	1.0000	1.0000
L34	11	MP3-05	21.00 - 26.00	1.0000	1.0000
L34	12	MP3-05	21.00 - 26.00	1.0000	1.0000
L35	2	LDF7-50A(1-5/8)	16.00 - 21.00	1.0000	1.0000
L35	4	WR-VG86ST-BRD(3/4")	16.00 - 21.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L35	6	FB-L98B-009-XXX(3/8")	16.00 - 21.00	1.0000	1.0000
L35	9	MP3-05	16.00 - 21.00	1.0000	1.0000
L35	10	MP3-05	16.00 - 21.00	1.0000	1.0000
L35	11	MP3-05	16.00 - 21.00	1.0000	1.0000
L35	12	MP3-05	16.00 - 21.00	1.0000	1.0000
L36	2	LDF7-50A(1-5/8)	11.00 - 16.00	1.0000	1.0000
L36	4	WR-VG86ST-BRD(3/4")	11.00 - 16.00	1.0000	1.0000
L36	6	FB-L98B-009-XXX(3/8")	11.00 - 16.00	1.0000	1.0000
L36	9	MP3-05	11.00 - 16.00	1.0000	1.0000
L36	10	MP3-05	11.00 - 16.00	1.0000	1.0000
L36	11	MP3-05	11.00 - 16.00	1.0000	1.0000
L36	12	MP3-05	11.00 - 16.00	1.0000	1.0000
L37	2	LDF7-50A(1-5/8)	10.00 - 11.00	1.0000	1.0000
L37	4	WR-VG86ST-BRD(3/4")	10.00 - 11.00	1.0000	1.0000
L37	6	FB-L98B-009-XXX(3/8")	10.00 - 11.00	1.0000	1.0000
L37	9	MP3-05	6.00 - 11.00	1.0000	1.0000
L37	10	MP3-05	6.00 - 11.00	1.0000	1.0000
L37	11	MP3-05	6.00 - 11.00	1.0000	1.0000
L37	12	MP3-05	6.00 - 11.00	1.0000	1.0000
L38	9	MP3-05	1.00 - 6.00	1.0000	1.0000
L38	10	MP3-05	1.00 - 6.00	1.0000	1.0000
L38	11	MP3-05	1.00 - 6.00	1.0000	1.0000
L38	12	MP3-05	1.00 - 6.00	1.0000	1.0000
L39	9	MP3-05	0.50 - 1.00	1.0000	1.0000
L39	10	MP3-05	0.50 - 1.00	1.0000	1.0000
L39	11	MP3-05	0.50 - 1.00	1.0000	1.0000
L39	12	MP3-05	0.50 - 1.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
152									
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
(2) SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.04 3.34 3.65 4.31	2.45 2.75 3.05 3.68	0.05 0.10 0.16 0.31
(2) SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.04 3.34 3.65 4.31	2.45 2.75 3.05 3.68	0.05 0.10 0.16 0.31
(2) SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.04 3.34 3.65 4.31	2.45 2.75 3.05 3.68	0.05 0.10 0.16 0.31
QS66512-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.60 9.29 9.91 11.18	5.00 9.66 10.62 12.61	0.11 0.21 0.30 0.49
QS66512-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.60 9.29 9.91 11.18	5.00 9.66 10.62 12.61	0.11 0.21 0.30 0.49
QS66512-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.60 9.29 9.91 11.18	5.00 9.66 10.62 12.61	0.11 0.21 0.30 0.49
RRUS 11 B12	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.04 3.26 3.71	1.18 1.33 1.48 1.83	0.05 0.07 0.10 0.15
RRUS 11 B12	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.04 3.26 3.71	1.18 1.33 1.48 1.83	0.05 0.07 0.10 0.15
RRUS 11 B12	C	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.04 3.26 3.71	1.18 1.33 1.48 1.83	0.05 0.07 0.10 0.15
RRUS 32	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.86 3.08 3.32 3.81	1.78 1.97 2.17 2.58	0.06 0.08 0.10 0.16
RRUS 32	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.86 3.08 3.32 3.81	1.78 1.97 2.17 2.58	0.06 0.08 0.10 0.16
RRUS 32	C	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.86 3.08 3.32 3.81	1.78 1.97 2.17 2.58	0.06 0.08 0.10 0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS 32 B2	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B2	C	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.73 2.95 3.18 3.66	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B66	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B66	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 32 B66	C	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.74 2.96 3.19 3.68	1.67 1.86 2.05 2.46	0.05 0.07 0.10 0.16
RRUS 4478 B14	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RRUS 4478 B14	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
RRUS 4478 B14	C	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.84 2.01 2.19 2.57	1.06 1.20 1.34 1.66	0.06 0.08 0.09 0.14
(2) 7020.00	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.10 0.15 0.20 0.33	0.17 0.24 0.31 0.48	0.00 0.01 0.01 0.02
(2) 7020.00	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.10 0.15 0.20 0.33	0.17 0.24 0.31 0.48	0.00 0.01 0.01 0.02
(2) 7020.00	C	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.10 0.15 0.20 0.33	0.17 0.24 0.31 0.48	0.00 0.01 0.01 0.02
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	0.01 0.02 0.03 0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	0.01 0.02 0.03 0.05
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.21 0.27 0.35 0.52	0.01 0.02 0.03 0.05
DC6-48-60-18-8F	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	1.21 1.89 2.11 2.57	1.21 1.89 2.11 2.57	0.02 0.04 0.07 0.13
(2) DC6-48-60-18-8F	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	1.21 1.89 2.11 2.57	1.21 1.89 2.11 2.57	0.02 0.04 0.07 0.13
Platform Mount [LP 603-1]	C	None		0.0000	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	30.10 37.80 45.50 60.90	30.10 37.80 45.50 60.90	1.47 1.91 2.36 3.24
Side Arm Mount [SO 102-3]	C	None		0.0000	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	3.00 3.48 3.96 4.92	3.00 3.48 3.96 4.92	0.08 0.11 0.14 0.20
Side Arm Mount [SO 202-3]	C	None		0.0000	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	6.18 8.56 10.94 15.70	6.18 8.56 10.94 15.70	0.33 0.40 0.47 0.61
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
** bridge stiffener	A	None		0.0000	110.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	1.55 1.82 2.09 2.63	0.54 1.01 1.48 2.42	0.09 0.11 0.13 0.18
bridge stiffener	A	None		0.0000	110.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	1.55 1.82 2.09 2.63	0.54 1.01 1.48 2.42	0.09 0.11 0.13 0.18
bridge stiffener	B	None		0.0000	110.00	No Ice 1/2" Ice Ice 1" Ice	1.55 1.82 2.09 2.63	0.54 1.01 1.48 2.42	0.09 0.11 0.13 0.18

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment ° 	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
bridge stiffener	C	None		0.0000	110.00	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	1.55 1.82 2.09 2.63	0.54 1.01 1.48 2.42	0.09 0.11 0.13 0.18

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service

Comb. No.	Description
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 145	Pole	Max Tension	26	0.00	0.00	-0.00
			Max. Compression	26	-10.87	-1.03	0.13
			Max. Mx	8	-4.08	-37.31	0.02
			Max. My	2	-4.18	-0.21	36.38
			Max. Vy	8	5.75	-37.31	0.02
			Max. Vx	2	-5.51	-0.21	36.38
			Max. Torque	2			-0.37
L2	145 - 140	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-11.61	-1.28	0.25
			Max. Mx	8	-4.38	-67.28	0.05
			Max. My	2	-4.50	-0.26	64.65
			Max. Vy	8	6.22	-67.28	0.05
			Max. Vx	2	-5.79	-0.26	64.65
			Max. Torque	22			-0.43
L3	140 - 139.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-11.68	-1.30	0.26
			Max. Mx	8	-4.40	-69.88	0.05
			Max. My	2	-4.53	-0.27	67.07
			Max. Vy	8	6.26	-69.88	0.05
			Max. Vx	2	-5.82	-0.27	67.07
			Max. Torque	22			-0.43
L4	139.583 - 139.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-11.74	-1.32	0.27
			Max. Mx	8	-4.43	-71.45	0.05
			Max. My	2	-4.55	-0.27	68.53
			Max. Vy	8	6.29	-71.45	0.05
			Max. Vx	2	-5.84	-0.27	68.53
			Max. Torque	22			-0.44
L5	139.333 - 134.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-12.89	-1.57	0.38
			Max. Mx	8	-4.96	-104.28	0.08
			Max. My	2	-5.10	-0.33	98.78
			Max. Vy	8	6.83	-104.28	0.08
			Max. Vx	2	-6.25	-0.33	98.78
			Max. Torque	22			-0.52
L6	134.333 - 129.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-14.06	-1.84	0.50
			Max. Mx	8	-5.51	-139.83	0.11
			Max. My	2	-5.67	-0.39	131.11
			Max. Vy	8	7.37	-139.83	0.11
			Max. Vx	2	-6.67	-0.39	131.11
			Max. Torque	22			-0.60
L7	129.333 - 124.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-15.24	-2.12	0.62
			Max. Mx	8	-6.08	-178.11	0.15
			Max. My	2	-6.26	-0.46	165.56
			Max. Vy	8	7.92	-178.11	0.15
			Max. Vx	2	-7.10	-0.46	165.56
			Max. Torque	22			-0.68
L8	124.333 - 119.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-16.44	-2.40	0.75
			Max. Mx	8	-6.67	-219.14	0.18
			Max. My	2	-6.86	-0.52	202.13

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	8	8.47	-219.14	0.18
			Max. Vx	2	-7.53	-0.52	202.13
			Max. Torque	22			-0.77
L9	119.333 - 114.333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-17.66	-2.69	0.88
			Max. Mx	8	-7.28	-262.94	0.22
			Max. My	2	-7.48	-0.59	240.87
			Max. Vy	8	9.03	-262.94	0.22
			Max. Vx	2	-7.96	-0.59	240.87
			Max. Torque	22			-0.86
L10	114.333 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.70	-2.95	1.00
			Max. Mx	8	-7.83	-303.11	0.25
			Max. My	2	-8.04	-0.65	276.17
			Max. Vy	8	9.50	-303.11	0.25
			Max. Vx	2	-8.33	-0.65	276.17
			Max. Torque	22			-0.94
L11	110 - 109.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19.44	-2.97	1.01
			Max. Mx	8	-8.27	-305.55	0.25
			Max. My	2	-8.48	-0.65	278.32
			Max. Vy	8	9.75	-305.55	0.25
			Max. Vx	2	-8.57	-0.65	278.32
			Max. Torque	22			-0.94
L12	109.75 - 104.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20.81	-3.27	1.14
			Max. Mx	8	-9.01	-355.81	0.29
			Max. My	2	-9.22	-0.73	322.35
			Max. Vy	8	10.33	-355.81	0.29
			Max. Vx	2	-9.03	-0.73	322.35
			Max. Torque	22			-1.03
L13	104.75 - 99.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22.19	-3.59	1.28
			Max. Mx	8	-9.76	-408.94	0.33
			Max. My	2	-9.99	-0.80	368.67
			Max. Vy	8	10.91	-408.94	0.33
			Max. Vx	2	-9.49	-0.80	368.67
			Max. Torque	22			-1.11
L14	99.75 - 94.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.58	-3.91	1.42
			Max. Mx	8	-10.54	-464.93	0.37
			Max. My	2	-10.77	-0.88	417.28
			Max. Vy	8	11.48	-464.93	0.37
			Max. Vx	2	-9.95	-0.88	417.28
			Max. Torque	22			-1.20
L15	94.75 - 89.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.99	-4.23	1.56
			Max. Mx	8	-11.34	-523.78	0.41
			Max. My	2	-11.57	-0.95	468.18
			Max. Vy	8	12.05	-523.78	0.41
			Max. Vx	2	-10.41	-0.95	468.18
			Max. Torque	22			-1.29
L16	89.75 - 84.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.41	-4.56	1.71
			Max. Mx	8	-12.17	-585.18	0.46
			Max. My	2	-12.39	-1.03	521.36
			Max. Vy	8	12.50	-585.18	0.46
			Max. Vx	2	-10.86	-1.03	521.36
			Max. Torque	22			-1.38
L17	84.75 - 81.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.35	-4.78	1.81
			Max. Mx	8	-12.71	-626.32	0.49

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-12.93	-1.08	557.15
			Max. Vy	8	12.80	-626.32	0.49
			Max. Vx	2	-11.16	-1.08	557.15
			Max. Torque	22			-1.44
L18	81.5 - 81.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.42	-4.80	1.82
			Max. Mx	8	-12.76	-629.52	0.49
			Max. My	2	-12.97	-1.09	559.94
			Max. Vy	8	12.81	-629.52	0.49
			Max. Vx	2	-11.17	-1.09	559.94
			Max. Torque	22			-1.44
L19	81.25 - 76.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.87	-5.13	1.96
			Max. Mx	8	-13.62	-694.78	0.54
			Max. My	2	-13.82	-1.17	616.97
			Max. Vy	8	13.27	-694.78	0.54
			Max. Vx	2	-11.63	-1.17	616.97
			Max. Torque	22			-1.53
L20	76.25 - 71.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.33	-5.47	2.12
			Max. Mx	8	-14.50	-762.26	0.59
			Max. My	2	-14.68	-1.25	676.22
			Max. Vy	8	13.71	-762.26	0.59
			Max. Vx	2	-12.07	-1.25	676.22
			Max. Torque	22			-1.63
L21	71.25 - 66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.70	-5.56	2.15
			Max. Mx	8	-14.72	-779.47	0.60
			Max. My	2	-14.90	-1.27	691.38
			Max. Vy	10	13.83	-739.04	-425.36
			Max. Vx	2	-12.18	-1.27	691.38
			Max. Torque	22			-1.65
L22	66 - 65	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.10	-5.90	2.31
			Max. Mx	8	-16.31	-849.92	0.65
			Max. My	2	-16.49	-1.36	753.59
			Max. Vy	10	14.45	-809.80	-466.11
			Max. Vx	2	-12.69	-1.36	753.59
			Max. Torque	22			-1.74
L23	65 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.69	-6.25	2.46
			Max. Mx	8	-17.32	-922.68	0.70
			Max. My	2	-17.49	-1.45	818.11
			Max. Vy	10	14.98	-883.40	-508.50
			Max. Vx	2	-13.12	-1.45	818.11
			Max. Torque	22			-1.83
L24	60 - 55	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36.29	-6.59	2.62
			Max. Mx	8	-18.36	-997.55	0.75
			Max. My	2	-18.51	-1.53	884.76
			Max. Vy	10	15.50	-959.63	-552.42
			Max. Vx	2	-13.54	-1.53	884.76
			Max. Torque	22			-1.93
L25	55 - 51.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.51	-6.85	2.73
			Max. Mx	8	-19.15	-1055.05	0.79
			Max. My	2	-19.29	-1.60	936.12
			Max. Vy	10	15.88	-1018.50	-586.32
			Max. Vx	2	-13.85	-1.60	936.12
			Max. Torque	22			-2.00
L26	51.25 - 51	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.60	-6.87	2.74
			Max. Mx	8	-19.22	-1058.92	0.79
			Max. My	2	-19.36	-1.61	939.58
			Max. Vy	10	15.90	-1022.47	-588.62
			Max. Vx	2	-13.86	-1.61	939.58
			Max. Torque	22			-2.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L27	51 - 46	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.38	-7.21	2.89
			Max. Mx	8	-20.40	-1137.51	0.85
			Max. My	2	-20.53	-1.70	1009.99
			Max. Vy	10	16.43	-1103.35	-635.21
			Max. Vx	2	-14.29	-1.70	1009.99
			Max. Torque	22			-2.09
L28	46 - 41	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.17	-7.56	3.04
			Max. Mx	8	-21.61	-1218.15	0.90
			Max. My	2	-21.72	-1.79	1082.49
			Max. Vy	10	16.94	-1186.82	-683.29
			Max. Vx	2	-14.70	-1.79	1082.49
			Max. Torque	22			-2.19
L29	41 - 36	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.97	-7.90	3.19
			Max. Mx	8	-22.83	-1300.77	0.95
			Max. My	2	-22.93	-1.88	1156.99
			Max. Vy	10	17.42	-1272.76	-732.81
			Max. Vx	2	-15.10	-1.88	1156.99
			Max. Torque	22			-2.28
L30	36 - 31	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.79	-8.24	3.34
			Max. Mx	8	-24.08	-1385.28	1.01
			Max. My	2	-24.17	-1.97	1233.42
			Max. Vy	10	17.89	-1361.07	-783.68
			Max. Vx	2	-15.47	-1.97	1233.42
			Max. Torque	22			-2.37
L31	31 - 27	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.15	-8.31	3.37
			Max. Mx	8	-24.33	-1402.40	1.02
			Max. My	2	-24.42	-1.99	1248.93
			Max. Vy	10	17.97	-1379.00	-794.02
			Max. Vx	2	-15.55	-1.99	1248.93
			Max. Torque	22			-2.39
L32	27 - 26.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.44	-8.57	3.49
			Max. Mx	8	-26.02	-1467.36	1.06
			Max. My	2	-26.10	-2.07	1307.85
			Max. Vy	10	18.36	-1447.17	-833.29
			Max. Vx	2	-15.86	-2.07	1307.85
			Max. Torque	22			-2.46
L33	26.25 - 26	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.53	-8.59	3.49
			Max. Mx	8	-26.09	-1471.73	1.06
			Max. My	2	-26.17	-2.07	1311.82
			Max. Vy	10	18.37	-1451.77	-835.94
			Max. Vx	2	-15.88	-2.07	1311.82
			Max. Torque	22			-2.46
L34	26 - 21	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.48	-8.92	3.64
			Max. Mx	8	-27.49	-1560.07	1.12
			Max. My	2	-27.55	-2.17	1392.14
			Max. Vy	10	18.82	-1544.79	-889.54
			Max. Vx	2	-16.24	-2.17	1392.14
			Max. Torque	22			-2.55
L35	21 - 16	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.43	-9.24	3.78
			Max. Mx	8	-28.91	-1650.15	1.17
			Max. My	2	-28.96	-2.26	1474.25
			Max. Vy	10	19.25	-1639.99	-944.39
			Max. Vx	2	-16.60	-2.26	1474.25
			Max. Torque	22			-2.65
L36	16 - 11	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.39	-9.54	3.92
			Max. Mx	8	-30.35	-1741.96	1.23
			Max. My	2	-30.39	-2.36	1558.15
			Max. Vy	10	19.68	-1737.34	-1000.49
			Max. Vx	2	-16.96	-2.36	1558.15

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	22			-2.74
L37	11 - 6	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.15	-9.60	3.91
			Max. Mx	10	-31.71	-1836.38	-1057.65
			Max. My	2	-31.77	-2.38	1643.79
			Max. Vy	10	19.96	-1836.38	-1057.65
			Max. Vx	2	-17.31	-2.38	1643.79
			Max. Torque	22			-2.74
L38	6 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.86	-9.60	3.88
			Max. Mx	10	-33.15	-1936.79	-1115.62
			Max. My	2	-33.16	-2.38	1731.18
			Max. Vy	10	20.23	-1936.79	-1115.62
			Max. Vx	2	-17.67	-2.38	1731.18
			Max. Torque	22			-2.74
L39	1 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.17	-9.60	3.87
			Max. Mx	10	-33.44	-1957.03	-1127.31
			Max. My	2	-33.44	-2.38	1748.86
			Max. Vy	10	20.27	-1957.03	-1127.31
			Max. Vx	2	-17.72	-2.38	1748.86
			Max. Torque	22			-2.74

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	31	57.17	-4.79	-2.77
	Max. H_x	23	25.09	20.25	11.69
	Max. H_z	3	25.09	0.00	17.70
	Max. M_x	2	1748.86	0.00	17.70
	Max. M_z	10	1957.03	-20.25	-11.69
	Max. Torsion	10	2.74	-20.25	-11.69
	Min. Vert	13	25.09	-8.85	-15.33
	Min. H_x	10	33.45	-20.25	-11.69
	Min. H_z	15	25.09	0.00	-17.70
	Min. M_x	14	-1746.37	0.00	-17.70
	Min. M_z	22	-1952.31	20.25	11.69
	Min. Torsion	22	-2.74	20.25	11.69

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	27.88	0.00	-0.00	-1.00	-1.91	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	33.45	0.00	-17.70	-1748.86	-2.38	0.37
0.9 Dead+1.0 Wind 0 deg - No Ice	25.09	0.00	-17.70	-1720.88	-1.75	0.36
1.2 Dead+1.0 Wind 30 deg - No Ice	33.45	8.85	-15.33	-1514.72	-876.18	0.32
0.9 Dead+1.0 Wind 30 deg - No Ice	25.09	8.85	-15.33	-1490.45	-861.73	0.31
1.2 Dead+1.0 Wind 60 deg - No Ice	33.45	16.03	-9.26	-927.46	-1606.62	-0.05
0.9 Dead+1.0 Wind 60 deg - No Ice	25.09	16.03	-9.26	-912.46	-1580.59	-0.06
1.2 Dead+1.0 Wind 90 deg - No Ice	33.45	19.24	0.00	-1.24	-1949.75	-0.63
0.9 Dead+1.0 Wind 90 deg - No Ice	25.09	19.24	-0.00	-0.91	-1918.22	-0.63

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 120 deg - No Ice	33.45	20.25	11.69	1127.31	-1957.03	-2.74
0.9 Dead+1.0 Wind 120 deg - No Ice	25.09	20.25	11.69	1110.31	-1926.41	-2.74
1.2 Dead+1.0 Wind 150 deg - No Ice	33.45	8.85	15.33	1512.23	-876.19	-0.32
0.9 Dead+1.0 Wind 150 deg - No Ice	25.09	8.85	15.33	1488.61	-861.73	-0.31
1.2 Dead+1.0 Wind 180 deg - No Ice	33.45	0.00	17.70	1746.37	-2.38	-0.37
0.9 Dead+1.0 Wind 180 deg - No Ice	25.09	0.00	17.70	1719.05	-1.75	-0.36
1.2 Dead+1.0 Wind 210 deg - No Ice	33.45	-8.85	15.33	1512.23	871.43	-0.32
0.9 Dead+1.0 Wind 210 deg - No Ice	25.09	-8.85	15.33	1488.62	858.24	-0.31
1.2 Dead+1.0 Wind 240 deg - No Ice	33.45	-16.03	9.26	924.97	1601.88	0.05
0.9 Dead+1.0 Wind 240 deg - No Ice	25.09	-16.03	9.26	910.63	1577.10	0.06
1.2 Dead+1.0 Wind 270 deg - No Ice	33.45	-19.24	0.00	-1.24	1945.00	0.63
0.9 Dead+1.0 Wind 270 deg - No Ice	25.09	-19.24	-0.00	-0.91	1914.73	0.63
1.2 Dead+1.0 Wind 300 deg - No Ice	33.45	-20.25	-11.69	-1129.75	1952.31	2.74
0.9 Dead+1.0 Wind 300 deg - No Ice	25.09	-20.25	-11.69	-1112.11	1922.94	2.74
1.2 Dead+1.0 Wind 330 deg - No Ice	33.45	-8.85	-15.33	-1514.73	871.42	0.32
0.9 Dead+1.0 Wind 330 deg - No Ice	25.09	-8.85	-15.33	-1490.46	858.23	0.31
1.2 Dead+1.0 Ice+1.0 Temp	57.17	0.00	-0.00	-3.87	-9.60	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	57.17	0.00	-3.91	-457.21	-9.64	0.14
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	57.17	1.95	-3.38	-396.48	-236.30	0.12
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	57.17	3.61	-2.08	-248.30	-432.97	-0.01
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	57.17	4.39	-0.00	-3.89	-529.32	-0.21
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	57.17	4.79	2.77	300.23	-536.37	-0.86
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	57.17	1.95	3.38	388.70	-236.30	-0.12
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	57.17	0.00	3.91	449.43	-9.64	-0.14
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	57.17	-1.95	3.38	388.70	217.02	-0.12
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	57.17	-3.61	2.08	240.52	413.70	0.01
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	57.17	-4.39	-0.00	-3.89	510.05	0.21
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	57.17	-4.79	-2.77	-308.00	517.11	0.86
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	57.17	-1.95	-3.38	-396.48	217.02	0.12
Dead+Wind 0 deg - Service	27.88	0.00	-4.17	-408.85	-1.97	0.09
Dead+Wind 30 deg - Service	27.88	2.08	-3.61	-354.21	-205.87	0.08
Dead+Wind 60 deg - Service	27.88	3.78	-2.18	-217.21	-376.40	-0.01
Dead+Wind 90 deg - Service	27.88	4.53	0.00	-1.03	-456.58	-0.15
Dead+Wind 120 deg - Service	27.88	4.77	2.75	262.61	-458.62	-0.65
Dead+Wind 150 deg - Service	27.88	2.08	3.61	352.14	-205.87	-0.08
Dead+Wind 180 deg - Service	27.88	0.00	4.17	406.78	-1.97	-0.09
Dead+Wind 210 deg - Service	27.88	-2.08	3.61	352.14	201.94	-0.08

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 240 deg - Service	27.88	-3.78	2.18	215.15	372.47	0.01
Dead+Wind 270 deg - Service	27.88	-4.53	0.00	-1.03	452.65	0.15
Dead+Wind 300 deg - Service	27.88	-4.77	-2.75	-264.68	454.68	0.65
Dead+Wind 330 deg - Service	27.88	-2.08	-3.61	-354.21	201.94	0.08

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-27.88	0.00	-0.00	27.88	0.00	0.000%
2	0.00	-33.45	-17.70	0.00	33.45	17.70	0.000%
3	0.00	-25.09	-17.70	0.00	25.09	17.70	0.000%
4	8.85	-33.45	-15.33	-8.85	33.45	15.33	0.000%
5	8.85	-25.09	-15.33	-8.85	25.09	15.33	0.000%
6	16.03	-33.45	-9.26	-16.03	33.45	9.26	0.000%
7	16.03	-25.09	-9.26	-16.03	25.09	9.26	0.000%
8	19.24	-33.45	0.00	-19.24	33.45	0.00	0.000%
9	19.24	-25.09	0.00	-19.24	25.09	0.00	0.000%
10	20.25	-33.45	11.69	-20.25	33.45	-11.69	0.000%
11	20.25	-25.09	11.69	-20.25	25.09	-11.69	0.000%
12	8.85	-33.45	15.33	-8.85	33.45	-15.33	0.000%
13	8.85	-25.09	15.33	-8.85	25.09	-15.33	0.000%
14	0.00	-33.45	17.70	0.00	33.45	-17.70	0.000%
15	0.00	-25.09	17.70	0.00	25.09	-17.70	0.000%
16	-8.85	-33.45	15.33	8.85	33.45	-15.33	0.000%
17	-8.85	-25.09	15.33	8.85	25.09	-15.33	0.000%
18	-16.03	-33.45	9.26	16.03	33.45	-9.26	0.000%
19	-16.03	-25.09	9.26	16.03	25.09	-9.26	0.000%
20	-19.24	-33.45	0.00	19.24	33.45	0.00	0.000%
21	-19.24	-25.09	0.00	19.24	25.09	0.00	0.000%
22	-20.25	-33.45	-11.69	20.25	33.45	11.69	0.000%
23	-20.25	-25.09	-11.69	20.25	25.09	11.69	0.000%
24	-8.85	-33.45	-15.33	8.85	33.45	15.33	0.000%
25	-8.85	-25.09	-15.33	8.85	25.09	15.33	0.000%
26	0.00	-57.17	0.00	-0.00	57.17	0.00	0.000%
27	0.00	-57.17	-3.91	-0.00	57.17	3.91	0.000%
28	1.95	-57.17	-3.38	-1.95	57.17	3.38	0.000%
29	3.61	-57.17	-2.08	-3.61	57.17	2.08	0.000%
30	4.39	-57.17	0.00	-4.39	57.17	0.00	0.000%
31	4.79	-57.17	2.77	-4.79	57.17	-2.77	0.000%
32	1.95	-57.17	3.38	-1.95	57.17	-3.38	0.000%
33	0.00	-57.17	3.91	-0.00	57.17	-3.91	0.000%
34	-1.95	-57.17	3.38	1.95	57.17	-3.38	0.000%
35	-3.61	-57.17	2.08	3.61	57.17	-2.08	0.000%
36	-4.39	-57.17	0.00	4.39	57.17	0.00	0.000%
37	-4.79	-57.17	-2.77	4.79	57.17	2.77	0.000%
38	-1.95	-57.17	-3.38	1.95	57.17	3.38	0.000%
39	0.00	-27.88	-4.17	0.00	27.88	4.17	0.000%
40	2.08	-27.88	-3.61	-2.08	27.88	3.61	0.000%
41	3.78	-27.88	-2.18	-3.78	27.88	2.18	0.000%
42	4.53	-27.88	0.00	-4.53	27.88	0.00	0.000%
43	4.77	-27.88	2.75	-4.77	27.88	-2.75	0.000%
44	2.08	-27.88	3.61	-2.08	27.88	-3.61	0.000%
45	0.00	-27.88	4.17	0.00	27.88	-4.17	0.000%
46	-2.08	-27.88	3.61	2.08	27.88	-3.61	0.000%
47	-3.78	-27.88	2.18	3.78	27.88	-2.18	0.000%
48	-4.53	-27.88	0.00	4.53	27.88	0.00	0.000%
49	-4.77	-27.88	-2.75	4.77	27.88	2.75	0.000%
50	-2.08	-27.88	-3.61	2.08	27.88	3.61	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000454
2	Yes	6	0.00000001	0.00010234
3	Yes	5	0.00000001	0.00062336
4	Yes	7	0.00000001	0.00029542
5	Yes	7	0.00000001	0.00007134
6	Yes	7	0.00000001	0.00032362
7	Yes	7	0.00000001	0.00007607
8	Yes	6	0.00000001	0.00013491
9	Yes	5	0.00000001	0.00085266
10	Yes	7	0.00000001	0.00038331
11	Yes	7	0.00000001	0.00008197
12	Yes	7	0.00000001	0.00029472
13	Yes	7	0.00000001	0.00007123
14	Yes	6	0.00000001	0.00010223
15	Yes	5	0.00000001	0.00062285
16	Yes	7	0.00000001	0.00028667
17	Yes	7	0.00000001	0.00006922
18	Yes	7	0.00000001	0.00032097
19	Yes	7	0.00000001	0.00007562
20	Yes	6	0.00000001	0.00013474
21	Yes	5	0.00000001	0.00085177
22	Yes	7	0.00000001	0.00041469
23	Yes	7	0.00000001	0.00009038
24	Yes	7	0.00000001	0.00028735
25	Yes	7	0.00000001	0.00006933
26	Yes	5	0.00000001	0.00036793
27	Yes	7	0.00000001	0.00036113
28	Yes	7	0.00000001	0.00055807
29	Yes	7	0.00000001	0.00062433
30	Yes	7	0.00000001	0.00041472
31	Yes	7	0.00000001	0.00080390
32	Yes	7	0.00000001	0.00054465
33	Yes	7	0.00000001	0.00035387
34	Yes	7	0.00000001	0.00049875
35	Yes	7	0.00000001	0.00057142
36	Yes	7	0.00000001	0.00039591
37	Yes	7	0.00000001	0.00082376
38	Yes	7	0.00000001	0.00051069
39	Yes	5	0.00000001	0.00008406
40	Yes	5	0.00000001	0.00078063
41	Yes	5	0.00000001	0.00089482
42	Yes	5	0.00000001	0.00011635
43	Yes	6	0.00000001	0.00008531
44	Yes	5	0.00000001	0.00077118
45	Yes	5	0.00000001	0.00008350
46	Yes	5	0.00000001	0.00070044
47	Yes	5	0.00000001	0.00085832
48	Yes	5	0.00000001	0.00011502
49	Yes	6	0.00000001	0.00010383
50	Yes	5	0.00000001	0.00070884

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	32.311	43	1.9160	0.0059
L2	145 - 140	30.315	43	1.8916	0.0056
L3	140 - 139.583	28.358	43	1.8446	0.0052
L4	139.583 - 139.333	28.197	43	1.8399	0.0051
L5	139.333 - 134.333	28.101	43	1.8385	0.0051
L6	134.333 - 129.333	26.193	43	1.8046	0.0049

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L7	129.333 - 124.333	24.325	43	1.7625	0.0047
L8	124.333 - 119.333	22.506	43	1.7129	0.0044
L9	119.333 - 114.333	20.741	43	1.6567	0.0042
L10	114.333 - 110	19.039	43	1.5945	0.0039
L11	110 - 109.75	17.619	43	1.5359	0.0037
L12	109.75 - 104.75	17.538	43	1.5330	0.0037
L13	104.75 - 99.75	15.965	43	1.4725	0.0034
L14	99.75 - 94.75	14.457	43	1.4081	0.0032
L15	94.75 - 89.75	13.018	43	1.3400	0.0030
L16	89.75 - 84.75	11.652	43	1.2686	0.0028
L17	84.75 - 81.5	10.363	43	1.1940	0.0026
L18	81.5 - 81.25	9.567	43	1.1448	0.0024
L19	81.25 - 76.25	9.507	43	1.1410	0.0024
L20	76.25 - 71.25	8.353	43	1.0626	0.0022
L21	71.25 - 66	7.283	43	0.9815	0.0020
L22	70 - 65	7.028	43	0.9611	0.0020
L23	65 - 60	6.043	43	0.9138	0.0018
L24	60 - 55	5.128	43	0.8355	0.0017
L25	55 - 51.25	4.294	43	0.7563	0.0015
L26	51.25 - 51	3.724	43	0.6961	0.0013
L27	51 - 46	3.687	43	0.6927	0.0013
L28	46 - 41	2.999	43	0.6229	0.0012
L29	41 - 36	2.384	43	0.5519	0.0010
L30	36 - 31	1.843	43	0.4798	0.0009
L31	31 - 27	1.378	43	0.4081	0.0007
L32	30 - 26.25	1.294	43	0.3938	0.0007
L33	26.25 - 26	0.996	43	0.3625	0.0006
L34	26 - 21	0.977	43	0.3591	0.0006
L35	21 - 16	0.637	43	0.2898	0.0005
L36	16 - 11	0.370	43	0.2210	0.0004
L37	11 - 6	0.175	43	0.1516	0.0003
L38	6 - 1	0.052	43	0.0829	0.0001
L39	1 - 0	0.001	43	0.0137	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.00	7770.00 w/ Mount Pipe	43	32.311	1.9160	0.0059	7961
110.00	bridge stiffener	43	17.619	1.5359	0.0037	4495

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 145	137.856	10	8.1960	0.0247
L2	145 - 140	129.367	10	8.0938	0.0234
L3	140 - 139.583	121.036	10	7.8944	0.0216
L4	139.583 - 139.333	120.351	10	7.8741	0.0215
L5	139.333 - 134.333	119.941	10	7.8681	0.0214
L6	134.333 - 129.333	111.818	10	7.7239	0.0205
L7	129.333 - 124.333	103.862	10	7.5441	0.0195
L8	124.333 - 119.333	96.108	10	7.3325	0.0184

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L9	119.333 - 114.333	88.588	10	7.0923	0.0174
L10	114.333 - 110	81.330	10	6.8260	0.0163
L11	110 - 109.75	75.272	10	6.5754	0.0153
L12	109.75 - 104.75	74.930	10	6.5631	0.0153
L13	104.75 - 99.75	68.216	10	6.3041	0.0144
L14	99.75 - 94.75	61.780	10	6.0284	0.0135
L15	94.75 - 89.75	55.637	10	5.7371	0.0126
L16	89.75 - 84.75	49.805	10	5.4313	0.0117
L17	84.75 - 81.5	44.298	10	5.1117	0.0108
L18	81.5 - 81.25	40.897	10	4.9010	0.0102
L19	81.25 - 76.25	40.642	10	4.8848	0.0101
L20	76.25 - 71.25	35.712	10	4.5490	0.0093
L21	71.25 - 66	31.137	10	4.2013	0.0084
L22	70 - 65	30.051	10	4.1139	0.0082
L23	65 - 60	25.840	10	3.9115	0.0077
L24	60 - 55	21.925	10	3.5761	0.0069
L25	55 - 51.25	18.361	10	3.2365	0.0061
L26	51.25 - 51	15.922	10	2.9789	0.0056
L27	51 - 46	15.767	10	2.9640	0.0056
L28	46 - 41	12.822	10	2.6651	0.0049
L29	41 - 36	10.191	10	2.3613	0.0043
L30	36 - 31	7.881	10	2.0525	0.0037
L31	31 - 27	5.894	10	1.7455	0.0031
L32	30 - 26.25	5.534	10	1.6843	0.0030
L33	26.25 - 26	4.258	10	1.5505	0.0027
L34	26 - 21	4.177	10	1.5359	0.0027
L35	21 - 16	2.724	10	1.2391	0.0021
L36	16 - 11	1.581	10	0.9450	0.0016
L37	11 - 6	0.747	10	0.6482	0.0011
L38	6 - 1	0.222	10	0.3546	0.0006
L39	1 - 0	0.006	10	0.0584	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.00	7770.00 w/ Mount Pipe	10	137.856	8.1960	0.0247	1959
110.00	bridge stiffener	10	75.272	6.5754	0.0153	1082

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 145 (1)	TP15.2541x14.5x0.25	5.00	0.00	0.0	12.0783	-4.00	706.58	0.006
L2	145 - 140 (2)	TP16.0083x15.2541x0.25	5.00	0.00	0.0	12.6854	-4.29	742.10	0.006
L3	140 - 139.583 (3)	TP16.0712x16.0083x0.25	0.42	0.00	0.0	12.7360	-4.31	745.06	0.006
L4	139.583 - 139.333 (4)	TP16.1089x16.0712x0.55	0.25	0.00	0.0	27.5548	-4.34	1611.95	0.003
L5	139.333 - 134.333 (5)	TP16.863x16.1089x0.525	5.00	0.00	0.0	27.6194	-4.85	1615.74	0.003
L6	134.333 - 129.333 (6)	TP17.6172x16.863x0.5125	5.00	0.00	0.0	28.2270	-5.38	1651.28	0.003
L7	129.333 - 124.333 (7)	TP18.3713x17.6172x0.5	5.00	0.00	0.0	28.7728	-5.93	1683.21	0.004

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L8	124.333 - 119.333 (8)	TP19.1254x18.3713x0.4875	5.00	0.00	0.0	29.2569	-6.50	1711.53	0.004
L9	119.333 - 114.333 (9)	TP19.8796x19.1254x0.475	5.00	0.00	0.0	29.6793	-7.10	1736.24	0.004
L10	114.333 - 110 (10)	TP20.5331x19.8796x0.4625	4.33	0.00	0.0	29.8901	-7.63	1748.57	0.004
L11	110 - 109.75 (11)	TP20.5708x20.5331x0.5625	0.25	0.00	0.0	36.2400	-8.07	2120.04	0.004
L12	109.75 - 104.75 (12)	TP21.3249x20.5708x0.55	5.00	0.00	0.0	36.7924	-8.79	2152.36	0.004
L13	104.75 - 99.75 (13)	TP22.0791x21.3249x0.5375	5.00	0.00	0.0	37.2831	-9.54	2181.06	0.004
L14	99.75 - 94.75 (14)	TP22.8332x22.0791x0.525	5.00	0.00	0.0	37.7120	-10.31	2206.15	0.005
L15	94.75 - 89.75 (15)	TP23.5874x22.8332x0.5125	5.00	0.00	0.0	38.0793	-11.10	2227.64	0.005
L16	89.75 - 84.75 (16)	TP24.3415x23.5874x0.5	5.00	0.00	0.0	38.3848	-11.92	2245.51	0.005
L17	84.75 - 81.5 (17)	TP24.8317x24.3415x0.5	3.25	0.00	0.0	39.1740	-12.46	2291.68	0.005
L18	81.5 - 81.25 (18)	TP24.8694x24.8317x0.5	0.25	0.00	0.0	39.2347	-12.51	2295.23	0.005
L19	81.25 - 76.25 (19)	TP25.6235x24.8694x0.4875	5.00	0.00	0.0	39.4573	-13.36	2308.25	0.006
L20	76.25 - 71.25 (20)	TP26.3777x25.6235x0.475	5.00	0.00	0.0	39.6181	-14.23	2317.66	0.006
L21	71.25 - 66 (21)	TP27.1695x26.3777x0.475	5.25	0.00	0.0	39.9065	-14.46	2334.53	0.006
L22	66 - 65 (22)	TP26.8203x26.0662x0.5375	5.00	0.00	0.0	45.4890	-16.04	2661.11	0.006
L23	65 - 60 (23)	TP27.5745x26.8203x0.5313	5.00	0.00	0.0	46.2608	-17.06	2706.26	0.006
L24	60 - 55 (24)	TP28.3286x27.5745x0.525	5.00	0.00	0.0	47.0020	-18.11	2749.62	0.007
L25	55 - 51.25 (25)	TP28.8942x28.3286x0.5188	3.75	0.00	0.0	47.3977	-18.91	2772.76	0.007
L26	51.25 - 51 (26)	TP28.9319x28.8942x0.6	0.25	0.00	0.0	54.7373	-18.98	3202.13	0.006
L27	51 - 46 (27)	TP29.6861x28.9319x0.6	5.00	0.00	0.0	56.1943	-20.17	3287.37	0.006
L28	46 - 41 (28)	TP30.4402x29.6861x0.5875	5.00	0.00	0.0	56.4739	-21.39	3303.72	0.006
L29	41 - 36 (29)	TP31.1943x30.4402x0.575	5.00	0.00	0.0	56.6917	-22.64	3316.47	0.007
L30	36 - 31 (30)	TP31.9485x31.1943x0.575	5.00	0.00	0.0	58.0880	-23.90	3398.15	0.007
L31	31 - 27 (31)	TP32.5518x31.9485x0.575	4.00	0.00	0.0	58.3673	-24.16	3414.49	0.007
L32	27 - 26.25 (32)	TP32.04x31.4743x0.6375	3.75	0.00	0.0	64.4615	-25.86	3771.00	0.007
L33	26.25 - 26 (33)	TP32.0777x32.04x0.6375	0.25	0.00	0.0	64.5390	-25.93	3775.53	0.007
L34	26 - 21 (34)	TP32.832x32.0777x0.625	5.00	0.00	0.0	64.8166	-27.35	3791.77	0.007
L35	21 - 16 (35)	TP33.5863x32.832x0.625	5.00	0.00	0.0	66.3346	-28.80	3880.58	0.007
L36	16 - 11 (36)	TP34.3406x33.5863x0.6125	5.00	0.00	0.0	66.5202	-30.27	3891.43	0.008
L37	11 - 6 (37)	TP35.0949x34.3406x0.6125	5.00	0.00	0.0	68.0078	-31.71	3978.46	0.008
L38	6 - 1 (38)	TP35.8491x35.0949x0.6	5.00	0.00	0.0	68.1013	-33.15	3983.93	0.008
L39	1 - 0 (39)	TP36x35.8491x0.6	1.00	0.00	0.0	68.3928	-33.44	4000.98	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 145 (1)	TP15.2541x14.5x0.25	37.63	269.80	0.139	0.00	269.80	0.000
L2	145 - 140 (2)	TP16.0083x15.2541x0.25	68.23	297.84	0.229	0.00	297.84	0.000
L3	140 - 139.583 (3)	TP16.0712x16.0083x0.25	70.90	300.24	0.236	0.00	300.24	0.000
L4	139.583 - 139.333 (4)	TP16.1089x16.0712x0.55	72.52	626.74	0.116	0.00	626.74	0.000
L5	139.333 - 134.333 (5)	TP16.863x16.1089x0.525	106.53	661.73	0.161	0.00	661.73	0.000
L6	134.333 - 129.333 (6)	TP17.6172x16.863x0.5125	143.87	709.51	0.203	0.00	709.51	0.000
L7	129.333 - 124.333 (7)	TP18.3713x17.6172x0.5	184.55	757.10	0.244	0.00	757.10	0.000
L8	124.333 - 119.333 (8)	TP19.1254x18.3713x0.4875	228.58	804.29	0.284	0.00	804.29	0.000
L9	119.333 - 114.333 (9)	TP19.8796x19.1254x0.475	275.97	850.86	0.324	0.00	850.86	0.000
L10	114.333 - 110 (10)	TP20.5331x19.8796x0.4625	319.72	887.56	0.360	0.00	887.56	0.000
L11	110 - 109.75 (11)	TP20.5708x20.5331x0.5625	322.37	1067.48	0.302	0.00	1067.48	0.000
L12	109.75 - 104.75 (12)	TP21.3249x20.5708x0.55	377.31	1127.08	0.335	0.00	1127.08	0.000
L13	104.75 - 99.75 (13)	TP22.0791x21.3249x0.5375	435.69	1186.01	0.367	0.00	1186.01	0.000
L14	99.75 - 94.75 (14)	TP22.8332x22.0791x0.525	497.50	1244.07	0.400	0.00	1244.07	0.000
L15	94.75 - 89.75 (15)	TP23.5874x22.8332x0.5125	562.70	1301.03	0.432	0.00	1301.03	0.000
L16	89.75 - 84.75 (16)	TP24.3415x23.5874x0.5	631.26	1356.69	0.465	0.00	1356.69	0.000
L17	84.75 - 81.5 (17)	TP24.8317x24.3415x0.5	677.61	1413.63	0.479	0.00	1413.63	0.000
L18	81.5 - 81.25 (18)	TP24.8694x24.8317x0.5	681.24	1418.07	0.480	0.00	1418.07	0.000
L19	81.25 - 76.25 (19)	TP25.6235x24.8694x0.4875	755.42	1472.59	0.513	0.00	1472.59	0.000
L20	76.25 - 71.25 (20)	TP26.3777x25.6235x0.475	832.85	1525.28	0.546	0.00	1525.28	0.000
L21	71.25 - 66 (21)	TP27.1695x26.3777x0.475	852.71	1547.76	0.551	0.00	1547.76	0.000
L22	66 - 65 (22)	TP26.8203x26.0662x0.5375	934.36	1773.33	0.527	0.00	1773.33	0.000
L23	65 - 60 (23)	TP27.5745x26.8203x0.5313	1019.30	1857.05	0.549	0.00	1857.05	0.000
L24	60 - 55 (24)	TP28.3286x27.5745x0.525	1107.28	1941.31	0.570	0.00	1941.31	0.000
L25	55 - 51.25 (25)	TP28.8942x28.3286x0.5188	1175.21	1999.09	0.588	0.00	1999.09	0.000
L26	51.25 - 51 (26)	TP28.9319x28.8942x0.6	1179.79	2298.57	0.513	0.00	2298.57	0.000
L27	51 - 46 (27)	TP29.6861x28.9319x0.6	1273.13	2423.88	0.525	0.00	2423.88	0.000
L28	46 - 41 (28)	TP30.4402x29.6861x0.5875	1369.46	2502.47	0.547	0.00	2502.47	0.000
L29	41 - 36 (29)	TP31.1943x30.4402x0.575	1468.65	2578.92	0.569	0.00	2578.92	0.000
L30	36 - 31 (30)	TP31.9485x31.1943x0.575	1570.56	2708.72	0.580	0.00	2708.72	0.000
L31	31 - 27 (31)	TP32.5518x31.9485x0.575	1591.26	2735.06	0.582	0.00	2735.06	0.000
L32	27 - 26.25 (32)	TP32.04x31.4743x0.6375	1669.93	3002.88	0.556	0.00	3002.88	0.000
L33	26.25 - 26 (33)	TP32.0777x32.04x0.6375	1675.24	3010.18	0.557	0.00	3010.18	0.000
L34	26 - 21 (34)	TP32.832x32.0777x0.625	1782.60	3099.50	0.575	0.00	3099.50	0.000
L35	21 - 16 (35)	TP33.5863x32.832x0.625	1892.47	3247.79	0.583	0.00	3247.79	0.000
L36	16 - 11 (36)	TP34.3406x33.5863x0.6125	2004.83	3335.27	0.601	0.00	3335.27	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L37	11 - 6 (37)	TP35.0949x34.3406x0.6125	2119.18	3487.47	0.608	0.00	3487.47	0.000
L38	6 - 1 (38)	TP35.8491x35.0949x0.6	2235.13	3572.53	0.626	0.00	3572.53	0.000
L39	1 - 0 (39)	TP36x35.8491x0.6	2258.49	3603.43	0.627	0.00	3603.43	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 145 (1)	TP15.2541x14.5x0.25	5.85	211.97	0.028	0.32	279.77	0.001
L2	145 - 140 (2)	TP16.0083x15.2541x0.25	6.38	222.63	0.029	0.43	308.60	0.001
L3	140 - 139.583 (3)	TP16.0712x16.0083x0.25	6.44	223.52	0.029	0.43	311.06	0.001
L4	139.583 - 139.333 (4)	TP16.1089x16.0712x0.55	6.47	483.59	0.013	0.44	661.84	0.001
L5	139.333 - 134.333 (5)	TP16.863x16.1089x0.525	7.13	484.72	0.015	0.52	696.61	0.001
L6	134.333 - 129.333 (6)	TP17.6172x16.863x0.5125	7.80	495.38	0.016	0.60	745.34	0.001
L7	129.333 - 124.333 (7)	TP18.3713x17.6172x0.5	8.47	504.96	0.017	0.68	793.81	0.001
L8	124.333 - 119.333 (8)	TP19.1254x18.3713x0.4875	9.14	513.46	0.018	0.77	841.79	0.001
L9	119.333 - 114.333 (9)	TP19.8796x19.1254x0.475	9.81	520.87	0.019	0.86	889.07	0.001
L10	114.333 - 110 (10)	TP20.5331x19.8796x0.4625	10.38	524.57	0.020	0.94	926.12	0.001
L11	110 - 109.75 (11)	TP20.5708x20.5331x0.5625	10.64	636.01	0.017	0.94	1119.38	0.001
L12	109.75 - 104.75 (12)	TP21.3249x20.5708x0.55	11.33	645.71	0.018	1.03	1179.98	0.001
L13	104.75 - 99.75 (13)	TP22.0791x21.3249x0.5375	12.02	654.32	0.018	1.11	1239.84	0.001
L14	99.75 - 94.75 (14)	TP22.8332x22.0791x0.525	12.70	661.85	0.019	1.20	1298.74	0.001
L15	94.75 - 89.75 (15)	TP23.5874x22.8332x0.5125	13.38	668.29	0.020	1.29	1356.45	0.001
L16	89.75 - 84.75 (16)	TP24.3415x23.5874x0.5	14.05	673.65	0.021	1.38	1412.77	0.001
L17	84.75 - 81.5 (17)	TP24.8317x24.3415x0.5	14.48	687.50	0.021	1.44	1471.46	0.001
L18	81.5 - 81.25 (18)	TP24.8694x24.8317x0.5	14.51	688.57	0.021	1.44	1476.02	0.001
L19	81.25 - 76.25 (19)	TP25.6235x24.8694x0.4875	15.16	692.48	0.022	1.53	1531.09	0.001
L20	76.25 - 71.25 (20)	TP26.3777x25.6235x0.475	15.81	695.30	0.023	1.63	1584.22	0.001
L21	71.25 - 66 (21)	TP27.1695x26.3777x0.475	15.97	700.36	0.023	1.65	1607.37	0.001
L22	66 - 65 (22)	TP26.8203x26.0662x0.5375	16.68	798.33	0.021	1.74	1845.68	0.001
L23	65 - 60 (23)	TP27.5745x26.8203x0.5313	17.30	811.88	0.021	1.83	1931.29	0.001
L24	60 - 55 (24)	TP28.3286x27.5745x0.525	17.90	824.88	0.022	1.93	2017.41	0.001
L25	55 - 51.25 (25)	TP28.8942x28.3286x0.5188	18.34	831.83	0.022	1.99	2076.24	0.001
L26	51.25 - 51 (26)	TP28.9319x28.8942x0.6	18.36	960.64	0.019	2.00	2394.07	0.001
L27	51 - 46 (27)	TP29.6861x28.9319x0.6	18.97	986.21	0.019	2.09	2523.22	0.001
L28	46 - 41 (28)	TP30.4402x29.6861x0.5875	19.56	991.12	0.020	2.19	2602.61	0.001
L29	41 - 36 (29)	TP31.1943x30.4402x0.575	20.12	994.94	0.020	2.28	2679.74	0.001

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L30	36 - 31 (30)	TP31.9485x31.1943x0.575	20.65	1019.44	0.020	2.37	2813.37	0.001
L31	31 - 27 (31)	TP32.5518x31.9485x0.575	20.75	1024.35	0.020	2.39	2840.48	0.001
L32	27 - 26.25 (32)	TP32.04x31.4743x0.6375	21.19	1131.30	0.019	2.46	3124.94	0.001
L33	26.25 - 26 (33)	TP32.0777x32.04x0.6375	21.21	1132.66	0.019	2.46	3132.46	0.001
L34	26 - 21 (34)	TP32.832x32.0777x0.625	21.73	1137.53	0.019	2.55	3222.66	0.001
L35	21 - 16 (35)	TP33.5863x32.832x0.625	22.23	1164.17	0.019	2.65	3375.38	0.001
L36	16 - 11 (36)	TP34.3406x33.5863x0.6125	22.72	1167.43	0.019	2.74	3463.56	0.001
L37	11 - 6 (37)	TP35.0949x34.3406x0.6125	23.05	1193.54	0.019	2.74	3620.20	0.001
L38	6 - 1 (38)	TP35.8491x35.0949x0.6	23.36	1195.18	0.020	2.74	3705.79	0.001
L39	1 - 0 (39)	TP36x35.8491x0.6	23.40	1200.29	0.019	2.74	3737.58	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 145 (1)	0.006	0.139	0.000	0.028	0.001	0.146	1.050	4.8.2
L2	145 - 140 (2)	0.006	0.229	0.000	0.029	0.001	0.236	1.050	4.8.2
L3	140 - 139.583 (3)	0.006	0.236	0.000	0.029	0.001	0.243	1.050	4.8.2
L4	139.583 - 139.333 (4)	0.003	0.116	0.000	0.013	0.001	0.119	1.050	4.8.2
L5	139.333 - 134.333 (5)	0.003	0.161	0.000	0.015	0.001	0.164	1.050	4.8.2
L6	134.333 - 129.333 (6)	0.003	0.203	0.000	0.016	0.001	0.206	1.050	4.8.2
L7	129.333 - 124.333 (7)	0.004	0.244	0.000	0.017	0.001	0.248	1.050	4.8.2
L8	124.333 - 119.333 (8)	0.004	0.284	0.000	0.018	0.001	0.288	1.050	4.8.2
L9	119.333 - 114.333 (9)	0.004	0.324	0.000	0.019	0.001	0.329	1.050	4.8.2
L10	114.333 - 110 (10)	0.004	0.360	0.000	0.020	0.001	0.365	1.050	4.8.2
L11	110 - 109.75 (11)	0.004	0.302	0.000	0.017	0.001	0.306	1.050	4.8.2
L12	109.75 - 104.75 (12)	0.004	0.335	0.000	0.018	0.001	0.339	1.050	4.8.2
L13	104.75 - 99.75 (13)	0.004	0.367	0.000	0.018	0.001	0.372	1.050	4.8.2
L14	99.75 - 94.75 (14)	0.005	0.400	0.000	0.019	0.001	0.405	1.050	4.8.2
L15	94.75 - 89.75 (15)	0.005	0.432	0.000	0.020	0.001	0.438	1.050	4.8.2
L16	89.75 - 84.75 (16)	0.005	0.465	0.000	0.021	0.001	0.471	1.050	4.8.2
L17	84.75 - 81.5 (17)	0.005	0.479	0.000	0.021	0.001	0.485	1.050	4.8.2
L18	81.5 - 81.25 (18)	0.005	0.480	0.000	0.021	0.001	0.486	1.050	4.8.2
L19	81.25 - 76.25 (19)	0.006	0.513	0.000	0.022	0.001	0.519	1.050	4.8.2
L20	76.25 - 71.25 (20)	0.006	0.546	0.000	0.023	0.001	0.553	1.050	4.8.2
L21	71.25 - 66 (21)	0.006	0.551	0.000	0.023	0.001	0.558	1.050	4.8.2
L22	66 - 65 (22)	0.006	0.527	0.000	0.021	0.001	0.533	1.050	4.8.2
L23	65 - 60 (23)	0.006	0.549	0.000	0.021	0.001	0.556	1.050	4.8.2
L24	60 - 55 (24)	0.007	0.570	0.000	0.022	0.001	0.577	1.050	4.8.2

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L25	55 - 51.25 (25)	0.007	0.588	0.000	0.022	0.001	0.595	1.050	4.8.2
L26	51.25 - 51 (26)	0.006	0.513	0.000	0.019	0.001	0.520	1.050	4.8.2
L27	51 - 46 (27)	0.006	0.525	0.000	0.019	0.001	0.532	1.050	4.8.2
L28	46 - 41 (28)	0.006	0.547	0.000	0.020	0.001	0.554	1.050	4.8.2
L29	41 - 36 (29)	0.007	0.569	0.000	0.020	0.001	0.577	1.050	4.8.2
L30	36 - 31 (30)	0.007	0.580	0.000	0.020	0.001	0.587	1.050	4.8.2
L31	31 - 27 (31)	0.007	0.582	0.000	0.020	0.001	0.589	1.050	4.8.2
L32	27 - 26.25 (32)	0.007	0.556	0.000	0.019	0.001	0.563	1.050	4.8.2
L33	26.25 - 26 (33)	0.007	0.557	0.000	0.019	0.001	0.564	1.050	4.8.2
L34	26 - 21 (34)	0.007	0.575	0.000	0.019	0.001	0.583	1.050	4.8.2
L35	21 - 16 (35)	0.007	0.583	0.000	0.019	0.001	0.591	1.050	4.8.2
L36	16 - 11 (36)	0.008	0.601	0.000	0.019	0.001	0.609	1.050	4.8.2
L37	11 - 6 (37)	0.008	0.608	0.000	0.019	0.001	0.616	1.050	4.8.2
L38	6 - 1 (38)	0.008	0.626	0.000	0.020	0.001	0.634	1.050	4.8.2
L39	1 - 0 (39)	0.008	0.627	0.000	0.019	0.001	0.636	1.050	4.8.2

Section Capacity Table

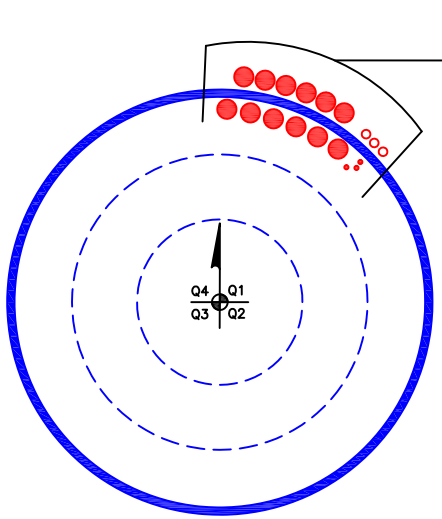
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 145	Pole	TP15.2541x14.5x0.25	1	-4.00	741.91	13.9	Pass
L2	145 - 140	Pole	TP16.0083x15.2541x0.25	2	-4.29	779.20	22.5	Pass
L3	140 - 139.583	Pole	TP16.0712x16.0083x0.25	3	-4.31	782.31	23.1	Pass
L4	139.583 - 139.333	Pole	TP16.1089x16.0712x0.55	4	-4.34	1692.55	11.3	Pass
L5	139.333 - 134.333	Pole	TP16.863x16.1089x0.525	5	-4.85	1696.53	15.6	Pass
L6	134.333 - 129.333	Pole	TP17.6172x16.863x0.5125	6	-5.38	1733.84	19.6	Pass
L7	129.333 - 124.333	Pole	TP18.3713x17.6172x0.5	7	-5.93	1767.37	23.6	Pass
L8	124.333 - 119.333	Pole	TP19.1254x18.3713x0.4875	8	-6.50	1797.11	27.5	Pass
L9	119.333 - 114.333	Pole	TP19.8796x19.1254x0.475	9	-7.10	1823.05	31.3	Pass
L10	114.333 - 110	Pole	TP20.5331x19.8796x0.4625	10	-7.63	1836.00	34.8	Pass
L11	110 - 109.75	Pole	TP20.5708x20.5331x0.5625	11	-8.07	2226.04	29.2	Pass
L12	109.75 - 104.75	Pole	TP21.3249x20.5708x0.55	12	-8.79	2259.98	32.3	Pass
L13	104.75 - 99.75	Pole	TP22.0791x21.3249x0.5375	13	-9.54	2290.11	35.4	Pass
L14	99.75 - 94.75	Pole	TP22.8332x22.0791x0.525	14	-10.31	2316.46	38.6	Pass
L15	94.75 - 89.75	Pole	TP23.5874x22.8332x0.5125	15	-11.10	2339.02	41.7	Pass
L16	89.75 - 84.75	Pole	TP24.3415x23.5874x0.5	16	-11.92	2357.79	44.9	Pass
L17	84.75 - 81.5	Pole	TP24.8317x24.3415x0.5	17	-12.46	2406.26	46.2	Pass
L18	81.5 - 81.25	Pole	TP24.8694x24.8317x0.5	18	-12.51	2409.99	46.3	Pass
L19	81.25 - 76.25	Pole	TP25.6235x24.8694x0.4875	19	-13.36	2423.66	49.5	Pass
L20	76.25 - 71.25	Pole	TP26.3777x25.6235x0.475	20	-14.23	2433.54	52.6	Pass
L21	71.25 - 66	Pole	TP27.1695x26.3777x0.475	21	-14.46	2451.26	53.1	Pass
L22	66 - 65	Pole	TP26.8203x26.0662x0.5375	22	-16.04	2794.17	50.8	Pass
L23	65 - 60	Pole	TP27.5745x26.8203x0.5313	23	-17.06	2841.57	52.9	Pass
L24	60 - 55	Pole	TP28.3286x27.5745x0.525	24	-18.11	2887.10	55.0	Pass
L25	55 - 51.25	Pole	TP28.8942x28.3286x0.5188	25	-18.91	2911.40	56.7	Pass
L26	51.25 - 51	Pole	TP28.9319x28.8942x0.6	26	-18.98	3362.24	49.5	Pass
L27	51 - 46	Pole	TP29.6861x28.9319x0.6	27	-20.17	3451.74	50.6	Pass
L28	46 - 41	Pole	TP30.4402x29.6861x0.5875	28	-21.39	3468.91	52.8	Pass
L29	41 - 36	Pole	TP31.1943x30.4402x0.575	29	-22.64	3482.29	54.9	Pass
L30	36 - 31	Pole	TP31.9485x31.1943x0.575	30	-23.90	3568.06	55.9	Pass
L31	31 - 27	Pole	TP32.5518x31.9485x0.575	31	-24.16	3585.21	56.1	Pass
L32	27 - 26.25	Pole	TP32.04x31.4743x0.6375	32	-25.86	3959.55	53.7	Pass
L33	26.25 - 26	Pole	TP32.0777x32.04x0.6375	33	-25.93	3964.31	53.7	Pass
L34	26 - 21	Pole	TP32.832x32.0777x0.625	34	-27.35	3981.36	55.5	Pass
L35	21 - 16	Pole	TP33.5863x32.832x0.625	35	-28.80	4074.61	56.2	Pass
L36	16 - 11	Pole	TP34.3406x33.5863x0.6125	36	-30.27	4086.00	58.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L37	11 - 6	Pole	TP35.0949x34.3406x0.6125	37	-31.71	4177.38	58.7	Pass
L38	6 - 1	Pole	TP35.8491x35.0949x0.6	38	-33.15	4183.13	60.4	Pass
L39	1 - 0	Pole	TP36x35.8491x0.6	39	-33.44	4201.03	60.5	Pass
							Summary	
						Pole (L39)	60.5	Pass
						RATING =	**60.5**	**Pass**

***NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 841287 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- H

Site BU: 841287

Work Order: 1760862

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	150	40	0	12	14.5	20.5331	0.25	Auto	A572-65
2	110	44	4	12	20.53	27.1695	0.25	Auto	A572-65
3	70	43	3	12	26.07	32.5518	0.3125	Auto	A572-65
4	30	30	0	12	31.47	36	0.375	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12
1	0	26.25	channel	MP3-05 (1.25in)	4		x			x			x			x	
2	26.25	51.25	channel	MP3-05 (1.25in)	4		x			x			x			x	
3	51.25	81.5	channel	MP3-04 (1.25in)	4		x			x			x			x	
4	81.5	110	channel	MP3-04 (1.25in)	4		x			x			x			x	
5	110	139.583	channel	MP3-03 (1.25in)	4		x			x			x			x	
6																	
7																	
8																	
9																	
10																	

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	5.33	2.09	5.65	0.79	29.000	29.000	18.000	4.994	1.2500	A572-65
2	5.33	2.09	5.65	0.79	29.000	29.000	18.000	4.994	1.2500	A572-65
3	4.78	1.61	4.13	0.61	17.000	17.000	18.000	3.566	1.2500	A572-65
4	4.78	1.61	4.13	0.61	17.000	17.000	18.000	3.566	1.2500	A572-65
5	4.06	1.57	2.92	0.59	14.000	14.000	18.000	2.526	1.2500	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	150 - 145	5		12	14.500	15.254	0.25	A572-65	1.000
2	145 - 140	5		12	15.254	16.008	0.25	A572-65	1.000
3	140 - 139.583	0.417		12	16.008	16.071	0.25	A572-65	1.000
4	139.583 - 139.333	0.25		12	16.071	16.109	0.55	A572-65	0.888
5	139.333 - 134.333	5		12	16.109	16.863	0.525	A572-65	0.908
6	134.333 - 129.333	5		12	16.863	17.617	0.5125	A572-65	0.910
7	129.333 - 124.333	5		12	17.617	18.371	0.5	A572-65	0.914
8	124.333 - 119.333	5		12	18.371	19.125	0.4875	A572-65	0.919
9	119.333 - 114.333	5		12	19.125	19.880	0.475	A572-65	0.927
10	114.333 - 110	4.333	0	12	19.880	20.533	0.4625	A572-65	0.938
11	110 - 109.75	0.25		12	20.533	20.571	0.5625	A572-65	0.908
12	109.75 - 104.75	5		12	20.571	21.325	0.55	A572-65	0.911
13	104.75 - 99.75	5		12	21.325	22.079	0.5375	A572-65	0.915
14	99.75 - 94.75	5		12	22.079	22.833	0.525	A572-65	0.921
15	94.75 - 89.75	5		12	22.833	23.587	0.5125	A572-65	0.928
16	89.75 - 84.75	5		12	23.587	24.341	0.5	A572-65	0.936
17	84.75 - 81.5	3.25		12	24.341	24.832	0.5	A572-65	0.927
18	81.5 - 81.25	0.25		12	24.832	24.869	0.5	A572-65	0.927
19	81.25 - 76.25	5		12	24.869	25.624	0.4875	A572-65	0.937
20	76.25 - 71.25	5		12	25.624	26.378	0.475	A572-65	0.948
21	71.25 - 70	5.25	4	12	26.378	27.170	0.475	A572-65	0.945
22	70 - 65	5		12	26.066	26.820	0.5375	A572-65	0.950
23	65 - 60	5		12	26.820	27.574	0.53125	A572-65	0.951
24	60 - 55	5		12	27.574	28.329	0.525	A572-65	0.952
25	55 - 51.25	3.75		12	28.329	28.894	0.51875	A572-65	0.956
26	51.25 - 51	0.25		12	28.894	28.932	0.6	A572-65	0.940
27	51 - 46	5		12	28.932	29.686	0.6	A572-65	0.929
28	46 - 41	5		12	29.686	30.440	0.5875	A572-65	0.938
29	41 - 36	5		12	30.440	31.194	0.575	A572-65	0.947
30	36 - 31	5		12	31.194	31.948	0.575	A572-65	0.938
31	31 - 30	4	3	12	31.948	32.552	0.575	A572-65	0.936
32	30 - 26.25	3.75		12	31.474	32.040	0.6375	A572-65	0.944
33	26.25 - 26	0.25		12	32.040	32.078	0.6375	A572-65	0.944
34	26 - 21	5		12	32.078	32.832	0.625	A572-65	0.954
35	21 - 16	5		12	32.832	33.586	0.625	A572-65	0.946
36	16 - 11	5		12	33.586	34.341	0.6125	A572-65	0.957
37	11 - 6	5		12	34.341	35.095	0.6125	A572-65	0.949
38	6 - 1	5		12	35.095	35.849	0.6	A572-65	0.961
39	1 - 0	1		12	35.849	36.000	0.6	A572-65	0.960

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	150 - 145	4.00	37.63	5.85
2	145 - 140	4.29	68.23	6.38
3	140 - 139.583	4.31	70.90	6.44
4	139.583 - 139.333	4.34	72.52	6.47
5	139.333 - 134.333	4.85	106.53	7.13
6	134.333 - 129.333	5.38	143.87	7.80
7	129.333 - 124.333	5.93	184.55	8.47
8	124.333 - 119.333	6.50	228.58	9.14
9	119.333 - 114.333	7.10	275.97	9.81
10	114.333 - 110	7.63	319.72	10.38
11	110 - 109.75	8.07	322.37	10.64
12	109.75 - 104.75	8.79	377.31	11.33
13	104.75 - 99.75	9.54	435.69	12.02
14	99.75 - 94.75	10.31	497.49	12.70
15	94.75 - 89.75	11.10	562.69	13.38
16	89.75 - 84.75	11.92	631.26	14.05
17	84.75 - 81.5	12.46	677.61	14.48
18	81.5 - 81.25	12.51	681.24	14.51
19	81.25 - 76.25	13.36	755.42	15.16
20	76.25 - 71.25	14.23	832.85	15.81
21	71.25 - 70	14.46	852.71	15.97
22	70 - 65	16.04	934.36	16.68
23	65 - 60	17.06	1019.30	17.30
24	60 - 55	18.11	1107.28	17.90
25	55 - 51.25	18.91	1175.21	18.34
26	51.25 - 51	18.98	1179.79	18.36
27	51 - 46	20.17	1273.14	18.97
28	46 - 41	21.39	1369.46	19.56
29	41 - 36	22.64	1468.65	20.12
30	36 - 31	23.90	1570.56	20.65
31	31 - 30	24.16	1591.26	20.75
32	30 - 26.25	25.86	1669.94	21.19
33	26.25 - 26	25.94	1675.24	21.21
34	26 - 21	27.35	1782.60	21.73
35	21 - 16	28.80	1892.47	22.23
36	16 - 11	30.27	2004.82	22.72
37	11 - 6	31.71	2119.18	23.05
38	6 - 1	33.15	2235.12	23.36
39	1 - 0	33.44	2258.49	23.40

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
150 - 145	Pole	TP15.254x14.5x0.25	Pole	13.7%	Pass
145 - 140	Pole	TP16.008x15.254x0.25	Pole	22.2%	Pass
140 - 139.58	Pole	TP16.071x16.008x0.25	Pole	22.9%	Pass
139.58 - 139.33	Pole + Reinf.	TP16.109x16.071x0.55	Reinf. 5 Tension Rupture	17.3%	Pass
139.33 - 134.33	Pole + Reinf.	TP16.863x16.109x0.525	Reinf. 5 Tension Rupture	23.7%	Pass
134.33 - 129.33	Pole + Reinf.	TP17.617x16.863x0.5125	Reinf. 5 Tension Rupture	29.9%	Pass
129.33 - 124.33	Pole + Reinf.	TP18.371x17.617x0.5	Reinf. 5 Tension Rupture	35.9%	Pass
124.33 - 119.33	Pole + Reinf.	TP19.125x18.371x0.4875	Reinf. 5 Tension Rupture	41.8%	Pass
119.33 - 114.33	Pole + Reinf.	TP19.88x19.125x0.475	Reinf. 5 Tension Rupture	47.5%	Pass
114.33 - 110	Pole + Reinf.	TP20.533x19.88x0.4625	Reinf. 5 Tension Rupture	52.3%	Pass
110 - 109.75	Pole + Reinf.	TP20.571x20.533x0.5625	Reinf. 4 Tension Rupture	44.0%	Pass
109.75 - 104.75	Pole + Reinf.	TP21.325x20.571x0.55	Reinf. 4 Tension Rupture	48.8%	Pass
104.75 - 99.75	Pole + Reinf.	TP22.079x21.325x0.5375	Reinf. 4 Tension Rupture	53.5%	Pass
99.75 - 94.75	Pole + Reinf.	TP22.833x22.079x0.525	Reinf. 4 Tension Rupture	58.1%	Pass
94.75 - 89.75	Pole + Reinf.	TP23.587x22.833x0.5125	Reinf. 4 Tension Rupture	62.5%	Pass
89.75 - 84.75	Pole + Reinf.	TP24.341x23.587x0.5	Reinf. 4 Tension Rupture	66.9%	Pass
84.75 - 81.5	Pole + Reinf.	TP24.832x24.341x0.5	Reinf. 4 Tension Rupture	69.6%	Pass
81.5 - 81.25	Pole + Reinf.	TP24.869x24.832x0.5	Reinf. 3 Tension Rupture	69.8%	Pass
81.25 - 76.25	Pole + Reinf.	TP25.624x24.869x0.4875	Reinf. 3 Tension Rupture	74.0%	Pass
76.25 - 71.25	Pole + Reinf.	TP26.378x25.624x0.475	Reinf. 3 Tension Rupture	78.0%	Pass
71.25 - 70	Pole + Reinf.	TP27.17x26.378x0.475	Reinf. 3 Tension Rupture	78.9%	Pass
70 - 65	Pole + Reinf.	TP26.82x26.066x0.5375	Reinf. 3 Tension Rupture	75.3%	Pass
65 - 60	Pole + Reinf.	TP27.574x26.82x0.5313	Reinf. 3 Tension Rupture	78.6%	Pass
60 - 55	Pole + Reinf.	TP28.329x27.574x0.525	Reinf. 3 Tension Rupture	81.7%	Pass
55 - 51.25	Pole + Reinf.	TP28.894x28.329x0.5188	Reinf. 3 Tension Rupture	83.9%	Pass
51.25 - 51	Pole + Reinf.	TP28.932x28.894x0.6	Reinf. 2 Tension Rupture	71.2%	Pass
51 - 46	Pole + Reinf.	TP29.686x28.932x0.6	Reinf. 2 Tension Rupture	73.8%	Pass
46 - 41	Pole + Reinf.	TP30.44x29.686x0.5875	Reinf. 2 Tension Rupture	76.3%	Pass
41 - 36	Pole + Reinf.	TP31.194x30.44x0.575	Reinf. 2 Tension Rupture	78.8%	Pass
36 - 31	Pole + Reinf.	TP31.948x31.194x0.575	Reinf. 2 Tension Rupture	81.2%	Pass
31 - 30	Pole + Reinf.	TP32.552x31.948x0.575	Reinf. 2 Tension Rupture	81.6%	Pass
30 - 26.25	Pole + Reinf.	TP32.04x31.474x0.6375	Reinf. 2 Tension Rupture	77.5%	Pass
26.25 - 26	Pole + Reinf.	TP32.078x32.04x0.6375	Reinf. 1 Tension Rupture	77.6%	Pass
26 - 21	Pole + Reinf.	TP32.832x32.078x0.625	Reinf. 1 Tension Rupture	79.5%	Pass
21 - 16	Pole + Reinf.	TP33.586x32.832x0.625	Reinf. 1 Tension Rupture	81.3%	Pass
16 - 11	Pole + Reinf.	TP34.341x33.586x0.6125	Reinf. 1 Tension Rupture	83.1%	Pass
11 - 6	Pole + Reinf.	TP35.095x34.341x0.6125	Reinf. 1 Tension Rupture	84.7%	Pass
6 - 1	Pole + Reinf.	TP35.849x35.095x0.6	Reinf. 1 Tension Rupture	86.3%	Pass
1 - 0	Pole + Reinf.	TP36x35.849x0.6	Reinf. 1 Tension Rupture	86.6%	Pass
				Summary	
			Pole	60.9%	Pass
			Reinforcement	86.6%	Pass
			Overall	86.6%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*					
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5
150 - 145	348	n/a	348	12.06	n/a	12.06	13.7%					
145 - 140	403	n/a	403	12.67	n/a	12.67	22.2%					
140 - 139.58	407	n/a	407	12.72	n/a	12.72	22.9%					
139.58 - 139.33	410	440	850	12.75	11.68	24.43	10.9%					17.3%
139.33 - 134.33	472	479	951	13.35	11.68	25.03	15.0%					23.7%
134.33 - 129.33	539	520	1059	13.96	11.68	25.64	18.9%					29.9%
129.33 - 124.33	612	562	1174	14.57	11.68	26.25	22.7%					35.9%
124.33 - 119.33	692	606	1298	15.17	11.68	26.85	26.5%					41.8%
119.33 - 114.33	778	651	1429	15.78	11.68	27.46	30.2%					47.5%
114.33 - 110	859	692	1551	16.30	11.68	27.98	33.2%					52.3%
110 - 109.75	863	989	1853	16.33	16.52	32.85	28.1%				44.0%	
109.75 - 104.75	963	1058	2022	16.94	16.52	33.46	31.5%				48.8%	
104.75 - 99.75	1070	1130	2200	17.55	16.52	34.07	35.0%				53.5%	
99.75 - 94.75	1185	1204	2389	18.15	16.52	34.67	38.5%				58.1%	
94.75 - 89.75	1308	1280	2587	18.76	16.52	35.28	41.9%				62.5%	
89.75 - 84.75	1439	1358	2797	19.37	16.52	35.89	45.4%				66.9%	
84.75 - 81.5	1528	1410	2939	19.76	16.52	36.28	47.7%				69.6%	
81.5 - 81.25	1535	1414	2950	19.79	16.52	36.31	47.8%			69.8%		
81.25 - 76.25	1681	1497	3178	20.40	16.52	36.92	51.3%			74.0%		
76.25 - 71.25	1835	1582	3417	21.00	16.52	37.52	54.8%			78.0%		
71.25 - 70	1875	1603	3478	21.15	16.52	37.67	55.7%			78.9%		
70 - 65	2396	1633	4028	26.64	16.52	43.16	49.3%			75.3%		
65 - 60	2606	1721	4327	27.39	16.52	43.91	51.9%			78.6%		
60 - 55	2828	1812	4640	28.15	16.52	44.67	54.5%			81.7%		
55 - 51.25	3003	1882	4885	28.72	16.52	45.24	56.4%			83.9%		
51.25 - 51	3015	2644	5659	28.76	22.60	51.36	49.0%		71.2%			
51 - 46	3259	2776	6036	29.51	22.60	52.11	51.3%		73.8%			
46 - 41	3517	2911	6428	30.27	22.60	52.87	53.6%		76.3%			
41 - 36	3788	3049	6837	31.03	22.60	53.63	55.9%		78.8%			
36 - 31	4072	3190	7262	31.79	22.60	54.39	58.2%		81.2%			
31 - 30	4131	3219	7349	31.94	22.60	54.54	58.6%		81.6%			
30 - 26.25	4900	3208	8108	38.18	22.60	60.78	52.2%		77.5%			
26.25 - 26	4918	3215	8132	38.23	22.60	60.83	52.3%	77.6%				
26 - 21	5277	3360	8637	39.14	22.60	61.74	54.0%	79.5%				
21 - 16	5654	3508	9162	40.05	22.60	62.65	55.7%	81.3%				
16 - 11	6048	3659	9707	40.95	22.60	63.55	57.4%	83.1%				
11 - 6	6459	3814	10274	41.86	22.60	64.46	59.0%	84.7%				
6 - 1	6890	3972	10862	42.77	22.60	65.37	60.6%	86.3%				
1 - 0	6978	4004	10982	42.96	22.60	65.56	60.9%	86.6%				

Note: Section capacity checked in 5 degree increments.
Rating per TIA-222-H Section 15.5.

Monopole Flange Plate Connection

Elevation = 110 ft.

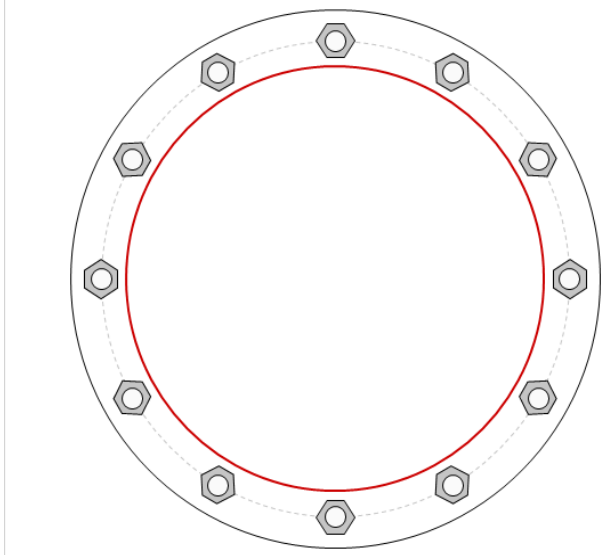
BU #	841287
Site Name	Norwalk West- Ct Ave
Order #	424185 Rev. 3

TIA-222 Revision	H

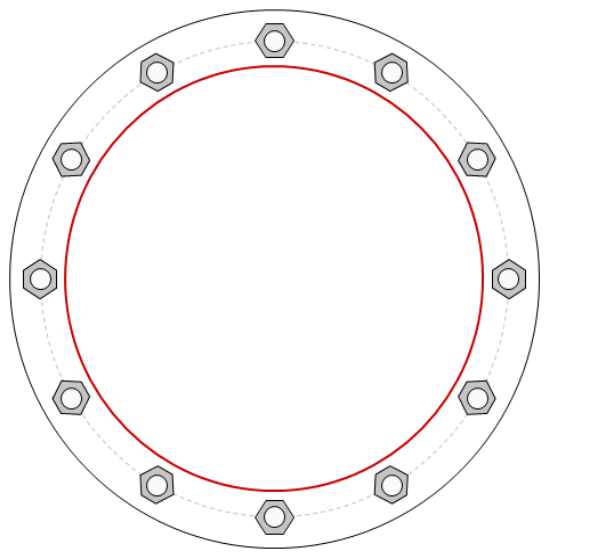
Applied Loads	
Moment (kip-ft)	319.72
Axial Force (kips)	7.63
Shear Force (kips)	10.38

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(12) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 23" BC

Top Plate Data

26" OD x 1" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Bottom Plate Data

26" OD x 1" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

20.5331" x 0.25" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Bottom Pole Data

20.5331" x 0.25" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	54.93	
Allowable (kips)	54.52	
Stress Rating:	**95.9%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	35.28	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	**74.7%**	**Pass**
Tension Side Stress Rating:	**48.8%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	35.28	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	**74.7%**	**Pass**
Tension Side Stress Rating:	**48.8%**	**Pass**

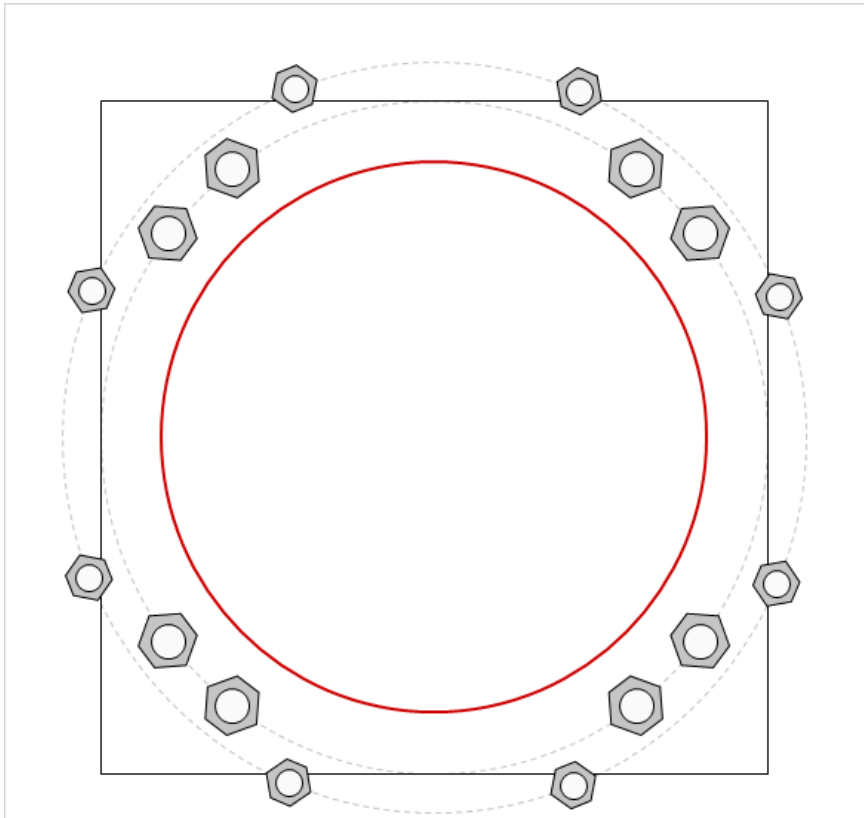
Monopole Base Plate Connection

Site Info	
BU #	841287
Site Name	Norwalk West- Ct Ave
Order #	424185 Rev. 3

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2

Applied Loads	
Moment (kip-ft)	2258.49
Axial Force (kips)	33.44
Shear Force (kips)	23.40

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (8) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 44" BC

Anchor Spacing: 6 in

GROUP 2: (8) 1-3/4" ø bolts (F1554-105 N; Fy=105 ksi, Fu=125 ksi) on 49" BC

Base Plate Data

44" OD x 2.5" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

36" x 0.375" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

GROUP 1:		
Pu_c = 182.44	ϕPn_c = 243.75	**Stress Rating**
Vu = 2.93	ϕVn = 73.13	**71.4%**
Mu = n/a	ϕMn = n/a	**Pass**
GROUP 2:		
Pu_c = 116.07	ϕPn_c = 199.5	**Stress Rating**
Vu = 0	ϕVn = 59.85	**55.4%**
Mu = 0	ϕMn = 59.26	**Pass**

Base Plate Summary

Max Stress (ksi):	33.5	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**59.1%**	**Pass**

Pier and Pad Foundation

BU # :	841287
Site Name:	Norwalk West- Ct A
App. Number:	424185 Rev. 3

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	33.44	kips
Base Shear, Vu_comp:	23.4	kips
Moment, M_u:	2258.49	ft-kips
Tower Height, **H**:	150	ft
BP Dist. Above Fdn, bp_{dist}:	2.5	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, **dpier**:	5	ft
Ext. Above Grade, **E**:	0.4	ft
Pier Rebar Size, **Sc**:	10	
Pier Rebar Quantity, **mc**:	30	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	7	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	7.1	ft
Pad Width, **W**:	21.25	ft
Pad Thickness, **T**:	2.5	ft
Pad Rebar Size (Bottom), **Sp**:	10	
Pad Rebar Quantity (Bottom), **mp**:	15	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	3	ksi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	110	pcf
Ultimate Gross Bearing, Qult:	20.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	28	degrees
SPT Blow Count, N_{blows}:	5	
Base Friction, μ:	0.4	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	12	ft

<--Toggle between Gross and Net

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	193.35	23.40	**11.5%**	**Pass**
Bearing Pressure (ksf)	15.00	2.30	**15.3%**	**Pass**
*Overturning (kip*ft)*	4345.76	2438.87	**56.1%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	3842.55	2375.49	**58.9%**	**Pass**
Pier Compression (kip)	11934.00	55.94	**0.4%**	**Pass**
*Pad Flexure (kip*ft)*	2075.93	1001.94	**46.0%**	**Pass**
Pad Shear - 1-way (kips)	525.75	174.65	**31.6%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.051	**29.3%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	2349.69	1425.29	**57.8%**	**Pass**

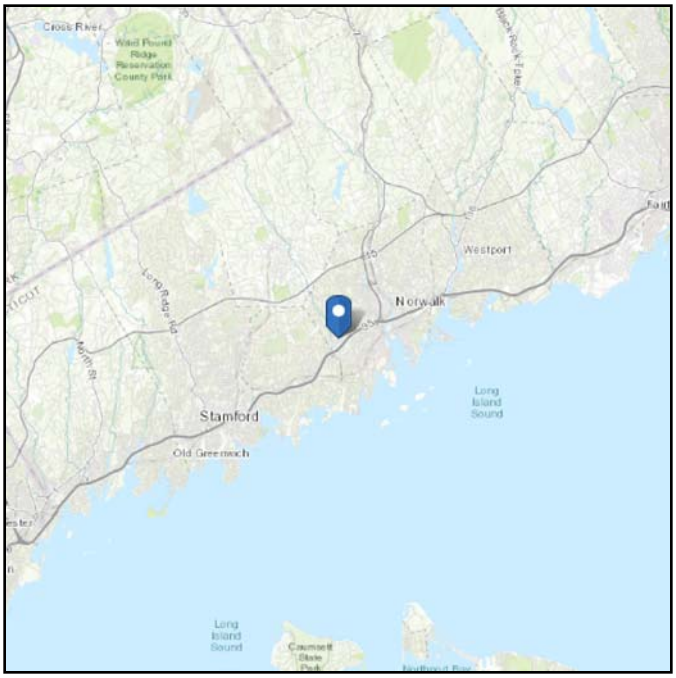
**Rating per TIA-222-H Section 15.5*

Soil Rating*:	**56.1%**
Structural Rating*:	**58.9%**

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-10	**Elevation:**	88.52 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.097069
Soil Class:	D - Stiff Soil	**Longitude:**	-73.449058



Wind

Results:

Wind Speed:	120 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	91 Vmph
100-year MRI	98 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Thu Jun 27 2019

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

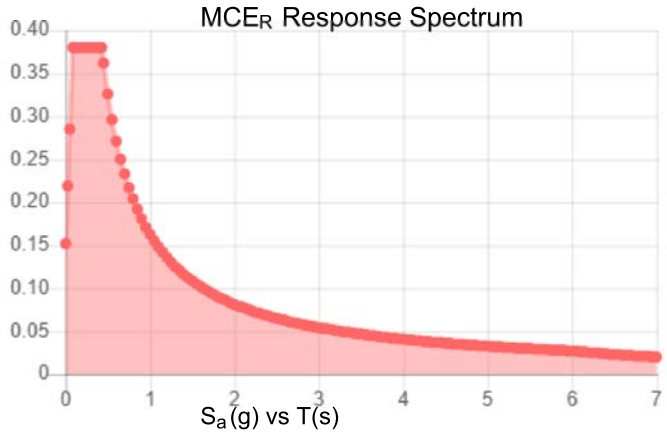
Seismic

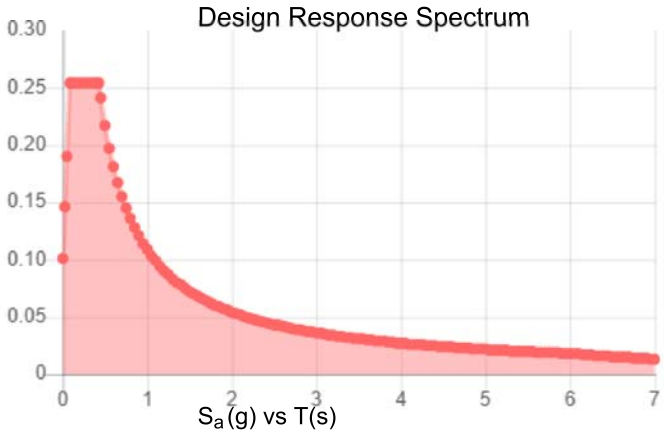
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.238	S_{DS} :	0.254
S_1 :	0.068	S_{D1} :	0.109
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.136
S_{MS} :	0.38	PGA_M :	0.208
S_{M1} :	0.163	F_{PGA} :	1.528
		I_e :	1

Seismic Design Category B





Data Accessed: Thu Jun 27 2019

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Thu Jun 27 2019

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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Fullerton Engineering Consultants, Inc.
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Schaumburg, IL 60173
Tel: 847.908.8400
www.fullertonengineering.com

December 5, 2018

RE:	**AT&T LTE 4C/5C/6C/7C/ RRH ADD**
Prepared For:	Smartlink / AT&T
Site Number:	CTL02108
FA Location:	10034974
Pace Number:	MRCTB025283/MRCTB025338/MRCTB025304/ MRCTB026716/MRCTB017068
Site Name:	NORWALK WEST-CT AVE.
Site Address:	613 Connecticut Avenue Norwalk, CT 06850

To Whom It May Concern,

This structural assessment is in regards to the adequacy of the existing low profile platform with handrails for the AT&T LTE 4C/5C/6C/7C/RRH ADD project. The purpose was to determine conformance of the existing antenna mounting structure under the 2016 Connecticut State Building Code and the industry standard ANSI/TIA-222-G (Structural Standards for Steel Antenna Towers and Antenna Supporting Structures). The antenna and the equipment supports were rated to the code requirement of 121 mph ultimate design wind speed, 110 mph (3-second gust) basic wind speed, and an ice thickness of 0.75in. In addition, the mount has been analyzed for various live loading conditions consisting of a 250-pound man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at mount pipe locations using a 3-second gust wind speed of 30 mph.

Based on collected information via a site visit dated 10/22/2018, technical data of the proposed equipment, structural calculations and engineering judgment, the existing low-profile platform with handrails is **adequate** to support the proposed installation for the above-referenced program. For installation details, see latest construction drawings prepared by Fullerton Engineering.

This PE certification completed by Fullerton Engineering Consultants 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 existing 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.

Respectfully,

Henry M. Bellagamba, P.E.

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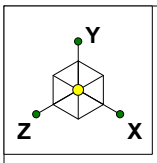
Fullerton Engineering Consultants, Inc.
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
Tel: 847.908.8400
www.fullertonengineering.com

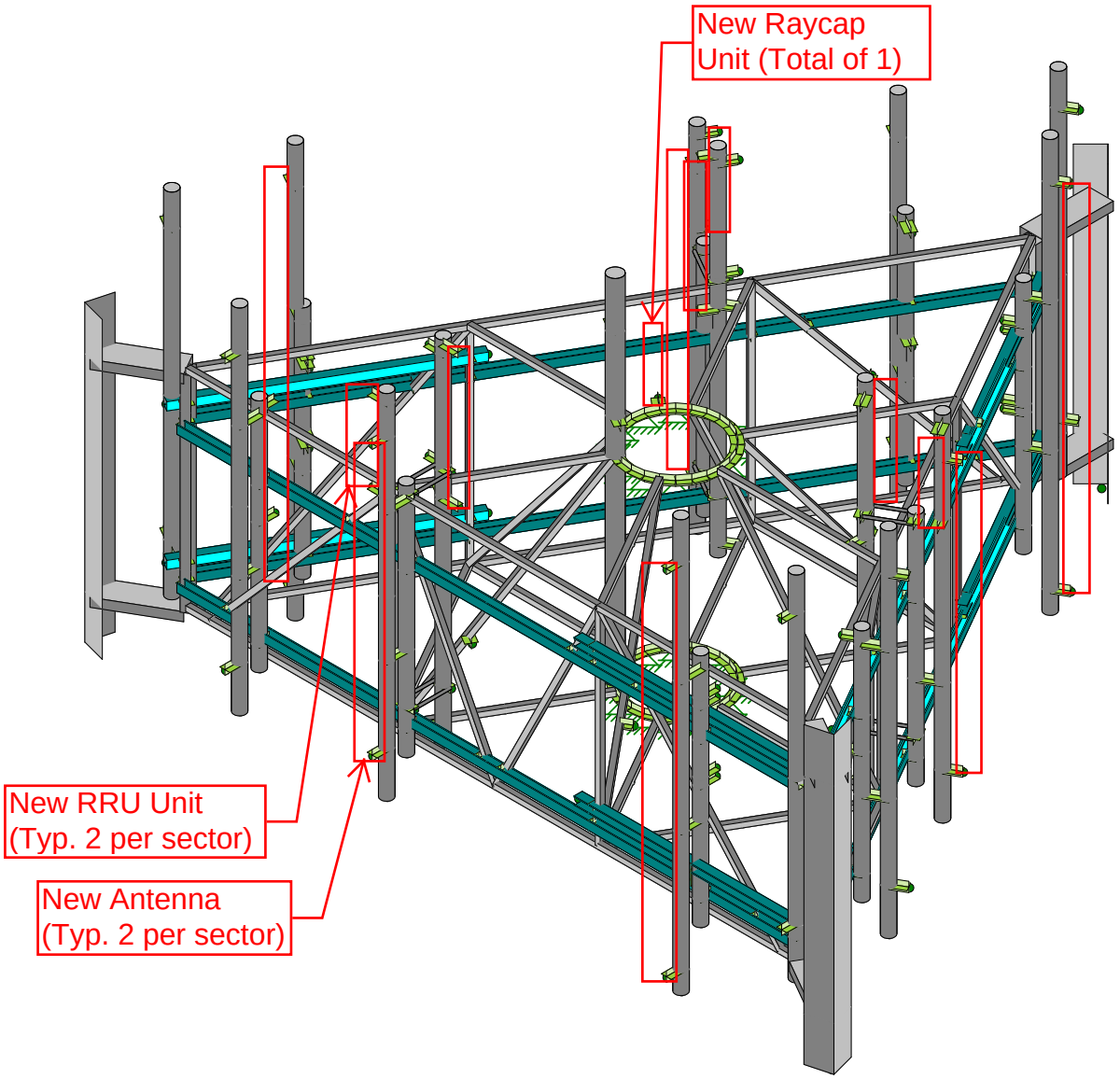
Site Number: **CTL02108**
Site Name: Norwalk West-Ct Ave.
Created By: RH
Checked By: BK
Date: 12/5/2018
Code: ANSI/TIA-222-G

Sectors	3
Ka	0.9

Base Structure Type	**Type**	Monopole	
Structure Height Above Grade (ft)	**Ht**	150.00	
RAD Center (ft)	**z**	135.00	
Windspeed no ice (mph, 3-sec gust)	**V**	110.00	see wind maps
Windspeed with ice (mph, 3-sec gust)	**Vi**	50.00	see wind maps
Windspeed for maintenance (mph, 3-sec gust)	**Vm**	30.00	Section 16.6
Ice Thickness	**ti**	0.75	see ice maps
Exposure Category (B/C/D)	**Exposure**	B	Section 2.6.5.1
Topographic Category (1,2,3,4)	**Topo**	1	Section 2.6.6.2
Structure Class (I,II,III)	**Class**	II	Table 2-1
Crest Height (or assume 5ft)	**C**	5.00	Section 2.6.6.4
Gust Effect Factor	**Gh**	0.85	Section 2.6.7.1
Design Ice Thickness	**tiz**	1.73	Section 2.6.8
Velocity Pressure for Maintenance	**qzm**	2.12	
Velocity Pressure With Ice	**qzi**	6.55	Section 2.6.9.6
Velocity Pressure No Ice	**qz**	31.68	Section 2.6.9.6

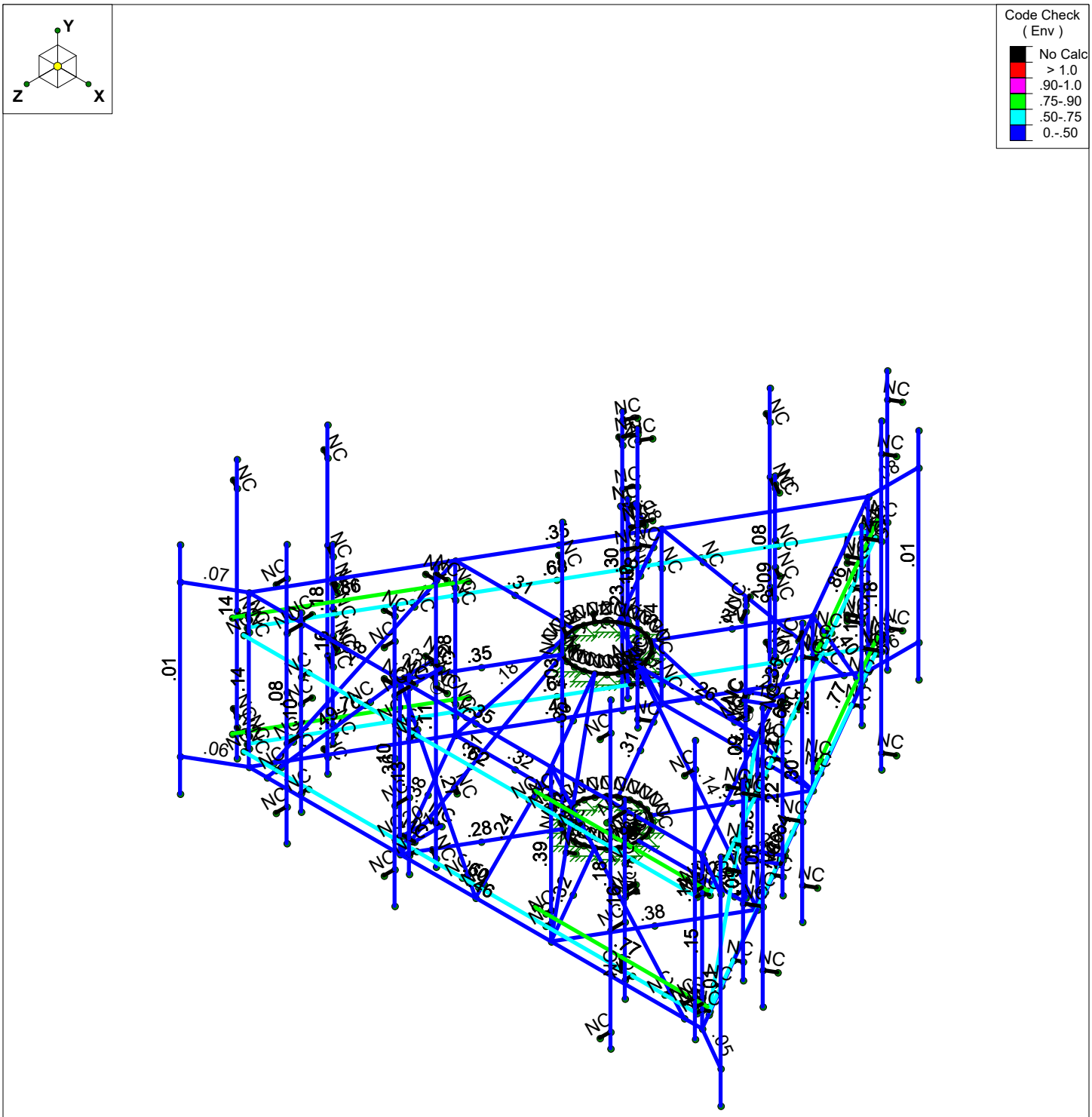
Appurtenance Properties								Loads (force per connection)							
Manufacturer	**Model**	**R/F**	**L**	**W**	**D**	**Weight**	**# Conn**	**Wt**	**Ice Wt**	**F no ice**	**S no ice**	**F ice**	**S ice**	**Fm**	**Sm**
Quintel	66512-2	Flat	72	12	9.6	111	2	55.5	85.7	99	82	26	23	7	6
Commscope	SBNHH-1D65A	Flat	55	11.9	7.1	43.5	2	21.8	53.8	71	47	20	14	5	3
Powerwave	7770	Flat	55	11	5	39	2	19.5	43.0	67	35	19	12	4	2
Ericsson	RRUS 32 B2	Flat	27.2	12.1	7	53	2	26.5	28.9	33	20	10	7	2	1
Ericsson	RRUS 4478 B14	Flat	16.5	13.4	7.7	59.5	2	29.8	22.5	22	13	7	5	1	1
Ericsson	RRUS-11	Flat	19.7	17	7.2	50	2	25.0	26.0	34	14	10	5	2	1
Ericsson	RRUS 32	Flat	27.2	12.1	7	60	2	30.0	28.9	33	20	10	7	2	1
Powerwave	LGP-21401	Flat	14.4	9.2	2.6	14.1	2	7.1	10.0	13	4	5	2	1	0
Raycap	DC6-48-60-18-8F	Round	24	9.7	9.7	32.8	1	32.8	63.9	27	27	9	9	2	2
						520.5									
	HSS1x1x8	Flat	126	1	1	0	10.5	0.0	6.6	4	4	4	4	0	0
	C3x6	Flat	42	3	1.6	0	3.500	0.0	10.8	10	6	4	3	1	1
	C5x6.7	Flat	14	5	1.8	0	1.167	0.0	14.9	12	5	5	3	1	1
	L5x5x5	Flat	60	5	5	0	5	0.0	18.6	16	16	5	5	1	1
	Unistrut	Flat	126	1.6	1.6	0	10.5	0.0	8.4	6	6	4	4	0	0
	Pipe 2.0	Round	72	2.4	2.4	0	6	0.0	8.7	6	6	2	2	0	0
	Pipe 2.0	Round	96	2.4	2.4	0	8	0.0	8.7	6	6	3	3	0	0
	Pipe 2.5	Round	96	2.9	2.9	0	8	0.0	9.8	7	7	3	3	0	0





Envelope Only Solution

Fullerton Engineering Con...		SK - 1
RH	Mount Analysis	Dec 5, 2018 at 6:12 PM
CTL02108	3D Render	CTL02108 - Mount Analysis - Con...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

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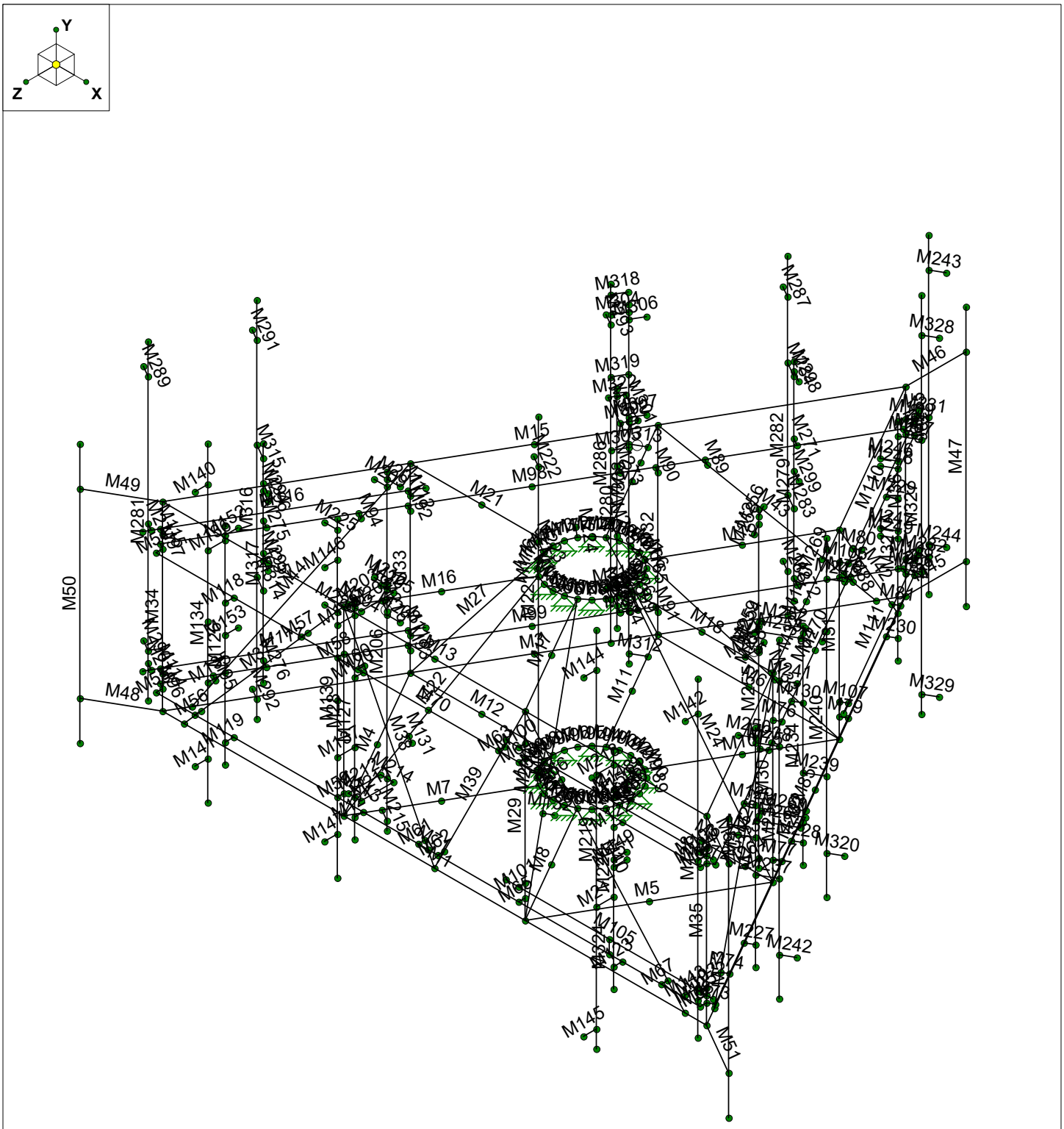
CTL02108	Unity Graphic	CTL02108 - Mount Analysis - Con...



Envelope Only Solution

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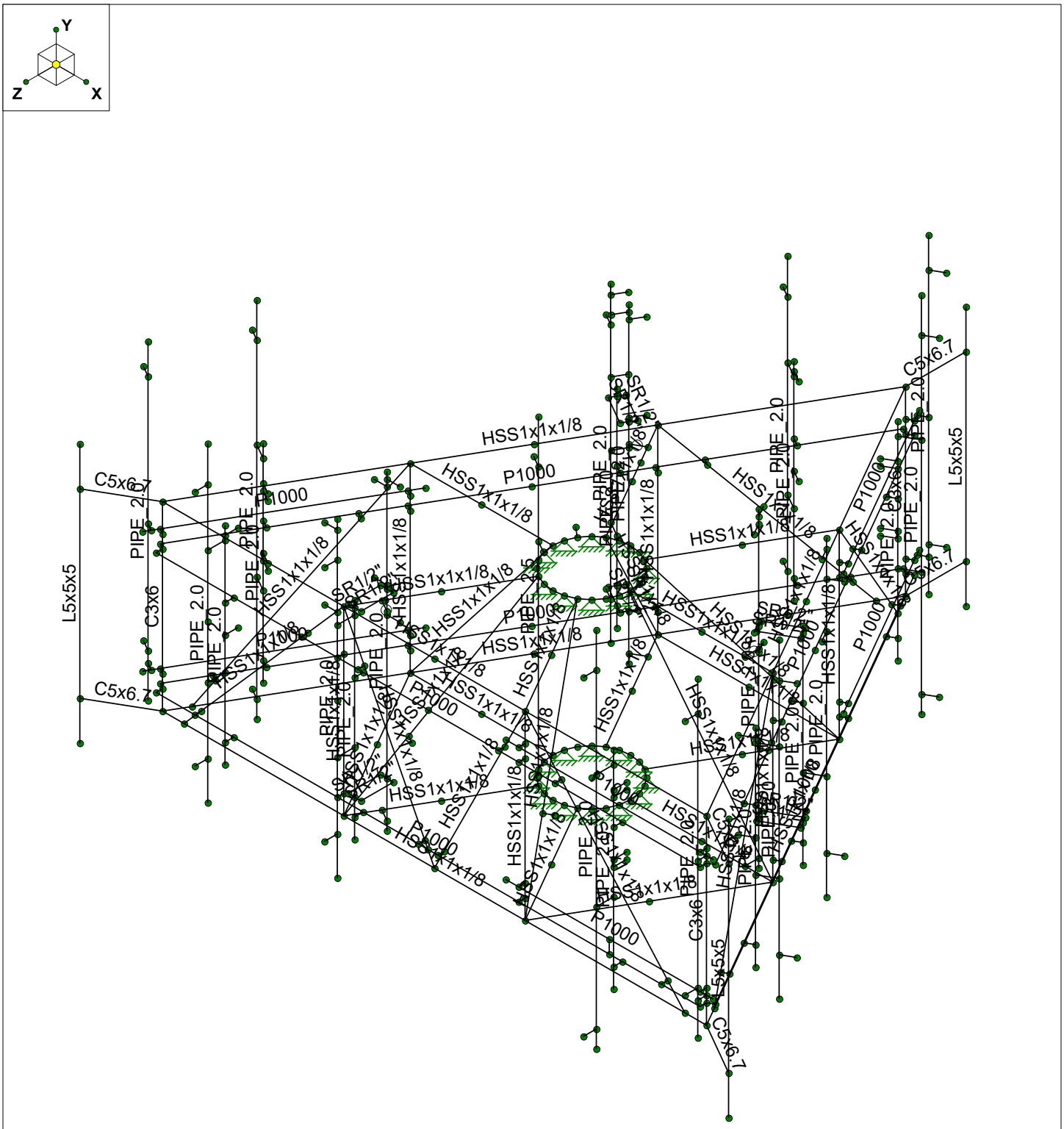

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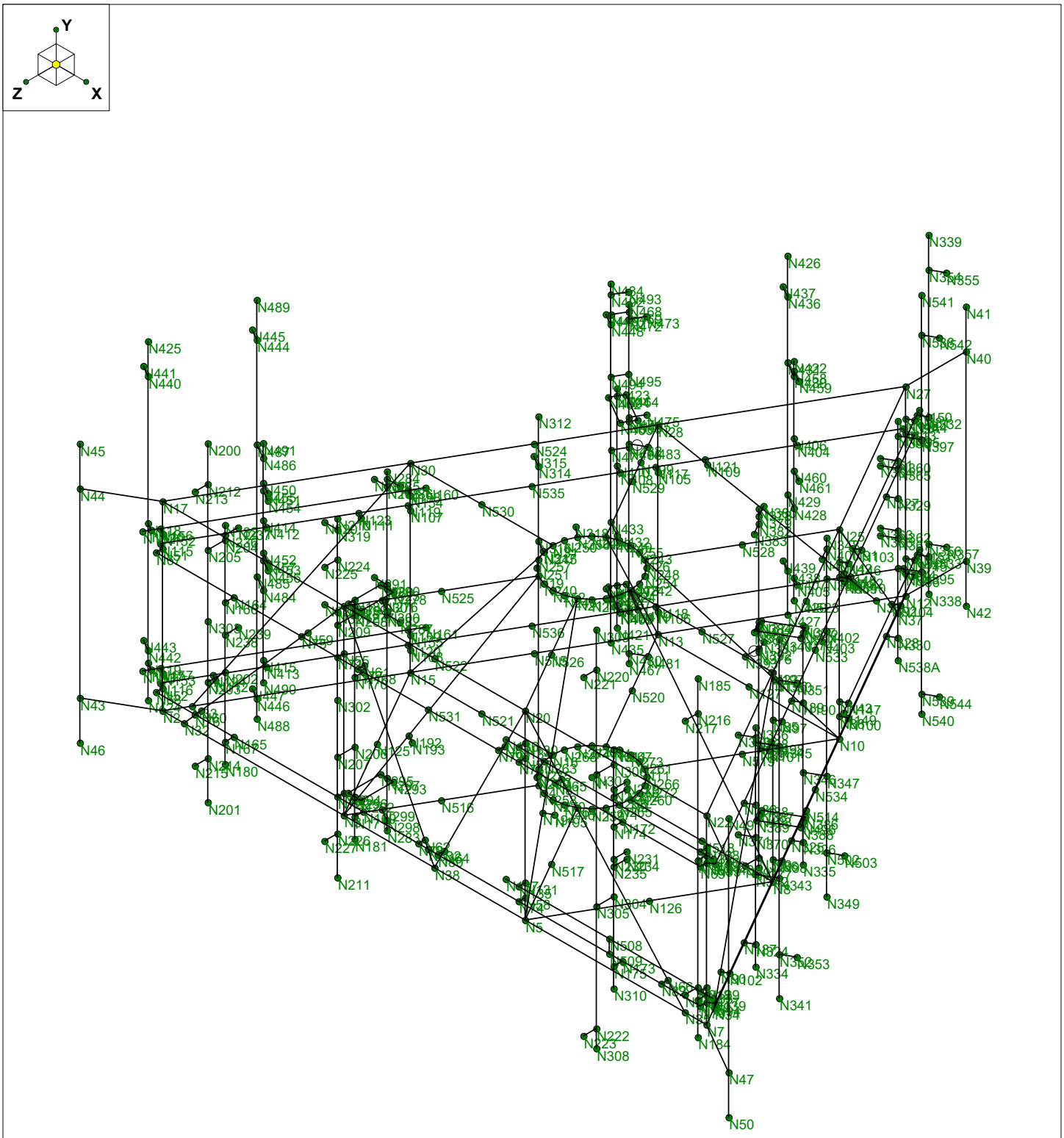

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Fullerton Engineering Con...		SK - 5
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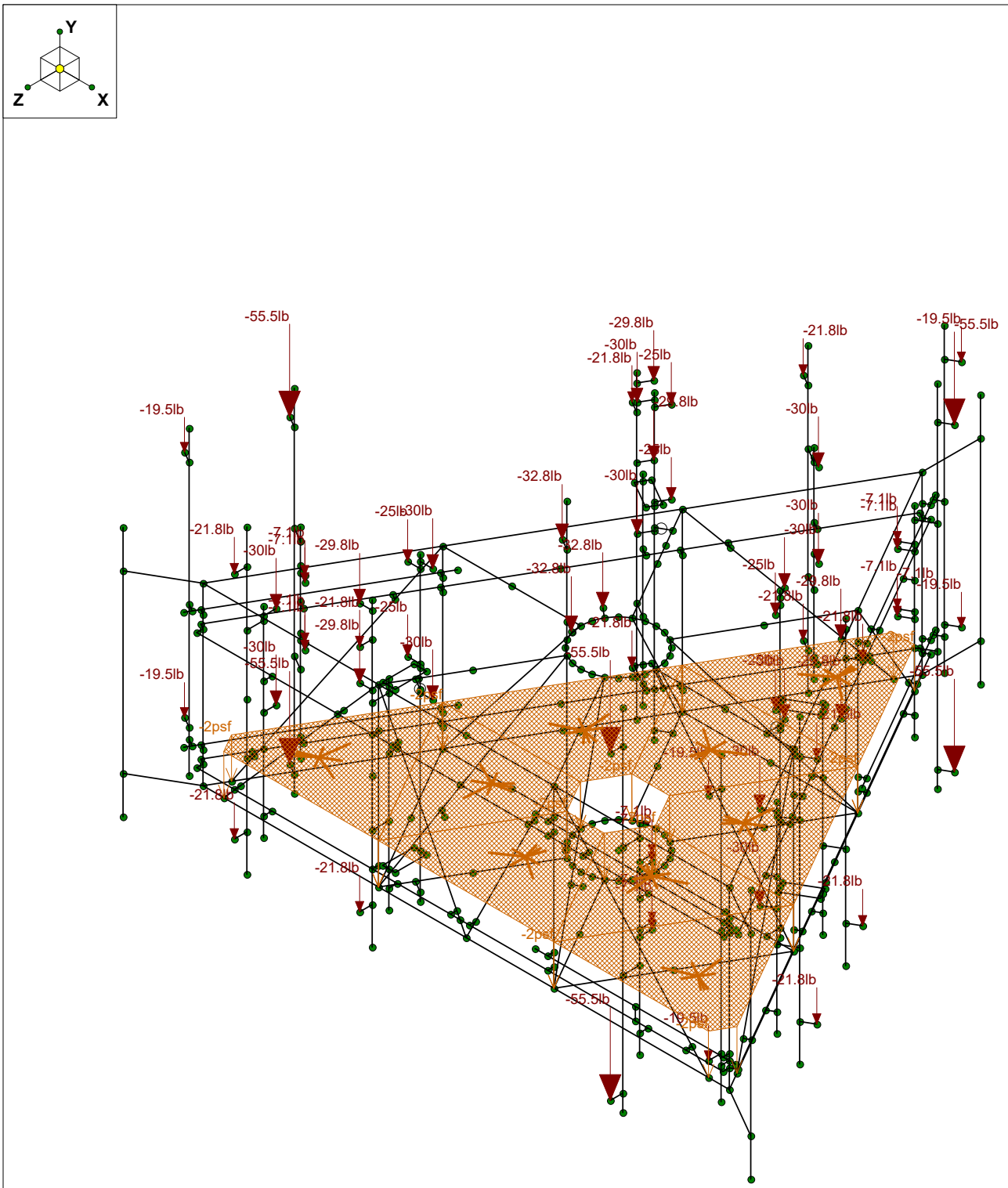
CTL02108	Nodes	CTL02108 - Mount Analysis - Con...



Loads: BLC 1, DL
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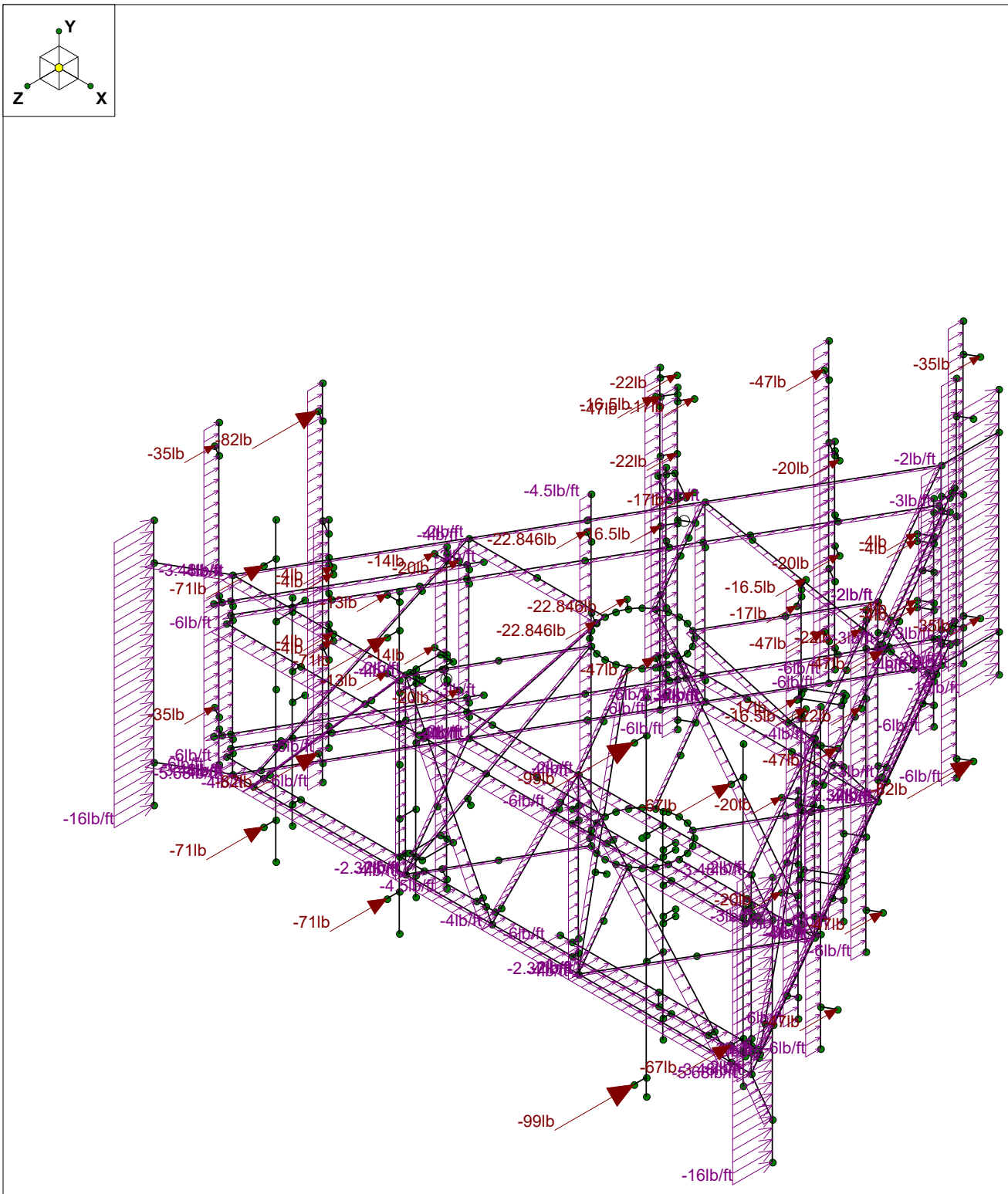
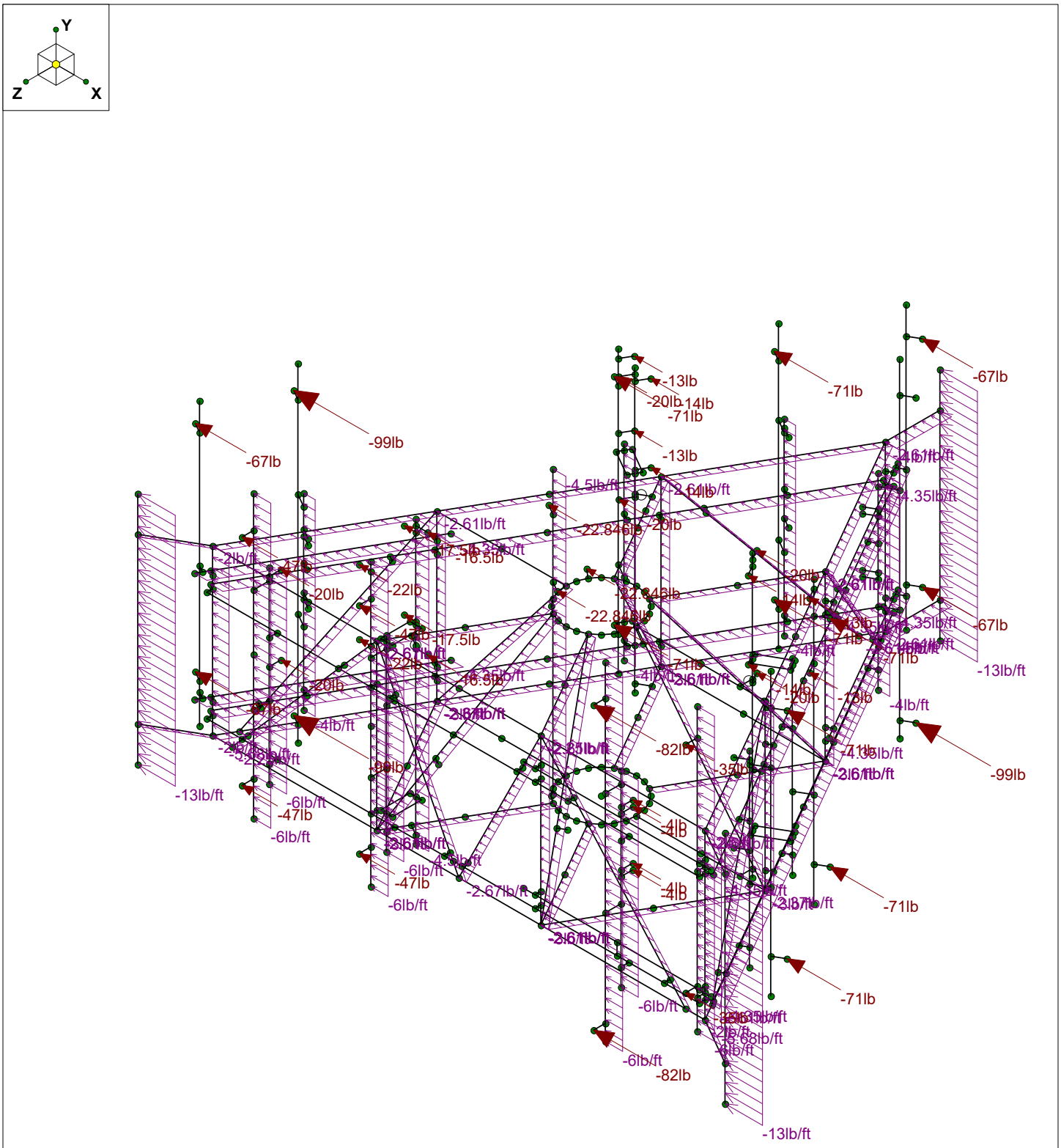
Fullerton Engineering Con...		SK - 6
RH	Mount Analysis	Dec 5, 2018 at 6:17 PM
CTL02108	Dead Load	CTL02108 - Mount Analysis - Con...



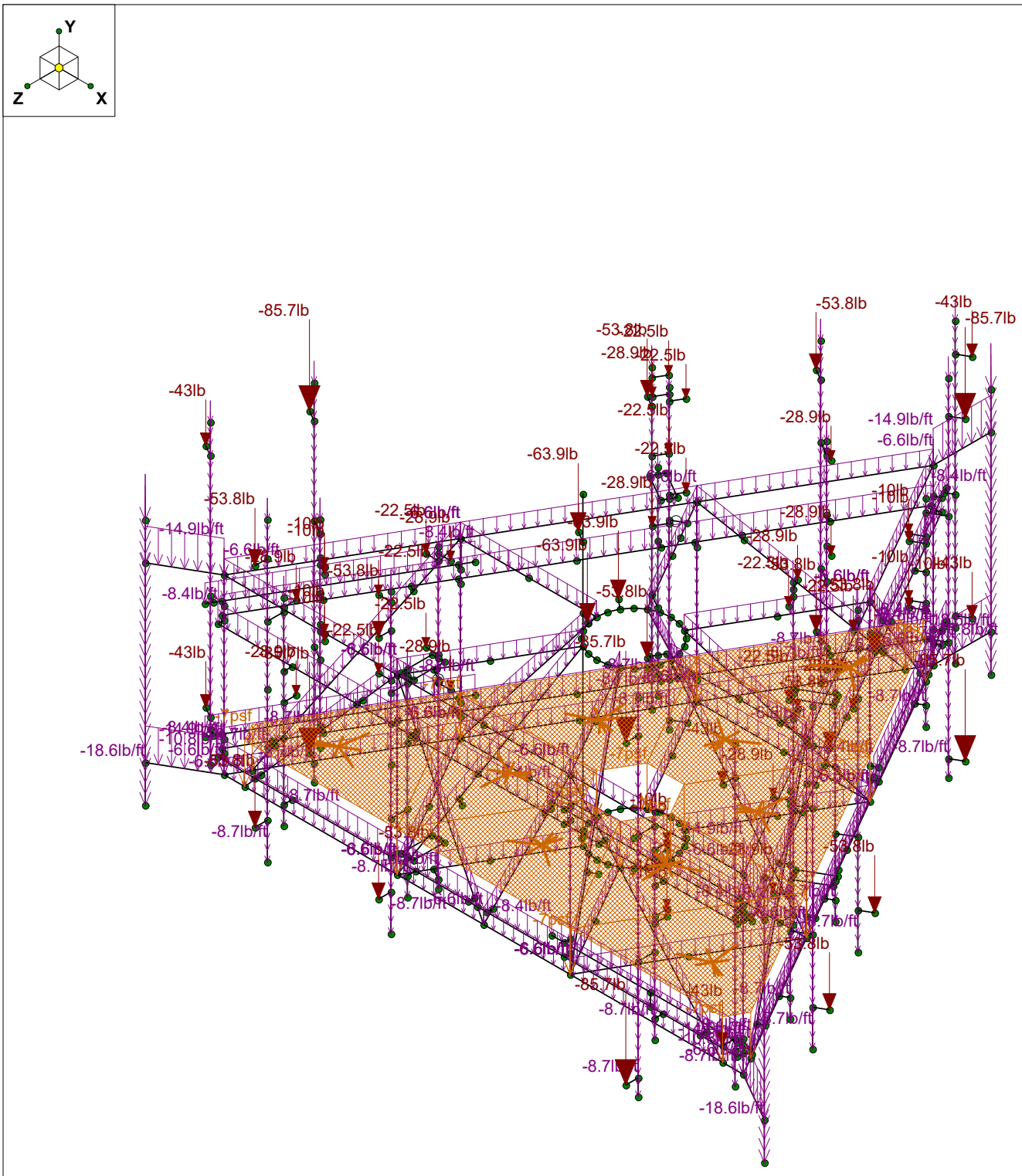
Loads: BLC 3, WL(0)
Envelope Only Solution

Fullerton Engineering Con...		SK - 7
RH	Mount Analysis	Dec 5, 2018 at 6:18 PM
CTL02108	Wind Load (Z-Direction)	CTL02108 - Mount Analysis - Con...



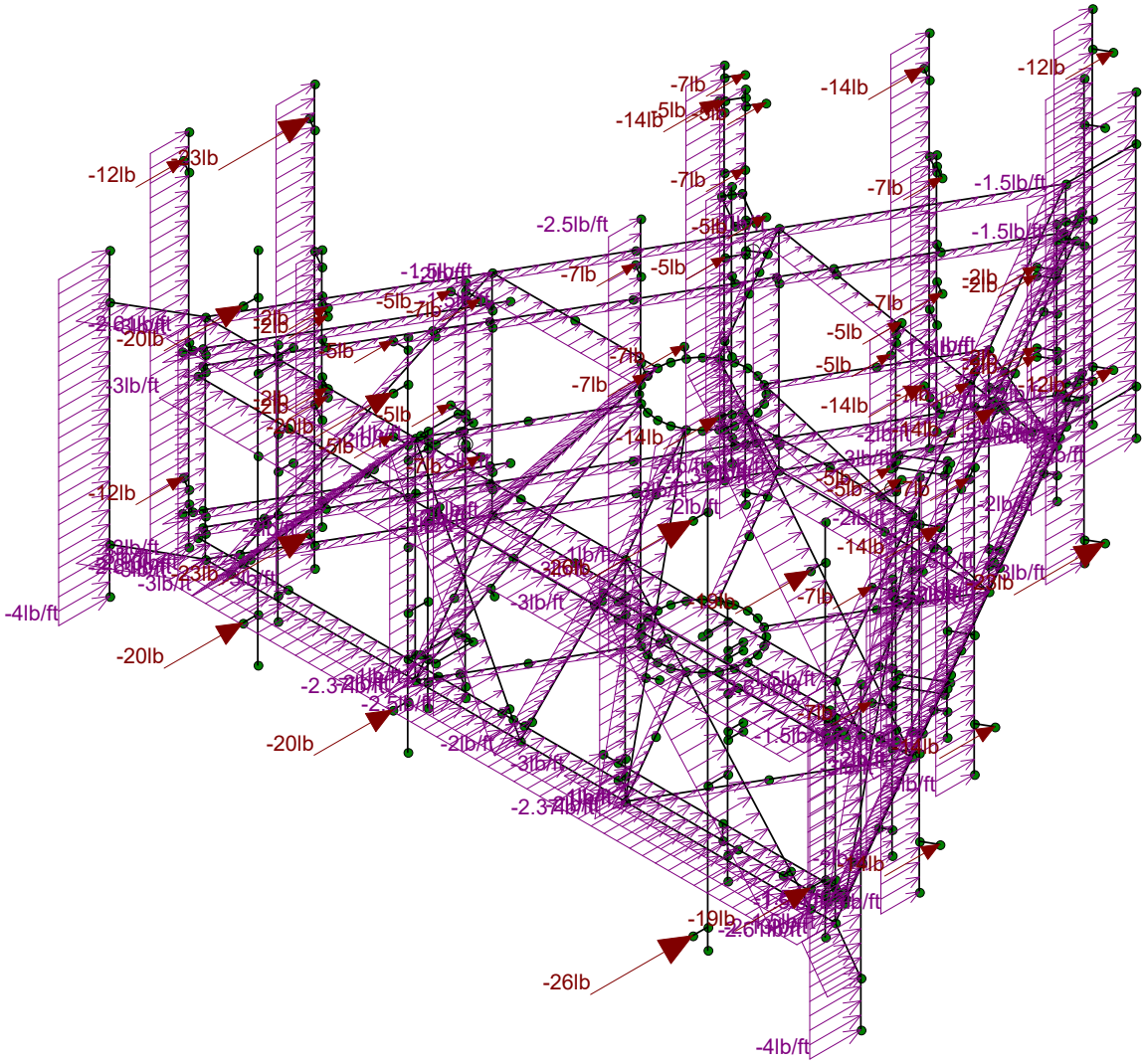
Loads: BLC 4, WL(90)
Envelope Only Solution

Fullerton Engineering Con...		SK - 8
RH	Mount Analysis	Dec 5, 2018 at 6:18 PM
CTL02108	Wind Load (X-Direction)	CTL02108 - Mount Analysis - Con...



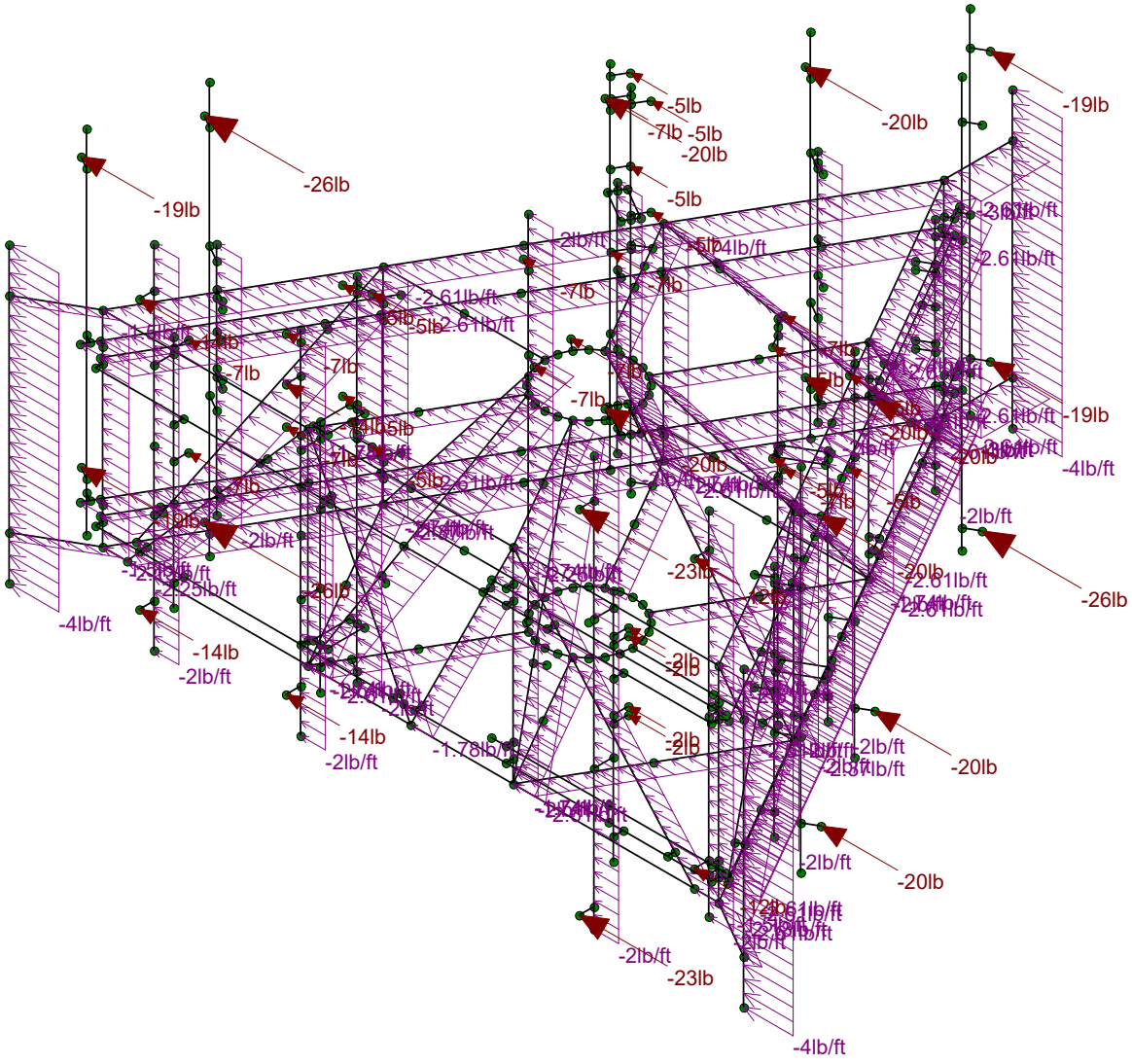
Loads: BLC 2, DLi
Envelope Only Solution

Fullerton Engineering Con...		SK - 9
RH	Mount Analysis	Dec 5, 2018 at 6:19 PM
CTL02108	Ice Load	CTL02108 - Mount Analysis - Con...



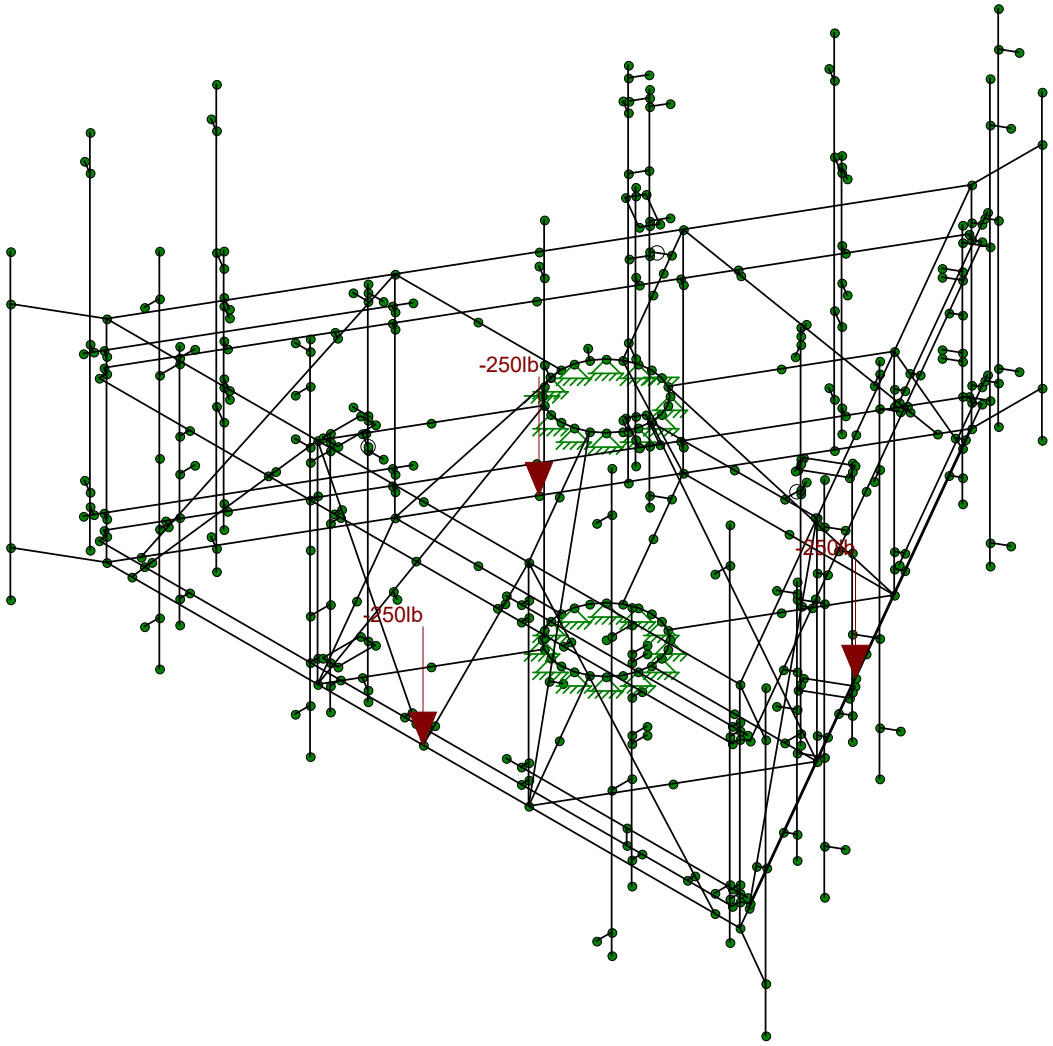
Loads: BLC 5, WL.i(0)
Envelope Only Solution

Fullerton Engineering Con...		SK - 10
RH	Mount Analysis	Dec 5, 2018 at 6:21 PM
CTL02108	Wind Load with Ice (Z-Direction)	CTL02108 - Mount Analysis - Con...



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

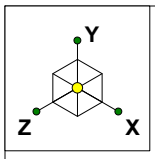
Fullerton Engineering Con...		SK - 11
RH	Mount Analysis	Dec 5, 2018 at 6:22 PM
CTL02108	Wind Load with Ice (X-Direction)	CTL02108 - Mount Analysis - Con...

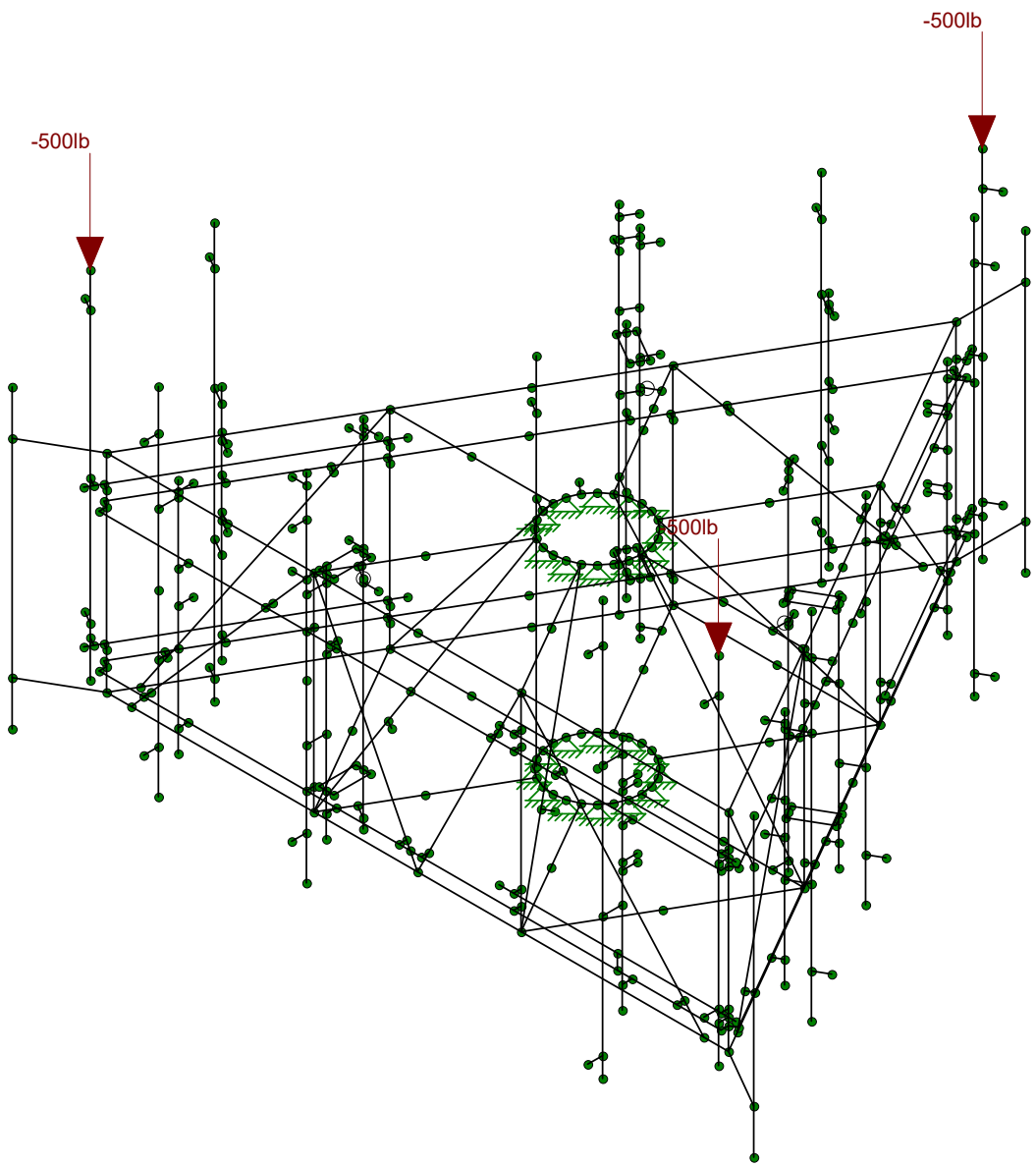


250 lb Live Loads are applied on each face horizontal and standoff members.
Only one is shown for clarification purposes but all are considered in the calculations.

Loads: BLC 10, LV1
Envelope Only Solution

Fullerton Engineering Con...		SK - 12
RH	Mount Analysis	Dec 5, 2018 at 6:22 PM
CTL02108	250 lb Live Load	CTL02108 - Mount Analysis - Con...





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

Loads: BLC 12, LM1
Envelope Only Solution

Fullerton Engineering Con...		SK - 13
RH	Mount Analysis	Dec 5, 2018 at 6:23 PM
CTL02108	500 lb Live Load	CTL02108 - Mount Analysis - Con...

(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)	12
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 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): LRFD
Cold Formed Steel Code	AISI S100-12: LRFD
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building

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

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(M...	Surface...
1	DL	None		-1		63			9	
2	DLi	None				63		89	9	
3	WL(0)	None				56		81		
4	WL(90)	None				50		66		
5	WL.i(0)	None				56		81		
6	WL.i(90)	None				50		67		
7	T	None								
8	WM(0)	None				45		51		
9	WM(90)	None				43		45		
10	LV1	None				3				
11	LV2	None				3				
12	LM1	None				3				
13	LM2	None				3				
14	LM3	None				3				
15	LM4	None				3				
16	LM5	None				3				
17	LM6	None				3				
18	LM7	None				3				
19	LM8	None				1				
20	LV3	None				3				
21	LV4	None				3				
22	LV5	None				3				
23	LV6	None				6				
24	LV7	None				3				
25	LV8	None								
26	BLC 1 Transient Area Loads	None						153		
27	BLC 2 Transient Area Loads	None						153		

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2*DL + 1.6 * WL(0)	Yes	Y		1	1.2	3	1.6																
2	1.2*DL + 1.6* WL(30)	Yes	Y		1	1.2	3	1.39	4	.8														
3	1.2*DL + 1.6* WL(60)	Yes	Y		1	1.2	3	.8	4	1.39														
4	1.2*DL + 1.6*WL(90)	Yes	Y		1	1.2	4	1.6																
5	1.2*DL + 1.6*WL(120)	Yes	Y		1	1.2	3	-.8	4	1.39														
6	1.2*DL +1.6*WL(150)	Yes	Y		1	1.2	3	-1.39	4	.8														
7	1.2*DL + 1.6 * WL(180)	Yes	Y		1	1.2	3	-1.6																
8	1.2*DL + 1.6* WL(210)	Yes	Y		1	1.2	3	-1.39	4	-.8														
9	1.2*DL + 1.6* WL(240)	Yes	Y		1	1.2	3	-.8	4	-1.39														
10	1.2*DL + 1.6*WL(270)	Yes	Y		1	1.2	4	-1.6																
11	1.2*DL + 1.6*WL(300)	Yes	Y		1	1.2	3	.8	4	-1.39														
12	1.2*DL +1.6*WL(330)	Yes	Y		1	1.2	3	1.39	4	-.8														
13	1.2*DL+1.0*DLi+1.0*WL.i(0)+1.0*T	Yes	Y		1	1.2	2	1	5	1	7	1												
14	1.2*DL+1.0*DLi+1.0*WL.i(30)+1.0...	Yes	Y		1	1.2	2	1	5	.866	6	.5	7											
15	1.2*DL+1.0*DLi+1.0*WL.i(60)+1.0...	Yes	Y		1	1.2	2	1	5	.5	6	.866	7											
16	1.2*DL+1.0*DLi+1.0*WL.i(90)+1.0...	Yes	Y		1	1.2	2	1	6	1	7	1												
17	1.2*DL+1.0*DLi+1.0*WL.i(120)+1....	Yes	Y		1	1.2	2	1	5	-.5	6	.866	7											
18	1.2*DL+1.0*DLi+1.0*WL.i(150)+1....	Yes	Y		1	1.2	2	1	5	-.866	6	.5	7											
19	1.2*DL+1.0*DLi+1.0*WL.i(180)+1....	Yes	Y		1	1.2	2	1	5	-1	7	1												
20	1.2*DL+1.0*DLi+1.0*WL.i(210)+1....	Yes	Y		1	1.2	2	1	5	-.866	6	-.5	7											
21	1.2*DL+1.0*DLi+1.0*WL.i(240)+1....	Yes	Y		1	1.2	2	1	5	-.5	6	-.866	7											
22	1.2*DL+1.0*DLi+1.0*WL.i(270)+1....	Yes	Y		1	1.2	2	1	6	-1	7	1												
23	1.2*DL+1.0*DLi+1.0*WL.i(300)+1....	Yes	Y		1	1.2	2	1	5	.5	6	-.866	7											
24	1.2*DL+1.0*DLi+1.0*WL.i(330)+1....	Yes	Y		1	1.2	2	1	5	.866	6	-.5	7											
25	0.9*DL+1.6*WL(0)	Yes	Y		1	.9	3	1.6																
26	0.9*DL+1.6*WL(30)	Yes	Y		1	.9	3	1.39	4	.8														
27	0.9*DL+1.6*WL(60)	Yes	Y		1	.9	3	.8	4	1.39														
28	0.9*DL+1.6*WL(90)	Yes	Y		1	.9	4	1.6																
29	0.9*DL+1.6*WL(120)	Yes	Y		1	.9	3	-.8	4	1.39														
30	0.9*DL+1.6*WL(150)	Yes	Y		1	.9	3	-1.39	4	.8														
31	0.9*DL+1.6*WL(180)	Yes	Y		1	.9	3	-1.6																
32	0.9*DL+1.6*WL(210)	Yes	Y		1	.9	3	-1.39	4	-.8														
33	0.9*DL+1.6*WL(240)	Yes	Y		1	.9	3	-.8	4	-1.39														
34	0.9*DL+1.6*WL(270)	Yes	Y		1	.9	4	-1.6																
35	0.9*DL+1.6*WL(300)	Yes	Y		1	.9	3	.8	4	-1.39														
36	0.9*DL+1.6*WL(330)	Yes	Y		1	.9	3	1.39	4	-.8														
37	1.2*DL+1.5*LV1	Yes	Y		1	1.2	10	1.5																
38	1.2*DL+1.5*LV2	Yes	Y		1	1.2	11	1.5																
39	1.2*DL+1.5*LM1+1.0*WM(0)	Yes	Y		1	1.2	12	1.5	8	1														
40	1.2*DL+1.5*LM1+1.0*WM(30)	Yes	Y		1	1.2	12	1.5	8	.866	9	.5												
41	1.2*DL+1.5*LM1+1.0*WM(60)	Yes	Y		1	1.2	12	1.5	8	.5	9	.866												
42	1.2*DL+1.5*LM1+1.0*WM(90)	Yes	Y		1	1.2	12	1.5	9	1														
43	1.2*DL+1.5*LM1+1.0*WM(120)	Yes	Y		1	1.2	12	1.5	8	-.5	9	.866												
44	1.2*DL+1.5*LM1+1.0*WM(150)	Yes	Y		1	1.2	12	1.5	8	-.866	9	.5												
45	1.2*DL+1.5*LM1+1.0*WM(180)	Yes	Y		1	1.2	12	1.5	8	-1														
46	1.2*DL+1.5*LM1+1.0*WM(210)	Yes	Y		1	1.2	12	1.5	8	-.866	9	-.5												
47	1.2*DL+1.5*LM1+1.0*WM(240)	Yes	Y		1	1.2	12	1.5	8	-.5	9	-.866												
48	1.2*DL+1.5*LM1+1.0*WM(270)	Yes	Y		1	1.2	12	1.5	9	-1														
49	1.2*DL+1.5*LM1+1.0*WM(300)	Yes	Y		1	1.2	12	1.5	8	.5	9	-.866												
50	1.2*DL+1.5*LM1+1.0*WM(330)	Yes	Y		1	1.2	12	1.5	8	.866	9	-.5												
51	1.2*DL+1.5*LM2+1.0*WM(0)	Yes	Y		1	1.2	13	1.5	8	1														
52	1.2*DL+1.5*LM2+1.0*WM(30)	Yes	Y		1	1.2	13	1.5	8	.866	9	.5												
53	1.2*DL+1.5*LM2+1.0*WM(60)	Yes	Y		1	1.2	13	1.5	8	.5	9	.866												
54	1.2*DL+1.5*LM2+1.0*WM(90)	Yes	Y		1	1.2	13	1.5	9	1														
55	1.2*DL+1.5*LM2+1.0*WM(120)	Yes	Y		1	1.2	13	1.5	8	-.5	9	.866												
56	1.2*DL+1.5*LM2+1.0*WM(150)	Yes	Y		1	1.2	13	1.5	8	-.866	9	.5												

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
57	1.2*DL+1.5*LM2+1.0*WM(180)	Yes	Y		1	1.2	13	1.5	8	-1														
58	1.2*DL+1.5*LM2+1.0*WM(210)	Yes	Y		1	1.2	13	1.5	8	-.866	9	-.5												
59	1.2*DL+1.5*LM2+1.0*WM(240)	Yes	Y		1	1.2	13	1.5	8	-.5	9	-.866												
60	1.2*DL+1.5*LM2+1.0*WM(270)	Yes	Y		1	1.2	13	1.5	9	-1														
61	1.2*DL+1.5*LM2+1.0*WM(300)	Yes	Y		1	1.2	13	1.5	8	.5	9	-.866												
62	1.2*DL+1.5*LM2+1.0*WM(330)	Yes	Y		1	1.2	13	1.5	8	.866	9	-.5												
63	1.2*DL+1.5*LM3+1.0*WM(0)	Yes	Y		1	1.2	14	1.5	8	1														
64	1.2*DL+1.5*LM3+1.0*WM(30)	Yes	Y		1	1.2	14	1.5	8	.866	9	.5												
65	1.2*DL+1.5*LM3+1.0*WM(60)	Yes	Y		1	1.2	14	1.5	8	.5	9	.866												
66	1.2*DL+1.5*LM3+1.0*WM(90)	Yes	Y		1	1.2	14	1.5	9	1														
67	1.2*DL+1.5*LM3+1.0*WM(120)	Yes	Y		1	1.2	14	1.5	8	-.5	9	.866												
68	1.2*DL+1.5*LM3+1.0*WM(150)	Yes	Y		1	1.2	14	1.5	8	-.866	9	.5												
69	1.2*DL+1.5*LM3+1.0*WM(180)	Yes	Y		1	1.2	14	1.5	8	-1														
70	1.2*DL+1.5*LM3+1.0*WM(210)	Yes	Y		1	1.2	14	1.5	8	-.866	9	-.5												
71	1.2*DL+1.5*LM3+1.0*WM(240)	Yes	Y		1	1.2	14	1.5	8	-.5	9	-.866												
72	1.2*DL+1.5*LM3+1.0*WM(270)	Yes	Y		1	1.2	14	1.5	9	-1														
73	1.2*DL+1.5*LM3+1.0*WM(300)	Yes	Y		1	1.2	14	1.5	8	.5	9	-.866												
74	1.2*DL+1.5*LM3+1.0*WM(330)	Yes	Y		1	1.2	14	1.5	8	.866	9	-.5												
75	1.2*DL+1.5*LM4+1.0*WM(0)	Yes	Y		1	1.2	15	1.5	8	1														
76	1.2*DL+1.5*LM4+1.0*WM(30)	Yes	Y		1	1.2	15	1.5	8	.866	9	.5												
77	1.2*DL+1.5*LM4+1.0*WM(60)	Yes	Y		1	1.2	15	1.5	8	.5	9	.866												
78	1.2*DL+1.5*LM4+1.0*WM(90)	Yes	Y		1	1.2	15	1.5	9	1														
79	1.2*DL+1.5*LM4+1.0*WM(120)	Yes	Y		1	1.2	15	1.5	8	-.5	9	.866												
80	1.2*DL+1.5*LM4+1.0*WM(150)	Yes	Y		1	1.2	15	1.5	8	-.866	9	.5												
81	1.2*DL+1.5*LM4+1.0*WM(180)	Yes	Y		1	1.2	15	1.5	8	-1														
82	1.2*DL+1.5*LM4+1.0*WM(210)	Yes	Y		1	1.2	15	1.5	8	-.866	9	-.5												
83	1.2*DL+1.5*LM4+1.0*WM(240)	Yes	Y		1	1.2	15	1.5	8	-.5	9	-.866												
84	1.2*DL+1.5*LM4+1.0*WM(270)	Yes	Y		1	1.2	15	1.5	9	-1														
85	1.2*DL+1.5*LM4+1.0*WM(300)	Yes	Y		1	1.2	15	1.5	8	.5	9	-.866												
86	1.2*DL+1.5*LM4+1.0*WM(330)	Yes	Y		1	1.2	15	1.5	8	.866	9	-.5												
87	1.2*DL+1.5*LM5+1.0*WM(0)	Yes	Y		1	1.2	16	1.5	8	1														
88	1.2*DL+1.5*LM5+1.0*WM(30)	Yes	Y		1	1.2	16	1.5	8	.866	9	.5												
89	1.2*DL+1.5*LM5+1.0*WM(60)	Yes	Y		1	1.2	16	1.5	8	.5	9	.866												
90	1.2*DL+1.5*LM5+1.0*WM(90)	Yes	Y		1	1.2	16	1.5	9	1														
91	1.2*DL+1.5*LM5+1.0*WM(120)	Yes	Y		1	1.2	16	1.5	8	-.5	9	.866												
92	1.2*DL+1.5*LM5+1.0*WM(150)	Yes	Y		1	1.2	16	1.5	8	-.866	9	.5												
93	1.2*DL+1.5*LM5+1.0*WM(180)	Yes	Y		1	1.2	16	1.5	8	-1														
94	1.2*DL+1.5*LM5+1.0*WM(210)	Yes	Y		1	1.2	16	1.5	8	-.866	9	-.5												
95	1.2*DL+1.5*LM5+1.0*WM(240)	Yes	Y		1	1.2	16	1.5	8	-.5	9	-.866												
96	1.2*DL+1.5*LM5+1.0*WM(270)	Yes	Y		1	1.2	16	1.5	9	-1														
97	1.2*DL+1.5*LM5+1.0*WM(300)	Yes	Y		1	1.2	16	1.5	8	.5	9	-.866												
98	1.2*DL+1.5*LM5+1.0*WM(330)	Yes	Y		1	1.2	16	1.5	8	.5	9	-.866												
99	1.2*DL+1.5*LM6+1.0*WM(30)	Yes	Y		1	1.2	17	1.5	8	.866	9	.5												
100	1.2*DL+1.5*LM6+1.0*WM(60)	Yes	Y		1	1.2	17	1.5	8	.5	9	.866												
101	1.2*DL+1.5*LM6+1.0*WM(90)	Yes	Y		1	1.2	17	1.5	9	1														
102	1.2*DL+1.5*LM6+1.0*WM(120)	Yes	Y		1	1.2	17	1.5	8	-.5	9	.866												
103	1.2*DL+1.5*LM6+1.0*WM(150)	Yes	Y		1	1.2	17	1.5	8	-.866	9	.5												
104	1.2*DL+1.5*LM6+1.0*WM(180)	Yes	Y		1	1.2	17	1.5	8	-1														
105	1.2*DL+1.5*LM6+1.0*WM(210)	Yes	Y		1	1.2	17	1.5	8	-.866	9	-.5												
106	1.2*DL+1.5*LM6+1.0*WM(240)	Yes	Y		1	1.2	17	1.5	8	-.5	9	-.866												
107	1.2*DL+1.5*LM6+1.0*WM(270)	Yes	Y		1	1.2	17	1.5	9	-1														
108	1.2*DL+1.5*LM6+1.0*WM(300)	Yes	Y		1	1.2	17	1.5	8	.5	9	-.866												
109	1.2*DL+1.5*LM6+1.0*WM(330)	Yes	Y		1	1.2	17	1.5	8	.5	9	-.866												
110	1.2*DL+1.5*LM7+1.0*WM(30)	Yes	Y		1	1.2	18	1.5	8	.866	9	.5												
111	1.2*DL+1.5*LM7+1.0*WM(60)	Yes	Y		1	1.2	18	1.5	8	.5	9	.866												
112	1.2*DL+1.5*LM7+1.0*WM(90)	Yes	Y		1	1.2	18	1.5	9	1														
113	1.2*DL+1.5*LM7+1.0*WM(120)	Yes	Y		1	1.2	18	1.5	8	-.5	9	.866												

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
114	1.2*DL+1.5*LM7+1.0*WM(150)	Yes	Y		1	1.2	18	1.5	8	-.866	9	.5												
115	1.2*DL+1.5*LM7+1.0*WM(180)	Yes	Y		1	1.2	18	1.5	8	-1														
116	1.2*DL+1.5*LM7+1.0*WM(210)	Yes	Y		1	1.2	18	1.5	8	-.866	9	-.5												
117	1.2*DL+1.5*LM7+1.0*WM(240)	Yes	Y		1	1.2	18	1.5	8	-.5	9	-.866												
118	1.2*DL+1.5*LM7+1.0*WM(270)	Yes	Y		1	1.2	18	1.5	9	-1														
119	1.2*DL+1.5*LM7+1.0*WM(300)	Yes	Y		1	1.2	18	1.5	8	.5	9	-.866												
120	1.2*DL+1.5*LM7+1.0*WM(330)	Yes	Y		1	1.2	18	1.5	8	.5	9	-.866												
121	1.2*DL+1.5*LM8+1.0*WM(30)	Yes	Y		1	1.2	19	1.5	8	.866	9	.5												
122	1.2*DL+1.5*LM8+1.0*WM(60)	Yes	Y		1	1.2	19	1.5	8	.5	9	.866												
123	1.2*DL+1.5*LM8+1.0*WM(90)	Yes	Y		1	1.2	19	1.5	9	1														
124	1.2*DL+1.5*LM8+1.0*WM(120)	Yes	Y		1	1.2	19	1.5	8	-.5	9	.866												
125	1.2*DL+1.5*LM8+1.0*WM(150)	Yes	Y		1	1.2	19	1.5	8	-.866	9	.5												
126	1.2*DL+1.5*LM8+1.0*WM(180)	Yes	Y		1	1.2	19	1.5	8	-1														
127	1.2*DL+1.5*LM8+1.0*WM(210)	Yes	Y		1	1.2	19	1.5	8	-.866	9	-.5												
128	1.2*DL+1.5*LM8+1.0*WM(240)	Yes	Y		1	1.2	19	1.5	8	-.5	9	-.866												
129	1.2*DL+1.5*LM8+1.0*WM(270)	Yes	Y		1	1.2	19	1.5	9	-1														
130	1.2*DL+1.5*LM8+1.0*WM(300)	Yes	Y		1	1.2	19	1.5	8	.5	9	-.866												
131	1.2*DL+1.5*LM8+1.0*WM(330)	Yes	Y		1	1.2	19	1.5	8	.5	9	-.866												
132	1.2*DL+1.5*LV3	Yes	Y		1	1.2	20	1.5																
133	1.2*DL+1.5*LV4	Yes	Y		1	1.2	21	1.5																
134	1.2*DL+1.5*LV5	Yes	Y		1	1.2	22	1.5																
135	1.2*DL+1.5*LV6	Yes	Y		1	1.2	23	1.5																
136	1.2*DL+1.5*LV7	Yes	Y		1	1.2	24	1.5																
137	1.2*DL+1.5*LV8	Yes	Y		1	1.2	25	1.5																

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N240	max	912.644	6	1012.194	5	539.537	36	0	1	0	1	0	1
2		min	-579.272	36	-454.728	35	-811.514	6	0	1	0	1	0	1
3	N241	max	218.246	25	1147.02	8	637.028	26	0	1	0	1	0	1
4		min	-257.314	7	-762.785	26	-1000.665	8	0	1	0	1	0	1
5	N242	max	304.947	29	1064.673	13	104.863	29	0	1	0	1	0	1
6		min	-903.556	23	-234.316	30	-311.477	23	0	1	0	1	0	1
7	N243	max	153.189	28	636.275	10	429.102	10	.096	135	.035	30	.136	135
8		min	-517.638	22	-394.869	28	-260.161	28	-.003	34	-.065	12	-.018	28
9	N244	max	215.926	3	1141.179	16	977.404	2	0	1	0	1	0	1
10		min	-115.936	33	-61.653	34	-457.023	32	0	1	0	1	0	1
11	N245	max	733.377	2	891.963	13	193.921	2	0	1	0	1	0	1
12		min	-389.58	32	-392.797	31	-103.358	32	0	1	0	1	0	1
13	N246	max	542.271	26	1054.882	9	494.025	27	0	1	0	1	0	1
14		min	-836.226	8	-670.936	27	-712.64	9	0	1	0	1	0	1
15	N247	max	704.015	30	1073.098	13	324.873	11	0	1	0	1	0	1
16		min	-1191.005	12	-416.425	31	-147.894	29	0	1	0	1	0	1
17	N248	max	48.436	78	521.5	135	585.302	11	0	1	0	1	0	1
18		min	-74.632	60	-237.626	28	-316.031	29	0	1	0	1	0	1
19	N249	max	749.671	15	1176.969	16	755.737	15	0	1	0	1	0	1
20		min	-336.894	33	-121.297	33	-331.742	33	0	1	0	1	0	1
21	N250	max	624.301	15	789.688	13	92.573	33	0	1	0	1	0	1
22		min	-239.158	32	-370.646	31	-278.968	15	0	1	0	1	0	1
23	N251	max	332.432	6	1207.885	5	773.613	36	.071	36	.122	6	.066	18
24		min	-238.997	36	-588.454	35	-1251.242	6	-.142	6	-.077	36	-.017	135
25	N258	max	41.997	28	186.016	38	355.46	22	0	1	0	1	0	1
26		min	-403.253	23	-161.007	132	-91.312	28	0	1	0	1	0	1
27	N259	max	100.066	7	279.254	132	419.186	16	0	1	0	1	0	1
28		min	-85.303	25	-107.688	38	-102.822	34	0	1	0	1	0	1

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
29	N260	max	1147.949	2	190.199	38	230.714	2	0	1	0	1	0	1
30		min	-818.122	32	-160.119	132	-124.92	32	0	1	0	1	0	1
31	N261	max	629.868	7	280.733	132	464.508	26	0	1	0	1	0	1
32		min	-503.823	26	-109.065	38	-531.639	8	0	1	0	1	0	1
33	N262	max	265.853	36	191.517	38	547.112	36	0	1	0	1	0	1
34		min	-341.005	6	-159.998	132	-912.199	6	0	1	0	1	0	1
35	N263	max	885.182	30	281.661	132	234.172	29	0	1	0	1	0	1
36		min	-1037.238	12	-107.193	38	-309.7	11	0	1	0	1	0	1
37	N264	max	327.073	15	271.66	132	311.596	4	0	1	0	1	0	1
38		min	-145.227	34	-108.883	38	-192.443	34	0	1	0	1	0	1
39	N265	max	1087.916	2	193.767	38	205.164	32	0	1	0	1	0	1
40		min	-753.12	32	-159.2	132	-319.859	2	0	1	0	1	0	1
41	N266	max	322.966	32	272.56	132	773.051	25	0	1	0	1	0	1
42		min	-323.41	2	-112.245	38	-921.014	7	0	1	0	1	0	1
43	N267	max	482.75	36	195.295	38	396.262	36	0	1	0	1	0	1
44		min	-766.236	6	-159.636	132	-657.479	6	0	1	0	1	0	1
45	N268	max	918.627	30	272.709	132	232.792	11	0	1	0	1	0	1
46		min	-1078.07	12	-112.063	38	-144.379	29	0	1	0	1	0	1
47	N269	max	72.268	36	191.984	38	578.849	22	0	1	0	1	0	1
48		min	-138.087	6	-160.647	132	12.632	27	0	1	0	1	0	1
49	Totals:	max	5154.786	28	9683.888	18	5854.973	25						
50		min	-5154.788	10	2559.137	36	-5854.981	7						

Envelope AISI S100-12: LRFD Cold Formed Steel Code Checks

	Member	Shape	Code Che...	Loc[in]	LC	Shear Check	Loc[in] ...		LC	phi*Pn[..	phi*T...	phi*M...	phi*M...	Cb	Cm...	Cm...	Eqn
1	M116	P1000	.864	46.5	47	.860	45	y	47	6344.4...	1327...	.442	.515	3.5...	.6	.85	C3.3...
2	M110	P1000	.863	46.5	42	.859	45	y	42	6344.4...	1327...	.442	.515	3.3...	.6	.85	C3.3...
3	M104	P1000	.859	46.5	50	.856	45	y	50	6344.4...	1327...	.442	.515	3.4...	.6	.85	C3.3...
4	M105	P1000	.771	46.5	45	.765	45	y	45	6344.4...	1327...	.442	.515	3.0...	.6	.85	C3.3...
5	M111	P1000	.765	46.5	48	.757	45	y	48	6344.4...	1327...	.442	.515	4.1...	.6	.85	C3.3...
6	M117	P1000	.764	46.5	41	.756	45	y	41	6344.4...	1327...	.442	.515	4.1...	.6	.85	C3.3...
7	M84	P1000	.684	126	56	.400	42	z	84	6382.9...	1327...	.262	.497	2.2...	.85	.76	C5.1...
8	M98	P1000	.681	126	55	.455	126	y	2	6382.9...	1327...	.262	.497	2.22	.85	.797	C5.1...
9	M99	P1000	.640	108.9...	60	.500	116....	z	61	6542.57	1327...	.442	.515	2.1...	.85	.687	C3.3...
10	M85	P1000	.640	108.9...	55	.499	116....	z	55	6542.57	1327...	.442	.515	2.2...	.85	.716	C3.3...
11	M70	P1000	.619	0	108	.570	47.25	z	84	6382.9...	1327...	.262	.497	2.1...	.85	.843	C5.1...
12	M71	P1000	.604	17.063	99	.472	9.188	z	102	6542.57	1327...	.442	.515	1.0...	.85	.625	C3.3...

Stress ratio <1. Members are adequate.

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Che...	Loc[in] ...		LC	phi*Pnc [..	phi*Pnt ...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M41	HSS1x1x1/8	.525	0	30	.101	0	y	12	4110.119	18133.2	.5	.5	4.384	H1-1a
2	M37	HSS1x1x1/8	.490	0	25	.096	0	y	7	4110.118	18133.2	.5	.5	4.33	H1-1a
3	M44	HSS1x1x1/8	.485	55.973	31	.092	55.973	y	1	4110.118	18133.2	.5	.5	3.926	H1-1a
4	M40	HSS1x1x1/8	.467	55.973	36	.093	55.973	y	6	4110.118	18133.2	.5	.5	4.345	H1-1a
5	M2	HSS1x1x1/8	.462	0	12	.278	3.938	y	12	17900.38	18133.2	.5	.5	1.503	H1-1b
6	M1	HSS1x1x1/8	.459	0	7	.273	122....	y	6	17900.381	18133.2	.5	.5	1.491	H1-1b
7	M3	HSS1x1x1/8	.437	126	1	.269	122....	y	1	17900.381	18133.2	.5	.5	2.205	H1-1b
8	M42	HSS1x1x1/8	.398	55.973	28	.068	50.143	y	54	4110.118	18133.2	.5	.5	4.185	H1-1a
9	M29	HSS1x1x1/8	.389	0	8	.073	4.813	y	56	7285.833	18133.2	.5	.5	2.921	H1-1a
10	M6	HSS1x1x1/8	.384	21	135	.051	42	y	135	7285.833	18133.2	.5	.5	1.758	H1-1b
11	M5	HSS1x1x1/8	.382	21	135	.051	42	y	135	7285.833	18133.2	.5	.5	1.766	H1-1b
12	M4	HSS1x1x1/8	.382	21	135	.052	42	y	135	7285.833	18133.2	.5	.5	1.763	H1-1b
13	M28	HSS1x1x1/8	.364	0	6	.055	0	y	6	7285.833	18133.2	.5	.5	3.772	H1-1a
14	M15	HSS1x1x1/8	.352	63	134	.050	84	y	134	14436.956	18133.2	.5	.5	2.244	H1-1b

Stress ratio <1. Members are adequate.

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Che	Loc[in]	...	LC	phi*Pnc [...	phi*Pnt ...	phi*Mn...	phi*Mn...	Cb	Eqn
15	M14	HSS1x1x1/8	.351	63	134	.050	84	y	134	14436.956	18133.2	.5	.5	2.248	H1-1b
16	M13	HSS1x1x1/8	.346	63	134	.050	84	y	134	14436.956	18133.2	.5	.5	2.251	H1-1b
17	M16	HSS1x1x1/8	.346	0	1	.096	0	y	88	10327.805	18133.2	.5	.5	3.526	H1-1b
18	M32	HSS1x1x1/8	.341	4.375	14	.101	0	y	37	7285.833	18133.2	.5	.5	3.845	H1-1a
19	M20	HSS1x1x1/8	.335	0	8	.089	0	y	96	10327.805	18133.2	.5	.5	3.598	H1-1b
20	M23	HSS1x1x1/8	.330	53.413	26	.011	53.413	z	11	4513.495	18133.2	.5	.5	1.723	H1-1a
21	M30	HSS1x1x1/8	.328	4.375	23	.100	0	y	37	7285.833	18133.2	.5	.5	4.033	H1-1a
22	M12	HSS1x1x1/8	.321	33	132	.061	33	y	132	10327.805	18133.2	.5	.5	1.857	H1-1b
23	M10	HSS1x1x1/8	.320	33	132	.061	33	y	132	10327.805	18133.2	.5	.5	1.856	H1-1b
24	M8	HSS1x1x1/8	.319	33	132	.061	33	y	132	10327.805	18133.2	.5	.5	1.862	H1-1b
25	M21	HSS1x1x1/8	.311	33	135	.061	33	y	135	10327.805	18133.2	.5	.5	1.853	H1-1b
26	M19	HSS1x1x1/8	.310	33	135	.061	33	y	135	10327.805	18133.2	.5	.5	1.853	H1-1b
27	M11	HSS1x1x1/8	.309	6.187	92	.138	0	y	89	10327.805	18133.2	.5	.5	3.135	H1-1b
28	M22	HSS1x1x1/8	.307	53.413	35	.010	53.413	z	4	4513.495	18133.2	.5	.5	1.948	H1-1a
29	M9	HSS1x1x1/8	.304	6.188	88	.137	0	y	97	10327.805	18133.2	.5	.5	3.154	H1-1b
30	M17	HSS1x1x1/8	.304	33	135	.058	33	y	135	10327.805	18133.2	.5	.5	1.872	H1-1b
31	M286	PIPE_2.0	.300	24.75	1	.031	24.75		11	20866.733	32130	1.872	1.872	1.469	H1-1b
32	M240	PIPE_2.0	.297	24.75	7	.034	24.75		1	20866.733	32130	1.872	1.872	1.285	H1-1b
33	M43	HSS1x1x1/8	.285	5.831	107	.074	0	y	4	4110.118	18133.2	.5	.5	3.422	H1-1b
34	M7	HSS1x1x1/8	.282	6.187	93	.127	0	y	92	10327.805	18133.2	.5	.5	3.197	H1-1b
35	M31	HSS1x1x1/8	.279	0	135	.143	0	y	7	7285.833	18133.2	.5	.5	4.625	H1-1b
36	M33	HSS1x1x1/8	.279	0	135	.122	4.813	y	1	7285.833	18133.2	.5	.5	4.613	H1-1b
37	M38	HSS1x1x1/8	.273	42.066	10	.033	0	y	4	5839.909	18133.2	.5	.5	3.812	H1-1a
38	M18	HSS1x1x1/8	.259	0	5	.091	0	y	92	10327.805	18133.2	.5	.5	3.717	H1-1b
39	M202	SR1/2"	.237	7.5	95	.028	7.5		97	5263.413	6361.725	.053	.053	2.271	H1-1b
40	M39	HSS1x1x1/8	.237	0	28	.029	5.381	z	7	5839.909	18133.2	.5	.5	1.608	H1-1a
41	M260	SR1/2"	.234	7.5	97	.019	7.5		9	5263.413	6361.725	.053	.053	2.255	H1-1b
42	M203	SR1/2"	.233	0	8	.026	7.5		97	5263.413	6361.725	.053	.053	2.216	H1-1b
43	M308	SR1/2"	.232	7.5	89	.022	7.5		1	5263.413	6361.725	.053	.053	2.255	H1-1b
44	M280	PIPE_2.0	.231	18.5	2	.079	18.5		6	26521.424	32130	1.872	1.872	1.714	H1-1b
45	M261	SR1/2"	.229	7.5	97	.019	7.5		2	5263.413	6361.725	.053	.053	2.254	H1-1b
46	M309	SR1/2"	.229	7.5	90	.021	7.5		1	5263.413	6361.725	.053	.053	2.255	H1-1b
47	M234	PIPE_2.0	.221	18.5	11	.089	18.5		2	26521.424	32130	1.872	1.872	1.95	H1-1b
48	M252	SR1/2"	.207	0	88	.043	7.5		2	5263.413	6361.725	.053	.053	2.252	H1-1b
49	M211	SR1/2"	.205	7.5	95	.013	7.5		92	5263.413	6361.725	.053	.053	2.265	H1-1b
50	M212	SR1/2"	.203	7.5	95	.013	7.5		93	5263.413	6361.725	.053	.053	2.265	H1-1b
51	M300	SR1/2"	.202	0	93	.047	7.5		6	5263.413	6361.725	.053	.053	2.253	H1-1b
52	M253	SR1/2"	.182	0	87	.040	7.5		2	5263.413	6361.725	.053	.053	2.247	H1-1b
53	M301	SR1/2"	.180	0	90	.044	7.5		6	5263.413	6361.725	.053	.053	2.244	H1-1b
54	M219	PIPE_2.0	.179	28	1	.036	55.125		10	17855.085	32130	1.872	1.872	2.594	H1-1b
55	M316	PIPE_2.0	.178	28	10	.037	55.125		12	17855.085	32130	1.872	1.872	1.832	H1-1b
56	M327	PIPE_2.0	.178	28	4	.037	28		26	17855.085	32130	1.872	1.872	2.606	H1-1b
57	M27	HSS1x1x1/8	.177	0	31	.009	53.413	y	135	4513.495	18133.2	.5	.5	1.863	H1-1b*
58	M317	PIPE_2.0	.159	32.5	12	.070	40		12	26521.424	32130	1.872	1.872	1.68	H1-1b
59	M220	PIPE_2.0	.155	32.5	4	.067	40		4	26521.424	32130	1.872	1.872	1.81	H1-1b
60	M327A	PIPE_2.0	.151	18.5	4	.066	18.5		7	26521.424	32130	1.872	1.872	2.933	H1-1b
61	M35	C3x6	.148	0	1	.094	32.813	y	6	37162.504	79200	1.572	6.525	1.61	H1-1b
62	M128	PIPE_2.0	.143	36	7	.027	10.5		7	20866.733	32130	1.872	1.872	3.147	H1-1b
63	M235	PIPE_2.0	.142	36	10	.034	35.25		5	20866.733	32130	1.872	1.872	1.51	H1-1b
64	M281	PIPE_2.0	.142	36	4	.024	7.5		6	20866.733	32130	1.872	1.872	1.549	H1-1b
65	M24	HSS1x1x1/8	.140	53.413	30	.013	53.413	z	7	4513.495	18133.2	.5	.5	2.49	H1-1b*
66	M34	C3x6	.137	0	1	.078	32.813	y	3	37162.504	79200	1.572	6.525	1.71	H1-1b
67	M127	PIPE_2.0	.127	32.5	4	.071	45		6	26521.424	32130	1.872	1.872	2.027	H1-1b
68	M25	HSS1x1x1/8	.124	53.413	28	.010	53.413	z	1	4513.495	18133.2	.5	.5	1.715	H1-1b*
69	M36	C3x6	.115	0	5	.064	7.438	z	4	37162.504	79200	1.572	6.525	1.627	H1-1b
70	M26	HSS1x1x1/8	.114	53.413	22	.008	53.413	y	22	4513.495	18133.2	.5	.5	2.145	H1-1b
71	M206	PIPE_2.0	.110	44.25	6	.082	44.25		7	20866.733	32130	1.872	1.872	1.615	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Che..	Loc[in] ...		LC	phi*Pnc [..	phi*Pnt ..	phi*Mn..	phi*Mn...	Cb	Eqn
72	M303	PIPE_2.0	.099	44.25	2	.060	44.25		2	20866.733	32130	1.872	1.872	2.054	H1-1b
73	M139	PIPE_2.0	.097	51	5	.030	51		9	20866.733	32130	1.872	1.872	1.554	H1-1b
74	M126	PIPE_2.0	.095	32.5	5	.043	32.5		10	26521.424	32130	1.872	1.872	2.091	H1-1b
75	M233	PIPE_2.0	.095	32.5	2	.047	32.5		2	26521.424	32130	1.872	1.872	1.871	H1-1b
76	M279	PIPE_2.0	.093	32.5	1	.049	32.5		6	26521.424	32130	1.872	1.872	1.475	H1-1b
77	M255	PIPE_2.0	.092	44.25	11	.054	44.25		11	20866.733	32130	1.872	1.872	2.035	H1-1b
78	M134	PIPE_2.0	.081	24	1	.021	24		4	20866.733	32130	1.872	1.872	2.454	H1-1b
79	M282	PIPE_2.0	.080	24	10	.024	24		5	20866.733	32130	1.872	1.872	1.827	H1-1b
80	M236	PIPE_2.0	.080	24	4	.024	24		3	20866.733	32130	1.872	1.872	1.781	H1-1b
81	M46	C5x6.7	.077	0	12	.022	7	z	11	83481.735	88650	2.227	13.313	1.907	H1-1b
82	M49	C5x6.7	.071	0	4	.020	7	z	3	83481.738	88650	2.227	13.313	1.699	H1-1b
83	M52	C5x6.7	.070	0	8	.020	7	z	7	83481.738	88650	2.227	13.313	1.741	H1-1b
84	M48	C5x6.7	.058	0	6	.019	7	z	6	83481.738	88650	2.227	13.313	1.651	H1-1b
85	M45	C5x6.7	.056	0	5	.019	7	z	4	83481.735	88650	2.227	13.313	1.624	H1-1b
86	M51	C5x6.7	.050	0	2	.016	7	z	1	83481.738	88650	2.227	13.313	1.649	H1-1b
87	M221	PIPE_2.5	.032	31.5	5	.006	24.75		12	37773.818	50715	3.596	3.596	2.476	H1-1b
88	M53	L5x5x5	.015	50.625	20	.006	9.375	y	1	76065.401	99468	6.383	12.944	1.255	H2-1
89	M47	L5x5x5	.015	50.625	24	.009	9.375	y	5	76065.401	99468	6.383	12.757	1.155	H2-1
90	M50	L5x5x5	.015	50.625	16	.005	9.375	y	8	76065.401	99468	6.383	12.743	1.148	H2-1

Stress ratio <1.0. Members are adequate.

CCI Site No. : CTL02108
CCI Site Name: Norwalk West-CT Ave
Prepared By: RH
Checked By: BK

Fullerton Engineering Consultants, Inc.
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
(847) 908-8400

Date: 12/5/2018

Mount-to-Tower Connection Calculations

Existing Platform is connected to the monopole via (12) 3/4" ϕ Bolts, grade A307 (conservatively assumed).

Maximum Reactions from Risa Mount Analysis Node "N251":

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
17	N248	max	48.436	78	521.501	135	585.3	11	0	1	0	1	0	1
18		min	-74.631	60	-237.628	28	-316.027	29	0	1	0	1	0	1
19	N249	max	749.682	15	1176.979	16	755.748	15	0	1	0	1	0	1
20		min	-336.88	33	-121.293	33	-331.725	33	0	1	0	1	0	1
21	N250	max	624.309	15	789.688	13	92.57	33	0	1	0	1	0	1
22		min	-239.14	32	-370.649	31	-278.972	15	0	1	0	1	0	1
23	N251	max	332.435	6	1207.877	5	773.629	36	.071	36	.122	6	.066	18
24		min	-239.001	36	-588.448	35	-1251.255	6	-.142	6	-.077	36	-.017	135
25	N258	max	42.007	28	186.016	38	355.45	22	0	1	0	1	0	1
26		min	-403.239	23	-161.007	132	-91.322	28	0	1	0	1	0	1
27	N259	max	100.074	7	279.254	132	419.195	16	0	1	0	1	0	1
28		min	-85.31	25	-107.688	38	-102.818	34	0	1	0	1	0	1
29	N260	max	1147.935	2	190.199	38	230.71	2	0	1	0	1	0	1
30		min	-818.105	32	-160.119	132	-124.913	32	0	1	0	1	0	1

$X := 332.435 lbf$ — *Maximum Reaction - X direction*

$Y := 1207.877 lbf$ — *Maximum Reaction - Y direction*

$Z := 1251.255 lbf$ — *Maximum Reaction - Z direction*

$P_t := Y$ $\quad P_t = 1207.88\,lbf$ — *Factored Tensile Force*

$P_v := \sqrt{X^2 + Z^2}$ $\quad P_v = 1294.66\,lbf$ — *Factored Shear Force*

$d_b := 0.75 in$ — *Diameter of rod*

$A_b := 0.25\pi \cdot d_b^{\,2}$ $\quad A_b = 0.44 \cdot in^2$ — *Area of rod*

$P_{t\_bolt} := P_t$ $\quad P_{t\_bolt} = 1207.88\,lbf$ — *Tension/Compression at rod*

$P_{v\_bolt} := P_v$ $\quad P_{v\_bolt} = 1294.66\,lbf$ — *Shear at rod*

CCI Site No. : CTL02108
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(847) 908-8400

Date: 12/5/2018

Tensile and Shear Strength of Threaded Rods

$F_{nt} := 45ksi$ — *Nominal tensile strength per AISC 360-10, Table J3.2*

$F_{nv} := 27ksi$ — *Nominal shear strength per AISC 360-10, Table J3.2*

$\phi_{bolt} := .75$ — *Resistance Factor (LRFD - AISC 360, Section J3-6)*

$R_{nt} := \phi_{bolt} \cdot F_{nt} \cdot A_b$ $\quad R_{nt} = 14.91 \cdot kip$ — *Design Nominal Tensile Strength (AISC 360, Section J3-1)*

$R_{nv} := \phi_{bolt} \cdot F_{nv} \cdot A_b$ $\quad R_{nv} = 8.95 \cdot kip$ — *Design Nominal Shear Strength (AISC 360, Section J3-1)*

$$\frac{P_{t\_bolt}}{R_{nt}} = 8.1 \cdot \%$$

$$\frac{P_{v\_bolt}}{R_{nv}} = 14.47 \cdot \%$$

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

Kristina Cottone

From: TrackingUpdates@fedex.com
Sent: Thursday, September 5, 2019 1:31 PM
To: Kristina Cottone
Subject: FedEx Shipment 776140273479 Delivered

Your package has been delivered

Tracking # 776140273479

Ship date:
Tue, 9/3/2019

Kristina Cottone
Smartlink LLC
NORTH BILLERICA, MA 01862
US

Delivered

Delivery date:
Thu, 9/5/2019 1:28 pm

ATTN: Zoning Planning
Steven K.
City of Norwalk
125 East Ave.
Room 223
NORWALK, CT 06856
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	776140273479
Status:	Delivered: 09/05/2019 1:28 PM Signed for By: S.SCHOEFIN
Reference:	CTL02108 - CSC Notice
Signed for by:	S.SCHOEFIN
Delivery location:	NORWALK, CT
Delivered to:	Mailroom
Service type:	FedEx Express Saver®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday
Standard transit:	9/6/2019 by 4:30 pm

Kristina Cottone

From: TrackingUpdates@fedex.com
Sent: Thursday, September 5, 2019 4:02 PM
To: Kristina Cottone
Subject: FedEx Shipment 776140384192 Delivered

Your package has been delivered

Tracking # 776140384192

Ship date:
Tue, 9/3/2019

Kristina Cottone
Smartlink LLC
NORTH BILLERICA, MA 01862
US

Delivered

Delivery date:
Thu, 9/5/2019 3:55 pm

ATTN: Prop Tax Dept#6204
Home Depot USA Inc.
2455 PACES FERRY RD
ATLANTA, GA 30339
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	776140384192
Status:	Delivered: 09/05/2019 3:55 PM Signed for By: C.ANTHONY
Reference:	CTL02108- CSC notice
Signed for by:	C.ANTHONY
Delivery location:	ATLANTA, GA
Delivered to:	Shipping/Receiving
Service type:	FedEx Express Saver®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday
Standard transit:	9/6/2019 by 4:30 pm

Kristina Cottone

From: TrackingUpdates@fedex.com
Sent: Friday, September 6, 2019 9:28 AM
To: Kristina Cottone
Subject: FedEx Shipment 776140321691 Delivered

Your package has been delivered

Tracking # 776140321691

Ship date:
Tue, 9/3/2019

Kristina Cottone
Smartlink LLC
NORTH BILLERICA, MA 01862
US

Delivered

Delivery date:
Fri, 9/6/2019 9:24 am

Tricia Pelon
Crown Castle
3 Corporate Drive
Suite 101
CLIFTON PARK, NY 12065
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	776140321691
Status:	Delivered: 09/06/2019 09:24 AM Signed for By: A.VIVCO
Reference:	CTL02108- CSC Notice
Signed for by:	A.VIVCO
Delivery location:	CLIFTON PARK, NY
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Express Saver®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday
Standard transit:	9/6/2019 by 4:30 pm

Kristina Cottone

From: TrackingUpdates@fedex.com
Sent: Thursday, September 5, 2019 1:31 PM
To: Kristina Cottone
Subject: FedEx Shipment 776140227631 Delivered

Your package has been delivered

Tracking # 776140227631

Ship date:
Tue, 9/3/2019

Kristina Cottone
Smartlink LLC
NORTH BILLERICA, MA 01862
US

Delivered

Delivery date:
Thu, 9/5/2019 1:28 pm

ATTN: Harry Rilling Mayor
City of Norwalk
125 East Ave
PO BOX 5125
NORWALK, CT 06856
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	776140227631
Status:	Delivered: 09/05/2019 1:28 PM Signed for By: S.SCHOEFIN
Reference:	CTL02108- CSC Notice
Signed for by:	S.SCHOEFIN
Delivery location:	NORWALK, CT
Delivered to:	Mailroom
Service type:	FedEx Express Saver®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday
Standard transit:	9/6/2019 by 4:30 pm

PROJECT:	4C/5C/6C/7C/RRH ADD
SITE NUMBER:	CTL02108
FA NUMBER:	10034974
PTN NUMBER:	2051A0D0Q3, 2051A0CZR8, 2051A0CZJM, 2051A0EDXG, 2051A0494T
PACE NUMBER:	MRCTB025283, MRCTB025338, MRCTB025304, MRCTB026716, MRCTB017068
CROWN BU#:	841287
SITE NAME:	NORWALK WEST-CT AVE.
SITE ADDRESS:	613 CONNECTICUT AVENUE NORWALK, CT 06850

CALCULATIONS FOR THE STRUCTURE WERE PREPARED BY CROWN CASTLE, REFER TO SA DATED 06/28/19, THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT.

PROJECT INFORMATION

SITE NAME:	NORWALK WEST-CT AVE.
SITE NUMBER:	CTL02108
SITE ADDRESS:	613 CONNECTICUT AVENUE NORWALK, CT 06850
FA NUMBER:	10034974
PTN NUMBER:	2051A0D0Q3, 2051A0CZR8, 2051A0CZJM, 2051A0EDXG, 2051A0494T
PACE NUMBER:	MRCTB025283, MRCTB025338, MRCTB025304, MRCTB026716, MRCTB017068
USID NUMBER:	60395
CROWN BU#:	841287
APPLICANT:	AT&T WIRELESS 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701
TOWER OWNER:	CROWN CASTLE INTERNATIONAL 12 GILL STREET, SUITE 5800 WOBURN, MA 01801
JURISDICTION:	CITY OF NORWALK
COUNTY:	FAIRFIELD
SITE COORDINATES FROM	(RFDS)
LATITUDE:	41.097075°
LONGITUDE:	-73.449055°
GROUND ELEV.:	152'
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
AT&T RF MANAGER:	DEEPAK RATHORE
PHONE:	(860) 965-3068
EMAIL:	dr701e@att.com

PROJECT CONSULTANTS

PROJECT MANAGER:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	EDWARD WEISSMAN (917) 528-1857
EMAIL:	Edward.Weissman@smartlinkllc.com
SITE AQUISITION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	SHARON KEEFE (978) 930-3918
EMAIL:	Sharon.Keefe@smartlinkllc.com
ENGINEER/ARCHITECT:	FULLERTON ENGINEERING
ADDRESS:	1100 E. WOODFIELD ROAD, SUITE 500 SCHAUMBURG, IL 60173
CONTACT:	MILEN DIMITROV (847) 908-8439
EMAIL:	MDimitrov@FullertonEngineering.com
CONSTRUCTION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	MARK DONNELLY (617) 515-2080
EMAIL:	mark.donnelly@smartlinkllc.com

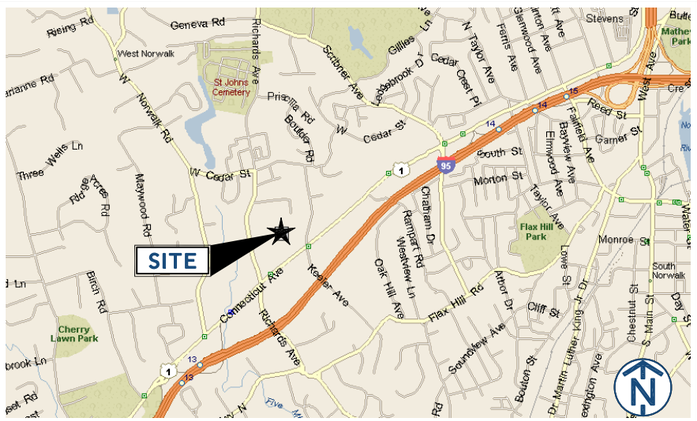
SCOPE OF WORK

LTE 850/700/AWS/700 WILL BE 4C/5C/6C/7C/RRH ADD AT THE SITE WITH BRONZE CONFIGURATION. PROPOSED 4C/5C/6C/7C/RRH ADD PROJECT SCOPE HEREIN BASED ON RFDS ID # 1811293, VERSION 3.00 LAST UPDATED 03/28/18 & RFDS ID # 1000709, VERSION 4 LAST UPDATED 07/12/2017.

- (6) NEW ANTENNAS TO REPLACE (3) EXISTING ANTENNAS
- (3) NEW RRUS-32 B66
- (3) NEW RRUS-4478 B14
- (3) NEW RRUS-E2 B29
- (3) NEW RRUS-4478 B5
- (1) NEW RAYCAP UNIT, (2) DC POWER CABLES
- INSTALL 2ND XMU & IDLe
- UPGRADE (2) EXISTING DUS W/ (2) NEW 5216

- CONTRACTOR SHALL FURNISH ALL MATERIAL WITH THE EXCEPTION OF AT&T SUPPLIED MATERIAL.
- ALL MATERIAL SHALL BE INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE.

SITE LOCATION MAP



NO SCALE

DIRECTIONS

SCAN QR CODE FOR LINK TO SITE LOCATION MAP

APPLICABLE BUILDING CODES AND STANDARDS

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

BUILDING CODE: 2015 INTERNATIONAL BUILDING CODE
2018 CONNECTICUT STATE BUILDING CODE SUPPLEMENT

ELECTRICAL CODE: 2017 NATIONAL ELECTRIC CODE

- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- ADA ACCESS REQUIREMENTS ARE NOT REQUIRED.
- THIS FACILITY DOES NOT REQUIRE POTABLE WATER AND WILL NOT PRODUCE ANY SEWAGE

DRAWING INDEX

NOTE: DRAWING SCALES ARE FOR 11"x17" SHEETS UNLESS OTHERWISE NOTED

at&t
550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

FULLERTON ENGINEERING · DESIGN
1100 E. WOODFIELD ROAD, SUITE 500
SCHAUMBURG, ILLINOIS 60173
TEL: 847-908-8400
COA# PEC.0001444
www.FullertonEngineering.com

REV	DATE	DESCRIPTION	BY
2	05/02/18	FOR CONSTRUCTION	EB
3	05/03/18	RRH ADD AND BWE	KC
4	11/30/18	MOUNT REVISION	EB
5	03/11/19	RF REDLINES	EB
6	08/26/19	REVISED	KC
7	08/28/19	REVISED	KC

I HEREBY CERTIFY THAT THESE DRAWINGS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

SITE NAME
NORWALK WEST-CT AVE.

SITE NUMBER:
CTL02108

SITE ADDRESS
613 CONNECTICUT AVENUE
NORWALK, CT 06850

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

PROJECT# 2017.0278.0090

GENERAL CONSTRUCTION

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR/CM – SMARTLINK
   OWNER – AT&T WIRELESS
2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.
3. GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.
12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
15. CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
16. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
17. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.
19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.
20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
21. THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2–A OT 2–A:10–B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.
23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
24. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
25. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE–APPROVED BY THE LOCAL JURISDICTION.
28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.
30. CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS–BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.
31. CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).
33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.
35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
36. CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.
37. CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
38. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
39. NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.

ANTENNA MOUNTING

40. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA–222 OR APPLICABLE LOCAL CODES.
41. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
42. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC–COATING (HOT–DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
43. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
44. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
45. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
46. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50–OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
47. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/– 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/– 0.5% AS DEFINED BY THE RFDS. REFER TO ND–00246.
48. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
49. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
50. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

51. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.
52. ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.
    A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.
    B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.

FIBER & POWER CABLE MOUNTING

53. THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.
54. THE TYPE TC–ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC–ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.
55. WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC–ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

62. TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO

    ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
63. CONTRACTOR SHALL VERIFY THE DOWN–TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
64. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.
65. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'–0".
66. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'–0" OC.
67. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
68. CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.
69. CONTRACTOR SHALL PROVIDE STRAIN–RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN–RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
70. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

71. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
72. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.
73. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
74. ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE–HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.
75. IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
    A. TEMPERATURE SHALL BE ABOVE 50° F.
    B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
    C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.
    D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS
76. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
    A. GROUNDING AT THE ANTENNA LEVEL.
    B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'–0", ADDITIONAL CABLE GROUNDING REQUIRED.
    C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
    D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
    E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
77. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWNLEADS A MINIMUM DISTANCE OF 4'–0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.

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STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · PROFESSIONAL ENGINEER

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WEST-CT AVE.

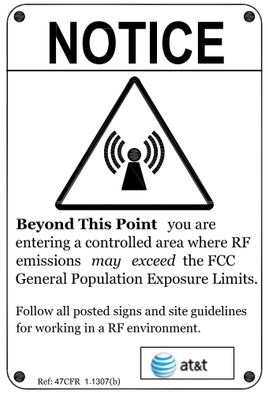
SITE NUMBER:
CTL02108

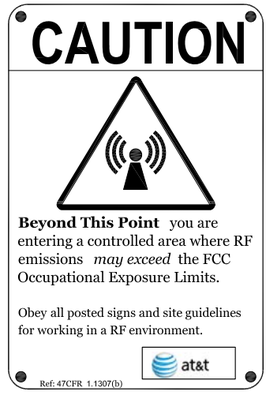
SITE ADDRESS
613 CONNECTICUT AVENUE
NORWALK, CT 06850

SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP1

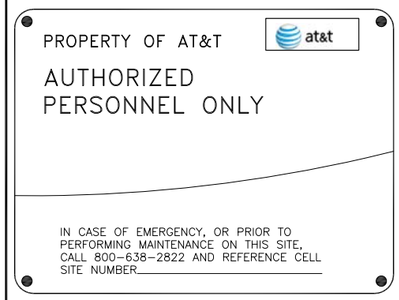
PROJECT# 2017.0278.0090





ALERTING SIGNS

ALERTING SIGN



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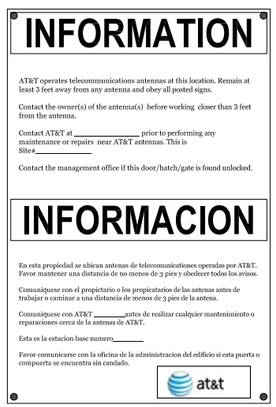

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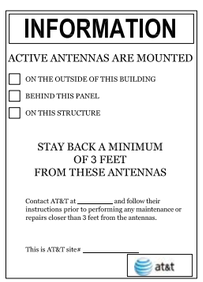

INFO SIGN #2

INFO SIGN #3

ALERTING SIGN (FOR CELL SITE BATTERIES)

ALERTING SIGN (FOR DIESEL FUEL)

ALERTING SIGN (FOR PROPANE)

GENERAL SIGNAGE GUIDELINES

STRUCTURE TYPE	INFO SIGN #1	INFO SIGN #2	INFO SIGN #3	INFO SIGN #4	STRIPING	NOTICE SIGN	CAUTION SIGN
TOWERS							
MONOPOLE/MONOPINE/MONOPALM	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			AT THE HEIGHT OF THE FIRST CLIMBING STEP, MIN 9 FT ABOVE GROUND
SEC TOWERS/TOWERS WITH HIGH VOLTAGE	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
LIGHT POLES/FLAG POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
UTILITY WOOD POLES (JPA)	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		IF GP MAX VALUE OF MPE AT ANTENNA LEVEL IS: 0-99%; NOTICE SIGN; OVER 99%: CAUTION SIGN AT NO LESS THAN 3FT BELOW ANTENNA AND 9FT ABOVE GROUND	
MICROCELLS MOUNTED ON NON-JPA POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		NOTICE OR CAUTION SIGN AT NO LESS THAN 9FT ABOVE GROUND: ONLY IF THE EXPOSURE EXCEEDS 90% OF THE GENERAL PUBLIC EXPOSURE AT EXPOSURE AT 6FT ABOVE GROUND OR AT OUTSIDE OF SURFACE OF ADJACENT BUILDING	
TOWERS							
AT ALL ACCESS POINTS TO THE ROOF	X			X			
ON ANTENNAS	X		X	X			
CONCEALED ANTENNAS	X	X		X			
ANTENNAS MOUNTED FACING OUTSIDE THE BUILDING	X	X		X			
ANTENNAS ON SUPPORT STRUCTURE	X	X		X			
ROOFVIEW GRAPH						EITHER NOTICE OR CAUTION SIGN (BASED ON ROOFVIEW RESULTS) AT ANTENNA /BARRIER	
RADIATION AREA IS WITHIN 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X			
RADIATION AREA IS BEYOND 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X	DIAGONAL, YELLOW STRIPING AS TO ROOFVIEW GRAPH		
CHURCH STEEPLES	ACCESS TO STEEPLE	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO STEEPLE			CAUTION SIGN AT THE ANTENNAS
WATER STATIONS	ACCESS TO LADDER	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO LADDER			CAUTION SIGN BESIDE INFO SIGN #1, MIN. 9FT ABOVE GROUND

NOTES FOR ROOFTOP SITES:

1. EITHER NOTICE OR CAUTION SIGNS NEED TO BE POSTED AT EACH SECTOR AS CLOSE AS POSSIBLE TO: THE OUTER EDGE OF THE STRIPED OFF AREA OR THE OUTER ANTENNAS OF THE SECTOR
2. IF ROOFVIEWS SHOWS: ONLY BLUE = NOTICE SIGN, BLUE AND YELLOW = CAUTION SIGN, ONLY YELLOW = CAUTION SIGN TO BE INSTALLED
3. SHOULD THE REQUIRED STRIPING AREAS INTERFERE WITH ANY STRUCTURE OR EQUIPMENT (A/C, VENTS, ROOF HATCH, DOORS, OTHER ANTENNAS, DISHES, ETC.). PLEASE NOTIFY AT&T TO MODIFY THE STRIPING AREA, PRIOR TO STARTING THE WORK.

SIGNAGE GUIDELINES CHART

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SP2

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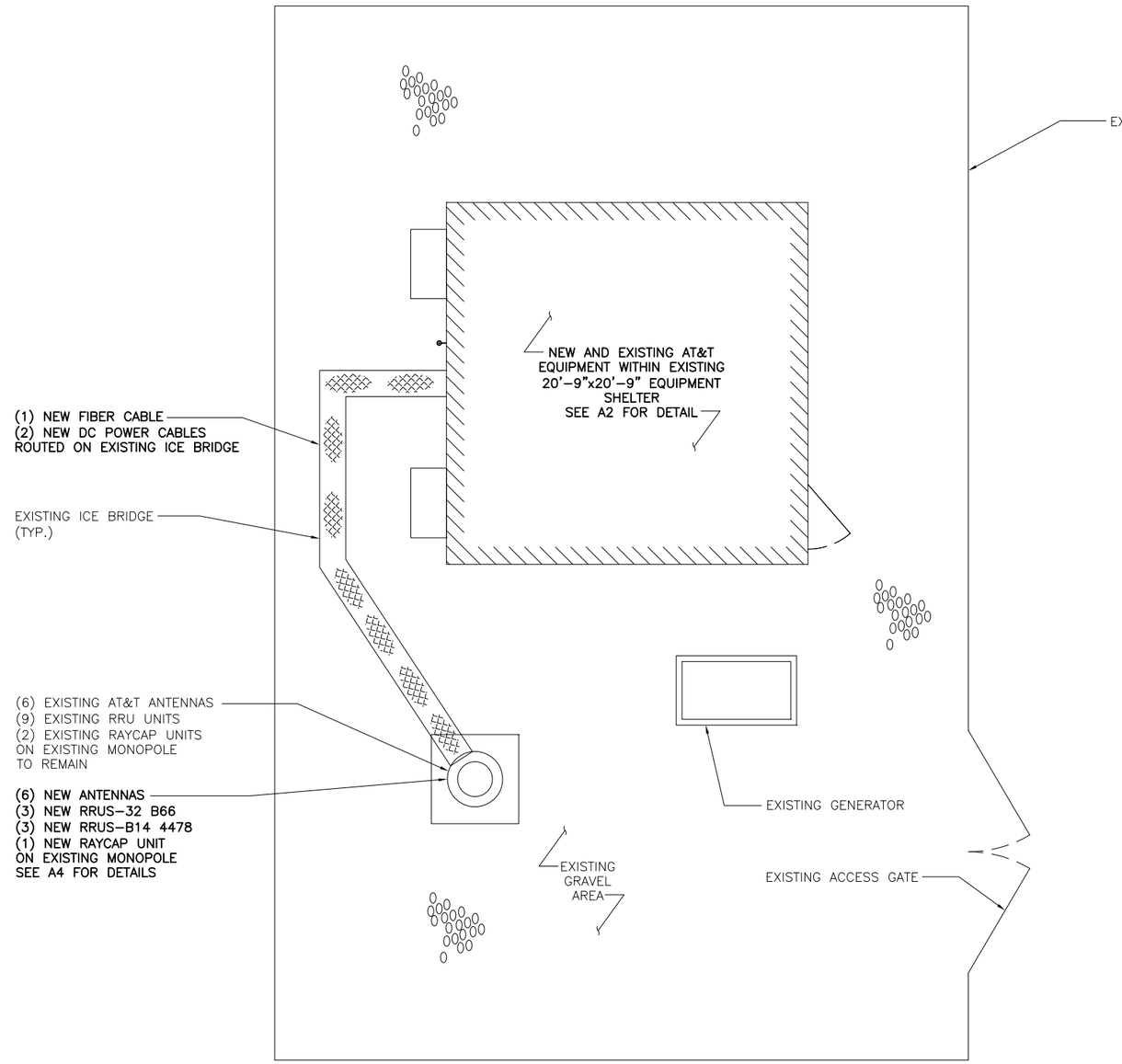
ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
℄	CENTERLINE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ELEV	ELEVATION
EQUIP	EQUIPMENT
(E)	EXISTING
EXT	EXTERIOR
FND	FOUNDATION
F	FIBER
FIF	FACILITY INTERFACE FRAME
GA	GAUGE
GALV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE COMMUNICATION
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MCPA	MULTI-CARRIER POWER AMPLIFIER
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTS	MANUAL TRANSFER SWITCH
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OE/OT	OVERHEAD ELECTRIC/TELCO
PPC	POWER PROTECTION CABINET
PL	PROPERY LINE
RBS	RADIO BASED STATION
RET	REMOTE ELECTRIC TILT
RRU	REMOTE RADIO UNIT
RGS	RIGID GALVANIZED STEEL
IN	INCH(ES)
INT	INTERIOR
LB(S), #	POUND(S)
SF	SQUARE FOOT
STL	STEEL
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UE/UT	UNDERGROUND ELECTRIC/TELCO
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELE-COMMUNICATION SYSTEM
VIF	VERIFY IN FIELD
W/	WITH
XFMR	TRANSFORMER

SYMBOLS

- REVISION
- WORK POINT
- UTILITY POLE
- COMPRESSED STONE
- BRICK
- CONCRETE
- EARTH
- GRAVEL
- MASONRY
- STEEL
- CENTERLINE
- PROPERTY LINE
- LEASE LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- WOOD FENCE
- UE — BELOW GRADE ELECTRIC
- UT — BELOW GRADE TELEPHONE
- OE/OT — OVERHEAD ELECTRIC/TELEPHONE
- SECTION REFERENCE (A / S-1 / A)



COMPOUND PLAN — SCALE: 1/8" = 1'-0" — 1

SITE PHOTO 1 — SCALE: N.T.S. — 2

SITE PHOTO 2 — SCALE: N.T.S. — 3

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COMPOUND PLAN

SHEET NUMBER
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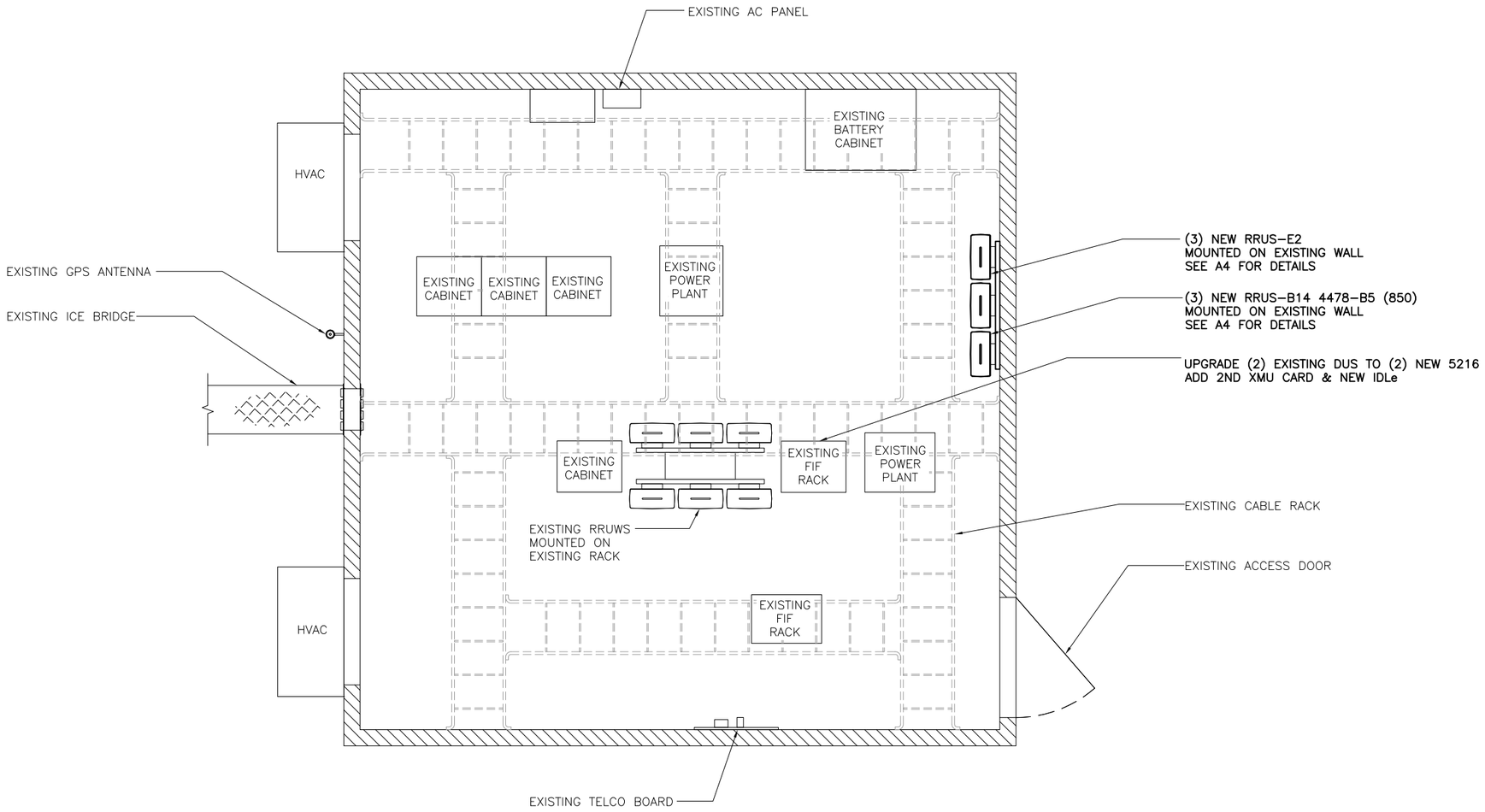
PROJECT# 2017.0278.0090



EQUIPMENT PLAN

SCALE: 1/4" = 1'-0" | 1

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SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

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TEL: 847-908-8400
COA# PEC.0001444
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REV	DATE	DESCRIPTION	BY
2	05/02/18	FOR CONSTRUCTION	EB
3	05/03/18	RRH ADD AND BWE	KC
4	11/30/18	MOUNT REVISION	EB
5	03/11/19	RF REDLINES	EB
6	08/26/19	REVISED	KC
7	08/28/19	REVISED	KC

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STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

SITE NAME
NORWALK
WEST-CT AVE.

SITE NUMBER:
CTL02108

SITE ADDRESS
613 CONNECTICUT AVENUE
NORWALK, CT 06850

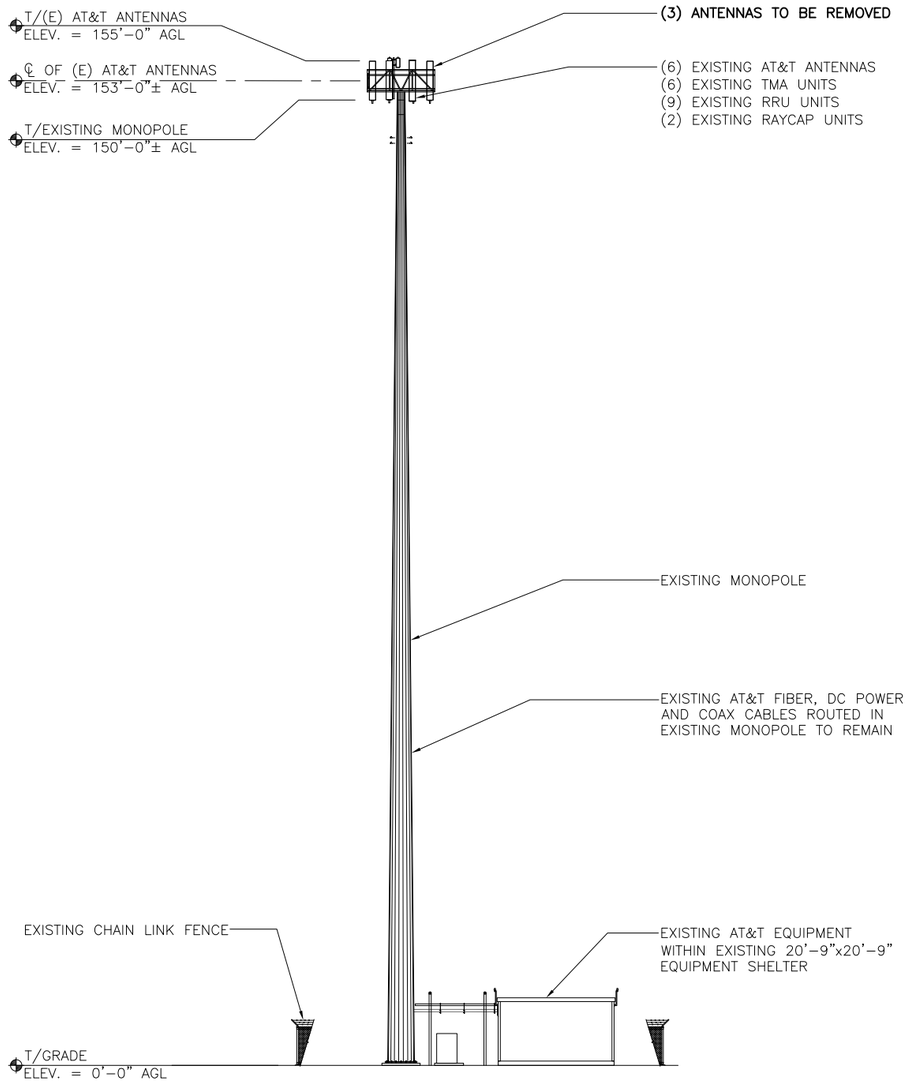
SHEET NAME
EQUIPMENT PLAN

SHEET NUMBER
A2

PROJECT# 2017.0278.0090

NOTES:

1. CALCULATIONS FOR THE STRUCTURE WERE PREPARED BY CROWN CASTLE, REFER TO SA DATED 06/28/19, THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT.
2. CALCULATIONS FOR THE ANTENNA MOUNTS WERE PREPARED BY FULLERTON AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
3. CABLES NOT SHOWN FOR CLARITY



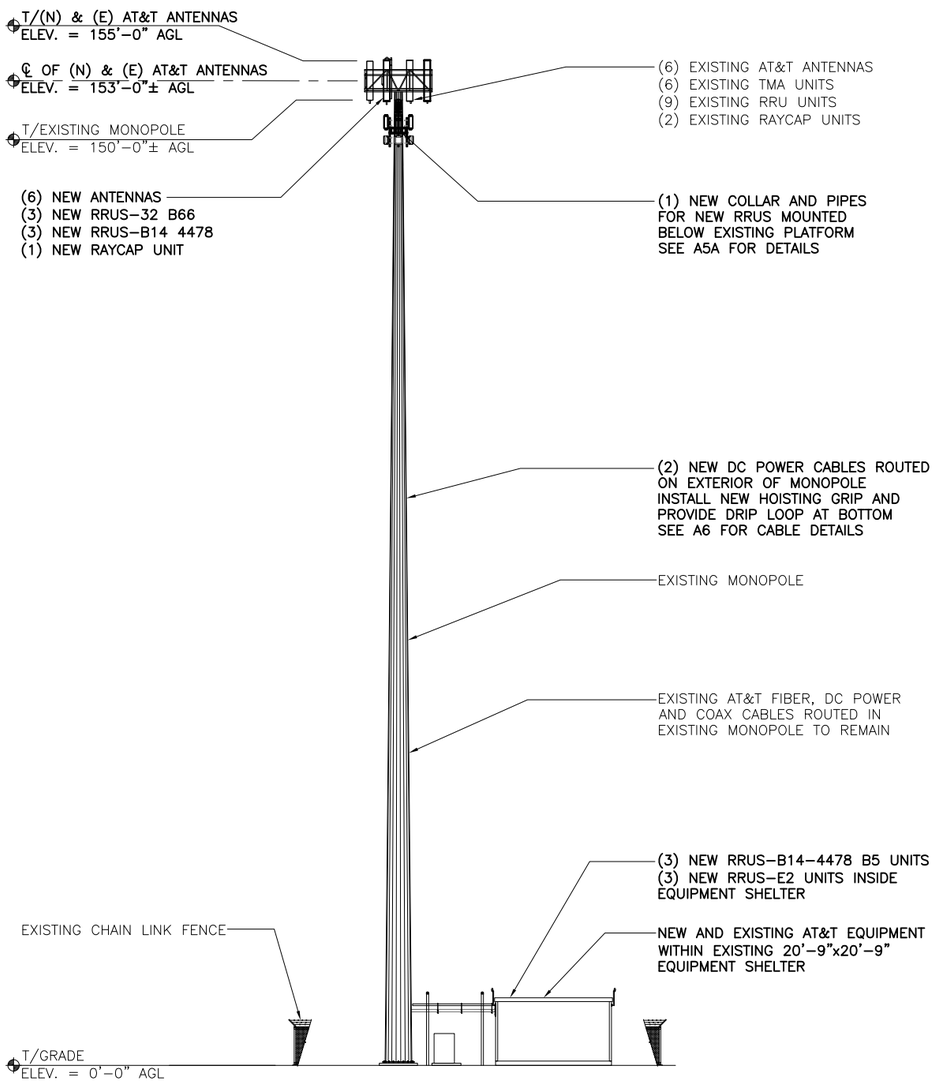
EXISTING ELEVATION — SCALE: 1/32" = 1'-0" — 1

NOTES:

1. ALL EQUIPMENT (ANTENNAS, LINES, ETC.) TO BE INSTALLED IN ACCORDANCE WITH PASSING STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE.
2. TAPE DROP FORMS AND PHOTOGRAPHS TO BE SUBMITTED PER CCI AND AT&T CLOSEOUT REQUIREMENTS.

NOTES:

1. 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
2. 6 FEET MINIMUM SEPARATION BETWEEN 700DE & 700BC



NEW ELEVATION — SCALE: 1/32" = 1'-0" — 2

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7	08/28/19	REVISED	KC

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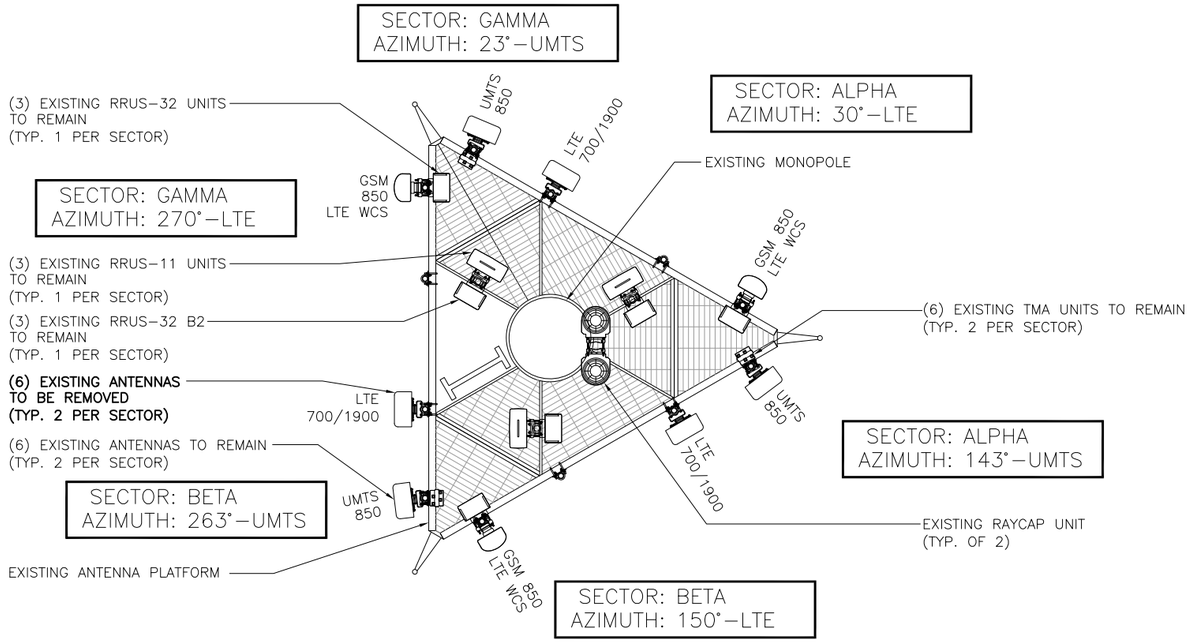
NORWALK, CT 06850

SHEET NAME
ELEVATIONS

SHEET NUMBER
A3

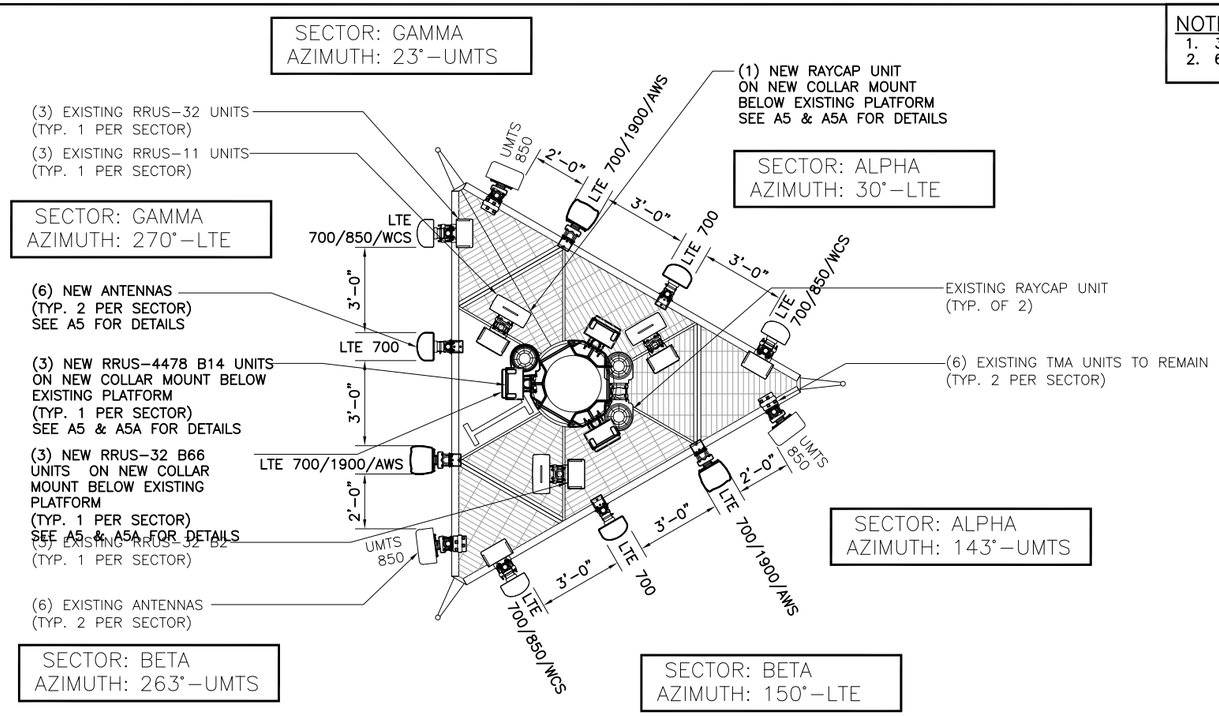
PROJECT# 2017.0278.0090



EXISTING ANTENNA PLAN

SCALE: 3/16" = 1'–0" | 1

NOTES:
1. EXISTING ANTENNA MOUNTING PIPE TO BE REUSED, RELOCATED OR REPLACED AS REQUIRED
2. IF REQUIRED INSTALL NEW GALV. MOUNTING PIPE(S) 2.5 STD. (2–7/8" O.D.)



NOTES:
1. 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
2. 6 FEET MINIMUM SEPARATION BETWEEN 700DE & 700BC

FINAL ANTENNA PLAN

SCALE: 3/16" = 1'–0" | 2

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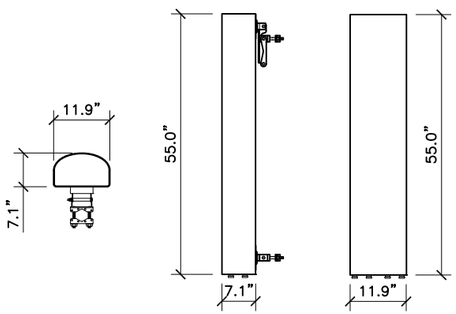
613 CONNECTICUT AVENUE
NORWALK, CT 06850

SHEET NAME
ANTENNA
PLANS

SHEET NUMBER
A4

PROJECT# 2017.0278.0090



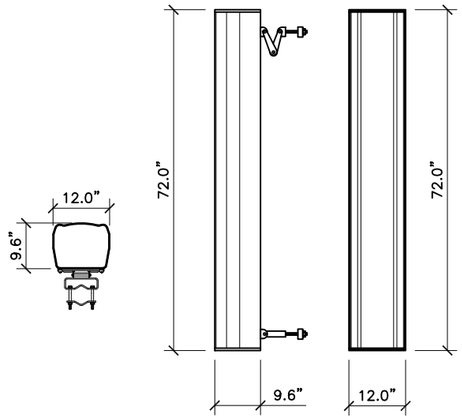
PLAN VIEW SIDE VIEW FRONT VIEW

COMMSCOPE – SBNHH-1D65A

ANDREW® TRI-BAND ANTENNA

FREQUENCY RANGE	698–806 MHz
	806–896 MHz
	1710–1880 MHz
	1850–1990 MHz
	1920–2180 MHz
	2300–2360 MHz
ANTENNA	33.5 Lbs
BRACKET	12.3 Lbs
TOTAL WEIGHT	45.8 Lbs

ANTENNA SPEC SCALE: N.T.S. 1



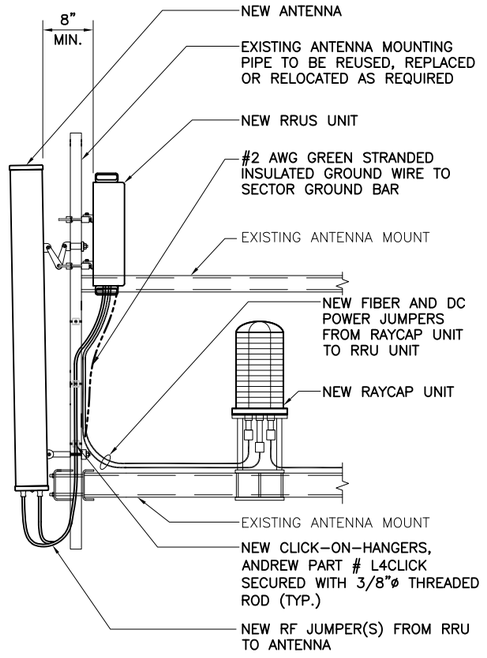
PLAN VIEW SIDE VIEW FRONT VIEW

QUINTEL – QS66512-2

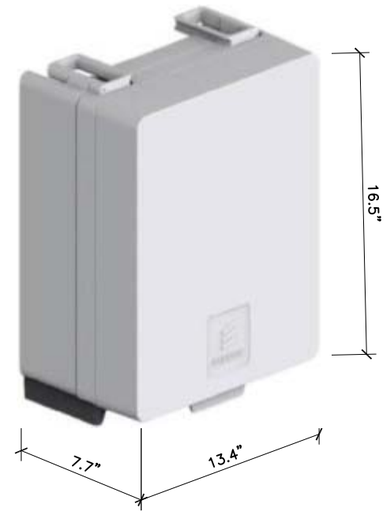
MULTISERVE MULITBAND 12 PORT ANTENNA WITH QTILT AND INTERNAL RET

FREQUENCY RANGE	2x698–806 MHz
	2x824–894 MHz
	4x1850–1990 MHz
	4x1695–1780 +2110–2400 MHz
ANTENNA	111 Lbs
BRACKET	15 Lbs
TOTAL WEIGHT	126 Lbs

ANTENNA SPEC SCALE: N.T.S. 2



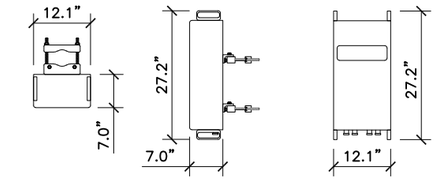
ANTENNA SCHEMATIC SCALE: N.T.S. 3



ERICSSON – RRUS 4478 B14

FREQUENCY RANGE	TX	758–768 MHz
	RX	788–798 MHz
TOTAL WEIGHT		59.9 Lbs

RRU SPEC SCALE: N.T.S. 4

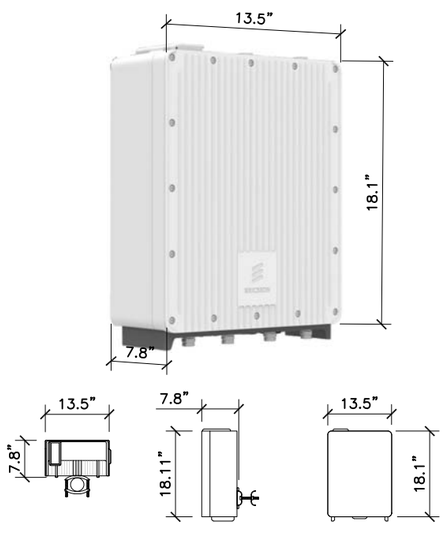


PLAN VIEW SIDE VIEW FRONT VIEW

ERICSSON – RRUS 32 B66

UNIT WEIGHT	60 Lbs

RRU SPEC SCALE: N.T.S. 5

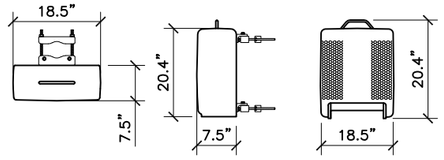


PLAN VIEW SIDE VIEW FRONT VIEW

Ericsson – RRUS 4478 B5

FREQUENCY RANGE	TX = 869–894 MHz
	RX = 824–849 MHz
TOTAL WEIGHT	56.1 Lbs

RRU SPEC SCALE: N.T.S. 6



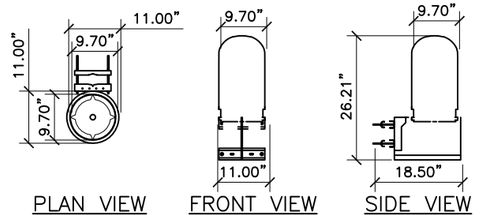
PLAN VIEW SIDE VIEW FRONT VIEW

ERICSSON – RRUS E2

WITH SOLAR SHIELD

UNIT WEIGHT	52.9 Lbs

RRU SPEC SCALE: N.T.S. 7



PLAN VIEW FRONT VIEW SIDE VIEW

RAYCAP – DC6-48-60-18-8F

TOWER DC OVER VOLTAGE PROTECTION POWER CONNECTION SOLUTION

UNIT WEIGHT	32.8 Lbs

RAYCAP SPEC SCALE: N.T.S. 8

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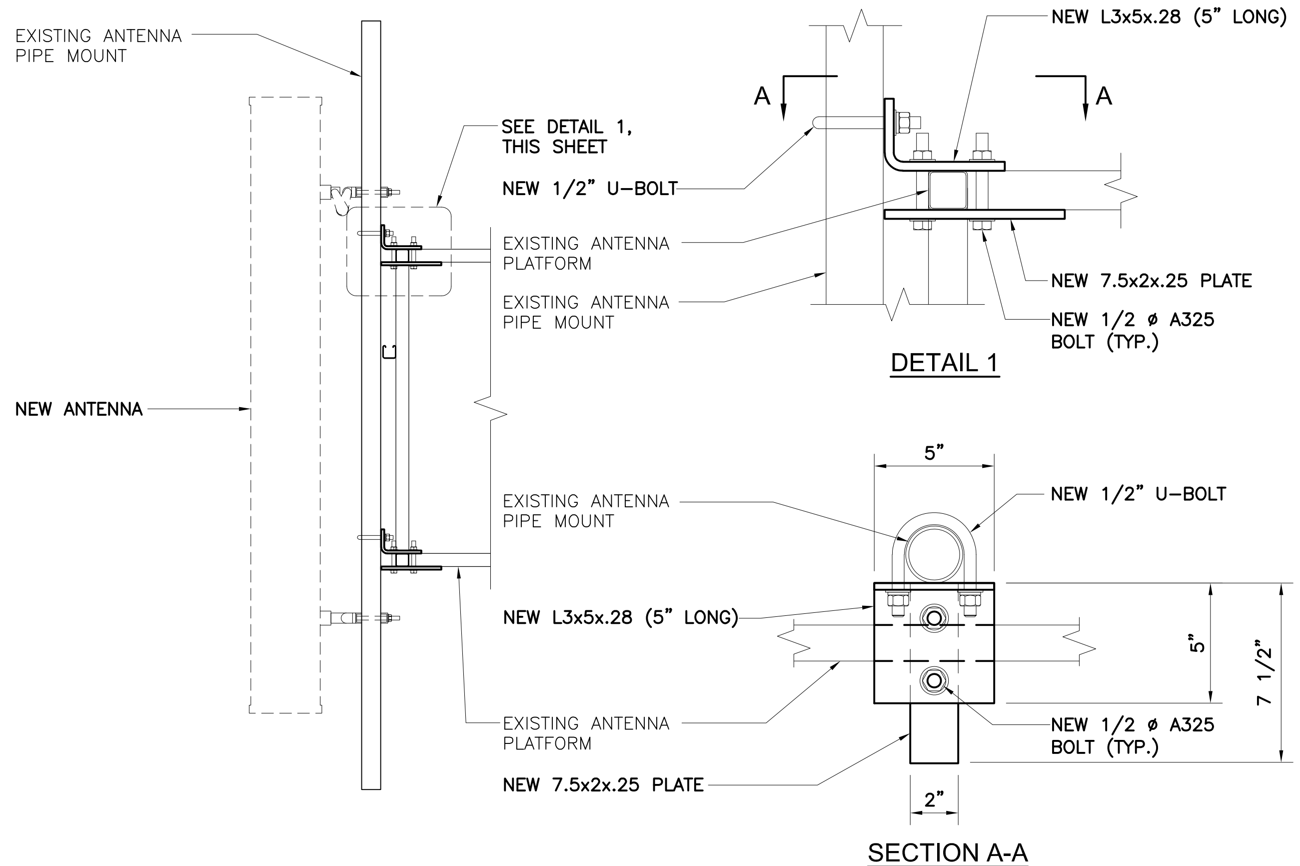
NORWALK, CT 06850

SHEET NAME
EQUIPMENT DETAILS

SHEET NUMBER
A5

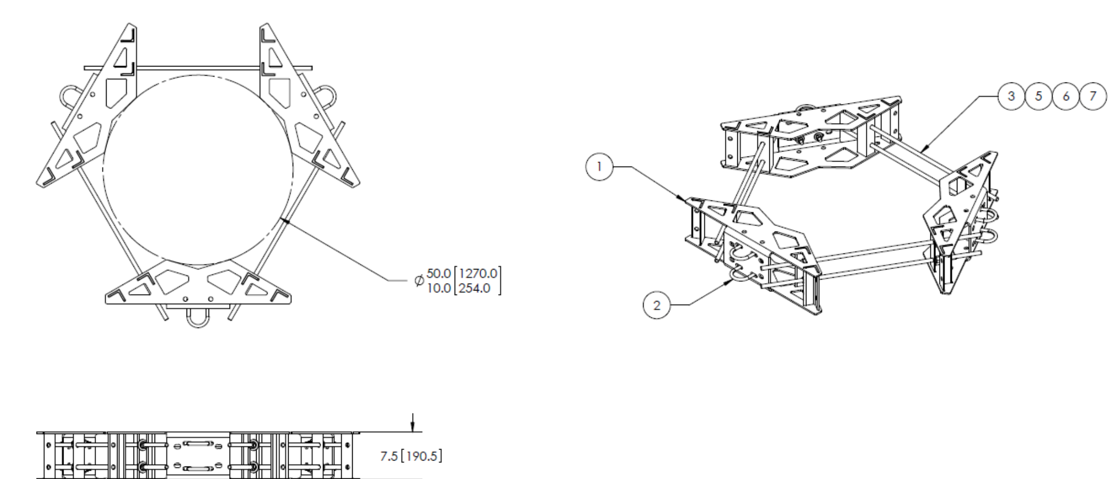
PROJECT# 2017.0278.0090



ANTENNA MOUNTING DETAIL @ NEW ANTENNA LOCATIONS (6 TYP.) SCALE: N.T.S. 1

ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	MTC328601	10-50 RRU Mount Weldment	3	27.77 LBS
2	GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT	6	0.56 LBS
3	MT-382-24	5/8" X 24" GALV THREADED ROD	6	2.07 LBS
4	MT38240	5/8" X 40" GALV THREADED ROD	6	3.46 LBS
5	GWF-05	5/8" GALV FLAT WASHER	12	0.03 LBS
6	GWL-05	5/8" GALV LOCK WASHER	12	0.00 LBS
7	GN-05	5/8" GALV HEX NUT	12	0.04 LBS
8	MT-XXX	2.375" OD PIPE (SEE TABLE)	2	21.80 LBS

NOT SHOWN



NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.
2. USE OUTER ANGLES AND 40" ROD FOR POLES 30"-50".

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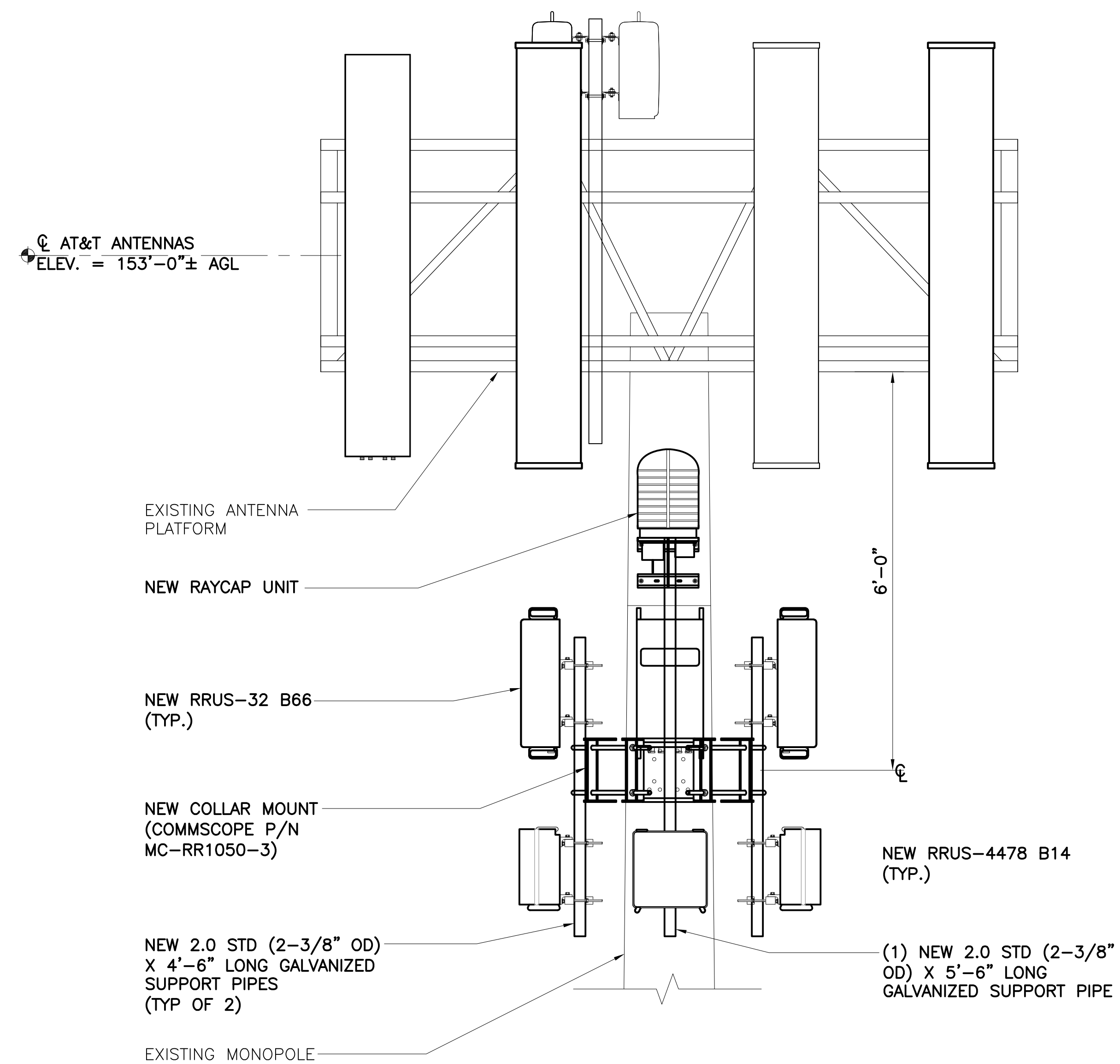
ALL DIMENSIONS ARE IN INCHES U.O.S.
TOLERANCES UNLESS OTHERWISE SPECIFIED:
.X = ± .12 ANGLES ±2°
.XX = ± .06 FRACTIONS ±1/32
.XXX= ± .03
REMOVE BURRS AND BREAK EDGES .005
DO NOT SCALE THIS PRINT

DRAWN BY: MSM	SHEET: 1 of 1	PART NUMBER: MC-RR1050-3
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: 10" – 50" RRU Monopole Mount
DATE: 11/21/11	MATERIAL: A36	DRAWING TYPE: ASSEMBLY DRAWING
REVISION: B	FINISH: GALV A123 / WEIGHT: 115.31 LBS	ANDREW® WESTCHESTER, IL. 60154 U.S.A.

NOTE:
MOUNTING PIPES MUST BE PURCHASED SEPARATELY

COLLAR MOUNT SPEC SCALE: N.T.S. 2



RRU MOUNTING DETAIL SCALE: N.T.S. 3

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SHEET NAME
MOUNTING DETAILS

SHEET NUMBER
A5A

PROJECT# 2017.0278.0090

FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIGS. DATED (7/15/17 & 3/28/18)

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT (BY ANTENNAS)	TMA/RRU UNIT (BY EQUIPMENT)	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A-1	(E) UMTS ANTENNA	7770	POWERWAVE	(2) EXISTING TMA UNITS	(2) EXISTING RRUW UNITS	143°	153'-0"	1-5/8"ø LDF7-50A	230'-0"	(2) (E) DC6-48-60-18-8F UNIT **(1) (N) DC6-48-60-18-8F UNIT**
									1-5/8"ø LDF7-50A	230'-0"	
	A-2	**(N) LTE 1C/2C/6C ANTENNA**	**QS66512-2**	**QUINTEL**	(1) EXISTING RRUS-11 UNIT (1) EXISTING RRUS-32 B2 UNIT (1) EXISTING RRUS-32 UNIT	-	30°	153'-0"	(1) EXISTING FIBER CABLE	230'-0"	
									(2) EXISTING DC POWER CABLES	230'-0"	
	A-3	**(N) LTE7C ANTENNA**	**SBNHH-1D65A**	**COMMSCOPE**	**(1) NEW RRUS-B14 4478 UNIT**	-	**30°**	**153'-0"**	**SEE ANTENNA A-4 FOR FIBER CABLE**		
									(2) NEW DC POWER CABLES	**230'-0"**	
	A-4	(E) LTE 3C/4C/5C ANTENNA	SBNHH-1D65A	COMMSCOPE	(1) EXISTING RRUS-32 UNIT	**(1) NEW RRUS-E2 UNIT** **(1) NEW RRUS-4478 B5 UNIT**	30°	153'-0"	(1) EXISTING FIBER CABLE	**230'-0"**	
									(2) EXISTING DC POWER CABLES	**230'-0"**	
BETA	B-1	(E) UMTS ANTENNA	7770	POWERWAVE	(2) EXISTING TMA UNITS	(2) EXISTING RRUW UNITS	263°	153'-0"	1-5/8"ø LDF7-50A	230'-0"	
									1-5/8"ø LDF7-50A	230'-0"	
	B-2	**(N) LTE 1C/2C/6C ANTENNA**	**QS66512-2**	**QUINTEL**	(1) EXISTING RRUS-11 UNIT (1) EXISTING RRUS-32 B2 UNIT (1) EXISTING RRUS-32 UNIT	-	150°	153'-0"	SEE ANTENNA A-2 FOR CABLE TYPE AND LENGTH		
	B-3	**(N) LTE7C ANTENNA**	**SBNHH-1D65A**	**COMMSCOPE**	**(1) NEW RRUS-B14 4478 UNIT**	-	**150°**	**153'-0"**	**SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH**		
	B-4	(E) LTE 3C/4C/5C ANTENNA	SBNHH-1D65A	COMMSCOPE	(1) EXISTING RRUS-32 UNIT	**(1) NEW RRUS-E2 UNIT** **(1) NEW RRUS-4478 B5 UNIT**	150°	153'-0"	SEE ANTENNA A-4 FOR CABLE TYPE AND LENGTH		
GAMMA	C-1	(E) UMTS ANTENNA	7770	POWERWAVE	(2) EXISTING TMA UNITS	(2) EXISTING RRUW UNITS	23°	153'-0"	1-5/8"ø LDF7-50A	230'-0"	
									1-5/8"ø LDF7-50A	230'-0"	
	C-2	**(N) LTE 1C/2C/6C ANTENNA**	**QS66512-2**	**QUINTEL**	(1) EXISTING RRUS-11 UNIT (1) EXISTING RRUS-32 B2 UNIT (1) EXISTING RRUS-32 UNIT	-	270°	153'-0"	SEE ANTENNA A-2 FOR CABLE TYPE AND LENGTH		
	C-3	**(N) LTE7C ANTENNA**	**SBNHH-1D65A**	**COMMSCOPE**	**(1) NEW RRUS-B14 4478 UNIT**	-	**270°**	**153'-0"**	**SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH**		
	C-4	(E) LTE 3C/4C/5C ANTENNA	SBNHH-1D65A	COMMSCOPE	(1) EXISTING RRUS-32 UNIT	**(1) NEW RRUS-E2 UNIT** **(1) NEW RRUS-4478 B5 UNIT**	270°	153'-0"	SEE ANTENNA A-4 FOR CABLE TYPE AND LENGTH		

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NORWALK, CT 06850

SHEET NAME
ANTENNA & CABLE CONFIGURATION

SHEET NUMBER
A6

1. CONTRACTOR IS TO REFER TO AT&T'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
2. THE SIZE, HEIGHT, AND DIRECTION OF THE ANTENNAS SHALL BE ADJUSTED TO ACHIEVE THE AZIMUTHS SPECIFIED AND LIMIT SHADOWING AND TO MEET THE SYSTEM REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY THE HEIGHT OF THE ANTENNA WITH THE AT&T WIRELESS PROJECT MANAGER.
4. VERIFY TYPE AND SIZE OF TOWER LEG PRIOR TO ORDERING ANY ANTENNA MOUNT.
5. UNLESS NOTED OTHERWISE THE CONTRACTOR MUST PROVIDE ALL MATERIAL NECESSARY.
6. ANTENNA AZIMUTHS ARE DEGREES OFF OF TRUE NORTH, BEARING CLOCKWISE, IN WHICH ANTENNA FACE IS DIRECTED. ALL ANTENNAS (AND SUPPORTING STRUCTURES AS PRACTICAL) SHALL BE ACCURATELY ORIENTED IN THE SPECIFIED DIRECTION.
7. CONTRACTOR SHALL VERIFY ALL RF INFORMATION PRIOR TO CONSTRUCTION.
8. SWEEP TEST SHALL BE PERFORMED BY GENERAL CONTRACTOR AND SUBMITTED TO AT&T WIRELESS CONSTRUCTION SPECIALIST. TEST SHALL BE PERFORMED PER AT&T WIRELESS STANDARDS.
9. CABLE LENGTHS WERE DETERMINED BASED ON THE DESIGN DRAWING. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK.
10. CONTRACTOR TO USE ROSENBERGER FIBER LINE HANGER COMPONENTS (OR ENGINEER APPROVED EQUAL).

ANTENNA AND CABLING NOTES

SCALE: N.T.S. | 1

RF, DC, & COAX CABLE MARKING LOCATIONS TABLE	
NO	LOCATIONS
1	EACH TOP-JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
2	EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
3	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER.
4	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.
5	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.

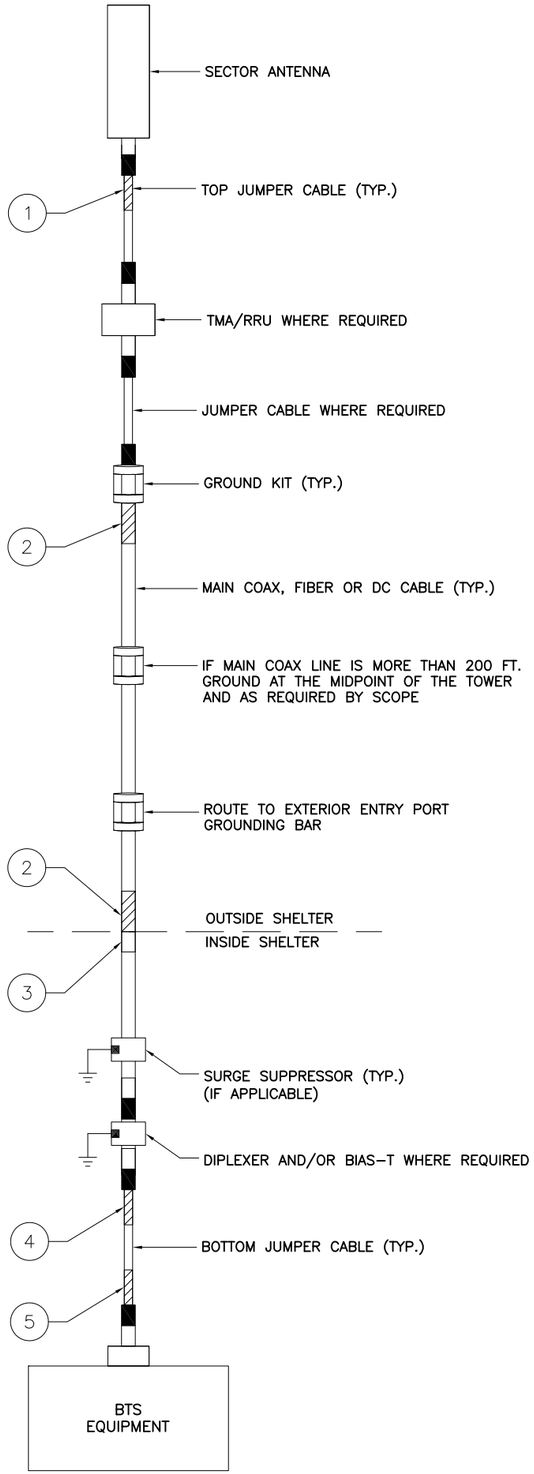
CABLE MARKING DIAGRAM

SCALE: N.T.S. | 2

1. THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE.
2. THE STANDARD IS BASED ON EIGHT COLORED TAPES-RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE, AND VIOLET. THESE TAPES MUST BE 3/4" WIDE & UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR CONTRACTOR ON SITE.
3. USING COLOR BANDS ON THE CABLES, MARK ALL RF CABLE BY SECTOR AND CABLE NUMBER AS SHOWN ON "CABLE COLOR CHART".
4. WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN TECHNOLOGIES IS ENCOUNTERED, THE CONTRACTOR SHALL REMOVE THE EXISTING COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING STANDARD. IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME, OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THIS GUIDELINE SHALL BE IMPLEMENTED AT THAT SITE REGARDLESS OF TECHNOLOGY.
5. ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) THREE WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID UNRAVELING.
6. ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM OF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE BETWEEN EACH COLOR.
7. ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
8. IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE NEW TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

CABLE MARKING NOTES

SCALE: N.T.S. | 3



CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. | 4

at&t
550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
1362 MELLON ROAD
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SCHAUMBURG, ILLINOIS 60173
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5	03/11/19	RF REDLINES	EB
6	08/26/19	REVISED	KC
7	08/28/19	REVISED	KC

I HEREBY CERTIFY THAT THESE DRAWINGS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

SITE NAME
NORWALK
WEST-CT AVE.

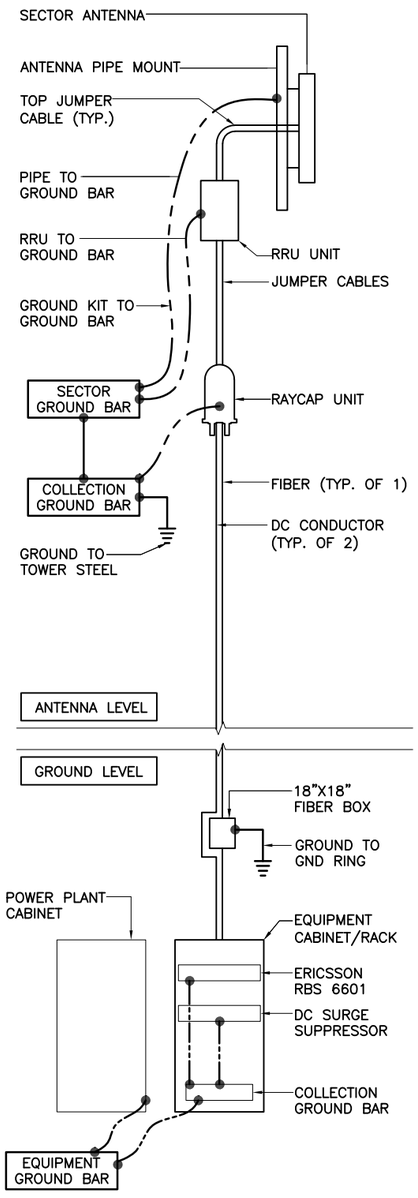
SITE NUMBER:
CTL02108

SITE ADDRESS
613 CONNECTICUT AVENUE
NORWALK, CT 06850

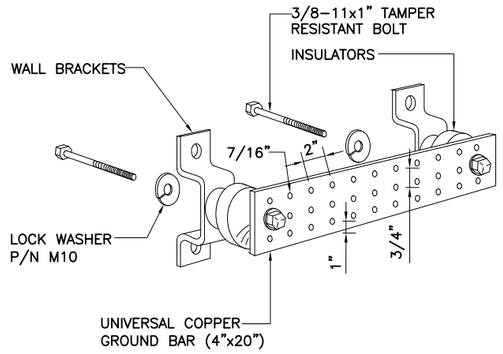
SHEET NAME
CABLE NOTES AND COLOR CODING

SHEET NUMBER
A7

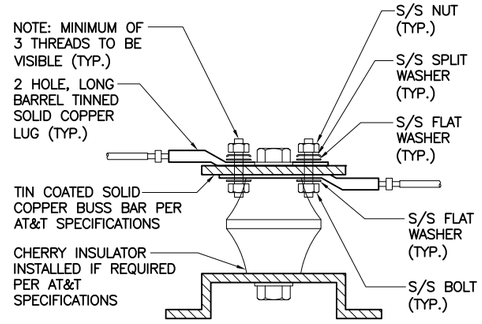
PROJECT# 2017.0278.0090



GROUNDING SCHEMATIC SCALE: N.T.S. 1



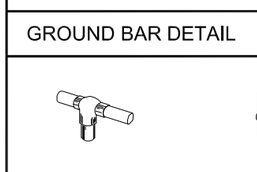
GROUND BAR DETAIL SCALE: N.T.S. 2



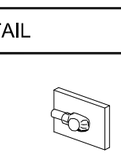
NOTES:

1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
2. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
3. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

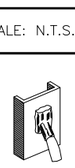
LUG DETAIL SCALE: N.T.S. 3



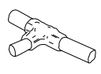
Type GT
THROUGH CABLE TO TOP OF GROUND ROD.



Type VN
HORIZONTAL CABLE TAP TO VERTICAL STEEL SURFACE OR THE SIDE OF HORIZONTAL PIPE

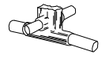


Type VV
THROUGH VERTICAL CABLE TO VERTICAL STEEL SURFACE OR TO THE SIDE OF EITHER HORIZONTAL OR VERTICAL PIPE



Type TA
TEE OF HORIZONTAL RUN AND TAP CABLES.

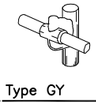
Type VS
CABLE TAP DOWN AT 45° TO VERTICAL STEEL SURFACE OR SIDE OF HORIZONTAL OR VERTICAL PIPE.



Type XB
CROSS OF HORIZONTAL CABLES. LAPPED AND NOT CUT

Type GR
CABLE TAP TO TOP OF GROUND ROD

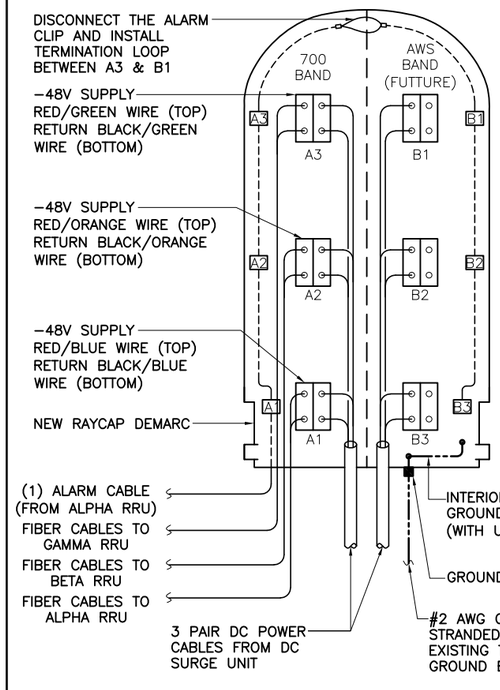
Type HS
HORIZONTAL CABLE TAP TO HORIZONTAL STEEL SURFACE OR PIPE. CABLE OFF SURFACE.



Type GY
THROUGH CABLE TO SIDE OF GROUND ROD

Type NC
THROUGH AND TAP CABLES TO GROUND ROD

EXOTHERMIC WELD DETAILS SCALE: N.T.S. 4



RAYCAP DC POWER AND ALARM DET. SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

at&t
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SUITE 550 13 AND 14
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smartlink
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SCHAUMBURG, ILLINOIS 60173
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5	03/11/19	RF REDLINES	EB
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WEST-CT AVE.

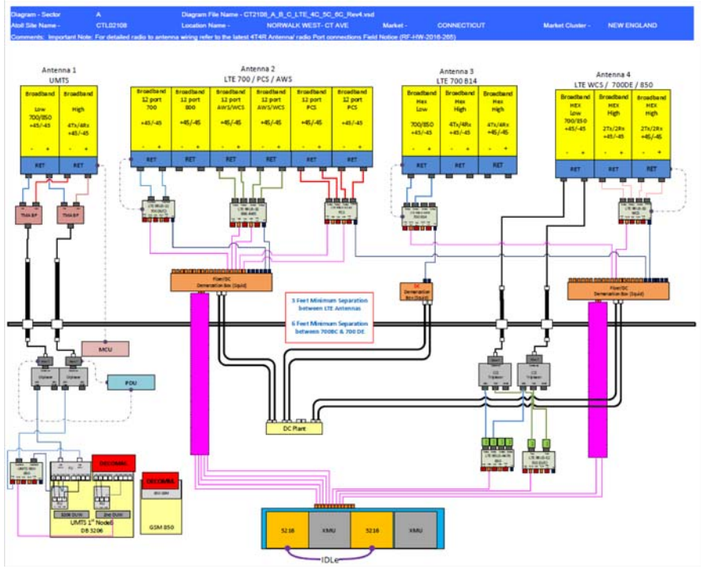
SITE NUMBER:
CTL02108

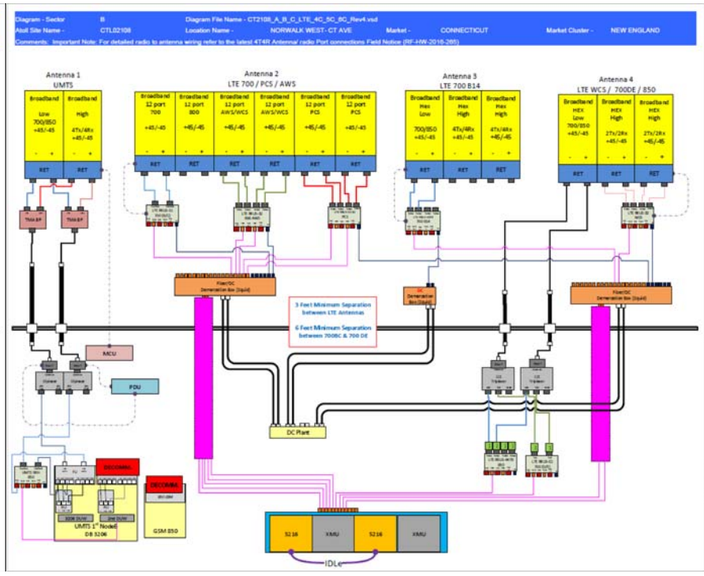
SITE ADDRESS
613 CONNECTICUT AVENUE
NORWALK, CT 06850

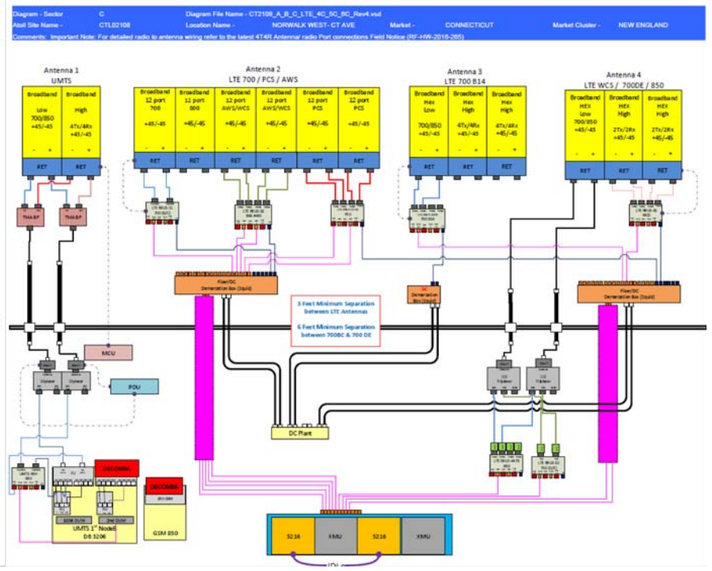
SHEET NAME
GROUNDING DETAILS

SHEET NUMBER
A8

PROJECT# 2017.0278.0090







*BASED ON RFDS V3.0, DATED (03/28/18)
LTE 4C, 5C, 6C & 7C

PLUMBING DIAGRAMS

SCALE: N.T.S.

1

at&t
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STATE OF CONNECTICUT
HENRY M. BELLAGAMBA
25358
LICENSED PROFESSIONAL ENGINEER

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SITE NUMBER:
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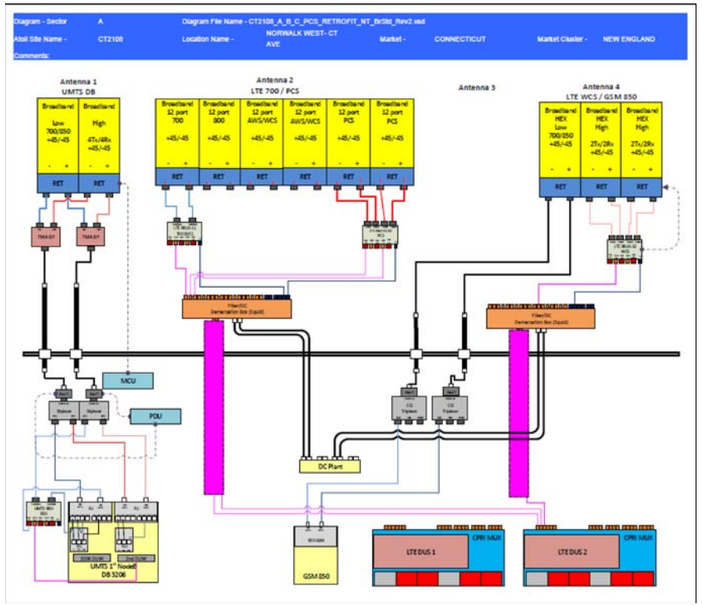
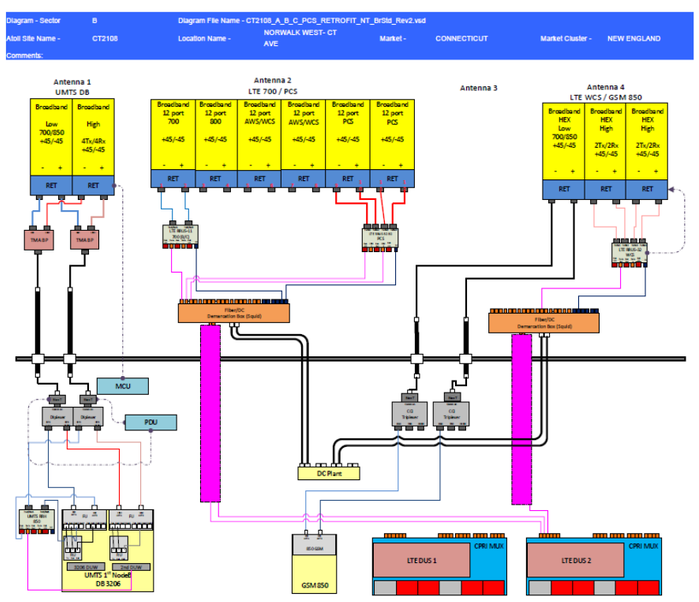
NORWALK, CT 06850

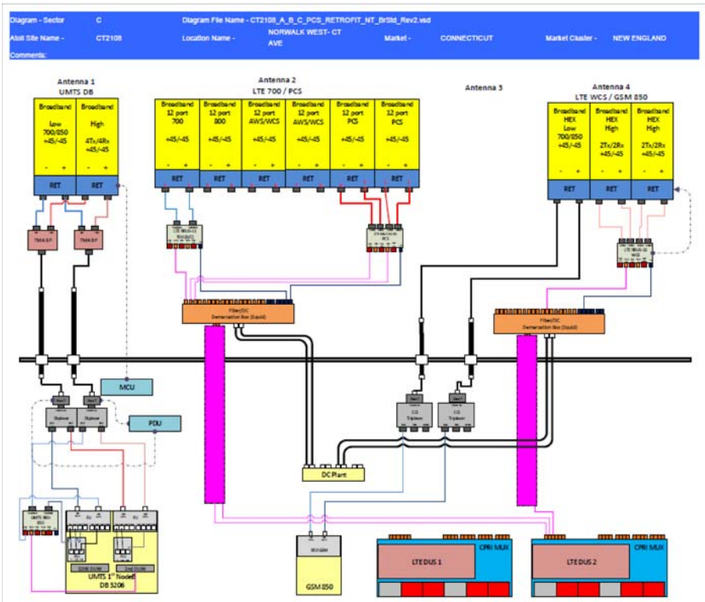
SHEET NAME
PLUMBING DIAGRAMS

SHEET NUMBER
A9

PROJECT# 2017.0278.0090







*BASED ON RFDS V4.0, DATED (07/12/2017)
RRH ADD

PLUMBING DIAGRAMS SCALE: N.T.S. 1

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SHEET NAME
PLUMBING DIAGRAMS

SHEET NUMBER
A9A

PROJECT# 2017.0278.0090

DOCKET NO. 45

AN APPLICATION SUBMITTED BY THE SOUTHERN NEW ENGLAND TELEPHONE COMPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN FAIRFIELD COUNTY.	:	CONNECTICUT SITING COUNCIL
	:	September 14, 1984

DECISION AND ORDER

Pursuant to the foregoing opinion, the Council hereby directs that a certificate of environmental compatibility and public need as required by section 16-50k of the General Statutes of Connecticut, revisions of 1958, revised to 1983, as amended, be issued to the Southern New England Telephone Company for the construction, operation, and maintenance of a telecommunications tower and associated equipment to provide cellular service at each of the following sites:

Kaechele Place, Bridgeport, Connecticut;
Connecticut Avenue, Norwalk, Connecticut;
Nells Rock Road, Shelton, Connecticut;
Newfield Avenue, Stamford, Connecticut; and
Bayberry Lane, (former Nike site), Westport, Connecticut.

The facilities shall be constructed, operated, and maintained as specified in the Council's record on this matter, and subject to the following conditions:

1. The towers shall be no taller than necessary to provide the proposed service, and in no event shall exceed

   a) 167' at the Bridgeport site,
   b) 167' at the Norwalk site,
   c) 189.5' at the Shelton site,
   d) 167' at the Stamford site,
   e) 117' at the Westport site;

2. A fence not lower than eight feet shall surround each tower and its associated equipment;

3. The applicant or its successor shall notify the Council if and when directional antennas or any other equipment is added to any of these facilities;

4. The applicant or its successor shall permit, in accordance with representations made by it during the proceeding, public or private entities to share space on the facilities, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing;
5. Unless necessary to comply with condition number six, below, no lights shall be installed on any of these towers;
6. The facilities shall be constructed in accordance with all applicable federal, state, and municipal laws and regulations;
7. The applicant shall submit a development and management plan (D&M) for the Bridgeport, Stamford, and Westport sites pursuant to sections 16-50j-85 through 16-50j-87 of the regulations of state agencies, except that irrelevant items in section 16-50j-86 need only be identified as such. The D&M plans shall include appropriate evergreen screening of the sites, erosion control measures, reseeding plans, and tree removal plans. The applicant shall consult with the Stamford Environmental Protection Board in the preparation of a drainage and erosion control plan for the Stamford tower. The applicant shall comply with the reporting requirements of section 16-50j-87 for all sites;
8. Construction activities shall take place during daylight working hours;
9. This decision and order shall be void and the towers and associated equipment approved herein shall be dismantled and

removed, or reapplication for any new use shall be made to the Connecticut Siting Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction;

10. This decision and order shall be void if all construction authorized is not completed within three years of the issuance of this decision.

Pursuant to section 16-50p of the General Statutes, we hereby direct that a copy of the opinion and decision and order be served on each person listed below. A notice of the issuance shall be published in the Bridgeport Post, the Norwalk Hour, the Stamford Advocate, and the Shelton Suburban News, and the Westport News.

The parties to this proceeding are

The Southern New England Telephone Company Room 314 227 Church Street New Haven, Connecticut 06506	(Applicant)
Attention: Mr. Peter J. Tyrrell Senior Attorney	(its attorney)
Rolnick Observatory 52 Sawyer Road Fairfield, Connecticut	represented by: Frederick H. Bump Director
Mr. Adam Norton 40 Highland Road Westport, Connecticut 06880	
Representative John Wayne Fox 13 Apple Tree Drive Stamford, Connecticut 06906	(service waived)
Mr. George C. Lenfest 4 Highland Road Westport, Connecticut	

Mr. William Seiden
First Selectman
Town of Westport
110 Myrtle Avenue
P.O. Box 549
Westport, Connecticut 06881

Mr. Arthur L. Schimel
174 Bayberry Lane
Westport, Connecticut

Mr. Seymour Bendremer
11 Apache Trail
Westport, Connecticut

Ms. Gladys Floch
32 Woody Lane
Westport, Connecticut

Ms. Helen S. Cohen
15 Highland Road
Westport, Connecticut
(service waived)

Mr. Jack Braverman
226 Bayberry Lane
Westport, Connecticut

Mr. Kevin Gavin
191 Bayberry Lane
Westport, Connecticut
(service waived)

Mr. A.B. Beiser
12 Highland Road
Westport, Connecticut

Mr. Edward V. Polusky
4 Hooper Road
Westport, Connecticut
(service waived)

Ms. Lois Schine
represented by:

Mary D. Mix, Esquire
830 Post Road - East
Suite 100
Westport, Connecticut 06880

Mr. Allen Witt
3 Apache Trail
Westport, Connecticut

Ms. Gayle Shiller
5 Apache Trail
Westport, Connecticut
(service waived)

Mrs. Ronnie Hammer
3 Hooper Road
Westport, Connecticut

Mr. Paul Rosenblatt (service waived)
7 Apache Trail
Westport, Connecticut

Mr. Henry J. Wolfson (service waived)
179 Bayberry Lane
Westport, Connecticut

Mr. Melvin H. Barr (service waived)
Planning Director
Town of Westport
110 Myrtle Avenue
P.O. Box 549
Westport, Connecticut 06881

Mr. Mark Infeld (service waived)
6 Apache Trail
Westport, Connecticut

Ms. Barbara Saipe (service waived)
Representative Town
Meeting Member
District #8
Town Hall
P.O. Box 549
Westport, Connecticut 06881

Ms. Peggy Goldenberg (service waived)
201 Bayberry Lane
Westport, Connecticut

Ms. Martha Hauhuth (service waived)
Board of Selectman
Town Hall
P.O. Box 549
Westport, Connecticut 06881

Ms. Meg Coffee
32 Otter Trail
Westport, Connecticut (service waived)

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut, this 14th day of September, 1984.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner John Downey Designee: Commissioner Peter G. Boucher	Absent
Commissioner Stanley Pac	Absent
Owen L. Clark	Yes
Fred J. Doocy	Yes
Mortimer A. Gelston	Yes
James G. Horsfall	Yes
Janet Sitty	Yes
Colin C. Tait	Absent

STATE OF CONNECTICUT)
: ss. New Britain, September 14, 1984
COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the decision and order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

Christopher S. Wood

Christopher S. Wood, Executive Director
Connecticut Siting Council