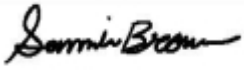
AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	190 ft Self Support Tower
ATC Asset Name	:	Unity Village MO 2
ATC Asset Number	:	306035
Engineering Number	:	14563974_C3_02
Proposed Carrier	:	DISH WIRELESS L.L.C.
Carrier Site Name	:	KCMCI00078B
Carrier Site Number	:	KCMCI00078B
Site Location	:	1097 NW Black Twig Ln Lees Summit, MO 64081-1905 38.9336° N, 94.4175° W
County	:	Jackson
Date	:	November 13, 2023
Max Usage	:	65%
Analysis Result	:	Pass

Created By:

Sammie Brown
Structural Engineer I



Scott Wirgau
Digitally signed by Scott Wirgau
Date: 2023.11.28 14:53:02 -05'00'

COA: 2015011232

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 190 ft Self Support tower to reflect the change in loading by DISH WIRELESS L.L.C..

Supporting Documents

Tower:	Allied Tower Drawing #B-16226, dated December 13, 1991
Foundation:	Allied Tower Drawing #B-16327, dated February 6, 1992
Geotechnical:	Geotechnology Job #J029737.02, dated May 19, 2017

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	109 mph (3-second gust)
Basic Wind Speed w/ Ice:	40 mph (3-second gust) w/ 1.50" radial ice concurrent
Code(s):	ANSI/TIA-222-H / 2018 IBC
Exposure Category:	C
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1
Feature:	Flat
Spectral Response:	Ss = 0.10, S_1 = 0.07
Site Class:	D - Stiff Soil - Default

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please reach out to your American Tower contact. If you do not have an American Tower contact and have an Engineering question, please contact **Engineering@americantower.com** Please include the American Tower asset name, asset number, and engineering number in the subject line for any questions.

Structure Usages

Structural Component	Usage	Control	Location	Result
Leg	65.0%	Member X	Section 2	Pass
Diagonal	39.0%	Block Shear	Section 8	Pass
Horizontal	2.0%	Block Shear	Section 10	Pass
Bolt	56.8%	-	Section 4	Pass
Serviceability Usage	8.5%	Rotation	Elevation 160 ft	Pass
Foundation	57.1%	Down	Base	Pass
Foundation	55.9%	Moment	Base	Pass
Foundation	56.6%	Shear	Base	Pass
Foundation	52.9%	Uplift	Base	Pass

Maximum Reactions

Foundation	Moment (k-ft)	Axial (k)	Uplift (k)	Shear (k)
Self Support Base (Global)	4,493.2	59.6	-	43.5
Self Support Base (Local)	-	325.1	276.3	26.2

Reactions shown are maximum overall and not limited by Load Case

Foundation usages were calculated by comparing the maximum reactions from this analysis to the reactions from the original design drawings, factored by 1.35 per ANSI/TIA-222-H, Section 15.6.2

DISH WIRELESS L.L.C. Final Loading

Elev (ft)	Qty	Equipment	Lines
180.0	1	Raycap RDIDC-9181-PF-48	(1) 1.75" (44.5mm) Hybrid
	3	Fujitsu TA08025-B604	
	3	Fujitsu TA08025-B605	
	3	JMA Wireless MX08FRO665-21	
	3	Samsung AT1K04	
	3	Light Sector Frame	

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Install proposed lines alongside existing DISH WIRELESS L.L.C. lines.

Other Existing/Reserved Loading

Elev (ft)	Qty	Equipment	Lines	Carrier
172.0	1	RFS DB-C1-12C-24AB-0Z	(2) 1 1/4" (1.25"- 31.8mm) Fiber (1) 1 5/8" Hybriflex	VERIZON WIRELESS
	3	Andrew LNX-6515DS-A1M		
	3	Ericsson 8843 Rev 2		
	3	Ericsson AIR 6449 B77D/ C-Band		
	3	Ericsson Radio 4449 - B13&B5		
	6	Commscope NHH-65C-R2B		
171.0	3	Light Sector Frame	-	VERIZON
162.0	1	Andrew Microwaves UHX6-105	(1) EW37	AT&T MOBILITY
158.2	1	Raycap DC6-48-60-18-8F ("Squid")	-	AT&T MOBILITY
151.0	3	Sector Frame	-	-
	1	Raycap DC6-48-60-0-8F	(2) 0.39" (10mm) Fiber Trunk (6) 0.76" (19.2mm) 8 AWG 6 (12) 1 5/8" Coax (1) 3/8" (0.38"- 9.5mm) RET Control Cable	AT&T MOBILITY
	1	Raycap DC6-48-60-18-8F		
	3	Alcatel-Lucent B25 RRH4x30		
	3	Alcatel-Lucent B66A RRH4x45-4R w/ Solar Shield		
	3	Alcatel-Lucent RRH4X25-WCS		
	3	Commscope SBNHH-1D65C		
	3	Nokia AEQK AirScale MAA 64T64R 192AE n77 200W		
	3	Nokia AHLBBA		
	3	Nokia AirScale RRH 4T4R B5 160W AHCA		
	3	Powerwave Allgon TT08-19DB111-001		
	6	Quintel QS86512-2		
120.0	2	Commscope HELIAX FiberFeed 12 RRU Pendant Connect	(5) 1 5/8" Coax (2) 1.46" (37.1mm) Hybrid (6) 7/8" Coax	T-MOBILE
	3	Andrew TMBX-6517-A1M		
	3	Commscope FFHH-65C-R3		
	3	Light Sector Frame		
	3	Nokia AEHC		
	3	Nokia AHFIG 70.55 lbs		
	3	Nokia AirScale Dual RRH 4T4R B12/71 240W AHLOA		

(If table breaks across pages, please see previous page for data in merged cells)

Standard Conditions

All engineering services performed by ATC Tower Services LLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts, and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of ATC Tower Services LLC

It is the responsibility of the client to ensure that the information provided to ATC Tower Services LLC and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates, and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

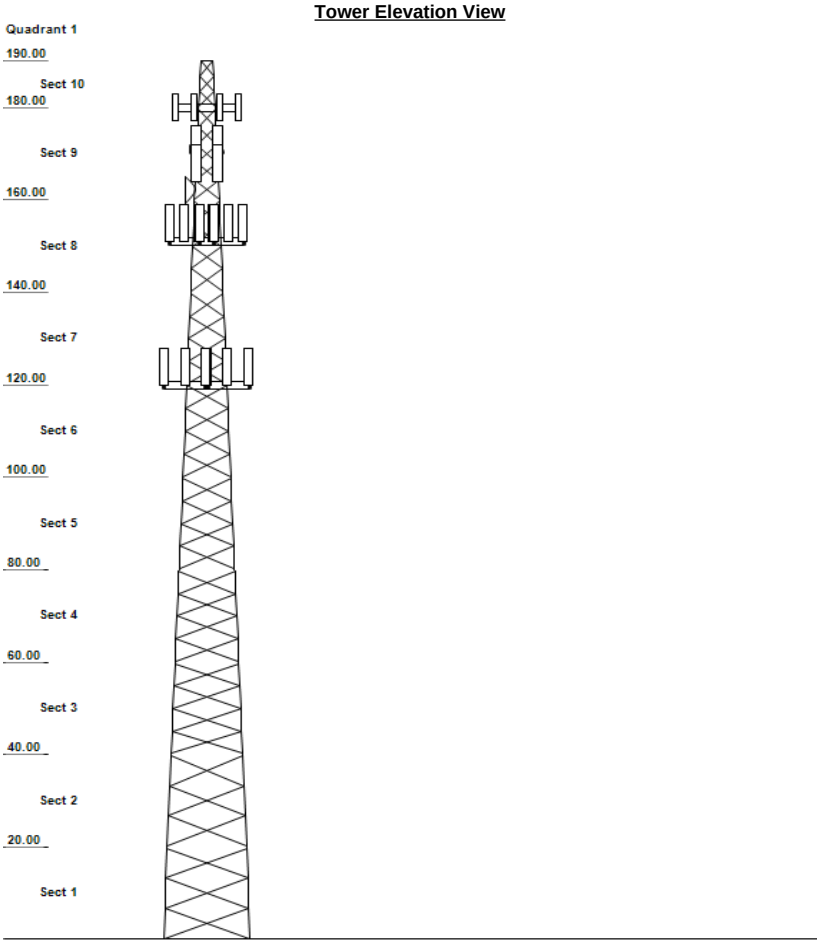
Unless explicitly agreed by both the client and ATC Tower Services LLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. ATC Tower Services LLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

ANALYSIS PARAMETERS

Nominal Wind:	109 mph	**Ice Wind:**	40 mph w/ 1.5" ice	**Service Wind:**	60 mph
Risk Category:	II	**Exposure:**	C	**S_s:** 0.099	**S_1:** 0.068
Topo Category:	1	**Topo Factor:**	Method 1	**Topo Feature:**	
Structure Height:	190 ft	**Base Elevation:**	0 ft	**Shape:**	Triangle
Base Width:	17 ft	**Top Width:**	2.75 ft		

Tower Elevation View



GLOBAL BASE REACTIONS

	DL+WL	DL+WL+IL
Moment (k-ft):	4493.18	1262.97
Axial (k):	59.64	139.73
Shear (k):	43.48	12.74

INDIVIDUAL BASE REACTIONS

Comp (k):	325.07
Uplift (k):	276.27
Shear (k):	26.25

TOWER SECTION PROPERTIES

Section	Leg Members	Diagonal Members	Horizontal Members
1	SOL 50 ksi 4 1/2" SOL	SAE 36 ksi 3.5X3.5X0.375	
2	SOL 50 ksi 4 1/4" SOL	SAE 36 ksi 3.5X3.5X0.3125	
3	SOL 50 ksi 4" SOLID	SAE 36 ksi 3X3X0.375	
4	SOL 50 ksi 3 3/4" SOL	SAE 36 ksi 3X3X0.25	
5	SOL 50 ksi 3 1/2" SOL	SAE 36 ksi 2.5X2.5X0.3125	
6	SOL 50 ksi 3 1/4" SOL	SAE 36 ksi 2.5X2.5X0.25	
7	SOL 50 ksi 3" SOLID	SAE 36 ksi 2.5X2.5X0.1875	
8	SOL 50 ksi 2 1/2" SOL	SAE 36 ksi 2X2X0.1875	
9	SOL 50 ksi 1 3/4" SOL	SAE 36 ksi 1.5X1.5X0.1875	
10	SOL 50 ksi 1 1/2" SOL	SAE 36 ksi 1.5X1.5X0.1875	SAE 36 ksi 1.5X1.5X0.1875

SECONDARY BRACING MEMBERS

DISCRETE APPURTENANCE

Elev (ft)	Description
180.0	(3) Fujitsu TA08025-B604
180.0	(3) Samsung AT1K04
180.0	(3) Fujitsu TA08025-B605
180.0	(3) Generic Flat Light Sector Fram
180.0	(3) JMA Wireless MX08FRO665-21
180.0	(1) Raycap RDIDC-9181-PF-48
172.0	(6) Commscope NHH-65C-R2B
172.0	(3) Ericsson 8843 Rev 2
172.0	(3) Andrew LNX-6515DS-A1M
172.0	(3) Ericsson Radio 4449 - B13&B5
172.0	(3) Ericsson AIR 6449 B77D/ C-Band
172.0	(1) RFS DB-C1-12C-24AB-0Z
171.0	(3) Flat Light Sector Frame
162.0	(1) Andrew Microwaves UHX6-105
158.2	(1) Raycap DC6-48-60-18-8F ("Squid
151.0	(6) Quintel QS86512-2
151.0	(3) Commscope SBNHH-1D65C
151.0	(3) Nokia AEQK AirScale MAA 64T64R
151.0	(3) Alcatel-Lucent RRH4X25-WCS
151.0	(3) Nokia AHLBBA
151.0	(3) Alcatel-Lucent B66A RRH4x45-4R
151.0	(3) Alcatel-Lucent B25 RRH4x30
151.0	(3) Nokia AirScale RRH 4T4R B5 160
151.0	(3) Powerwave Allgon TT08-19DB111-
151.0	(3) Generic Round Sector Frame
151.0	(1) Raycap DC6-48-60-18-8F
151.0	(1) Raycap DC6-48-60-0-8F
120.0	(3) Andrew TMBX-6517-A1M
120.0	(3) Nokia AEHC
120.0	(3) Commscope FFHH-65C-R3
120.0	(3) Flat Light Sector Frame
120.0	(3) Nokia AHFIG 70.55 lbs
120.0	(3) Nokia AirScale Dual RRH 4T4R B
120.0	(2) Commscope HELIAX FiberFeed 12

LINEAR APPURTENANCE

Elev To (ft)	Description
180.0	(2) Waveguide
180.0	(1) Climbing Ladder
180.0	(1) 1.75" (44.5mm) Hybrid
172.0	(2) 1 1/4" (1.25"- 31.8mm) Fiber
172.0	(1) 1 5/8" Hybriflex
162.0	(1) EW37
151.0	(12) 1 5/8" Coax
151.0	(6) 0.76" (19.2mm) 8 AWG 6
151.0	(2) 0.39" (10mm) Fiber Trunk
151.0	(1) Waveguide
151.0	(1) 3/8" (0.38"- 9.5mm) RET Contr
120.0	(6) 7/8" Coax
120.0	(5) 1 5/8" Coax
120.0	(2) 1.46" (37.1mm) Hybrid
120.0	(1) Waveguide

ANALYSIS PARAMETERS

Location:	Jackson County, MO	**Height:**	190 ft
Type and Shape:	Self Support, Triangle	**Base Elevation:**	0.00 ft
Manufacturer:	Undetermined	**Bottom Face Width:**	17.00 ft
Kd	0.85	**Top Face Width:**	2.75 ft
Ke:	0.97	**Anchor Bolt Detail Type:**	c

ICE & WIND PARAMETERS

Exposure Category:	C	**Design Wind Speed Without Ice:**	109 mph
Risk Category:	II	**Design Wind Speed with Ice:**	40 mph
Topographic Factor Procedure:	Method 1	**Operational Windspeed:**	60 mph
Topographic Category:	Flat	**Design Ice Thickness:**	1.50 in
Crest Height:	0 ft	**HMSL:**	983 ft

SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method				
Site Class:	D - Stiff Soil			**Period Based on Rayleigh Method (sec):**	0.97
T_L (sec):	12	**P:**	1.3	**C_s:**	0.035
S_s:	0.099	**S_1:**	0.068	**C_s Max:**	0.038
F_a:	1.600	**F_v:**	2.400	**C_s Min:**	0.030
S_{ds}:	0.106	**S_{d1}:**	0.109		

LOAD CASES

1.2D + 1.0W Normal	1.2D + 1.0W Normal - 109 mph Wind with No Ice
1.2D + 1.0W 60°	1.2D + 1.0W 60° - 109 mph Wind with No Ice
1.2D + 1.0W 90°	1.2D + 1.0W 90° - 109 mph Wind with No Ice
0.9D + 1.0W Normal	0.9D + 1.0W Normal - 109 mph Wind with No Ice (Reduced DL)
0.9D + 1.0W 60°	0.9D + 1.0W 60° - 109 mph Wind with No Ice (Reduced DL)
0.9D + 1.0W 90°	0.9D + 1.0W 90° - 109 mph Wind with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi Normal	1.2D + 1.0Di + 1.0Wi Normal - 40 mph Wind with 1.5" Radial Ice
1.2D + 1.0Di + 1.0Wi 60°	1.2D + 1.0Di + 1.0Wi 60° - 40 mph Wind with 1.5" Radial Ice
1.2D + 1.0Di + 1.0Wi 90°	1.2D + 1.0Di + 1.0Wi 90° - 40 mph Wind with 1.5" Radial Ice
1.2D + 1.0Ev + 1.0Eh Normal	1.2D + 1.0Ev + 1.0Eh Normal - Seismic
1.2D + 1.0Ev + 1.0Eh 60°	1.2D + 1.0Ev + 1.0Eh 60° - Seismic
1.2D + 1.0Ev + 1.0Eh 90°	1.2D + 1.0Ev + 1.0Eh 90° - Seismic
0.9D - 1.0Ev + 1.0Eh Normal	0.9D - 1.0Ev + 1.0Eh Normal - Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 60°	0.9D - 1.0Ev + 1.0Eh 60° - Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 90°	0.9D - 1.0Ev + 1.0Eh 90° - Seismic (Reduced DL)
1.0D + 1.0W Service Normal	1.0D + 1.0W Service Normal - 60 mph Wind with No Ice
1.0D + 1.0W Service 60°	1.0D + 1.0W Service 60° - 60 mph Wind with No Ice
1.0D + 1.0W Service 90°	1.0D + 1.0W Service 90° - 60 mph Wind with No Ice

TOWER LOADING – DISCRETE APPURTENANCE

Discrete Appurtenance Properties for LC: **1.2D + 1.0W**

Elev (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient. Factor	Vert. Ecc. (ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
180.0	Samsung AT1K04	3	32	1.3	1.4	9.6	6.9	0.80	0.50	0.0	0.00	35.74	49	115
180.0	Raycap RDIDC-9181-PF-48	1	22	1.9	1.3	14.0	8.0	0.80	1.00	0.0	0.00	35.74	45	26
180.0	Fujitsu TA08025-B605	3	75	2.0	1.3	15.0	9.1	0.80	0.50	0.0	0.00	35.74	72	270
180.0	Fujitsu TA08025-B604	3	64	2.0	1.3	15.0	7.9	0.80	0.50	0.0	0.00	35.74	72	230
180.0	JMA Wireless MX08FRO665-21	3	65	12.5	6.0	20.0	8.0	0.80	0.64	0.0	0.00	35.74	583	232
180.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	35.74	918	1440
172.0	Ericsson Radio 4449 - B13&B5	3	70	1.6	1.3	13.2	9.3	0.80	0.50	0.0	0.00	35.40	60	252
172.0	Ericsson 8843 Rev 2	3	75	1.6	1.3	13.2	11.1	0.80	0.50	0.0	0.00	35.40	60	270
172.0	Ericsson AIR 6449 B77D/ C-Band	3	82	4.0	2.5	15.9	10.6	0.80	0.70	0.0	0.00	35.40	204	294
172.0	RFS DB-C1-12C-24AB-0Z	1	32	4.1	2.5	16.5	12.6	0.80	1.00	0.0	0.00	35.40	98	38
172.0	Commscope NHH-65C-R2B	6	52	11.4	8.0	11.9	7.1	0.80	0.70	0.0	0.00	35.40	1151	372
172.0	Andrew LNX-6515DS-A1M	3	50	11.4	8.0	11.9	7.1	0.80	0.70	-0.6	345.77	35.37	576	179
171.0	Flat Light Sector Frame	3	400	17.9	0.0	0.0	0.0	0.75	0.67	0.0	0.00	35.35	811	1440
162.0	Andrew Microwaves UHX6-105	1	281	35.7	6.0	72.0	0.0	1.00	1.00	1.0	1,061.09	35.00	1061	337
158.2	Raycap DC6-48-60-18-8F ("Squid	1	19	1.5	2.0	11.0	11.0	0.80	1.00	0.0	0.00	34.78	35	23
151.0	Powerwave Allgon TT08-19DB111-	3	22	0.8	1.2	6.7	5.4	0.80	0.50	0.6	16.73	34.47	28	79
151.0	Raycap DC6-48-60-18-8F	1	20	1.3	2.0	9.7	9.7	0.80	1.00	0.0	0.00	34.44	30	24
151.0	Nokia AirScale RRH 4T4R B5 160	3	35	1.3	1.1	11.6	6.5	0.80	0.50	2.6	117.87	34.56	45	127
151.0	Raycap DC6-48-60-0-8F	1	33	1.4	1.9	11.0	11.0	0.80	1.00	-0.2	6.37	34.43	32	39
151.0	Alcatel-Lucent B25 RRH4x30	3	53	2.1	1.8	12.0	7.2	0.80	0.67	2.9	290.55	34.58	100	191
151.0	Alcatel-Lucent B66A RRH4x45-4R	3	57	2.5	2.2	11.8	7.2	0.80	0.67	0.3	35.84	34.45	119	204
151.0	Nokia AHLBBA	3	95	2.8	2.0	14.1	7.8	0.80	0.67	0.0	0.00	34.44	133	341
151.0	Alcatel-Lucent RRH4X25-WCS	3	70	3.2	2.6	12.0	8.7	0.80	0.72	0.2	32.03	34.45	160	252
151.0	Nokia AEQK AirScale MAA 64T64R	3	99	4.4	2.5	17.7	9.5	0.80	0.66	0.0	0.00	34.44	202	357
151.0	Commscope SBNHH-1D65C	3	50	11.4	8.0	11.9	7.1	0.80	0.70	1.3	732.69	34.50	564	179
151.0	Quintel QS86512-2	6	135	11.5	8.0	12.0	9.6	0.80	0.74	0.7	835.42	34.47	1193	972
151.0	Generic Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.75	0.0	0.00	34.44	711	1080
120.0	Commscope HELIAX FiberFeed 12	2	20	0.9	1.4	6.7	4.7	0.80	0.50	0.0	0.00	32.81	21	48
120.0	Nokia AirScale Dual RRH 4T4R B	3	84	2.2	1.8	12.1	7.4	0.80	0.67	3.6	360.33	33.02	100	302
120.0	Nokia AHFIG 70.55 lbs	3	71	2.8	2.3	12.1	5.2	0.80	0.67	0.0	0.00	32.81	124	254
120.0	Andrew TMBX-6517-A1M	3	20	6.0	7.0	6.5	3.3	0.80	0.77	0.4	123.99	32.83	310	71
120.0	Nokia AEHC	3	104	6.8	3.2	21.5	8.1	0.80	0.62	0.0	0.00	32.81	284	373
120.0	Flat Light Sector Frame	3	400	17.9	0.0	0.0	0.0	0.75	0.67	0.0	0.00	32.81	753	1440
120.0	Commscope FFHH-65C-R3	3	126	21.1	8.0	25.2	9.3	0.80	0.63	1.5	1,340.58	32.90	894	453
	Totals	**95**	**10,254**	**700.9**									11,595	12,305

Discrete Appurtenance Properties for LC: **0.9D + 1.0W**

Elev (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient. Factor	Vert. Ecc. (ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
180.0	Samsung AT1K04	3	32	1.3	1.4	9.6	6.9	0.80	0.50	0.0	0.00	35.74	49	86
180.0	Raycap RDIDC-9181-PF-48	1	22	1.9	1.3	14.0	8.0	0.80	1.00	0.0	0.00	35.74	45	20
180.0	Fujitsu TA08025-B605	3	75	2.0	1.3	15.0	9.1	0.80	0.50	0.0	0.00	35.74	72	202
180.0	Fujitsu TA08025-B604	3	64	2.0	1.3	15.0	7.9	0.80	0.50	0.0	0.00	35.74	72	173
180.0	JMA Wireless MX08FRO665-21	3	65	12.5	6.0	20.0	8.0	0.80	0.64	0.0	0.00	35.74	583	174
180.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	35.74	918	1080
172.0	Ericsson Radio 4449 - B13&B5	3	70	1.6	1.3	13.2	9.3	0.80	0.50	0.0	0.00	35.40	60	189
172.0	Ericsson 8843 Rev 2	3	75	1.6	1.3	13.2	11.1	0.80	0.50	0.0	0.00	35.40	60	202
172.0	Ericsson AIR 6449 B77D/ C-Band	3	82	4.0	2.5	15.9	10.6	0.80	0.70	0.0	0.00	35.40	204	220
172.0	RFS DB-C1-12C-24AB-0Z	1	32	4.1	2.5	16.5	12.6	0.80	1.00	0.0	0.00	35.40	98	29
172.0	Commscope NHH-65C-R2B	6	52	11.4	8.0	11.9	7.1	0.80	0.70	0.0	0.00	35.40	1151	279
172.0	Andrew LNX-6515DS-A1M	3	50	11.4	8.0	11.9	7.1	0.80	0.70	-0.6	345.77	35.37	576	134
171.0	Flat Light Sector Frame	3	400	17.9	0.0	0.0	0.0	0.75	0.67	0.0	0.00	35.35	811	1080
162.0	Andrew Microwaves UHX6-105	1	281	35.7	6.0	72.0	0.0	1.00	1.00	1.0	1,061.09	35.00	1061	253
158.2	Raycap DC6-48-60-18-8F ("Squid	1	19	1.5	2.0	11.0	11.0	0.80	1.00	0.0	0.00	34.78	35	17
151.0	Powerwave Allgon TT08-19DB111-	3	22	0.8	1.2	6.7	5.4	0.80	0.50	0.6	16.73	34.47	28	59
151.0	Raycap DC6-48-60-18-8F	1	20	1.3	2.0	9.7	9.7	0.80	1.00	0.0	0.00	34.44	30	18
151.0	Nokia AirScale RRH 4T4R B5 160	3	35	1.3	1.1	11.6	6.5	0.80	0.50	2.6	117.87	34.56	45	95
151.0	Raycap DC6-48-60-0-8F	1	33	1.4	1.9	11.0	11.0	0.80	1.00	-0.2	6.37	34.43	32	30
151.0	Alcatel-Lucent B25 RRH4x30	3	53	2.1	1.8	12.0	7.2	0.80	0.67	2.9	290.55	34.58	100	143
151.0	Alcatel-Lucent B66A RRH4x45-4R	3	57	2.5	2.2	11.8	7.2	0.80	0.67	0.3	35.84	34.45	119	153
151.0	Nokia AHLBBA	3	95	2.8	2.0	14.1	7.8	0.80	0.67	0.0	0.00	34.44	133	256
151.0	Alcatel-Lucent RRH4X25-WCS	3	70	3.2	2.6	12.0	8.7	0.80	0.72	0.2	32.03	34.45	160	189
151.0	Nokia AEQK AirScale MAA 64T64R	3	99	4.4	2.5	17.7	9.5	0.80	0.66	0.0	0.00	34.44	202	268
151.0	Commscope SBNHH-1D65C	3	50	11.4	8.0	11.9	7.1	0.80	0.70	1.3	732.69	34.50	564	134
151.0	Quintel QS86512-2	6	135	11.5	8.0	12.0	9.6	0.80	0.74	0.7	835.42	34.47	1193	729
151.0	Generic Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.75	0.0	0.00	34.44	711	810
120.0	Commscope HELIAX FiberFeed 12	2	20	0.9	1.4	6.7	4.7	0.80	0.50	0.0	0.00	32.81	21	36
120.0	Nokia AirScale Dual RRH 4T4R B	3	84	2.2	1.8	12.1	7.4	0.80	0.67	3.6	360.33	33.02	100	226
120.0	Nokia AHFIG 70.55 lbs	3	71	2.8	2.3	12.1	5.2	0.80	0.67	0.0	0.00	32.81	124	191
120.0	Andrew TMBX-6517-A1M	3	20	6.0	7.0	6.5	3.3	0.80	0.77	0.4	123.99	32.83	310	53
120.0	Nokia AEHC	3	104	6.8	3.2	21.5	8.1	0.80	0.62	0.0	0.00	32.81	284	280
120.0	Flat Light Sector Frame	3	400	17.9	0.0	0.0	0.0	0.75	0.67	0.0	0.00	32.81	753	1080
120.0	Commscope FFHH-65C-R3	3	126	21.1	8.0	25.2	9.3	0.80	0.63	1.5	1,340.58	32.90	894	339
	Totals	**95**	**10,254**	**700.9**									11,595	9,229

Discrete Appurtenance Properties for LC: **1.2D + 1.0Di + 1.0Wi**

Elev (ft)	Description	Qty	Ice Wt (lb)	Ice EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient. Factor	Vert. Ecc. (ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
180.0	Samsung AT1K04	3	75	2.2	1.4	9.6	6.9	0.80	0.50	0.0	0.00	4.81	11	244
180.0	Raycap RDIDC-9181-PF-48	1	80	2.8	1.3	14.0	8.0	0.80	1.00	0.0	0.00	4.81	9	84
180.0	Fujitsu TA08025-B605	3	139	2.9	1.3	15.0	9.1	0.80	0.50	0.0	0.00	4.81	14	461
180.0	Fujitsu TA08025-B604	3	123	2.9	1.3	15.0	7.9	0.80	0.50	0.0	0.00	4.81	14	408
180.0	JMA Wireless MX08FRO665-21	3	325	15.3	6.0	20.0	8.0	0.80	0.64	0.0	0.00	4.81	96	1015
180.0	Generic Flat Light Sector Fram	3	705	33.2	0.0	0.0	0.0	0.75	0.75	0.0	0.00	4.81	229	2356
172.0	Ericsson Radio 4449 - B13&B5	3	127	2.5	1.3	13.2	9.3	0.80	0.50	0.0	0.00	4.77	12	423
172.0	Ericsson 8843 Rev 2	3	138	2.5	1.3	13.2	11.1	0.80	0.50	0.0	0.00	4.77	12	459
172.0	Ericsson AIR 6449 B77D/ C-Band	3	200	5.4	2.5	15.9	10.6	0.80	0.70	0.0	0.00	4.77	37	648
172.0	RFS DB-C1-12C-24AB-0Z	1	161	5.4	2.5	16.5	12.6	0.80	1.00	0.0	0.00	4.77	18	167
172.0	Commscope NHH-65C-R2B	6	283	14.7	8.0	11.9	7.1	0.80	0.70	0.0	0.00	4.77	200	1763
172.0	Andrew LNX-6515DS-A1M	3	282	14.7	8.0	11.9	7.1	0.80	0.70	-0.6	59.99	4.76	100	877
171.0	Flat Light Sector Frame	3	705	33.2	0.0	0.0	0.0	0.75	0.67	0.0	0.00	4.76	203	2356
162.0	Andrew Microwaves UHX6-105	1	1000	39.2	6.0	72.0	0.0	1.00	1.00	1.0	157.04	4.71	157	1056
158.2	Raycap DC6-48-60-18-8F ("Squid	1	81	2.2	2.0	11.0	11.0	0.80	1.00	0.0	0.00	4.68	7	85
151.0	Powerwave Allgon TT08-19DB111-	3	49	1.4	1.2	6.7	5.4	0.80	0.50	0.6	4.06	4.64	7	159
151.0	Raycap DC6-48-60-18-8F	1	73	1.9	2.0	9.7	9.7	0.80	1.00	0.0	0.00	4.64	6	77
151.0	Nokia AirScale RRH 4T4R B5 160	3	75	2.0	1.1	11.6	6.5	0.80	0.50	2.6	25.18	4.65	10	245
151.0	Raycap DC6-48-60-0-8F	1	91	2.0	1.9	11.0	11.0	0.80	1.00	-0.2	1.28	4.64	6	98
151.0	Alcatel-Lucent B25 RRH4x30	3	113	3.1	1.8	12.0	7.2	0.80	0.67	2.9	57.48	4.66	20	372
151.0	Alcatel-Lucent B66A RRH4x45-4R	3	127	3.7	2.2	11.8	7.2	0.80	0.67	0.3	6.96	4.64	23	415
151.0	Nokia AHLBBA	3	172	4.0	2.0	14.1	7.8	0.80	0.67	0.0	0.00	4.64	25	573
151.0	Alcatel-Lucent RRH4X25-WCS	3	162	4.5	2.6	12.0	8.7	0.80	0.72	0.2	6.09	4.64	30	527
151.0	Nokia AEQK AirScale MAA 64T64R	3	216	5.8	2.5	17.7	9.5	0.80	0.66	0.0	0.00	4.64	36	706
151.0	Commscope SBNHH-1D65C	3	280	14.7	8.0	11.9	7.1	0.80	0.70	1.3	126.64	4.65	97	868
151.0	Quintel QS86512-2	6	396	14.7	8.0	12.0	9.6	0.80	0.74	0.7	144.31	4.64	206	2538
151.0	Generic Round Sector Frame	3	669	31.0	0.0	0.0	0.0	0.75	0.75	0.0	0.00	4.64	206	2186
120.0	Commscope HELIAX FiberFeed 12	2	48	1.6	1.4	6.7	4.7	0.80	0.50	0.0	0.00	4.42	5	104
120.0	Nokia AirScale Dual RRH 4T4R B	3	146	3.2	1.8	12.1	7.4	0.80	0.67	3.6	70.13	4.45	19	487
120.0	Nokia AHFIG 70.55 lbs	3	134	3.9	2.3	12.1	5.2	0.80	0.67	0.0	0.00	4.42	24	445
120.0	Andrew TMBX-6517-A1M	3	122	8.6	7.0	6.5	3.3	0.80	0.77	0.4	24.00	4.42	60	379
120.0	Nokia AEHC	3	254	8.6	3.2	21.5	8.1	0.80	0.62	0.0	0.00	4.42	48	824
120.0	Flat Light Sector Frame	3	692	32.6	0.0	0.0	0.0	0.75	0.67	0.0	0.00	4.42	184	2317
120.0	Commscope FFHH-65C-R3	3	529	24.8	8.0	25.2	9.3	0.80	0.63	1.5	211.45	4.43	141	1662
	Totals	**95**	**25,333**	**1032.7**									2273	27,384

Discrete Appurtenance Properties for LC: **1.0D + 1.0W Service**

Elev (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient. Factor	Vert. Ecc. (ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
180.0	Samsung AT1K04	3	32	1.3	1.4	9.6	6.9	0.80	0.50	0.0	0.00	10.83	15	96
180.0	Raycap RDIDC-9181-PF-48	1	22	1.9	1.3	14.0	8.0	0.80	1.00	0.0	0.00	10.83	14	22
180.0	Fujitsu TA08025-B605	3	75	2.0	1.3	15.0	9.1	0.80	0.50	0.0	0.00	10.83	22	225
180.0	Fujitsu TA08025-B604	3	64	2.0	1.3	15.0	7.9	0.80	0.50	0.0	0.00	10.83	22	192
180.0	JMA Wireless MX08FRO665-21	3	65	12.5	6.0	20.0	8.0	0.80	0.64	0.0	0.00	10.83	177	194
180.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	10.83	278	1200
172.0	Ericsson Radio 4449 - B13&B5	3	70	1.6	1.3	13.2	9.3	0.80	0.50	0.0	0.00	10.72	18	210
172.0	Ericsson 8843 Rev 2	3	75	1.6	1.3	13.2	11.1	0.80	0.50	0.0	0.00	10.72	18	225
172.0	Ericsson AIR 6449 B77D/ C-Band	3	82	4.0	2.5	15.9	10.6	0.80	0.70	0.0	0.00	10.72	62	245
172.0	RFS DB-C1-12C-24AB-0Z	1	32	4.1	2.5	16.5	12.6	0.80	1.00	0.0	0.00	10.72	30	32
172.0	Commscope NHH-65C-R2B	6	52	11.4	8.0	11.9	7.1	0.80	0.70	0.0	0.00	10.72	349	310
172.0	Andrew LNX-6515DS-A1M	3	50	11.4	8.0	11.9	7.1	0.80	0.70	-0.6	104.77	10.72	175	149
171.0	Flat Light Sector Frame	3	400	17.9	0.0	0.0	0.0	0.75	0.67	0.0	0.00	10.71	246	1200
162.0	Andrew Microwaves UHX6-105	1	281	35.7	6.0	72.0	0.0	1.00	1.00	1.0	321.52	10.60	322	281
158.2	Raycap DC6-48-60-18-8F ("Squid	1	19	1.5	2.0	11.0	11.0	0.80	1.00	0.0	0.00	10.54	11	19
151.0	Powerwave Allgon TT08-19DB111-	3	22	0.8	1.2	6.7	5.4	0.80	0.50	0.6	5.07	10.44	8	66
151.0	Raycap DC6-48-60-18-8F	1	20	1.3	2.0	9.7	9.7	0.80	1.00	0.0	0.00	10.43	9	20
151.0	Nokia AirScale RRH 4T4R B5 160	3	35	1.3	1.1	11.6	6.5	0.80	0.50	2.6	35.72	10.47	14	106
151.0	Raycap DC6-48-60-0-8F	1	33	1.4	1.9	11.0	11.0	0.80	1.00	-0.2	1.93	10.43	10	33
151.0	Alcatel-Lucent B25 RRH4x30	3	53	2.1	1.8	12.0	7.2	0.80	0.67	2.9	88.04	10.48	30	159
151.0	Alcatel-Lucent B66A RRH4x45-4R	3	57	2.5	2.2	11.8	7.2	0.80	0.67	0.3	10.86	10.44	36	170
151.0	Nokia AHLBBA	3	95	2.8	2.0	14.1	7.8	0.80	0.67	0.0	0.00	10.43	40	284
151.0	Alcatel-Lucent RRH4X25-WCS	3	70	3.2	2.6	12.0	8.7	0.80	0.72	0.2	9.70	10.44	49	210
151.0	Nokia AEQK AirScale MAA 64T64R	3	99	4.4	2.5	17.7	9.5	0.80	0.66	0.0	0.00	10.43	61	298
151.0	Commscope SBNHH-1D65C	3	50	11.4	8.0	11.9	7.1	0.80	0.70	1.3	222.01	10.45	171	149
151.0	Quintel QS86512-2	6	135	11.5	8.0	12.0	9.6	0.80	0.74	0.7	253.13	10.45	362	810
151.0	Generic Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.75	0.0	0.00	10.43	216	900
120.0	Commscope HELIAX FiberFeed 12	2	20	0.9	1.4	6.7	4.7	0.80	0.50	0.0	0.00	9.94	6	40
120.0	Nokia AirScale Dual RRH 4T4R B	3	84	2.2	1.8	12.1	7.4	0.80	0.67	3.6	109.18	10.00	30	251
120.0	Nokia AHFIG 70.55 lbs	3	71	2.8	2.3	12.1	5.2	0.80	0.67	0.0	0.00	9.94	38	212
120.0	Andrew TMBX-6517-A1M	3	20	6.0	7.0	6.5	3.3	0.80	0.77	0.4	37.57	9.95	94	59
120.0	Nokia AEHC	3	104	6.8	3.2	21.5	8.1	0.80	0.62	0.0	0.00	9.94	86	311
120.0	Flat Light Sector Frame	3	400	17.9	0.0	0.0	0.0	0.75	0.67	0.0	0.00	9.94	228	1200
120.0	Commscope FFHH-65C-R3	3	126	21.1	8.0	25.2	9.3	0.80	0.63	1.5	406.20	9.97	271	377
	Totals	**95**	**10,254**	**700.9**									3,513	10,254

TOWER LOADING – LINEAR APPURTENANCE

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	% In Wind	Spread On Faces	Bundling	Cluster Dia (in)	Out of Zone	Spacing (in)	Orient. Factor	K_a Override
5.0	162.0	EW37	1	2.90	0.84	100	2	Individual	0.00	N	1.00	1.00	0.00
5.0	151.0	Waveguide	1	2.00	6.00	100	2	Individual	0.00	N	1.00	1.00	0.00
5.0	151.0	1 5/8" Coax	12	1.98	0.82	100	2	Individual	0.00	N	1.00	1.00	0.00
5.0	151.0	3/8" (0.38"- 9.5mm) RET Contro	1	0.38	0.23	100	2	Individual	0.00	N	1.00	1.00	0.00
5.0	151.0	0.76" (19.2mm) 8 AWG 6	6	0.76	0.53	100	2	Individual	0.00	N	1.00	1.00	0.00
5.0	151.0	0.39" (10mm) Fiber Trunk	2	0.39	0.06	100	2	Individual	0.00	N	1.00	1.00	0.00
5.0	120.0	1 5/8" Coax	5	1.98	0.82	100	3	Individual	0.00	N	1.00	1.00	0.00
5.0	120.0	Waveguide	1	2.00	6.00	100	3	Individual	0.00	N	1.00	1.00	0.00
5.0	120.0	7/8" Coax	6	1.09	0.33	100	3	Individual	0.00	N	1.00	1.00	0.00
0.0	180.0	Waveguide	1	2.00	6.00	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	180.0	Climbing Ladder	1	2.00	6.00	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	180.0	1.75" (44.5mm) Hybrid	1	1.75	2.72	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	180.0	Waveguide	1	2.00	6.00	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	172.0	1 5/8" Hybriflex	1	1.98	1.30	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	172.0	1 1/4" (1.25"- 31.8mm) Fiber	2	1.25	1.05	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	120.0	1.46" (37.1mm) Hybrid	2	1.46	1.70	100	3	Individual	0.00	N	1.00	1.00	0.00

SECTION FORCES

1.2D + 1.0W Normal — Gust Response Factor (Gh): 0.85
109 mph Wind with No Ice — Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
10	185	35.94	3.614	2.502	0.00	0.188	2.64	1.00	1.00	0.0	5.05	13.30	0.00	410	0	406	0	406
9	170	35.31	7.039	5.839	0.00	0.146	2.78	1.00	1.00	0.0	10.35	28.82	0.00	1512	0	865	530	1395
8	150	34.39	9.782	8.341	0.00	0.152	2.76	1.00	1.00	0.0	14.52	40.13	0.00	2589	0	1173	1304	2477
7	130	33.37	14.152	10.009	0.00	0.161	2.73	1.00	1.00	0.0	19.84	54.20	0.00	3570	0	1537	1768	3305
6	110	32.22	16.346	10.844	0.00	0.151	2.77	1.00	1.00	0.0	22.50	62.31	0.00	4660	0	1706	2453	4159
5	90	30.88	18.435	11.678	0.00	0.143	2.80	1.00	1.00	0.0	25.05	70.11	0.00	5430	0	1840	2351	4191
4	70	29.29	24.821	12.512	0.00	0.155	2.75	1.00	1.00	0.0	31.93	87.94	0.00	5939	0	2189	2230	4419
3	50	27.29	27.573	13.346	0.00	0.151	2.77	1.00	1.00	0.0	35.15	97.33	0.00	7445	0	2258	2077	4335
2	30	24.51	27.591	14.180	0.00	0.138	2.82	1.00	1.00	0.0	35.62	100.28	0.00	7421	0	2089	1866	3955
1	10	21.21	29.974	15.014	0.00	0.135	2.83	1.00	1.00	0.0	37.87	107.03	0.00	8356	0	1929	1314	3244
													Totals	**47,332**	**0**			**31,887**

1.2D + 1.0W 60° — Gust Response Factor (Gh): 0.85
109 mph Wind with No Ice — Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
10	185	35.94	3.614	2.502	0.00	0.188	2.64	0.80	1.00	0.0	4.32	11.40	0.00	410	0	348	0	348
9	170	35.31	7.039	5.839	0.00	0.146	2.78	0.80	1.00	0.0	8.94	24.90	0.00	1512	0	747	530	1278
8	150	34.39	9.782	8.341	0.00	0.152	2.76	0.80	1.00	0.0	12.56	34.72	0.00	2589	0	1015	1304	2319
7	130	33.37	14.152	10.009	0.00	0.161	2.73	0.80	1.00	0.0	17.01	46.47	0.00	3570	0	1318	1768	3086
6	110	32.22	16.346	10.844	0.00	0.151	2.77	0.80	1.00	0.0	19.23	53.25	0.00	4660	0	1458	2453	3911
5	90	30.88	18.435	11.678	0.00	0.143	2.80	0.80	1.00	0.0	21.37	59.79	0.00	5430	0	1570	2351	3921
4	70	29.29	24.821	12.512	0.00	0.155	2.75	0.80	1.00	0.0	26.96	74.26	0.00	5939	0	1849	2230	4079
3	50	27.29	27.573	13.346	0.00	0.151	2.77	0.80	1.00	0.0	29.63	82.06	0.00	7445	0	1903	2077	3981
2	30	24.51	27.591	14.180	0.00	0.138	2.82	0.80	1.00	0.0	30.10	84.75	0.00	7421	0	1765	1866	3631
1	10	21.21	29.974	15.014	0.00	0.135	2.83	0.80	1.00	0.0	32.01	90.46	0.00	8356	0	1631	1314	2945
													Totals	**47,332**	**0**			**29,499**

1.2D + 1.0W 90° — Gust Response Factor (Gh): 0.85
109 mph Wind with No Ice — Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
10	185	35.94	3.614	2.502	0.00	0.188	2.64	0.85	1.00	0.0	4.50	11.88	0.00	410	0	363	0	363
9	170	35.31	7.039	5.839	0.00	0.146	2.78	0.85	1.00	0.0	9.29	25.88	0.00	1512	0	777	530	1307
8	150	34.39	9.782	8.341	0.00	0.152	2.76	0.85	1.00	0.0	13.05	36.07	0.00	2589	0	1054	1304	2359
7	130	33.37	14.152	10.009	0.00	0.161	2.73	0.85	1.00	0.0	17.72	48.40	0.00	3570	0	1373	1768	3141
6	110	32.22	16.346	10.844	0.00	0.151	2.77	0.85	1.00	0.0	20.05	55.52	0.00	4660	0	1520	2453	3973
5	90	30.88	18.435	11.678	0.00	0.143	2.80	0.85	1.00	0.0	22.29	62.37	0.00	5430	0	1637	2351	3988
4	70	29.29	24.821	12.512	0.00	0.155	2.75	0.85	1.00	0.0	28.21	77.68	0.00	5939	0	1934	2230	4164
3	50	27.29	27.573	13.346	0.00	0.151	2.77	0.85	1.00	0.0	31.01	85.88	0.00	7445	0	1992	2077	4070
2	30	24.51	27.591	14.180	0.00	0.138	2.82	0.85	1.00	0.0	31.48	88.63	0.00	7421	0	1846	1866	3712
1	10	21.21	29.974	15.014	0.00	0.135	2.83	0.85	1.00	0.0	33.51	94.70	0.00	8356	0	1707	1314	3021
													Totals	**47,332**	**0**			**30,098**

0.9D + 1.0W Normal — Gust Response Factor (Gh): 0.85
109 mph Wind with No Ice (Reduced DL) — Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
10	185	35.94	3.614	2.502	0.00	0.188	2.64	1.00	1.00	0.0	5.05	13.30	0.00	307	0	406	0	406
9	170	35.31	7.039	5.839	0.00	0.146	2.78	1.00	1.00	0.0	10.35	28.82	0.00	1134	0	865	530	1395
8	150	34.39	9.782	8.341	0.00	0.152	2.76	1.00	1.00	0.0	14.52	40.13	0.00	1941	0	1173	1304	2477
7	130	33.37	14.152	10.009	0.00	0.161	2.73	1.00	1.00	0.0	19.84	54.20	0.00	2677	0	1537	1768	3305
6	110	32.22	16.346	10.844	0.00	0.151	2.77	1.00	1.00	0.0	22.50	62.31	0.00	3495	0	1706	2453	4159
5	90	30.88	18.435	11.678	0.00	0.143	2.80	1.00	1.00	0.0	25.05	70.11	0.00	4072	0	1840	2351	4191
4	70	29.29	24.821	12.512	0.00	0.155	2.75	1.00	1.00	0.0	31.93	87.94	0.00	4454	0	2189	2230	4419
3	50	27.29	27.573	13.346	0.00	0.151	2.77	1.00	1.00	0.0	35.15	97.33	0.00	5584	0	2258	2077	4335
2	30	24.51	27.591	14.180	0.00	0.138	2.82	1.00	1.00	0.0	35.62	100.28	0.00	5566	0	2089	1866	3955
1	10	21.21	29.974	15.014	0.00	0.135	2.83	1.00	1.00	0.0	38.00	107.41	0.00	6267	0	1936	1314	3250
													Totals	**35,499**	**0**			**31,894**

0.9D + 1.0W 60° — Gust Response Factor (Gh): 0.85
109 mph Wind with No Ice (Reduced DL) — Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
10	185	35.94	3.614	2.502	0.00	0.188	2.64	0.80	1.00	0.0	4.32	11.40	0.00	307	0	348	0	348
9	170	35.31	7.039	5.839	0.00	0.146	2.78	0.80	1.00	0.0	8.94	24.90	0.00	1134	0	747	530	1278
8	150	34.39	9.782	8.341	0.00	0.152	2.76	0.80	1.00	0.0	12.56	34.72	0.00	1941	0	1015	1304	2319
7	130	33.37	14.152	10.009	0.00	0.161	2.73	0.80	1.00	0.0	17.01	46.47	0.00	2677	0	1318	1768	3086
6	110	32.22	16.346	10.844	0.00	0.151	2.77	0.80	1.00	0.0	19.23	53.25	0.00	3495	0	1458	2453	3911
5	90	30.88	18.435	11.678	0.00	0.143	2.80	0.80	1.00	0.0	21.37	59.79	0.00	4072	0	1570	2351	3921
4	70	29.29	24.821	12.512	0.00	0.155	2.75	0.80	1.00	0.0	26.96	74.26	0.00	4454	0	1849	2230	4079
3	50	27.29	27.573	13.346	0.00	0.151	2.77	0.80	1.00	0.0	29.63	82.06	0.00	5584	0	1903	2077	3981
2	30	24.51	27.591	14.180	0.00	0.138	2.82	0.80	1.00	0.0	30.10	84.75	0.00	5566	0	1765	1866	3631

SECTION FORCES

0.9D + 1.0W 60° Gust Response Factor (Gh): 0.85
109 mph Wind with No Ice (Reduced DL) Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)	
1	10	21.21	29.974	15.014	0.00	0.135	2.83	0.80	1.00	0.0	32.01	90.46	0.00	6267	0	1631	1314	2945	
													Totals	**35,499**	**0**			**29,499**	

0.9D + 1.0W 90° Gust Response Factor (Gh): 0.85
109 mph Wind with No Ice (Reduced DL) Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)	
10	185	35.94	3.614	2.502	0.00	0.188	2.64	0.85	1.00	0.0	4.50	11.88	0.00	307	0	363	0	363	
9	170	35.31	7.039	5.839	0.00	0.146	2.78	0.85	1.00	0.0	9.29	25.88	0.00	1134	0	777	530	1307	
8	150	34.39	9.782	8.341	0.00	0.152	2.76	0.85	1.00	0.0	13.05	36.07	0.00	1941	0	1054	1304	2359	
7	130	33.37	14.152	10.009	0.00	0.161	2.73	0.85	1.00	0.0	17.72	48.40	0.00	2677	0	1373	1768	3141	
6	110	32.22	16.346	10.844	0.00	0.151	2.77	0.85	1.00	0.0	20.05	55.52	0.00	3495	0	1520	2453	3973	
5	90	30.88	18.435	11.678	0.00	0.143	2.80	0.85	1.00	0.0	22.29	62.37	0.00	4072	0	1637	2351	3988	
4	70	29.29	24.821	12.512	0.00	0.155	2.75	0.85	1.00	0.0	28.21	77.68	0.00	4454	0	1934	2230	4164	
3	50	27.29	27.573	13.346	0.00	0.151	2.77	0.85	1.00	0.0	31.01	85.88	0.00	5584	0	1992	2077	4070	
2	30	24.51	27.591	14.180	0.00	0.138	2.82	0.85	1.00	0.0	31.48	88.63	0.00	5566	0	1846	1866	3712	
1	10	21.21	29.974	15.014	0.00	0.135	2.83	0.85	1.00	0.0	33.51	94.70	0.00	6267	0	1707	1314	3021	
													Totals	**35,499**	**0**			**30,098**	

1.2D + 1.0Di + 1.0Wi Normal Gust Response Factor (Gh): 0.85 Ice Importance Factor: 1.00
40 mph Wind with 1.5" Radial Ice Wind Importance Factor (Iw): 1.00 Ice Dead Load Factor: 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)	
10	185	4.84	3.614	17.297	14.79	0.589	1.81	1.00	1.00	1.8	16.36	29.63	14.79	1217	807	122	0	122	
9	170	4.75	7.039	34.646	28.81	0.444	1.98	1.00	1.00	1.8	29.78	59.06	28.81	4018	2505	239	192	430	
8	150	4.63	9.782	37.543	29.20	0.379	2.11	1.00	1.00	1.7	33.33	70.26	29.20	7424	4835	277	560	837	
7	130	4.49	14.152	41.541	31.53	0.358	2.15	1.00	1.00	1.7	39.86	85.87	31.53	10181	6611	328	795	1123	
6	110	4.34	16.346	44.876	34.03	0.329	2.22	1.00	1.00	1.7	43.65	96.98	34.03	13292	8632	358	1139	1441	**
5	90	4.16	18.435	47.845	36.17	0.306	2.28	1.00	1.00	1.7	47.19	107.55	36.17	14108	8678	380	1107	1487	
4	70	3.94	24.821	50.736	38.22	0.306	2.28	1.00	1.00	1.6	55.31	126.07	38.22	14999	9060	423	1032	1455	
3	50	3.68	27.573	53.218	39.87	0.292	2.32	1.00	1.00	1.6	59.31	137.49	39.87	16426	8981	429	956	1386	
2	30	3.30	27.591	48.046	33.87	0.246	2.45	1.00	1.00	1.5	55.65	136.27	33.87	15733	8312	382	875	1257	
1	10	2.86	29.974	47.197	32.18	0.229	2.50	1.00	1.00	1.3	57.36	143.50	32.18	14950	6595	348	580	928	
	*** = Section Force Exceeds Solidity Ratio Criteria*												**Totals**	**112,348**	**65,016**			**10,465**	

1.2D + 1.0Di + 1.0Wi 60° Gust Response Factor (Gh): 0.85 Ice Importance Factor: 1.00
40 mph Wind with 1.5" Radial Ice Wind Importance Factor (Iw): 1.00 Ice Dead Load Factor: 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)	
10	185	4.84	3.614	17.297	14.79	0.589	1.81	0.80	1.00	1.8	15.64	28.32	14.79	1217	807	117	0	117	
9	170	4.75	7.039	34.646	28.81	0.444	1.98	0.80	1.00	1.8	28.37	56.27	28.81	4018	2505	227	192	419	
8	150	4.63	9.782	37.543	29.20	0.379	2.11	0.80	1.00	1.7	31.37	66.14	29.20	7424	4835	260	560	820	
7	130	4.49	14.152	41.541	31.53	0.358	2.15	0.80	1.00	1.7	37.03	79.77	31.53	10181	6611	305	795	1100	
6	110	4.34	16.346	44.876	34.03	0.329	2.22	0.80	1.00	1.7	40.38	89.72	34.03	13292	8632	331	1139	1441	**
5	90	4.16	18.435	47.845	36.17	0.306	2.28	0.80	1.00	1.7	43.50	99.15	36.17	14108	8678	351	1107	1457	
4	70	3.94	24.821	50.736	38.22	0.306	2.28	0.80	1.00	1.6	50.35	114.75	38.22	14999	9060	385	1032	1417	
3	50	3.68	27.573	53.218	39.87	0.292	2.32	0.80	1.00	1.6	53.80	124.71	39.87	16426	8981	390	956	1346	
2	30	3.30	27.591	48.046	33.87	0.246	2.45	0.80	1.00	1.5	50.14	122.76	33.87	15733	8312	344	875	1219	
1	10	2.86	29.974	47.197	32.18	0.229	2.50	0.80	1.00	1.3	51.36	128.50	32.18	14950	6595	312	580	892	
	*** = Section Force Exceeds Solidity Ratio Criteria*												**Totals**	**112,348**	**65,016**			**10,227**	

1.2D + 1.0Di + 1.0Wi 90° Gust Response Factor (Gh): 0.85 Ice Importance Factor: 1.00
40 mph Wind with 1.5" Radial Ice Wind Importance Factor (Iw): 1.00 Ice Dead Load Factor: 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)	
10	185	4.84	3.614	17.297	14.79	0.589	1.81	0.85	1.00	1.8	15.82	28.65	14.79	1217	807	118	0	118	
9	170	4.75	7.039	34.646	28.81	0.444	1.98	0.85	1.00	1.8	28.73	56.97	28.81	4018	2505	230	192	422	
8	150	4.63	9.782	37.543	29.20	0.379	2.11	0.85	1.00	1.7	31.86	67.17	29.20	7424	4835	264	560	824	
7	130	4.49	14.152	41.541	31.53	0.358	2.15	0.85	1.00	1.7	37.74	81.30	31.53	10181	6611	311	795	1105	
6	110	4.34	16.346	44.876	34.03	0.329	2.22	0.85	1.00	1.7	41.20	91.54	34.03	13292	8632	338	1139	1441	**
5	90	4.16	18.435	47.845	36.17	0.306	2.28	0.85	1.00	1.7	44.42	101.25	36.17	14108	8678	358	1107	1465	
4	70	3.94	24.821	50.736	38.22	0.306	2.28	0.85	1.00	1.6	51.59	117.58	38.22	14999	9060	394	1032	1426	
3	50	3.68	27.573	53.218	39.87	0.292	2.32	0.85	1.00	1.6	55.18	127.90	39.87	16426	8981	400	956	1356	
2	30	3.30	27.591	48.046	33.87	0.246	2.45	0.85	1.00	1.5	51.52	126.14	33.87	15733	8312	354	875	1228	
1	10	2.86	29.974	47.197	32.18	0.229	2.50	0.85	1.00	1.3	52.86	132.25	32.18	14950	6595	321	580	901	
	*** = Section Force Exceeds Solidity Ratio Criteria*												**Totals**	**112,348**	**65,016**			**10,286**	

1.0D + 1.0W Service Normal Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
10	185	10.89	3.614	2.502	0.00	0.188	2.64	1.00	1.00	0.0	5.05	13.30	0.00	341	0	123	0	123

SECTION FORCES

1.0D + 1.0W Service Normal — Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice — Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
9	170	10.70	7.039	5.839	0.00	0.146	2.78	1.00	1.00	0.0	10.35	28.82	0.00	1260	0	262	161	423
8	150	10.42	9.782	8.341	0.00	0.152	2.76	1.00	1.00	0.0	14.52	40.13	0.00	2157	0	355	395	751
7	130	10.11	14.152	10.009	0.00	0.161	2.73	1.00	1.00	0.0	19.84	54.20	0.00	2975	0	466	536	1002
6	110	9.76	16.346	10.844	0.00	0.151	2.77	1.00	1.00	0.0	22.50	62.31	0.00	3884	0	517	743	1260
5	90	9.36	18.435	11.678	0.00	0.143	2.80	1.00	1.00	0.0	25.05	70.11	0.00	4525	0	558	712	1270
4	70	8.88	24.821	12.512	0.00	0.155	2.75	1.00	1.00	0.0	31.93	87.94	0.00	4949	0	663	676	1339
3	50	8.27	27.573	13.346	0.00	0.151	2.77	1.00	1.00	0.0	35.15	97.33	0.00	6204	0	684	629	1314
2	30	7.43	27.591	14.180	0.00	0.138	2.82	1.00	1.00	0.0	35.62	100.28	0.00	6184	0	633	565	1198
1	10	6.43	29.974	15.014	0.00	0.135	2.83	1.00	1.00	0.0	38.48	108.74	0.00	6963	0	594	398	992
	*** = Section Force Exceeds Solidity Ratio Criteria*												**Totals**	**39,443**	**0**			**9,671**

1.0D + 1.0W Service 60° — Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice — Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
10	185	10.89	3.614	2.502	0.00	0.188	2.64	0.80	1.00	0.0	4.32	11.40	0.00	341	0	106	0	106
9	170	10.70	7.039	5.839	0.00	0.146	2.78	0.80	1.00	0.0	8.94	24.90	0.00	1260	0	226	161	387
8	150	10.42	9.782	8.341	0.00	0.152	2.76	0.80	1.00	0.0	12.56	34.72	0.00	2157	0	308	395	703
7	130	10.11	14.152	10.009	0.00	0.161	2.73	0.80	1.00	0.0	17.01	46.47	0.00	2975	0	399	536	935
6	110	9.76	16.346	10.844	0.00	0.151	2.77	0.80	1.00	0.0	19.23	53.25	0.00	3884	0	442	743	1185
5	90	9.36	18.435	11.678	0.00	0.143	2.80	0.80	1.00	0.0	21.37	59.79	0.00	4525	0	476	712	1188
4	70	8.88	24.821	12.512	0.00	0.155	2.75	0.80	1.00	0.0	26.96	74.26	0.00	4949	0	560	676	1236
3	50	8.27	27.573	13.346	0.00	0.151	2.77	0.80	1.00	0.0	29.63	82.06	0.00	6204	0	577	629	1206
2	30	7.43	27.591	14.180	0.00	0.138	2.82	0.80	1.00	0.0	30.10	84.75	0.00	6184	0	535	565	1100
1	10	6.43	29.974	15.014	0.00	0.135	2.83	0.80	1.00	0.0	32.48	91.80	0.00	6963	0	501	398	900
	*** = Section Force Exceeds Solidity Ratio Criteria*												**Totals**	**39,443**	**0**			**8,946**

1.0D + 1.0W Service 90° — Gust Response Factor (Gh): 0.85
60 mph Wind with No Ice — Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q_z (psf)	A_f (sf)	A_r (sf)	Ice A_r (sf)	e	C_f	D_f	D_r	T_{iz} (in)	A_e (sf)	EPA_a (sf)	EPA_{ai} (sf)	Wt (lb)	Ice Wt (lb)	F_{st} (lb)	F_a (lb)	Force (lb)
10	185	10.89	3.614	2.502	0.00	0.188	2.64	0.85	1.00	0.0	4.50	11.88	0.00	341	0	110	0	110
9	170	10.70	7.039	5.839	0.00	0.146	2.78	0.85	1.00	0.0	9.29	25.88	0.00	1260	0	235	161	396
8	150	10.42	9.782	8.341	0.00	0.152	2.76	0.85	1.00	0.0	13.05	36.07	0.00	2157	0	319	395	715
7	130	10.11	14.152	10.009	0.00	0.161	2.73	0.85	1.00	0.0	17.72	48.40	0.00	2975	0	416	536	952
6	110	9.76	16.346	10.844	0.00	0.151	2.77	0.85	1.00	0.0	20.05	55.52	0.00	3884	0	461	743	1204
5	90	9.36	18.435	11.678	0.00	0.143	2.80	0.85	1.00	0.0	22.29	62.37	0.00	4525	0	496	712	1208
4	70	8.88	24.821	12.512	0.00	0.155	2.75	0.85	1.00	0.0	28.21	77.68	0.00	4949	0	586	676	1262
3	50	8.27	27.573	13.346	0.00	0.151	2.77	0.85	1.00	0.0	31.01	85.88	0.00	6204	0	604	629	1233
2	30	7.43	27.591	14.180	0.00	0.138	2.82	0.85	1.00	0.0	31.48	88.63	0.00	6184	0	559	565	1125
1	10	6.43	29.974	15.014	0.00	0.135	2.83	0.85	1.00	0.0	33.98	96.04	0.00	6963	0	525	398	923
	*** = Section Force Exceeds Solidity Ratio Criteria*												**Totals**	**39,443**	**0**			**9,127**

EQUIVALENT LATERAL FORCE METHOD

Spectral Response Acceleration for Short Period (S_S):	0.10
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.07
Long-Period Transition Period (T_L – Seconds):	12
Importance Factor (I_e):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v:	2.40
Response Modification Coefficient (R):	3.00
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.11
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.11
Seismic Response Coefficient (C_s):	0.04
Upper Limit C_S:	0.04
Lower Limit C_S:	0.03
Period based on Rayleigh Method (sec):	0.97
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.23
Total Unfactored Dead Load:	49.70 k
Seismic Base Shear (E):	2.27 k

SEISMIC FORCES

0.9D - 1.0Ev + 1.0Eh

Section/Appurtenance	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	Cvx	Horizontal Force (lb)	Vertical Force (lb)
10	185.00	341	212,697	0.016	37	300
9	170.00	1,260	707,483	0.055	124	1,108
8	150.00	2,157	1,037,781	0.080	182	1,896
7	130.00	2,975	1,199,768	0.093	211	2,615
6	110.00	3,884	1,274,735	0.098	224	3,413
5	90.00	4,525	1,159,747	0.090	204	3,977
4	70.00	4,949	930,647	0.072	164	4,350
3	50.00	6,204	770,551	0.060	135	5,453
2	30.00	6,184	409,229	0.032	72	5,435
1	10.00	6,963	118,953	0.009	21	6,120
Samsung AT1K04	180.00	96	57,821	0.004	10	84
Raycap RDIDC-9181-PF-48	180.00	22	13,190	0.001	2	19
Fujitsu TA08025-B605	180.00	225	135,517	0.010	24	198
Fujitsu TA08025-B604	180.00	192	115,460	0.009	20	168
JMA Wireless MX08FRO665-21	180.00	194	116,545	0.009	20	170
Generic Flat Light Sector Frame	180.00	1,200	722,757	0.056	127	1,055
Ericsson Radio 4449 - B13&B5	172.00	210	119,590	0.009	21	185
Ericsson 8843 Rev 2	172.00	225	128,132	0.010	23	198
Ericsson AIR 6449 B77D/ C-Band	172.00	245	139,407	0.011	25	215
RFS DB-C1-12C-24AB-0Z	172.00	32	18,223	0.001	3	28
Commscope NHH-65C-R2B	172.00	310	176,309	0.014	31	272
Andrew LNX-6515DS-A1M	172.00	149	85,080	0.007	15	131
Flat Light Sector Frame	171.00	1,200	678,476	0.052	119	1,055
Andrew Microwaves UHX6-105	162.00	281	148,634	0.012	26	247
Raycap DC6-48-60-18-8F ("Squid")	158.20	19	9,709	0.001	2	17
Powerwave Allgon TT08-19DB111-001	151.00	66	32,012	0.002	6	58
Raycap DC6-48-60-18-8F	151.00	20	9,701	0.001	2	18
Nokia AirScale RRH 4T4R B5 160W AHCA	151.00	106	51,365	0.004	9	93
Raycap DC6-48-60-0-8F	151.00	33	15,909	0.001	3	29
Alcatel-Lucent B25 RRH4x30	151.00	159	77,120	0.006	14	140
Alcatel-Lucent B66A RRH4x45-4R w/ Solar Shield	151.00	170	82,649	0.006	15	150
Nokia AHLBBA	151.00	284	137,943	0.011	24	250
Alcatel-Lucent RRH4X25-WCS	151.00	210	101,857	0.008	18	185
Nokia AEQK AirScale MAA 64T64R 192AE n77 200W	151.00	298	144,345	0.011	25	262
Commscope SBNHH-1D65C	151.00	149	72,173	0.006	13	131
Quintel QS86512-2	151.00	810	392,876	0.030	69	712
Generic Round Sector Frame	151.00	900	436,529	0.034	77	791
Commscope HELIAX FiberFeed 12 RRU Pendant Connect	120.00	40	14,616	0.001	3	35
Nokia AirScale Dual RRH 4T4R B12/71 240W AHLOA	120.00	251	91,861	0.007	16	221
Nokia AHFIG 70.55 lbs	120.00	212	77,391	0.006	14	186
Andrew TMBX-6517-A1M	120.00	59	21,705	0.002	4	52
Nokia AEHC	120.00	311	113,565	0.009	20	273

Flat Light Sector Frame	120.00	1,200	438,475	0.034	77	1,055
Commscope FFHH-65C-R3	120.00	377	137,791	0.011	24	331
Totals		**49,697**	**12,936,321**	**1.000**	**2,274**	**43,678**

1.2D + 1.0Ev + 1.0Eh

Section/Appurtenance	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	Cvx	Horizontal Force (lb)	Vertical Force (lb)
10	185.00	341	212,697	0.016	37	417
9	170.00	1,260	707,483	0.055	124	1,539
8	150.00	2,157	1,037,781	0.080	182	2,634
7	130.00	2,975	1,199,768	0.093	211	3,633
6	110.00	3,884	1,274,735	0.098	224	4,742
5	90.00	4,525	1,159,747	0.090	204	5,525
4	70.00	4,949	930,647	0.072	164	6,044
3	50.00	6,204	770,551	0.060	135	7,576
2	30.00	6,184	409,229	0.032	72	7,552
1	10.00	6,963	118,953	0.009	21	8,503
Samsung AT1K04	180.00	96	57,821	0.004	10	117
Raycap RDIDC-9181-PF-48	180.00	22	13,190	0.001	2	27
Fujitsu TA08025-B605	180.00	225	135,517	0.010	24	275
Fujitsu TA08025-B604	180.00	192	115,460	0.009	20	234
JMA Wireless MX08FRO665-21	180.00	194	116,545	0.009	20	236
Generic Flat Light Sector Frame	180.00	1,200	722,757	0.056	127	1,465
Ericsson Radio 4449 - B13&B5	172.00	210	119,590	0.009	21	256
Ericsson 8843 Rev 2	172.00	225	128,132	0.010	23	275
Ericsson AIR 6449 B77D/ C-Band	172.00	245	139,407	0.011	25	299
RFS DB-C1-12C-24AB-0Z	172.00	32	18,223	0.001	3	39
Commscope NHH-65C-R2B	172.00	310	176,309	0.014	31	378
Andrew LNX-6515DS-A1M	172.00	149	85,080	0.007	15	182
Flat Light Sector Frame	171.00	1,200	678,476	0.052	119	1,465
Andrew Microwaves UHX6-105	162.00	281	148,634	0.012	26	343
Raycap DC6-48-60-18-8F ("Squid")	158.20	19	9,709	0.001	2	23
Powerwave Allgon TT08-19DB111-001	151.00	66	32,012	0.002	6	81
Raycap DC6-48-60-18-8F	151.00	20	9,701	0.001	2	24
Nokia AirScale RRH 4T4R B5 160W AHCA	151.00	106	51,365	0.004	9	129
Raycap DC6-48-60-0-8F	151.00	33	15,909	0.001	3	40
Alcatel-Lucent B25 RRH4x30	151.00	159	77,120	0.006	14	194
Alcatel-Lucent B66A RRH4x45-4R w/ Solar Shield	151.00	170	82,649	0.006	15	208
Nokia AHLBBA	151.00	284	137,943	0.011	24	347
Alcatel-Lucent RRH4X25-WCS	151.00	210	101,857	0.008	18	256
Nokia AEQK AirScale MAA 64T64R 192AE n77 200W	151.00	298	144,345	0.011	25	363
Commscope SBNHH-1D65C	151.00	149	72,173	0.006	13	182
Quintel QS86512-2	151.00	810	392,876	0.030	69	989
Generic Round Sector Frame	151.00	900	436,529	0.034	77	1,099
Commscope HELIAX FiberFeed 12 RRU Pendant Connect	120.00	40	14,616	0.001	3	49
Nokia AirScale Dual RRH 4T4R B12/71 240W AHLOA	120.00	251	91,861	0.007	16	307
Nokia AHFIG 70.55 lbs	120.00	212	77,391	0.006	14	259
Andrew TMBX-6517-A1M	120.00	59	21,705	0.002	4	73
Nokia AEHC	120.00	311	113,565	0.009	20	380
Flat Light Sector Frame	120.00	1,200	438,475	0.034	77	1,465
Commscope FFHH-65C-R3	120.00	377	137,791	0.011	24	460
Totals		**49,697**	**12,936,321**	**1.000**	**2,274**	**60,686**

FORCE/STRESS SUMMARY

Section 1 – 0.0' to 20.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 4 1/2" SOLID	-318.99	1.2D + 1.0W N	6.506	100	100	100	69.40	50.00	503.25	0.00	0.00	0	0	63	Member X
D SAE - 3.5X3.5X0.375	-8.57	1.2D + 1.0W 90°	17.051	50	50	50	148.92	36.00	32.01	27.61	52.20	2	1	31	Bolt Shear

Member Tension	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c Pn$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 4 1/2" SOLID	272.94	1.2D + 1.0W 60°	50.0	65	715.68	0.00	0.00		0	0	38	Member
D SAE - 3.5X3.5X0.375	8.34	1.2D + 1.0W 90°	36.0	58	72.50	27.61	41.76	34.87	2	1	30	Bolt Shear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	277.41	0.9D + 1.0W 60°	843.15	11	6	2" F1554 GD 55
Bot Compression	325.48	1.2D + 1.0W N	824.41	0	0	

Section 2 – 20.0' to 40.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 4 1/4" SOLID	-283.74	1.2D + 1.0W N	6.506	100	100	100	73.48	50.00	430.15	0.00	0.00	0	0	65	Member X
D SAE - 3.5X3.5X0.3125	-8.08	1.2D + 1.0W 90°	16.567	50	50	50	144.06	36.00	28.82	27.61	43.50	2	1	29	Bolt Shear

Member Tension	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c Pn$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 4 1/4" SOLID	244.78	1.2D + 1.0W 60°	50.0	65	638.37	0.00	0.00		0	0	38	Member
D SAE - 3.5X3.5X0.3125	8.02	1.2D + 1.0W 90°	36.0	58	61.18	27.61	34.80	29.06	2	1	29	Bolt Shear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	248.30	0.9D + 1.0W 60°	523.32	47	6	1.25" A325

Section 3 – 40.0' to 60.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 4" SOLID	-247.96	1.2D + 1.0W N	4.88	100	100	100	58.56	50.00	440.08	0.00	0.00	0	0	56	Member X
D SAE - 3X3X0.375	-7.44	1.2D + 1.0W 90°	14.635	50	50	50	149.59	36.00	26.99	27.61	52.20	2	1	27	Member Z

Member Tension	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c Pn$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 4" SOLID	217.74	0.9D + 1.0W 60°	50.0	65	565.47	0.00	0.00		0	0	38	Member
D SAE - 3X3X0.375	7.41	1.2D + 1.0W 90°	36.0	58	60.43	27.61	41.76	30.79	2	1	26	Bolt Shear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	217.41	0.9D + 1.0W 60°	523.32	42	6	1.25" A325

Section 4 – 60.0' to 80.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 3 3/4" SOLID	-210.00	1.2D + 1.0W N	4.88	100	100	100	62.46	50.00	373.68	0.00	0.00	0	0	56	Member X
D SAE - 3X3X0.25	-6.80	1.2D + 1.0W 90°	13.23	50	50	50	134.09	36.00	22.92	27.61	34.80	2	1	29	Member Z

Member Tension	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c Pn$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 3 3/4" SOLID	185.93	0.9D + 1.0W 60°	50.0	65	497.02	0.00	0.00		0	0	37	Member
D SAE - 3X3X0.25	6.74	1.2D + 1.0W 90°	36.0	58	41.37	27.61	27.84	20.53	2	1	32	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	185.65	0.9D + 1.0W 60°	327.10	57	6	1 A325

FORCE/STRESS SUMMARY

Section 5 – 80.0' to 100.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 3 1/2" SOLID	-171.99	1.2D + 1.0W N	4.88	100	100	100	66.92	50.00	312.05	0.00	0.00	0	0	55	Member X
D SAE - 2.5X2.5X0.3125	-6.23	1.2D + 1.0W 90°	11.849	50	50	50	145.39	36.00	19.77	17.67	34.80	2	1	35	Bolt Shear

Member Tension	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c Pn$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 3 1/2" SOLID	153.08	0.9D + 1.0W 60°	50.0	65	432.94	0.00	0.00		0	0	35	Member
D SAE - 2.5X2.5X0.3125	6.20	1.2D + 1.0W 90°	36.0	58	41.90	17.67	27.73	21.75	2	1	35	Bolt Shear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	152.86	0.9D + 1.0W 60°	327.10	47	6	1 A325

FORCE/STRESS SUMMARY

Section 6 – 100.0' to 120.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Φc Pn (kip)	Shear ΦRnv (kip)	Bear ΦRn (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 3 1/4" SOLID	-133.50	1.2D + 1.0W N	5.005	100	100	100	73.92	50.00	250.37	0.00	0.00	0	0	53	Member X
D SAE - 2.5X2.5X0.25	-5.88	1.2D + 1.0W 90°	10.571	50	50	50	129.18	36.00	20.41	17.67	27.84	2	1	33	Bolt Shear

Member Tension	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	ΦcPn (kip)	Shear ΦRnv (kip)	Bear ΦRn (kip)	Blk Shear Φt Pn (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 3 1/4" SOLID	112.37	1.2D + 1.0W 60°	50.0	65	373.32	0.00	0.00		0	0	30	Member
D SAE - 2.5X2.5X0.25	5.82	1.2D + 1.0W 90°	36.0	58	34.24	17.67	22.18	17.40	2	1	33	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	ΦRnt (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	119.00	0.9D + 1.0W 60°	218.07	55	4	1 A325

Section 7 – 120.0' to 140.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Φc Pn (kip)	Shear ΦRnv (kip)	Bear ΦRn (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 3" SOLID	-91.81	1.2D + 1.0W N	4.88	100	100	100	78.07	50.00	203.71	0.00	0.00	0	0	45	Member X
D SAE - 2.5X2.5X0.1875	-4.68	1.2D + 1.0W 90°	8.289	50	50	50	105.35	36.00	21.14	17.67	20.88	2	1	26	Bolt Shear

Member Tension	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	ΦcPn (kip)	Shear ΦRnv (kip)	Bear ΦRn (kip)	Blk Shear Φt Pn (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 3" SOLID	82.81	0.9D + 1.0W 60°	50.0	65	318.10	0.00	0.00		0	0	26	Member
D SAE - 2.5X2.5X0.1875	4.61	1.2D + 1.0W 90°	36.0	58	25.99	17.67	16.64	13.05	2	1	35	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	ΦRnt (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	81.27	0.9D + 1.0W 60°	218.07	37	4	1 A325

Section 8 – 140.0' to 160.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Φc Pn (kip)	Shear ΦRnv (kip)	Bear ΦRn (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 2 1/2" SOLID	-56.34	1.2D + 1.0W N	4.88	100	100	100	93.69	50.00	116.30	0.00	0.00	0	0	48	Member X
D SAE - 2X2X0.1875	-4.29	1.2D + 1.0W 90°	7.966	50	50	50	121.31	36.00	13.83	17.67	20.88	2	1	31	Member Z

Member Tension	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	ΦcPn (kip)	Shear ΦRnv (kip)	Bear ΦRn (kip)	Blk Shear Φt Pn (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 2 1/2" SOLID	49.71	1.2D + 1.0W 60°	50.0	65	220.95	0.00	0.00		0	0	22	Member
D SAE - 2X2X0.1875	4.30	1.2D + 1.0W 90°	36.0	58	19.89	17.67	16.64	11.01	2	1	39	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	ΦRnt (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	50.56	0.9D + 1.0W 60°	120.41	42	4	0.75" A325

Section 9 – 160.0' to 180.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Φc Pn (kip)	Shear ΦRnv (kip)	Bear ΦRn (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 1 3/4" SOLID	-21.87	1.2D + 1.0W N	3.904	100	100	100	107.07	50.00	46.81	0.00	0.00	0	0	46	Member X
D SAE - 1.5X1.5X0.1875	-2.29	1.2D + 1.0W N	6.214	50	50	50	127.24	36.00	9.37	17.67	20.88	2	1	24	Member Z

Member Tension	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	ΦcPn (kip)	Shear ΦRnv (kip)	Bear ΦRn (kip)	Blk Shear Φt Pn (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 1 3/4" SOLID	19.51	1.2D + 1.0W 60°	50.0	65	108.24	0.00	0.00		0	0	18	Member
D SAE - 1.5X1.5X0.1875	2.39	1.2D + 1.0W 60°	36.0	58	13.85	17.67	16.64	8.97	2	1	26	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	ΦRnt (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	19.95	0.9D + 1.0W 60°	120.41	17	4	0.75" A325

FORCE/STRESS SUMMARY

Section 10 – 180.0' to 190.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'_y (ksi)	$\Phi_c P_n$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 1 1/2" SOLID	-0.92	1.2D + 1.0W N	0.25	100	100	100	8.01	50.00	79.15	0.00	0.00	0	0	1	Member X
H SAE - 1.5X1.5X0.1875	-0.21	1.2D + 1.0W N	2.752	100	100	100	116.35	36.00	10.96	17.67	20.88	2	1	1	Member Z
D SAE - 1.5X1.5X0.1875	-0.40	1.2D + 1.0W 90°	4.676	50	50	50	101.81	36.00	12.86	17.67	20.88	2	1	3	Member Z

Member Tension	Pu (kip)	Load Case	F_y (ksi)	F_u (ksi)	$\Phi_c Pn$ (kip)	Shear ΦR_{nv} (kip)	Bear ΦR_n (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 1 1/2" SOLID	0.26	1.2D + 1.0W N	50.0	65	79.52	0.00	0.00		0	0	0	Member
H SAE - 1.5X1.5X0.1875	0.23	1.2D + 1.0W 60°	36.0	58	13.85	17.67	16.64	8.97	2	1	2	Blk Shear
D SAE - 1.5X1.5X0.1875	0.37	1.2D + 1.0W 90°	36.0	58	13.85	17.67	16.64	8.97	2	1	4	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	ΦR_{nt} (kip)	Use %	Num Bolts	Bolt Type

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	120.00	0.1704	-0.0978	0.1690	0.1855
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	150.00	0.2681	-0.1444	0.1888	0.2302
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	159.75	0.3039	-0.1522	0.2617	0.2729
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	160.25	0.3061	-0.1525	0.2569	0.2679
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	171.95	0.3523	-0.1387	0.2420	0.2724
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	180.00	0.3847	-0.1391	0.2708	0.2836
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	120.00	0.1689	0.0849	0.1761	0.1954
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	150.00	0.2659	0.1277	0.2038	0.2405
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	159.75	0.3015	0.1338	0.2772	0.3078
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	160.25	0.3038	0.1340	0.2805	0.3109
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	171.95	0.3495	0.1219	0.2366	0.2661
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	180.00	0.3817	0.1212	0.2761	0.3015
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	120.00	0.176	0.0719	0.1956	0.2033
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	150.00	0.277	0.1096	0.2446	0.268
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	159.75	0.3139	0.1135	0.3164	0.3164
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	160.25	0.3167	0.1137	0.3385	0.3385
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	171.95	0.3641	0.1034	0.2270	0.2494
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	180.00	0.3975	0.1020	0.2834	0.2879
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	120.00	0.0388	-0.0018	0.0426	0.0426
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	150.00	0.0624	-0.0022	0.0525	0.0525
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	159.75	0.0713	-0.0027	0.0710	0.071
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	160.25	0.0719	-0.0027	0.0724	0.0724
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	171.95	0.0831	-0.0024	0.0563	0.0563
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	180.00	0.0911	-0.0026	0.0633	0.0633
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	120.00	0.0388	0.0015	0.0433	0.0433
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	150.00	0.0624	0.0019	0.0529	0.0529
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	159.75	0.0713	0.0024	0.0735	0.0735
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	160.25	0.0719	0.0024	0.0753	0.0753
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	171.95	0.0831	0.0021	0.0562	0.0562
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	180.00	0.0911	0.0022	0.0644	0.0644
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	120.00	0.0388	0.0015	0.0432	0.0432
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	150.00	0.0624	0.0019	0.0527	0.0527
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	159.75	0.0713	0.0023	0.0726	0.0726
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	160.25	0.0719	0.0023	0.0753	0.0753
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	171.95	0.0831	0.0021	0.0564	0.0564
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	180.00	0.0911	0.0022	0.0627	0.0627
1.2D + 1.0Ev + 1.0Eh 90° Seismic	120.00	0.0389	-0.0018	0.0428	0.0428
1.2D + 1.0Ev + 1.0Eh 90° Seismic	150.00	0.0626	-0.0022	0.0526	0.0526
1.2D + 1.0Ev + 1.0Eh 90° Seismic	159.75	0.0714	-0.0027	0.0713	0.0714
1.2D + 1.0Ev + 1.0Eh 90° Seismic	160.25	0.072	-0.0027	0.0726	0.0727
1.2D + 1.0Ev + 1.0Eh 90° Seismic	171.95	0.0833	-0.0024	0.0565	0.0565
1.2D + 1.0Ev + 1.0Eh 90° Seismic	180.00	0.0913	-0.0026	0.0638	0.0638
1.2D + 1.0Ev + 1.0Eh 60° Seismic	120.00	0.0389	0.0015	0.0435	0.0435
1.2D + 1.0Ev + 1.0Eh 60° Seismic	150.00	0.0625	0.0019	0.0531	0.0531
1.2D + 1.0Ev + 1.0Eh 60° Seismic	159.75	0.0714	0.0024	0.0739	0.0739
1.2D + 1.0Ev + 1.0Eh 60° Seismic	160.25	0.072	0.0024	0.0755	0.0755
1.2D + 1.0Ev + 1.0Eh 60° Seismic	171.95	0.0833	0.0021	0.0563	0.0563
1.2D + 1.0Ev + 1.0Eh 60° Seismic	180.00	0.0913	0.0022	0.0649	0.0649
1.2D + 1.0Ev + 1.0Eh Normal Seismic	120.00	0.0389	0.0015	0.0432	0.0432
1.2D + 1.0Ev + 1.0Eh Normal Seismic	150.00	0.0626	0.0019	0.0528	0.0528
1.2D + 1.0Ev + 1.0Eh Normal Seismic	159.75	0.0714	0.0023	0.0726	0.0726
1.2D + 1.0Ev + 1.0Eh Normal Seismic	160.25	0.0721	0.0023	0.0755	0.0755
1.2D + 1.0Ev + 1.0Eh Normal Seismic	171.95	0.0833	0.0021	0.0566	0.0566
1.2D + 1.0Ev + 1.0Eh Normal Seismic	180.00	0.0913	0.0022	0.0625	0.0625
1.2D + 1.0Di + 1.0Wi 90° 40 mph Wind with 1.5" Radial Ice	120.00	0.1578	-0.0565	0.1547	0.1573
1.2D + 1.0Di + 1.0Wi 90° 40 mph Wind with 1.5" Radial Ice	150.00	0.2436	-0.0825	0.1719	0.1842
1.2D + 1.0Di + 1.0Wi 90° 40 mph Wind with 1.5" Radial Ice	159.75	0.2747	-0.0866	0.2286	0.2327
1.2D + 1.0Di + 1.0Wi 90° 40 mph Wind with 1.5" Radial Ice	160.25	0.2767	-0.0867	0.2290	0.2331
1.2D + 1.0Di + 1.0Wi 90° 40 mph Wind with 1.5" Radial Ice	171.95	0.3163	-0.0783	0.2066	0.2159

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.2D + 1.0Di + 1.0Wi 90° 40 mph Wind with 1.5" Radial Ice	180.00	0.3444	-0.0786	0.2355	0.2388
1.2D + 1.0Di + 1.0Wi 60° 40 mph Wind with 1.5" Radial Ice	120.00	0.1576	0.0462	0.1599	0.1665
1.2D + 1.0Di + 1.0Wi 60° 40 mph Wind with 1.5" Radial Ice	150.00	0.2432	0.0694	0.1813	0.1941
1.2D + 1.0Di + 1.0Wi 60° 40 mph Wind with 1.5" Radial Ice	159.75	0.2742	0.0721	0.2356	0.2464
1.2D + 1.0Di + 1.0Wi 60° 40 mph Wind with 1.5" Radial Ice	160.25	0.2763	0.0722	0.2385	0.2492
1.2D + 1.0Di + 1.0Wi 60° 40 mph Wind with 1.5" Radial Ice	171.95	0.3157	0.0649	0.2044	0.2145
1.2D + 1.0Di + 1.0Wi 60° 40 mph Wind with 1.5" Radial Ice	180.00	0.3438	0.0643	0.2412	0.2496
1.2D + 1.0Di + 1.0Wi Normal 40 mph Wind with 1.5" Radial Ice	120.00	0.1594	0.0374	0.1683	0.1683
1.2D + 1.0Di + 1.0Wi Normal 40 mph Wind with 1.5" Radial Ice	150.00	0.2466	0.0578	0.2022	0.2103
1.2D + 1.0Di + 1.0Wi Normal 40 mph Wind with 1.5" Radial Ice	159.75	0.2781	0.0591	0.2580	0.258
1.2D + 1.0Di + 1.0Wi Normal 40 mph Wind with 1.5" Radial Ice	160.25	0.2802	0.0591	0.2720	0.272
1.2D + 1.0Di + 1.0Wi Normal 40 mph Wind with 1.5" Radial Ice	171.95	0.3206	0.0530	0.1959	0.2029
1.2D + 1.0Di + 1.0Wi Normal 40 mph Wind with 1.5" Radial Ice	180.00	0.3491	0.0518	0.2379	0.2379
0.9D + 1.0W 90° 109 mph Wind with No Ice (Reduced DL)	120.00	0.562	-0.3233	0.5570	0.612
0.9D + 1.0W 90° 109 mph Wind with No Ice (Reduced DL)	150.00	0.8843	-0.4777	0.6217	0.76
0.9D + 1.0W 90° 109 mph Wind with No Ice (Reduced DL)	159.75	1.0022	-0.5037	0.8624	0.9009
0.9D + 1.0W 90° 109 mph Wind with No Ice (Reduced DL)	160.25	1.0093	-0.5048	0.8460	0.8817
0.9D + 1.0W 90° 109 mph Wind with No Ice (Reduced DL)	171.95	1.1616	-0.4605	0.7975	0.8998
0.9D + 1.0W 90° 109 mph Wind with No Ice (Reduced DL)	180.00	1.2685	-0.4622	0.8897	0.9367
0.9D + 1.0W 60° 109 mph Wind with No Ice (Reduced DL)	120.00	0.5571	0.3321	0.5801	0.6684
0.9D + 1.0W 60° 109 mph Wind with No Ice (Reduced DL)	150.00	0.8769	0.5021	0.6719	0.8388
0.9D + 1.0W 60° 109 mph Wind with No Ice (Reduced DL)	159.75	0.9942	0.5279	0.9136	1.0551
0.9D + 1.0W 60° 109 mph Wind with No Ice (Reduced DL)	160.25	1.0021	0.5290	0.9253	1.0658
0.9D + 1.0W 60° 109 mph Wind with No Ice (Reduced DL)	171.95	1.1525	0.4826	0.7794	0.9167
0.9D + 1.0W 60° 109 mph Wind with No Ice (Reduced DL)	180.00	1.2587	0.4805	0.9071	1.0265
0.9D + 1.0W Normal 109 mph Wind with No Ice (Reduced DL)	120.00	0.5806	0.2401	0.6466	0.671
0.9D + 1.0W Normal 109 mph Wind with No Ice (Reduced DL)	150.00	0.9133	0.3665	0.8060	0.8851
0.9D + 1.0W Normal 109 mph Wind with No Ice (Reduced DL)	159.75	1.0353	0.3812	1.0460	1.046
0.9D + 1.0W Normal 109 mph Wind with No Ice (Reduced DL)	160.25	1.0441	0.3818	1.1191	1.1191
0.9D + 1.0W Normal 109 mph Wind with No Ice (Reduced DL)	171.95	1.2006	0.3484	0.7483	0.8254
0.9D + 1.0W Normal 109 mph Wind with No Ice (Reduced DL)	180.00	1.3107	0.3448	0.9373	0.9504
1.2D + 1.0W 90° 109 mph Wind with No Ice	120.00	0.5631	-0.3234	0.5583	0.6132
1.2D + 1.0W 90° 109 mph Wind with No Ice	150.00	0.8861	-0.4778	0.6234	0.7614
1.2D + 1.0W 90° 109 mph Wind with No Ice	159.75	1.0044	-0.5038	0.8654	0.9027
1.2D + 1.0W 90° 109 mph Wind with No Ice	160.25	1.0115	-0.5049	0.8492	0.8847
1.2D + 1.0W 90° 109 mph Wind with No Ice	171.95	1.1642	-0.4605	0.7996	0.9015
1.2D + 1.0W 90° 109 mph Wind with No Ice	180.00	1.2714	-0.4622	0.8927	0.9388
1.2D + 1.0W 60° 109 mph Wind with No Ice	120.00	0.5582	0.3323	0.5815	0.6697
1.2D + 1.0W 60° 109 mph Wind with No Ice	150.00	0.8788	0.5024	0.6739	0.8405
1.2D + 1.0W 60° 109 mph Wind with No Ice	159.75	0.9964	0.5282	0.9160	1.0574
1.2D + 1.0W 60° 109 mph Wind with No Ice	160.25	1.0042	0.5293	0.9278	1.0681
1.2D + 1.0W 60° 109 mph Wind with No Ice	171.95	1.1551	0.4829	0.7815	0.9187
1.2D + 1.0W 60° 109 mph Wind with No Ice	180.00	1.2616	0.4807	0.9102	1.0294
1.2D + 1.0W Normal 109 mph Wind with No Ice	120.00	0.5818	0.2401	0.6479	0.6723
1.2D + 1.0W Normal 109 mph Wind with No Ice	150.00	0.9153	0.3664	0.8078	0.8868
1.2D + 1.0W Normal 109 mph Wind with No Ice	159.75	1.0375	0.3811	1.0495	1.0495
1.2D + 1.0W Normal 109 mph Wind with No Ice	160.25	1.0464	0.3817	1.1228	1.1228
1.2D + 1.0W Normal 109 mph Wind with No Ice	171.95	1.2033	0.3483	0.7504	0.8273
1.2D + 1.0W Normal 109 mph Wind with No Ice	180.00	1.3137	0.3447	0.9399	0.953

DETAILED REACTIONS

Load Case	Radius (ft)	Elevation (ft)	Azimuth (deg)	Node	FX* (kip)	FY* (kip)	FZ* (kip)
					(-) Uplift and (+) Down		
	9.82	0.00	0	1	0.00	325.07	-26.25
1.2D + 1.0W Normal	9.81	0.00	120	1a	8.71	-132.72	-8.61
	9.81	0.00	240	1b	-8.71	-132.72	-8.61
	9.82	0.00	0	1	-2.86	165.92	-12.90
1.2D + 1.0W 60°	9.81	0.00	120	1a	-12.59	165.44	3.98
	9.81	0.00	240	1b	-20.13	-271.73	-11.62
	9.82	0.00	0	1	-3.39	19.88	-0.87
1.2D + 1.0W 90°	9.81	0.00	120	1a	-19.87	275.12	9.54
	9.81	0.00	240	1b	-18.43	-235.36	-8.67
	9.82	0.00	0	1	0.00	319.66	-26.02
0.9D + 1.0W Normal	9.81	0.00	120	1a	8.91	-137.47	-8.73
	9.81	0.00	240	1b	-8.91	-137.47	-8.73
	9.82	0.00	0	1	-2.87	160.74	-12.67
0.9D + 1.0W 60°	9.81	0.00	120	1a	-12.39	160.26	3.86
	9.81	0.00	240	1b	-20.33	-276.27	-11.73
	9.82	0.00	0	1	-3.39	14.91	-0.64
0.9D + 1.0W 90°	9.81	0.00	120	1a	-19.67	269.77	9.42
	9.81	0.00	240	1b	-18.63	-239.96	-8.78
	9.82	0.00	0	1	0.00	132.36	-6.79
1.2D + 1.0Di + 1.0Wi Normal	9.81	0.00	120	1a	3.30	3.68	-2.97
	9.81	0.00	240	1b	-3.30	3.68	-2.97
	9.82	0.00	0	1	-0.90	88.87	-3.01
1.2D + 1.0Di + 1.0Wi 60°	9.81	0.00	120	1a	-3.06	88.78	0.73
	9.81	0.00	240	1b	-6.87	-37.92	-3.97
	9.82	0.00	0	1	-1.05	46.59	0.63
1.2D + 1.0Di + 1.0Wi 90°	9.81	0.00	120	1a	-5.20	119.98	2.40
	9.81	0.00	240	1b	-6.31	-26.84	-3.04
	9.82	0.00	0	1	0.00	38.87	-2.29
1.2D + 1.0Ev + 1.0Eh Normal	9.81	0.00	120	1a	-0.29	10.20	0.04
	9.81	0.00	240	1b	0.29	10.20	0.04
	9.82	0.00	0	1	-0.11	29.31	-1.61
1.2D + 1.0Ev + 1.0Eh 60°	9.81	0.00	120	1a	-1.45	29.31	0.71
	9.81	0.00	240	1b	-0.35	0.65	-0.20
	9.82	0.00	0	1	-0.13	19.76	-0.94
1.2D + 1.0Ev + 1.0Eh 90°	9.81	0.00	120	1a	-1.86	36.31	1.00
	9.81	0.00	240	1b	-0.23	3.21	-0.06
	9.82	0.00	0	1	0.00	33.30	-2.02
0.9D - 1.0Ev + 1.0Eh Normal	9.81	0.00	120	1a	-0.06	4.68	-0.10
	9.81	0.00	240	1b	0.06	4.68	-0.10
	9.82	0.00	0	1	-0.11	23.76	-1.35
0.9D - 1.0Ev + 1.0Eh 60°	9.81	0.00	120	1a	-1.23	23.76	0.58
	9.81	0.00	240	1b	-0.58	-4.86	-0.33
	9.82	0.00	0	1	-0.13	14.22	-0.68
0.9D - 1.0Ev + 1.0Eh 90°	9.81	0.00	120	1a	-1.63	30.74	0.87
	9.81	0.00	240	1b	-0.46	-2.30	-0.19
	9.82	0.00	0	1	0.00	108.96	-8.47
1.0D + 1.0W Service Normal	9.81	0.00	120	1a	2.21	-29.63	-2.36
	9.81	0.00	240	1b	-2.21	-29.63	-2.36
	9.82	0.00	0	1	-0.87	60.78	-4.42
1.0D + 1.0W Service 60°	9.81	0.00	120	1a	-4.26	60.63	1.45
	9.81	0.00	240	1b	-5.66	-71.71	-3.27
	9.82	0.00	0	1	-1.03	16.57	-0.77
1.0D + 1.0W Service 90°	9.81	0.00	120	1a	-6.47	93.83	3.14
	9.81	0.00	240	1b	-5.15	-60.71	-2.38

MAXIMUM REACTIONS SUMMARY

Individual		Global (DL+WL+IL)		Global (DL+WL)	
Max Uplift:	276.27 (kip)	Moment Ice:	1262.97 (kip-ft)	Moment:	4493.18 (kip-ft)
Max Down:	325.07 (kip)	Total Down Ice:	139.73 (kip)	Total Down:	59.64 (kip)
Max Shear:	26.25 (kip)	Total Shear Ice:	12.74 (kip)	Total Shear:	43.48 (kip)

1.2D + 1.0W Normal