



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

December 16, 2019

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103

RE: **TS-VER-105-191107** – Cellco Partnership d/b/a Verizon Wireless request for an order to approve tower sharing at an existing telecommunications facility located at 30 Short Hills Road, Old Lyme, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) is in receipt of your correspondence of December 11, 2019 submitted in response to the Council's November 14, 2019 notification of an incomplete request for tower sharing with regard to the above-referenced matter.

The submission renders the request for tower sharing complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/IN/emr



Robidoux, Evan

From: Dandeneau, Kathleen <KDANDENEAU@RC.com>
Sent: Wednesday, December 11, 2019 10:41 AM
To: Bachman, Melanie; CSC-DL Siting Council
Cc: Baldwin, Kenneth; Mayo, Rachel
Subject: TS-VER-105-191107 - 30 Short Hills Road, Old Lyme, CT - Additional Information
Attachments: TS-VER-105-191107 - Old_001.pdf

The original has been mailed to the Siting Council.

Kathleen M. Dandeneau
Legal Administrative Assistant

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KENNETH C. BALDWIN

280 Trumbull Street
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Also admitted in Massachusetts

December 11, 2019

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

Re: **TS-VER-105-191107 – Celco Partnership d/b/a Verizon Wireless Order to Approve the Shared Use of an Existing Telecommunications Facility Located at 30 Short Hills Road, Old Lyme, Connecticut**

Dear Ms. Bachman:

In response to your November 14, 2019 letter regarding the above-referenced pending tower share request, attached is the following additional information.

1. A Mounts Analysis dated December 6, 2019, prepared by Hudson Design Group; and
2. An updated Structural Analysis Report prepared by B&T Group including the final equipment configuration (with the corrected reference to the mount manufacturer) and the percentage stress capacity of the antenna support structure and the tower.

If you have any questions or need any additional information please do not hesitate to contact me.

Sincerely,



Kenneth C. Baldwin

Enclosures

20132699-v1



December 6, 2019



99 East River Road, 9th Floor
East Hartford, CT 06108

RE: Site Name: OLD LYME RELO 2 CT
Site Address: 30 Short Hills Road
Old Lyme, CT 06371

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by VERIZON to perform a mount analysis on the proposed VERIZON antenna mount to determine its capability of supporting the following equipment loading:

- **(6) SBNHH-1D65B Antennas (72.9"x11.9"x7.1" – Wt. = 41 lbs. /each)**
- **(2) LPA-80063/4CF 5 Antennas (47.4"x15.2"x13.2" – Wt. 20 lbs. /each)**
- **(4) LPA-80080/4CF Antennas (47.2"x5.5"x13.2" – Wt. 12 lbs. /each)**
- **(3) RRH2x60-700 RRH's (21.6"x12.0"x9.0" – Wt. = 58 lbs. /each)**
- **(3) RRH 4x30 PCS RRH's (21.4"x12.0"x7.2" – Wt. = 51 lbs. /each)**
- **(3) RRH 4x45 AWS RRH's (25.8"x11.8"x7.2" – Wt. = 57 lbs. /each)**
- **(2) Junction Box (28.93"x15.73"x10.31" – Wt. 32 lbs. /each)**

**Proposed equipment shown in bold.*

Based on our analysis, we have determined that the New SitePro1 P/N RMQP-496-HK mount **IS CAPABLE** of supporting the proposed installation.

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
New Mount Rating	54	LC1	98%	PASS

This analysis was conducted in accordance with EIA/TIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the International Building Code 2015. (See the attached analysis).

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The proposed mounts will be adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to the Verizon mount must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting structure.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Hudson Design Group LLC



Michael Cabral
Vice President



Daniel P. Hamm, PE
Principal

FIELD PHOTOS:

(To be removed and replaced)





HUDSON
Design Group LLC

**Wind & Ice
Calculations**

Date: 12/6/2019
 Project Name: OLD LYME RELO 2 CT
 Designed By: LBW Checked By: MSC



2.6.5.2 Velocity Pressure Coeff:

$$K_z = 2.01 (z/z_g)^{2/\alpha}$$

$K_z =$ **1.132** $z =$ 161 (ft)
 $z_g =$ 1200 (ft)
 $\alpha =$ 7.0

$K_{zmin} \leq K_z \leq 2.01$

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_e
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.4 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$$K_{zt} = [1 + (K_e K_t / K_h)]^2$$

$$K_h = e^{(fz/H)}$$

K_{zt}	#DIV/O!
(If Category 1 then $K_{zt} = 1.0$)	
Category=	1

$K_h =$	#DIV/O!
$K_e =$	0 (from Table 2-4)
$K_t =$	0 (from Table 2-5)
f =	0 (from Table 2-5)
z =	161
H =	0 (Ht. of the crest above surrounding terrain)
$K_{zt} =$	1.00
$K_{iz} =$	1.17 (from Sec. 2.6.8)

2.6.8 Design Ice Thickness

Max Ice Thickness =

$t_i =$ 0.75 in

Importance Factor, $I_{ice} =$

$I_{ice} =$ 1.00 (from Table 2-3)

$$t_{iz} = 2.0 * t_i * I_{ice} * K_{iz} * (K_z t)^{0.35}$$

$t_{iz} =$ 1.76 in

Date: 12/6/2019
 Project Name: OLD LYME RELO 2 CT
 Designed By: LBW Checked By: MSC



2.6.7 Gust Effect Factor

2.6.7.1 Self Supporting Lattice Structures

Gh = 1.0 Latticed Structures > 600 ft

Gh = 0.85 Latticed Structures 450 ft or less

Gh = 0.85 + 0.15 [h/150 - 3.0] h = ht. of structure

h = 180 Gh = 0.85

2.6.7.2 Guyed Masts Gh = 0.85

2.6.7.3 Pole Structures Gh = 1.1

2.6.9 Appurtenances Gh = 1.0

2.6.7.4 Structures Supported on Other Structures
 (Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

Gh = 1.35 Gh = 1.00

2.6.9.2 Design Wind Force on Appurtenances

$F = q_z * Gh * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_d * V_{max}^{2*1}$

q_z = 39.65

q_{z(ice)} = 6.88

K_z = 1.132

K_{zt} = 1.0

K_d = 0.95 (from Table 2-2)

V_{max} = 120

V_{max(ice)} = 50

I = 1.0 (from Table 2-3)

I_{wice} = 1.0 (from Table 2-3)

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95

Determine Ca:

Table 2-8

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Round	C < 32 (Subcritical)	0.7	0.8	1.2
	32 ≤ C ≤ 64 (Transitional)	$3.76/(C^{0.485})$	$3.37/(C^{0.415})$	$38.4/(C^{1.0})$
	C > 64 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
 (Aspect ratio is independent of the spacing between support points of a linear appurtenance, and the section length considered to have uniform wind load).

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = 1.76 in

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/Ice)
SBNHH-1D65B Antenna	72.9	11.9	7.1	6.02	6.13	1.36	325	77
LPA-80063/4CF 5 Antenna	47.4	15.2	13.2	5.00	3.12	1.23	244	56
LPA-80080/4CF Antenna	47.2	5.5	13.2	1.80	8.58	1.45	104	32
RRH2x60-700 RRH	21.6	12.0	9.0	1.80	1.80	1.20	86	22
RRH2x60-700 RRH (Shielded)	21.6	0.1	9.0	0.01	216.00	8.37	5	36
RRH4x30 PCS RRH	21.4	12.0	7.2	1.78	1.78	1.20	85	22
RRH4x30 PCS RRH (Shielded)	21.4	0.0	7.2	0.00	0.00	1.20	0	5
RRH4x45 AWS RRH	25.8	11.8	7.2	2.11	2.19	1.20	101	26
RRH4x45 AWS RRH (Shielded)	25.8	6.3	7.2	1.13	4.10	1.27	57	17
Junction Box	28.9	15.7	10.3	3.15	1.84	1.20	150	36
2" Pipe	2.4	12.0		0.20	0.20	1.20	9	5
3" Pipe	3.5	12.0		0.29	0.29	1.20	14	6
2x2 Angle	2.0	12.0		0.17	0.17	2.00	13	8
2-1/2x2-1/2 Angle	2.5	12.0		0.21	0.21	2.00	17	9
4x4 HSS	4.0	12.0		0.33	0.33	1.25	17	7
6x1/2 Plate	6.0	12.0		0.50	0.50	2.00	40	14

WIND LOADS

Angle = **60** (deg) Ice Thickness = **1.76** in.

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
SBNMH-1D65B Antenna	72.9	11.9	7.1	6.02	3.59	6.13	10.27	1.36	1.51	325	215	249
LPA-80063/4CF 5 Antenna	47.4	15.2	13.2	5.00	4.95	3.12	3.59	1.23	1.25	244	215	222
LPA-80080/4CF Antenna	47.2	5.5	13.2	1.80	4.33	8.58	3.58	1.45	1.25	104	214	187
RRH2x60-700 RRH	21.6	12.0	9.0	1.80	1.35	1.80	2.40	1.20	1.20	86	64	70
RRH2x60-700 RRH (Shielded)	21.6	6.0	9.0	0.90	1.35	3.60	2.40	1.25	1.20	45	64	59
RRH4x30 PCS RRH	21.4	12.0	7.2	1.78	1.07	1.78	2.97	1.20	1.22	85	52	60
RRH4x30 PCS RRH (Shielded)	21.4	6.0	7.2	0.89	1.07	3.57	2.97	1.25	1.22	44	52	50
RRH4x45 AWS RRH	25.8	11.8	7.2	2.11	1.29	2.19	3.58	1.20	1.25	101	64	79
RRH4x45 AWS RRH (Shielded)	25.8	5.9	7.2	1.06	1.29	4.37	3.58	1.28	1.25	54	64	61
Junction Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	150	99	112

WIND LOADS WITH ICE:

SBNMH-1D65B Antenna	76.4	15.4	10.6	8.18	5.63	4.96	7.20	1.31	1.41	74	55	59
LPA-80063/4CF 5 Antenna	50.9	18.7	16.7	6.62	5.91	2.72	3.05	1.21	1.22	55	50	51
LPA-80080/4CF Antenna	50.7	9.0	16.7	3.18	5.89	5.63	3.03	1.34	1.22	29	50	45
RRH2x60-700 RRH	25.1	15.5	12.5	2.71	2.18	1.62	2.01	1.20	1.20	22	18	19
RRH2x60-700 RRH (Shielded)	25.1	7.8	12.5	1.35	2.18	3.24	2.01	1.23	1.20	11	18	16
RRH4x30 PCS RRH	24.9	15.5	10.7	2.68	1.85	1.61	2.33	1.20	1.20	22	15	17
RRH4x30 PCS RRH (Shielded)	24.9	7.8	10.7	1.34	1.85	3.21	2.33	1.23	1.20	11	15	14
RRH4x45 AWS RRH	29.3	15.3	10.7	3.12	2.18	1.91	2.74	1.20	1.21	26	18	20
RRH4x45 AWS RRH (Shielded)	29.3	7.7	10.7	1.56	2.18	3.83	2.74	1.26	1.21	14	18	17
Junction Box	32.4	19.2	13.8	4.33	3.11	1.69	2.35	1.20	1.20	36	26	28

Date: 12/6/2019
 Project Name: OLD LYME RELO 2 CT
 Designed By: LBW Checked By: MSC



ICE WEIGHT CALCULATIONS

Thickness of ice: 1.76 in.
 Density of ice: 56 pcf

SBNHH-1D65B Antenna

Weight of ice based on total radial SF area:
 Height (in): 72.9
 Width (in): 11.9
 Depth (in): 7.1
 Total weight of ice on object: 204 lbs
 Weight of object: 41.0 lbs
Combined weight of ice and object: 245 lbs

LPA-80063/4CF 5 Antenna

Weight of ice based on total radial SF area:
 Height (in): 47.4
 Width (in): 15.2
 Depth (in): 13.2
 Total weight of ice on object: 186 lbs
 Weight of object: 20.0 lbs
Combined weight of ice and object: 206 lbs

LPA-80080/4CF Antenna

Weight of ice based on total radial SF area:
 Height (in): 47.2
 Width (in): 5.5
 Depth (in): 13.2
 Total weight of ice on object: 136 lbs
 Weight of object: 12.0 lbs
Combined weight of ice and object: 148 lbs

RRH2x60-700 RRH

Weight of ice based on total radial SF area:
 Height (in): 21.6
 Width (in): 12.0
 Depth (in): 9.0
 Total weight of ice on object: 65 lbs
 Weight of object: 58.0 lbs
Combined weight of ice and object: 123 lbs

RRH4x30 PCS RRH

Weight of ice based on total radial SF area:
 Height (in): 21.4
 Width (in): 12.0
 Depth (in): 7.2
 Total weight of ice on object: 60 lbs
 Weight of object: 51.0 lbs
Combined weight of ice and object: 111 lbs

RRH4x45 AWS RRH

Weight of ice based on total radial SF area:
 Height (in): 25.8
 Width (in): 11.8
 Depth (in): 7.2
 Total weight of ice on object: 72 lbs
 Weight of object: 57.0 lbs
Combined weight of ice and object: 129 lbs

Junction Box

Weight of ice based on total radial SF area:
 Height (in): 28.9
 Width (in): 15.7
 Depth (in): 10.3
 Total weight of ice on object: 106 lbs
 Weight of object: 32.0 lbs
Combined weight of ice and object: 138 lbs

2" pipe

Per foot weight of ice:
 diameter (in): 2.38
Per foot weight of ice on object: 9 plf

3" Pipe

Per foot weight of ice:
 diameter (in): 3.5
Per foot weight of ice on object: 11 plf

L 2x2 Angles

Weight of ice based on total radial SF area:
 Height (in): 2
 Width (in): 2
Per foot weight of ice on object: 10 plf

L 2-1/2x2-1/2 Angles

Weight of ice based on total radial SF area:
 Height (in): 2.5
 Width (in): 2.5
Per foot weight of ice on object: 11 plf

HSS 4x4

Weight of ice based on total radial SF area:
 Height (in): 4
 Width (in): 4
Per foot weight of ice on object: 16 plf

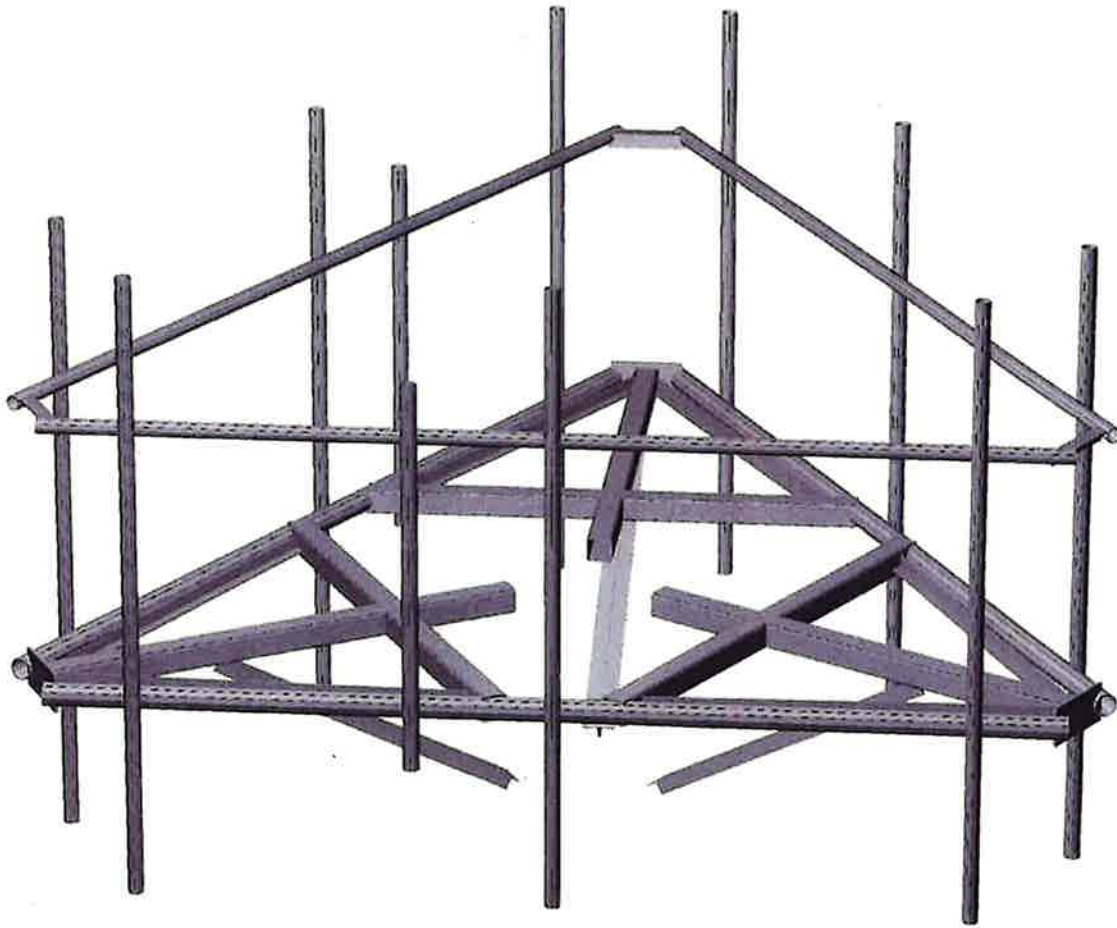
PL 6x1/2

Weight of ice based on total radial SF area:
 Height (in): 6
 Width (in): 0.5
Per foot weight of ice on object: 17 plf



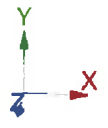
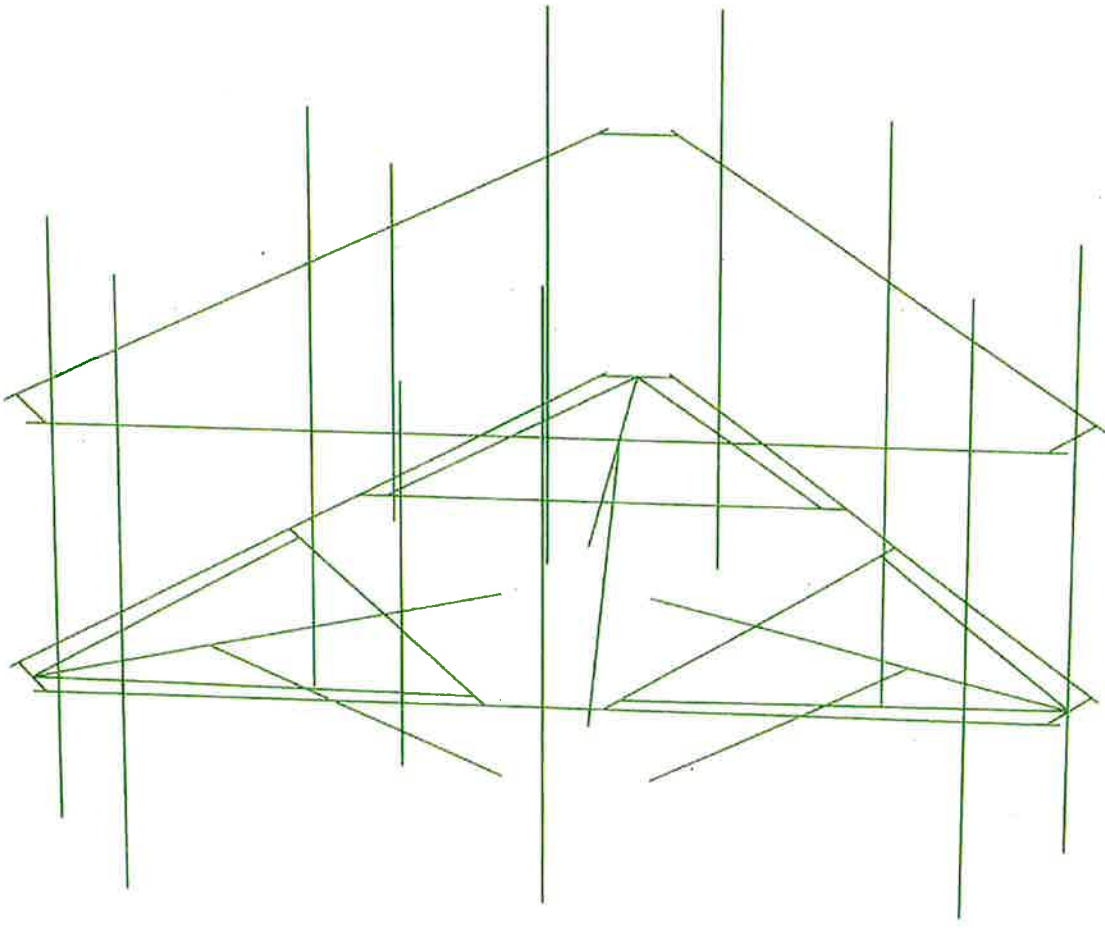
HUDSON
Design Group LLC

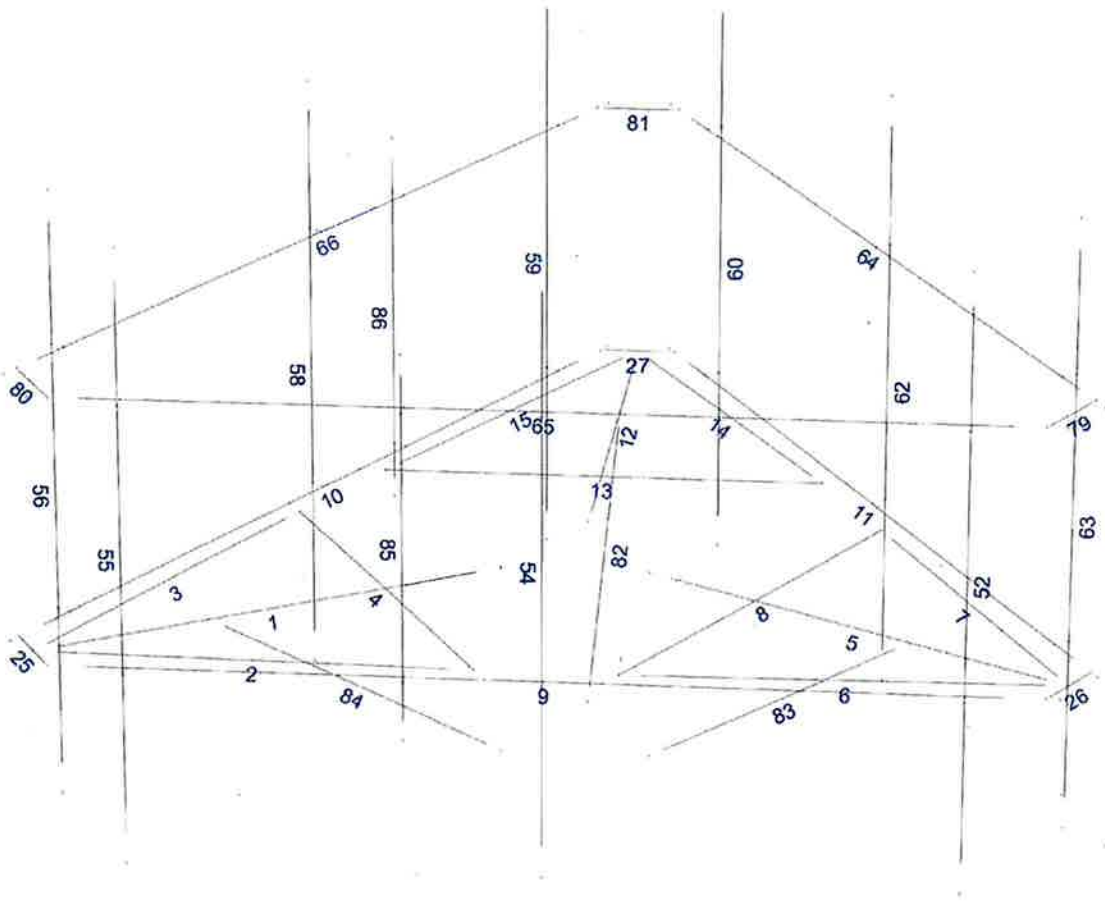
**New Mount
Calculations**



Design status

-  Not designed
-  Error on design
-  Design O.K.
-  With warnings





Current Date: 12/6/2019 4:50 PM

Units system: English

File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\VERIZON\CT\OLD LYME RELO 2 CT\MACRO\O1 LYME RELO 2 CT (MACRO).retx

Load data

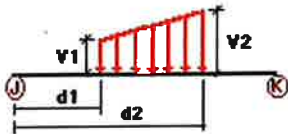
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wo	Wind Load (No Ice)	No	WIND
Wi	Wind Load (With Ice)	No	WIND
Di	Ice Load	No	LL

Distributed force on members



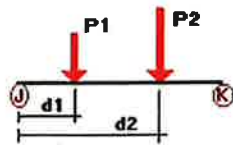
Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%	
DL	1	y	-0.01	0.00	25.00	Yes	0.00	No	
	2	y	-0.01	0.00	0.00	No	0.00	No	
	3	y	-0.01	0.00	0.00	No	0.00	No	
	4	y	-0.01	0.00	0.00	No	0.00	No	
	5	y	-0.01	0.00	25.00	Yes	0.00	No	
	6	y	-0.01	0.00	0.00	No	0.00	No	
	7	y	-0.01	0.00	0.00	No	0.00	No	
	8	y	-0.01	0.00	0.00	No	0.00	No	
	12	y	-0.01	0.00	25.00	Yes	0.00	No	
	13	y	-0.01	0.00	0.00	No	0.00	No	
	14	y	-0.01	0.00	0.00	No	0.00	No	
	15	y	-0.01	0.00	0.00	No	0.00	No	
	Wo	1	z	-0.017	0.00	0.00	No	0.00	No
		2	z	-0.013	0.00	0.00	No	0.00	No
		3	z	-0.013	0.00	0.00	No	0.00	No
4		z	-0.017	0.00	0.00	No	0.00	No	
5		z	-0.017	0.00	0.00	No	0.00	No	
6		z	-0.013	0.00	0.00	No	0.00	No	
7		z	-0.013	0.00	0.00	No	0.00	No	
8		z	-0.017	0.00	0.00	No	0.00	No	
9		z	-0.014	0.00	0.00	No	0.00	No	
10		z	-0.014	0.00	0.00	No	0.00	No	
11		z	-0.014	0.00	0.00	No	0.00	No	
12		z	-0.017	0.00	0.00	No	0.00	No	

Di

13	z	-0.017	0.00	0.00	No	0.00	No
14	z	-0.013	0.00	0.00	No	0.00	No
15	z	-0.013	0.00	0.00	No	0.00	No
25	z	-0.04	0.00	0.00	No	0.00	No
26	z	-0.04	0.00	0.00	No	0.00	No
27	z	-0.04	0.00	0.00	No	0.00	No
56	z	-0.009	0.00	0.00	No	0.00	No
58	z	-0.009	0.00	0.00	No	0.00	No
59	z	-0.009	0.00	0.00	No	0.00	No
60	z	-0.009	0.00	0.00	No	0.00	No
62	z	-0.009	0.00	0.00	No	0.00	No
63	z	-0.009	0.00	0.00	No	0.00	No
64	z	-0.009	0.00	0.00	No	0.00	No
65	z	-0.009	0.00	0.00	No	0.00	No
66	z	-0.009	0.00	0.00	No	0.00	No
79	z	-0.017	0.00	0.00	No	0.00	No
80	z	-0.017	0.00	0.00	No	0.00	No
81	z	-0.017	0.00	0.00	No	0.00	No
82	z	-0.017	0.00	0.00	No	0.00	No
83	z	-0.017	0.00	0.00	No	0.00	No
84	z	-0.017	0.00	0.00	No	0.00	No
85	z	-0.009	0.00	0.00	No	0.00	No
86	z	-0.009	0.00	0.00	No	0.00	No
1	y	-0.016	0.00	0.00	No	0.00	No
2	y	-0.01	0.00	0.00	No	0.00	No
3	y	-0.01	0.00	0.00	No	0.00	No
4	y	-0.016	0.00	0.00	No	0.00	No
5	y	-0.016	0.00	0.00	No	0.00	No
6	y	-0.01	0.00	0.00	No	0.00	No
7	y	-0.01	0.00	0.00	No	0.00	No
8	y	-0.016	0.00	0.00	No	0.00	No
9	y	-0.011	0.00	0.00	No	0.00	No
10	y	-0.011	0.00	0.00	No	0.00	No
11	y	-0.011	0.00	0.00	No	0.00	No
12	y	-0.016	0.00	0.00	No	0.00	No
13	y	-0.016	0.00	0.00	No	0.00	No
14	y	-0.01	0.00	0.00	No	0.00	No
15	y	-0.01	0.00	0.00	No	0.00	No
25	y	-0.017	0.00	0.00	No	0.00	No
26	y	-0.017	0.00	0.00	No	0.00	No
27	y	-0.017	0.00	0.00	No	0.00	No
52	y	-0.009	0.00	0.00	No	0.00	No
54	y	-0.009	0.00	0.00	No	0.00	No
55	y	-0.009	0.00	0.00	No	0.00	No
56	y	-0.009	0.00	0.00	No	0.00	No
58	y	-0.009	0.00	0.00	No	0.00	No
59	y	-0.009	0.00	0.00	No	0.00	No
60	y	-0.009	0.00	0.00	No	0.00	No
62	y	-0.009	0.00	0.00	No	0.00	No
63	y	-0.009	0.00	0.00	No	0.00	No
64	y	-0.009	0.00	0.00	No	0.00	No
65	y	-0.009	0.00	0.00	No	0.00	No
66	y	-0.009	0.00	0.00	No	0.00	No
79	y	-0.011	0.00	0.00	No	0.00	No
80	y	-0.011	0.00	0.00	No	0.00	No
81	y	-0.011	0.00	0.00	No	0.00	No
82	y	-0.011	0.00	0.00	No	0.00	No
83	y	-0.011	0.00	0.00	No	0.00	No
84	y	-0.011	0.00	0.00	No	0.00	No
85	y	-0.009	0.00	0.00	No	0.00	No

86 y -0.009 0.00 0.00 No 0.00 No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	52	y	-0.01	3.00	No
		y	-0.01	5.00	No
		y	-0.058	4.00	No
	54	y	-0.041	1.50	No
		y	-0.041	6.50	No
		y	-0.051	4.00	No
	55	y	-0.01	3.00	No
		y	-0.01	5.00	No
		y	-0.057	4.00	No
	56	y	-0.006	3.00	No
		y	-0.006	5.00	No
		y	-0.058	4.00	No
	58	y	-0.041	1.50	No
		y	-0.041	6.50	No
		y	-0.051	4.00	No
	59	y	-0.006	3.00	No
		y	-0.006	5.00	No
		y	-0.057	4.00	No
	60	y	-0.01	3.00	No
		y	-0.01	5.00	No
		y	-0.058	4.00	No
	62	y	-0.041	1.50	No
		y	-0.041	6.50	No
		y	-0.051	4.00	No
63	y	-0.01	3.00	No	
	y	-0.01	5.00	No	
	y	-0.057	4.00	No	
85	y	-0.032	2.50	No	
		-0.032	2.50	No	
Wo	52	z	-0.122	3.00	No
		z	-0.122	5.00	No
		z	-0.005	4.00	No
	54	z	-0.325	1.50	No
		z	-0.325	6.50	No
		z	-0.122	3.00	No
	55	z	-0.122	5.00	No
		z	-0.057	4.00	No
		z	-0.093	3.00	No
	56	z	-0.093	5.00	No
		z	-0.059	4.00	No
		z	-0.243	1.50	No
58	z	-0.243	6.50	No	
	z	-0.05	4.00	No	
	z	-0.093	3.00	No	

		z	-0.093	5.00	No
		z	-0.061	4.00	No
60		z	-0.111	3.00	No
		z	-0.111	5.00	No
		z	-0.059	4.00	No
62		z	-0.243	1.50	No
		z	-0.243	6.50	No
		z	-0.05	4.00	No
63		z	-0.111	3.00	No
		z	-0.111	5.00	No
		z	-0.061	4.00	No
85		z	-0.15	2.50	No
86		z	-0.112	2.50	No
WI	52	z	-0.028	3.00	No
		z	-0.028	5.00	No
		z	-0.036	4.00	No
54		z	-0.077	1.50	No
		z	-0.077	6.50	No
		z	-0.005	4.00	No
55		z	-0.028	3.00	No
		z	-0.028	5.00	No
		z	-0.017	4.00	No
56		z	-0.022	3.00	No
		z	-0.022	5.00	No
		z	-0.016	4.00	No
58		z	-0.059	1.50	No
		z	-0.059	6.50	No
		z	-0.014	4.00	No
59		z	-0.022	3.00	No
		z	-0.022	5.00	No
		z	-0.017	4.00	No
60		z	-0.026	3.00	No
		z	-0.026	5.00	No
		z	-0.016	4.00	No
62		z	-0.059	1.50	No
		z	-0.059	6.50	No
		z	-0.014	4.00	No
63		z	-0.026	3.00	No
		z	-0.026	5.00	No
		z	-0.017	4.00	No
85		z	-0.036	2.50	No
86		z	-0.028	2.50	No
Di	52	y	-0.093	3.00	No
		y	-0.093	5.00	No
		y	-0.065	4.00	No
54		y	-0.204	1.50	No
		y	-0.204	6.50	No
		y	-0.06	4.00	No
55		y	-0.093	3.00	No
		y	-0.093	5.00	No
		y	-0.072	4.00	No
56		y	-0.068	3.00	No
		y	-0.068	5.00	No
		y	-0.065	4.00	No
58		y	-0.204	1.50	No
		y	-0.204	6.50	No
		y	-0.06	4.00	No
59		y	-0.068	3.00	No
		y	-0.068	5.00	No
		y	-0.072	4.00	No

60	y	-0.093	3.00	No
	y	-0.093	5.00	No
	y	-0.065	4.00	No
62	y	-0.204	1.50	No
	y	-0.204	6.50	No
	y	-0.06	4.00	No
63	y	-0.093	3.00	No
	y	-0.093	5.00	No
	y	-0.072	4.00	No
85	y	-0.106	2.50	No
86	y	-0.106	2.50	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (No Ice)	No	0.00	0.00	0.00
Wi	Wind Load (With Ice)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wo	0.00	0.00	0.00
Wi	0.00	0.00	0.00
Di	0.00	0.00	0.00



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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+1.6Wo

LC2=0.9DL+1.6Wo

LC3=1.2DL+Wi+Di

LC4=1.2DL

LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
<i>HSS_SQR 4X4X1_4</i>		1	LC1 at 0.00%	0.24	OK	Eq. H1-1b
		4	LC3 at 50.00%	0.19	OK	Eq. H1-1b
		5	LC3 at 64.58%	0.18	OK	Eq. H1-1b
		8	LC3 at 50.00%	0.18	OK	Eq. H1-1b
		12	LC1 at 64.58%	0.23	OK	Eq. H1-1b
		13	LC3 at 50.00%	0.18	OK	Eq. H1-1b
<i>L 2-1_2X2-1_2X3_16</i>		79	LC1 at 0.00%	0.29	OK	Sec. F1
		80	LC2 at 0.00%	0.28	OK	Sec. F1
		81	LC1 at 100.00%	0.32	OK	Eq. H2-1
<i>L 2X2X1_4</i>		2	LC3 at 0.00%	0.28	OK	Eq. H2-1
		3	LC3 at 0.00%	0.25	OK	Eq. H2-1
		6	LC3 at 0.00%	0.27	OK	Eq. H2-1
		7	LC3 at 0.00%	0.24	OK	Eq. H2-1
		14	LC1 at 100.00%	0.46	OK	Eq. H2-1
		15	LC1 at 100.00%	0.44	OK	Eq. H2-1
<i>PIPE 2x0.154</i>		52	LC1 at 66.67%	0.47	OK	Eq. H1-1b
		54	LC1 at 66.67%	0.98	OK	Eq. H1-1b
		55	LC2 at 66.67%	0.37	OK	Eq. H1-1b
		56	LC1 at 66.67%	0.52	OK	Eq. H1-1b
		58	LC2 at 66.67%	0.78	OK	Eq. H1-1b
		59	LC1 at 66.67%	0.58	OK	Eq. H1-1b
		60	LC1 at 66.67%	0.67	OK	Eq. H1-1b
		62	LC2 at 66.67%	0.90	OK	Eq. H1-1b
		63	LC1 at 66.67%	0.64	OK	Eq. H1-1b
		64	LC1 at 9.38%	0.45	OK	Eq. H1-1b
		65	LC1 at 8.93%	0.32	OK	Eq. H1-1b
		66	LC1 at 50.89%	0.41	OK	Eq. H1-1b
		85	LC1 at 83.33%	0.80	OK	Eq. H1-1b
		86	LC2 at 83.33%	0.62	OK	Eq. H1-1b
<i>PIPE 3x0.216</i>		9	LC1 at 43.75%	0.31	OK	Eq. H3-6
		10	LC1 at 9.72%	0.20	OK	Eq. H1-1b
		11	LC2 at 9.38%	0.23	OK	Eq. H1-1b
<i>PL 6X1/2</i>		25	LC2 at 50.00%	0.18	OK	Eq. H1-1b
		26	LC2 at 46.88%	0.16	OK	Eq. H1-1b
		27	LC1 at 50.00%	0.25	OK	Eq. H1-1b
<i>T2L 2-1_2X2-1_2X3_16</i>		82	LC1 at 0.00%	0.45	OK	Eq. H2-1
		83	LC3 at 0.00%	0.35	OK	Eq. H2-1



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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
2	-0.7253	0.00	4.0896	0
4	-6.25	0.00	4.0896	0
5	-6.3333	0.00	3.6566	0
6	-6.5833	0.00	3.2236	0
7	-3.7376	0.00	-1.128	0
8	-3.9043	0.00	-1.4166	0
9	-0.892	0.00	3.8009	0
10	-6.6667	0.00	3.3679	0
11	-3.179	0.00	-2.6729	0
12	-2.8457	0.00	-2.6729	0
13	-0.50	0.00	-7.3131	0
14	-0.4167	0.00	-7.4574	0
17	0.7253	0.00	4.0896	0
18	6.0833	0.00	4.0896	0
19	6.25	0.00	4.0896	0
20	6.3333	0.00	3.6566	0
21	6.5833	0.00	3.2236	0
22	3.7376	0.00	-1.128	0
23	3.9043	0.00	-1.4166	0
24	0.892	0.00	3.8009	0
25	6.6667	0.00	3.3679	0

26	3.179	0.00	-2.6729	0
27	2.8457	0.00	-2.6729	0
28	0.50	0.00	-7.3131	0
29	0.4167	0.00	-7.4574	0
32	0.00	0.00	-7.3131	0
51	-6.2717	5.50	2.2838	0
53	-1.1581	5.50	-6.5733	0
63	-6.2717	-2.50	2.2838	0
67	-1.1581	-2.50	-6.5733	0
69	0.9427	0.00	0.5443	0
70	0.00	0.00	-1.0885	0
71	-0.9427	0.00	0.5443	0
73	-3.7149	5.50	-2.1448	0
83	-3.7149	-2.50	-2.1448	0
92	1.1581	5.50	-6.5733	0
93	6.2717	5.50	2.2838	0
94	1.1581	-2.50	-6.5733	0
95	6.2717	-2.50	2.2838	0
97	3.7149	5.50	-2.1448	0
99	3.7149	-2.50	-2.1448	0
108	5.1136	5.50	4.2896	0
109	-5.1136	5.50	4.2896	0
110	5.1136	-2.50	4.2896	0
111	-5.1136	-2.50	4.2896	0
113	0.00	5.50	4.2896	0
115	0.00	-2.50	4.2896	0
148	0.4167	3.50	-7.4574	0
149	6.6667	3.50	3.3679	0
150	-6.25	3.50	4.0896	0
151	6.25	3.50	4.0896	0
152	-6.6667	3.50	3.3679	0
153	-0.4167	3.50	-7.4574	0
154	6.00	3.50	4.0896	0
155	6.5416	3.50	3.1514	0
156	-6.5416	3.50	3.1514	0
157	-6.00	3.50	4.0896	0
158	0.5417	3.50	-7.2409	0
159	-0.5417	3.50	-7.2409	0
160	0.9427	-2.50	0.5443	0
161	0.00	-2.50	-1.0885	0
162	-0.9427	-2.50	0.5443	0
163	0.00	0.00	-5.00	0
164	4.3301	0.00	2.50	0
165	-4.3301	0.00	2.50	0
171	-1.7045	-0.75	4.2896	0
172	-1.7045	4.25	4.2896	0
177	-2.8626	-0.75	-3.621	0
178	-2.8626	4.25	-3.621	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
69	1	1	1	1	1	1
70	1	1	1	1	1	1
71	1	1	1	1	1	1
160	1	1	1	1	1	1
161	1	1	1	1	1	1
162	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	71	5		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
2	5	9		L 2X2X1_4	A36	0.00	0.00	0.00
3	5	7		L 2X2X1_4	A36	0.00	0.00	0.00
4	8	2		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
5	69	20		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
6	20	24		L 2X2X1_4	A36	0.00	0.00	0.00
7	20	22		L 2X2X1_4	A36	0.00	0.00	0.00
8	23	17		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
9	4	19		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
10	10	14		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
11	29	25		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
12	70	32		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
13	11	26		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
14	27	32		L 2X2X1_4	A36	0.00	0.00	0.00
15	12	32		L 2X2X1_4	A36	0.00	0.00	0.00
25	6	3		PL 6X1/2	A36	0.00	0.00	0.00
26	18	21		PL 6X1/2	A36	0.00	0.00	0.00
27	28	13		PL 6X1/2	A36	0.00	0.00	0.00
52	108	110		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
54	113	115		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
55	109	111		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
56	51	63		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
58	73	83		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
59	53	67		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
60	92	94		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
62	97	99		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
63	93	95		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
64	148	149		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
65	150	151		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
66	152	153		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
79	154	155		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
80	156	157		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
81	158	159		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
82	163	161		T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
83	164	160		T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
84	165	162		T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
85	172	171		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
86	178	177		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
2	270.00	0	0.00	0.00	0.00
4	180.00	0	0.00	0.00	0.00
7	270.00	0	0.00	0.00	0.00
8	90.00	0	0.00	0.00	0.00
13	90.00	0	0.00	0.00	0.00
14	270.00	0	0.00	0.00	0.00
52	0.00	2	1.00	0.00	0.00
54	0.00	2	1.00	0.00	0.00
55	0.00	2	1.00	0.00	0.00
56	0.00	2	1.00	0.00	0.00
58	0.00	2	1.00	0.00	0.00
59	0.00	2	1.00	0.00	0.00
60	0.00	2	1.00	0.00	0.00
62	0.00	2	1.00	0.00	0.00
63	0.00	2	1.00	0.00	0.00
79	90.00	0	0.00	0.00	0.00
80	90.00	0	0.00	0.00	0.00
81	90.00	0	0.00	0.00	0.00
85	0.00	2	-1.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
82	0.00	-2.00	0.00	0.00	0.00	0.00
83	0.00	-2.00	0.00	0.00	0.00	0.00
84	0.00	-2.00	0.00	0.00	0.00	0.00



Date: **November 27, 2019**

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Crown Castle
3530 Toringdon Way
Charlotte, NC 28277

B+T Group
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(918) 587-4630

Subject: **Structural Analysis Report**

Carrier Designation: **Verizon Wireless Co-Locate**
Carrier Site Name: Old Lyme Relo 2

Crown Castle Designation: **Crown Castle BU Number:** 876337
Crown Castle Site Name: Shoreline Sanitation
Crown Castle JDE Job Number: 541832
Crown Castle Work Order Number: 1813198
Crown Castle Order Number: 465673 Rev. 6

Engineering Firm Designation: **B+T Group Project Number:** 85773.006.01

Site Data: **30 Short Hills Road, Old Lyme, New London County, CT**
Latitude 41° 19' 7.6", Longitude -72° 16' 14.6"
180 Foot - Monopole Tower

Dear Amanda D Brown,

B+T Group is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above-mentioned tower.

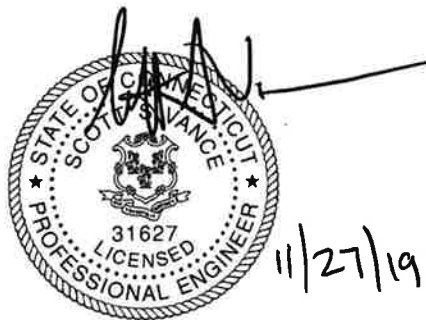
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Proposed Equipment Configuration **Sufficient Capacity - 87.7%**

This analysis utilizes an ultimate 3-second gust wind speed of 135 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: Jacob Johnson, E.I.T.

Respectfully submitted by: B+T Engineering, Inc.
COA: PEC.0001564; Expires: 02/10/2020



Scott S. Vance, P.E.

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1) INTRODUCTION

This is a 180 ft. monopole designed by Rohn in January 1997 and mapped by Tower Engineering Professionals in December 2007. The monopole was originally designed for a wind speed of 85 mph per TIA/EIA-222-E. This monopole has been modified by B+T Engineering Inc. in May 2009 and those modifications were incorporated in this analysis. Modifications include addition of Bridge Stiffeners and channel reinforcement.

2) ANALYSIS CRITERIA

TIA-222 Revision:TIA-222-H
Risk Category:II
Wind Speed: 135 mph
Exposure Category:B
Topographic Factor:1
Ice Thickness: 1.5 in
Wind Speed with Ice: 50 mph
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)
161.0	161.0	3	Alcatel Lucent	PCS B25 RRH4X30	8	1-5/8
		3	Alcatel Lucent	RRH2X60-700		
		3	Alcatel Lucent	RRH4X45-AWS4 B66		
		2	Antel	LPA-80063/4CF-5		
		4	Antel	LPA-80080/4CF		
		2	Commscope	RC3DC-3315-PF-48		
		6	Commscope	SBNHH-1D65B		
		1	Site Pro 1	RMQP-496-HK		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
177.0	179.0	3	Alcatel Lucent	800MHZ 2X50W RRH W/Filter	4	1-1/4
		3	Alcatel Lucent	PCS 1900MHZ 4X45W-65MHZ		
		3	Alcatel Lucent	TD-RRH8X20-25		
		3	Alcatel Lucent	TME-PCS 1900MHZ 4X45W-65MHZ		
		3	Rfs Celwave	APXVSPP18-C-A20		
		3	Rfs Celwave	APXVTM14-C-120		
	177.0	1	--	Platform Mount [LP 502-1]		
151.0	151.0	3	Kathrein	800 10504	6	1-5/8
		1	--	T-Arm Mount [TA 602-3]		
136.0	136.0	1	ShivelyLabs	6812B-1	1	1/2
		1	--	Side Arm Mount [SO 701-1]		
118.0	121.0	1	Decibel	DB806-XT	1	7/8
	118.0	1	--	Side Arm Mount [SO 701-1]		
101.0	101.0	1	Lucent	KS24019-L112A	1	1/2
		1	--	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Online Order Information	Verizon Wireless Co-Locate, Rev# 6	465673	CCI Sites
Tower Manufacturer Drawing	Rohn Engg. File No-347385W	2172538	CCI Sites
Tower Mapping	TEP, Project No. 072115		
Tower Modification Drawing	B+T Group & Aero Solutions, Project No. 79934	2434696	CCI Sites
Post Modification Inspection		2434695	CCI Sites
Foundation Mapping	Vertical Solutions, Project No. 070986	2259251	CCI Sites
Geotech Report	CHA, Project No.5835.07.19	1531891	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 09/25/2019	CCI Sites

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.

3.2) Assumptions

- 1) The tower and structures were built and have been maintained in accordance with the manufacturer's specification.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 3) Mount areas and weights are assumed based on photographs provided.
- 4) The existing base plate grout was not considered in this analysis.
- 5) Base and Flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	180 - 175	Pole	TP24x24x0.25	1	-2.829	695.378	3.5	Pass
L2	175 - 170	Pole	TP24x24x0.25	2	-3.213	695.378	8.6	Pass
L3	170 - 165	Pole	TP24x24x0.25	3	-3.599	695.378	14.0	Pass
L4	165 - 160	Pole	TP24x24x0.25	4	-7.578	695.378	22.0	Pass
L5	160 - 155	Pole	TP24x24x0.25	5	-8.045	695.378	35.5	Pass
L6	155 - 150	Pole	TP24x24x0.25	6	-9.595	695.378	49.8	Pass
L7	150 - 145	Pole	TP30x30x0.375	7	-10.423	1376.613	27.6	Pass
L8	145 - 140	Pole	TP30x30x0.375	8	-11.255	1376.613	34.5	Pass
L9	140 - 135	Pole	TP30x30x0.375	9	-12.173	1376.613	41.5	Pass
L10	135 - 130	Pole	TP30x30x0.375	10	-13.023	1376.613	48.8	Pass
L11	130 - 125	Pole	TP30x30x0.375	11	-13.882	1376.613	56.3	Pass
L12	125 - 120	Pole	TP30x30x0.375	12	-14.752	1376.613	64.0	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L13	120 - 115	Pole	TP36x36x0.375	13	-15.841	1564.605	51.2	Pass
L14	115 - 110	Pole	TP36x36x0.375	14	-16.844	1564.605	57.1	Pass
L15	110 - 107.58	Pole	TP36x36x0.375	15	-17.284	1564.605	60.0	Pass
L16	107.58 - 107.33	Pole + Reinf.	TP36x36x0.525	16	-17.355	2322.274	43.2	Pass
L17	107.33 - 102.33	Pole + Reinf.	TP36x36x0.525	17	-18.677	2322.274	47.7	Pass
L18	102.33 - 97.33	Pole + Reinf.	TP36x36x0.525	18	-20.093	2322.274	52.4	Pass
L19	97.33 - 92.33	Pole + Reinf.	TP36x36x0.525	19	-21.437	2322.274	57.4	Pass
L20	92.33 - 90	Pole + Reinf.	TP36x36x0.525	20	-22.067	2322.274	59.8	Pass
L21	90 - 89.75	Pole + Reinf.	TP42x42x0.6125	21	-22.160	3160.867	38.6	Pass
L22	89.75 - 84.75	Pole + Reinf.	TP42x42x0.6125	22	-23.932	3160.867	42.0	Pass
L23	84.75 - 79.75	Pole + Reinf.	TP42x42x0.6125	23	-25.712	3160.867	45.5	Pass
L24	79.75 - 74.75	Pole + Reinf.	TP42x42x0.6125	24	-27.496	3160.867	49.1	Pass
L25	74.75 - 69.75	Pole + Reinf.	TP42x42x0.6125	25	-29.287	3160.867	52.7	Pass
L26	69.75 - 64.75	Pole + Reinf.	TP42x42x0.6125	26	-31.084	3160.867	56.5	Pass
L27	64.75 - 60	Pole + Reinf.	TP42x42x0.6125	27	-32.795	3160.867	60.0	Pass
L28	60 - 59.75	Pole	TP48x48x0.5	28	-32.887	2781.513	55.4	Pass
L29	59.75 - 54.75	Pole	TP48x48x0.5	29	-34.569	2781.513	59.0	Pass
L30	54.75 - 49.75	Pole	TP48x48x0.5	30	-36.261	2781.513	62.6	Pass
L31	49.75 - 46.58	Pole	TP48x48x0.5	31	-37.329	2781.513	64.9	Pass
L32	46.58 - 46.33	Pole + Reinf.	TP48x48x0.675	32	-37.444	3983.143	48.9	Pass
L33	46.33 - 41.33	Pole + Reinf.	TP48x48x0.675	33	-39.636	3983.143	51.8	Pass
L34	41.33 - 36.33	Pole + Reinf.	TP48x48x0.675	34	-41.839	3983.143	54.8	Pass
L35	36.33 - 31.33	Pole + Reinf.	TP48x48x0.675	35	-44.049	3983.143	57.8	Pass
L36	31.33 - 30	Pole + Reinf.	TP48x48x0.675	36	-44.637	3983.143	58.6	Pass
L37	30 - 29.75	Pole + Reinf.	TP48x48x0.7125	37	-44.765	4201.092	55.7	Pass
L38	29.75 - 24.75	Pole + Reinf.	TP48x48x0.7125	38	-47.090	4201.092	58.7	Pass
L39	24.75 - 19.75	Pole + Reinf.	TP48x48x0.7125	39	-49.427	4201.092	61.8	Pass
L40	19.75 - 14.75	Pole + Reinf.	TP48x48x0.7125	40	-51.770	4201.092	65.0	Pass
L41	14.75 - 9.75	Pole + Reinf.	TP48x48x0.7125	41	-54.121	4201.092	68.3	Pass
L42	9.75 - 4.75	Pole + Reinf.	TP48x48x0.7125	42	-56.480	4201.092	71.6	Pass
L43	4.75 - 0	Pole + Reinf.	TP48x48x0.7125	43	-58.726	4201.092	74.8	Pass
							Summary	
						Pole (L43)	74.8	Pass
						Reinforcement	61.4	Pass
						Rating =	74.8	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1, 2	Flange Connections	150	49.8	Pass
1	Flange Connections	120	58.5	Pass
1	Flange Connections	90	81.5	Pass
1	Bridge Stiffeners	60	78.8	Pass
1	Flange Connections	60	85.9	Pass
1	Bridge Stiffeners	30	87.7	Pass
1	Flange Connections	30	70.4	Pass
1	Anchor Rods	Base	64.1	Pass
1	Base Plate	Base	67.5	Pass
1	Base Foundation (Structure)	Base	10.8	Pass
1	Base Foundation (Soil Interaction)	Base	44.9	Pass

Structure Rating (max from all components) =	87.7%
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Notes:

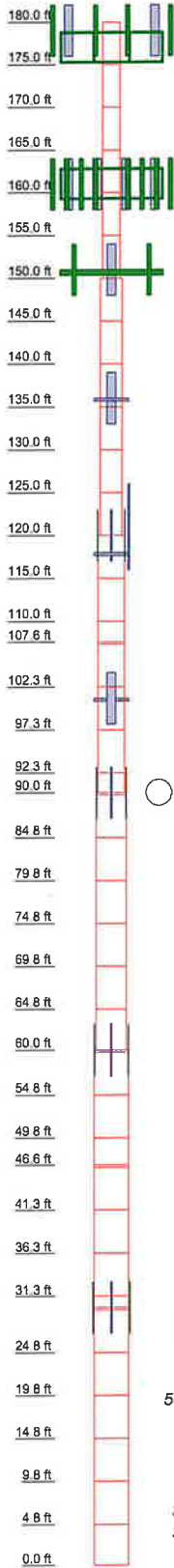
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Flange plates are assumed to have the same capacity as their respective splice bolts or shaft.
- 3) Rating per TIA-222-H Section 15.5.

4.1) Recommendations

The tower and its foundations 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	17	18	19	22	23	24	25	26	27	29	30	33	34	35	38	39	40	41	42	43
Size	A53-B-42																																	
Length (ft)	4.750																																	
Grade	38.8																																	
Weight (K)	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	1.0	1.0	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.7	1.7	1.8	1.8	1.8	1.8	1.7		



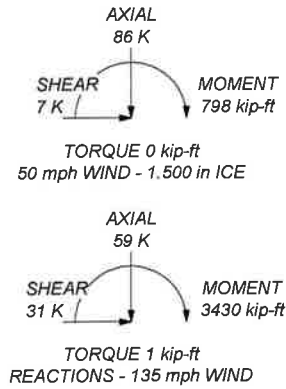
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 135 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 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 74.8%

ALL REACTIONS
ARE FACTORED



B+T Group
1717 S, Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: **85773.006.01 - Shoreline Sanitation, CT (BU# 87633)**

Project:	Client: Crown Castle	Drawn by: JD Prabhu	App'd:
Code: TIA-222-H	Date: 11/27/19	Scale: NTS	Dwg No: E-1

— Vx —

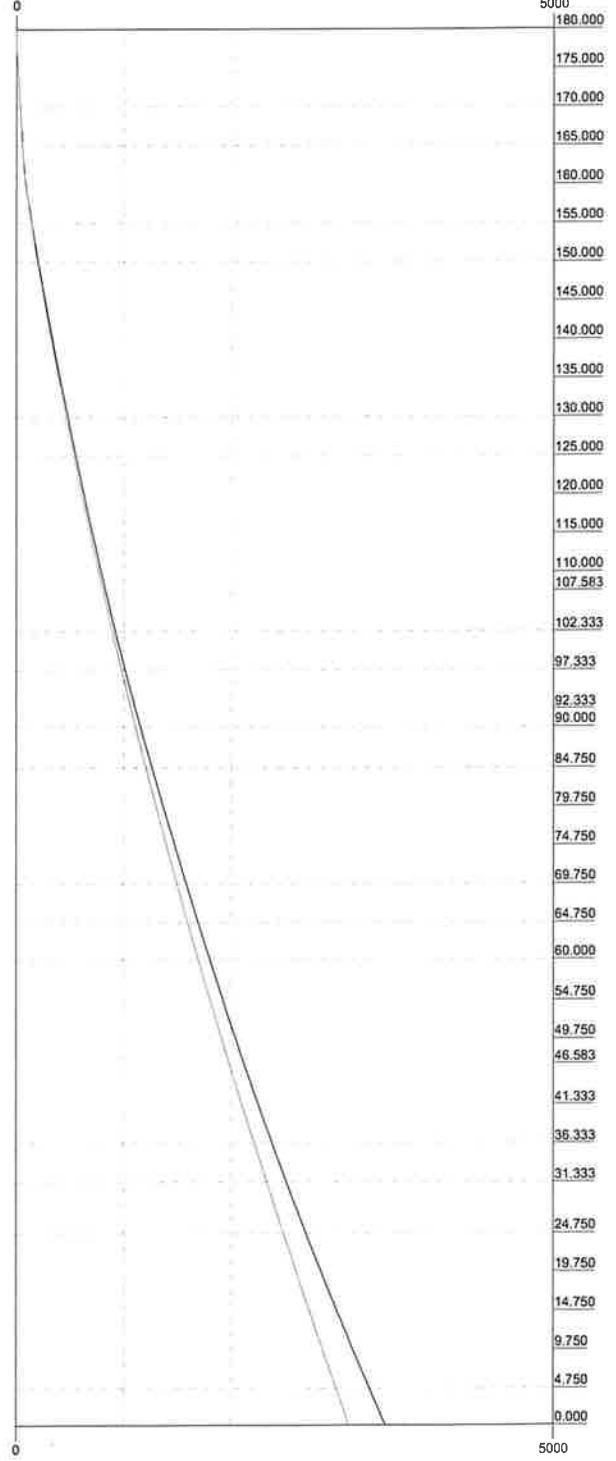
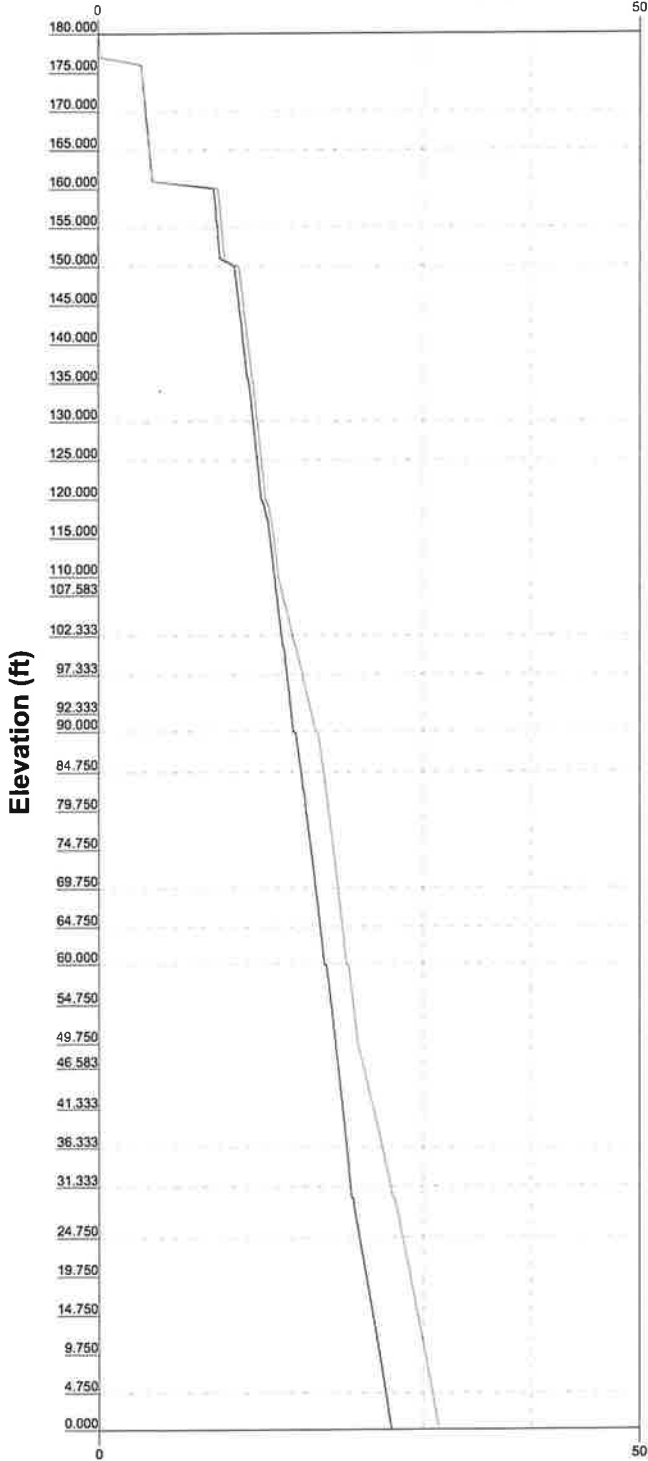
— Vz —


— Mx —

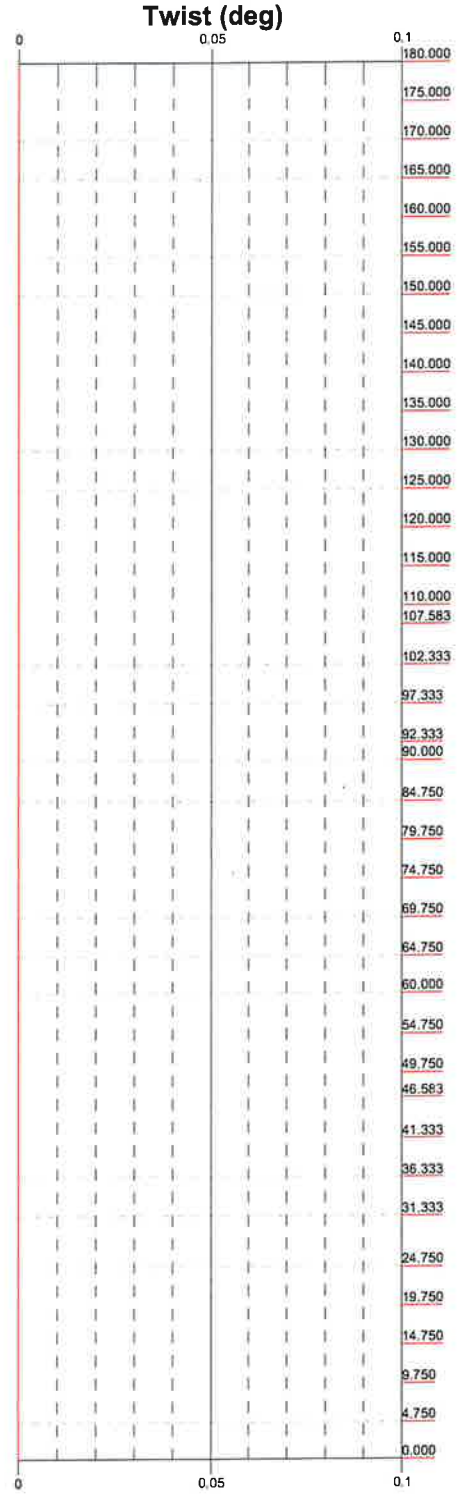
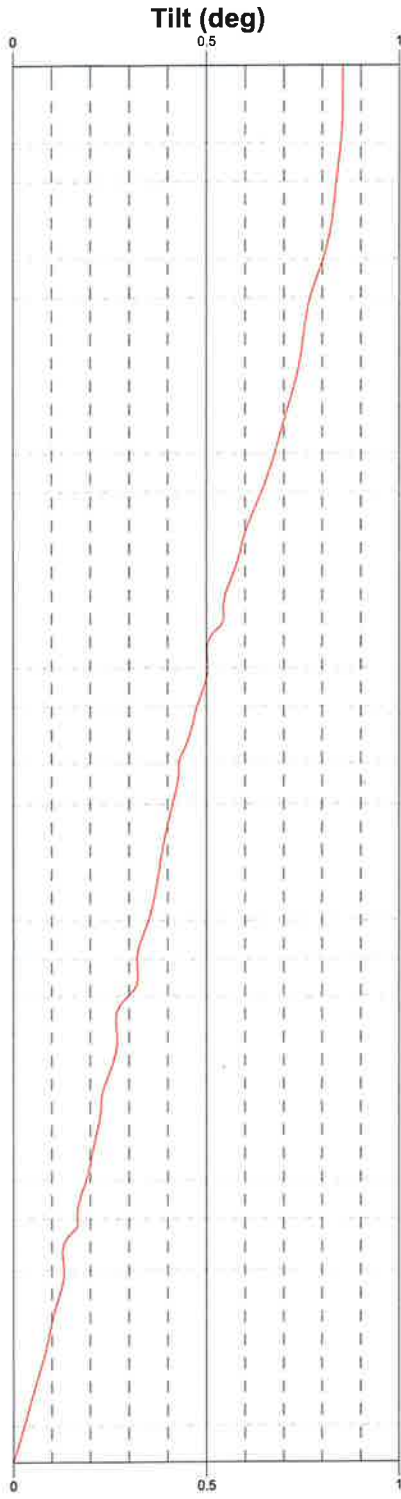
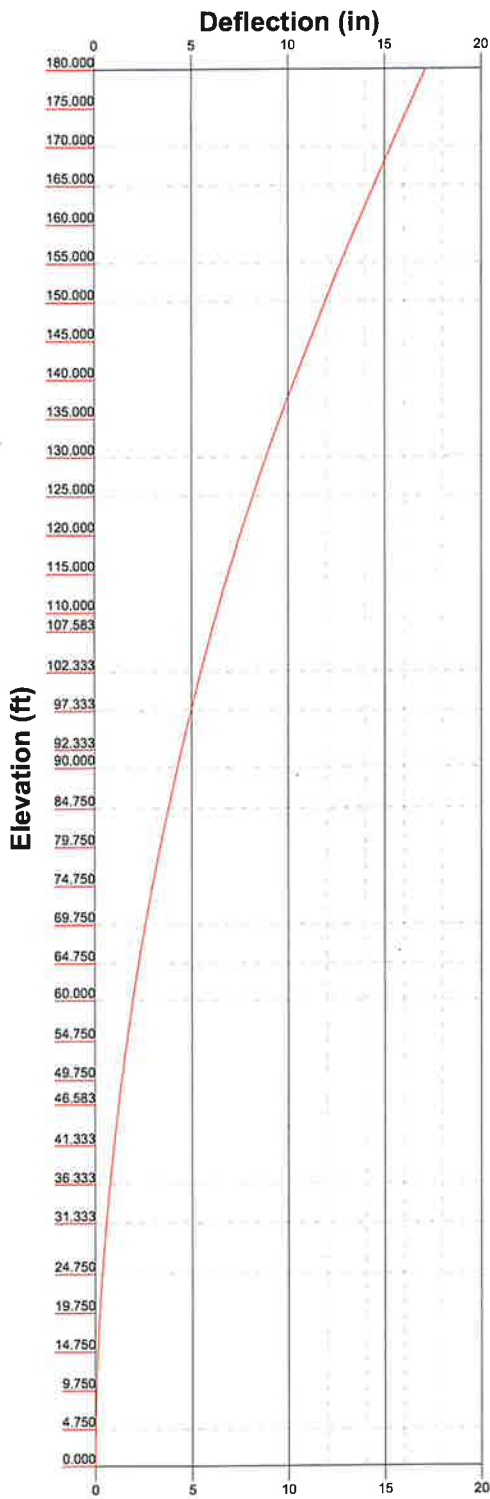
— Mz —


Global Mast Shear (K)

Global Mast Moment (kip-ft)



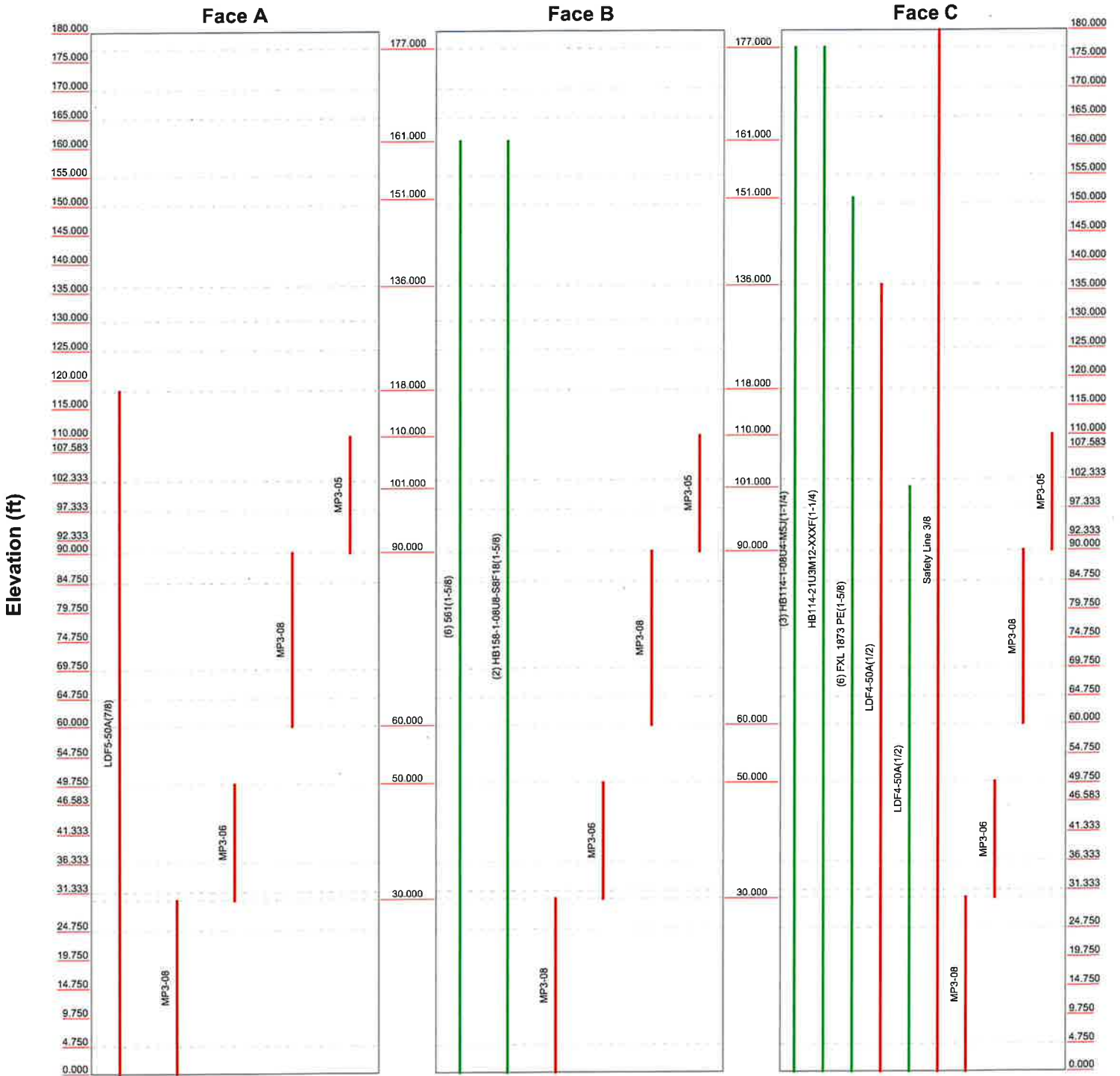
 <p>B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<p>Job: 85773.006.01 - Shoreline Sanitation, CT (BU# 87633)</p>		
	<p>Project: Crown Castle</p>	<p>Drawn by: JD Prabhu</p>	<p>App'd:</p>
	<p>Code: TIA-222-H</p>	<p>Date: 11/27/19</p>	<p>Scale: NTS</p>
	<p>Path:</p>	<p>Dwg No. E-4</p>	



 B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job: 85773.006.01 - Shoreline Sanitation, CT (BU# 87633)		
	Project:	Client: Crown Castle	Drawn by: JD Prabhu
	Code: TIA-222-H	Date: 11/27/19	App'd:
	Path:	Scale: NTS	Dwg No. E-5

Feed Line Distribution Chart 0' - 180'

— Round
 — Flat
 — App In Face
 — App Out Face
 — Truss Leg



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	Project:		
	Client: Crown Castle	Drawn by: JD Prabhu	App'd:
	Code: TIA-222-H	Date: 11/27/19	Scale: NTS
	Path:		Dwg No. E-7

tnxTower B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 85773.006.01 - Shoreline Sanitation, CT (BU# 876337)	Page 1 of 53
	Project	Date 14:29:14 11/27/19
	Client Crown Castle	Designed by JD Prabhu

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower is located in New London County, Connecticut.

Tower base elevation above sea level: 173.000 ft.

Basic wind speed of 135 mph.

Risk Category II.

Exposure Category B.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.000 ft.

Nominal ice thickness of 1.500 in.

Ice thickness is considered to increase with height.

Ice density of 56.000 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50.000 °F.

Deflections calculated using a wind speed of 60 mph.

TIA-222-H Annex S.

TOWER RATING: 74.8%.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.05.

Tower analysis based on target reliabilities in accordance with Annex S.

Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retention Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs | <ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Arc Known |
|--|---|--|

tnxTower B+T Group 1717 S, Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 85773.006.01 - Shoreline Sanitation, CT (BU# 876337)	Page 2 of 53
	Project	Date 14:29:14 11/27/19
	Client Crown Castle	Designed by JD Prabhu

Pole Section Geometry

Section	Elevation <i>ft</i>	Section Length <i>ft</i>	Pole Size	Pole Grade	Socket Length <i>ft</i>
L1	180.000-175.000	5.000	P24x0.25	A53-B-42 (42 ksi)	
L2	175.000-170.000	5.000	P24x0.25	A53-B-42 (42 ksi)	
L3	170.000-165.000	5.000	P24x0.25	A53-B-42 (42 ksi)	
L4	165.000-160.000	5.000	P24x0.25	A53-B-42 (42 ksi)	
L5	160.000-155.000	5.000	P24x0.25	A53-B-42 (42 ksi)	
L6	155.000-150.000	5.000	P24x0.25	A53-B-42 (42 ksi)	
L7	150.000-145.000	5.000	P30x0.375	A53-B-42 (42 ksi)	
L8	145.000-140.000	5.000	P30x0.375	A53-B-42 (42 ksi)	
L9	140.000-135.000	5.000	P30x0.375	A53-B-42 (42 ksi)	
L10	135.000-130.000	5.000	P30x0.375	A53-B-42 (42 ksi)	
L11	130.000-125.000	5.000	P30x0.375	A53-B-42 (42 ksi)	
L12	125.000-120.000	5.000	P30x0.375	A53-B-42 (42 ksi)	
L13	120.000-115.000	5.000	P36x0.375	A53-B-42 (42 ksi)	
L14	115.000-110.000	5.000	P36x0.375	A53-B-42 (42 ksi)	
L15	110.000-107.583	2.417	P36x0.375	A53-B-42 (42 ksi)	
L16	107.583-107.333	0.250	P36x0.525	A53-B-42 (42 ksi)	
L17	107.333-102.333	5.000	P36x0.525	A53-B-42 (42 ksi)	
L18	102.333-97.333	5.000	P36x0.525	A53-B-42 (42 ksi)	
L19	97.333-92.333	5.000	P36x0.525	A53-B-42 (42 ksi)	
L20	92.333-90.000	2.333	P36x0.525	A53-B-42 (42 ksi)	
L21	90.000-89.750	0.250	P42x0.6125	A53-B-42 (42 ksi)	
L22	89.750-84.750	5.000	P42x0.6125	A53-B-42 (42 ksi)	
L23	84.750-79.750	5.000	P42x0.6125	A53-B-42 (42 ksi)	
L24	79.750-74.750	5.000	P42x0.6125	A53-B-42 (42 ksi)	
L25	74.750-69.750	5.000	P42x0.6125	A53-B-42 (42 ksi)	
L26	69.750-64.750	5.000	P42x0.6125	A53-B-42 (42 ksi)	
L27	64.750-60.000	4.750	P42x0.6125	A53-B-42 (42 ksi)	
L28	60.000-59.750	0.250	P48x0.5	A53-B-42 (42 ksi)	
L29	59.750-54.750	5.000	P48x0.5	A53-B-42 (42 ksi)	

tnxTower B+T Group 1717 S, Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 85773.006.01 - Shoreline Sanitation, CT (BU# 876337)	Page 3 of 53
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Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L30	54.750-49.750	5.000	P48x0.5	A53-B-42 (42 ksi)	
L31	49.750-46.583	3.167	P48x0.5	A53-B-42 (42 ksi)	
L32	46.583-46.333	0.250	P48x0.675	A53-B-42 (42 ksi)	
L33	46.333-41.333	5.000	P48x0.675	A53-B-42 (42 ksi)	
L34	41.333-36.333	5.000	P48x0.675	A53-B-42 (42 ksi)	
L35	36.333-31.333	5.000	P48x0.675	A53-B-42 (42 ksi)	
L36	31.333-30.000	1.333	P48x0.675	A53-B-42 (42 ksi)	
L37	30.000-29.750	0.250	P48x0.7125	A53-B-42 (42 ksi)	
L38	29.750-24.750	5.000	P48x0.7125	A53-B-42 (42 ksi)	
L39	24.750-19.750	5.000	P48x0.7125	A53-B-42 (42 ksi)	
L40	19.750-14.750	5.000	P48x0.7125	A53-B-42 (42 ksi)	
L41	14.750-9.750	5.000	P48x0.7125	A53-B-42 (42 ksi)	
L42	9.750-4.750	5.000	P48x0.7125	A53-B-42 (42 ksi)	
L43	4.750-0.000	4.750	P48x0.7125	A53-B-42 (42 ksi)	

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 180.000-175.000				1	1	1			
L2 175.000-170.000				1	1	1			
L3 170.000-165.000				1	1	1			
L4 165.000-160.000				1	1	1			
L5 160.000-155.000				1	1	1			
L6 155.000-150.000				1	1	1			
L7 150.000-145.000				1	1	1			
L8 145.000-140.000				1	1	1			

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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L9				1	1	1			
140.000-135.000									
L10				1	1	1			
135.000-130.000									
L11				1	1	1			
130.000-125.000									
L12				1	1	1			
125.000-120.000									
L13				1	1	1			
120.000-115.000									
L14				1	1	1			
115.000-110.000									
L15				1	1	1			
110.000-107.583									
L16				1	1	1.007			
107.583-107.333									
L17				1	1	1.007			
107.333-102.333									
L18				1	1	1.007			
102.333-97.333									
L19				1	1	1.007			
97.333-92.333									
L20				1	1	1.007			
92.333-90.000									
L21				1	1	1.00451			
90.000-89.750									
L22				1	1	1.00451			
89.750-84.750									
L23				1	1	1.00451			
84.750-79.750									
L24				1	1	1.00451			
79.750-74.750									
L25				1	1	1.00451			
74.750-69.750									
L26				1	1	1.00451			
69.750-64.750									
L27				1	1	1.00451			
64.750-60.000									
L28				1	1	1			
60.000-59.750									
L29				1	1	1			
59.750-54.750									
L30				1	1	1			
54.750-49.750									
L31				1	1	1			
49.750-46.583									
L32				1	1	0.996678			
46.583-46.333									
L33				1	1	0.996678			

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Tower Elevation	Gusset Area (per face)	Gusset Thickness	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
ft	ft ²	in							
46.333-41.333				1	1	0.996678			
L34									
41.333-36.333				1	1	0.996678			
L35									
36.333-31.333				1	1	0.996678			
L36									
31.333-30.000				1	1	0.997404			
L37									
30.000-29.750				1	1	0.997404			
L38									
29.750-24.750				1	1	0.997404			
L39									
24.750-19.750				1	1	0.997404			
L40									
19.750-14.750				1	1	0.997404			
L41									
14.750-9.750				1	1	0.997404			
L42									
9.750-4.750				1	1	0.997404			
L43									
4.750-0.000									

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 klf
*										
LDF4-50A(1/2)	C	No	Surface Ar (CaAa)	136.000 - 0.000	1	1	-0.350 -0.330	0.630		0.000
*										
LDF5-50A(7/8)	A	No	Surface Ar (CaAa)	118.000 - 0.000	1	1	-0.120 -0.100	1.090		0.000
*										
Safety Linc 3/8	C	No	Surface Ar (CaAa)	180.000 - 0.000	1	1	0.000 0.010	0.375		0.000
*										
MP3-08	A	No	Surface Af (CaAa)	30.000 - 0.000	1	1	0.000 0.000	7.933	21.472	0.000
MP3-08	B	No	Surface Af (CaAa)	30.000 - 0.000	1	1	0.000 0.000	7.933	21.472	0.000
MP3-08	C	No	Surface Af (CaAa)	30.000 - 0.000	1	1	0.000 0.000	7.933	21.472	0.000
*										
MP3-06	A	No	Surface Af (CaAa)	50.000 - 30.000	1	1	0.000 0.000	6.890	18.992	0.000
MP3-06	B	No	Surface Af (CaAa)	50.000 - 30.000	1	1	0.000 0.000	6.890	18.992	0.000
MP3-06	C	No	Surface Af (CaAa)	50.000 - 30.000	1	1	0.000 0.000	6.890	18.992	0.000
*										
MP3-08	A	No	Surface Af (CaAa)	90.000 - 60.000	1	1	0.000 0.000	0.000	0.000	0.000
MP3-08	B	No	Surface Af	90.000 -	1	1	0.000	0.000	0.000	0.000

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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 klf
MP3-08	C	No	(CaAa) Surface Af	60.000 - 90.000 - 60.000	1	1	0.000 - 0.000 - 0.000	0.000	0.000	0.000
*										
MP3-05	A	No	(CaAa) Surface Af	110.000 - 90.000	1	1	0.000 - 0.000	5.330	14.840	0.000
MP3-05	B	No	(CaAa) Surface Af	110.000 - 90.000	1	1	0.000 - 0.000	5.330	14.840	0.000
MP3-05	C	No	(CaAa) Surface Af	110.000 - 90.000	1	1	0.000 - 0.000	5.330	14.840	0.000
*										
*										
*										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight klf
HB114-1-08U4-M5J (1-1/4)	C	No	No	Inside Pole	177.000 - 0.000	3	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
HB114-21U3M12-XXF(1-1/4)	C	No	No	Inside Pole	177.000 - 0.000	1	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
* 561(1-5/8)	B	No	No	Inside Pole	161.000 - 0.000	6	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
HB158-1-08U8-S8F 18(1-5/8)	B	No	No	Inside Pole	161.000 - 0.000	2	No Ice	0.000	0.002
							1/2" Ice	0.000	0.002
							1" Ice	0.000	0.002
							2" Ice	0.000	0.002
* FXL 1873 PE(1-5/8)	C	No	No	Inside Pole	151.000 - 0.000	6	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
* LDF4-50A(1/2)	C	No	No	Inside Pole	101.000 - 0.000	1	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
*									

Feed Line/Linear Appurtenances Section Areas

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Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
L1	180.000-175.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.188	0.000	0.010
L2	175.000-170.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.188	0.000	0.023
L3	170.000-165.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.188	0.000	0.023
L4	165.000-160.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.012
		C	0.000	0.000	0.188	0.000	0.023
L5	160.000-155.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.188	0.000	0.023
L6	155.000-150.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.188	0.000	0.027
L7	150.000-145.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.188	0.000	0.043
L8	145.000-140.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.188	0.000	0.043
L9	140.000-135.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.251	0.000	0.044
L10	135.000-130.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.502	0.000	0.044
L11	130.000-125.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.502	0.000	0.044
L12	125.000-120.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.502	0.000	0.044
L13	120.000-115.000	A	0.000	0.000	0.327	0.000	0.001
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.502	0.000	0.044
L14	115.000-110.000	A	0.000	0.000	0.545	0.000	0.002
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.502	0.000	0.044
L15	110.000-107.583	A	0.000	0.000	2.411	0.000	0.001
		B	0.000	0.000	2.147	0.000	0.028
		C	0.000	0.000	2.390	0.000	0.021
L16	107.583-107.333	A	0.000	0.000	0.249	0.000	0.000
		B	0.000	0.000	0.222	0.000	0.003
		C	0.000	0.000	0.247	0.000	0.002
L17	107.333-102.333	A	0.000	0.000	4.987	0.000	0.002
		B	0.000	0.000	4.442	0.000	0.058
		C	0.000	0.000	4.944	0.000	0.044
L18	102.333-97.333	A	0.000	0.000	4.987	0.000	0.002
		B	0.000	0.000	4.442	0.000	0.058
		C	0.000	0.000	4.944	0.000	0.045
L19	97.333-92.333	A	0.000	0.000	4.987	0.000	0.002
		B	0.000	0.000	4.442	0.000	0.058
		C	0.000	0.000	4.944	0.000	0.045
L20	92.333-90.000	A	0.000	0.000	2.327	0.000	0.001
		B	0.000	0.000	2.072	0.000	0.027
		C	0.000	0.000	2.307	0.000	0.021
L21	90.000-89.750	A	0.000	0.000	0.027	0.000	0.000

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Tower Section	Tower Elevation ft	Face	A_R	A_F	$C_A A_A$	$C_A A_A$	Weight K
			ft ²	ft ²	In Face ft ²	Out Face ft ²	
		B	0.000	0.000	0.000	0.000	0.003
		C	0.000	0.000	0.025	0.000	0.002
L22	89.750-84.750	A	0.000	0.000	0.545	0.000	0.002
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.502	0.000	0.045
L23	84.750-79.750	A	0.000	0.000	0.545	0.000	0.002
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.502	0.000	0.045
L24	79.750-74.750	A	0.000	0.000	0.545	0.000	0.002
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.502	0.000	0.045
L25	74.750-69.750	A	0.000	0.000	0.545	0.000	0.002
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.502	0.000	0.045
L26	69.750-64.750	A	0.000	0.000	0.545	0.000	0.002
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.502	0.000	0.045
L27	64.750-60.000	A	0.000	0.000	0.518	0.000	0.002
		B	0.000	0.000	0.000	0.000	0.055
		C	0.000	0.000	0.477	0.000	0.043
L28	60.000-59.750	A	0.000	0.000	0.027	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.003
		C	0.000	0.000	0.025	0.000	0.002
L29	59.750-54.750	A	0.000	0.000	0.545	0.000	0.002
		B	0.000	0.000	0.000	0.000	0.058
		C	0.000	0.000	0.502	0.000	0.045
L30	54.750-49.750	A	0.000	0.000	0.832	0.000	0.002
		B	0.000	0.000	0.287	0.000	0.058
		C	0.000	0.000	0.790	0.000	0.045
L31	49.750-46.583	A	0.000	0.000	3.982	0.000	0.001
		B	0.000	0.000	3.637	0.000	0.036
		C	0.000	0.000	3.955	0.000	0.029
L32	46.583-46.333	A	0.000	0.000	0.314	0.000	0.000
		B	0.000	0.000	0.287	0.000	0.003
		C	0.000	0.000	0.312	0.000	0.002
L33	46.333-41.333	A	0.000	0.000	6.287	0.000	0.002
		B	0.000	0.000	5.742	0.000	0.058
		C	0.000	0.000	6.244	0.000	0.045
L34	41.333-36.333	A	0.000	0.000	6.287	0.000	0.002
		B	0.000	0.000	5.742	0.000	0.058
		C	0.000	0.000	6.244	0.000	0.045
L35	36.333-31.333	A	0.000	0.000	6.287	0.000	0.002
		B	0.000	0.000	5.742	0.000	0.058
		C	0.000	0.000	6.244	0.000	0.045
L36	31.333-30.000	A	0.000	0.000	1.676	0.000	0.000
		B	0.000	0.000	1.531	0.000	0.015
		C	0.000	0.000	1.665	0.000	0.012
L37	30.000-29.750	A	0.000	0.000	0.358	0.000	0.000
		B	0.000	0.000	0.331	0.000	0.003
		C	0.000	0.000	0.356	0.000	0.002
L38	29.750-24.750	A	0.000	0.000	7.156	0.000	0.002
		B	0.000	0.000	6.611	0.000	0.058
		C	0.000	0.000	7.113	0.000	0.045
L39	24.750-19.750	A	0.000	0.000	7.156	0.000	0.002
		B	0.000	0.000	6.611	0.000	0.058
		C	0.000	0.000	7.113	0.000	0.045
L40	19.750-14.750	A	0.000	0.000	7.156	0.000	0.002
		B	0.000	0.000	6.611	0.000	0.058
		C	0.000	0.000	7.113	0.000	0.045
L41	14.750-9.750	A	0.000	0.000	7.156	0.000	0.002
		B	0.000	0.000	6.611	0.000	0.058

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Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
L42	9.750-4.750	C	0.000	0.000	7.113	0.000	0.045
		A	0.000	0.000	7.156	0.000	0.002
		B	0.000	0.000	6.611	0.000	0.058
L43	4.750-0.000	C	0.000	0.000	7.113	0.000	0.045
		A	0.000	0.000	6.798	0.000	0.002
		B	0.000	0.000	6.280	0.000	0.055
		C	0.000	0.000	6.758	0.000	0.043

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	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
L1	180.000-175.000	A	1.509	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	1.696	0.000	0.027
L2	175.000-170.000	A	1.504	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	1.692	0.000	0.041
L3	170.000-165.000	A	1.500	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	1.687	0.000	0.041
L4	165.000-160.000	A	1.495	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.012
		C		0.000	0.000	1.683	0.000	0.040
L5	160.000-155.000	A	1.491	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.058
		C		0.000	0.000	1.678	0.000	0.040
L6	155.000-150.000	A	1.486	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.058
		C		0.000	0.000	1.673	0.000	0.044
L7	150.000-145.000	A	1.481	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.058
		C		0.000	0.000	1.668	0.000	0.060
L8	145.000-140.000	A	1.476	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.058
		C		0.000	0.000	1.663	0.000	0.060
L9	140.000-135.000	A	1.471	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.058
		C		0.000	0.000	2.015	0.000	0.064
L10	135.000-130.000	A	1.465	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.058
		C		0.000	0.000	3.433	0.000	0.079
L11	130.000-125.000	A	1.460	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.058
		C		0.000	0.000	3.422	0.000	0.079
L12	125.000-120.000	A	1.454	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.058
		C		0.000	0.000	3.410	0.000	0.079
L13	120.000-115.000	A	1.448	0.000	0.000	1.196	0.000	0.014
		B		0.000	0.000	0.000	0.000	0.058
		C		0.000	0.000	3.398	0.000	0.079
L14	115.000-110.000	A	1.441	0.000	0.000	1.986	0.000	0.024
		B		0.000	0.000	0.000	0.000	0.058
		C		0.000	0.000	3.385	0.000	0.078
L15	110.000-107.583	A	1.437	0.000	0.000	3.799	0.000	0.039
		B		0.000	0.000	2.842	0.000	0.055
		C		0.000	0.000	4.473	0.000	0.065

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	Client	Crown Castle		Designed by

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
L16	107.583-107.333	A	1.435	0.000	0.000	0.393	0.000	0.004
		B		0.000	0.000	0.294	0.000	0.006
		C		0.000	0.000	0.462	0.000	0.007
L17	107.333-102.333	A	1.431	0.000	0.000	7.849	0.000	0.080
		B		0.000	0.000	5.873	0.000	0.114
		C		0.000	0.000	9.238	0.000	0.134
L18	102.333-97.333	A	1.424	0.000	0.000	7.835	0.000	0.080
		B		0.000	0.000	5.866	0.000	0.114
		C		0.000	0.000	9.217	0.000	0.134
L19	97.333-92.333	A	1.417	0.000	0.000	7.821	0.000	0.079
		B		0.000	0.000	5.859	0.000	0.113
		C		0.000	0.000	9.195	0.000	0.134
L20	92.333-90.000	A	1.411	0.000	0.000	3.644	0.000	0.037
		B		0.000	0.000	2.731	0.000	0.053
		C		0.000	0.000	4.283	0.000	0.062
L21	90.000-89.750	A	1.409	0.000	0.000	0.168	0.000	0.002
		B		0.000	0.000	0.070	0.000	0.004
		C		0.000	0.000	0.237	0.000	0.005
L22	89.750-84.750	A	1.405	0.000	0.000	3.355	0.000	0.038
		B		0.000	0.000	1.405	0.000	0.072
		C		0.000	0.000	4.718	0.000	0.092
L23	84.750-79.750	A	1.397	0.000	0.000	3.339	0.000	0.037
		B		0.000	0.000	1.397	0.000	0.072
		C		0.000	0.000	4.693	0.000	0.092
L24	79.750-74.750	A	1.388	0.000	0.000	3.321	0.000	0.037
		B		0.000	0.000	1.388	0.000	0.072
		C		0.000	0.000	4.667	0.000	0.091
L25	74.750-69.750	A	1.379	0.000	0.000	3.303	0.000	0.036
		B		0.000	0.000	1.379	0.000	0.071
		C		0.000	0.000	4.639	0.000	0.091
L26	69.750-64.750	A	1.369	0.000	0.000	3.283	0.000	0.036
		B		0.000	0.000	1.369	0.000	0.071
		C		0.000	0.000	4.610	0.000	0.090
L27	64.750-60.000	A	1.359	0.000	0.000	3.099	0.000	0.034
		B		0.000	0.000	1.291	0.000	0.068
		C		0.000	0.000	4.350	0.000	0.085
L28	60.000-59.750	A	1.353	0.000	0.000	0.095	0.000	0.001
		B		0.000	0.000	0.000	0.000	0.003
		C		0.000	0.000	0.160	0.000	0.004
L29	59.750-54.750	A	1.347	0.000	0.000	1.892	0.000	0.022
		B		0.000	0.000	0.000	0.000	0.058
		C		0.000	0.000	3.197	0.000	0.075
L30	54.750-49.750	A	1.335	0.000	0.000	2.233	0.000	0.025
		B		0.000	0.000	0.353	0.000	0.061
		C		0.000	0.000	3.525	0.000	0.078
L31	49.750-46.583	A	1.324	0.000	0.000	5.647	0.000	0.053
		B		0.000	0.000	4.464	0.000	0.076
		C		0.000	0.000	6.459	0.000	0.086
L32	46.583-46.333	A	1.319	0.000	0.000	0.445	0.000	0.004
		B		0.000	0.000	0.352	0.000	0.006
		C		0.000	0.000	0.509	0.000	0.007
L33	46.333-41.333	A	1.312	0.000	0.000	8.893	0.000	0.082
		B		0.000	0.000	7.036	0.000	0.119
		C		0.000	0.000	10.162	0.000	0.135
L34	41.333-36.333	A	1.296	0.000	0.000	8.863	0.000	0.081
		B		0.000	0.000	7.022	0.000	0.118
		C		0.000	0.000	10.117	0.000	0.134
L35	36.333-31.333	A	1.278	0.000	0.000	8.830	0.000	0.079
		B		0.000	0.000	7.007	0.000	0.117
		C		0.000	0.000	10.066	0.000	0.132
L36	31.333-30.000	A	1.266	0.000	0.000	2.348	0.000	0.021

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
		B		0.000	0.000	1.865	0.000	0.031
		C		0.000	0.000	2.674	0.000	0.035
L37	30.000-29.750	A	1.262	0.000	0.000	0.484	0.000	0.004
		B		0.000	0.000	0.394	0.000	0.006
		C		0.000	0.000	0.545	0.000	0.007
L38	29.750-24.750	A	1.251	0.000	0.000	9.657	0.000	0.083
		B		0.000	0.000	7.862	0.000	0.121
		C		0.000	0.000	10.866	0.000	0.136
L39	24.750-19.750	A	1.226	0.000	0.000	9.607	0.000	0.081
		B		0.000	0.000	7.837	0.000	0.120
		C		0.000	0.000	10.790	0.000	0.133
L40	19.750-14.750	A	1.195	0.000	0.000	9.546	0.000	0.079
		B		0.000	0.000	7.806	0.000	0.118
		C		0.000	0.000	10.698	0.000	0.130
L41	14.750-9.750	A	1.155	0.000	0.000	9.465	0.000	0.076
		B		0.000	0.000	7.766	0.000	0.116
		C		0.000	0.000	10.577	0.000	0.126
L42	9.750-4.750	A	1.096	0.000	0.000	9.347	0.000	0.071
		B		0.000	0.000	7.707	0.000	0.112
		C		0.000	0.000	10.400	0.000	0.121
L43	4.750-0.000	A	0.980	0.000	0.000	8.660	0.000	0.059
		B		0.000	0.000	7.211	0.000	0.100
		C		0.000	0.000	9.551	0.000	0.105

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	180.000-175.000	-0.004	0.369	-0.014	1.359
L2	175.000-170.000	-0.004	0.369	-0.014	1.357
L3	170.000-165.000	-0.004	0.369	-0.014	1.354
L4	165.000-160.000	-0.004	0.369	-0.014	1.351
L5	160.000-155.000	-0.004	0.369	-0.014	1.348
L6	155.000-150.000	-0.004	0.369	-0.014	1.345
L7	150.000-145.000	-0.004	0.370	-0.015	1.396
L8	145.000-140.000	-0.004	0.370	-0.015	1.393
L9	140.000-135.000	0.077	0.462	0.179	1.586
L10	135.000-130.000	0.390	0.812	0.882	2.299
L11	130.000-125.000	0.390	0.812	0.880	2.293
L12	125.000-120.000	0.390	0.812	0.878	2.287
L13	120.000-115.000	-0.211	0.613	-0.018	1.987
L14	115.000-110.000	-0.591	0.483	-0.587	1.746
L15	110.000-107.583	-0.254	0.208	-0.342	1.018
L16	107.583-107.333	-0.254	0.208	-0.342	1.017
L17	107.333-102.333	-0.254	0.208	-0.342	1.016
L18	102.333-97.333	-0.254	0.208	-0.341	1.012
L19	97.333-92.333	-0.254	0.208	-0.341	1.009
L20	92.333-90.000	-0.254	0.208	-0.340	1.006
L21	90.000-89.750	-0.597	0.490	-0.522	1.551
L22	89.750-84.750	-0.597	0.490	-0.521	1.548
L23	84.750-79.750	-0.597	0.490	-0.520	1.543
L24	79.750-74.750	-0.597	0.490	-0.519	1.537
L25	74.750-69.750	-0.597	0.490	-0.519	1.531
L26	69.750-64.750	-0.597	0.490	-0.517	1.525
L27	64.750-60.000	-0.597	0.490	-0.516	1.518
L28	60.000-59.750	-0.602	0.496	-0.607	1.789

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Section	Elevation	CP _x	CP _z	CP _x	CP _z
		Ice	Ice	Ice	Ice
	ft	in	in	in	in
L29	59.750-54.750	-0.602	0.496	-0.606	1.784
L30	54.750-49.750	-0.564	0.465	-0.583	1.713
L31	49.750-46.583	-0.259	0.214	-0.355	1.039
L32	46.583-46.333	-0.259	0.214	-0.354	1.036
L33	46.333-41.333	-0.259	0.214	-0.353	1.032
L34	41.333-36.333	-0.259	0.214	-0.352	1.023
L35	36.333-31.333	-0.259	0.214	-0.350	1.013
L36	31.333-30.000	-0.259	0.214	-0.348	1.006
L37	30.000-29.750	-0.239	0.197	-0.331	0.955
L38	29.750-24.750	-0.239	0.197	-0.330	0.948
L39	24.750-19.750	-0.239	0.197	-0.327	0.935
L40	19.750-14.750	-0.239	0.197	-0.324	0.918
L41	14.750-9.750	-0.239	0.197	-0.320	0.896
L42	9.750-4.750	-0.239	0.197	-0.313	0.863
L43	4.750-0.000	-0.239	0.197	-0.301	0.797

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	15	Safety Line 3/8	175.00 - 180.00	1.0000	1.0000
L2	15	Safety Line 3/8	170.00 - 175.00	1.0000	1.0000
L3	15	Safety Line 3/8	165.00 - 170.00	1.0000	1.0000
L4	15	Safety Line 3/8	160.00 - 165.00	1.0000	1.0000
L5	15	Safety Line 3/8	155.00 - 160.00	1.0000	1.0000
L6	15	Safety Line 3/8	150.00 - 155.00	1.0000	1.0000
L7	15	Safety Line 3/8	145.00 - 150.00	1.0000	1.0000
L8	15	Safety Line 3/8	140.00 - 145.00	1.0000	1.0000
L9	9	LDF4-50A(1/2)	135.00 - 136.00	1.0000	1.0000
L9	15	Safety Line 3/8	135.00 - 140.00	1.0000	1.0000
L10	9	LDF4-50A(1/2)	130.00 - 135.00	1.0000	1.0000
L10	15	Safety Line 3/8	130.00 - 135.00	1.0000	1.0000
L11	9	LDF4-50A(1/2)	125.00 - 130.00	1.0000	1.0000
L11	15	Safety Line 3/8	125.00 - 130.00	1.0000	1.0000
L12	9	LDF4-50A(1/2)	120.00 - 125.00	1.0000	1.0000
L12	15	Safety Line 3/8	120.00 - 125.00	1.0000	1.0000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L13	9	LDF4-50A(1/2)	115.00 - 120.00	1.0000	1.0000
L13	11	LDF5-50A(7/8)	115.00 - 118.00	1.0000	1.0000
L13	15	Safety Line 3/8	115.00 - 120.00	1.0000	1.0000
L14	9	LDF4-50A(1/2)	110.00 - 115.00	1.0000	1.0000
L14	11	LDF5-50A(7/8)	110.00 - 115.00	1.0000	1.0000
L14	15	Safety Line 3/8	110.00 - 115.00	1.0000	1.0000
L15	9	LDF4-50A(1/2)	107.58 - 110.00	1.0000	1.0000
L15	11	LDF5-50A(7/8)	107.58 - 110.00	1.0000	1.0000
L15	15	Safety Line 3/8	107.58 - 110.00	1.0000	1.0000
L15	29	MP3-05	107.58 - 110.00	1.0000	1.0000
L15	30	MP3-05	107.58 - 110.00	1.0000	1.0000
L15	31	MP3-05	107.58 - 110.00	1.0000	1.0000
L16	9	LDF4-50A(1/2)	107.33 - 107.58	1.0000	1.0000
L16	11	LDF5-50A(7/8)	107.33 - 107.58	1.0000	1.0000
L16	15	Safety Line 3/8	107.33 - 107.58	1.0000	1.0000
L16	29	MP3-05	107.33 - 107.58	1.0000	1.0000
L16	30	MP3-05	107.33 - 107.58	1.0000	1.0000
L16	31	MP3-05	107.33 - 107.58	1.0000	1.0000
L17	9	LDF4-50A(1/2)	102.33 - 107.33	1.0000	1.0000
L17	11	LDF5-50A(7/8)	102.33 - 107.33	1.0000	1.0000
L17	15	Safety Line 3/8	102.33 - 107.33	1.0000	1.0000
L17	29	MP3-05	102.33 - 107.33	1.0000	1.0000
L17	30	MP3-05	102.33 - 107.33	1.0000	1.0000
L17	31	MP3-05	102.33 - 107.33	1.0000	1.0000
L18	9	LDF4-50A(1/2)	97.33 - 102.33	1.0000	1.0000
L18	11	LDF5-50A(7/8)	97.33 - 102.33	1.0000	1.0000
L18	15	Safety Line 3/8	97.33 - 102.33	1.0000	1.0000
L18	29	MP3-05	97.33 - 102.33	1.0000	1.0000
L18	30	MP3-05	97.33 - 102.33	1.0000	1.0000
L18	31	MP3-05	97.33 - 102.33	1.0000	1.0000
L19	9	LDF4-50A(1/2)	92.33 - 97.33	1.0000	1.0000
L19	11	LDF5-50A(7/8)	92.33 - 97.33	1.0000	1.0000
L19	15	Safety Line 3/8	92.33 - 97.33	1.0000	1.0000
L19	29	MP3-05	92.33 - 97.33	1.0000	1.0000
L19	30	MP3-05	92.33 - 97.33	1.0000	1.0000
L19	31	MP3-05	92.33 - 97.33	1.0000	1.0000
L20	9	LDF4-50A(1/2)	90.00 - 92.33	1.0000	1.0000
L20	11	LDF5-50A(7/8)	90.00 - 92.33	1.0000	1.0000

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	Client Crown Castle	Designed by JD Prabhu

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L20	15	Safety Line 3/8	90.00 - 92.33	1.0000	1.0000
L20	29	MP3-05	90.00 - 92.33	1.0000	1.0000
L20	30	MP3-05	90.00 - 92.33	1.0000	1.0000
L20	31	MP3-05	90.00 - 92.33	1.0000	1.0000
L21	9	LDF4-50A(1/2)	89.75 - 90.00	1.0000	1.0000
L21	11	LDF5-50A(7/8)	89.75 - 90.00	1.0000	1.0000
L21	15	Safety Line 3/8	89.75 - 90.00	1.0000	1.0000
L21	25	MP3-08	89.75 - 90.00	1.0000	1.0000
L21	26	MP3-08	89.75 - 90.00	1.0000	1.0000
L21	27	MP3-08	89.75 - 90.00	1.0000	1.0000
L22	9	LDF4-50A(1/2)	84.75 - 89.75	1.0000	1.0000
L22	11	LDF5-50A(7/8)	84.75 - 89.75	1.0000	1.0000
L22	15	Safety Line 3/8	84.75 - 89.75	1.0000	1.0000
L22	25	MP3-08	84.75 - 89.75	1.0000	1.0000
L22	26	MP3-08	84.75 - 89.75	1.0000	1.0000
L22	27	MP3-08	84.75 - 89.75	1.0000	1.0000
L23	9	LDF4-50A(1/2)	79.75 - 84.75	1.0000	1.0000
L23	11	LDF5-50A(7/8)	79.75 - 84.75	1.0000	1.0000
L23	15	Safety Line 3/8	79.75 - 84.75	1.0000	1.0000
L23	25	MP3-08	79.75 - 84.75	1.0000	1.0000
L23	26	MP3-08	79.75 - 84.75	1.0000	1.0000
L23	27	MP3-08	79.75 - 84.75	1.0000	1.0000
L24	9	LDF4-50A(1/2)	74.75 - 79.75	1.0000	1.0000
L24	11	LDF5-50A(7/8)	74.75 - 79.75	1.0000	1.0000
L24	15	Safety Line 3/8	74.75 - 79.75	1.0000	1.0000
L24	25	MP3-08	74.75 - 79.75	1.0000	1.0000
L24	26	MP3-08	74.75 - 79.75	1.0000	1.0000
L24	27	MP3-08	74.75 - 79.75	1.0000	1.0000
L25	9	LDF4-50A(1/2)	69.75 - 74.75	1.0000	1.0000
L25	11	LDF5-50A(7/8)	69.75 - 74.75	1.0000	1.0000
L25	15	Safety Line 3/8	69.75 - 74.75	1.0000	1.0000
L25	25	MP3-08	69.75 - 74.75	1.0000	1.0000
L25	26	MP3-08	69.75 - 74.75	1.0000	1.0000
L25	27	MP3-08	69.75 - 74.75	1.0000	1.0000
L26	9	LDF4-50A(1/2)	64.75 - 69.75	1.0000	1.0000
L26	11	LDF5-50A(7/8)	64.75 - 69.75	1.0000	1.0000
L26	15	Safety Line 3/8	64.75 - 69.75	1.0000	1.0000
L26	25	MP3-08	64.75 - 69.75	1.0000	1.0000
L26	26	MP3-08	64.75 - 69.75	1.0000	1.0000
L26	27	MP3-08	64.75 - 69.75	1.0000	1.0000
L27	9	LDF4-50A(1/2)	60.00 - 64.75	1.0000	1.0000
L27	11	LDF5-50A(7/8)	60.00 - 64.75	1.0000	1.0000
L27	15	Safety Line 3/8	60.00 - 64.75	1.0000	1.0000
L27	25	MP3-08	60.00 - 64.75	1.0000	1.0000
L27	26	MP3-08	60.00 - 64.75	1.0000	1.0000
L27	27	MP3-08	60.00 - 64.75	1.0000	1.0000
L28	9	LDF4-50A(1/2)	59.75 - 60.00	1.0000	1.0000
L28	11	LDF5-50A(7/8)	59.75 - 60.00	1.0000	1.0000
L28	15	Safety Line 3/8	59.75 - 60.00	1.0000	1.0000
L29	9	LDF4-50A(1/2)	54.75 - 59.75	1.0000	1.0000
L29	11	LDF5-50A(7/8)	54.75 - 59.75	1.0000	1.0000
L29	15	Safety Line 3/8	54.75 - 59.75	1.0000	1.0000
L30	9	LDF4-50A(1/2)	49.75 - 54.75	1.0000	1.0000
L30	11	LDF5-50A(7/8)	49.75 - 54.75	1.0000	1.0000
L30	15	Safety Line 3/8	49.75 - 54.75	1.0000	1.0000
L30	21	MP3-06	49.75 - 50.00	1.0000	1.0000
L30	22	MP3-06	49.75 - 50.00	1.0000	1.0000
L30	23	MP3-06	49.75 - 50.00	1.0000	1.0000
L31	9	LDF4-50A(1/2)	46.58 - 49.75	1.0000	1.0000
L31	11	LDF5-50A(7/8)	46.58 - 49.75	1.0000	1.0000
L31	15	Safety Line 3/8	46.58 - 49.75	1.0000	1.0000
L31	21	MP3-06	46.58 - 49.75	1.0000	1.0000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L31	22	MP3-06	46.58 - 49.75	1.0000	1.0000
L31	23	MP3-06	46.58 - 49.75	1.0000	1.0000
L32	9	LDF4-50A(1/2)	46.33 - 46.58	1.0000	1.0000
L32	11	LDF5-50A(7/8)	46.33 - 46.58	1.0000	1.0000
L32	15	Safety Line 3/8	46.33 - 46.58	1.0000	1.0000
L32	21	MP3-06	46.33 - 46.58	1.0000	1.0000
L32	22	MP3-06	46.33 - 46.58	1.0000	1.0000
L32	23	MP3-06	46.33 - 46.58	1.0000	1.0000
L33	9	LDF4-50A(1/2)	41.33 - 46.33	1.0000	1.0000
L33	11	LDF5-50A(7/8)	41.33 - 46.33	1.0000	1.0000
L33	15	Safety Line 3/8	41.33 - 46.33	1.0000	1.0000
L33	21	MP3-06	41.33 - 46.33	1.0000	1.0000
L33	22	MP3-06	41.33 - 46.33	1.0000	1.0000
L33	23	MP3-06	41.33 - 46.33	1.0000	1.0000
L34	9	LDF4-50A(1/2)	36.33 - 41.33	1.0000	1.0000
L34	11	LDF5-50A(7/8)	36.33 - 41.33	1.0000	1.0000
L34	15	Safety Line 3/8	36.33 - 41.33	1.0000	1.0000
L34	21	MP3-06	36.33 - 41.33	1.0000	1.0000
L34	22	MP3-06	36.33 - 41.33	1.0000	1.0000
L34	23	MP3-06	36.33 - 41.33	1.0000	1.0000
L35	9	LDF4-50A(1/2)	31.33 - 36.33	1.0000	1.0000
L35	11	LDF5-50A(7/8)	31.33 - 36.33	1.0000	1.0000
L35	15	Safety Line 3/8	31.33 - 36.33	1.0000	1.0000
L35	21	MP3-06	31.33 - 36.33	1.0000	1.0000
L35	22	MP3-06	31.33 - 36.33	1.0000	1.0000
L35	23	MP3-06	31.33 - 36.33	1.0000	1.0000
L36	9	LDF4-50A(1/2)	30.00 - 31.33	1.0000	1.0000
L36	11	LDF5-50A(7/8)	30.00 - 31.33	1.0000	1.0000
L36	15	Safety Line 3/8	30.00 - 31.33	1.0000	1.0000
L36	21	MP3-06	30.00 - 31.33	1.0000	1.0000
L36	22	MP3-06	30.00 - 31.33	1.0000	1.0000
L36	23	MP3-06	30.00 - 31.33	1.0000	1.0000
L37	9	LDF4-50A(1/2)	29.75 - 30.00	1.0000	1.0000
L37	11	LDF5-50A(7/8)	29.75 - 30.00	1.0000	1.0000
L37	15	Safety Line 3/8	29.75 - 30.00	1.0000	1.0000
L37	17	MP3-08	29.75 - 30.00	1.0000	1.0000
L37	18	MP3-08	29.75 - 30.00	1.0000	1.0000
L37	19	MP3-08	29.75 - 30.00	1.0000	1.0000
L38	9	LDF4-50A(1/2)	24.75 - 29.75	1.0000	1.0000
L38	11	LDF5-50A(7/8)	24.75 - 29.75	1.0000	1.0000
L38	15	Safety Line 3/8	24.75 - 29.75	1.0000	1.0000
L38	17	MP3-08	24.75 - 29.75	1.0000	1.0000
L38	18	MP3-08	24.75 - 29.75	1.0000	1.0000
L38	19	MP3-08	24.75 - 29.75	1.0000	1.0000
L39	9	LDF4-50A(1/2)	19.75 - 24.75	1.0000	1.0000
L39	11	LDF5-50A(7/8)	19.75 - 24.75	1.0000	1.0000
L39	15	Safety Line 3/8	19.75 - 24.75	1.0000	1.0000
L39	17	MP3-08	19.75 - 24.75	1.0000	1.0000
L39	18	MP3-08	19.75 - 24.75	1.0000	1.0000
L39	19	MP3-08	19.75 - 24.75	1.0000	1.0000
L40	9	LDF4-50A(1/2)	14.75 - 19.75	1.0000	1.0000
L40	11	LDF5-50A(7/8)	14.75 - 19.75	1.0000	1.0000
L40	15	Safety Line 3/8	14.75 - 19.75	1.0000	1.0000
L40	17	MP3-08	14.75 - 19.75	1.0000	1.0000
L40	18	MP3-08	14.75 - 19.75	1.0000	1.0000
L40	19	MP3-08	14.75 - 19.75	1.0000	1.0000
L41	9	LDF4-50A(1/2)	9.75 - 14.75	1.0000	1.0000
L41	11	LDF5-50A(7/8)	9.75 - 14.75	1.0000	1.0000
L41	15	Safety Line 3/8	9.75 - 14.75	1.0000	1.0000
L41	17	MP3-08	9.75 - 14.75	1.0000	1.0000
L41	18	MP3-08	9.75 - 14.75	1.0000	1.0000
L41	19	MP3-08	9.75 - 14.75	1.0000	1.0000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L42	9	LDF4-50A(1/2)	4.75 - 9.75	1.0000	1.0000
L42	11	LDF5-50A(7/8)	4.75 - 9.75	1.0000	1.0000
L42	15	Safety Line 3/8	4.75 - 9.75	1.0000	1.0000
L42	17	MP3-08	4.75 - 9.75	1.0000	1.0000
L42	18	MP3-08	4.75 - 9.75	1.0000	1.0000
L42	19	MP3-08	4.75 - 9.75	1.0000	1.0000
L43	9	LDF4-50A(1/2)	0.00 - 4.75	1.0000	1.0000
L43	11	LDF5-50A(7/8)	0.00 - 4.75	1.0000	1.0000
L43	15	Safety Line 3/8	0.00 - 4.75	1.0000	1.0000
L43	17	MP3-08	0.00 - 4.75	1.0000	1.0000
L43	18	MP3-08	0.00 - 4.75	1.0000	1.0000
L43	19	MP3-08	0.00 - 4.75	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	$C_A A_A$ Front	$C_A A_A$ Side	Weight	
			Horz	Lateral						ft
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	177.000	No Ice	4.600	4.010	0.095
			0.000				1/2" Ice	5.050	4.450	0.160
			2.000				1" Ice	5.500	4.890	0.235
							2" Ice	6.440	5.820	0.419
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	177.000	No Ice	4.600	4.010	0.095
			0.000				1/2" Ice	5.050	4.450	0.160
			2.000				1" Ice	5.500	4.890	0.235
							2" Ice	6.440	5.820	0.419
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	177.000	No Ice	4.600	4.010	0.095
			0.000				1/2" Ice	5.050	4.450	0.160
			2.000				1" Ice	5.500	4.890	0.235
							2" Ice	6.440	5.820	0.419
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	177.000	No Ice	4.090	2.860	0.077
			0.000				1/2" Ice	4.480	3.230	0.127
			2.000				1" Ice	4.880	3.610	0.185
							2" Ice	5.710	4.400	0.331
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	177.000	No Ice	4.090	2.860	0.077
			0.000				1/2" Ice	4.480	3.230	0.127
			2.000				1" Ice	4.880	3.610	0.185
							2" Ice	5.710	4.400	0.331
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	177.000	No Ice	4.090	2.860	0.077
			0.000				1/2" Ice	4.480	3.230	0.127
			2.000				1" Ice	4.880	3.610	0.185
							2" Ice	5.710	4.400	0.331
TME-PCS 1900MHZ 4X45W-65MHZ	A	From Leg	4.000	0.000	0.000	177.000	No Ice	2.322	2.238	0.060
			0.000				1/2" Ice	2.527	2.441	0.083
			2.000				1" Ice	2.739	2.651	0.110
							2" Ice	3.185	3.093	0.173
TME-PCS 1900MHZ 4X45W-65MHZ	B	From Leg	4.000	0.000	0.000	177.000	No Ice	2.322	2.238	0.060
			0.000				1/2" Ice	2.527	2.441	0.083
			2.000				1" Ice	2.739	2.651	0.110
							2" Ice	3.185	3.093	0.173
TME-PCS 1900MHZ	C	From Leg	4.000	0.000	0.000	177.000	No Ice	2.322	2.238	0.060

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A ₁ Front ft ²	C _A A ₂ Side ft ²	Weight K
4X45W-65MHZ			0.000 2.000			1/2" Ice 2.527 1" Ice 2.739 2" Ice 3.185	2.441 2.651 3.093	0.083 0.110 0.173
800MHZ 2X50W RRH W/FILTER	A	From Leg	4.000 0.000 2.000	0.000	177.000	No Ice 2.058 1/2" Ice 2.240 1" Ice 2.429 2" Ice 2.829	1.932 2.109 2.293 2.684	0.064 0.086 0.111 0.172
800MHZ 2X50W RRH W/FILTER	B	From Leg	4.000 0.000 2.000	0.000	177.000	No Ice 2.058 1/2" Ice 2.240 1" Ice 2.429 2" Ice 2.829	1.932 2.109 2.293 2.684	0.064 0.086 0.111 0.172
800MHZ 2X50W RRH W/FILTER	C	From Leg	4.000 0.000 2.000	0.000	177.000	No Ice 2.058 1/2" Ice 2.240 1" Ice 2.429 2" Ice 2.829	1.932 2.109 2.293 2.684	0.064 0.086 0.111 0.172
PCS 1900MHZ 4X45W-65MHZ	A	From Leg	4.000 0.000 2.000	0.000	177.000	No Ice 2.322 1/2" Ice 2.527 1" Ice 2.739 2" Ice 3.185	2.238 2.441 2.651 3.093	0.060 0.083 0.110 0.173
PCS 1900MHZ 4X45W-65MHZ	B	From Leg	4.000 0.000 2.000	0.000	177.000	No Ice 2.322 1/2" Ice 2.527 1" Ice 2.739 2" Ice 3.185	2.238 2.441 2.651 3.093	0.060 0.083 0.110 0.173
PCS 1900MHZ 4X45W-65MHZ	C	From Leg	4.000 0.000 2.000	0.000	177.000	No Ice 2.322 1/2" Ice 2.527 1" Ice 2.739 2" Ice 3.185	2.238 2.441 2.651 3.093	0.060 0.083 0.110 0.173
TD-RRH8X20-25	A	From Leg	4.000 0.000 2.000	0.000	177.000	No Ice 4.045 1/2" Ice 4.298 1" Ice 4.557 2" Ice 5.098	1.535 1.714 1.901 2.295	0.070 0.097 0.128 0.201
TD-RRH8X20-25	B	From Leg	4.000 0.000 2.000	0.000	177.000	No Ice 4.045 1/2" Ice 4.298 1" Ice 4.557 2" Ice 5.098	1.535 1.714 1.901 2.295	0.070 0.097 0.128 0.201
TD-RRH8X20-25	C	From Leg	4.000 0.000 2.000	0.000	177.000	No Ice 4.045 1/2" Ice 4.298 1" Ice 4.557 2" Ice 5.098	1.535 1.714 1.901 2.295	0.070 0.097 0.128 0.201
4' x 2" Pipe Mount	A	From Leg	4.000 0.000 0.000	0.000	177.000	No Ice 0.785 1/2" Ice 1.028 1" Ice 1.281 2" Ice 1.814	0.785 1.028 1.281 1.814	0.029 0.035 0.044 0.072
4' x 2" Pipe Mount	B	From Leg	4.000 0.000 0.000	0.000	177.000	No Ice 0.785 1/2" Ice 1.028 1" Ice 1.281 2" Ice 1.814	0.785 1.028 1.281 1.814	0.029 0.035 0.044 0.072
4' x 2" Pipe Mount	C	From Leg	4.000 0.000 0.000	0.000	177.000	No Ice 0.785 1/2" Ice 1.028 1" Ice 1.281 2" Ice 1.814	0.785 1.028 1.281 1.814	0.029 0.035 0.044 0.072
Platform Mount [LP 502-1]	C	None		0.000	177.000	No Ice 18.280 1/2" Ice 23.540 1" Ice 28.530 2" Ice 38.850	18.280 23.540 28.530 38.850	0.925 1.435 2.070 3.714
* (2) SBNHH-1D65B	A	From Leg	4.000	0.000	161.000	No Ice 4.160	2.490	0.041

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
			0.000			1/2" Ice	4.570	2.880	0.091
			0.000			1" Ice	4.990	3.270	0.148
						2" Ice	5.850	4.090	0.281
(2) SBNHH-1D65B	B	From Leg	4.000	0.000	161.000	No Ice	4.160	2.490	0.041
			0.000			1/2" Ice	4.570	2.880	0.091
			0.000			1" Ice	4.990	3.270	0.148
						2" Ice	5.850	4.090	0.281
(2) SBNHH-1D65B	C	From Leg	4.000	0.000	161.000	No Ice	4.160	2.490	0.041
			0.000			1/2" Ice	4.570	2.880	0.091
			0.000			1" Ice	4.990	3.270	0.148
						2" Ice	5.850	4.090	0.281
(2) LPA-80063/4CF-5	A	From Leg	4.000	0.000	161.000	No Ice	6.147	5.426	0.020
			0.000			1/2" Ice	6.486	5.755	0.073
			0.000			1" Ice	6.832	6.091	0.130
						2" Ice	7.544	6.783	0.262
(2) LPA-80080/4CF	B	From Leg	4.000	0.000	161.000	No Ice	2.619	5.399	0.012
			0.000			1/2" Ice	2.922	5.726	0.045
			0.000			1" Ice	3.232	6.061	0.083
						2" Ice	3.847	6.750	0.172
(2) LPA-80080/4CF	C	From Leg	4.000	0.000	161.000	No Ice	2.619	5.399	0.012
			0.000			1/2" Ice	2.922	5.726	0.045
			0.000			1" Ice	3.232	6.061	0.083
						2" Ice	3.847	6.750	0.172
(3) RRH2X60-700	A	From Leg	4.000	0.000	161.000	No Ice	3.500	1.816	0.060
			0.000			1/2" Ice	3.761	2.052	0.083
			0.000			1" Ice	4.029	2.289	0.109
						2" Ice	4.585	2.785	0.173
PCS B25 RRH4X30	A	From Leg	4.000	0.000	161.000	No Ice	2.200	1.742	0.055
			0.000			1/2" Ice	2.393	1.920	0.075
			0.000			1" Ice	2.593	2.106	0.099
						2" Ice	3.015	2.501	0.156
(2) PCS B25 RRH4X30	B	From Leg	4.000	0.000	161.000	No Ice	2.200	1.742	0.055
			0.000			1/2" Ice	2.393	1.920	0.075
			0.000			1" Ice	2.593	2.106	0.099
						2" Ice	3.015	2.501	0.156
(2) RRH4X45-AWS4 B66	B	From Leg	4.000	0.000	161.000	No Ice	2.660	1.586	0.064
			0.000			1/2" Ice	2.878	1.769	0.084
			0.000			1" Ice	3.104	1.959	0.108
						2" Ice	3.577	2.359	0.165
RRH4X45-AWS4 B66	C	From Leg	4.000	0.000	161.000	No Ice	2.660	1.586	0.064
			0.000			1/2" Ice	2.878	1.769	0.084
			0.000			1" Ice	3.104	1.959	0.108
						2" Ice	3.577	2.359	0.165
(2) RC3DC-3315-PF-48	C	From Leg	4.000	0.000	161.000	No Ice	3.792	2.512	0.032
			0.000			1/2" Ice	4.044	2.725	0.063
			0.000			1" Ice	4.303	2.945	0.099
						2" Ice	4.844	3.414	0.181
(4) 8' x 2.375" Mount Pipe	A	From Leg	4.000	0.000	161.000	No Ice	1.900	1.900	0.038
			0.000			1/2" Ice	2.728	2.728	0.052
			0.000			1" Ice	3.401	3.401	0.072
						2" Ice	4.396	4.396	0.127
(4) 8' x 2.375" Mount Pipe	B	From Leg	4.000	0.000	161.000	No Ice	1.900	1.900	0.038
			0.000			1/2" Ice	2.728	2.728	0.052
			0.000			1" Ice	3.401	3.401	0.072
						2" Ice	4.396	4.396	0.127
(4) 8' x 2.375" Mount Pipe	C	From Leg	4.000	0.000	161.000	No Ice	1.900	1.900	0.038
			0.000			1/2" Ice	2.728	2.728	0.052

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	Client	Crown Castle		Designed by

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A ₁ Front	C _A A ₁ Side	Weight
			Horz	Lateral					
			0.000						
RMQP-496-HK	C	None			0.000	161.000	1" Ice 3.401	3.401	0.072
							2" Ice 4.396	4.396	0.127
							No Ice 23.140	23.140	1.945
							1/2" Ice 28.170	28.170	2.335
							1" Ice 33.230	33.230	2.845
							2" Ice 43.350	43.350	3.865
*									
800 10504 w/ Mount Pipe	A	From Leg	4.000		0.000	151.000	No Ice 2.690	2.260	0.038
			0.000				1/2" Ice 3.120	2.680	0.067
			0.000				1" Ice 3.560	3.120	0.105
							2" Ice 4.490	4.030	0.206
800 10504 w/ Mount Pipe	B	From Leg	4.000		0.000	151.000	No Ice 2.690	2.260	0.038
			0.000				1/2" Ice 3.120	2.680	0.067
			0.000				1" Ice 3.560	3.120	0.105
							2" Ice 4.490	4.030	0.206
800 10504 w/ Mount Pipe	C	From Leg	4.000		0.000	151.000	No Ice 2.690	2.260	0.038
			0.000				1/2" Ice 3.120	2.680	0.067
			0.000				1" Ice 3.560	3.120	0.105
							2" Ice 4.490	4.030	0.206
6' x 2" Mount Pipe	A	From Leg	4.000		0.000	151.000	No Ice 1.425	1.425	0.022
			0.000				1/2" Ice 1.925	1.925	0.033
			0.000				1" Ice 2.294	2.294	0.048
							2" Ice 3.060	3.060	0.090
6' x 2" Mount Pipe	B	From Leg	4.000		0.000	151.000	No Ice 1.425	1.425	0.022
			0.000				1/2" Ice 1.925	1.925	0.033
			0.000				1" Ice 2.294	2.294	0.048
							2" Ice 3.060	3.060	0.090
6' x 2" Mount Pipe	C	From Leg	4.000		0.000	151.000	No Ice 1.425	1.425	0.022
			0.000				1/2" Ice 1.925	1.925	0.033
			0.000				1" Ice 2.294	2.294	0.048
							2" Ice 3.060	3.060	0.090
T-Arm Mount [TA 602-3]	C	None			0.000	151.000	No Ice 13.400	13.400	0.774
							1/2" Ice 16.440	16.440	1.004
							1" Ice 19.700	19.700	1.292
							2" Ice 25.860	25.860	2.053
*									
6812B-1	A	From Leg	1.000		0.000	136.000	No Ice 0.200	0.200	0.003
			0.000				1/2" Ice 0.220	0.220	0.006
			0.000				1" Ice 0.240	0.240	0.010
							2" Ice 0.280	0.280	0.017
Side Arm Mount [SO 701-1]	A	From Leg	0.500		0.000	136.000	No Ice 0.850	1.670	0.065
			0.000				1/2" Ice 1.140	2.340	0.079
			0.000				1" Ice 1.430	3.010	0.093
							2" Ice 2.010	4.350	0.121
*									
DB806-XT	A	From Leg	1.000		0.000	118.000	No Ice 1.140	1.140	0.021
			0.000				1/2" Ice 1.675	1.675	0.030
			3.000				1" Ice 2.025	2.025	0.043
							2" Ice 2.753	2.753	0.080
Side Arm Mount [SO 701-1]	A	From Leg	0.500		0.000	118.000	No Ice 0.850	1.670	0.065
			0.000				1/2" Ice 1.140	2.340	0.079
			0.000				1" Ice 1.430	3.010	0.093
							2" Ice 2.010	4.350	0.121
*									
KS24019-L112A	A	From Leg	1.000		0.000	101.000	No Ice 0.141	0.141	0.005
			0.000				1/2" Ice 0.198	0.198	0.007
			0.000				1" Ice 0.262	0.262	0.009

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A ₁ Front	C _A A ₁ Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
Side Arm Mount [SO 701-1]	A	From Leg	0.500		0.000	101.000	2" Ice	0.415	0.415	0.018
			0.000				No Ice	0.850	1.670	0.065
			0.000				1/2" Ice	1.140	2.340	0.079
							1" Ice	1.430	3.010	0.093
							2" Ice	2.010	4.350	0.121
* Bridge Stiffener	A	From Leg	0.500		0.000	30.000	No Ice	3.827	0.288	0.002
			0.000				1/2" Ice	4.109	0.683	0.018
			0.000				1" Ice	4.399	1.061	0.038
							2" Ice	4.999	1.585	0.091
Bridge Stiffener	B	From Leg	0.500		0.000	30.000	No Ice	3.827	0.288	0.002
			0.000				1/2" Ice	4.109	0.683	0.018
			0.000				1" Ice	4.399	1.061	0.038
							2" Ice	4.999	1.585	0.091
Bridge Stiffener	C	From Leg	0.500		0.000	30.000	No Ice	3.827	0.288	0.002
			0.000				1/2" Ice	4.109	0.683	0.018
			0.000				1" Ice	4.399	1.061	0.038
							2" Ice	4.999	1.585	0.091
* Bridge Stiffener	A	From Leg	0.500		0.000	60.000	No Ice	3.827	0.288	0.002
			0.000				1/2" Ice	4.109	0.683	0.018
			0.000				1" Ice	4.399	1.061	0.038
							2" Ice	4.999	1.585	0.091
Bridge Stiffener	B	From Leg	0.500		0.000	60.000	No Ice	3.827	0.288	0.002
			0.000				1/2" Ice	4.109	0.683	0.018
			0.000				1" Ice	4.399	1.061	0.038
							2" Ice	4.999	1.585	0.091
Bridge Stiffener	C	From Leg	0.500		0.000	60.000	No Ice	3.827	0.288	0.002
			0.000				1/2" Ice	4.109	0.683	0.018
			0.000				1" Ice	4.399	1.061	0.038
							2" Ice	4.999	1.585	0.091
* Bridge Stiffener	A	From Leg	0.500		0.000	90.000	No Ice	3.827	0.288	0.002
			0.000				1/2" Ice	4.109	0.683	0.018
			0.000				1" Ice	4.399	1.061	0.038
							2" Ice	4.999	1.585	0.091
Bridge Stiffener	B	From Leg	0.500		0.000	90.000	No Ice	3.827	0.288	0.002
			0.000				1/2" Ice	4.109	0.683	0.018
			0.000				1" Ice	4.399	1.061	0.038
							2" Ice	4.999	1.585	0.091
Bridge Stiffener	C	From Leg	0.500		0.000	90.000	No Ice	3.827	0.288	0.002
			0.000				1/2" Ice	4.109	0.683	0.018
			0.000				1" Ice	4.399	1.061	0.038
							2" Ice	4.999	1.585	0.091
* Bridge Stiffener	A	From Leg	0.500		0.000	120.000	No Ice	3.827	0.288	0.002
			0.000				1/2" Ice	4.109	0.683	0.018
			0.000				1" Ice	4.399	1.061	0.038
							2" Ice	4.999	1.585	0.091
Bridge Stiffener	B	From Leg	0.500		0.000	120.000	No Ice	3.827	0.288	0.002
			0.000				1/2" Ice	4.109	0.683	0.018
			0.000				1" Ice	4.399	1.061	0.038
							2" Ice	4.999	1.585	0.091
Bridge Stiffener	C	From Leg	0.500		0.000	120.000	No Ice	3.827	0.288	0.002
			0.000				1/2" Ice	4.109	0.683	0.018
			0.000				1" Ice	4.399	1.061	0.038
							2" Ice	4.999	1.585	0.091

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
*								

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

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Comb. No.	Description
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
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	180 - 175	Pole	Max Tension	45	0.000	0.000	0.000
			Max. Compression	26	-7.720	-0.001	-0.017
			Max. Mx	8	-2.844	-12.798	0.000
			Max. My	14	-2.829	-0.000	-12.820
			Max. Vy	8	3.978	-12.798	0.000
			Max. Vx	14	3.988	-0.000	-12.820
			Max. Torque	24			0.004
L2	175 - 170	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-8.380	-0.003	-0.030
			Max. Mx	8	-3.228	-33.557	0.002
			Max. My	14	-3.213	-0.001	-33.637
			Max. Vy	8	4.326	-33.557	0.002
			Max. Vx	14	4.338	-0.001	-33.637
			Max. Torque	24			0.004
L3	170 - 165	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-9.040	-0.006	-0.043
			Max. Mx	8	-3.616	-56.046	0.004
			Max. My	14	-3.599	-0.001	-56.189
			Max. Vy	8	4.670	-56.046	0.004
			Max. Vx	14	4.683	-0.001	-56.189
			Max. Torque	24			0.004
L4	165 - 160	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-18.588	-0.586	1.095
			Max. Mx	8	-7.614	-86.391	0.414
			Max. My	2	-7.568	-0.588	86.699
			Max. Vy	8	10.586	-86.391	0.414
			Max. Vx	14	10.995	-0.561	-86.020
			Max. Torque	10			0.165
L5	160 - 155	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-19.315	-0.591	1.088
			Max. Mx	8	-8.090	-140.142	0.472
			Max. My	2	-8.045	-0.644	142.415
			Max. Vy	8	10.915	-140.142	0.472
			Max. Vx	14	11.326	-0.510	-141.819
			Max. Torque	10			0.165
L6	155 - 150	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-22.564	-0.595	1.080
			Max. Mx	8	-9.641	-196.786	0.529
			Max. My	2	-9.595	-0.700	201.028
			Max. Vy	8	12.516	-196.786	0.529
			Max. Vx	14	12.932	-0.459	-200.524
			Max. Torque	10			0.165
L7	150 - 145	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-23.699	-0.596	1.059
			Max. Mx	8	-10.468	-260.408	0.587
			Max. My	2	-10.423	-0.756	266.629
			Max. Vy	8	12.937	-260.408	0.587
			Max. Vx	14	13.355	-0.407	-266.233
			Max. Torque	10			0.165

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L8	145 - 140	Pole	Max. Torque	10			0.165
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-24.833	-0.596	1.036
			Max. Mx	8	-11.299	-326.117	0.645
			Max. My	2	-11.255	-0.813	334.319
			Max. Vy	8	13.349	-326.117	0.645
			Max. Vx	14	13.770	-0.356	-334.040
L9	140 - 135	Pole	Max. Torque	10			0.165
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-26.103	-0.596	1.248
			Max. Mx	8	-12.214	-393.950	0.836
			Max. My	2	-12.173	-0.869	404.242
			Max. Vy	8	13.847	-393.950	0.836
			Max. Vx	14	14.230	-0.304	-403.801
L10	135 - 130	Pole	Max. Torque	20			-0.334
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-27.254	-0.596	1.200
			Max. Mx	8	-13.062	-464.139	0.893
			Max. My	2	-13.023	-0.926	476.214
			Max. Vy	8	14.234	-464.139	0.893
			Max. Vx	14	14.618	-0.252	-475.911
L11	130 - 125	Pole	Max. Torque	20			-0.334
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-28.405	-0.596	1.153
			Max. Mx	8	-13.920	-536.218	0.949
			Max. My	2	-13.882	-0.982	550.078
			Max. Vy	8	14.605	-536.218	0.949
			Max. Vx	14	14.992	-0.200	-549.921
L12	125 - 120	Pole	Max. Torque	20			-0.333
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-29.553	-0.596	1.106
			Max. Mx	8	-14.787	-610.109	1.006
			Max. My	14	-14.719	-0.148	-625.752
			Max. Vy	8	14.960	-610.109	1.006
			Max. Vx	14	15.348	-0.148	-625.752
L13	120 - 115	Pole	Max. Torque	20			-0.333
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-31.282	-0.576	1.458
			Max. Mx	8	-15.873	-687.754	1.265
			Max. My	2	-15.841	-1.093	705.285
			Max. Vy	8	15.777	-687.754	1.265
			Max. Vx	14	16.129	-0.094	-705.013
L14	115 - 110	Pole	Max. Torque	20			-0.640
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-32.649	-0.544	1.422
			Max. Mx	8	-16.875	-767.689	1.322
			Max. My	2	-16.844	-1.146	786.811
			Max. Vy	8	16.205	-767.689	1.322
			Max. Vx	14	16.559	-0.039	-786.716
L15	110 - 107.583	Pole	Max. Torque	20			-0.640
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-33.392	-0.528	1.404
			Max. Mx	8	-17.360	-807.087	1.349
			Max. My	14	-17.284	-0.012	-827.231
			Max. Vy	8	16.407	-807.087	1.349
			Max. Vx	14	16.977	-0.012	-827.231
L16	107.583 - 107.333	Pole	Max. Torque	20			-0.640
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-33.486	-0.527	1.402
			Max. Mx	8	-17.432	-811.190	1.352

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L17	107.333 - 102.333	Polc	Max. My	14	-17.355	-0.009	-831.479
			Max. Vy	8	16.425	-811.190	1.352
			Max. Vx	14	17.017	-0.009	-831.479
			Max. Torque	20			-0.640
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-35.365	-0.494	1.366
			Max. Mx	8	-18.774	-894.392	1.409
			Max. My	14	-18.677	0.046	-918.750
			Max. Vy	8	16.862	-894.392	1.409
			Max. Vx	14	17.896	0.046	-918.750
L18	102.333 - 97.333	Polc	Max. Torque	20			-0.640
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-37.374	-0.462	1.601
			Max. Mx	8	-20.206	-980.038	1.629
			Max. My	14	-20.093	0.101	-1010.353
			Max. Vy	8	17.366	-980.038	1.629
			Max. Vx	14	18.799	0.101	-1010.353
			Max. Torque	20			-0.806
			Max Tension	1	0.000	0.000	0.000
			L19	97.333 - 92.333	Polc	Max. Compression	26
Max. Mx	8	-21.564				-1067.841	1.685
Max. My	14	-21.437				0.157	-1106.398
Max. Vy	8	17.766				-1067.841	1.685
Max. Vx	14	19.628				0.157	-1106.398
Max. Torque	20						-0.806
Max Tension	1	0.000				0.000	0.000
Max. Compression	26	-40.120				-0.416	1.548
Max. Mx	8	-22.199				-1109.484	1.711
Max. My	14	-22.067				0.183	-1152.618
L20	92.333 - 90	Polc	Max. Vy	8	17.947	-1109.484	1.711
			Max. Vx	14	20.008	0.183	-1152.618
			Max. Torque	20			-0.805
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-40.413	-0.414	1.546
			Max. Mx	8	-22.292	-1114.026	1.714
			Max. My	14	-22.160	0.185	-1157.675
			Max. Vy	8	18.185	-1114.026	1.714
			Max. Vx	14	20.245	0.185	-1157.675
			Max. Torque	20			-0.805
L21	90 - 89.75	Polc	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-40.413	-0.414	1.546
			Max. Mx	8	-22.292	-1114.026	1.714
			Max. My	14	-22.160	0.185	-1157.675
			Max. Vy	8	18.185	-1114.026	1.714
			Max. Vx	14	20.245	0.185	-1157.675
			Max. Torque	20			-0.805
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-42.641	-0.378	1.505
			Max. Mx	8	-24.061	-1206.152	1.769
L22	89.75 - 84.75	Polc	Max. My	14	-23.932	0.241	-1260.115
			Max. Vy	8	18.672	-1206.152	1.769
			Max. Vx	14	20.735	0.241	-1260.115
			Max. Torque	20			-0.805
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-44.867	-0.342	1.465
			Max. Mx	8	-25.836	-1300.662	1.824
			Max. My	14	-25.711	0.297	-1364.954
			Max. Vy	8	19.141	-1300.662	1.824
			Max. Vx	14	21.207	0.297	-1364.954
L23	84.75 - 79.75	Polc	Max. Torque	20			-0.805
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-44.867	-0.342	1.465
			Max. Mx	8	-25.836	-1300.662	1.824
			Max. My	14	-25.711	0.297	-1364.954
			Max. Vy	8	19.141	-1300.662	1.824
			Max. Vx	14	21.207	0.297	-1364.954
			Max. Torque	20			-0.805
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-47.089	-0.306	1.425
L24	79.75 - 74.75	Polc	Max. Mx	8	-27.616	-1397.467	1.880
			Max. My	14	-27.496	0.353	-1472.099
			Max. Vy	8	19.591	-1397.467	1.880
			Max. Vx	8	19.591	-1397.467	1.880

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L25	74.75 - 69.75	Polc	Max. Vx	14	21.660	0.353	-1472.099
			Max. Torque	20			-0.805
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-49.307	-0.271	1.385
			Max. Mx	8	-29.401	-1496.473	1.935
			Max. My	14	-29.287	0.410	-1581.454
			Max. Vy	8	20.022	-1496.473	1.935
			Max. Vx	14	22.092	0.410	-1581.454
			Max. Torque	20			-0.805
L26	69.75 - 64.75	Polc	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-51.521	-0.236	1.346
			Max. Mx	8	-31.191	-1597.579	1.989
			Max. My	14	-31.084	0.466	-1692.912
			Max. Vy	8	20.433	-1597.579	1.989
			Max. Vx	14	22.503	0.466	-1692.912
			Max. Torque	20			-0.805
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-53.621	-0.194	1.309
L27	64.75 - 60	Polc	Max. Mx	8	-32.896	-1695.477	2.041
			Max. My	14	-32.795	0.519	-1800.645
			Max. Vy	8	20.804	-1695.477	2.041
			Max. Vx	14	22.873	0.519	-1800.645
			Max. Torque	20			-0.805
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-53.898	-0.201	1.307
			Max. Mx	8	-32.987	-1700.727	2.044
			Max. My	14	-32.887	0.522	-1806.412
L28	60 - 59.75	Polc	Max. Vy	8	21.014	-1700.727	2.044
			Max. Vx	14	23.083	0.522	-1806.412
			Max. Torque	20			-0.805
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-56.003	-0.162	1.264
			Max. Mx	8	-34.664	-1806.872	2.098
			Max. My	14	-34.569	0.578	-1922.906
			Max. Vy	8	21.454	-1806.872	2.098
			Max. Vx	14	23.523	0.578	-1922.906
L29	59.75 - 54.75	Polc	Max. Torque	20			-0.805
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-58.113	-0.123	1.221
			Max. Mx	8	-36.349	-1915.139	2.151
			Max. My	14	-36.261	0.635	-2041.515
			Max. Vy	8	21.868	-1915.139	2.151
			Max. Vx	14	23.935	0.635	-2041.515
			Max. Torque	20			-0.805
			Max Tension	1	0.000	0.000	0.000
L30	54.75 - 49.75	Polc	Max. Compression	26	-59.558	-0.099	1.194
			Max. Mx	8	-37.418	-1984.760	2.185
			Max. My	14	-37.329	0.671	-2118.151
			Max. Vy	8	22.117	-1984.760	2.185
			Max. Vx	14	24.478	0.671	-2118.151
			Max. Torque	20			-0.805
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-59.698	-0.097	1.192
			Max. Mx	8	-37.533	-1990.290	2.188
L31	49.75 - 46.583	Polc	Max. My	14	-37.444	0.673	-2124.274
			Max. Vy	8	22.132	-1990.290	2.188
			Max. Vx	14	24.516	0.673	-2124.274
			Max. Torque	20			-0.804
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-59.698	-0.097	1.192
			Max. Mx	8	-37.533	-1990.290	2.188
			Max. My	14	-37.444	0.673	-2124.274
			Max. Vy	8	22.132	-1990.290	2.188
L32	46.583 - 46.333	Polc	Max. Vx	14	24.516	0.673	-2124.274
			Max. Torque	20			-0.804
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-59.698	-0.097	1.192
			Max. Mx	8	-37.533	-1990.290	2.188
			Max. My	14	-37.444	0.673	-2124.274
			Max. Vy	8	22.132	-1990.290	2.188
			Max. Vx	14	24.516	0.673	-2124.274
			Max. Torque	20			-0.804
L33	46.333 - 41.333	Polc	Max Tension	1	0.000	0.000	0.000

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L34	41.333 - 36.333	Pole	Max. Compression	26	-62.492	-0.059	1.150
			Max. Mx	8	-39.728	-2101.942	2.241
			Max. My	14	-39.636	0.730	-2248.984
			Max. Vy	8	22.539	-2101.942	2.241
			Max. Vx	14	25.377	0.730	-2248.984
			Max. Torque	20			-0.804
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-65.277	-0.023	1.110
			Max. Mx	8	-41.931	-2215.541	2.293
			Max. My	14	-41.839	0.786	-2377.869
L35	36.333 - 31.333	Pole	Max. Vy	8	22.916	-2215.541	2.293
			Max. Vx	14	26.191	0.786	-2377.869
			Max. Torque	20			-0.804
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-68.053	0.014	1.070
			Max. Mx	8	-44.138	-2330.948	2.346
			Max. My	14	-44.049	0.842	-2510.701
			Max. Vy	8	23.264	-2330.948	2.346
			Max. Vx	14	26.958	0.842	-2510.701
			Max. Torque	20			-0.804
L36	31.333 - 30	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-68.791	0.023	1.060
			Max. Mx	8	-44.725	-2362.003	2.359
			Max. My	14	-44.637	0.857	-2546.754
			Max. Vy	8	23.354	-2362.003	2.359
			Max. Vx	14	27.157	0.857	-2546.754
			Max. Torque	20			-0.804
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-69.094	0.025	1.058
			Max. Mx	8	-44.851	-2367.880	2.362
L37	30 - 29.75	Pole	Max. My	14	-44.765	0.860	-2553.585
			Max. Vy	8	23.521	-2367.880	2.362
			Max. Vx	14	27.343	0.860	-2553.585
			Max. Torque	20			-0.804
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-71.987	0.060	1.019
			Max. Mx	8	-47.171	-2486.275	2.414
			Max. My	14	-47.090	0.916	-2692.131
			Max. Vy	6	24.091	-2296.237	1348.788
			Max. Vx	14	28.086	0.916	-2692.131
L38	29.75 - 24.75	Pole	Max. Torque	20			-0.804
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-74.866	0.094	0.982
			Max. Mx	8	-49.498	-2606.242	2.465
			Max. My	14	-49.427	0.972	-2834.314
			Max. Vy	6	24.716	-2418.210	1419.923
			Max. Vx	14	28.806	0.972	-2834.314
			Max. Torque	20			-0.804
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-77.728	0.128	0.947
L39	24.75 - 19.75	Pole	Max. Mx	8	-51.830	-2727.708	2.516
			Max. My	14	-51.770	1.028	-2980.051
			Max. Vy	6	25.326	-2543.267	1492.835
			Max. Vx	14	29.509	1.028	-2980.051
			Max. Torque	20			-0.804
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-80.568	0.159	0.913
			Max. Mx	8	-54.165	-2850.596	2.566
			Max. My	14	-54.121	1.084	-3129.254

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L42	9.75 - 4.75	Pole	Max. Vy	6	25.922	-2671.333	1567.479	
			Max. Vx	14	30.195	1.084	-3129.254	
			Max. Torque	20			-0.804	
			Max Tension	1	0.000	0.000	0.000	
			Max. Compression	26	-83.377	0.189	0.883	
			Max. Mx	8	-56.504	-2974.825	2.616	
			Max. My	14	-56.480	1.139	-3281.832	
			Max. Vy	6	26.501	-2802.329	1643.809	
L43	4.75 - 0	Pole	Max. Vx	14	30.862	1.139	-3281.832	
			Max. Torque	20			-0.804	
			Max Tension	1	0.000	0.000	0.000	
			Max. Compression	26	-85.987	0.213	0.858	
			Max. Mx	8	-58.729	-3094.006	2.662	
			Max. My	14	-58.726	1.192	-3429.817	
			Max. Vy	6	27.038	-2929.414	1717.841	
			Max. Vx	14	31.479	1.192	-3429.817	
		Max. Torque	20			-0.804		

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	85.987	-0.000	0.000
	Max. H _x	23	44.053	27.010	15.721
	Max. H _z	2	58.737	-0.010	25.470
	Max. M _x	2	3144.155	-0.010	25.470
	Max. M _z	8	3094.006	-25.205	0.010
	Max. Torsion	8	0.804	-25.205	0.010
	Min. Vert	11	44.053	-21.823	-12.726
	Min. H _x	6	58.737	-27.020	15.739
	Min. H _z	14	58.737	0.010	-31.459
	Min. M _x	14	-3429.817	0.010	-31.459
	Min. M _z	20	-3092.927	25.205	-0.010
	Min. Torsion	20	-0.804	25.205	-0.010

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	48.948	0.000	0.000	-0.722	-0.413	0.000
1.2 Dead+1.0 Wind 0 deg - No Icc	58.737	0.010	-25.470	-3144.155	-2.276	0.051
0.9 Dead+1.0 Wind 0 deg - No Icc	44.053	0.010	-25.470	-3111.677	-2.112	0.040
1.2 Dead+1.0 Wind 30 deg - No Icc	58.737	12.612	-22.063	-2723.928	-1548.739	-0.354
0.9 Dead+1.0 Wind 30 deg - No Icc	44.053	12.612	-22.063	-2695.758	-1532.762	-0.358
1.2 Dead+1.0 Wind 60 deg - No Icc	58.737	27.020	-15.739	-1717.841	-2929.414	-0.668
0.9 Dead+1.0 Wind 60 deg - No Icc	44.053	27.020	-15.739	-1700.625	-2900.415	-0.663

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Load Combination	Vertical K	Shear _x K	Shear _y K	Overturning Moment, M _x kip-ft	Overturning Moment, M _y kip-ft	Torque kip-ft
Icc						
1.2 Dead+1.0 Wind 90 deg - No Ice	58.737	25.205	-0.010	-2.662	-3094.006	-0.804
Icc						
0.9 Dead+1.0 Wind 90 deg - No Ice	44.053	25.205	-0.010	-2.398	-3062.228	-0.791
Icc						
1.2 Dead+1.0 Wind 120 deg - No Ice	58.737	21.823	12.726	1569.221	-2678.675	-0.725
Icc						
0.9 Dead+1.0 Wind 120 deg - No Ice	44.053	21.823	12.726	1553.365	-2651.145	-0.708
Icc						
1.2 Dead+1.0 Wind 150 deg - No Ice	58.737	12.594	22.053	2720.341	-1545.738	-0.450
Icc						
0.9 Dead+1.0 Wind 150 deg - No Ice	44.053	12.594	22.053	2692.680	-1529.795	-0.434
Icc						
1.2 Dead+1.0 Wind 180 deg - No Ice	58.737	-0.010	31.459	3429.817	1.192	-0.053
Icc						
0.9 Dead+1.0 Wind 180 deg - No Ice	44.053	-0.010	31.459	3396.158	1.316	-0.041
Icc						
1.2 Dead+1.0 Wind 210 deg - No Ice	58.737	-12.612	22.063	2722.072	1547.655	0.360
Icc						
0.9 Dead+1.0 Wind 210 deg - No Ice	44.053	-12.612	22.063	2694.391	1531.967	0.364
Icc						
1.2 Dead+1.0 Wind 240 deg - No Ice	58.737	-21.834	12.744	1572.223	2679.324	0.674
Icc						
0.9 Dead+1.0 Wind 240 deg - No Ice	44.053	-21.834	12.744	1556.332	2652.062	0.668
Icc						
1.2 Dead+1.0 Wind 270 deg - No Ice	58.737	-25.205	0.010	0.806	3092.927	0.804
Icc						
0.9 Dead+1.0 Wind 270 deg - No Ice	44.053	-25.205	0.010	1.031	3061.436	0.792
Icc						
1.2 Dead+1.0 Wind 300 deg - No Ice	58.737	-27.010	-15.721	-1714.843	2926.604	0.721
Icc						
0.9 Dead+1.0 Wind 300 deg - No Ice	44.053	-27.010	-15.721	-1697.660	2897.914	0.704
Icc						
1.2 Dead+1.0 Wind 330 deg - No Ice	58.737	-12.594	-22.053	-2722.201	1544.656	0.443
Icc						
0.9 Dead+1.0 Wind 330 deg - No Ice	44.053	-12.594	-22.053	-2694.049	1529.001	0.427
Icc						
1.2 Dead+1.0 Ice+1.0 Temp	85.987	0.000	-0.000	-0.858	0.213	-0.000
Icc						
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	85.987	0.002	-6.541	-797.778	-0.078	0.021
Icc						
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	85.987	3.264	-5.665	-691.163	-396.121	-0.106
Icc						
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	85.987	5.699	-3.299	-400.865	-688.128	-0.205
Icc						
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	85.987	6.525	-0.002	-1.273	-791.973	-0.249
Icc						
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	85.987	5.650	3.269	397.146	-685.712	-0.226
Icc						
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	85.987	3.261	5.664	688.878	-395.666	-0.142
Icc						
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	85.987	-0.002	6.596	798.242	0.448	-0.021
Icc						
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	85.987	-3.264	5.665	689.141	396.491	0.106
Icc						
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	85.987	-5.651	3.272	397.601	686.345	0.205
Icc						
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	85.987	-6.525	0.002	-0.748	792.343	0.249
Icc						
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	85.987	-5.697	-3.296	-400.409	688.235	0.226
Icc						
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	85.987	-3.261	-5.664	-690.900	396.036	0.142

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Load Combination	Vertical K	Shear _x K	Shear _y K	Overturning Moment, M _x kip-ft	Overturning Moment, M _y kip-ft	Torque kip-ft
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	48.948	0.002	-4.738	-581.957	-0.766	0.008
Dead+Wind 30 deg - Service	48.948	2.346	-4.105	-504.254	-286.713	-0.067
Dead+Wind 60 deg - Service	48.948	5.027	-2.928	-318.307	-542.143	-0.125
Dead+Wind 90 deg - Service	48.948	4.689	-0.002	-1.088	-572.426	-0.149
Dead+Wind 120 deg - Service	48.948	4.060	2.368	289.551	-495.636	-0.133
Dead+Wind 150 deg - Service	48.948	2.343	4.103	502.398	-286.158	-0.082
Dead+Wind 180 deg - Service	48.948	-0.002	5.853	633.754	-0.125	-0.008
Dead+Wind 210 deg - Service	48.948	-2.346	4.105	502.719	285.823	0.067
Dead+Wind 240 deg - Service	48.948	-4.062	2.371	290.106	495.066	0.125
Dead+Wind 270 deg - Service	48.948	-4.689	0.002	-0.447	571.535	0.149
Dead+Wind 300 deg - Service	48.948	-5.025	-2.925	-317.752	540.932	0.133
Dead+Wind 330 deg - Service	48.948	-2.343	-4.103	-503.934	285.268	0.081

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-48.948	0.000	0.000	48.948	0.000	0.000%
2	0.010	-58.737	-25.470	-0.010	58.737	25.470	0.000%
3	0.010	-44.053	-25.470	-0.010	44.053	25.470	0.000%
4	12.612	-58.737	-22.063	-12.612	58.737	22.063	0.000%
5	12.612	-44.053	-22.063	-12.612	44.053	22.063	0.000%
6	27.020	-58.737	-15.739	-27.020	58.737	15.739	0.000%
7	27.020	-44.053	-15.739	-27.020	44.053	15.739	0.000%
8	25.205	-58.737	-0.010	-25.205	58.737	0.010	0.000%
9	25.205	-44.053	-0.010	-25.205	44.053	0.010	0.000%
10	21.823	-58.737	12.726	-21.823	58.737	-12.726	0.000%
11	21.823	-44.053	12.726	-21.823	44.053	-12.726	0.000%
12	12.594	-58.737	22.053	-12.594	58.737	-22.053	0.000%
13	12.594	-44.053	22.053	-12.594	44.053	-22.053	0.000%
14	-0.010	-58.737	31.459	0.010	58.737	-31.459	0.000%
15	-0.010	-44.053	31.459	0.010	44.053	-31.459	0.000%
16	-12.612	-58.737	22.063	12.612	58.737	-22.063	0.000%
17	-12.612	-44.053	22.063	12.612	44.053	-22.063	0.000%
18	-21.834	-58.737	12.744	21.834	58.737	-12.744	0.000%
19	-21.834	-44.053	12.744	21.834	44.053	-12.744	0.000%
20	-25.205	-58.737	0.010	25.205	58.737	-0.010	0.000%
21	-25.205	-44.053	0.010	25.205	44.053	-0.010	0.000%
22	-27.010	-58.737	-15.721	27.010	58.737	15.721	0.000%
23	-27.010	-44.053	-15.721	27.010	44.053	15.721	0.000%
24	-12.594	-58.737	-22.053	12.594	58.737	22.053	0.000%
25	-12.594	-44.053	-22.053	12.594	44.053	22.053	0.000%
26	0.000	-85.987	0.000	-0.000	85.987	0.000	0.000%
27	0.002	-85.987	-6.541	-0.002	85.987	6.541	0.000%
28	3.264	-85.987	-5.665	-3.264	85.987	5.665	0.000%
29	5.699	-85.987	-3.299	-5.699	85.987	3.299	0.000%
30	6.525	-85.987	-0.002	-6.525	85.987	0.002	0.000%
31	5.650	-85.987	3.269	-5.650	85.987	-3.269	0.000%
32	3.261	-85.987	5.664	-3.261	85.987	-5.664	0.000%
33	-0.002	-85.987	6.596	0.002	85.987	-6.596	0.000%
34	-3.264	-85.987	5.665	3.264	85.987	-5.665	0.000%
35	-5.651	-85.987	3.272	5.651	85.987	-3.272	0.000%
36	-6.525	-85.987	0.002	6.525	85.987	-0.002	0.000%
37	-5.697	-85.987	-3.296	5.697	85.987	3.296	0.000%
38	-3.261	-85.987	-5.664	3.261	85.987	5.664	0.000%
39	0.002	-48.948	-4.738	-0.002	48.948	4.738	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
40	2.346	-48.948	-4.105	-2.346	48.948	4.105	0.000%
41	5.027	-48.948	-2.928	-5.027	48.948	2.928	0.000%
42	4.689	-48.948	-0.002	-4.689	48.948	0.002	0.000%
43	4.060	-48.948	2.368	-4.060	48.948	-2.368	0.000%
44	2.343	-48.948	4.103	-2.343	48.948	-4.103	0.000%
45	-0.002	-48.948	5.853	0.002	48.948	-5.853	0.000%
46	-2.346	-48.948	4.105	2.346	48.948	-4.105	0.000%
47	-4.062	-48.948	2.371	4.062	48.948	-2.371	0.000%
48	-4.689	-48.948	0.002	4.689	48.948	-0.002	0.000%
49	-5.025	-48.948	-2.925	5.025	48.948	2.925	0.000%
50	-2.343	-48.948	-4.103	2.343	48.948	4.103	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Ycs	4	0.00000001	0.00000001
2	Ycs	5	0.00000001	0.00012062
3	Ycs	5	0.00000001	0.00004544
4	Ycs	6	0.00000001	0.00025461
5	Ycs	6	0.00000001	0.00008958
6	Ycs	6	0.00000001	0.00028441
7	Ycs	6	0.00000001	0.00009864
8	Ycs	5	0.00000001	0.00022258
9	Ycs	5	0.00000001	0.00010300
10	Ycs	6	0.00000001	0.00024981
11	Ycs	6	0.00000001	0.00008809
12	Ycs	6	0.00000001	0.00025787
13	Ycs	6	0.00000001	0.00009091
14	Ycs	5	0.00000001	0.00011915
15	Ycs	5	0.00000001	0.00004392
16	Ycs	6	0.00000001	0.00025776
17	Ycs	6	0.00000001	0.00009091
18	Ycs	6	0.00000001	0.00025049
19	Ycs	6	0.00000001	0.00008833
20	Ycs	5	0.00000001	0.00020979
21	Ycs	5	0.00000001	0.00009635
22	Ycs	6	0.00000001	0.00028352
23	Ycs	6	0.00000001	0.00009839
24	Ycs	6	0.00000001	0.00025296
25	Ycs	6	0.00000001	0.00008910
26	Ycs	4	0.00000001	0.00005122
27	Ycs	6	0.00000001	0.00040330
28	Ycs	6	0.00000001	0.00043483
29	Ycs	6	0.00000001	0.00043407
30	Ycs	6	0.00000001	0.00039856
31	Ycs	6	0.00000001	0.00042981
32	Ycs	6	0.00000001	0.00043135
33	Ycs	6	0.00000001	0.00040026
34	Ycs	6	0.00000001	0.00043093
35	Ycs	6	0.00000001	0.00042918
36	Ycs	6	0.00000001	0.00039747
37	Ycs	6	0.00000001	0.00043274
38	Ycs	6	0.00000001	0.00043372
39	Ycs	4	0.00000001	0.00039859
40	Ycs	5	0.00000001	0.00004372

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41	Ycs	5	0.00000001	0.00005128
42	Ycs	4	0.00000001	0.00041255
43	Ycs	5	0.00000001	0.00004226
44	Ycs	5	0.00000001	0.00004524
45	Ycs	4	0.00000001	0.00041334
46	Ycs	5	0.00000001	0.00004487
47	Ycs	5	0.00000001	0.00004225
48	Ycs	4	0.00000001	0.00041021
49	Ycs	5	0.00000001	0.00005098
50	Ycs	5	0.00000001	0.00004310

Maximum Tower Deflections - Service Wind

Section No.	Elevation <i>ft</i>	Horz. Deflection <i>m</i>	Gov. Load Comb.	Tilt <i>°</i>	Twist <i>°</i>
L1	180 - 175	17.116	45	0.852	0.001
L2	175 - 170	16.224	45	0.851	0.001
L3	170 - 165	15.335	45	0.846	0.001
L4	165 - 160	14.453	45	0.837	0.001
L5	160 - 155	13.583	45	0.824	0.001
L6	155 - 150	12.731	45	0.801	0.001
L7	150 - 145	11.909	45	0.768	0.001
L8	145 - 140	11.113	45	0.752	0.001
L9	140 - 135	10.336	45	0.731	0.000
L10	135 - 130	9.583	45	0.706	0.000
L11	130 - 125	8.859	45	0.676	0.000
L12	125 - 120	8.169	45	0.641	0.000
L13	120 - 115	7.518	45	0.601	0.000
L14	115 - 110	6.903	45	0.575	0.000
L15	110 - 107.583	6.316	45	0.545	0.000
L16	107.583 - 107.333	6.044	45	0.530	0.000
L17	107.333 - 102.333	6.016	45	0.529	0.000
L18	102.333 - 97.333	5.475	45	0.504	0.000
L19	97.333 - 92.333	4.961	45	0.477	0.000
L20	92.333 - 90	4.478	45	0.447	0.000
L21	90 - 89.75	4.263	45	0.432	0.000
L22	89.75 - 84.75	4.240	45	0.431	0.000
L23	84.75 - 79.75	3.799	45	0.412	0.000
L24	79.75 - 74.75	3.378	45	0.392	0.000
L25	74.75 - 69.75	2.979	45	0.370	0.000
L26	69.75 - 64.75	2.603	45	0.347	0.000
L27	64.75 - 60	2.253	45	0.322	0.000
L28	60 - 59.75	1.945	45	0.296	0.000
L29	59.75 - 54.75	1.930	45	0.295	0.000
L30	54.75 - 49.75	1.633	45	0.272	0.000
L31	49.75 - 46.583	1.361	45	0.247	0.000
L32	46.583 - 46.333	1.203	45	0.231	0.000
L33	46.333 - 41.333	1.191	45	0.230	0.000
L34	41.333 - 36.333	0.961	45	0.209	0.000
L35	36.333 - 31.333	0.753	45	0.188	0.000
L36	31.333 - 30	0.568	45	0.165	0.000
L37	30 - 29.75	0.523	45	0.159	0.000
L38	29.75 - 24.75	0.515	45	0.157	0.000
L39	24.75 - 19.75	0.362	45	0.134	0.000
L40	19.75 - 14.75	0.234	45	0.110	0.000
L41	14.75 - 9.75	0.133	45	0.084	0.000
L42	9.75 - 4.75	0.059	45	0.057	0.000
L43	4.75 - 0	0.014	45	0.028	0.000

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
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Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.000	APXVSP18-C-A20 w/ Mount Pipe	45	16.580	0.852	0.001	111936
161.000	(2) SBNHH-1D65B	45	13.756	0.827	0.001	17676
151.000	800 10504 w/ Mount Pipe	45	12.071	0.773	0.001	10425
136.000	6812B-1	45	9.731	0.711	0.000	10603
120.000	Bridge Stiffener	45	7.518	0.601	0.000	8543
118.000	DB806-XT	45	7.268	0.589	0.000	9373
101.000	KS24019-L112A	45	5.335	0.497	0.000	10662
90.000	Bridge Stiffener	45	4.263	0.432	0.000	11456
60.000	Bridge Stiffener	45	1.945	0.296	0.000	11461
30.000	Bridge Stiffener	45	0.523	0.159	0.000	12361

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 175	92.832	14	4.627	0.003
L2	175 - 170	87.993	14	4.623	0.003
L3	170 - 165	83.168	14	4.598	0.003
L4	165 - 160	78.381	14	4.550	0.003
L5	160 - 155	73.658	14	4.475	0.003
L6	155 - 150	69.035	14	4.352	0.003
L7	150 - 145	64.573	14	4.168	0.003
L8	145 - 140	60.255	14	4.081	0.003
L9	140 - 135	56.041	14	3.970	0.003
L10	135 - 130	51.956	14	3.833	0.003
L11	130 - 125	48.028	14	3.670	0.002
L12	125 - 120	44.285	14	3.479	0.002
L13	120 - 115	40.756	14	3.261	0.002
L14	115 - 110	37.416	14	3.119	0.002
L15	110 - 107.583	34.233	14	2.959	0.002
L16	107.583 - 107.333	32.757	14	2.876	0.002
L17	107.333 - 102.333	32.607	14	2.870	0.002
L18	102.333 - 97.333	29.672	14	2.735	0.002
L19	97.333 - 92.333	26.887	14	2.586	0.001
L20	92.333 - 90	24.264	14	2.422	0.001
L21	90 - 89.75	23.101	14	2.341	0.001
L22	89.75 - 84.75	22.978	14	2.336	0.001
L23	84.75 - 79.75	20.585	14	2.235	0.001
L24	79.75 - 74.75	18.302	14	2.126	0.001
L25	74.75 - 69.75	16.138	14	2.007	0.001
L26	69.75 - 64.75	14.102	14	1.880	0.001
L27	64.75 - 60	12.204	14	1.743	0.001
L28	60 - 59.75	10.538	14	1.605	0.001
L29	59.75 - 54.75	10.454	14	1.599	0.001
L30	54.75 - 49.75	8.846	14	1.473	0.001

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L31	49.75 - 46.583	7.373	14	1.339	0.001
L32	46.583 - 46.333	6.514	14	1.250	0.000
L33	46.333 - 41.333	6.449	14	1.244	0.000
L34	41.333 - 36.333	5.203	14	1.134	0.000
L35	36.333 - 31.333	4.077	14	1.017	0.000
L36	31.333 - 30	3.076	14	0.893	0.000
L37	30 - 29.75	2.832	14	0.859	0.000
L38	29.75 - 24.75	2.787	14	0.853	0.000
L39	24.75 - 19.75	1.959	14	0.727	0.000
L40	19.75 - 14.75	1.267	14	0.594	0.000
L41	14.75 - 9.75	0.718	14	0.454	0.000
L42	9.75 - 4.75	0.319	14	0.307	0.000
L43	4.75 - 0	0.077	14	0.153	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.000	APXVSPP18-C-A20 w/ Mount Pipe	14	89.928	4.626	0.003	20971
161.000	(2) SBNHH-1D65B	14	74.596	4.493	0.003	3354
151.000	800 10504 w/ Mount Pipe	14	65.452	4.199	0.003	1961
136.000	6812B-1	14	52.761	3.862	0.003	1982
120.000	Bridge Stiffener	14	40.756	3.261	0.002	1591
118.000	DB806-XT	14	39.400	3.197	0.002	1746
101.000	KS24019-L112A	14	28.914	2.695	0.002	1974
90.000	Bridge Stiffener	14	23.101	2.341	0.001	2115
60.000	Bridge Stiffener	14	10.538	1.605	0.001	2115
30.000	Bridge Stiffener	14	2.832	0.859	0.000	2281

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A	P _u	φP _u	Ratio
						in ²	K	K	$\frac{P_u}{\phi P_u}$
L1	180 - 179	P24x0.25	5.000	0.000	0.0	18.653	-0.129	662.265	0.000 ¹
	179 - 178					18.653	-0.146	662.265	0.000
	178 - 177					18.653	-0.219	662.265	0.000
	177 - 176					18.653	-2.756	662.265	0.004
	176 - 175					18.653	-2.829	662.265	0.004
L2	175 - 174	P24x0.25	5.000	0.000	0.0	18.653	-2.906	662.265	0.004
	174 - 173					18.653	-2.982	662.265	0.005
	173 - 172					18.653	-3.059	662.265	0.005
	172 - 171					18.653	-3.136	662.265	0.005
	171 - 170					18.653	-3.213	662.265	0.005
L3	170 - 169	P24x0.25	5.000	0.000	0.0	18.653	-3.290	662.265	0.005
	169 - 168					18.653	-3.367	662.265	0.005
	168 - 167					18.653	-3.444	662.265	0.005

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _n K	φP _n K	Ratio P _n φP _n
	167 - 166					18.653	-3.521	662.265	0.005
	166 - 165					18.653	-3.599	662.265	0.005
L4	165 - 164	P24x0.25	5.000	0.000	0.0	18.653	-3.679	662.265	0.006
	164 - 163					18.653	-3.759	662.265	0.006
	163 - 162					18.653	-3.840	662.265	0.006
	162 - 161					18.653	-3.920	662.265	0.006
	161 - 160					18.653	-7.578	662.265	0.011
L5	160 - 159	P24x0.25	5.000	0.000	0.0	18.653	-7.673	662.265	0.012
	159 - 158					18.653	-7.757	662.265	0.012
	158 - 157					18.653	-7.853	662.265	0.012
	157 - 156					18.653	-7.948	662.265	0.012
	156 - 155					18.653	-8.045	662.265	0.012
L6	155 - 154	P24x0.25	5.000	0.000	0.0	18.653	-8.142	662.265	0.012
	154 - 153					18.653	-8.241	662.265	0.012
	153 - 152					18.653	-8.340	662.265	0.013
	152 - 151					18.653	-8.439	662.265	0.013
	151 - 150					18.653	-9.595	662.265	0.014
L7	150 - 149	P30x0.375	5.000	0.000	0.0	34.901	-9.763	1311.060	0.007
	149 - 148					34.901	-9.927	1311.060	0.008
	148 - 147					34.901	-10.092	1311.060	0.008
	147 - 146					34.901	-10.257	1311.060	0.008
	146 - 145					34.901	-10.423	1311.060	0.008
L8	145 - 144	P30x0.375	5.000	0.000	0.0	34.901	-10.589	1311.060	0.008
	144 - 143					34.901	-10.755	1311.060	0.008
	143 - 142					34.901	-10.921	1311.060	0.008
	142 - 141					34.901	-11.088	1311.060	0.008
	141 - 140					34.901	-11.255	1311.060	0.009
L9	140 - 139	P30x0.375	5.000	0.000	0.0	34.901	-11.422	1311.060	0.009
	139 - 138					34.901	-11.590	1311.060	0.009
	138 - 137					34.901	-11.758	1311.060	0.009
	137 - 136					34.901	-11.926	1311.060	0.009
	136 - 135					34.901	-12.173	1311.060	0.009
L10	135 - 134	P30x0.375	5.000	0.000	0.0	34.901	-12.342	1311.0600.009	
	134 - 133					34.901	-12.512	1311.060	0.010
	133 - 132					34.901	-12.682	1311.060	0.010
	132 - 131					34.901	-12.852	1311.060	0.010
	131 - 130					34.901	-13.023	1311.060	0.010
L11	130 - 129	P30x0.375	5.000	0.000	0.0	34.901	-13.194	1311.0600.010	
	129 - 128					34.901	-13.365	1311.060	0.010
	128 - 127					34.901	-13.537	1311.060	0.010
	127 - 126					34.901	-13.709	1311.060	0.010
	126 - 125					34.901	-13.882	1311.060	0.011
L12	125 - 124	P30x0.375	5.000	0.000	0.0	34.901	-14.055	1311.0600.011	
	124 - 123					34.901	-14.229	1311.060	0.011
	123 - 122					34.901	-14.403	1311.060	0.011
	122 - 121					34.901	-14.577	1311.060	0.011
	121 - 120					34.901	-14.752	1311.060	0.011
L13	120 - 119	P36x0.375	5.000	0.000	0.0	41.970	-14.914	1490.1000.010	
	119 - 118					41.970	-15.112	1490.100	0.010
	118 - 117					41.970	-15.442	1490.100	0.010
	117 - 116					41.970	-15.641	1490.100	0.010
	116 - 115					41.970	-15.841	1490.100	0.011
L14	115 - 114	P36x0.375	5.000	0.000	0.0	41.970	-16.041	1490.1000.011	
	114 - 113					41.970	-16.241	1490.100	0.011
	113 - 112					41.970	-16.442	1490.100	0.011
	112 - 111					41.970	-16.642	1490.100	0.011
	111 - 110					41.970	-16.844	1490.100	0.011
L15	110 - 108.792	P36x0.375	2.417	0.000	0.0	41.970	-17.046	1490.100	0.011
	108.792 - 107.583					41.970	-17.284	1490.100	0.012

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L16	107.583 - 107.333 (16)	P36x0.525	0.250	0.000	0.0	58.510	-17.355	2211.690	0.008
L17	107.333 - 106.333 106.333 - 105.333 105.333 - 104.333 104.333 - 103.333 103.333 - 102.333	P36x0.525	5.000	0.000	0.0	58.510	-17.617 -17.881 -18.146 -18.411 -18.677	2211.690	0.008
L18	102.333 - 101.333 101.333 - 100.333 100.333 - 99.333 99.333 - 98.333 98.333 - 97.333	P36x0.525	5.000	0.000	0.0	58.510	-18.943 -19.291 -19.558 -19.825 -20.093	2211.690	0.009
L19	97.333 - 96.333 96.333 - 95.333 95.333 - 94.333 94.333 - 93.333 93.333 - 92.333	P36x0.525	5.000	0.000	0.0	58.510	-20.361 -20.629 -20.898 -21.168 -21.437	2211.690	0.009
L20	92.333 - 91.1665	P36x0.525	2.333	0.000	0.0	58.510	-21.751	2211.690	0.010
L21	91.1665 - 90	P42x0.6125	0.250	0.000	0.0	79.639	-22.067	2211.690	0.010
L22	90 - 89.75 (21)	P42x0.6125	0.250	0.000	0.0	79.639	-22.160	3010.350	0.007
	89.75 - 88.75	P42x0.6125	5.000	0.000	0.0	79.639	-22.512	3010.350	0.007
	88.75 - 87.75					79.639	-22.867	3010.350	0.008
	87.75 - 86.75					79.639	-23.222	3010.350	0.008
	86.75 - 85.75					79.639	-23.577	3010.350	0.008
	85.75 - 84.75					79.639	-23.932	3010.350	0.008
L23	84.75 - 83.75	P42x0.6125	5.000	0.000	0.0	79.639	-24.288	3010.350	0.008
	83.75 - 82.75					79.639	-24.643	3010.350	0.008
	82.75 - 81.75					79.639	-24.999	3010.350	0.008
	81.75 - 80.75					79.639	-25.355	3010.350	0.008
	80.75 - 79.75					79.639	-25.712	3010.350	0.009
L24	79.75 - 78.75	P42x0.6125	5.000	0.000	0.0	79.639	-26.068	3010.350	0.009
	78.75 - 77.75					79.639	-26.425	3010.350	0.009
	77.75 - 76.75					79.639	-26.782	3010.350	0.009
	76.75 - 75.75					79.639	-27.139	3010.350	0.009
	75.75 - 74.75					79.639	-27.496	3010.350	0.009
L25	74.75 - 73.75	P42x0.6125	5.000	0.000	0.0	79.639	-27.854	3010.350	0.009
	73.75 - 72.75					79.639	-28.212	3010.350	0.009
	72.75 - 71.75					79.639	-28.570	3010.350	0.009
	71.75 - 70.75					79.639	-28.929	3010.350	0.010
	70.75 - 69.75					79.639	-29.287	3010.350	0.010
L26	69.75 - 68.75	P42x0.6125	5.000	0.000	0.0	79.639	-29.646	3010.350	0.010
	68.75 - 67.75					79.639	-30.005	3010.350	0.010
	67.75 - 66.75					79.639	-30.364	3010.350	0.010
	66.75 - 65.75					79.639	-30.724	3010.350	0.010

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L27	65.75 - 64.75	P42x0.6125	4.750	0.000	0.0	79.639	-31.084	3010.350	0.010
	64.75 - 63.5625					79.639	-31.510	3010.350	0.010
	63.5625 - 62.375					79.639	-31.938	3010.350	0.011
	62.375 - 61.1875					79.639	-32.366	3010.350	0.011
	61.1875 - 60					79.639	-32.795	3010.350	0.011
L28	60 - 59.75 (28)	P48x0.5	0.250	0.000	0.0	74.613	-32.887	2649.060	0.012
L29	59.75 - 58.75	P48x0.5	5.000	0.000	0.0	74.613	-33.220	2649.060	0.013
	58.75 - 57.75					74.613	-33.557	2649.060	0.013
	57.75 - 56.75					74.613	-33.894	2649.060	0.013
	56.75 - 55.75					74.613	-34.231	2649.060	0.013
	55.75 - 54.75					74.613	-34.569	2649.060	0.013
L30	54.75 - 53.75	P48x0.5	5.000	0.000	0.0	74.613	-34.907	2649.060	0.013
	53.75 - 52.75					74.613	-35.245	2649.060	0.013
	52.75 - 51.75					74.613	-35.584	2649.060	0.013
	51.75 - 50.75					74.613	-35.922	2649.060	0.014
	50.75 - 49.75					74.613	-36.261	2649.060	0.014
L31	49.75 - 48.6943	P48x0.5	3.167	0.000	0.0	74.613	-36.616	2649.060	0.014
	48.6943 - 47.6387					74.613	-36.972	2649.060	0.014
	47.6387 - 46.583					74.613	-37.329	2649.060	0.014
	46.583 - 46.333 (32)					74.613	-37.686	2649.060	0.014
	46.333 - 45.333					74.613	-38.043	2649.060	0.014
L32	45.333 - 44.333	P48x0.675	0.250	0.000	0.0	100.356	-37.444	3793.470	0.010
	44.333 - 43.333					100.356	-37.801	3793.470	0.010
	43.333 - 42.333					100.356	-38.158	3793.470	0.010
	42.333 - 41.333					100.356	-38.515	3793.470	0.010
	41.333 - 40.333					100.356	-38.872	3793.470	0.010
L33	40.333 - 39.333	P48x0.675	5.000	0.000	0.0	100.356	-37.879	3793.470	0.010
	39.333 - 38.333					100.356	-38.236	3793.470	0.010
	38.333 - 37.333					100.356	-38.593	3793.470	0.010
	37.333 - 36.333					100.356	-38.950	3793.470	0.010
	36.333 - 35.333					100.356	-39.307	3793.470	0.010
L34	35.333 - 34.333	P48x0.675	5.000	0.000	0.0	100.356	-39.664	3793.470	0.010
	34.333 - 33.333					100.356	-40.021	3793.470	0.011
	33.333 - 32.333					100.356	-40.378	3793.470	0.011
	32.333 - 31.333					100.356	-40.735	3793.470	0.011
	31.333 - 30					100.356	-41.092	3793.470	0.011
L35	(36)	P48x0.675	1.333	0.000	0.0	100.356	-44.637	3793.470	0.012
	30 - 29.75 (37)					100.356	-44.994	3793.470	0.012
						100.356	-45.351	3793.470	0.012
						100.356	-45.708	3793.470	0.012
						100.356	-46.065	3793.470	0.012
L36	30 - 29.75 (37)	P48x0.7125	0.250	0.000	0.0	105.848	-44.765	4001.040	0.011

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L38	29.75 - 28.75	P48x0.7125	5.000	0.000	0.0	105.848	-45.226	4001.040	0.011
	28.75 - 27.75					105.848	-45.692	4001.040	0.011
	27.75 - 26.75					105.848	-46.158	4001.040	0.012
	26.75 - 25.75					105.848	-46.624	4001.040	0.012
	25.75 - 24.75					105.848	-47.090	4001.040	0.012
L39	24.75 - 23.75	P48x0.7125	5.000	0.000	0.0	105.848	-47.557	4001.040	0.012
	23.75 - 22.75					105.848	-48.024	4001.040	0.012
	22.75 - 21.75					105.848	-48.491	4001.040	0.012
	21.75 - 20.75					105.848	-48.959	4001.040	0.012
	20.75 - 19.75					105.848	-49.427	4001.040	0.012
L40	19.75 - 18.75	P48x0.7125	5.000	0.000	0.0	105.848	-49.895	4001.040	0.012
	18.75 - 17.75					105.848	-50.363	4001.040	0.013
	17.75 - 16.75					105.848	-50.832	4001.040	0.013
	16.75 - 15.75					105.848	-51.301	4001.040	0.013
	15.75 - 14.75					105.848	-51.770	4001.040	0.013
L41	14.75 - 13.75	P48x0.7125	5.000	0.000	0.0	105.848	-52.240	4001.040	0.013
	13.75 - 12.75					105.848	-52.710	4001.040	0.013
	12.75 - 11.75					105.848	-53.180	4001.040	0.013
	11.75 - 10.75					105.848	-53.651	4001.040	0.013
	10.75 - 9.75					105.848	-54.121	4001.040	0.014
L42	9.75 - 8.75	P48x0.7125	5.000	0.000	0.0	105.848	-54.592	4001.040	0.014
	8.75 - 7.75					105.848	-55.064	4001.040	0.014
	7.75 - 6.75					105.848	-55.536	4001.040	0.014
	6.75 - 5.75					105.848	-56.008	4001.040	0.014
	5.75 - 4.75					105.848	-56.480	4001.040	0.014
L43	4.75 - 3.5625	P48x0.7125	4.750	0.000	0.0	105.848	-57.040	4001.040	0.014
	3.5625 - 2.375					105.848	-57.602	4001.040	0.014
	2.375 - 1.1875					105.848	-58.164	4001.040	0.015
	1.1875 - 0					105.848	-58.726	4001.040	0.015

¹ P_u / φP_n controls

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio M _{ux} / φM _{ux}	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio M _{uy} / φM _{uy}
L1	180 - 179	P24x0.25	0.015	396.683	0.000	0.000	396.683	0.000
	179 - 178		0.141	396.683	0.000	0.000	396.683	0.000
	178 - 177		0.318	396.683	0.001	0.000	396.683	0.000
	177 - 176		8.867	396.683	0.022	0.000	396.683	0.000
	176 - 175		12.820	396.683	0.032	0.000	396.683	0.000
L2	175 - 174	P24x0.25	16.844	396.683	0.042	0.000	396.683	0.000
	174 - 173		20.937	396.683	0.053	0.000	396.683	0.000
	173 - 172		25.100	396.683	0.063	0.000	396.683	0.000
	172 - 171		29.334	396.683	0.074	0.000	396.683	0.000
	171 - 170		33.637	396.683	0.085	0.000	396.683	0.000
L3	170 - 169	P24x0.25	38.009	396.683	0.096	0.000	396.683	0.000
	169 - 168		42.450	396.683	0.107	0.000	396.683	0.000
	168 - 167		46.961	396.683	0.118	0.000	396.683	0.000
	167 - 166		51.541	396.683	0.130	0.000	396.683	0.000
	166 - 165		56.189	396.683	0.142	0.000	396.683	0.000
L4	165 - 164	P24x0.25	60.906	396.683	0.154	0.000	396.683	0.000
	164 - 163		65.692	396.683	0.166	0.000	396.683	0.000
	163 - 162		70.545	396.683	0.178	0.000	396.683	0.000
	162 - 161		75.467	396.683	0.190	0.000	396.683	0.000

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Section No.	Elevation ft	Size	M_{ux}	ϕM_{ux}	Ratio	M_{uy}	ϕM_{uy}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{ux}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{uy}}$
	161 - 160		86.825	396.683	0.219	0.000	396.683	0.000
L5	160 - 159	P24x0.25	97.748	396.683	0.246	0.000	396.683	0.000
	159 - 158		108.790	396.683	0.274	0.000	396.683	0.000
	158 - 157		119.933	396.683	0.302	0.000	396.683	0.000
	157 - 156		131.143	396.683	0.331	0.000	396.683	0.000
	156 - 155		142.417	396.683	0.359	0.000	396.683	0.000
L6	155 - 154	P24x0.25	153.755	396.683	0.388	0.000	396.683	0.000
	154 - 153		165.158	396.683	0.416	0.000	396.683	0.000
	153 - 152		176.623	396.683	0.445	0.000	396.683	0.000
	152 - 151		188.152	396.683	0.474	0.000	396.683	0.000
	151 - 150		201.029	396.683	0.507	0.000	396.683	0.000
L7	150 - 149	P30x0.375	213.980	947.858	0.226	0.000	947.858	0.000
	149 - 148		227.015	947.858	0.240	0.000	947.858	0.000
	148 - 147		240.136	947.858	0.253	0.000	947.858	0.000
	147 - 146		253.341	947.858	0.267	0.000	947.858	0.000
	146 - 145		266.630	947.858	0.281	0.000	947.858	0.000
L8	145 - 144	P30x0.375	280.003	947.858	0.295	0.000	947.858	0.000
	144 - 143		293.458	947.858	0.310	0.000	947.858	0.000
	143 - 142		306.997	947.858	0.324	0.000	947.858	0.000
	142 - 141		320.618	947.858	0.338	0.000	947.858	0.000
	141 - 140		334.320	947.858	0.353	0.000	947.858	0.000
L9	140 - 139	P30x0.375	348.104	947.858	0.367	0.000	947.858	0.000
	139 - 138		361.968	947.858	0.382	0.000	947.858	0.000
	138 - 137		375.913	947.858	0.397	0.000	947.858	0.000
	137 - 136		389.938	947.858	0.411	0.000	947.858	0.000
	136 - 135		404.243	947.858	0.426	0.000	947.858	0.000
L10	135 - 134	P30x0.375	418.483	947.858	0.442	0.000	947.858	0.000
	134 - 133		432.800	947.858	0.457	0.000	947.858	0.000
	133 - 132		447.195	947.858	0.472	0.000	947.858	0.000
	132 - 131		461.667	947.858	0.487	0.000	947.858	0.000
	131 - 130		476.215	947.858	0.502	0.000	947.858	0.000
L11	130 - 129	P30x0.375	490.839	947.858	0.518	0.000	947.858	0.000
	129 - 128		505.538	947.858	0.533	0.000	947.858	0.000
	128 - 127		520.311	947.858	0.549	0.000	947.858	0.000
	127 - 126		535.158	947.858	0.565	0.000	947.858	0.000
	126 - 125		550.078	947.858	0.580	0.000	947.858	0.000
L12	125 - 124	P30x0.375	565.072	947.858	0.596	0.000	947.858	0.000
	124 - 123		580.136	947.858	0.612	0.000	947.858	0.000
	123 - 122		595.272	947.858	0.628	0.000	947.858	0.000
	122 - 121		610.477	947.858	0.644	0.000	947.858	0.000
	121 - 120		625.753	947.858	0.660	0.000	947.858	0.000
L13	120 - 119	P36x0.375	641.377	1338.808	0.479	0.000	1338.808	0.000
	119 - 118		657.091	1338.808	0.491	0.000	1338.808	0.000
	118 - 117		673.280	1338.808	0.503	0.000	1338.808	0.000
	117 - 116		689.239	1338.808	0.515	0.000	1338.808	0.000
	116 - 115		705.286	1338.808	0.527	0.000	1338.808	0.000
L14	115 - 114	P36x0.375	721.420	1338.808	0.539	0.000	1338.808	0.000
	114 - 113		737.640	1338.808	0.551	0.000	1338.808	0.000
	113 - 112		753.945	1338.808	0.563	0.000	1338.808	0.000
	112 - 111		770.337	1338.808	0.575	0.000	1338.808	0.000
	111 - 110		786.812	1338.808	0.588	0.000	1338.808	0.000
L15	110 - 108.792	P36x0.375	806.847	1338.808	0.603	0.000	1338.808	0.000
	108.792 - 107.583		827.231	1338.808	0.618	0.000	1338.808	0.000
L16	107.583 - 107.333 (16)	P36x0.525	831.479	1946.900	0.427	0.000	1946.900	0.000
L17	107.333 - 106.333	P36x0.525	848.583	1946.900	0.436	0.000	1946.900	0.000
	106.333 - 105.333		865.858	1946.900	0.445	0.000	1946.900	0.000

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Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M_{uy} kip-ft	ϕM_{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$		
L18	105.333 - 104.333	P36x0.525	883.317	1946.900	0.454	0.000	1946.900	0.000		
	104.333 - 103.333		900.942	1946.900	0.463	0.000	1946.900	0.000		
	103.333 - 102.333		918.750	1946.900	0.472	0.000	1946.900	0.000		
	102.333 - 101.333		936.725	1946.900	0.481	0.000	1946.900	0.000		
	101.333 - 100.333		954.733	1946.900	0.490	0.000	1946.900	0.000		
	100.333 - 99.333		973.108	1946.900	0.500	0.000	1946.900	0.000		
	99.333 - 98.333		991.642	1946.900	0.509	0.000	1946.900	0.000		
	98.333 - 97.333		1010.350	1946.900	0.519	0.000	1946.900	0.000		
	L19		97.333 - 96.333	P36x0.525	1029.233	1946.900	0.529	0.000	1946.900	0.000
			96.333 - 95.333		1048.275	1946.900	0.538	0.000	1946.900	0.000
95.333 - 94.333		1067.483	1946.900		0.548	0.000	1946.900	0.000		
94.333 - 93.333		1086.858	1946.900		0.558	0.000	1946.900	0.000		
93.333 - 92.333		1106.400	1946.900		0.568	0.000	1946.900	0.000		
L20		92.333 - 91.1665	P36x0.525		1129.400	1946.900	0.580	0.000	1946.900	0.000
		91.1665 - 90			1152.617	1946.900	0.592	0.000	1946.900	0.000
L21	90 - 89.75 (21)	P42x0.6125	1157.675	3091.608	0.374	0.000	3091.608	0.000		
L22	89.75 - 88.75	P42x0.6125	1177.967	3091.608	0.381	0.000	3091.608	0.000		
	88.75 - 87.75		1198.358	3091.608	0.388	0.000	3091.608	0.000		
	87.75 - 86.75		1218.850	3091.608	0.394	0.000	3091.608	0.000		
	86.75 - 85.75		1239.433	3091.608	0.401	0.000	3091.608	0.000		
	85.75 - 84.75		1260.117	3091.608	0.408	0.000	3091.608	0.000		
	L23		84.75 - 83.75	P42x0.6125	1280.892	3091.608	0.414	0.000	3091.608	0.000
			83.75 - 82.75		1301.767	3091.608	0.421	0.000	3091.608	0.000
82.75 - 81.75		1322.733	3091.608		0.428	0.000	3091.608	0.000		
81.75 - 80.75		1343.800	3091.608		0.435	0.000	3091.608	0.000		
L24	80.75 - 79.75	P42x0.6125	1364.950	3091.608	0.442	0.000	3091.608	0.000		
	79.75 - 78.75		1386.200	3091.608	0.448	0.000	3091.608	0.000		
	78.75 - 77.75		1407.542	3091.608	0.455	0.000	3091.608	0.000		
	77.75 - 76.75		1428.967	3091.608	0.462	0.000	3091.608	0.000		
	76.75 - 75.75		1450.492	3091.608	0.469	0.000	3091.608	0.000		
L25	75.75 - 74.75	P42x0.6125	1472.100	3091.608	0.476	0.000	3091.608	0.000		
	74.75 - 73.75		1493.800	3091.608	0.483	0.000	3091.608	0.000		
	73.75 - 72.75		1515.583	3091.608	0.490	0.000	3091.608	0.000		
	72.75 - 71.75		1537.450	3091.608	0.497	0.000	3091.608	0.000		
	71.75 - 70.75		1559.408	3091.608	0.504	0.000	3091.608	0.000		
	70.75 - 69.75		1581.450	3091.608	0.512	0.000	3091.608	0.000		
L26	69.75 - 68.75	P42x0.6125	1603.583	3091.608	0.519	0.000	3091.608	0.000		
	68.75 - 67.75		1625.792	3091.608	0.526	0.000	3091.608	0.000		
	67.75 - 66.75		1648.083	3091.608	0.533	0.000	3091.608	0.000		
	66.75 - 65.75		1670.458	3091.608	0.540	0.000	3091.608	0.000		
	65.75 - 64.75		1692.917	3091.608	0.548	0.000	3091.608	0.000		
L27	64.75 - 63.5625	P42x0.6125	1719.683	3091.608	0.556	0.000	3091.608	0.000		
	63.5625 - 62.375		1746.558	3091.608	0.565	0.000	3091.608	0.000		
	62.375 - 62.375		1773.550	3091.608	0.574	0.000	3091.608	0.000		
	62.375 -									

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Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M_{uy} kip-ft	ϕM_{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
	61.1875							
L28	61.1875 - 60	P48x0.5	1800.642	3091.608	0.582	0.000	3091.608	0.000
L29	60 - 59.75 (28)	P48x0.5	1806.417	3173.467	0.569	0.000	3173.467	0.000
	59.75 - 58.75		1829.533	3173.467	0.577	0.000	3173.467	0.000
	58.75 - 57.75		1852.750	3173.467	0.584	0.000	3173.467	0.000
	57.75 - 56.75		1876.050	3173.467	0.591	0.000	3173.467	0.000
	56.75 - 55.75		1899.433	3173.467	0.599	0.000	3173.467	0.000
	55.75 - 54.75		1922.908	3173.467	0.606	0.000	3173.467	0.000
L30	54.75 - 53.75	P48x0.5	1946.467	3173.467	0.613	0.000	3173.467	0.000
	53.75 - 52.75		1970.100	3173.467	0.621	0.000	3173.467	0.000
	52.75 - 51.75		1993.825	3173.467	0.628	0.000	3173.467	0.000
	51.75 - 50.75		2017.633	3173.467	0.636	0.000	3173.467	0.000
	50.75 - 49.75		2041.517	3173.467	0.643	0.000	3173.467	0.000
L31	49.75 - 48.6943	P48x0.5	2066.867	3173.467	0.651	0.000	3173.467	0.000
	48.6943 - 48.6943		2092.417	3173.467	0.659	0.000	3173.467	0.000
	47.6387 - 47.6387		2118.150	3173.467	0.667	0.000	3173.467	0.000
	46.583 - 46.583		2148.875	3173.467	0.675	0.000	3173.467	0.000
L32	46.583 - 46.333 (32)	P48x0.675	2124.275	4429.592	0.480	0.000	4429.592	0.000
L33	46.333 - 45.333	P48x0.675	2148.875	4429.592	0.485	0.000	4429.592	0.000
	45.333 - 45.333		2173.642	4429.592	0.491	0.000	4429.592	0.000
	44.333 - 44.333		2198.583	4429.592	0.496	0.000	4429.592	0.000
	43.333 - 43.333		2223.700	4429.592	0.502	0.000	4429.592	0.000
	42.333 - 42.333		2248.983	4429.592	0.508	0.000	4429.592	0.000
	41.333 - 41.333		2274.433	4429.592	0.513	0.000	4429.592	0.000
L34	41.333 - 40.333	P48x0.675	2274.433	4429.592	0.513	0.000	4429.592	0.000
	40.333 - 40.333		2300.050	4429.592	0.519	0.000	4429.592	0.000
	39.333 - 39.333		2325.825	4429.592	0.525	0.000	4429.592	0.000
	38.333 - 38.333		2351.767	4429.592	0.531	0.000	4429.592	0.000
	37.333 - 37.333		2377.867	4429.592	0.537	0.000	4429.592	0.000
	36.333 - 36.333		2404.125	4429.592	0.543	0.000	4429.592	0.000
L35	36.333 - 35.333	P48x0.675	2404.125	4429.592	0.543	0.000	4429.592	0.000
	35.333 - 35.333		2430.542	4429.592	0.549	0.000	4429.592	0.000
	34.333 - 34.333		2457.108	4429.592	0.555	0.000	4429.592	0.000
	33.333 - 33.333		2483.825	4429.592	0.561	0.000	4429.592	0.000
	32.333 - 32.333		2510.700	4429.592	0.567	0.000	4429.592	0.000
	31.333 - 31.333		2546.758	4429.592	0.575	0.000	4429.592	0.000
L36	31.333 - 30 (36)	P48x0.675	2546.758	4429.592	0.575	0.000	4429.592	0.000
L37	30 - 29.75 (37)	P48x0.7125	2553.583	4708.058	0.542	0.000	4708.058	0.000
L38	29.75 - 28.75	P48x0.7125	2581.000	4708.058	0.548	0.000	4708.058	0.000
	28.75 - 27.75		2608.558	4708.058	0.554	0.000	4708.058	0.000
	27.75 - 26.75		2636.275	4708.058	0.560	0.000	4708.058	0.000
	26.75 - 25.75		2664.125	4708.058	0.566	0.000	4708.058	0.000
	25.75 - 24.75		2692.133	4708.058	0.572	0.000	4708.058	0.000
L39	24.75 - 23.75	P48x0.7125	2720.283	4708.058	0.578	0.000	4708.058	0.000

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Section No.	Elevation ft	Size	M_{ux}	ϕM_{ux}	Ratio	M_{uy}	ϕM_{uy}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{ux}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{uy}}$
L40	23.75 - 22.75	P48x0.7125	2748.575	4708.058	0.584	0.000	4708.058	0.000
	22.75 - 21.75		2777.008	4708.058	0.590	0.000	4708.058	0.000
	21.75 - 20.75		2805.592	4708.058	0.596	0.000	4708.058	0.000
	20.75 - 19.75		2834.317	4708.058	0.602	0.000	4708.058	0.000
	19.75 - 18.75		2863.183	4708.058	0.608	0.000	4708.058	0.000
	18.75 - 17.75		2892.183	4708.058	0.614	0.000	4708.058	0.000
	17.75 - 16.75		2921.333	4708.058	0.620	0.000	4708.058	0.000
L41	16.75 - 15.75	P48x0.7125	2950.625	4708.058	0.627	0.000	4708.058	0.000
	15.75 - 14.75		2980.050	4708.058	0.633	0.000	4708.058	0.000
	14.75 - 13.75		3009.617	4708.058	0.639	0.000	4708.058	0.000
	13.75 - 12.75		3039.325	4708.058	0.646	0.000	4708.058	0.000
	12.75 - 11.75		3069.167	4708.058	0.652	0.000	4708.058	0.000
	11.75 - 10.75		3099.142	4708.058	0.658	0.000	4708.058	0.000
	10.75 - 9.75		3129.258	4708.058	0.665	0.000	4708.058	0.000
L42	9.75 - 8.75	P48x0.7125	3159.500	4708.058	0.671	0.000	4708.058	0.000
	8.75 - 7.75		3189.883	4708.058	0.678	0.000	4708.058	0.000
	7.75 - 6.75		3220.400	4708.058	0.684	0.000	4708.058	0.000
	6.75 - 5.75		3251.050	4708.058	0.691	0.000	4708.058	0.000
	5.75 - 4.75		3281.833	4708.058	0.697	0.000	4708.058	0.000
L43	4.75 - 3.5625	P48x0.7125	3318.558	4708.058	0.705	0.000	4708.058	0.000
	3.5625 - 2.375		3355.458	4708.058	0.713	0.000	4708.058	0.000
	2.375 - 1.1875		3392.550	4708.058	0.721	0.000	4708.058	0.000
	1.1875 - 0		3429.817	4708.058	0.729	0.000	4708.058	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	V_u	ϕV_n	Ratio	T_u	ϕT_n	Ratio
			K	K	$\frac{V_u}{\phi V_n}$	kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	180 - 179	P24x0.25	0.023	201.861	0.000	0.000	324.229	0.000
	179 - 178		0.141	201.861	0.001	0.000	324.229	0.000
	178 - 177		0.211	201.861	0.001	0.000	324.229	0.000
	177 - 176		3.918	201.861	0.019	0.000	324.229	0.000
	176 - 175		3.988	201.861	0.020	0.000	324.229	0.000
L2	175 - 174	P24x0.25	4.058	201.861	0.020	0.000	324.229	0.000
	174 - 173		4.128	201.861	0.020	0.000	324.229	0.000
	173 - 172		4.198	201.861	0.021	0.000	324.229	0.000
	172 - 171		4.268	201.861	0.021	0.000	324.229	0.000
	171 - 170		4.338	201.861	0.021	0.000	324.229	0.000
L3	170 - 169	P24x0.25	4.407	201.861	0.022	0.000	324.229	0.000
	169 - 168		4.476	201.861	0.022	0.000	324.229	0.000
	168 - 167		4.545	201.861	0.023	0.000	324.229	0.000
	167 - 166		4.614	201.861	0.023	0.000	324.229	0.000
	166 - 165		4.683	201.861	0.023	0.000	324.229	0.000
L4	165 - 164	P24x0.25	4.751	201.861	0.024	0.000	324.229	0.000
	164 - 163		4.820	201.861	0.024	0.000	324.229	0.000
	163 - 162		4.888	201.861	0.024	0.000	324.229	0.000
	162 - 161		4.956	201.861	0.025	0.000	324.229	0.000
	161 - 160		10.892	201.861	0.054	0.031	324.229	0.000
L5	160 - 159	P24x0.25	10.959	201.861	0.054	0.031	324.229	0.000
	159 - 158		11.113	201.861	0.055	0.051	324.229	0.000
	158 - 157		11.178	201.861	0.055	0.051	324.229	0.000
	157 - 156		11.244	201.861	0.056	0.051	324.229	0.000
	156 - 155		11.309	201.861	0.056	0.051	324.229	0.000
L6	155 - 154	P24x0.25	11.373	201.861	0.056	0.051	324.229	0.000
	154 - 153		11.437	201.861	0.057	0.051	324.229	0.000

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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 $\frac{T_u}{\phi T_n}$
L7	153 - 152	P30x0.375	11.500	201.861	0.057	0.051	324.229	0.000
	152 - 151		11.563	201.861	0.057	0.051	324.229	0.000
	151 - 150		12.912	201.861	0.064	0.051	324.229	0.000
	150 - 149		12.995	395.779	0.033	0.051	994.725	0.000
	149 - 148		13.080	395.779	0.033	0.051	994.725	0.000
	148 - 147		13.165	395.779	0.033	0.051	994.725	0.000
	147 - 146		13.249	395.779	0.033	0.051	994.725	0.000
L8	146 - 145	P30x0.375	13.333	395.779	0.034	0.051	994.725	0.000
	145 - 144		13.417	395.779	0.034	0.051	994.725	0.000
	144 - 143		13.499	395.779	0.034	0.051	994.725	0.000
	143 - 142		13.582	395.779	0.034	0.051	994.725	0.000
	142 - 141		13.664	395.779	0.035	0.051	994.725	0.000
	141 - 140		13.746	395.779	0.035	0.051	994.725	0.000
	140 - 139		13.827	395.779	0.035	0.051	994.725	0.000
L9	139 - 138	P30x0.375	13.908	395.779	0.035	0.051	994.725	0.000
	138 - 137		13.988	395.779	0.035	0.051	994.725	0.000
	137 - 136		14.068	395.779	0.036	0.051	994.725	0.000
	136 - 135		14.204	395.779	0.036	0.051	994.725	0.000
	135 - 134		14.283	395.779	0.036	0.051	994.725	0.000
	134 - 133		14.360	395.779	0.036	0.051	994.725	0.000
	133 - 132		14.438	395.779	0.036	0.051	994.725	0.000
L10	132 - 131	P30x0.375	14.515	395.779	0.037	0.051	994.725	0.000
	131 - 130		14.591	395.779	0.037	0.051	994.725	0.000
	130 - 129		14.666	395.779	0.037	0.051	994.725	0.000
	129 - 128		14.741	395.779	0.037	0.051	994.725	0.000
	128 - 127		14.815	395.779	0.037	0.051	994.725	0.000
	127 - 126		14.889	395.779	0.038	0.051	994.725	0.000
	126 - 125		14.963	395.779	0.038	0.051	994.725	0.000
L11	125 - 124	P30x0.375	15.035	395.779	0.038	0.051	994.725	0.000
	124 - 123		15.106	395.779	0.038	0.051	994.725	0.000
	123 - 122		15.177	395.779	0.038	0.051	994.725	0.000
	122 - 121		15.247	395.779	0.039	0.051	994.725	0.000
	121 - 120		15.317	395.779	0.039	0.051	994.725	0.000
	120 - 119		15.672	454.187	0.035	0.053	1094.275	0.000
	119 - 118		15.762	454.187	0.035	0.053	1094.275	0.000
L12	118 - 117	P36x0.375	15.919	454.187	0.035	0.051	1094.275	0.000
	117 - 116		16.007	454.187	0.035	0.051	1094.275	0.000
	116 - 115		16.095	454.187	0.035	0.051	1094.275	0.000
	115 - 114		16.182	454.187	0.036	0.051	1094.275	0.000
	114 - 113		16.268	454.187	0.036	0.051	1094.275	0.000
	113 - 112		16.353	454.187	0.036	0.051	1094.275	0.000
	112 - 111		16.439	454.187	0.036	0.051	1094.275	0.000
L13	111 - 110	P36x0.375	16.523	454.187	0.036	0.051	1094.275	0.000
	110 - 108.792		16.769	454.187	0.037	0.053	1094.275.000	0.000
	108.792 - 107.583		16.977	454.187	0.037	0.053	1094.275	0.000
	107.583 - 107.333 (16)		17.017	663.506	0.026	0.053	2069.408	0.000
	107.333 - 106.333		17.195	663.506	0.026	0.053	2069.408	0.000
	106.333 - 105.333		17.371	663.506	0.026	0.053	2069.408	0.000
	105.333 - 104.333		17.546	663.506	0.026	0.053	2069.408	0.000
L14	104.333 - 103.333	P36x0.525	17.721	663.506	0.027	0.053	2069.408	0.000
	103.333 - 102.333		17.895	663.506	0.027	0.053	2069.408	0.000
	102.333 - 101.333		18.067	663.506	0.027	0.053	2069.408	0.000

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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 $\frac{T_u}{\phi T_n}$
	101.333 - 100.333		18.288	663.506	0.028	0.053	2069.408	0.000
	100.333 - 99.333		18.459	663.506	0.028	0.053	2069.408	0.000
	99.333 - 98.333		18.629	663.506	0.028	0.053	2069.408	0.000
	98.333 - 97.333		18.799	663.506	0.028	0.053	2069.408	0.000
L19	97.333 - 96.333	P36x0.525	18.966	663.506	0.029	0.053	2069.408	0.000
	96.333 - 95.333		19.132	663.506	0.029	0.053	2069.408	0.000
	95.333 - 94.333		19.298	663.506	0.029	0.053	2069.408	0.000
	94.333 - 93.333		19.463	663.506	0.029	0.053	2069.408	0.000
	93.333 - 92.333		19.628	663.506	0.030	0.053	2069.408	0.000
L20	92.333 - 91.1665	P36x0.525	19.819	663.506	0.030	0.053	2069.408	0.000
	91.1665 - 90		20.008	663.506	0.030	0.053	2069.408	0.000
L21	90 - 89.75 (21)	P42x0.6125	20.245	903.105	0.022	0.053	3286.150	0.000
L22	89.75 - 88.75	P42x0.6125	20.345	903.105	0.023	0.053	3286.150	0.000
	88.75 - 87.75		20.443	903.105	0.023	0.053	3286.150	0.000
	87.75 - 86.75		20.541	903.105	0.023	0.053	3286.150	0.000
	86.75 - 85.75		20.638	903.105	0.023	0.053	3286.150	0.000
	85.75 - 84.75		20.735	903.105	0.023	0.053	3286.150	0.000
L23	84.75 - 83.75	P42x0.6125	20.831	903.105	0.023	0.053	3286.150	0.000
	83.75 - 82.75		20.925	903.105	0.023	0.053	3286.150	0.000
	82.75 - 81.75		21.020	903.105	0.023	0.053	3286.150	0.000
	81.75 - 80.75		21.113	903.105	0.023	0.053	3286.150	0.000
	80.75 - 79.75		21.207	903.105	0.023	0.053	3286.150	0.000
L24	79.75 - 78.75	P42x0.6125	21.298	903.105	0.024	0.053	3286.150	0.000
	78.75 - 77.75		21.389	903.105	0.024	0.053	3286.150	0.000
	77.75 - 76.75		21.480	903.105	0.024	0.053	3286.150	0.000
	76.75 - 75.75		21.570	903.105	0.024	0.053	3286.150	0.000
	75.75 - 74.75		21.660	903.105	0.024	0.053	3286.150	0.000
L25	74.75 - 73.75	P42x0.6125	21.747	903.105	0.024	0.053	3286.150	0.000
	73.75 - 72.75		21.834	903.105	0.024	0.053	3286.150	0.000
	72.75 - 71.75		21.921	903.105	0.024	0.053	3286.150	0.000
	71.75 - 70.75		22.006	903.105	0.024	0.053	3286.150	0.000
	70.75 - 69.75		22.092	903.105	0.024	0.053	3286.150	0.000
L26	69.75 - 68.75	P42x0.6125	22.175	903.105	0.025	0.053	3286.150	0.000
	68.75 - 67.75		22.258	903.105	0.025	0.053	3286.150	0.000
	67.75 - 66.75		22.340	903.105	0.025	0.053	3286.150	0.000
	66.75 - 65.75		22.422	903.105	0.025	0.053	3286.150	0.000
	65.75 - 64.75		22.503	903.105	0.025	0.053	3286.150	0.000
L27	64.75 - 63.5625	P42x0.6125	22.598	903.105	0.025	0.053	3286.150	0.000
	63.5625 - 62.375		22.690	903.105	0.025	0.053	3286.150	0.000
	62.375 - 61.1875		22.782	903.105	0.025	0.053	3286.150	0.000
	61.1875 - 60		22.873	903.105	0.025	0.053	3286.150	0.000
L28	60 - 59.75 (28)	P48x0.5	23.083	807.443	0.029	0.053	2593.8330.000	0.000
L29	59.75 - 58.75	P48x0.5	23.175	807.443	0.029	0.053	2593.833	0.000
	58.75 - 57.75		23.262	807.443	0.029	0.053	2593.833	0.000
	57.75 - 56.75		23.350	807.443	0.029	0.053	2593.833	0.000
	56.75 - 55.75		23.436	807.443	0.029	0.053	2593.833	0.000
	55.75 - 54.75		23.523	807.443	0.029	0.053	2593.833	0.000

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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	54.75 - 53.75	P48x0.5	23.606	807.443	0.029	0.053	2593.833	0.000
	53.75 - 52.75		23.689	807.443	0.029	0.053	2593.833	0.000
	52.75 - 51.75		23.771	807.443	0.029	0.053	2593.833	0.000
	51.75 - 50.75		23.853	807.443	0.030	0.053	2593.833	0.000
	50.75 - 49.75		23.935	807.443	0.030	0.053	2593.833	0.000
L31	49.75 - 48.6943	P48x0.5	24.117	807.443	0.030	0.053	2593.833	0.000
	48.6943 - 47.6387		24.298	807.443	0.030	0.053	2593.833	0.000
	47.6387 - 46.583		24.478	807.443	0.030	0.053	2593.833	0.000
	46.583 - 45.333		24.515	1138.040	0.022	0.053	4735.083	0.000
L32	46.333 (32)	P48x0.675	24.692	1138.040	0.022	0.053	4735.083	0.000
L33	45.333 - 44.333	P48x0.675	24.864	1138.040	0.022	0.053	4735.083	0.000
	44.333 - 43.333		25.035	1138.040	0.022	0.053	4735.083	0.000
	43.333 - 42.333		25.206	1138.040	0.022	0.053	4735.083	0.000
	42.333 - 41.333		25.377	1138.040	0.022	0.053	4735.083	0.000
	41.333 - 40.333		25.541	1138.040	0.022	0.053	4735.083	0.000
L34	40.333 - 39.333	P48x0.675	25.704	1138.040	0.023	0.053	4735.083	0.000
	39.333 - 38.333		25.867	1138.040	0.023	0.053	4735.083	0.000
	38.333 - 37.333		26.029	1138.040	0.023	0.053	4735.083	0.000
	37.333 - 36.333		26.191	1138.040	0.023	0.053	4735.083	0.000
	36.333 - 35.333		26.345	1138.040	0.023	0.053	4735.083	0.000
L35	35.333 - 34.333	P48x0.675	26.499	1138.040	0.023	0.053	4735.083	0.000
	34.333 - 33.333		26.653	1138.040	0.023	0.053	4735.083	0.000
	33.333 - 32.333		26.805	1138.040	0.024	0.053	4735.083	0.000
	32.333 - 31.333		26.958	1138.040	0.024	0.053	4735.083	0.000
	31.333 - 30 (36)		27.157	1138.040	0.024	0.053	4735.083	0.000
L37	30 - 29.75 (37)	P48x0.7125	27.343	1200.310	0.023	0.053	4990.225	0.000
L38	29.75 - 28.75	P48x0.7125	27.498	1200.310	0.023	0.053	4990.225	0.000
	28.75 - 27.75		27.646	1200.310	0.023	0.053	4990.225	0.000
	27.75 - 26.75		27.793	1200.310	0.023	0.053	4990.225	0.000
	26.75 - 25.75		27.940	1200.310	0.023	0.053	4990.225	0.000
	25.75 - 24.75		28.086	1200.310	0.023	0.053	4990.225	0.000
L39	24.75 - 23.75	P48x0.7125	28.231	1200.310	0.024	0.053	4990.225	0.000
	23.75 - 22.75		28.376	1200.310	0.024	0.053	4990.225	0.000
	22.75 - 21.75		28.520	1200.310	0.024	0.053	4990.225	0.000
	21.75 - 20.75		28.663	1200.310	0.024	0.053	4990.225	0.000
	20.75 - 19.75		28.806	1200.310	0.024	0.053	4990.225	0.000
L40	19.75 - 18.75	P48x0.7125	28.948	1200.310	0.024	0.053	4990.225	0.000
	18.75 - 17.75		29.090	1200.310	0.024	0.053	4990.225	0.000
	17.75 - 16.75		29.230	1200.310	0.024	0.053	4990.225	0.000
	16.75 - 15.75		29.370	1200.310	0.024	0.053	4990.225	0.000

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					$\frac{V_u}{\phi V_n}$			$\frac{T_u}{\phi T_n}$
L41	15.75 - 14.75	P48x0.7125	29.509	1200.310	0.025	0.053	4990.225	0.000
	14.75 - 13.75		29.648	1200.310	0.025	0.053	4990.225	0.000
	13.75 - 12.75		29.786	1200.310	0.025	0.053	4990.225	0.000
	12.75 - 11.75		29.923	1200.310	0.025	0.053	4990.225	0.000
	11.75 - 10.75		30.059	1200.310	0.025	0.053	4990.225	0.000
L42	10.75 - 9.75	P48x0.7125	30.195	1200.310	0.025	0.053	4990.225	0.000
	9.75 - 8.75		30.330	1200.310	0.025	0.053	4990.2250.000	0.000
	8.75 - 7.75		30.464	1200.310	0.025	0.053	4990.225	0.000
	7.75 - 6.75		30.597	1200.310	0.025	0.053	4990.225	0.000
	6.75 - 5.75		30.730	1200.310	0.026	0.053	4990.225	0.000
L43	5.75 - 4.75	P48x0.7125	30.861	1200.310	0.026	0.053	4990.225	0.000
	4.75 - 3.5625		31.020	1200.310	0.026	0.053	4990.225	0.000
	3.5625 - 2.375		31.174	1200.310	0.026	0.053	4990.225	0.000
	2.375 - 1.1875		31.327	1200.310	0.026	0.053	4990.225	0.000
	1.1875 - 0		31.479	1200.310	0.026	0.053	4990.225	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$\frac{P_u}{\phi P_n}$	$\frac{M_{ux}}{\phi M_{nx}}$	$\frac{M_{uy}}{\phi M_{ny}}$	$\frac{V_u}{\phi V_n}$	$\frac{T_u}{\phi T_n}$			
L1	180 - 179	0.000	0.000	0.000	0.000	0.000	0.000 ¹	1.050	4.8.2 ✓
	179 - 178	0.000	0.000	0.000	0.001	0.000	0.001	1.050	4.8.2 ✓
	178 - 177	0.000	0.001	0.000	0.001	0.000	0.001	1.050	4.8.2 ✓
	177 - 176	0.004	0.022	0.000	0.019	0.000	0.027	1.050	4.8.2 ✓
	176 - 175	0.004	0.032	0.000	0.020	0.000	0.037	1.050	4.8.2 ✓
L2	175 - 174	0.004	0.042	0.000	0.020	0.000	0.047	1.050	4.8.2 ✓
	174 - 173	0.005	0.053	0.000	0.020	0.000	0.058	1.050	4.8.2 ✓
	173 - 172	0.005	0.063	0.000	0.021	0.000	0.068	1.050	4.8.2 ✓
	172 - 171	0.005	0.074	0.000	0.021	0.000	0.079	1.050	4.8.2 ✓
	171 - 170	0.005	0.085	0.000	0.021	0.000	0.090	1.050	4.8.2 ✓
L3	170 - 169	0.005	0.096	0.000	0.022	0.000	0.101	1.050	4.8.2 ✓
	169 - 168	0.005	0.107	0.000	0.022	0.000	0.113	1.050	4.8.2 ✓
	168 - 167	0.005	0.118	0.000	0.023	0.000	0.124	1.050	4.8.2 ✓
	167 - 166	0.005	0.130	0.000	0.023	0.000	0.136	1.050	4.8.2 ✓
	166 - 165	0.005	0.142	0.000	0.023	0.000	0.148	1.050	4.8.2 ✓

inxTower

B+T Group
 1717 S, Boulder, Suite 300
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Client

Crown Castle

Designed by
 JD Prabhu

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L4	165 - 164	0.006	0.154	0.000	0.024	0.000	0.160	1.050	4.8.2 ✓
	164 - 163	0.006	0.166	0.000	0.024	0.000	0.172	1.050	4.8.2 ✓
	163 - 162	0.006	0.178	0.000	0.024	0.000	0.184	1.050	4.8.2 ✓
	162 - 161	0.006	0.190	0.000	0.025	0.000	0.197	1.050	4.8.2 ✓
	161 - 160	0.011	0.219	0.000	0.054	0.000	0.233	1.050	4.8.2 ✓
L5	160 - 159	0.012	0.246	0.000	0.054	0.000	0.261	1.050	4.8.2 ✓
	159 - 158	0.012	0.274	0.000	0.055	0.000	0.289	1.050	4.8.2 ✓
	158 - 157	0.012	0.302	0.000	0.055	0.000	0.317	1.050	4.8.2 ✓
	157 - 156	0.012	0.331	0.000	0.056	0.000	0.346	1.050	4.8.2 ✓
	156 - 155	0.012	0.359	0.000	0.056	0.000	0.374	1.050	4.8.2 ✓
L6	155 - 154	0.012	0.388	0.000	0.056	0.000	0.403	1.050	4.8.2 ✓
	154 - 153	0.012	0.416	0.000	0.057	0.000	0.432	1.050	4.8.2 ✓
	153 - 152	0.013	0.445	0.000	0.057	0.000	0.461	1.050	4.8.2 ✓
	152 - 151	0.013	0.474	0.000	0.057	0.000	0.490	1.050	4.8.2 ✓
	151 - 150	0.014	0.507	0.000	0.064	0.000	0.525	1.050	4.8.2 ✓
L7	150 - 149	0.007	0.226	0.000	0.033	0.000	0.234	1.050	4.8.2 ✓
	149 - 148	0.008	0.240	0.000	0.033	0.000	0.248	1.050	4.8.2 ✓
	148 - 147	0.008	0.253	0.000	0.033	0.000	0.262	1.050	4.8.2 ✓
	147 - 146	0.008	0.267	0.000	0.033	0.000	0.276	1.050	4.8.2 ✓
	146 - 145	0.008	0.281	0.000	0.034	0.000	0.290	1.050	4.8.2 ✓
L8	145 - 144	0.008	0.295	0.000	0.034	0.000	0.305	1.050	4.8.2 ✓
	144 - 143	0.008	0.310	0.000	0.034	0.000	0.319	1.050	4.8.2 ✓
	143 - 142	0.008	0.324	0.000	0.034	0.000	0.333	1.050	4.8.2 ✓
	142 - 141	0.008	0.338	0.000	0.035	0.000	0.348	1.050	4.8.2 ✓
	141 - 140	0.009	0.353	0.000	0.035	0.000	0.363	1.050	4.8.2 ✓
L9	140 - 139	0.009	0.367	0.000	0.035	0.000	0.377	1.050	4.8.2 ✓

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		P_u	M_{ux}	M_{uy}	V_u	T_u			
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
	139 - 138	0.009	0.382	0.000	0.035	0.000	0.392	1.050	4.8.2 ✓
	138 - 137	0.009	0.397	0.000	0.035	0.000	0.407	1.050	4.8.2 ✓
	137 - 136	0.009	0.411	0.000	0.036	0.000	0.422	1.050	4.8.2 ✓
	136 - 135	0.009	0.426	0.000	0.036	0.000	0.437	1.050	4.8.2 ✓
L10	135 - 134	0.009	0.442	0.000	0.036	0.000	0.452	1.050	4.8.2 ✓
	134 - 133	0.010	0.457	0.000	0.036	0.000	0.467	1.050	4.8.2 ✓
	133 - 132	0.010	0.472	0.000	0.036	0.000	0.483	1.050	4.8.2 ✓
	132 - 131	0.010	0.487	0.000	0.037	0.000	0.498	1.050	4.8.2 ✓
	131 - 130	0.010	0.502	0.000	0.037	0.000	0.514	1.050	4.8.2 ✓
L11	130 - 129	0.010	0.518	0.000	0.037	0.000	0.529	1.050	4.8.2 ✓
	129 - 128	0.010	0.533	0.000	0.037	0.000	0.545	1.050	4.8.2 ✓
	128 - 127	0.010	0.549	0.000	0.037	0.000	0.561	1.050	4.8.2 ✓
	127 - 126	0.010	0.565	0.000	0.038	0.000	0.576	1.050	4.8.2 ✓
	126 - 125	0.011	0.580	0.000	0.038	0.000	0.592	1.050	4.8.2 ✓
L12	125 - 124	0.011	0.596	0.000	0.038	0.000	0.608	1.050	4.8.2 ✓
	124 - 123	0.011	0.612	0.000	0.038	0.000	0.624	1.050	4.8.2 ✓
	123 - 122	0.011	0.628	0.000	0.038	0.000	0.640	1.050	4.8.2 ✓
	122 - 121	0.011	0.644	0.000	0.039	0.000	0.657	1.050	4.8.2 ✓
	121 - 120	0.011	0.660	0.000	0.039	0.000	0.673	1.050	4.8.2 ✓
L13	120 - 119	0.010	0.479	0.000	0.035	0.000	0.490	1.050	4.8.2 ✓
	119 - 118	0.010	0.491	0.000	0.035	0.000	0.502	1.050	4.8.2 ✓
	118 - 117	0.010	0.503	0.000	0.035	0.000	0.514	1.050	4.8.2 ✓
	117 - 116	0.010	0.515	0.000	0.035	0.000	0.527	1.050	4.8.2 ✓
	116 - 115	0.011	0.527	0.000	0.035	0.000	0.539	1.050	4.8.2 ✓
L14	115 - 114	0.011	0.539	0.000	0.036	0.000	0.551	1.050	4.8.2 ✓
	114 - 113	0.011	0.551	0.000	0.036	0.000	0.563	1.050	4.8.2 ✓

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Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
	113 - 112	0.011	0.563	0.000	0.036	0.000	0.575	1.050	4.8.2 ✓
	112 - 111	0.011	0.575	0.000	0.036	0.000	0.588	1.050	4.8.2 ✓
	111 - 110	0.011	0.588	0.000	0.036	0.000	0.600	1.050	4.8.2 ✓
L15	110 - 108.792	0.011	0.603	0.000	0.037	0.000	0.615	1.050	4.8.2 ✓
	108.792 - 107.583	0.012	0.618	0.000	0.037	0.000	0.631	1.050	4.8.2 ✓
L16	107.583 - 107.333 (16)	0.008	0.427	0.000	0.026	0.000	0.436	1.050	4.8.2 ✓
L17	107.333 - 106.333	0.008	0.436	0.000	0.026	0.000	0.445	1.050	4.8.2 ✓
	106.333 - 105.333	0.008	0.445	0.000	0.026	0.000	0.454	1.050	4.8.2 ✓
	105.333 - 104.333	0.008	0.454	0.000	0.026	0.000	0.463	1.050	4.8.2 ✓
	104.333 - 103.333	0.008	0.463	0.000	0.027	0.000	0.472	1.050	4.8.2 ✓
	103.333 - 102.333	0.008	0.472	0.000	0.027	0.000	0.481	1.050	4.8.2 ✓
L18	102.333 - 101.333	0.009	0.481	0.000	0.027	0.000	0.490	1.050	4.8.2 ✓
	101.333 - 100.333	0.009	0.490	0.000	0.028	0.000	0.500	1.050	4.8.2 ✓
	100.333 - 99.333	0.009	0.500	0.000	0.028	0.000	0.509	1.050	4.8.2 ✓
	99.333 - 98.333	0.009	0.509	0.000	0.028	0.000	0.519	1.050	4.8.2 ✓
	98.333 - 97.333	0.009	0.519	0.000	0.028	0.000	0.529	1.050	4.8.2 ✓
L19	97.333 - 96.333	0.009	0.529	0.000	0.029	0.000	0.539	1.050	4.8.2 ✓
	96.333 - 95.333	0.009	0.538	0.000	0.029	0.000	0.549	1.050	4.8.2 ✓
	95.333 - 94.333	0.009	0.548	0.000	0.029	0.000	0.559	1.050	4.8.2 ✓
	94.333 - 93.333	0.010	0.558	0.000	0.029	0.000	0.569	1.050	4.8.2 ✓
	93.333 - 92.333	0.010	0.568	0.000	0.030	0.000	0.579	1.050	4.8.2 ✓
L20	92.333 - 91.1665	0.010	0.580	0.000	0.030	0.000	0.591	1.050	4.8.2 ✓
	91.1665 - 90	0.010	0.592	0.000	0.030	0.000	0.603	1.050	4.8.2 ✓
L21	90 - 89.75 (21)	0.007	0.374	0.000	0.022	0.000	0.382	1.050	4.8.2 ✓
L22	89.75 - 88.75	0.007	0.381	0.000	0.023	0.000	0.389	1.050	4.8.2 ✓
	88.75 - 87.75	0.008	0.388	0.000	0.023	0.000	0.396	1.050	4.8.2 ✓

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Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
	87.75 - 86.75	0.008	0.394	0.000	0.023	0.000	0.402	1.050	4.8.2 ✓
	86.75 - 85.75	0.008	0.401	0.000	0.023	0.000	0.409	1.050	4.8.2 ✓
	85.75 - 84.75	0.008	0.408	0.000	0.023	0.000	0.416	1.050	4.8.2 ✓
L23	84.75 - 83.75	0.008	0.414	0.000	0.023	0.000	0.423	1.050	4.8.2 ✓
	83.75 - 82.75	0.008	0.421	0.000	0.023	0.000	0.430	1.050	4.8.2 ✓
	82.75 - 81.75	0.008	0.428	0.000	0.023	0.000	0.437	1.050	4.8.2 ✓
	81.75 - 80.75	0.008	0.435	0.000	0.023	0.000	0.444	1.050	4.8.2 ✓
	80.75 - 79.75	0.009	0.442	0.000	0.023	0.000	0.451	1.050	4.8.2 ✓
L24	79.75 - 78.75	0.009	0.448	0.000	0.024	0.000	0.458	1.050	4.8.2 ✓
	78.75 - 77.75	0.009	0.455	0.000	0.024	0.000	0.465	1.050	4.8.2 ✓
	77.75 - 76.75	0.009	0.462	0.000	0.024	0.000	0.472	1.050	4.8.2 ✓
	76.75 - 75.75	0.009	0.469	0.000	0.024	0.000	0.479	1.050	4.8.2 ✓
	75.75 - 74.75	0.009	0.476	0.000	0.024	0.000	0.486	1.050	4.8.2 ✓
L25	74.75 - 73.75	0.009	0.483	0.000	0.024	0.000	0.493	1.050	4.8.2 ✓
	73.75 - 72.75	0.009	0.490	0.000	0.024	0.000	0.500	1.050	4.8.2 ✓
	72.75 - 71.75	0.009	0.497	0.000	0.024	0.000	0.507	1.050	4.8.2 ✓
	71.75 - 70.75	0.010	0.504	0.000	0.024	0.000	0.515	1.050	4.8.2 ✓
	70.75 - 69.75	0.010	0.512	0.000	0.024	0.000	0.522	1.050	4.8.2 ✓
L26	69.75 - 68.75	0.010	0.519	0.000	0.025	0.000	0.529	1.050	4.8.2 ✓
	68.75 - 67.75	0.010	0.526	0.000	0.025	0.000	0.536	1.050	4.8.2 ✓
	67.75 - 66.75	0.010	0.533	0.000	0.025	0.000	0.544	1.050	4.8.2 ✓
	66.75 - 65.75	0.010	0.540	0.000	0.025	0.000	0.551	1.050	4.8.2 ✓
	65.75 - 64.75	0.010	0.548	0.000	0.025	0.000	0.559	1.050	4.8.2 ✓
L27	64.75 - 63.5625	0.010	0.556	0.000	0.025	0.000	0.567	1.050	4.8.2 ✓
	63.5625 - 62.375	0.011	0.565	0.000	0.025	0.000	0.576	1.050	4.8.2 ✓
	62.375 -	0.011	0.574	0.000	0.025	0.000	0.585	1.050	4.8.2 ✓

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Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
	61.1875						✓		
	61.1875 - 60	0.011	0.582	0.000	0.025	0.000	0.594	1.050	4.8.2 ✓
L28	60 - 59.75 (28)	0.012	0.569	0.000	0.029	0.000	0.582	1.050	4.8.2 ✓
L29	59.75 - 58.75	0.013	0.577	0.000	0.029	0.000	0.590	1.050	4.8.2 ✓
	58.75 - 57.75	0.013	0.584	0.000	0.029	0.000	0.597	1.050	4.8.2 ✓
	57.75 - 56.75	0.013	0.591	0.000	0.029	0.000	0.605	1.050	4.8.2 ✓
	56.75 - 55.75	0.013	0.599	0.000	0.029	0.000	0.612	1.050	4.8.2 ✓
	55.75 - 54.75	0.013	0.606	0.000	0.029	0.000	0.620	1.050	4.8.2 ✓
L30	54.75 - 53.75	0.013	0.613	0.000	0.029	0.000	0.627	1.050	4.8.2 ✓
	53.75 - 52.75	0.013	0.621	0.000	0.029	0.000	0.635	1.050	4.8.2 ✓
	52.75 - 51.75	0.013	0.628	0.000	0.029	0.000	0.643	1.050	4.8.2 ✓
	51.75 - 50.75	0.014	0.636	0.000	0.030	0.000	0.650	1.050	4.8.2 ✓
	50.75 - 49.75	0.014	0.643	0.000	0.030	0.000	0.658	1.050	4.8.2 ✓
L31	49.75 - 48.6943	0.014	0.651	0.000	0.030	0.000	0.666	1.050	4.8.2 ✓
	48.6943 - 47.6387	0.014	0.659	0.000	0.030	0.000	0.674	1.050	4.8.2 ✓
	47.6387 - 46.583	0.014	0.667	0.000	0.030	0.000	0.682	1.050	4.8.2 ✓
L32	46.583 - 46.333 (32)	0.010	0.480	0.000	0.022	0.000	0.490	1.050	4.8.2 ✓
L33	46.333 - 45.333	0.010	0.485	0.000	0.022	0.000	0.496	1.050	4.8.2 ✓
	45.333 - 44.333	0.010	0.491	0.000	0.022	0.000	0.501	1.050	4.8.2 ✓
	44.333 - 43.333	0.010	0.496	0.000	0.022	0.000	0.507	1.050	4.8.2 ✓
	43.333 - 42.333	0.010	0.502	0.000	0.022	0.000	0.513	1.050	4.8.2 ✓
	42.333 - 41.333	0.010	0.508	0.000	0.022	0.000	0.519	1.050	4.8.2 ✓
L34	41.333 - 40.333	0.011	0.513	0.000	0.022	0.000	0.525	1.050	4.8.2 ✓
	40.333 - 39.333	0.011	0.519	0.000	0.023	0.000	0.530	1.050	4.8.2 ✓
	39.333 - 38.333	0.011	0.525	0.000	0.023	0.000	0.536	1.050	4.8.2 ✓
	38.333 - 37.333	0.011	0.531	0.000	0.023	0.000	0.542	1.050	4.8.2 ✓
	37.333 -	0.011	0.537	0.000	0.023	0.000	0.548	1.050	4.8.2 ✓

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Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
		ϕP_n	ϕM_{nc}	ϕM_{ny}	ϕV_n	ϕT_n			
	36.333						✓		
L35	36.333 - 35.333	0.011	0.543	0.000	0.023	0.000	0.554	1.050	4.8.2 ✓
	35.333 - 34.333	0.011	0.549	0.000	0.023	0.000	0.561	1.050	4.8.2 ✓
	34.333 - 33.333	0.011	0.555	0.000	0.023	0.000	0.567	1.050	4.8.2 ✓
	33.333 - 32.333	0.011	0.561	0.000	0.024	0.000	0.573	1.050	4.8.2 ✓
	32.333 - 31.333	0.012	0.567	0.000	0.024	0.000	0.579	1.050	4.8.2 ✓
L36	31.333 - 30 (36)	0.012	0.575	0.000	0.024	0.000	0.587	1.050	4.8.2 ✓
L37	30 - 29.75 (37)	0.011	0.542	0.000	0.023	0.000	0.554	1.050	4.8.2 ✓
L38	29.75 - 28.75	0.011	0.548	0.000	0.023	0.000	0.560	1.050	4.8.2 ✓
	28.75 - 27.75	0.011	0.554	0.000	0.023	0.000	0.566	1.050	4.8.2 ✓
	27.75 - 26.75	0.012	0.560	0.000	0.023	0.000	0.572	1.050	4.8.2 ✓
	26.75 - 25.75	0.012	0.566	0.000	0.023	0.000	0.578	1.050	4.8.2 ✓
	25.75 - 24.75	0.012	0.572	0.000	0.023	0.000	0.584	1.050	4.8.2 ✓
L39	24.75 - 23.75	0.012	0.578	0.000	0.024	0.000	0.590	1.050	4.8.2 ✓
	23.75 - 22.75	0.012	0.584	0.000	0.024	0.000	0.596	1.050	4.8.2 ✓
	22.75 - 21.75	0.012	0.590	0.000	0.024	0.000	0.603	1.050	4.8.2 ✓
	21.75 - 20.75	0.012	0.596	0.000	0.024	0.000	0.609	1.050	4.8.2 ✓
	20.75 - 19.75	0.012	0.602	0.000	0.024	0.000	0.615	1.050	4.8.2 ✓
L40	19.75 - 18.75	0.012	0.608	0.000	0.024	0.000	0.621	1.050	4.8.2 ✓
	18.75 - 17.75	0.013	0.614	0.000	0.024	0.000	0.627	1.050	4.8.2 ✓
	17.75 - 16.75	0.013	0.620	0.000	0.024	0.000	0.634	1.050	4.8.2 ✓
	16.75 - 15.75	0.013	0.627	0.000	0.024	0.000	0.640	1.050	4.8.2 ✓
	15.75 - 14.75	0.013	0.633	0.000	0.025	0.000	0.647	1.050	4.8.2 ✓
L41	14.75 - 13.75	0.013	0.639	0.000	0.025	0.000	0.653	1.050	4.8.2 ✓
	13.75 - 12.75	0.013	0.646	0.000	0.025	0.000	0.659	1.050	4.8.2 ✓
	12.75 - 11.75	0.013	0.652	0.000	0.025	0.000	0.666	1.050	4.8.2 ✓
	11.75 - 10.75	0.013	0.658	0.000	0.025	0.000	0.672	1.050	4.8.2 ✓

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Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
L42	10.75 - 9.75	0.014	0.665	0.000	0.025	0.000	0.679 ✓	1.050	4.8.2 ✓
	9.75 - 8.75	0.014	0.671	0.000	0.025	0.000	0.685 ✓	1.050	4.8.2 ✓
	8.75 - 7.75	0.014	0.678	0.000	0.025	0.000	0.692 ✓	1.050	4.8.2 ✓
	7.75 - 6.75	0.014	0.684	0.000	0.025	0.000	0.699 ✓	1.050	4.8.2 ✓
	6.75 - 5.75	0.014	0.691	0.000	0.026	0.000	0.705 ✓	1.050	4.8.2 ✓
L43	5.75 - 4.75	0.014	0.697	0.000	0.026	0.000	0.712 ✓	1.050	4.8.2 ✓
	4.75 - 3.5625	0.014	0.705	0.000	0.026	0.000	0.720 ✓	1.050	4.8.2 ✓
	3.5625 - 2.375	0.014	0.713	0.000	0.026	0.000	0.728 ✓	1.050	4.8.2 ✓
	2.375 - 1.1875	0.015	0.721	0.000	0.026	0.000	0.736 ✓	1.050	4.8.2 ✓
	1.1875 - 0	0.015	0.729	0.000	0.026	0.000	0.744 ✓	1.050	4.8.2 ✓

¹ $P_u / \phi P_n$ controls

Section Capacity Table

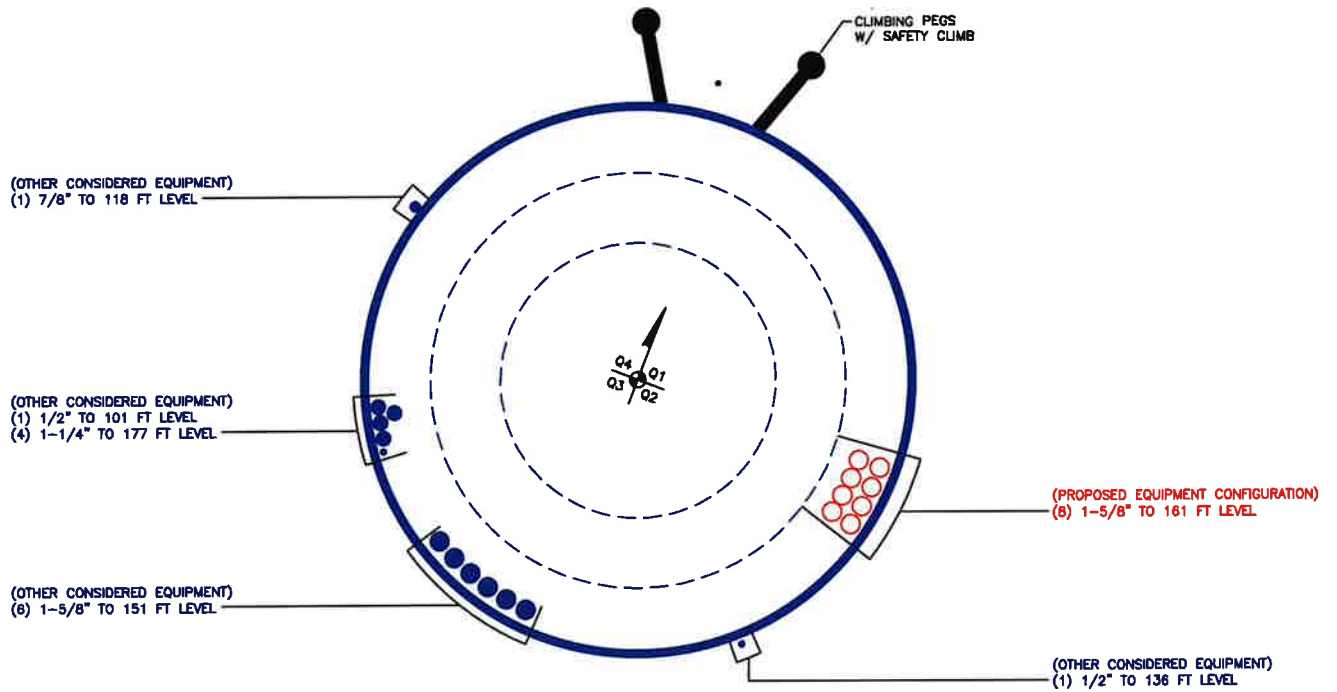
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	180 - 175	Pole	P24x0.25	1	-2.829	695.378	**	**
L2	175 - 170	Pole	P24x0.25	2	-3.213	695.378	**	**
L3	170 - 165	Pole	P24x0.25	3	-3.599	695.378	**	**
L4	165 - 160	Pole	P24x0.25	4	-7.578	695.378	**	**
L5	160 - 155	Pole	P24x0.25	5	-8.045	695.378	**	**
L6	155 - 150	Pole	P24x0.25	6	-9.595	695.378	**	**
L7	150 - 145	Pole	P30x0.375	7	-10.423	1376.613	**	**
L8	145 - 140	Pole	P30x0.375	8	-11.255	1376.613	**	**
L9	140 - 135	Pole	P30x0.375	9	-12.173	1376.613	**	**
L10	135 - 130	Pole	P30x0.375	10	-13.023	1376.613	**	**
L11	130 - 125	Pole	P30x0.375	11	-13.882	1376.613	**	**
L12	125 - 120	Pole	P30x0.375	12	-14.752	1376.613	**	**
L13	120 - 115	Pole	P36x0.375	13	-15.841	1564.605	**	**
L14	115 - 110	Pole	P36x0.375	14	-16.844	1564.605	**	**
L15	110 - 107.583	Pole	P36x0.375	15	-17.284	1564.605	**	**
L16	107.583 - 107.333	Pole	P36x0.525	16	-17.355	2322.274	**	**
L17	107.333 - 102.333	Pole	P36x0.525	17	-18.677	2322.274	**	**
L18	102.333 - 97.333	Pole	P36x0.525	18	-20.093	2322.274	**	**
L19	97.333 - 92.333	Pole	P36x0.525	19	-21.437	2322.274	**	**
L20	92.333 - 90	Pole	P36x0.525	20	-22.067	2322.274	**	**
L21	90 - 89.75	Pole	P42x0.6125	21	-22.160	3160.867	**	**

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
L22	89.75 - 84.75	Pole	P42x0.6125	22	-23.932	3160.867	**	**	
L23	84.75 - 79.75	Pole	P42x0.6125	23	-25.712	3160.867	**	**	
L24	79.75 - 74.75	Pole	P42x0.6125	24	-27.496	3160.867	**	**	
L25	74.75 - 69.75	Pole	P42x0.6125	25	-29.287	3160.867	**	**	
L26	69.75 - 64.75	Pole	P42x0.6125	26	-31.084	3160.867	**	**	
L27	64.75 - 60	Pole	P42x0.6125	27	-32.795	3160.867	**	**	
L28	60 - 59.75	Pole	P48x0.5	28	-32.887	2781.513	**	**	
L29	59.75 - 54.75	Pole	P48x0.5	29	-34.569	2781.513	**	**	
L30	54.75 - 49.75	Pole	P48x0.5	30	-36.261	2781.513	**	**	
L31	49.75 - 46.583	Pole	P48x0.5	31	-37.329	2781.513	**	**	
L32	46.583 - 46.333	Pole	P48x0.675	32	-37.444	3983.143	**	**	
L33	46.333 - 41.333	Pole	P48x0.675	33	-39.636	3983.143	**	**	
L34	41.333 - 36.333	Pole	P48x0.675	34	-41.839	3983.143	**	**	
L35	36.333 - 31.333	Pole	P48x0.675	35	-44.049	3983.143	**	**	
L36	31.333 - 30	Pole	P48x0.675	36	-44.637	3983.143	**	**	
L37	30 - 29.75	Pole	P48x0.7125	37	-44.765	4201.092	**	**	
L38	29.75 - 24.75	Pole	P48x0.7125	38	-47.090	4201.092	**	**	
L39	24.75 - 19.75	Pole	P48x0.7125	39	-49.427	4201.092	**	**	
L40	19.75 - 14.75	Pole	P48x0.7125	40	-51.770	4201.092	**	**	
L41	14.75 - 9.75	Pole	P48x0.7125	41	-54.121	4201.092	**	**	
L42	9.75 - 4.75	Pole	P48x0.7125	42	-56.480	4201.092	**	**	
L43	4.75 - 0	Pole	P48x0.7125	43	-58.726	4201.092	**	**	
							Summary		
							Pole (L43)	**	**
							RATING =	**	**

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

APPENDIX B
BASE LEVEL DRAWING



BUSINESS UNIT: 876337

APPENDIX C
ADDITIONAL CALCULATIONS



Site BU: 876337

Work Order: 1813198



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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
180	30		0	24	24	0.25		A53-B-42
150	30		0	30.00	30	0.375		A53-B-42
120	30		0	36.00	36	0.375		A53-B-42
90	30		0	42.00	42	0.375		A53-B-42
60	30		0	48.00	48	0.5		A53-B-42
30	30		0	48.00	48	0.5		A53-B-42

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	13	14	15	16	17	18	
0	30	channel	MP3-08 (1.1875in)	3								126											
30	46.583	channel	MP3-06 (1.1875in)	3								126											
60	90	channel	MP3-08 (1.1875in)	3								126											
90	107.583	channel	MP3-05 (1.1875in)	3								126											

Reinforcement Details

B (in)	H (in)	Gross Area (in ²)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L _w (in)	Net Area (in ²)	Bolt Hole Size (in)	Reinforcement Material
7.93	2.8	10.32	0.95	47,000	44,000	24,000	9.370	1.1875	A572-65
6.89	2.61	8.47	0.93	41,000	41,000	24,000	7.670	1.1875	A572-65
7.93	2.8	10.32	0.95	47,000	44,000	24,000	9.370	1.1875	A572-65
5.33	2.09	5.65	0.79	29,000	29,000	18,000	5.025	1.1875	A572-65

TNX Geometry Input

Increment (ft):

	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	180 - 175	5		0	24.000	24.000	0.25	A53-B-42	1.000
2	175 - 170	5		0	24.000	24.000	0.25	A53-B-42	1.000
3	170 - 165	5		0	24.000	24.000	0.25	A53-B-42	1.000
4	165 - 160	5		0	24.000	24.000	0.25	A53-B-42	1.000
5	160 - 155	5		0	24.000	24.000	0.25	A53-B-42	1.000
6	155 - 150	5	0	0	24.000	24.000	0.25	A53-B-42	1.000
7	150 - 145	5		0	30.000	30.000	0.375	A53-B-42	1.000
8	145 - 140	5		0	30.000	30.000	0.375	A53-B-42	1.000
9	140 - 135	5		0	30.000	30.000	0.375	A53-B-42	1.000
10	135 - 130	5		0	30.000	30.000	0.375	A53-B-42	1.000
11	130 - 125	5		0	30.000	30.000	0.375	A53-B-42	1.000
12	125 - 120	5	0	0	30.000	30.000	0.375	A53-B-42	1.000
13	120 - 115	5		0	36.000	36.000	0.375	A53-B-42	1.000
14	115 - 110	5		0	36.000	36.000	0.375	A53-B-42	1.000
15	110 - 107.583	2.417		0	36.000	36.000	0.375	A53-B-42	1.000
16	107.583 - 107.333	0.25		0	36.000	36.000	0.525	A53-B-42	1.007
17	107.333 - 102.333	5		0	36.000	36.000	0.525	A53-B-42	1.007
18	102.333 - 97.333	5		0	36.000	36.000	0.525	A53-B-42	1.007
19	97.333 - 92.333	5		0	36.000	36.000	0.525	A53-B-42	1.007
20	92.333 - 90	2.333	0	0	36.000	36.000	0.525	A53-B-42	1.007
21	90 - 89.75	0.25		0	42.000	42.000	0.6125	A53-B-42	1.005
22	89.75 - 84.75	5		0	42.000	42.000	0.6125	A53-B-42	1.005
23	84.75 - 79.75	5		0	42.000	42.000	0.6125	A53-B-42	1.005
24	79.75 - 74.75	5		0	42.000	42.000	0.6125	A53-B-42	1.005
25	74.75 - 69.75	5		0	42.000	42.000	0.6125	A53-B-42	1.005
26	69.75 - 64.75	5		0	42.000	42.000	0.6125	A53-B-42	1.005
27	64.75 - 60	4.75	0	0	42.000	42.000	0.6125	A53-B-42	1.005
28	60 - 59.75	0.25		0	48.000	48.000	0.5	A53-B-42	1.000
29	59.75 - 54.75	5		0	48.000	48.000	0.5	A53-B-42	1.000
30	54.75 - 49.75	5		0	48.000	48.000	0.5	A53-B-42	1.000
31	49.75 - 46.583	3.167		0	48.000	48.000	0.5	A53-B-42	1.000
32	46.583 - 46.333	0.25		0	48.000	48.000	0.675	A53-B-42	0.997
33	46.333 - 41.333	5		0	48.000	48.000	0.675	A53-B-42	0.997
34	41.333 - 36.333	5		0	48.000	48.000	0.675	A53-B-42	0.997
35	36.333 - 31.333	5		0	48.000	48.000	0.675	A53-B-42	0.997
36	31.333 - 30	1.333	0	0	48.000	48.000	0.675	A53-B-42	0.997
37	30 - 29.75	0.25		0	48.000	48.000	0.7125	A53-B-42	0.997
38	29.75 - 24.75	5		0	48.000	48.000	0.7125	A53-B-42	0.997
39	24.75 - 19.75	5		0	48.000	48.000	0.7125	A53-B-42	0.997
40	19.75 - 14.75	5		0	48.000	48.000	0.7125	A53-B-42	0.997
41	14.75 - 9.75	5		0	48.000	48.000	0.7125	A53-B-42	0.997
42	9.75 - 4.75	5		0	48.000	48.000	0.7125	A53-B-42	0.997
43	4.75 - 0	4.75		0	48.000	48.000	0.7125	A53-B-42	0.997

TNX Section Forces

Increment (ft):		TNX Output			
	5	Section Height (ft)	P _u (K)	M _{ux} (kip-ft)	V _u (K)
1	180 - 175		2.83	12.82	3.99
2	175 - 170		3.21	33.64	4.34
3	170 - 165		3.60	56.19	4.68
4	165 - 160		7.58	86.82	10.89
5	160 - 155		8.04	142.42	11.31
6	155 - 150		9.60	201.03	12.91
7	150 - 145		10.42	266.63	13.33
8	145 - 140		11.25	334.32	13.75
9	140 - 135		12.17	404.24	14.20
10	135 - 130		13.02	476.22	14.59
11	130 - 125		13.88	550.08	14.96
12	125 - 120		14.75	625.75	15.32
13	120 - 115		15.84	705.29	16.10
14	115 - 110		16.84	786.81	16.52
15	110 - 107.583		17.28	827.23	16.98
16	107.583 - 107.333		17.36	831.48	17.02
17	107.333 - 102.333		18.68	918.75	17.90
18	102.333 - 97.333		20.09	1010.35	18.80
19	97.333 - 92.333		21.44	1106.40	19.63
20	92.333 - 90		22.07	1152.62	20.01
21	90 - 89.75		22.16	1157.68	20.24
22	89.75 - 84.75		23.93	1260.12	20.74
23	84.75 - 79.75		25.71	1364.95	21.21
24	79.75 - 74.75		27.50	1472.10	21.66
25	74.75 - 69.75		29.29	1581.45	22.09
26	69.75 - 64.75		31.08	1692.91	22.50
27	64.75 - 60		32.79	1800.65	22.87
28	60 - 59.75		32.89	1806.41	23.08
29	59.75 - 54.75		34.57	1922.91	23.52
30	54.75 - 49.75		36.26	2041.52	23.93
31	49.75 - 46.583		37.33	2118.15	24.48
32	46.583 - 46.333		37.44	2124.27	24.52
33	46.333 - 41.333		39.64	2248.98	25.38
34	41.333 - 36.333		41.84	2377.87	26.19
35	36.333 - 31.333		44.05	2510.70	26.96
36	31.333 - 30		44.64	2546.75	27.16
37	30 - 29.75		44.77	2553.58	27.34
38	29.75 - 24.75		47.09	2692.13	28.09
39	24.75 - 19.75		49.43	2834.31	28.81
40	19.75 - 14.75		51.77	2980.05	29.51
41	14.75 - 9.75		54.12	3129.25	30.19
42	9.75 - 4.75		56.48	3281.83	30.86
43	4.75 - 0		58.73	3429.82	31.48

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
180 - 175	Pole	TP24x24x0.25	Pole	3.5%	Pass
175 - 170	Pole	TP24x24x0.25	Pole	8.6%	Pass
170 - 165	Pole	TP24x24x0.25	Pole	14.0%	Pass
165 - 160	Pole	TP24x24x0.25	Pole	22.0%	Pass
160 - 155	Pole	TP24x24x0.25	Pole	35.5%	Pass
155 - 150	Pole	TP24x24x0.25	Pole	49.8%	Pass
150 - 145	Pole	TP30x30x0.375	Pole	27.6%	Pass
145 - 140	Pole	TP30x30x0.375	Pole	34.5%	Pass
140 - 135	Pole	TP30x30x0.375	Pole	41.5%	Pass
135 - 130	Pole	TP30x30x0.375	Pole	48.8%	Pass
130 - 125	Pole	TP30x30x0.375	Pole	56.3%	Pass
125 - 120	Pole	TP30x30x0.375	Pole	64.0%	Pass
120 - 115	Pole	TP36x36x0.375	Pole	51.2%	Pass
115 - 110	Pole	TP36x36x0.375	Pole	57.1%	Pass
110 - 107.58	Pole	TP36x36x0.375	Pole	60.0%	Pass
107.58 - 107.33	Pole + Reinf.	TP36x36x0.525	Pole	43.2%	Pass
107.33 - 102.33	Pole + Reinf.	TP36x36x0.525	Pole	47.7%	Pass
102.33 - 97.33	Pole + Reinf.	TP36x36x0.525	Pole	52.4%	Pass
97.33 - 92.33	Pole + Reinf.	TP36x36x0.525	Pole	57.4%	Pass
92.33 - 90	Pole + Reinf.	TP36x36x0.525	Pole	59.8%	Pass
90 - 89.75	Pole + Reinf.	TP42x42x0.6125	Pole	38.6%	Pass
89.75 - 84.75	Pole + Reinf.	TP42x42x0.6125	Pole	42.0%	Pass
84.75 - 79.75	Pole + Reinf.	TP42x42x0.6125	Pole	45.5%	Pass
79.75 - 74.75	Pole + Reinf.	TP42x42x0.6125	Pole	49.1%	Pass
74.75 - 69.75	Pole + Reinf.	TP42x42x0.6125	Pole	52.7%	Pass
69.75 - 64.75	Pole + Reinf.	TP42x42x0.6125	Pole	56.5%	Pass
64.75 - 60	Pole + Reinf.	TP42x42x0.6125	Pole	60.0%	Pass
60 - 59.75	Pole	TP48x48x0.5	Pole	55.4%	Pass
59.75 - 54.75	Pole	TP48x48x0.5	Pole	59.0%	Pass
54.75 - 49.75	Pole	TP48x48x0.5	Pole	62.6%	Pass
49.75 - 46.58	Pole	TP48x48x0.5	Pole	64.9%	Pass
46.58 - 46.33	Pole + Reinf.	TP48x48x0.675	Pole	48.9%	Pass
46.33 - 41.33	Pole + Reinf.	TP48x48x0.675	Pole	51.8%	Pass
41.33 - 36.33	Pole + Reinf.	TP48x48x0.675	Pole	54.8%	Pass
36.33 - 31.33	Pole + Reinf.	TP48x48x0.675	Pole	57.8%	Pass
31.33 - 30	Pole + Reinf.	TP48x48x0.675	Pole	58.6%	Pass
30 - 29.75	Pole + Reinf.	TP48x48x0.7125	Pole	55.7%	Pass
29.75 - 24.75	Pole + Reinf.	TP48x48x0.7125	Pole	58.7%	Pass
24.75 - 19.75	Pole + Reinf.	TP48x48x0.7125	Pole	61.8%	Pass
19.75 - 14.75	Pole + Reinf.	TP48x48x0.7125	Pole	65.0%	Pass
14.75 - 9.75	Pole + Reinf.	TP48x48x0.7125	Pole	68.3%	Pass
9.75 - 4.75	Pole + Reinf.	TP48x48x0.7125	Pole	71.6%	Pass
4.75 - 0	Pole + Reinf.	TP48x48x0.7125	Pole	74.8%	Pass
				Summary	
			Pole	74.8%	Pass
			Reinforcement	61.4%	Pass
			Overall	74.8%	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
180 - 175	1315	n/a	1315	18.65	n/a	18.65	3.5%				
175 - 170	1315	n/a	1315	18.65	n/a	18.65	8.6%				
170 - 165	1315	n/a	1315	18.65	n/a	18.65	14.0%				
165 - 160	1315	n/a	1315	18.65	n/a	18.65	22.0%				
160 - 155	1315	n/a	1315	18.65	n/a	18.65	35.5%				
155 - 150	1315	n/a	1315	18.65	n/a	18.65	49.8%				
150 - 145	3829	n/a	3829	34.90	n/a	34.90	27.6%				
145 - 140	3829	n/a	3829	34.90	n/a	34.90	34.5%				
140 - 135	3829	n/a	3829	34.90	n/a	34.90	41.5%				
135 - 130	3829	n/a	3829	34.90	n/a	34.90	48.8%				
130 - 125	3829	n/a	3829	34.90	n/a	34.90	56.3%				
125 - 120	3829	n/a	3829	34.90	n/a	34.90	64.0%				
120 - 115	6659	n/a	6659	41.97	n/a	41.97	51.2%				
115 - 110	6659	n/a	6659	41.97	n/a	41.97	57.1%				
110 - 107.58	6659	n/a	6659	41.97	n/a	41.97	60.0%				
107.58 - 107.33	6659	2629	9288	41.97	16.95	58.92	43.2%				36.6%
107.33 - 102.33	6659	2629	9288	41.97	16.95	58.92	47.7%				40.4%
102.33 - 97.33	6659	2629	9288	41.97	16.95	58.92	52.4%				44.4%
97.33 - 92.33	6659	2629	9288	41.97	16.95	58.92	57.4%				48.6%
92.33 - 90	6659	2629	9288	41.97	16.95	58.92	59.8%				50.7%
90 - 89.75	10622	6570	17191	49.04	30.96	80.00	38.6%			32.6%	
89.75 - 84.75	10622	6570	17191	49.04	30.96	80.00	42.0%			33.7%	
84.75 - 79.75	10622	6570	17191	49.04	30.96	80.00	45.5%			36.5%	
79.75 - 74.75	10622	6570	17191	49.04	30.96	80.00	49.1%			39.4%	
74.75 - 69.75	10622	6570	17191	49.04	30.96	80.00	52.7%			42.3%	
69.75 - 64.75	10622	6570	17191	49.04	30.96	80.00	56.5%			45.3%	
64.75 - 60	10622	6570	17191	49.04	30.96	80.00	60.0%			48.1%	
60 - 59.75	21045	n/a	21045	74.61	n/a	74.61	55.4%				
59.75 - 54.75	21045	n/a	21045	74.61	n/a	74.61	59.0%				
54.75 - 49.75	21045	n/a	21045	74.61	n/a	74.61	62.6%				
49.75 - 46.58	21045	n/a	21045	74.61	n/a	74.61	64.9%				
46.58 - 46.33	21046	6934	27979	74.61	25.41	100.02	48.9%		40.5%		
46.33 - 41.33	21046	6934	27979	74.61	25.41	100.02	51.8%		42.9%		
41.33 - 36.33	21046	6934	27979	74.61	25.41	100.02	54.8%		45.3%		
36.33 - 31.33	21046	6934	27979	74.61	25.41	100.02	57.8%		47.8%		
31.33 - 30	21046	6934	27979	74.61	25.41	100.02	58.6%		48.5%		
30 - 29.75	21046	8475	29520	74.61	30.96	105.57	55.7%	48.1%			
29.75 - 24.75	21046	8475	29520	74.61	30.96	105.57	58.7%	48.2%			
24.75 - 19.75	21046	8475	29520	74.61	30.96	105.57	61.8%	50.7%			
19.75 - 14.75	21046	8475	29520	74.61	30.96	105.57	65.0%	53.3%			
14.75 - 9.75	21046	8475	29520	74.61	30.96	105.57	68.3%	56.0%			
9.75 - 4.75	21046	8475	29520	74.61	30.96	105.57	71.6%	58.7%			
4.75 - 0	21046	8475	29520	74.61	30.96	105.57	74.8%	61.4%			

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

Monopole Flange Plate Connection

Elevation = 150 ft.



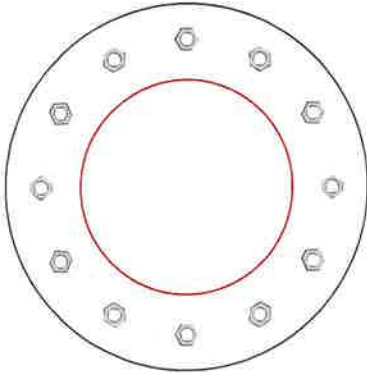
BU #	876337
Site Name	ORELINE SANITATION,
Order #	465673, Rev. 6

Applied Loads	
Moment (kip-ft)	201.03
Axial Force (kips)	9.60
Shear Force (kips)	12.91

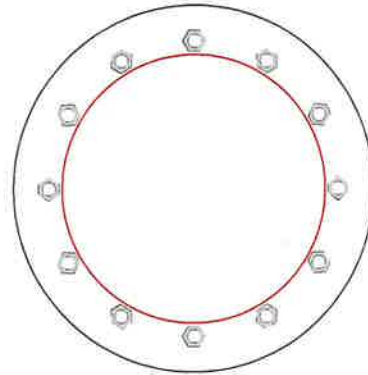
TIA-222 Revision	H
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*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(12) 1-1/2" ϕ bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 33" BC

Top Plate Data

41" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

41" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.25" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

30" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	23.55
Allowable (kips)	111.02
Stress Rating:	20.2% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Rohn OK
Tension Side Stress Rating:	Rohn OK

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Rohn OK
Tension Side Stress Rating:	Rohn OK

Monopole Flange Plate Connection

Elevation = 120 ft.

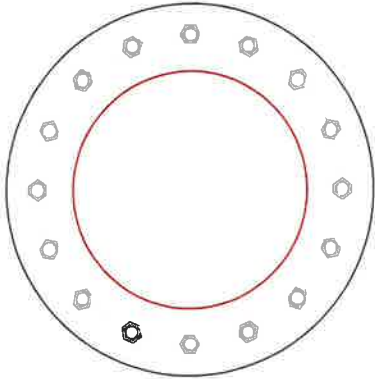


BU #	876337
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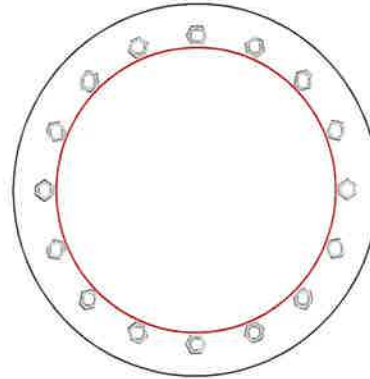
Applied Loads	
Moment (kip-ft)	625.75
Axial Force (kips)	14.73
Shear Force (kips)	15.32

*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(16) 1-1/2" ϕ bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 39" BC

Top Plate Data

47" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

47" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

30" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	47.18
Allowable (kips)	111.03
Stress Rating:	40.5% Pass

Top Plate Capacity

Max Stress (ksi):	19.91	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	58.5%	Pass
Tension Side Stress Rating:	31.6%	Pass

Bottom Plate Capacity

Max Stress (ksi):	7.22	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	21.2%	Pass
Tension Side Stress Rating:	5.1%	Pass

Monopole Flange Plate Connection

Elevation = 90 ft.

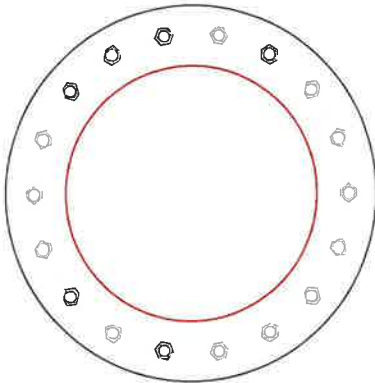


BU #	876337
Site Name	ORELINE SANITATION,
Order #	465673, Rev. 6
TIA-222 Revision	H

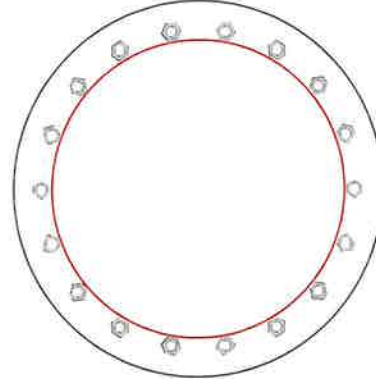
Applied Loads	
Moment (kip-ft)	1152.62
Axial Force (kips)	22.07
Shear Force (kips)	20.01

*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(18) 1-1/2" ϕ bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 45" BC

Top Plate Data

53" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

53" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

42" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	67.05
Allowable (kips)	111.02
Stress Rating:	57.5% Pass

Top Plate Capacity

Max Stress (ksi):	27.73	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	81.5%	Pass
Tension Side Stress Rating:	41.6%	Pass

Bottom Plate Capacity

Max Stress (ksi):	9.82	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	28.9%	Pass
Tension Side Stress Rating:	7.0%	Pass

Welded-Plate Monopole Bridge Stiffeners per TIA-222-H



Site Data

BU#: 876337
Site Name: SHORELINE SANITATION, CT
Order #: 465673, Rev. 6

Factored Loads at Splice Elevation

Moment:	1800.65	ft-kips
Axial:	32.79	kips
Shear:	22.87	kips

Elevation:	60	ft
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Splice Bolt Data

Quantity:	20	
Bolt Diameter:	1.5	in
Bolt Circle:	51	in

Pole Data

Upper Diam:	42	in
Upper Thickness:	0.375	in
Lower Diam:	48	in
Lower Thickness:	0.5	in
Pipe Steel (Fy):	42	ksi

Bridge Stiffener Data

Quantity:	3	
Total Length:	54.0	in
Plate Thickness:	1.250	in
Steel Grade (Fy):	65.0	ksi
Steel Ultimate (Fu):	80.0	ksi
Weld Type:	Fillet (both sides)	
Weld Size:	0.375	in
Weld Strength:	70	ksi
Upper Weld Length:	18	in
Upper Weld, C:	3.66	Table 8-4
Upper Plate Width:	6	in
Lower Weld Length:	18	in
Lower Weld, C:	3.66	Table 8-4
Lower Plate Width:	6	in
Gap PL Length:	18.0	in
Gap PL Width:	3	in

Stress Increase Factor

ASIF:	1.000	
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Stiffener Results	78.8%
Maximum Compression:	136.4 kips
Allowable Compression:	173.2 kips
Compression Stress Ratio:	78.8%
Maximum Tension:	136.4 kips
Allowable Tension:	219.4 kips
Tension Stress Ratio:	62.2%
Maximum Flexure:	613.8 in.kips
Allowable Flexure:	3948.8 in.kips
Bending&Shear Stress Ratio:	13.4%

Weld Results	46.0%
Upper Weld Eccentric Load:	136.40 kip
Allowable Weld Strength:	296.31 kip
Upper Weld Strength Ratio:	46.0%
Upper Weld Eccentric Load:	136.40 kip
Allowable Weld Strength:	296.31 kip
Lower Weld Strength Ratio:	46.0%

Pole Results	40.1%
Punching Shear Stress:	11.37 kip/in
Allowable Punching Stress:	28.35 kip/in
Punching Shear Stress Ratio:	40.1%

Loads to Use to Check Flange and Bolts w / CCIPlate		
Moment:	1365.88	ft.kips
Axial:	32.79	kips
Shear:	22.87	kips

Monopole Flange Plate Connection

Elevation = 60 ft.

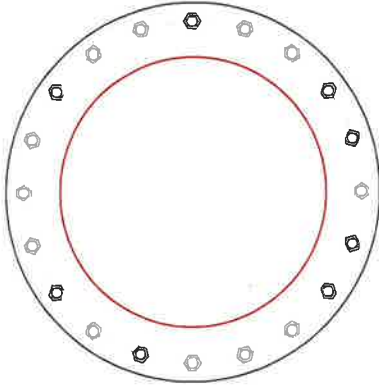


BU #	876337
Site Name	SEELINE SANITATION
Order #	465673, Rev. 6
TIA-222 Revision	H

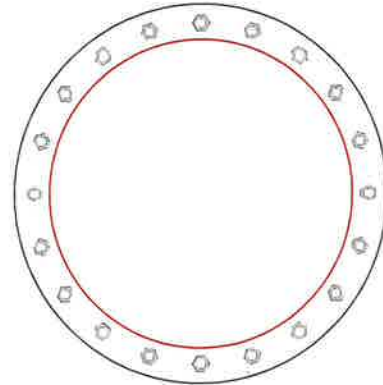
Applied Loads	
Moment (kip-ft)	1365.88
Axial Force (kips)	32.79
Shear Force (kips)	22.87

*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(20) 1-1/2" ϕ bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 53" BC

Top Plate Data

59" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

59" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

42" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

48" x 0.5" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	60.19
Allowable (kips)	111.02
Stress Rating:	51.6% Pass

Top Plate Capacity

Max Stress (ksi):	29.24	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	85.9%	Pass
Tension Side Stress Rating:	44.8%	Pass

Bottom Plate Capacity

Max Stress (ksi):	13.53	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	39.8%	Pass
Tension Side Stress Rating:	14.2%	Pass



Welded-Plate Monopole Bridge Stiffeners per TIA-222-H

Site Data

BU#: 876337
Site Name: SHORELINE SANITATION, CT
Order #: 465673, Rev. 6

Factored Loads at Splice Elevation

Moment:	2546.75	ft-kips
Axial:	44.64	kips
Shear:	27.16	kips

Elevation:	30	ft
------------	----	----

Splice Bolt Data

Quantity:	20	
Bolt Diameter:	1.5	in
Bolt Circle:	53	in

Pole Data

Upper Diam:	48	in
Upper Thickness:	0.5	in
Lower Diam:	48	in
Lower Thickness:	0.5	in
Pipe Steel (Fy):	42	ksi

Bridge Stiffener Data

Quantity:	3	
Total Length:	48.0	in
Plate Thickness:	1.250	in
Steel Grade (Fy):	65.0	ksi
Steel Ultimate (Fu):	80.0	ksi
Weld Type:	Fillet (both sides)	
Weld Size:	0.375	in
Weld Strength:	70	ksi
Upper Weld Length:	24	in
Upper Weld, C:	3.71	Table 8-4
Upper Plate Width:	6	in
Lower Weld Length:	24	in
Lower Weld, C:	3.71	Table 8-4
Lower Plate Width:	6	in
Gap PL Length:	0.0	in
Gap PL Width:	3	in

Stress Increase Factor

ASIF:	1.000	
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Stiffener Results

87.7%

Maximum Compression:	192.4	kips
Allowable Compression:	219.4	kips
Compression Stress Ratio:	87.7%	
Maximum Tension:	192.4	kips
Allowable Tension:	219.4	kips
Tension Stress Ratio:	87.7%	
Maximum Flexure:	865.7	in.kips
Allowable Flexure:	7020.0	in.kips
Bending&Shear Stress Ratio:	11.6%	

Weld Results

48.0%

Upper Weld Eccentric Load:	192.37	kip
Allowable Weld Strength:	400.68	kip
Upper Weld Strength Ratio:	48.0%	
Upper Weld Eccentric Load:	192.37	kip
Allowable Weld Strength:	400.68	kip
Lower Weld Strength Ratio:	48.0%	

Pole Results

23.9%

Punching Shear Stress:	9.02	kip/in
Allowable Punching Stress:	37.80	kip/in
Punching Shear Stress Ratio:	23.9%	

Loads to Use to Check Flange and Bolts w / CCIPlate

Moment:	1861.43	ft.kips
Axial:	44.64	kips
Shear:	27.16	kips

Monopole Flange Plate Connection

Elevation = 30 ft.

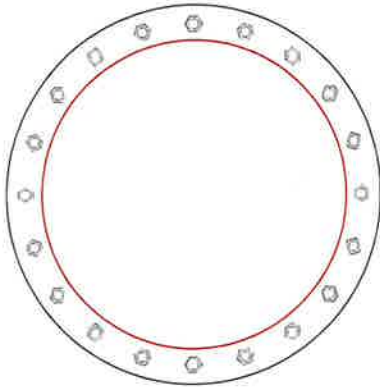


BU #	876337
Site Name	ORELINE SANITATION,
Order #	465673, Rev. 6
TIA-222 Revision	H

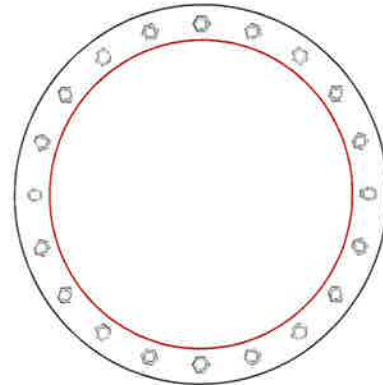
Applied Loads	
Moment (kip-ft)	1861.43
Axial Force (kips)	44.64
Shear Force (kips)	27.16

*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(20) 1-1/2" \emptyset bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 53" BC

Top Plate Data

59" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

59" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

48" x 0.5" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

48" x 0.5" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	82.03
Allowable (kips)	111.02
Stress Rating:	70.4% Pass

Top Plate Capacity

Max Stress (ksi):	18.44	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	54.2%	Pass
Tension Side Stress Rating:	19.4%	Pass

Bottom Plate Capacity

Max Stress (ksi):	18.44	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	54.2%	Pass
Tension Side Stress Rating:	19.4%	Pass

Monopole Base Plate Connection

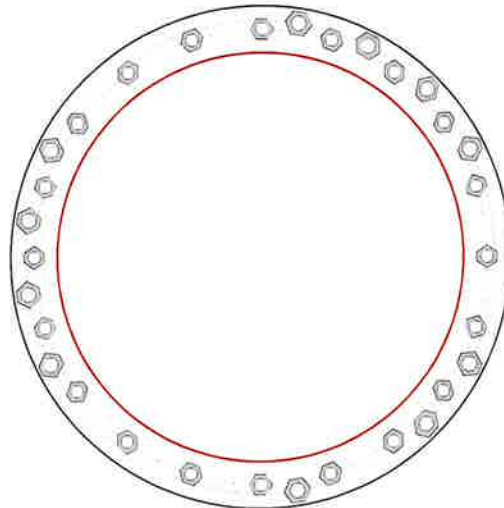


Site Info	
BU #	876337
Site Name	ORELINE SANITATION,
Order #	465673, Rev. 6

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.5

Applied Loads	
Moment (kip-ft)	3429.82
Axial Force (kips)	58.73
Shear Force (kips)	31.48

*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results	
Anchor Rod Data <hr/> GROUP 1: (20) 1-1/2" ϕ bolts (A354-BC N; $F_y=109$ ksi, $F_u=125$ ksi) on 53.5" BC GROUP 2: (11) 1-3/4" ϕ bolts (A687 N; $F_y=105$ ksi, $F_u=125$ ksi) on 55.5" BC <i>pos. (deg): 27, 45, 63, 81, 153, 171, 189, 207, 279, 315, 333</i>	Anchor Rod Summary <i>(units of kips, kip-in)</i>	
Base Plate Data <hr/> 59" OD x 2" Plate (A36; $F_y=36$ ksi, $F_u=58$ ksi)	GROUP 1: $Pu_c = 98.82$ $\phi Pn_c = 153.69$ Stress Rating $Vu = 1.57$ $\phi Vn = 46.11$ 61.3% $Mu = n/a$ $\phi Mn = n/a$ Pass	
Stiffener Data <hr/> N/A	GROUP 2: $Pu_c = 134.25$ $\phi Pn_c = 199.5$ Stress Rating $Vu = 0$ $\phi Vn = 59.85$ 64.1% $Mu = n/a$ $\phi Mn = n/a$ Pass	
Pole Data <hr/> 48" x 0.5" round pole (A53-B-42; $F_y=42$ ksi, $F_u=63$ ksi)	Base Plate Summary <hr/> $Max\ Stress\ (ksi):$ 22.95 (Flexural) $Allowable\ Stress\ (ksi):$ 32.4 $Stress\ Rating:$ 67.5% Pass	

Pier and Pad Foundation



BU #: 876337
 Site Name: SHORELINE SANI
 App. Number: 465673, Rev. 6

TIA-222 Revision: H
 Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, P_{comp} :	59	kips
Base Shear, Vu_{comp} :	31	kips
Moment, M_u :	3430	ft-kips
Tower Height, H :	180	ft
BP Dist. Above Fdn, bp_{dist} :	3	in
Bolt Circle / Bearing Plate Width, BC :	53.5	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	216.96	31.00	13.6%	Pass
<i>Bearing Pressure (ksf)</i>	90.00	3.44	3.6%	Pass
<i>Overturing (kip*ft)</i>	8171.55	3665.07	44.9%	Pass
<i>Pad Flexure (kip*ft)</i>	13114.70	1491.09	10.8%	Pass
<i>Pad Shear - 1-way (kips)</i>	2341.76	114.28	4.6%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.001	0.7%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	22734.15	0.00	0.0%	Pass

*Rating per TIA-222-H Section 15.5

Soil Rating*:	44.9%
Structural Rating*:	10.8%

Pad Properties		
Depth, D :	4.666	ft
Pad Width, W :	25	ft
Pad Thickness, T :	7.333	ft
Pad Rebar Size (Bottom), Sp :	11	
Pad Rebar Quantity (Bottom), mp :	23	
Pad Clear Cover, cc_{pad} :	3.6	in

Material Properties		
Rebar Grade, F_y :	60	ksi
Concrete Compressive Strength, F'_c :	4	ksi
Dry Concrete Density, δ_c :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	120	pcf
Ultimate Gross Bearing, Q_{ult} :	120.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	30	degrees
SPT Blow Count, N_{blows} :		
Base Friction, μ :		
Neglected Depth, N :	3.33	ft
Foundation Bearing on Rock?	Yes	
Groundwater Depth, gw :	N/A	ft

<-- Toggle between Gross and Net

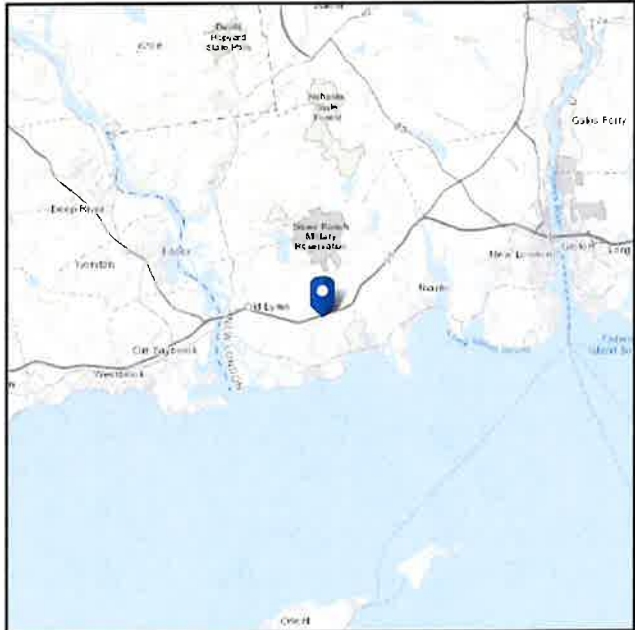


ASCE 7 Hazards Report

Address:
No Address at This
Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 172.73 ft (NAVD 88)
Latitude: 41.318778
Longitude: -72.270722

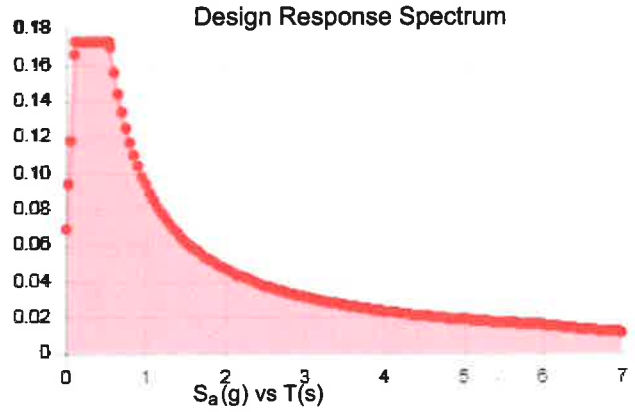
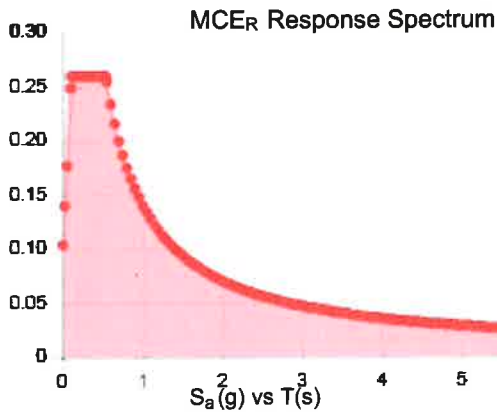


Site Soil Class: D - Stiff Soil

Results:

S_s :	0.163	S_{DS} :	0.173
S_1 :	0.058	S_{D1} :	0.094
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.081
S_{MS} :	0.26	PGA _M :	0.13
S_{M1} :	0.14	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Wed Nov 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: Wed Nov 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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