Michael Gentile, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (508) 844-9813
mgentile@clinellc.com

January 26, 2017

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

RE: Notice of Exempt Modification // Site Number: CT2037
69 Wheeler Street, New Haven, CT 06512 (Site Name: New Haven Wheeler Street)
N 41.2959694// W -72.897925

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains nine (9) antennas at the 91 foot level of the existing 98 foot monopole tower at 69 Wheeler Street, New Haven, CT 06512. The tower is owned by Landmark Dividend, LLC. The property is owned by Elmer & William Laydon. AT&T now intends to swap three (3) of its existing antennas for three (3) new LTE models for its LTE upgrade. These antennas would be installed at the 91 foot level of the tower. AT&T also intends to install three (3) new RRUS (radios).

The current proposal involves an antenna swap only (three for three); zero antennas will be added. AT&T was originally approved for nine (9) antennas on August 1, 2002.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Toni Harp, Mayor for the City of New Haven, as well as the tower owner, Landmark Dividend, LLC and the ground owner, Elmer & William Laydon.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

Attached to accommodate this filing are construction drawings dated 1/20/2017 by ComEx Consultants, a structural analysis dated 1/11/2017 by DESKTEK Engineering and an Emissions Analysis Report dated 1/04/2017 by Centerline Communications, LLC.

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading as shown in the attached structural analysis by DESKTEK Engineering, dated 1/11/2017.

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

Sincerely,

_____

Michael Gentile, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (508) 844-9813
mgentile@centerlincommunications.com

Attachments

cc: Toni Harp, Mayor, City of New Haven - as elected official
Landmark Dividend, LLC - as tower owner
Elmer & William Laydon - as property owner

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT2037

New Haven Wheeler St
69 Wheeler Street
New Haven, CT 06512

January 4, 2017

Centerline Communications Project Number: 950006-010

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**18.52 %**

January 4, 2017

AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT2037 – New Haven Wheeler St**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **69 Wheeler Street, New Haven, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed AT&T Wireless antenna facility located at **69 Wheeler Street, New Haven, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
UMTS	1900 MHz (PCS)	2	30
GSM	850 MHz	2	30
LTE	2300 MHz (WCS)	2	60
LTE	700 MHz	2	60
LTE	1900 MHz (PCS)	2	60

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7750	91
A	2	Commscope SBNHH-1D65A	91
A	3	Commscope SBNHH-1D65A	91
B	1	Powerwave 7750	91
B	2	CCI HPA-65R-BUU-H6	91
B	3	Quintel QS66512-2	91
C	1	Powerwave 7750	91
C	2	CCI HPA-65R-BUU-H6	91
C	3	Quintel QS66512-2	91

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general population threshold limits.

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7750	850 MHz / 1900 MHz (PCS)	12.5 / 15.6	4	120	3,245.44	2.02
Antenna A2	Commscope SBNHH-1D65A	850 MHz / 2300 MHz (WCS)	10.65 / 15.85	4	180	5,311.97	2.91
Antenna A3	Commscope SBNHH-1D65A	700 MHz / 1900 MHz (PCS)	10.85 / 14.55	4	240	4,880.65	3.26
						Sector A Composite MPE%	**8.19**
Antenna B1	Powerwave 7750	850 MHz / 1900 MHz (PCS)	12.5 / 15.6	4	120	3,245.44	2.02
Antenna B2	CCI HPA-65R-BUU-H6	850 MHz / 2300 MHz (WCS)	12.65 / 15.25	4	180	5,124.05	2.97
Antenna B3	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	4	240	4,371.36	3.00
						Sector B Composite MPE%	**7.99**
Antenna C1	Powerwave 7750	850 MHz / 1900 MHz (PCS)	12.5 / 15.6	4	120	3,245.44	2.02
Antenna C2	CCI HPA-65R-BUU-H6	850 MHz / 2300 MHz (WCS)	12.65 / 15.25	4	180	5,124.05	2.97
Antenna C3	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	4	240	4,371.36	3.00
						Sector C Composite MPE%	**7.99**

Table 3: AT&T Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, the sector with the largest calculated MPE% is Sector A. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Sector Value	**8.19 %**
Nextel	2.78 %
Clearwire	0.48 %
T-Mobile	7.07 %
Site Total MPE %:	**18.52 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	8.19 %
AT&T Sector B Total:	7.99 %
AT&T Sector C Total:	7.99 %
Site Total:	18.52 %

Table 5: Site MPE Summary

Per FCC OET 65, carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, the sector with the largest calculated MPE% is Sector A.

AT&T _ Frequency Band / Technology	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	533.48	91	5.31	850 MHz	567	0.94 %
AT&T 1900 MHz (PCS) UMTS	2	1,089.23	91	10.84	1900 MHz (PCS)	1000	1.08 %
AT&T 850 MHz GSM	2	348.43	91	3.47	850 MHz	567	0.61 %
AT&T 2300 MHz (WCS) LTE	2	2,307.55	91	22.96	2300 MHz (WCS)	1000	2.30 %
AT&T 700 MHz LTE	2	729.71	91	7.26	700 MHz	467	1.56 %
AT&T 1900 MHz (PCS) LTE	2	1,710.61	91	17.02	1900 MHz (PCS)	1000	1.70 %
						Total:	8.19 %

Table 6: AT&T Maximum Sector MPE Power Values

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	8.19 %
Sector B:	7.99 %
Sector C:	7.99 %
AT&T Maximum Total (per sector):	8.19 %
Site Total:	18.52 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **18.52 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
RF Engineering Director
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767

STRUCTURAL ANALYSIS REPORT
MONOPOLE

Prepared For:

Com-Ex Consultants, LLC
115 Route 46 – Suite E39
Mountain Lakes, NJ 07046

Structure Rating:	
Monopole:	**Pass (80.2%)**
Foundation:	**Pass (71.0%)**

Sincerely,
Destek Engineering, LLC
License # PEC 001429

01-11-2017

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED
PROFESSIONAL ENGINEER

Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

AT&T Site ID: CT2037
FA Number: 10035247
Site Name: New Haven Wheeler Street
69 Wheeler Street
New Haven, CT 06512

Destek Job No: 1629163 January 11, 2017

CONTENTS

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the existing monopole located at 69 Wheeler Street, New Haven CT, 06512 for the additions and alterations proposed by AT&T.

The structural analysis is based on the following information provided to Destek Engineering, LLC (Destek):

- Structural Analysis Report prepared by Bennett & Pless, Inc. , dated 08/26/2016
- Upgrade Drawings prepared by Bennett & Pless, Inc., dated 08/26/2016.
- Upgrade Drawings prepared by Centek Engineering, dated 04/26/2012.
- Construction Drawings prepared by Com-Ex, dated 12/13/2016.
- RFDS prepared by AT&T, dated 10/18/2016.

1.1 STRUCTURE

The structure is a 98'-0" (18) sided monopole, which is attached to the foundation with anchor bolts and a base plate. Please refer to the software output in Appendix A, for tower geometry, member sizes, and other details.

ELEVATION (FEET)	SECTION LENGTH (FEET)	LAP SPLICE (FT)	SHAFT THICKNESS (IN)	TOP DIAMETER (IN)	BOTTOM DIAMETER (IN)	YIELD STRENGTH (KSI)
98.00-88.00	10.00	-	0.2500	12.75	16.50	65
88.00-70.00	18.00	-	0.1875	16.50	20.07	65
70.00-48.68	21.32	-	0.3125	20.07	24.31	65
48.68-20.00	28.68	-	0.3125	24.31	30.02	65
20.00-0.00	20.00	-	0.3750	30.02	34.00	65

*Does not include description of existing monopole modifications.

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

2.0 EXISTING AND PROPOSED APPURTENANCES

AT&T is proposing the following antenna configuration on the tower:

Existing Configuration of AT&T Appurtenances:

Rad. Center (ft)	Antenna & TMA	Mount	Cables*
91	(3) 7750.00 (1) SBNHH-1D65A (2) HPA-65R-BUU-H6 (1) AM-X-CD-14-65-00T-RET (2) AM-X-CD-16-65-00T-RET (3) RRU 32 (6) RRUS-11 (6) LGP21401 (2) DC-6	10’ Low Profile Platform w/ Handrails	(15) 7/8"

Proposed and Final Configuration of AT&T Appurtenances:

Rad. Center (ft)	Antenna & TMA	Mount	Cables*
91	(3) 7750.00 (2) SBNHH-1D65A (2) HPA-65R-BUU-H6 (2) QS66512-2 (3) RRUS-32 (3) RRUS-32 B2 (3) RRUS-11 (6) LGP21401 (2) DC-6	10’ Low Profile Platform w/ Handrails	(17) 7/8"

*All feed lines inside the shaft

Existing Appurtenances by Others

Rad. Center (ft) Carrier	Antenna & TMA	Mount	Feedlines
98 T-Mobile	(6) APX16DWV-16DWV-S-E-A20 w/ Pipe Mount (9) ATMAA1412D	(1) Platform	(18) 1-1/4” (1) 1/4" Conduit
82 Clearwire	(1) A-ANT-18G-2-C (1) 1’ HP Dish w/ Shroud (4) ODU	(2) Pipe Mount	(4) 1/2”
80 Nextel	(3) LLPX310R-V1 w/ Pipe Mount (11) DB844H65E-XY w/ Pipe Mount (3) Samsung RRUS	(3) Sector Mounts	(12) 7/8” (1) 2-3/8” Conduit

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

3.0 CODES AND LOADING

This analysis has been performed in accordance with the 2016 Connecticut Building Code based upon an ultimate 3-second gust wind speed of 125 mph (Risk Category II) converted to a nominal 3-second gust wind speed of 97 mph per section 1609.3.1 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. The following loading criteria were used in the analysis:

- Basic wind speed of 97 mph without ice (V)
- Basic wind speed of 50 mph concurrent with the design ice thickness of 1" (V_i and t_i)
- Exposure Category C, Topographic Category 1

The following load combinations were used with wind blowing at 0^o, 60^o, and 90^o, measured from a line normal to the face of the tower:

- $1.2D + 1.6W_o$
- $0.9D + 1.6W_o$
- $1.2D + 1.0D_i + 1.0W_i$

D: Dead load of structure and appurtenances
W_o: Wind load without ice (based upon V)
W_i: Concurrent wind load with factored ice thickness (based upon V_i)
D_i: Weight of ice due to factored ice thickness (based upon t_i)

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

The analysis is based on the information provided to Destek and is assumed to be current and correct. Unless otherwise noted, the structure is assumed to be in good condition, free of defects, and can achieve theoretical strength.

It is assumed that the structure has been maintained and shall be maintained during its service lifespan. The superstructure and the foundation system are assumed to be designed with proper engineering practice and fabricated, constructed and erected in accordance with the design documents. Destek will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc. or lack of maintenance.

The analysis does not include a qualification of the antenna mounts attached on the structure or their connections. The analysis is performed to verify the capacity of the main structural members, which is the current practice in the tower industry.

The analysis results presented in this report are only applicable for the previously mentioned existing and proposed appurtenances. Any deviation of the appurtenances and placement, etc., will require Destek to generate an additional structural analysis. Additionally, the proposed linear appurtenances should be placed per recommendations of this report.

5.0 ANALYSIS AND ASSUMPTIONS

The Monopole was analyzed by utilizing tnxTower, a non-linear, three-dimensional, finite element-analysis software package, a product of Tower Numerics, Inc. Software output for this analysis is provided in Appendix A of this report.

This analysis assumes that the modifications detailed in the Structural Modification Drawings prepared by Bennett & Pless, Inc., dated 8/26/2016, have been installed.

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

6.0 RESULTS AND CONCLUSION

The structural modifications detailed in the Structural Modification Drawings prepared by Bennett & Pless, Inc., dated 8/26/2016, have been incorporated into our analysis. After analyzing the upgraded structure, Destek has deemed the modifications to be **effective**. The added wind area of the reinforcement has been considered in this analysis.

Based on a structural analysis per TIA-222-G, the existing reinforced monopole has **adequate** structural capacity for the proposed changes by AT&T. As a maximum, the monopole shaft reinforcing plates between 0 feet and 1.75 feet is stressed to **80.2%** of its capacity. The anchor rods, base plate, and tower shaft also have **adequate** structural capacity for the proposed changes by AT&T. As a maximum, the anchor rods, and tower shaft are stressed to **49.1%** and **67.6%** of their respective capacities. The existing foundation is also found to have **adequate** capacity to support the proposed installation by AT&T.

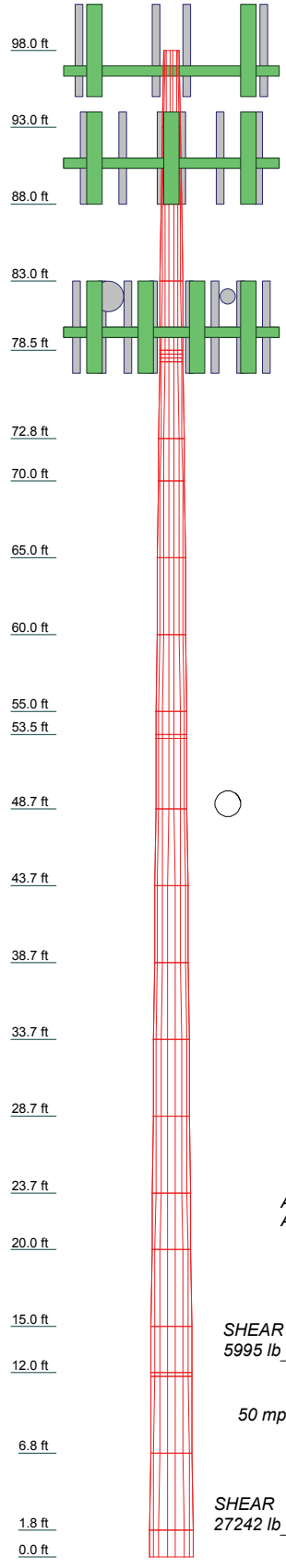
Therefore, the proposed additions and alterations by AT&T can be implemented as intended with the conditions outlined in this report.

Should you have any questions about this report, please contact Ahmet Colakoglu at (770) 693-0835 or acolakoglu@destekengineering.com.

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

APPENDIX A
CALCULATIONS

Section	Length (ft)	Number of Sides	Thickness (in)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	5.00	18	0.2500	12.7500	14.6250	A572-65	181.4
2	5.00	18	0.2500	14.6250	16.5000		206.7
3	5.00	18	0.1875	16.5000	17.4917		170.2
4	4.50	18	0.1875	17.4917	18.3842		161.8
8	5.00	18	0.6500	18.5329	19.5246		472.2
9	2.75	18	0.6250	19.5246	20.0700		266.0
10	5.00	18	0.7375	20.0700	21.0644		623.7
11	5.00	18	0.7125	21.0644	22.0587		640.8
12	5.00	18	0.6875	22.0587	23.0531		657.9
15	4.57	18	0.8500	23.4031	24.3100		794.9
16	5.00	18	0.8125	24.3100	25.3055		885.3
17	5.00	18	0.7875	25.3055	26.3009		902.5
18	5.00	18	0.7625	26.3009	27.2964		919.7
19	5.00	18	0.7375	27.2964	28.2919		936.8
20	5.00	18	0.7250	28.2919	29.2873		954.0
21	3.68	18	0.7125	29.2873	30.0200		714.6
22	5.00	18	0.7625	30.0200	31.0150		1084.3
23	0.25	18	0.7500	31.0150	31.0812		82.2
24	0.25	18	0.7500	31.0812	31.1475		82.2
25	5.00	18	0.6625	31.6618	32.6568		1023.1
26	5.00	18	0.6500	32.6568	33.6518		1043.4
27	1.75	18	0.6500	33.6518	34.0000		371.3
							14011.6



ALL REACTIONS ARE FACTORED

AXIAL 47557 lb

SHEAR 5995 lb *MOMENT 427 kip-ft*

TORQUE 1 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 26893 lb

SHEAR 27242 lb *MOMENT 1787 kip-ft*

TORQUE 3 kip-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) APX16DWV-16DWV-S-E-A20 W/ Mount PIpe	98	(2) LGP21401	91
(2) APX16DWV-16DWV-S-E-A20 W/ Mount PIpe	98	(2) LGP21401	91
(2) APX16DWV-16DWV-S-E-A20 W/ Mount PIpe	98	DC-6 Squid Surge Arrestors	91
(3) ATMAA1412D TMA	98	DC-6 Squid Surge Arrestors	91
(3) ATMAA1412D TMA	98	(2) 860-10025	91
(3) ATMAA1412D TMA	98	(2) 860-10025	91
Platform Mount [LP 601-1]	97	(2) 860-10025	91
7750.00	91	860-10006	91
7750.00	91	10' Low Profile Platform w/ Rails	91
7750.00	91	6'x1/2" Lightning Rod	88
(2) SBNHH-1D65A	91	(2) ODU	82
HPA-65R-BUU-H6	91	(2) ODU	82
HPA-65R-BUU-H6	91	A-ANT-18G-2-C	82
QS86512-2 w/ Mount Pipe	91	1' HP Dish w/ Shroud	82
QS86512-2 w/ Mount Pipe	91	Samsung RRUS	80
RRU-32	91	Samsung RRUS	80
RRU-32	91	(3) DB844H65E-XY w/ Pipe Mount	80
RRU-32	91	(4) DB844H65E-XY w/ Pipe Mount	80
RRUS-11	91	(4) DB844H65E-XY w/ Pipe Mount	80
RRUS-11	91	T-Arm Mount [TA 602-3]	80
RRUS-11	91	LLPX310R-V1 w/ Pipe Mounts	80
(2) LGP21401	91	LLPX310R-V1 w/ Pipe Mounts	80
		LLPX310R-V1 w/ Pipe Mounts	80
		Samsung RRUS	80

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 80.2%

DESTEK ENGINEERING
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Job: *CT2037*			
Project: *1629163*			
Client: Com-Ex	Drawn by: Ahmet Colakoglu	App'd:	
Code: TIA-222-G	Date: 01/11/17	Scale: NTS	
Path: Z:\Projects\2016\29 - Com-Ex\163 - CT2037\TNX\CT2037_Modified(Final).eri		Dwg No. E-1	

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	98.00-93.00	5.00	0.00	18	12.7500	14.6250	0.2500	1.0000	A572-65 (65 ksi)
L2	93.00-88.00	5.00	0.00	18	14.6250	16.5000	0.2500	1.0000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	88.00-83.00	5.00	0.00	18	16.5000	17.4917	0.1875	0.7500	A572-65 (65 ksi)
L4	83.00-78.50	4.50	0.00	18	17.4917	18.3842	0.1875	0.7500	A572-65 (65 ksi)
L5	78.50-78.25	0.25	0.00	18	18.3842	18.4338	0.1875	0.7500	A572-65 (65 ksi)
L6	78.25-78.00	0.25	0.00	18	18.4338	18.4833	0.1875	0.7500	A572-65 (65 ksi)
L7	78.00-77.75	0.25	0.00	18	18.4833	18.5329	0.6875	2.7500	A572-65 (65 ksi)
L8	77.75-72.75	5.00	0.00	18	18.5329	19.5246	0.6500	2.6000	A572-65 (65 ksi)
L9	72.75-70.00	2.75	0.00	18	19.5246	20.0700	0.6250	2.5000	A572-65 (65 ksi)
L10	70.00-65.00	5.00	0.00	18	20.0700	21.0644	0.7375	2.9500	A572-65 (65 ksi)
L11	65.00-60.00	5.00	0.00	18	21.0644	22.0587	0.7125	2.8500	A572-65 (65 ksi)
L12	60.00-55.00	5.00	0.00	18	22.0587	23.0531	0.6875	2.7500	A572-65 (65 ksi)
L13	55.00-53.50	1.50	0.00	18	23.0531	23.3514	0.6750	2.7000	A572-65 (65 ksi)
L14	53.50-53.25	0.25	0.00	18	23.3514	23.4011	0.8875	3.5500	A572-65 (65 ksi)
L15	53.25-48.68	4.57	0.00	18	23.4011	24.3100	0.8500	3.4000	A572-65 (65 ksi)
L16	48.68-43.68	5.00	0.00	18	24.3100	25.3055	0.8125	3.2500	A572-65 (65 ksi)
L17	43.68-38.68	5.00	0.00	18	25.3055	26.3009	0.7875	3.1500	A572-65 (65 ksi)
L18	38.68-33.68	5.00	0.00	18	26.3009	27.2964	0.7625	3.0500	A572-65 (65 ksi)
L19	33.68-28.68	5.00	0.00	18	27.2964	28.2919	0.7375	2.9500	A572-65 (65 ksi)
L20	28.68-23.68	5.00	0.00	18	28.2919	29.2873	0.7250	2.9000	A572-65 (65 ksi)
L21	23.68-20.00	3.68	0.00	18	29.2873	30.0200	0.7125	2.8500	A572-65 (65 ksi)
L22	20.00-15.00	5.00	0.00	18	30.0200	31.0150	0.7625	3.0500	A572-65 (65 ksi)
L23	15.00-12.00	3.00	0.00	18	31.0150	31.6120	0.7500	3.0000	A572-65 (65 ksi)
L24	12.00-11.75	0.25	0.00	18	31.6120	31.6618	0.6750	2.7000	A572-65 (65 ksi)
L25	11.75-6.75	5.00	0.00	18	31.6618	32.6568	0.6625	2.6500	A572-65 (65 ksi)
L26	6.75-1.75	5.00	0.00	18	32.6568	33.6518	0.6500	2.6000	A572-65 (65 ksi)
L27	1.75-0.00	1.75		18	33.6518	34.0000	0.6500	2.6000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	12.9467	9.9187	195.8008	4.4375	6.4770	30.2302	391.8592	4.9603	1.8040	7.216

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	14.8506	11.4066	297.7885	5.1031	7.4295	40.0819	595.9689	5.7044	2.1340	8.536
L2	14.8506	11.4066	297.7885	5.1031	7.4295	40.0819	595.9689	5.7044	2.1340	8.536
	16.7545	12.8944	430.1743	5.7687	8.3820	51.3212	860.9147	6.4484	2.4640	9.856
L3	16.7545	9.7080	326.3677	5.7909	8.3820	38.9367	653.1649	4.8549	2.5740	13.728
	17.7615	10.2981	389.5810	6.1430	8.8858	43.8433	779.6745	5.1500	2.7485	14.659
L4	17.7615	10.2981	389.5810	6.1430	8.8858	43.8433	779.6745	5.1500	2.7485	14.659
	18.6678	10.8293	453.0240	6.4598	9.3392	48.5080	906.6440	5.4157	2.9056	15.497
L5	18.6678	10.8293	453.0240	6.4598	9.3392	48.5080	906.6440	5.4157	2.9056	15.497
	18.7181	10.8588	456.7373	6.4774	9.3643	48.7741	914.0756	5.4304	2.9143	15.543
L6	18.7181	10.8588	456.7373	6.4774	9.3643	48.7741	914.0756	5.4304	2.9143	15.543
	18.7685	10.8883	460.4709	6.4950	9.3895	49.0409	921.5478	5.4452	2.9231	15.59
L7	18.7685	38.8327	1553.7175	6.3175	9.3895	165.4733	3109.4795	19.4201	2.0431	2.972
	18.8188	38.9409	1566.7408	6.3351	9.4147	166.4139	3135.5432	19.4742	2.0518	2.984
L8	18.8188	36.8942	1490.6401	6.3484	9.4147	158.3308	2983.2415	18.4506	2.1178	3.258
	19.8258	38.9402	1752.6284	6.7005	9.9185	176.7032	3507.5630	19.4738	2.2923	3.527
L9	19.8258	37.4920	1691.9249	6.7094	9.9185	170.5829	3386.0761	18.7496	2.3363	3.738
	20.3796	38.5740	1842.6728	6.9030	10.1956	180.7329	3687.7703	19.2907	2.4323	3.892
L10	20.3796	45.2540	2136.8324	6.8630	10.1956	209.5846	4276.4764	22.6313	2.2343	3.03
	21.3893	47.5816	2483.8080	7.2160	10.7007	232.1164	4970.8843	23.7953	2.4093	3.267
L11	21.3893	46.0252	2408.4758	7.2249	10.7007	225.0765	4820.1208	23.0170	2.4533	3.443
	22.3990	48.2740	2779.0322	7.5779	11.2058	247.9985	5561.7212	24.1416	2.6283	3.689
L12	22.3990	46.6347	2690.9549	7.5868	11.2058	240.1386	5385.4506	23.3218	2.6723	3.887
	23.4087	48.8046	3084.3210	7.9398	11.7110	263.3700	6172.7005	24.4069	2.8473	4.142
L13	23.4087	47.9440	3033.3227	7.9442	11.7110	259.0152	6070.6368	23.9766	2.8693	4.251
	23.7117	48.5831	3156.2541	8.0501	11.8625	266.0693	6316.6613	24.2962	2.9219	4.329
L14	23.7117	63.2792	4034.3141	7.9747	11.8625	340.0890	8073.9366	31.6456	2.5479	2.871
	23.7621	63.4192	4061.1604	7.9923	11.8878	341.6248	8127.6646	31.7156	2.5566	2.881
L15	23.7621	60.8407	3909.0305	8.0057	11.8878	328.8276	7823.2046	30.4261	2.6226	3.085
	24.6850	63.2927	4400.9590	8.3283	12.3495	356.3680	8807.7089	31.6524	2.7826	3.274
L16	24.6850	60.5971	4227.0046	8.3416	12.3495	342.2820	8459.5711	30.3043	2.8486	3.506
	25.6958	63.1643	4787.3144	8.6950	12.8552	372.4036	9580.9280	31.5882	3.0238	3.722
L17	25.6958	61.2833	4654.2351	8.7039	12.8552	362.0514	9314.5943	30.6475	3.0678	3.896
	26.7067	63.7715	5244.4712	9.0573	13.3609	392.5245	10495.8433	31.8918	3.2430	4.118
L18	26.7067	61.8075	5092.9221	9.0661	13.3609	381.1818	10192.5456	30.9096	3.2870	4.311
	27.7175	64.2167	5711.9917	9.4195	13.8666	411.9253	11431.4994	32.1144	3.4622	4.541
L19	27.7175	62.1697	5540.3440	9.4284	13.8666	399.5468	11087.9781	31.0908	3.5062	4.754
	28.7283	64.5000	6186.9670	9.7818	14.3723	430.4795	12382.0751	32.2561	3.6814	4.992
L20	28.7283	63.4355	6090.3844	9.7862	14.3723	423.7594	12188.7826	31.7238	3.7034	5.108
	29.7391	65.7262	6774.2864	10.1396	14.8780	455.3234	13557.4867	32.8694	3.8786	5.35
L21	29.7391	64.6213	6666.2330	10.1441	14.8780	448.0608	13341.2375	32.3168	3.9006	5.474
	30.4831	66.2782	7192.2630	10.4042	15.2502	471.6189	14393.9898	33.1454	4.0295	5.655
L22	30.4831	70.8083	7657.6562	10.3864	15.2502	502.1361	15325.3885	35.4109	3.9415	5.169
	31.4935	73.2163	8465.8005	10.7396	15.7556	537.3194	16942.7405	36.6151	4.1166	5.399
L23	31.4935	72.0458	8337.3430	10.7441	15.7556	529.1663	16685.6566	36.0298	4.1386	5.518
	32.0997	73.4670	8840.5205	10.9560	16.0589	550.5061	17692.6736	36.7405	4.2437	5.658
L24	32.0997	66.2810	8014.6163	10.9826	16.0589	499.0764	16039.7785	33.1468	4.3757	6.483
	32.1502	66.3876	8053.3436	11.0003	16.0842	500.7000	16117.2840	33.2001	4.3845	6.496
L25	32.1502	65.1844	7913.7771	11.0047	16.0842	492.0228	15837.9674	32.5984	4.4065	6.651
	33.1605	67.2767	8700.5370	11.3580	16.5896	524.4564	17412.5224	33.6447	4.5816	6.916
L26	33.1605	66.0331	8546.3852	11.3624	16.5896	515.1643	17104.0159	33.0228	4.6036	7.082
	34.1709	68.0859	9368.4693	11.7156	17.0951	548.0211	18749.2659	34.0494	4.7787	7.352
L27	34.1709	68.0859	9368.4693	11.7156	17.0951	548.0211	18749.2659	34.0494	4.7787	7.352
	34.5245	68.8044	9668.1915	11.8393	17.2720	559.7610	19349.1047	34.4087	4.8400	7.446

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 98.00-93.00				1	1	1			
L2 93.00-88.00				1	1	1			

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
L3 88.00-83.00				1	1	1			
L4 83.00-78.50				1	1	1			
L5 78.50-78.25				1	1	1			
L6 78.25-78.00				1	1	1			
L7 78.00-77.75				1	1	0.716784			
L8 77.75-72.75				1	1	0.731954			
L9 72.75-70.00				1	1	0.747316			
L10 70.00-65.00				1	1	0.789751			
L11 65.00-60.00				1	1	0.798856			
L12 60.00-55.00				1	1	0.81038			
L13 55.00-53.50				1	1	0.820165			
L14 53.50-53.25				1	1	0.807721			
L15 53.25-48.68				1	1	0.823579			
L16 48.68-43.68				1	1	0.840885			
L17 43.68-38.68				1	1	0.848362			
L18 38.68-33.68				1	1	0.857856			
L19 33.68-28.68				1	1	0.869397			
L20 28.68-23.68				1	1	0.868199			
L21 23.68-20.00				1	1	0.871933			
L22 20.00-15.00				1	1	0.884957			
L23 15.00-12.00				1	1	0.891609			
L24 12.00-11.75				1	1	0.902251			
L25 11.75-6.75				1	1	0.90793			
L26 6.75-1.75				1	1	0.914534			
L27 1.75-0.00				1	1	0.911008			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safetly Line 3/8 ***	A	Surface Ar (CaAa)	70.00 - 10.00	1	1	0.000 0.000	0.3750		0.22
Switchblade	A	Surface Af (CaAa)	80.00 - 0.00	1	1	-0.500 -0.500	3.5000	20.0000	0.00
Switchblade	A	Surface Af (CaAa)	55.00 - 0.00	1	1	0.170 0.170	3.5000	20.0000	0.00
Switchblade	A	Surface Af (CaAa)	80.00 - 10.00	1	1	0.500 0.500	3.5000	20.0000	0.00

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Switchblade	B	Surface Af (CaAa)	55.00 - 0.00	1	1	-0.250 -0.250	3.5000	20.0000	0.00
Switchblade	C	Surface Af (CaAa)	80.00 - 0.00	1	1	-0.500 -0.500	3.5000	20.0000	0.00
Switchblade	C	Surface Af (CaAa)	5.00 - 0.00	1	1	0.000 0.000	3.5000	20.0000	0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***								
LDF6-50A (1-1/4 FOAM)	C	No	Inside Pole	98.00 - 3.00	18	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
1/4" OD	C	No	Inside Pole	98.00 - 3.00	1	No Ice	0.00	0.10
						1/2" Ice	0.00	0.10
						1" Ice	0.00	0.10
***								
LDF5-50A (7/8 FOAM)	B	No	Inside Pole	91.00 - 7.50	17	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
2" ID	B	No	Inside Pole	91.00 - 7.50	2	No Ice	0.00	3.15
						1/2" Ice	0.00	3.15
						1" Ice	0.00	3.15
***								
LDF4RN-50A (1/2 FOAM)	A	No	Inside Pole	82.00 - 7.50	4	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
2-3/8" OD Conduit	A	No	Inside Pole	80.00 - 7.50	2	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF5-50A (7/8 FOAM)	A	No	Inside Pole	80.00 - 7.50	12	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	98.00-93.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	59.90
L2	93.00-88.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	35.73
		C	0.000	0.000	0.000	0.000	59.90
L3	88.00-83.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	59.55
		C	0.000	0.000	0.000	0.000	59.90
L4	83.00-78.50	A	0.000	0.000	1.750	0.000	10.50
		B	0.000	0.000	0.000	0.000	53.59
		C	0.000	0.000	0.875	0.000	53.91
L5	78.50-78.25	A	0.000	0.000	0.292	0.000	1.55

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B	0.000	0.000	0.000	0.000	2.98
		C	0.000	0.000	0.146	0.000	3.00
L6	78.25-78.00	A	0.000	0.000	0.292	0.000	1.55
		B	0.000	0.000	0.000	0.000	2.98
		C	0.000	0.000	0.146	0.000	3.00
L7	78.00-77.75	A	0.000	0.000	0.292	0.000	1.55
		B	0.000	0.000	0.000	0.000	2.98
		C	0.000	0.000	0.146	0.000	3.00
L8	77.75-72.75	A	0.000	0.000	5.833	0.000	31.00
		B	0.000	0.000	0.000	0.000	59.55
		C	0.000	0.000	2.917	0.000	59.90
L9	72.75-70.00	A	0.000	0.000	3.208	0.000	17.05
		B	0.000	0.000	0.000	0.000	32.75
		C	0.000	0.000	1.604	0.000	32.95
L10	70.00-65.00	A	0.000	0.000	6.021	0.000	32.10
		B	0.000	0.000	0.000	0.000	59.55
		C	0.000	0.000	2.917	0.000	59.90
L11	65.00-60.00	A	0.000	0.000	6.021	0.000	32.10
		B	0.000	0.000	0.000	0.000	59.55
		C	0.000	0.000	2.917	0.000	59.90
L12	60.00-55.00	A	0.000	0.000	6.021	0.000	32.10
		B	0.000	0.000	0.000	0.000	59.55
		C	0.000	0.000	2.917	0.000	59.90
L13	55.00-53.50	A	0.000	0.000	2.681	0.000	9.63
		B	0.000	0.000	0.875	0.000	17.86
		C	0.000	0.000	0.875	0.000	17.97
L14	53.50-53.25	A	0.000	0.000	0.447	0.000	1.61
		B	0.000	0.000	0.146	0.000	2.98
		C	0.000	0.000	0.146	0.000	3.00
L15	53.25-48.68	A	0.000	0.000	8.169	0.000	29.34
		B	0.000	0.000	2.666	0.000	54.43
		C	0.000	0.000	2.666	0.000	54.75
L16	48.68-43.68	A	0.000	0.000	8.938	0.000	32.10
		B	0.000	0.000	2.917	0.000	59.55
		C	0.000	0.000	2.917	0.000	59.90
L17	43.68-38.68	A	0.000	0.000	8.938	0.000	32.10
		B	0.000	0.000	2.917	0.000	59.55
		C	0.000	0.000	2.917	0.000	59.90
L18	38.68-33.68	A	0.000	0.000	8.938	0.000	32.10
		B	0.000	0.000	2.917	0.000	59.55
		C	0.000	0.000	2.917	0.000	59.90
L19	33.68-28.68	A	0.000	0.000	8.938	0.000	32.10
		B	0.000	0.000	2.917	0.000	59.55
		C	0.000	0.000	2.917	0.000	59.90
L20	28.68-23.68	A	0.000	0.000	8.938	0.000	32.10
		B	0.000	0.000	2.917	0.000	59.55
		C	0.000	0.000	2.917	0.000	59.90
L21	23.68-20.00	A	0.000	0.000	6.578	0.000	23.63
		B	0.000	0.000	2.147	0.000	43.83
		C	0.000	0.000	2.147	0.000	44.09
L22	20.00-15.00	A	0.000	0.000	8.938	0.000	32.10
		B	0.000	0.000	2.917	0.000	59.55
		C	0.000	0.000	2.917	0.000	59.90
L23	15.00-12.00	A	0.000	0.000	5.362	0.000	19.26
		B	0.000	0.000	1.750	0.000	35.73
		C	0.000	0.000	1.750	0.000	35.94
L24	12.00-11.75	A	0.000	0.000	0.447	0.000	1.61
		B	0.000	0.000	0.146	0.000	2.98
		C	0.000	0.000	0.146	0.000	3.00
L25	11.75-6.75	A	0.000	0.000	6.920	0.000	26.73
		B	0.000	0.000	2.917	0.000	50.62

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C	0.000	0.000	2.917	0.000	59.90
L26	6.75-1.75	A	0.000	0.000	5.833	0.000	0.00
		B	0.000	0.000	2.917	0.000	0.00
		C	0.000	0.000	4.813	0.000	44.92
L27	1.75-0.00	A	0.000	0.000	2.042	0.000	0.00
		B	0.000	0.000	1.021	0.000	0.00
		C	0.000	0.000	2.042	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	98.00-93.00	A	1.668	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	59.90
L2	93.00-88.00	A	1.659	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	35.73
		C		0.000	0.000	0.000	0.000	59.90
L3	88.00-83.00	A	1.650	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	59.55
		C		0.000	0.000	0.000	0.000	59.90
L4	83.00-78.50	A	1.640	0.000	0.000	2.734	0.000	60.66
		B		0.000	0.000	0.000	0.000	53.59
		C		0.000	0.000	1.367	0.000	78.99
L5	78.50-78.25	A	1.636	0.000	0.000	0.455	0.000	9.88
		B		0.000	0.000	0.000	0.000	2.98
		C		0.000	0.000	0.228	0.000	7.16
L6	78.25-78.00	A	1.635	0.000	0.000	0.455	0.000	9.88
		B		0.000	0.000	0.000	0.000	2.98
		C		0.000	0.000	0.228	0.000	7.16
L7	78.00-77.75	A	1.634	0.000	0.000	0.455	0.000	9.87
		B		0.000	0.000	0.000	0.000	2.98
		C		0.000	0.000	0.228	0.000	7.16
L8	77.75-72.75	A	1.629	0.000	0.000	9.091	0.000	196.74
		B		0.000	0.000	0.000	0.000	59.55
		C		0.000	0.000	4.546	0.000	142.77
L9	72.75-70.00	A	1.620	0.000	0.000	4.991	0.000	107.62
		B		0.000	0.000	0.000	0.000	32.75
		C		0.000	0.000	2.495	0.000	78.23
L10	70.00-65.00	A	1.611	0.000	0.000	10.855	0.000	215.18
		B		0.000	0.000	0.000	0.000	59.55
		C		0.000	0.000	4.528	0.000	141.67
L11	65.00-60.00	A	1.599	0.000	0.000	10.817	0.000	213.37
		B		0.000	0.000	0.000	0.000	59.55
		C		0.000	0.000	4.516	0.000	140.89
L12	60.00-55.00	A	1.586	0.000	0.000	10.778	0.000	211.42
		B		0.000	0.000	0.000	0.000	59.55
		C		0.000	0.000	4.502	0.000	140.07
L13	55.00-53.50	A	1.576	0.000	0.000	4.573	0.000	86.91
		B		0.000	0.000	1.348	0.000	41.74
		C		0.000	0.000	1.348	0.000	41.85
L14	53.50-53.25	A	1.574	0.000	0.000	0.762	0.000	14.46
		B		0.000	0.000	0.225	0.000	6.95
		C		0.000	0.000	0.225	0.000	6.97
L15	53.25-48.68	A	1.567	0.000	0.000	13.896	0.000	262.90
		B		0.000	0.000	4.098	0.000	126.62
		C		0.000	0.000	4.098	0.000	126.94

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L16	48.68-43.68	A	1.551	0.000	0.000	15.142	0.000	284.46
		B		0.000	0.000	4.468	0.000	137.59
		C		0.000	0.000	4.468	0.000	137.94
L17	43.68-38.68	A	1.534	0.000	0.000	15.072	0.000	280.82
		B		0.000	0.000	4.450	0.000	136.50
		C		0.000	0.000	4.450	0.000	136.85
L18	38.68-33.68	A	1.514	0.000	0.000	14.993	0.000	276.78
		B		0.000	0.000	4.430	0.000	135.29
		C		0.000	0.000	4.430	0.000	135.64
L19	33.68-28.68	A	1.491	0.000	0.000	14.903	0.000	272.22
		B		0.000	0.000	4.408	0.000	133.92
		C		0.000	0.000	4.408	0.000	134.27
L20	28.68-23.68	A	1.466	0.000	0.000	14.800	0.000	266.99
		B		0.000	0.000	4.382	0.000	132.36
		C		0.000	0.000	4.382	0.000	132.71
L21	23.68-20.00	A	1.439	0.000	0.000	10.815	0.000	192.62
		B		0.000	0.000	3.206	0.000	96.25
		C		0.000	0.000	3.206	0.000	96.50
L22	20.00-15.00	A	1.408	0.000	0.000	14.568	0.000	255.42
		B		0.000	0.000	4.324	0.000	128.88
		C		0.000	0.000	4.324	0.000	129.23
L23	15.00-12.00	A	1.372	0.000	0.000	8.655	0.000	148.99
		B		0.000	0.000	2.573	0.000	76.05
		C		0.000	0.000	2.573	0.000	76.26
L24	12.00-11.75	A	1.354	0.000	0.000	0.718	0.000	12.25
		B		0.000	0.000	0.214	0.000	6.29
		C		0.000	0.000	0.214	0.000	6.30
L25	11.75-6.75	A	1.321	0.000	0.000	10.486	0.000	182.39
		B		0.000	0.000	4.237	0.000	114.81
		C		0.000	0.000	4.237	0.000	124.10
L26	6.75-1.75	A	1.222	0.000	0.000	8.277	0.000	116.99
		B		0.000	0.000	4.138	0.000	58.49
		C		0.000	0.000	6.205	0.000	141.44
L27	1.75-0.00	A	1.043	0.000	0.000	2.772	0.000	34.01
		B		0.000	0.000	1.386	0.000	17.00
		C		0.000	0.000	2.466	0.000	34.01

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	98.00-93.00	0.0000	0.0000	0.0000	0.0000
L2	93.00-88.00	0.0000	0.0000	0.0000	0.0000
L3	88.00-83.00	0.0000	0.0000	0.0000	0.0000
L4	83.00-78.50	0.4219	0.0000	0.5124	0.0000
L5	78.50-78.25	0.8116	0.0000	0.9185	0.0000
L6	78.25-78.00	0.8128	0.0000	0.9201	0.0000
L7	78.00-77.75	0.8139	0.0000	0.9217	0.0000
L8	77.75-72.75	0.8259	0.0000	0.9383	0.0000
L9	72.75-70.00	0.8429	0.0000	0.9622	0.0000
L10	70.00-65.00	0.8261	-0.0139	0.7552	-0.0926
L11	65.00-60.00	0.8459	-0.0142	0.7794	-0.0950
L12	60.00-55.00	0.8648	-0.0145	0.8027	-0.0972
L13	55.00-53.50	0.5493	-0.8926	0.4819	-1.0176
L14	53.50-53.25	0.5518	-0.8954	0.4847	-1.0217
L15	53.25-48.68	0.5588	-0.9031	0.4923	-1.0328

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L16	48.68-43.68	0.5724	-0.9181	0.5074	-1.0544
L17	43.68-38.68	0.5861	-0.9332	0.5227	-1.0762
L18	38.68-33.68	0.5994	-0.9478	0.5378	-1.0972
L19	33.68-28.68	0.6123	-0.9620	0.5526	-1.1173
L20	28.68-23.68	0.6247	-0.9757	0.5672	-1.1364
L21	23.68-20.00	0.6352	-0.9873	0.5797	-1.1522
L22	20.00-15.00	0.6454	-0.9985	0.5921	-1.1668
L23	15.00-12.00	0.6546	-1.0086	0.6035	-1.1792
L24	12.00-11.75	0.6583	-1.0127	0.6081	-1.1838
L25	11.75-6.75	0.4407	-0.7386	0.4565	-0.8659
L26	6.75-1.75	0.2912	-0.1959	0.3386	-0.3200
L27	1.75-0.00	0.2839	-0.0143	0.3265	-0.1455

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L4	3	Switchblade	78.50 - 80.00	1.0000	1.0000
L4	5	Switchblade	78.50 - 80.00	1.0000	1.0000
L4	7	Switchblade	78.50 - 80.00	1.0000	1.0000
L5	3	Switchblade	78.25 - 78.50	1.0000	1.0000
L5	5	Switchblade	78.25 - 78.50	1.0000	1.0000
L5	7	Switchblade	78.25 - 78.50	1.0000	1.0000
L6	3	Switchblade	78.00 - 78.25	1.0000	1.0000
L6	5	Switchblade	78.00 - 78.25	1.0000	1.0000
L6	7	Switchblade	78.00 - 78.25	1.0000	1.0000
L7	3	Switchblade	77.75 - 78.00	1.0000	1.0000
L7	5	Switchblade	77.75 - 78.00	1.0000	1.0000
L7	7	Switchblade	77.75 - 78.00	1.0000	1.0000
L8	3	Switchblade	72.75 - 77.75	1.0000	1.0000
L8	5	Switchblade	72.75 - 77.75	1.0000	1.0000
L8	7	Switchblade	72.75 - 77.75	1.0000	1.0000
L9	3	Switchblade	70.00 - 72.75	1.0000	1.0000
L9	5	Switchblade	70.00 - 72.75	1.0000	1.0000
L9	7	Switchblade	70.00 - 72.75	1.0000	1.0000
L10	1	Safetly Line 3/8	65.00 - 70.00	1.0000	1.0000
L10	3	Switchblade	65.00 - 70.00	1.0000	1.0000
L10	5	Switchblade	65.00 - 70.00	1.0000	1.0000
L10	7	Switchblade	65.00 - 70.00	1.0000	1.0000
L11	1	Safetly Line 3/8	60.00 - 65.00	1.0000	1.0000
L11	3	Switchblade	60.00 - 65.00	1.0000	1.0000
L11	5	Switchblade	60.00 - 65.00	1.0000	1.0000
L11	7	Switchblade	60.00 - 65.00	1.0000	1.0000
L12	1	Safetly Line 3/8	55.00 - 60.00	1.0000	1.0000
L12	3	Switchblade	55.00 - 60.00	1.0000	1.0000
L12	5	Switchblade	55.00 - 60.00	1.0000	1.0000
L12	7	Switchblade	55.00 - 60.00	1.0000	1.0000
L13	1	Safetly Line 3/8	53.50 - 55.00	1.0000	1.0000
L13	3	Switchblade	53.50 - 55.00	1.0000	1.0000
L13	4	Switchblade	53.50 - 55.00	1.0000	1.0000
L13	5	Switchblade	53.50 - 55.00	1.0000	1.0000
L13	6	Switchblade	53.50 - 55.00	1.0000	1.0000
L13	7	Switchblade	53.50 - 55.00	1.0000	1.0000
L14	1	Safetly Line 3/8	53.25 - 53.50	1.0000	1.0000
L14	3	Switchblade	53.25 - 53.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L14	4	Switchblade	53.25 - 53.50	1.0000	1.0000
L14	5	Switchblade	53.25 - 53.50	1.0000	1.0000
L14	6	Switchblade	53.25 - 53.50	1.0000	1.0000
L14	7	Switchblade	53.25 - 53.50	1.0000	1.0000
L15	1	Safetly Line 3/8	48.68 - 53.25	1.0000	1.0000
L15	3	Switchblade	48.68 - 53.25	1.0000	1.0000
L15	4	Switchblade	48.68 - 53.25	1.0000	1.0000
L15	5	Switchblade	48.68 - 53.25	1.0000	1.0000
L15	6	Switchblade	48.68 - 53.25	1.0000	1.0000
L15	7	Switchblade	48.68 - 53.25	1.0000	1.0000
L16	1	Safetly Line 3/8	43.68 - 48.68	1.0000	1.0000
L16	3	Switchblade	43.68 - 48.68	1.0000	1.0000
L16	4	Switchblade	43.68 - 48.68	1.0000	1.0000
L16	5	Switchblade	43.68 - 48.68	1.0000	1.0000
L16	6	Switchblade	43.68 - 48.68	1.0000	1.0000
L16	7	Switchblade	43.68 - 48.68	1.0000	1.0000
L17	1	Safetly Line 3/8	38.68 - 43.68	1.0000	1.0000
L17	3	Switchblade	38.68 - 43.68	1.0000	1.0000
L17	4	Switchblade	38.68 - 43.68	1.0000	1.0000
L17	5	Switchblade	38.68 - 43.68	1.0000	1.0000
L17	6	Switchblade	38.68 - 43.68	1.0000	1.0000
L17	7	Switchblade	38.68 - 43.68	1.0000	1.0000
L18	1	Safetly Line 3/8	33.68 - 38.68	1.0000	1.0000
L18	3	Switchblade	33.68 - 38.68	1.0000	1.0000
L18	4	Switchblade	33.68 - 38.68	1.0000	1.0000
L18	5	Switchblade	33.68 - 38.68	1.0000	1.0000
L18	6	Switchblade	33.68 - 38.68	1.0000	1.0000
L18	7	Switchblade	33.68 - 38.68	1.0000	1.0000
L19	1	Safetly Line 3/8	28.68 - 33.68	1.0000	1.0000
L19	3	Switchblade	28.68 - 33.68	1.0000	1.0000
L19	4	Switchblade	28.68 - 33.68	1.0000	1.0000
L19	5	Switchblade	28.68 - 33.68	1.0000	1.0000
L19	6	Switchblade	28.68 - 33.68	1.0000	1.0000
L19	7	Switchblade	28.68 - 33.68	1.0000	1.0000
L20	1	Safetly Line 3/8	23.68 - 28.68	1.0000	1.0000
L20	3	Switchblade	23.68 - 28.68	1.0000	1.0000
L20	4	Switchblade	23.68 - 28.68	1.0000	1.0000
L20	5	Switchblade	23.68 - 28.68	1.0000	1.0000
L20	6	Switchblade	23.68 - 28.68	1.0000	1.0000
L20	7	Switchblade	23.68 - 28.68	1.0000	1.0000
L21	1	Safetly Line 3/8	20.00 - 23.68	1.0000	1.0000
L21	3	Switchblade	20.00 - 23.68	1.0000	1.0000
L21	4	Switchblade	20.00 - 23.68	1.0000	1.0000
L21	5	Switchblade	20.00 - 23.68	1.0000	1.0000
L21	6	Switchblade	20.00 - 23.68	1.0000	1.0000
L21	7	Switchblade	20.00 - 23.68	1.0000	1.0000
L22	1	Safetly Line 3/8	15.00 - 20.00	1.0000	1.0000
L22	3	Switchblade	15.00 - 20.00	1.0000	1.0000
L22	4	Switchblade	15.00 - 20.00	1.0000	1.0000
L22	5	Switchblade	15.00 - 20.00	1.0000	1.0000
L22	6	Switchblade	15.00 - 20.00	1.0000	1.0000
L22	7	Switchblade	15.00 - 20.00	1.0000	1.0000
L23	1	Safetly Line 3/8	12.00 - 15.00	1.0000	1.0000
L23	3	Switchblade	12.00 - 15.00	1.0000	1.0000
L23	4	Switchblade	12.00 - 15.00	1.0000	1.0000
L23	5	Switchblade	12.00 - 15.00	1.0000	1.0000
L23	6	Switchblade	12.00 - 15.00	1.0000	1.0000
L23	7	Switchblade	12.00 - 15.00	1.0000	1.0000
L24	1	Safetly Line 3/8	11.75 - 12.00	1.0000	1.0000
L24	3	Switchblade	11.75 - 12.00	1.0000	1.0000
L24	4	Switchblade	11.75 - 12.00	1.0000	1.0000
L24	5	Switchblade	11.75 - 12.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L24	6	Switchblade	11.75 - 12.00	1.0000	1.0000
L24	7	Switchblade	11.75 - 12.00	1.0000	1.0000
L25	1	Safetly Line 3/8	10.00 - 11.75	1.0000	1.0000
L25	3	Switchblade	6.75 - 11.75	1.0000	1.0000
L25	4	Switchblade	6.75 - 11.75	1.0000	1.0000
L25	5	Switchblade	10.00 - 11.75	1.0000	1.0000
L25	6	Switchblade	6.75 - 11.75	1.0000	1.0000
L25	7	Switchblade	6.75 - 11.75	1.0000	1.0000
L26	3	Switchblade	1.75 - 6.75	1.0000	1.0000
L26	4	Switchblade	1.75 - 6.75	1.0000	1.0000
L26	6	Switchblade	1.75 - 6.75	1.0000	1.0000
L26	7	Switchblade	1.75 - 6.75	1.0000	1.0000
L26	8	Switchblade	1.75 - 5.00	1.0000	1.0000
L27	3	Switchblade	0.00 - 1.75	1.0000	1.0000
L27	4	Switchblade	0.00 - 1.75	1.0000	1.0000
L27	6	Switchblade	0.00 - 1.75	1.0000	1.0000
L27	7	Switchblade	0.00 - 1.75	1.0000	1.0000
L27	8	Switchblade	0.00 - 1.75	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2)	A	From Face	3.50	0.0000	98.00	No Ice	7.61	3.63	63.51
APX16DWV-16DWV-S-E-A			0.00			1/2" Ice	8.20	4.53	113.59
20 W/ Mount PIpe			0.00			1" Ice	8.76	5.26	170.27
(2)	B	From Face	3.50	0.0000	98.00	No Ice	7.61	3.63	63.51
APX16DWV-16DWV-S-E-A			0.00			1/2" Ice	8.20	4.53	113.59
20 W/ Mount PIpe			0.00			1" Ice	8.76	5.26	170.27
(2)	C	From Face	3.50	0.0000	98.00	No Ice	7.61	3.63	63.51
APX16DWV-16DWV-S-E-A			0.00			1/2" Ice	8.20	4.53	113.59
20 W/ Mount PIpe			0.00			1" Ice	8.76	5.26	170.27
(3) ATMAA1412D TMA	A	From Face	3.00	0.0000	98.00	No Ice	1.00	0.41	13.00
			0.00			1/2" Ice	1.13	0.50	20.62
			0.00			1" Ice	1.26	0.59	30.11
(3) ATMAA1412D TMA	B	From Face	3.00	0.0000	98.00	No Ice	1.00	0.41	13.00
			0.00			1/2" Ice	1.13	0.50	20.62
			0.00			1" Ice	1.26	0.59	30.11
(3) ATMAA1412D TMA	C	From Face	3.00	0.0000	98.00	No Ice	1.00	0.41	13.00
			0.00			1/2" Ice	1.13	0.50	20.62
			0.00			1" Ice	1.26	0.59	30.11
Platform Mount [LP 601-1]	A	None		0.0000	97.00	No Ice	28.47	28.47	1122.00
						1/2" Ice	33.59	33.59	1513.66
						1" Ice	38.71	38.71	1905.31
***									
7750.00	A	From Face	3.00	0.0000	91.00	No Ice	5.88	2.93	35.00
			0.00			1/2" Ice	6.31	3.27	67.63
			0.00			1" Ice	6.75	3.63	105.06
7750.00	B	From Face	3.00	0.0000	91.00	No Ice	5.88	2.93	35.00
			0.00			1/2" Ice	6.31	3.27	67.63

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	6.75	3.63	105.06
7750.00	C	From Face	3.00	0.0000	91.00	No Ice	5.88	2.93	35.00
			0.00			1/2" Ice	6.31	3.27	67.63
			0.00			1" Ice	6.75	3.63	105.06
(2) SBNHH-1D65A	A	From Face	3.00	0.0000	91.00	No Ice	6.36	3.86	33.50
			0.00			1/2" Ice	6.80	4.22	72.53
			0.00			1" Ice	7.25	4.62	116.56
HPA-65R-BUU-H6	B	From Face	3.00	0.0000	91.00	No Ice	10.36	6.45	50.70
			0.00			1/2" Ice	10.93	6.91	113.69
			0.00			1" Ice	11.50	7.38	183.08
HPA-65R-BUU-H6	C	From Face	3.00	0.0000	91.00	No Ice	10.36	6.45	50.70
			0.00			1/2" Ice	10.93	6.91	113.69
			0.00			1" Ice	11.50	7.38	183.08
QS86512-2 w/ Mount Pipe	B	From Face	2.50	0.0000	91.00	No Ice	11.70	11.74	172.85
			0.00			1/2" Ice	12.42	13.27	271.33
			0.00			1" Ice	13.15	14.83	379.91
QS86512-2 w/ Mount Pipe	C	From Face	2.50	0.0000	91.00	No Ice	11.70	11.74	172.85
			0.00			1/2" Ice	12.42	13.27	271.33
			0.00			1" Ice	13.15	14.83	379.91
RRU-32	A	From Face	2.50	0.0000	91.00	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.00			1" Ice	3.81	2.86	136.47
RRU-32	B	From Face	2.50	0.0000	91.00	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.00			1" Ice	3.81	2.86	136.47
RRU-32	C	From Face	2.50	0.0000	91.00	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.00			1" Ice	3.81	2.86	136.47
RRUS-11	A	From Face	1.00	0.0000	91.00	No Ice	2.94	1.25	55.00
			0.00			1/2" Ice	3.17	1.41	74.32
			0.00			1" Ice	3.40	1.57	93.64
RRUS-11	B	From Face	1.00	0.0000	91.00	No Ice	2.94	1.25	55.00
			0.00			1/2" Ice	3.17	1.41	74.32
			0.00			1" Ice	3.40	1.57	93.64
RRUS-11	C	From Face	1.00	0.0000	91.00	No Ice	2.94	1.25	55.00
			0.00			1/2" Ice	3.17	1.41	74.32
			0.00			1" Ice	3.40	1.57	93.64
(2) LGP21401	A	From Face	2.50	0.0000	91.00	No Ice	0.82	0.35	17.50
			0.00			1/2" Ice	0.94	0.44	23.31
			0.00			1" Ice	1.06	0.54	30.86
(2) LGP21401	B	From Face	2.50	0.0000	91.00	No Ice	0.82	0.35	17.50
			0.00			1/2" Ice	0.94	0.44	23.31
			0.00			1" Ice	1.06	0.54	30.86
(2) LGP21401	C	From Face	2.50	0.0000	91.00	No Ice	0.82	0.35	17.50
			0.00			1/2" Ice	0.94	0.44	23.31
			0.00			1" Ice	1.06	0.54	30.86
DC-6 Squid Surge Arrestors	A	From Face	1.00	0.0000	91.00	No Ice	2.20	1.81	32.80
			0.00			1/2" Ice	2.40	1.99	53.02
			0.00			1" Ice	2.60	2.18	76.29
DC-6 Squid Surge Arrestors	B	From Face	1.00	0.0000	91.00	No Ice	2.20	1.81	32.80
			0.00			1/2" Ice	2.40	1.99	53.02
			0.00			1" Ice	2.60	2.18	76.29
(2) 860-10025	A	From Face	2.50	0.0000	91.00	No Ice	0.14	0.11	1.16
			0.00			1/2" Ice	0.20	0.17	2.52
			0.00			1" Ice	0.26	0.23	4.75
(2) 860-10025	B	From Face	2.50	0.0000	91.00	No Ice	0.14	0.11	1.16
			0.00			1/2" Ice	0.20	0.17	2.52

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	0.26	0.23	4.75
(2) 860-10025	C	From Face	2.50	0.0000	91.00	No Ice	0.14	0.11	1.16
			0.00			1/2" Ice	0.20	0.17	2.52
			0.00			1" Ice	0.26	0.23	4.75
860-10006	A	From Face	2.50	0.0000	91.00	No Ice	1.66	0.35	5.00
			0.00			1/2" Ice	1.85	0.47	13.08
			0.00			1" Ice	2.04	0.60	23.28
10' Low Profile Platform w/ Rails	C	None		0.0000	91.00	No Ice	25.00	25.00	1350.00
						1/2" Ice	29.00	29.00	1660.00
						1" Ice	33.00	33.00	1970.00
***									
6'x1/2" Lightning Rod	B	From Face	2.50	0.0000	88.00	No Ice	0.30	0.30	50.00
			0.00			1/2" Ice	0.62	0.62	65.00
			3.00			1" Ice	0.94	0.94	80.00
***									
LLPX310R-V1 w/ Pipe Mounts	A	From Face	3.50	0.0000	80.00	No Ice	5.21	3.15	45.85
			0.00			1/2" Ice	5.66	3.73	85.18
			0.00			1" Ice	6.11	4.32	129.99
LLPX310R-V1 w/ Pipe Mounts	B	From Face	3.50	0.0000	80.00	No Ice	5.21	3.15	45.85
			0.00			1/2" Ice	5.66	3.73	85.18
			0.00			1" Ice	6.11	4.32	129.99
LLPX310R-V1 w/ Pipe Mounts	C	From Face	3.50	0.0000	80.00	No Ice	5.21	3.15	45.85
			0.00			1/2" Ice	5.66	3.73	85.18
			0.00			1" Ice	6.11	4.32	129.99
Samsung RRUS	A	From Face	2.50	0.0000	80.00	No Ice	2.78	1.19	50.70
			0.00			1/2" Ice	2.99	1.33	71.50
			0.00			1" Ice	3.21	1.49	95.33
Samsung RRUS	B	From Face	2.50	0.0000	80.00	No Ice	2.78	1.19	50.70
			0.00			1/2" Ice	2.99	1.33	71.50
			0.00			1" Ice	3.21	1.49	95.33
Samsung RRUS	C	From Face	2.50	0.0000	80.00	No Ice	2.78	1.19	50.70
			0.00			1/2" Ice	2.99	1.33	71.50
			0.00			1" Ice	3.21	1.49	95.33
(3) DB844H65E-XY w/ Pipe Mount	A	From Face	3.50	0.0000	80.00	No Ice	9.80	5.39	38.25
			0.00			1/2" Ice	10.31	6.07	105.94
			0.00			1" Ice	10.83	6.76	180.33
(4) DB844H65E-XY w/ Pipe Mount	B	From Face	3.50	0.0000	80.00	No Ice	9.80	5.39	38.25
			0.00			1/2" Ice	10.31	6.07	105.94
			0.00			1" Ice	10.83	6.76	180.33
(4) DB844H65E-XY w/ Pipe Mount	C	From Face	3.50	0.0000	80.00	No Ice	9.80	5.39	38.25
			0.00			1/2" Ice	10.31	6.07	105.94
			0.00			1" Ice	10.83	6.76	180.33
T-Arm Mount [TA 602-3]	C	None		0.0000	80.00	No Ice	11.59	11.59	774.30
						1/2" Ice	15.44	15.44	990.35
						1" Ice	19.29	19.29	1206.41
***									
(2) ODU	A	From Face	3.00	0.0000	82.00	No Ice	1.14	0.43	14.10
			0.00			1/2" Ice	1.27	0.52	23.28
			0.50			1" Ice	1.41	0.62	34.50
(2) ODU	B	From Face	3.00	0.0000	82.00	No Ice	1.14	0.43	14.10
			0.00			1/2" Ice	1.27	0.52	23.28
			0.50			1" Ice	1.41	0.62	34.50

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ° ° ft	Azimuth Adjustment	3 dB Beam Width	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight lb
A-ANT-18G-2-C	A	Paraboloid w/Shroud (HP)	From Face	4.00 0.00 0.00	0.0000		82.00	2.00	No Ice 1/2" Ice 1" Ice	3.14 3.41 3.68	25.00 42.50 60.01
1' HP Dish w/ Shroud	B	Paraboloid w/Shroud (HP)	From Face	3.50 0.00 0.00	0.0000		82.00	1.00	No Ice 1/2" Ice 1" Ice	0.79 0.92 1.06	19.00 25.00 31.00

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg % %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 98.00-93.00	95.44	1.253	29	5.791	A	0.000	5.791	5.791	100.00	0.000	0.000
					B	0.000	5.791		100.00	0.000	0.000
					C	0.000	5.791		100.00	0.000	0.000
L2 93.00-88.00	90.45	1.239	28	6.584	A	0.000	6.584	6.584	100.00	0.000	0.000
					B	0.000	6.584		100.00	0.000	0.000
					C	0.000	6.584		100.00	0.000	0.000
L3 88.00-83.00	85.48	1.224	28	7.191	A	0.000	7.191	7.191	100.00	0.000	0.000
					B	0.000	7.191		100.00	0.000	0.000
					C	0.000	7.191		100.00	0.000	0.000
L4 83.00-78.50	80.73	1.21	28	6.830	A	0.000	6.830	6.830	100.00	1.750	0.000
					B	0.000	6.830		100.00	0.000	0.000
					C	0.000	6.830		100.00	0.875	0.000
L5 78.50-78.25	78.37	1.202	28	0.389	A	0.000	0.389	0.389	100.00	0.292	0.000
					B	0.000	0.389		100.00	0.000	0.000
					C	0.000	0.389		100.00	0.146	0.000
L6 78.25-78.00	78.12	1.202	27	0.390	A	0.000	0.390	0.390	100.00	0.292	0.000
					B	0.000	0.390		100.00	0.000	0.000
					C	0.000	0.390		100.00	0.146	0.000
L7 78.00-77.75	77.87	1.201	27	0.392	A	0.000	0.392	0.392	100.00	0.292	0.000
					B	0.000	0.392		100.00	0.000	0.000
					C	0.000	0.392		100.00	0.146	0.000
L8 77.75-72.75	75.23	1.192	27	8.051	A	0.000	8.051	8.051	100.00	5.833	0.000
					B	0.000	8.051		100.00	0.000	0.000
					C	0.000	8.051		100.00	2.917	0.000
L9 72.75-70.00	71.37	1.179	27	4.607	A	0.000	4.607	4.607	100.00	3.208	0.000
					B	0.000	4.607		100.00	0.000	0.000
					C	0.000	4.607		100.00	1.604	0.000
L10 70.00-65.00	67.48	1.165	27	8.702	A	0.000	8.702	8.702	100.00	6.021	0.000
					B	0.000	8.702		100.00	0.000	0.000
					C	0.000	8.702		100.00	2.917	0.000
L11 65.00-60.00	62.48	1.146	26	9.123	A	0.000	9.123	9.123	100.00	6.021	0.000
					B	0.000	9.123		100.00	0.000	0.000
					C	0.000	9.123		100.00	2.917	0.000
L12 60.00-55.00	57.48	1.126	26	9.543	A	0.000	9.543	9.543	100.00	6.021	0.000
					B	0.000	9.543		100.00	0.000	0.000
					C	0.000	9.543		100.00	2.917	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L13	54.25	1.113	25	2.945	A	0.000	2.945	2.945	100.00	2.681	0.000
55.00-53.50					B	0.000	2.945		100.00	0.875	0.000
					C	0.000	2.945		100.00	0.875	0.000
L14	53.37	1.109	25	0.495	A	0.000	0.495	0.495	100.00	0.447	0.000
53.50-53.25					B	0.000	0.495		100.00	0.146	0.000
					C	0.000	0.495		100.00	0.146	0.000
L15	50.95	1.098	25	9.225	A	0.000	9.225	9.225	100.00	8.169	0.000
53.25-48.68					B	0.000	9.225		100.00	2.666	0.000
					C	0.000	9.225		100.00	2.666	0.000
L16	46.16	1.076	25	10.496	A	0.000	10.496	10.496	100.00	8.938	0.000
48.68-43.68					B	0.000	10.496		100.00	2.917	0.000
					C	0.000	10.496		100.00	2.917	0.000
L17	41.16	1.05	24	10.917	A	0.000	10.917	10.917	100.00	8.938	0.000
43.68-38.68					B	0.000	10.917		100.00	2.917	0.000
					C	0.000	10.917		100.00	2.917	0.000
L18	36.16	1.022	23	11.338	A	0.000	11.338	11.338	100.00	8.938	0.000
38.68-33.68					B	0.000	11.338		100.00	2.917	0.000
					C	0.000	11.338		100.00	2.917	0.000
L19	31.17	0.99	23	11.760	A	0.000	11.760	11.760	100.00	8.938	0.000
33.68-28.68					B	0.000	11.760		100.00	2.917	0.000
					C	0.000	11.760		100.00	2.917	0.000
L20	26.17	0.954	22	12.181	A	0.000	12.181	12.181	100.00	8.938	0.000
28.68-23.68					B	0.000	12.181		100.00	2.917	0.000
					C	0.000	12.181		100.00	2.917	0.000
L21	21.83	0.919	21	9.234	A	0.000	9.234	9.234	100.00	6.578	0.000
23.68-20.00					B	0.000	9.234		100.00	2.147	0.000
					C	0.000	9.234		100.00	2.147	0.000
L22	17.49	0.877	20	12.912	A	0.000	12.912	12.912	100.00	8.938	0.000
20.00-15.00					B	0.000	12.912		100.00	2.917	0.000
					C	0.000	12.912		100.00	2.917	0.000
L23	13.50	0.85	19	7.949	A	0.000	7.949	7.949	100.00	5.362	0.000
15.00-12.00					B	0.000	7.949		100.00	1.750	0.000
					C	0.000	7.949		100.00	1.750	0.000
L24	11.87	0.85	19	0.669	A	0.000	0.669	0.669	100.00	0.447	0.000
12.00-11.75					B	0.000	0.669		100.00	0.146	0.000
					C	0.000	0.669		100.00	0.146	0.000
L25 11.75-6.75	9.24	0.85	19	13.606	A	0.000	13.606	13.606	100.00	6.920	0.000
					B	0.000	13.606		100.00	2.917	0.000
					C	0.000	13.606		100.00	2.917	0.000
L26 6.75-1.75	4.24	0.85	19	14.027	A	0.000	14.027	14.027	100.00	5.833	0.000
					B	0.000	14.027		100.00	2.917	0.000
					C	0.000	14.027		100.00	4.813	0.000
L27 1.75-0.00	0.87	0.85	19	5.009	A	0.000	5.009	5.009	100.00	2.042	0.000
					B	0.000	5.009		100.00	1.021	0.000
					C	0.000	5.009		100.00	2.042	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 98.00-93.00	95.44	1.253	8	1.6681	7.181	A	0.000	7.181	7.181	100.00	0.000	0.000
						B	0.000	7.181		100.00	0.000	0.000

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
						C	0.000	7.181		100.00	0.000	0.000
L2 93.00-88.00	90.45	1.239	8	1.6591	7.967	A	0.000	7.967	7.967	100.00	0.000	0.000
						B	0.000	7.967		100.00	0.000	0.000
						C	0.000	7.967		100.00	0.000	0.000
L3 88.00-83.00	85.48	1.224	7	1.6498	8.566	A	0.000	8.566	8.566	100.00	0.000	0.000
						B	0.000	8.566		100.00	0.000	0.000
						C	0.000	8.566		100.00	0.000	0.000
L4 83.00-78.50	80.73	1.21	7	1.6404	8.061	A	0.000	8.061	8.061	100.00	2.734	0.000
						B	0.000	8.061		100.00	0.000	0.000
						C	0.000	8.061		100.00	1.367	0.000
L5 78.50-78.25	78.37	1.202	7	1.6355	0.458	A	0.000	0.458	0.458	100.00	0.455	0.000
						B	0.000	0.458		100.00	0.000	0.000
						C	0.000	0.458		100.00	0.228	0.000
L6 78.25-78.00	78.12	1.202	7	1.6350	0.459	A	0.000	0.459	0.459	100.00	0.455	0.000
						B	0.000	0.459		100.00	0.000	0.000
						C	0.000	0.459		100.00	0.228	0.000
L7 78.00-77.75	77.87	1.201	7	1.6345	0.460	A	0.000	0.460	0.460	100.00	0.455	0.000
						B	0.000	0.460		100.00	0.000	0.000
						C	0.000	0.460		100.00	0.228	0.000
L8 77.75-72.75	75.23	1.192	7	1.6288	9.408	A	0.000	9.408	9.408	100.00	9.091	0.000
						B	0.000	9.408		100.00	0.000	0.000
						C	0.000	9.408		100.00	4.546	0.000
L9 72.75-70.00	71.37	1.179	7	1.6203	5.349	A	0.000	5.349	5.349	100.00	4.991	0.000
						B	0.000	5.349		100.00	0.000	0.000
						C	0.000	5.349		100.00	2.495	0.000
L10 70.00-65.00	67.48	1.165	7	1.6112	10.045	A	0.000	10.045	10.045	100.00	10.855	0.000
						B	0.000	10.045		100.00	0.000	0.000
						C	0.000	10.045		100.00	4.528	0.000
L11 65.00-60.00	62.48	1.146	7	1.5989	10.455	A	0.000	10.455	10.455	100.00	10.817	0.000
						B	0.000	10.455		100.00	0.000	0.000
						C	0.000	10.455		100.00	4.516	0.000
L12 60.00-55.00	57.48	1.126	7	1.5856	10.865	A	0.000	10.865	10.865	100.00	10.778	0.000
						B	0.000	10.865		100.00	0.000	0.000
						C	0.000	10.865		100.00	4.502	0.000
L13 55.00-53.50	54.25	1.113	7	1.5764	3.339	A	0.000	3.339	3.339	100.00	4.573	0.000
						B	0.000	3.339		100.00	1.348	0.000
						C	0.000	3.339		100.00	1.348	0.000
L14 53.50-53.25	53.37	1.109	7	1.5739	0.560	A	0.000	0.560	0.560	100.00	0.762	0.000
						B	0.000	0.560		100.00	0.225	0.000
						C	0.000	0.560		100.00	0.225	0.000
L15 53.25-48.68	50.95	1.098	7	1.5666	10.418	A	0.000	10.418	10.418	100.00	13.896	0.000
						B	0.000	10.418		100.00	4.098	0.000
						C	0.000	10.418		100.00	4.098	0.000
L16 48.68-43.68	46.16	1.076	7	1.5512	11.789	A	0.000	11.789	11.789	100.00	15.142	0.000
						B	0.000	11.789		100.00	4.468	0.000
						C	0.000	11.789		100.00	4.468	0.000
L17 43.68-38.68	41.16	1.05	6	1.5335	12.195	A	0.000	12.195	12.195	100.00	15.072	0.000
						B	0.000	12.195		100.00	4.450	0.000
						C	0.000	12.195		100.00	4.450	0.000
L18 38.68-33.68	36.16	1.022	6	1.5138	12.600	A	0.000	12.600	12.600	100.00	14.993	0.000
						B	0.000	12.600		100.00	4.430	0.000
						C	0.000	12.600		100.00	4.430	0.000
L19 33.68-28.68	31.17	0.99	6	1.4914	13.002	A	0.000	13.002	13.002	100.00	14.903	0.000
						B	0.000	13.002		100.00	4.408	0.000
						C	0.000	13.002		100.00	4.408	0.000
L20 28.68-23.68	26.17	0.954	6	1.4656	13.402	A	0.000	13.402	13.402	100.00	14.800	0.000
						B	0.000	13.402		100.00	4.382	0.000
						C	0.000	13.402		100.00	4.382	0.000
L21 23.68-20.00	21.83	0.919	6	1.4393	10.117	A	0.000	10.117	10.117	100.00	10.815	0.000
						B	0.000	10.117		100.00	3.206	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	0.000	10.117		100.00	3.206	0.000
L22 20.00-15.00	17.49	0.877	5	1.4077	14.085	A	0.000	14.085	14.085	100.00	14.568	0.000
						B	0.000	14.085		100.00	4.324	0.000
						C	0.000	14.085		100.00	4.324	0.000
L23 15.00-12.00	13.50	0.85	5	1.3717	8.635	A	0.000	8.635	8.635	100.00	8.655	0.000
						B	0.000	8.635		100.00	2.573	0.000
						C	0.000	8.635		100.00	2.573	0.000
L24 12.00-11.75	11.87	0.85	5	1.3543	0.726	A	0.000	0.726	0.726	100.00	0.718	0.000
						B	0.000	0.726		100.00	0.214	0.000
						C	0.000	0.726		100.00	0.214	0.000
L25 11.75-6.75	9.24	0.85	5	1.3207	14.707	A	0.000	14.707	14.707	100.00	10.486	0.000
						B	0.000	14.707		100.00	4.237	0.000
						C	0.000	14.707		100.00	4.237	0.000
L26 6.75-1.75	4.24	0.85	5	1.2217	15.045	A	0.000	15.045	15.045	100.00	8.277	0.000
						B	0.000	15.045		100.00	4.138	0.000
						C	0.000	15.045		100.00	6.205	0.000
L27 1.75-0.00	0.87	0.85	5	1.0432	5.313	A	0.000	5.313	5.313	100.00	2.772	0.000
						B	0.000	5.313		100.00	1.386	0.000
						C	0.000	5.313		100.00	2.466	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 98.00-93.00	95.44	1.253	10	5.791	A	0.000	5.791	5.791	100.00	0.000	0.000
					B	0.000	5.791		100.00	0.000	0.000
					C	0.000	5.791		100.00	0.000	0.000
L2 93.00-88.00	90.45	1.239	10	6.584	A	0.000	6.584	6.584	100.00	0.000	0.000
					B	0.000	6.584		100.00	0.000	0.000
					C	0.000	6.584		100.00	0.000	0.000
L3 88.00-83.00	85.48	1.224	10	7.191	A	0.000	7.191	7.191	100.00	0.000	0.000
					B	0.000	7.191		100.00	0.000	0.000
					C	0.000	7.191		100.00	0.000	0.000
L4 83.00-78.50	80.73	1.21	9	6.830	A	0.000	6.830	6.830	100.00	1.750	0.000
					B	0.000	6.830		100.00	0.000	0.000
					C	0.000	6.830		100.00	0.875	0.000
L5 78.50-78.25	78.37	1.202	9	0.389	A	0.000	0.389	0.389	100.00	0.292	0.000
					B	0.000	0.389		100.00	0.000	0.000
					C	0.000	0.389		100.00	0.146	0.000
L6 78.25-78.00	78.12	1.202	9	0.390	A	0.000	0.390	0.390	100.00	0.292	0.000
					B	0.000	0.390		100.00	0.000	0.000
					C	0.000	0.390		100.00	0.146	0.000
L7 78.00-77.75	77.87	1.201	9	0.392	A	0.000	0.392	0.392	100.00	0.292	0.000
					B	0.000	0.392		100.00	0.000	0.000
					C	0.000	0.392		100.00	0.146	0.000
L8 77.75-72.75	75.23	1.192	9	8.051	A	0.000	8.051	8.051	100.00	5.833	0.000
					B	0.000	8.051		100.00	0.000	0.000
					C	0.000	8.051		100.00	2.917	0.000
L9 72.75-70.00	71.37	1.179	9	4.607	A	0.000	4.607	4.607	100.00	3.208	0.000
					B	0.000	4.607		100.00	0.000	0.000
					C	0.000	4.607		100.00	1.604	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L10	67.48	1.165	9	8.702	A	0.000	8.702	8.702	100.00	6.021	0.000
70.00-65.00					B	0.000	8.702		100.00	0.000	0.000
					C	0.000	8.702		100.00	2.917	0.000
L11	62.48	1.146	9	9.123	A	0.000	9.123	9.123	100.00	6.021	0.000
65.00-60.00					B	0.000	9.123		100.00	0.000	0.000
					C	0.000	9.123		100.00	2.917	0.000
L12	57.48	1.126	9	9.543	A	0.000	9.543	9.543	100.00	6.021	0.000
60.00-55.00					B	0.000	9.543		100.00	0.000	0.000
					C	0.000	9.543		100.00	2.917	0.000
L13	54.25	1.113	9	2.945	A	0.000	2.945	2.945	100.00	2.681	0.000
55.00-53.50					B	0.000	2.945		100.00	0.875	0.000
					C	0.000	2.945		100.00	0.875	0.000
L14	53.37	1.109	9	0.495	A	0.000	0.495	0.495	100.00	0.447	0.000
53.50-53.25					B	0.000	0.495		100.00	0.146	0.000
					C	0.000	0.495		100.00	0.146	0.000
L15	50.95	1.098	9	9.225	A	0.000	9.225	9.225	100.00	8.169	0.000
53.25-48.68					B	0.000	9.225		100.00	2.666	0.000
					C	0.000	9.225		100.00	2.666	0.000
L16	46.16	1.076	8	10.496	A	0.000	10.496	10.496	100.00	8.938	0.000
48.68-43.68					B	0.000	10.496		100.00	2.917	0.000
					C	0.000	10.496		100.00	2.917	0.000
L17	41.16	1.05	8	10.917	A	0.000	10.917	10.917	100.00	8.938	0.000
43.68-38.68					B	0.000	10.917		100.00	2.917	0.000
					C	0.000	10.917		100.00	2.917	0.000
L18	36.16	1.022	8	11.338	A	0.000	11.338	11.338	100.00	8.938	0.000
38.68-33.68					B	0.000	11.338		100.00	2.917	0.000
					C	0.000	11.338		100.00	2.917	0.000
L19	31.17	0.99	8	11.760	A	0.000	11.760	11.760	100.00	8.938	0.000
33.68-28.68					B	0.000	11.760		100.00	2.917	0.000
					C	0.000	11.760		100.00	2.917	0.000
L20	26.17	0.954	7	12.181	A	0.000	12.181	12.181	100.00	8.938	0.000
28.68-23.68					B	0.000	12.181		100.00	2.917	0.000
					C	0.000	12.181		100.00	2.917	0.000
L21	21.83	0.919	7	9.234	A	0.000	9.234	9.234	100.00	6.578	0.000
23.68-20.00					B	0.000	9.234		100.00	2.147	0.000
					C	0.000	9.234		100.00	2.147	0.000
L22	17.49	0.877	7	12.912	A	0.000	12.912	12.912	100.00	8.938	0.000
20.00-15.00					B	0.000	12.912		100.00	2.917	0.000
					C	0.000	12.912		100.00	2.917	0.000
L23	13.50	0.85	7	7.949	A	0.000	7.949	7.949	100.00	5.362	0.000
15.00-12.00					B	0.000	7.949		100.00	1.750	0.000
					C	0.000	7.949		100.00	1.750	0.000
L24	11.87	0.85	7	0.669	A	0.000	0.669	0.669	100.00	0.447	0.000
12.00-11.75					B	0.000	0.669		100.00	0.146	0.000
					C	0.000	0.669		100.00	0.146	0.000
L25 11.75-6.75	9.24	0.85	7	13.606	A	0.000	13.606	13.606	100.00	6.920	0.000
					B	0.000	13.606		100.00	2.917	0.000
					C	0.000	13.606		100.00	2.917	0.000
L26 6.75-1.75	4.24	0.85	7	14.027	A	0.000	14.027	14.027	100.00	5.833	0.000
					B	0.000	14.027		100.00	2.917	0.000
					C	0.000	14.027		100.00	4.813	0.000
L27 1.75-0.00	0.87	0.85	7	5.009	A	0.000	5.009	5.009	100.00	2.042	0.000
					B	0.000	5.009		100.00	1.021	0.000
					C	0.000	5.009		100.00	2.042	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	59.90	181.41	A	1	0.65	29	1	1	5.791	118.74	23.75	C
98.00-93.00			B	1	0.65		1	1	5.791			
			C	1	0.65		1	1	5.791			
L2	95.63	206.73	A	1	0.65	28	1	1	6.584	133.49	26.70	C
93.00-88.00			B	1	0.65		1	1	6.584			
			C	1	0.65		1	1	6.584			
L3	119.45	170.19	A	1	0.65	28	1	1	7.191	144.06	28.81	C
88.00-83.00			B	1	0.65		1	1	7.191			
			C	1	0.65		1	1	7.191			
L4	118.01	161.76	A	1	0.735	28	1	1	6.830	152.82	33.96	B
83.00-78.50			B	1	0.735		1	1	6.830			
			C	1	0.732		1	1	6.830			
L5	7.52	9.23	A	1	1.2	28	1	1	0.389	21.55	86.22	B
78.50-78.25			B	1	1.2		1	1	0.389			
			C	1	1.2		1	1	0.389			
L6	7.52	9.25	A	1	1.2	27	1	1	0.390	21.58	86.31	B
78.25-78.00			B	1	1.2		1	1	0.390			
			C	1	1.2		1	1	0.390			
L7	7.52	23.71	A	1	1.2	27	1	1	0.392	21.60	86.41	B
78.00-77.75			B	1	1.2		1	1	0.392			
			C	1	1.2		1	1	0.392			
L8	150.45	472.20	A	1	1.2	27	1	1	8.051	436.83	87.37	B
77.75-72.75			B	1	1.2		1	1	8.051			
			C	1	1.2		1	1	8.051			
L9	82.75	265.97	A	1	1.2	27	1	1	4.607	243.97	88.72	B
72.75-70.00			B	1	1.2		1	1	4.607			
			C	1	1.2		1	1	4.607			
L10	151.55	623.71	A	1	1.2	27	1	1	8.702	449.85	89.97	B
70.00-65.00			B	1	1.2		1	1	8.702			
			C	1	1.2		1	1	8.702			
L11	151.55	640.84	A	1	1.2	26	1	1	9.123	457.19	91.44	B
65.00-60.00			B	1	1.2		1	1	9.123			
			C	1	1.2		1	1	9.123			
L12	151.55	657.95	A	1	1.2	26	1	1	9.543	463.54	92.71	B
60.00-55.00			B	1	1.2		1	1	9.543			
			C	1	1.2		1	1	9.543			
L13	45.47	202.04	A	1	1.2	25	1	1	2.945	174.27	116.18	A
55.00-53.50			B	1	1.2		1	1	2.945			
			C	1	1.2		1	1	2.945			
L14	7.58	43.53	A	1	1.2	25	1	1	0.495	29.07	116.28	A
53.50-53.25			B	1	1.2		1	1	0.495			
			C	1	1.2		1	1	0.495			
L15	138.52	794.91	A	1	1.2	25	1	1	9.225	532.36	116.49	A
53.25-48.68			B	1	1.2		1	1	9.225			
			C	1	1.2		1	1	9.225			
L16	151.55	885.31	A	1	1.2	25	1	1	10.496	583.56	116.71	A
48.68-43.68			B	1	1.2		1	1	10.496			
			C	1	1.2		1	1	10.496			
L17	151.55	902.52	A	1	1.2	24	1	1	10.917	583.01	116.60	A
43.68-38.68			B	1	1.2		1	1	10.917			
			C	1	1.2		1	1	10.917			
L18	151.55	919.69	A	1	1.2	23	1	1	11.338	580.33	116.07	A
38.68-33.68			B	1	1.2		1	1	11.338			
			C	1	1.2		1	1	11.338			
L19	151.55	936.84	A	1	1.2	23	1	1	11.760	575.03	115.01	A
33.68-28.68			B	1	1.2		1	1	11.760			
			C	1	1.2		1	1	11.760			
L20	151.55	953.96	A	1	1.2	22	1	1	12.181	566.39	113.28	A
28.68-23.68			B	1	1.2		1	1	12.181			
			C	1	1.2		1	1	12.181			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L21	111.54	714.62	A	1	1.2	21	1	1	9.234	408.74	111.07	A
23.68-20.00			B	1	1.2		1	1	9.234			
			C	1	1.2		1	1	9.234			
L22	151.55	1084.26	A	1	1.2	20	1	1	12.912	539.67	107.93	A
20.00-15.00			B	1	1.2		1	1	12.912			
			C	1	1.2		1	1	12.912			
L23	90.93	662.22	A	1	1.2	19	1	1	7.949	319.11	106.37	A
15.00-12.00			B	1	1.2		1	1	7.949			
			C	1	1.2		1	1	7.949			
L24	7.58	50.91	A	1	1.2	19	1	1	0.669	26.77	107.07	A
12.00-11.75			B	1	1.2		1	1	0.669			
			C	1	1.2		1	1	0.669			
L25	137.25	1023.10	A	1	1.2	19	1	1	13.606	506.70	101.34	A
11.75-6.75			B	1	1.2		1	1	13.606			
			C	1	1.2		1	1	13.606			
L26 6.75-1.75	44.92	1043.44	A	1	1.2	19	1	1	14.027	528.43	105.69	A
			B	1	1.2		1	1	14.027			
			C	1	1.2		1	1	14.027			
L27 1.75-0.00	0.00	371.31	A	1	1.2	19	1	1	5.009	193.05	110.31	A
			B	1	1.2		1	1	5.009			
			C	1	1.2		1	1	5.009			
Sum Weight:	2596.49	14011.61						OTM	361.82 kip-ft	8811.70		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	59.90	181.41	A	1	0.65	29	1	1	5.791	118.74	23.75	C
98.00-93.00			B	1	0.65		1	1	5.791			
			C	1	0.65		1	1	5.791			
L2	95.63	206.73	A	1	0.65	28	1	1	6.584	133.49	26.70	C
93.00-88.00			B	1	0.65		1	1	6.584			
			C	1	0.65		1	1	6.584			
L3	119.45	170.19	A	1	0.65	28	1	1	7.191	144.06	28.81	C
88.00-83.00			B	1	0.65		1	1	7.191			
			C	1	0.65		1	1	7.191			
L4	118.01	161.76	A	1	0.732	28	1	1	6.830	152.82	33.96	C
83.00-78.50			B	1	0.735		1	1	6.830			
			C	1	0.735		1	1	6.830			
L5	7.52	9.23	A	1	1.2	28	1	1	0.389	21.55	86.22	C
78.50-78.25			B	1	1.2		1	1	0.389			
			C	1	1.2		1	1	0.389			
L6	7.52	9.25	A	1	1.2	27	1	1	0.390	21.58	86.31	C
78.25-78.00			B	1	1.2		1	1	0.390			
			C	1	1.2		1	1	0.390			
L7	7.52	23.71	A	1	1.2	27	1	1	0.392	21.60	86.41	C
78.00-77.75			B	1	1.2		1	1	0.392			
			C	1	1.2		1	1	0.392			
L8	150.45	472.20	A	1	1.2	27	1	1	8.051	436.83	87.37	C
77.75-72.75			B	1	1.2		1	1	8.051			
			C	1	1.2		1	1	8.051			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L9	82.75	265.97	A	1	1.2	27	1	1	4.607	243.97	88.72	C
72.75-70.00			B	1	1.2		1	1	4.607			
			C	1	1.2		1	1	4.607			
L10	151.55	623.71	A	1	1.2	27	1	1	8.702	449.85	89.97	C
70.00-65.00			B	1	1.2		1	1	8.702			
			C	1	1.2		1	1	8.702			
L11	151.55	640.84	A	1	1.2	26	1	1	9.123	457.19	91.44	C
65.00-60.00			B	1	1.2		1	1	9.123			
			C	1	1.2		1	1	9.123			
L12	151.55	657.95	A	1	1.2	26	1	1	9.543	463.54	92.71	C
60.00-55.00			B	1	1.2		1	1	9.543			
			C	1	1.2		1	1	9.543			
L13	45.47	202.04	A	1	1.2	25	1	1	2.945	174.27	116.18	B
55.00-53.50			B	1	1.2		1	1	2.945			
			C	1	1.2		1	1	2.945			
L14	7.58	43.53	A	1	1.2	25	1	1	0.495	29.07	116.28	B
53.50-53.25			B	1	1.2		1	1	0.495			
			C	1	1.2		1	1	0.495			
L15	138.52	794.91	A	1	1.2	25	1	1	9.225	532.36	116.49	B
53.25-48.68			B	1	1.2		1	1	9.225			
			C	1	1.2		1	1	9.225			
L16	151.55	885.31	A	1	1.2	25	1	1	10.496	583.56	116.71	B
48.68-43.68			B	1	1.2		1	1	10.496			
			C	1	1.2		1	1	10.496			
L17	151.55	902.52	A	1	1.2	24	1	1	10.917	583.01	116.60	B
43.68-38.68			B	1	1.2		1	1	10.917			
			C	1	1.2		1	1	10.917			
L18	151.55	919.69	A	1	1.2	23	1	1	11.338	580.33	116.07	B
38.68-33.68			B	1	1.2		1	1	11.338			
			C	1	1.2		1	1	11.338			
L19	151.55	936.84	A	1	1.2	23	1	1	11.760	575.03	115.01	B
33.68-28.68			B	1	1.2		1	1	11.760			
			C	1	1.2		1	1	11.760			
L20	151.55	953.96	A	1	1.2	22	1	1	12.181	566.39	113.28	B
28.68-23.68			B	1	1.2		1	1	12.181			
			C	1	1.2		1	1	12.181			
L21	111.54	714.62	A	1	1.2	21	1	1	9.234	408.74	111.07	B
23.68-20.00			B	1	1.2		1	1	9.234			
			C	1	1.2		1	1	9.234			
L22	151.55	1084.26	A	1	1.2	20	1	1	12.912	539.67	107.93	B
20.00-15.00			B	1	1.2		1	1	12.912			
			C	1	1.2		1	1	12.912			
L23	90.93	662.22	A	1	1.2	19	1	1	7.949	319.11	106.37	B
15.00-12.00			B	1	1.2		1	1	7.949			
			C	1	1.2		1	1	7.949			
L24	7.58	50.91	A	1	1.2	19	1	1	0.669	26.77	107.07	B
12.00-11.75			B	1	1.2		1	1	0.669			
			C	1	1.2		1	1	0.669			
L25	137.25	1023.10	A	1	1.2	19	1	1	13.606	506.70	101.34	B
11.75-6.75			B	1	1.2		1	1	13.606			
			C	1	1.2		1	1	13.606			
L26 6.75-1.75	44.92	1043.44	A	1	1.2	19	1	1	14.027	528.43	105.69	B
			B	1	1.2		1	1	14.027			
			C	1	1.2		1	1	14.027			
L27 1.75-0.00	0.00	371.31	A	1	1.2	19	1	1	5.009	193.05	110.31	B
			B	1	1.2		1	1	5.009			
			C	1	1.2		1	1	5.009			
Sum Weight:	2596.49	14011.61						OTM	361.82 kip-ft	8811.70		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	59.90	181.41	A	1	0.65	29	1	1	5.791	118.74	23.75	C
98.00-93.00			B	1	0.65		1	1	5.791			
			C	1	0.65		1	1	5.791			
L2	95.63	206.73	A	1	0.65	28	1	1	6.584	133.49	26.70	C
93.00-88.00			B	1	0.65		1	1	6.584			
			C	1	0.65		1	1	6.584			
L3	119.45	170.19	A	1	0.65	28	1	1	7.191	144.06	28.81	C
88.00-83.00			B	1	0.65		1	1	7.191			
			C	1	0.65		1	1	7.191			
L4	118.01	161.76	A	1	0.687	28	1	1	6.830	142.89	31.75	C
83.00-78.50			B	1	0.687		1	1	6.830			
			C	1	0.687		1	1	6.830			
L5	7.52	9.23	A	1	1.2	28	1	1	0.389	20.29	81.16	C
78.50-78.25			B	1	1.2		1	1	0.389			
			C	1	1.2		1	1	0.389			
L6	7.52	9.25	A	1	1.2	27	1	1	0.390	20.31	81.26	C
78.25-78.00			B	1	1.2		1	1	0.390			
			C	1	1.2		1	1	0.390			
L7	7.52	23.71	A	1	1.2	27	1	1	0.392	20.34	81.36	C
78.00-77.75			B	1	1.2		1	1	0.392			
			C	1	1.2		1	1	0.392			
L8	150.45	472.20	A	1	1.2	27	1	1	8.051	411.76	82.35	C
77.75-72.75			B	1	1.2		1	1	8.051			
			C	1	1.2		1	1	8.051			
L9	82.75	265.97	A	1	1.2	27	1	1	4.607	230.34	83.76	C
72.75-70.00			B	1	1.2		1	1	4.607			
			C	1	1.2		1	1	4.607			
L10	151.55	623.71	A	1	1.2	27	1	1	8.702	432.23	86.45	A
70.00-65.00			B	1	1.2		1	1	8.702			
			C	1	1.2		1	1	8.702			
L11	151.55	640.84	A	1	1.2	26	1	1	9.123	439.85	87.97	A
65.00-60.00			B	1	1.2		1	1	9.123			
			C	1	1.2		1	1	9.123			
L12	151.55	657.95	A	1	1.2	26	1	1	9.543	446.50	89.30	A
60.00-55.00			B	1	1.2		1	1	9.543			
			C	1	1.2		1	1	9.543			
L13	45.47	202.04	A	1	1.2	25	1	1	2.945	162.38	108.25	A
55.00-53.50			B	1	1.2		1	1	2.945			
			C	1	1.2		1	1	2.945			
L14	7.58	43.53	A	1	1.2	25	1	1	0.495	27.09	108.38	A
53.50-53.25			B	1	1.2		1	1	0.495			
			C	1	1.2		1	1	0.495			
L15	138.52	794.91	A	1	1.2	25	1	1	9.225	496.61	108.67	A
53.25-48.68			B	1	1.2		1	1	9.225			
			C	1	1.2		1	1	9.225			
L16	151.55	885.31	A	1	1.2	25	1	1	10.496	545.26	109.05	A
48.68-43.68			B	1	1.2		1	1	10.496			
			C	1	1.2		1	1	10.496			
L17	151.55	902.52	A	1	1.2	24	1	1	10.917	545.62	109.12	A
43.68-38.68			B	1	1.2		1	1	10.917			
			C	1	1.2		1	1	10.917			
L18	151.55	919.69	A	1	1.2	23	1	1	11.338	543.94	108.79	A

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
38.68-33.68			B	1	1.2		1	1	11.338			
			C	1	1.2		1	1	11.338			
L19	151.55	936.84	A	1	1.2	23	1	1	11.760	539.76	107.95	A
33.68-28.68			B	1	1.2		1	1	11.760			
			C	1	1.2		1	1	11.760			
L20	151.55	953.96	A	1	1.2	22	1	1	12.181	532.40	106.48	A
28.68-23.68			B	1	1.2		1	1	12.181			
			C	1	1.2		1	1	12.181			
L21	111.54	714.62	A	1	1.2	21	1	1	9.234	384.66	104.53	A
23.68-20.00			B	1	1.2		1	1	9.234			
			C	1	1.2		1	1	9.234			
L22	151.55	1084.26	A	1	1.2	20	1	1	12.912	508.45	101.69	A
20.00-15.00			B	1	1.2		1	1	12.912			
			C	1	1.2		1	1	12.912			
L23	90.93	662.22	A	1	1.2	19	1	1	7.949	300.95	100.32	A
15.00-12.00			B	1	1.2		1	1	7.949			
			C	1	1.2		1	1	7.949			
L24	7.58	50.91	A	1	1.2	19	1	1	0.669	25.25	101.02	A
12.00-11.75			B	1	1.2		1	1	0.669			
			C	1	1.2		1	1	0.669			
L25	137.25	1023.10	A	1	1.2	19	1	1	13.606	507.51	101.50	A
11.75-6.75			B	1	1.2		1	1	13.606			
			C	1	1.2		1	1	13.606			
L26 6.75-1.75	44.92	1043.44	A	1	1.2	19	1	1	14.027	516.57	103.31	A
			B	1	1.2		1	1	14.027			
			C	1	1.2		1	1	14.027			
L27 1.75-0.00	0.00	371.31	A	1	1.2	19	1	1	5.009	184.55	105.46	C
			B	1	1.2		1	1	5.009			
			C	1	1.2		1	1	5.009			
Sum Weight:	2596.49	14011.61						OTM	344.05 kip-ft	8381.82		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	59.90	339.50	A	1	1.2	8	1	1	7.181	72.23	14.45	C
98.00-93.00			B	1	1.2		1	1	7.181			
			C	1	1.2		1	1	7.181			
L2	95.63	383.07	A	1	1.2	8	1	1	7.967	79.23	15.85	C
93.00-88.00			B	1	1.2		1	1	7.967			
			C	1	1.2		1	1	7.967			
L3	119.45	360.04	A	1	1.2	7	1	1	8.566	84.18	16.84	C
88.00-83.00			B	1	1.2		1	1	8.566			
			C	1	1.2		1	1	8.566			
L4	193.24	340.14	A	1	1.2	7	1	1	8.061	78.27	17.39	C
83.00-78.50			B	1	1.2		1	1	8.061			
			C	1	1.2		1	1	8.061			
L5	20.02	19.34	A	1	1.2	7	1	1	0.458	7.10	28.39	B
78.50-78.25			B	1	1.2		1	1	0.458			
			C	1	1.2		1	1	0.458			
L6	20.01	19.39	A	1	1.2	7	1	1	0.459	7.10	28.41	B

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
78.25-78.00			B	1	1.2		1	1	0.459			
			C	1	1.2		1	1	0.459			
L7	20.01	33.87	A	1	1.2	7	1	1	0.460	7.11	28.43	B
78.00-77.75			B	1	1.2		1	1	0.460			
			C	1	1.2		1	1	0.460			
L8	399.07	679.86	A	1	1.2	7	1	1	9.408	143.11	28.62	B
77.75-72.75			B	1	1.2		1	1	9.408			
			C	1	1.2		1	1	9.408			
L9	218.60	383.77	A	1	1.2	7	1	1	5.349	79.46	28.89	B
72.75-70.00			B	1	1.2		1	1	5.349			
			C	1	1.2		1	1	5.349			
L10	416.40	844.25	A	1	1.2	7	1	1	10.045	145.67	29.13	B
70.00-65.00			B	1	1.2		1	1	10.045			
			C	1	1.2		1	1	10.045			
L11	413.81	869.38	A	1	1.2	7	1	1	10.455	147.00	29.40	B
65.00-60.00			B	1	1.2		1	1	10.455			
			C	1	1.2		1	1	10.455			
L12	411.04	894.19	A	1	1.2	7	1	1	10.865	148.04	29.61	B
60.00-55.00			B	1	1.2		1	1	10.865			
			C	1	1.2		1	1	10.865			
L13	170.50	274.37	A	1	1.2	7	1	1	3.339	55.83	37.22	A
55.00-53.50			B	1	1.2		1	1	3.339			
			C	1	1.2		1	1	3.339			
L14	28.37	55.65	A	1	1.2	7	1	1	0.560	9.30	37.22	A
53.50-53.25			B	1	1.2		1	1	0.560			
			C	1	1.2		1	1	0.560			
L15	516.47	1019.56	A	1	1.2	7	1	1	10.418	169.92	37.18	A
53.25-48.68			B	1	1.2		1	1	10.418			
			C	1	1.2		1	1	10.418			
L16	559.98	1137.66	A	1	1.2	7	1	1	11.789	185.27	37.05	A
48.68-43.68			B	1	1.2		1	1	11.789			
			C	1	1.2		1	1	11.789			
L17	554.16	1161.25	A	1	1.2	6	1	1	12.195	184.06	36.81	A
43.68-38.68			B	1	1.2		1	1	12.195			
			C	1	1.2		1	1	12.195			
L18	547.70	1184.21	A	1	1.2	6	1	1	12.600	182.20	36.44	A
38.68-33.68			B	1	1.2		1	1	12.600			
			C	1	1.2		1	1	12.600			
L19	540.42	1206.41	A	1	1.2	6	1	1	13.002	179.53	35.91	A
33.68-28.68			B	1	1.2		1	1	13.002			
			C	1	1.2		1	1	13.002			
L20	532.05	1227.62	A	1	1.2	6	1	1	13.402	175.82	35.16	A
28.68-23.68			B	1	1.2		1	1	13.402			
			C	1	1.2		1	1	13.402			
L21	385.37	917.90	A	1	1.2	6	1	1	10.117	126.22	34.30	A
23.68-20.00			B	1	1.2		1	1	10.117			
			C	1	1.2		1	1	10.117			
L22	513.53	1361.62	A	1	1.2	5	1	1	14.085	165.74	33.15	A
20.00-15.00			B	1	1.2		1	1	14.085			
			C	1	1.2		1	1	14.085			
L23	301.29	828.24	A	1	1.2	5	1	1	8.635	97.46	32.49	A
15.00-12.00			B	1	1.2		1	1	8.635			
			C	1	1.2		1	1	8.635			
L24	24.83	64.70	A	1	1.2	5	1	1	0.726	8.15	32.62	A
12.00-11.75			B	1	1.2		1	1	0.726			
			C	1	1.2		1	1	0.726			
L25	421.30	1295.98	A	1	1.2	5	1	1	14.707	152.32	30.46	A
11.75-6.75			B	1	1.2		1	1	14.707			
			C	1	1.2		1	1	14.707			
L26 6.75-1.75	316.92	1302.62	A	1	1.2	5	1	1	15.045	157.89	31.58	A

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			B	1	1.2		1	1	15.045			
			C	1	1.2		1	1	15.045			
L27 1.75-0.00	85.01	449.89	A	1	1.2	5	1	1	5.313	56.91	32.52	A
			B	1	1.2		1	1	5.313			
			C	1	1.2		1	1	5.313			
Sum Weight:	7885.10	18654.47						OTM	127.49 kip-ft	2905.12		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	59.90	339.50	A	1	1.2	8	1	1	7.181	72.23	14.45	C
98.00-93.00			B	1	1.2		1	1	7.181			
			C	1	1.2		1	1	7.181			
L2	95.63	383.07	A	1	1.2	8	1	1	7.967	79.23	15.85	C
93.00-88.00			B	1	1.2		1	1	7.967			
			C	1	1.2		1	1	7.967			
L3	119.45	360.04	A	1	1.2	7	1	1	8.566	84.18	16.84	C
88.00-83.00			B	1	1.2		1	1	8.566			
			C	1	1.2		1	1	8.566			
L4	193.24	340.14	A	1	1.2	7	1	1	8.061	78.27	17.39	C
83.00-78.50			B	1	1.2		1	1	8.061			
			C	1	1.2		1	1	8.061			
L5	20.02	19.34	A	1	1.2	7	1	1	0.458	7.10	28.39	C
78.50-78.25			B	1	1.2		1	1	0.458			
			C	1	1.2		1	1	0.458			
L6	20.01	19.39	A	1	1.2	7	1	1	0.459	7.10	28.41	C
78.25-78.00			B	1	1.2		1	1	0.459			
			C	1	1.2		1	1	0.459			
L7	20.01	33.87	A	1	1.2	7	1	1	0.460	7.11	28.43	C
78.00-77.75			B	1	1.2		1	1	0.460			
			C	1	1.2		1	1	0.460			
L8	399.07	679.86	A	1	1.2	7	1	1	9.408	143.11	28.62	C
77.75-72.75			B	1	1.2		1	1	9.408			
			C	1	1.2		1	1	9.408			
L9	218.60	383.77	A	1	1.2	7	1	1	5.349	79.46	28.89	C
72.75-70.00			B	1	1.2		1	1	5.349			
			C	1	1.2		1	1	5.349			
L10	416.40	844.25	A	1	1.2	7	1	1	10.045	145.67	29.13	C
70.00-65.00			B	1	1.2		1	1	10.045			
			C	1	1.2		1	1	10.045			
L11	413.81	869.38	A	1	1.2	7	1	1	10.455	147.00	29.40	C
65.00-60.00			B	1	1.2		1	1	10.455			
			C	1	1.2		1	1	10.455			
L12	411.04	894.19	A	1	1.2	7	1	1	10.865	148.04	29.61	C
60.00-55.00			B	1	1.2		1	1	10.865			
			C	1	1.2		1	1	10.865			
L13	170.50	274.37	A	1	1.2	7	1	1	3.339	55.83	37.22	B
55.00-53.50			B	1	1.2		1	1	3.339			
			C	1	1.2		1	1	3.339			
L14	28.37	55.65	A	1	1.2	7	1	1	0.560	9.30	37.22	B

Section Elevation ft	Add Weight .23Self W	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
53.50-53.25			B	1	1.2		1	1	0.560			
			C	1	1.2		1	1	0.560			
L15	516.47	1019.56	A	1	1.2	7	1	1	10.418	169.92	37.18	B
53.25-48.68			B	1	1.2		1	1	10.418			
			C	1	1.2		1	1	10.418			
L16	559.98	1137.66	A	1	1.2	7	1	1	11.789	185.27	37.05	B
48.68-43.68			B	1	1.2		1	1	11.789			
			C	1	1.2		1	1	11.789			
L17	554.16	1161.25	A	1	1.2	6	1	1	12.195	184.06	36.81	B
43.68-38.68			B	1	1.2		1	1	12.195			
			C	1	1.2		1	1	12.195			
L18	547.70	1184.21	A	1	1.2	6	1	1	12.600	182.20	36.44	B
38.68-33.68			B	1	1.2		1	1	12.600			
			C	1	1.2		1	1	12.600			
L19	540.42	1206.41	A	1	1.2	6	1	1	13.002	179.53	35.91	B
33.68-28.68			B	1	1.2		1	1	13.002			
			C	1	1.2		1	1	13.002			
L20	532.05	1227.62	A	1	1.2	6	1	1	13.402	175.82	35.16	B
28.68-23.68			B	1	1.2		1	1	13.402			
			C	1	1.2		1	1	13.402			
L21	385.37	917.90	A	1	1.2	6	1	1	10.117	126.22	34.30	B
23.68-20.00			B	1	1.2		1	1	10.117			
			C	1	1.2		1	1	10.117			
L22	513.53	1361.62	A	1	1.2	5	1	1	14.085	165.74	33.15	B
20.00-15.00			B	1	1.2		1	1	14.085			
			C	1	1.2		1	1	14.085			
L23	301.29	828.24	A	1	1.2	5	1	1	8.635	97.46	32.49	B
15.00-12.00			B	1	1.2		1	1	8.635			
			C	1	1.2		1	1	8.635			
L24	24.83	64.70	A	1	1.2	5	1	1	0.726	8.15	32.62	B
12.00-11.75			B	1	1.2		1	1	0.726			
			C	1	1.2		1	1	0.726			
L25	421.30	1295.98	A	1	1.2	5	1	1	14.707	152.32	30.46	B
11.75-6.75			B	1	1.2		1	1	14.707			
			C	1	1.2		1	1	14.707			
L26 6.75-1.75	316.92	1302.62	A	1	1.2	5	1	1	15.045	157.89	31.58	B
			B	1	1.2		1	1	15.045			
			C	1	1.2		1	1	15.045			
L27 1.75-0.00	85.01	449.89	A	1	1.2	5	1	1	5.313	56.91	32.52	B
			B	1	1.2		1	1	5.313			
			C	1	1.2		1	1	5.313			
Sum Weight:	7885.10	18654.47						OTM	127.49 kip-ft	2905.12		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	59.90	339.50	A	1	1.2	8	1	1	7.181	72.23	14.45	C
98.00-93.00			B	1	1.2		1	1	7.181			
			C	1	1.2		1	1	7.181			
L2	95.63	383.07	A	1	1.2	8	1	1	7.967	79.23	15.85	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
93.00-88.00			B	1	1.2		1	1	7.967			
			C	1	1.2		1	1	7.967			
L3	119.45	360.04	A	1	1.2	7	1	1	8.566	84.18	16.84	C
88.00-83.00			B	1	1.2		1	1	8.566			
			C	1	1.2		1	1	8.566			
L4	193.24	340.14	A	1	1.2	7	1	1	8.061	78.27	17.39	C
83.00-78.50			B	1	1.2		1	1	8.061			
			C	1	1.2		1	1	8.061			
L5	20.02	19.34	A	1	1.2	7	1	1	0.458	6.46	25.84	C
78.50-78.25			B	1	1.2		1	1	0.458			
			C	1	1.2		1	1	0.458			
L6	20.01	19.39	A	1	1.2	7	1	1	0.459	6.47	25.86	C
78.25-78.00			B	1	1.2		1	1	0.459			
			C	1	1.2		1	1	0.459			
L7	20.01	33.87	A	1	1.2	7	1	1	0.460	6.47	25.88	C
78.00-77.75			B	1	1.2		1	1	0.460			
			C	1	1.2		1	1	0.460			
L8	399.07	679.86	A	1	1.2	7	1	1	9.408	130.51	26.10	C
77.75-72.75			B	1	1.2		1	1	9.408			
			C	1	1.2		1	1	9.408			
L9	218.60	383.77	A	1	1.2	7	1	1	5.349	72.62	26.41	C
72.75-70.00			B	1	1.2		1	1	5.349			
			C	1	1.2		1	1	5.349			
L10	416.40	844.25	A	1	1.2	7	1	1	10.045	143.09	28.62	A
70.00-65.00			B	1	1.2		1	1	10.045			
			C	1	1.2		1	1	10.045			
L11	413.81	869.38	A	1	1.2	7	1	1	10.455	144.45	28.89	A
65.00-60.00			B	1	1.2		1	1	10.455			
			C	1	1.2		1	1	10.455			
L12	411.04	894.19	A	1	1.2	7	1	1	10.865	145.51	29.10	A
60.00-55.00			B	1	1.2		1	1	10.865			
			C	1	1.2		1	1	10.865			
L13	170.50	274.37	A	1	1.2	7	1	1	3.339	53.13	35.42	A
55.00-53.50			B	1	1.2		1	1	3.339			
			C	1	1.2		1	1	3.339			
L14	28.37	55.65	A	1	1.2	7	1	1	0.560	8.85	35.42	A
53.50-53.25			B	1	1.2		1	1	0.560			
			C	1	1.2		1	1	0.560			
L15	516.47	1019.56	A	1	1.2	7	1	1	10.418	161.77	35.40	A
53.25-48.68			B	1	1.2		1	1	10.418			
			C	1	1.2		1	1	10.418			
L16	559.98	1137.66	A	1	1.2	7	1	1	11.789	176.52	35.30	A
48.68-43.68			B	1	1.2		1	1	11.789			
			C	1	1.2		1	1	11.789			
L17	554.16	1161.25	A	1	1.2	6	1	1	12.195	175.51	35.10	A
43.68-38.68			B	1	1.2		1	1	12.195			
			C	1	1.2		1	1	12.195			
L18	547.70	1184.21	A	1	1.2	6	1	1	12.600	173.86	34.77	A
38.68-33.68			B	1	1.2		1	1	12.600			
			C	1	1.2		1	1	12.600			
L19	540.42	1206.41	A	1	1.2	6	1	1	13.002	171.42	34.28	A
33.68-28.68			B	1	1.2		1	1	13.002			
			C	1	1.2		1	1	13.002			
L20	532.05	1227.62	A	1	1.2	6	1	1	13.402	167.99	33.60	A
28.68-23.68			B	1	1.2		1	1	13.402			
			C	1	1.2		1	1	13.402			
L21	385.37	917.90	A	1	1.2	6	1	1	10.117	120.66	32.79	A
23.68-20.00			B	1	1.2		1	1	10.117			
			C	1	1.2		1	1	10.117			
L22	513.53	1361.62	A	1	1.2	5	1	1	14.085	158.50	31.70	A

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
20.00-15.00			B	1	1.2		1	1	14.085			
			C	1	1.2		1	1	14.085			
L23	301.29	828.24	A	1	1.2	5	1	1	8.635	93.23	31.08	A
15.00-12.00			B	1	1.2		1	1	8.635			
			C	1	1.2		1	1	8.635			
L24	24.83	64.70	A	1	1.2	5	1	1	0.726	7.80	31.21	A
12.00-11.75			B	1	1.2		1	1	0.726			
			C	1	1.2		1	1	0.726			
L25	421.30	1295.98	A	1	1.2	5	1	1	14.707	153.09	30.62	A
11.75-6.75			B	1	1.2		1	1	14.707			
			C	1	1.2		1	1	14.707			
L26 6.75-1.75	316.92	1302.62	A	1	1.2	5	1	1	15.045	152.61	30.52	A
			B	1	1.2		1	1	15.045			
			C	1	1.2		1	1	15.045			
L27 1.75-0.00	85.01	449.89	A	1	1.2	5	1	1	5.313	54.53	31.16	C
			B	1	1.2		1	1	5.313			
			C	1	1.2		1	1	5.313			
Sum Weight:	7885.10	18654.47						OTM	123.00 kip-ft	2798.96		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	59.90	181.41	A	1	0.65	10	1	1	5.791	40.65	8.13	C
98.00-93.00			B	1	0.65		1	1	5.791			
			C	1	0.65		1	1	5.791			
L2	95.63	206.73	A	1	0.65	10	1	1	6.584	45.70	9.14	C
93.00-88.00			B	1	0.65		1	1	6.584			
			C	1	0.65		1	1	6.584			
L3	119.45	170.19	A	1	0.65	10	1	1	7.191	49.32	9.86	C
88.00-83.00			B	1	0.65		1	1	7.191			
			C	1	0.65		1	1	7.191			
L4	118.01	161.76	A	1	0.735	9	1	1	6.830	52.31	11.63	B
83.00-78.50			B	1	0.735		1	1	6.830			
			C	1	0.732		1	1	6.830			
L5	7.52	9.23	A	1	1.2	9	1	1	0.389	7.38	29.52	B
78.50-78.25			B	1	1.2		1	1	0.389			
			C	1	1.2		1	1	0.389			
L6	7.52	9.25	A	1	1.2	9	1	1	0.390	7.39	29.55	B
78.25-78.00			B	1	1.2		1	1	0.390			
			C	1	1.2		1	1	0.390			
L7	7.52	23.71	A	1	1.2	9	1	1	0.392	7.39	29.58	B
78.00-77.75			B	1	1.2		1	1	0.392			
			C	1	1.2		1	1	0.392			
L8	150.45	472.20	A	1	1.2	9	1	1	8.051	149.54	29.91	B
77.75-72.75			B	1	1.2		1	1	8.051			
			C	1	1.2		1	1	8.051			
L9	82.75	265.97	A	1	1.2	9	1	1	4.607	83.52	30.37	B
72.75-70.00			B	1	1.2		1	1	4.607			
			C	1	1.2		1	1	4.607			
L10	151.55	623.71	A	1	1.2	9	1	1	8.702	154.00	30.80	B

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
70.00-65.00			B	1	1.2		1	1	8.702			
			C	1	1.2		1	1	8.702			
L11	151.55	640.84	A	1	1.2	9	1	1	9.123	156.51	31.30	B
65.00-60.00			B	1	1.2		1	1	9.123			
			C	1	1.2		1	1	9.123			
L12	151.55	657.95	A	1	1.2	9	1	1	9.543	158.69	31.74	B
60.00-55.00			B	1	1.2		1	1	9.543			
			C	1	1.2		1	1	9.543			
L13	45.47	202.04	A	1	1.2	9	1	1	2.945	59.66	39.77	A
55.00-53.50			B	1	1.2		1	1	2.945			
			C	1	1.2		1	1	2.945			
L14	7.58	43.53	A	1	1.2	9	1	1	0.495	9.95	39.81	A
53.50-53.25			B	1	1.2		1	1	0.495			
			C	1	1.2		1	1	0.495			
L15	138.52	794.91	A	1	1.2	9	1	1	9.225	182.25	39.88	A
53.25-48.68			B	1	1.2		1	1	9.225			
			C	1	1.2		1	1	9.225			
L16	151.55	885.31	A	1	1.2	8	1	1	10.496	199.78	39.96	A
48.68-43.68			B	1	1.2		1	1	10.496			
			C	1	1.2		1	1	10.496			
L17	151.55	902.52	A	1	1.2	8	1	1	10.917	199.58	39.92	A
43.68-38.68			B	1	1.2		1	1	10.917			
			C	1	1.2		1	1	10.917			
L18	151.55	919.69	A	1	1.2	8	1	1	11.338	198.67	39.73	A
38.68-33.68			B	1	1.2		1	1	11.338			
			C	1	1.2		1	1	11.338			
L19	151.55	936.84	A	1	1.2	8	1	1	11.760	196.85	39.37	A
33.68-28.68			B	1	1.2		1	1	11.760			
			C	1	1.2		1	1	11.760			
L20	151.55	953.96	A	1	1.2	7	1	1	12.181	193.89	38.78	A
28.68-23.68			B	1	1.2		1	1	12.181			
			C	1	1.2		1	1	12.181			
L21	111.54	714.62	A	1	1.2	7	1	1	9.234	139.93	38.02	A
23.68-20.00			B	1	1.2		1	1	9.234			
			C	1	1.2		1	1	9.234			
L22	151.55	1084.26	A	1	1.2	7	1	1	12.912	184.75	36.95	A
20.00-15.00			B	1	1.2		1	1	12.912			
			C	1	1.2		1	1	12.912			
L23	90.93	662.22	A	1	1.2	7	1	1	7.949	109.24	36.41	A
15.00-12.00			B	1	1.2		1	1	7.949			
			C	1	1.2		1	1	7.949			
L24	7.58	50.91	A	1	1.2	7	1	1	0.669	9.16	36.66	A
12.00-11.75			B	1	1.2		1	1	0.669			
			C	1	1.2		1	1	0.669			
L25	137.25	1023.10	A	1	1.2	7	1	1	13.606	173.46	34.69	A
11.75-6.75			B	1	1.2		1	1	13.606			
			C	1	1.2		1	1	13.606			
L26 6.75-1.75	44.92	1043.44	A	1	1.2	7	1	1	14.027	180.90	36.18	A
			B	1	1.2		1	1	14.027			
			C	1	1.2		1	1	14.027			
L27 1.75-0.00	0.00	371.31	A	1	1.2	7	1	1	5.009	66.09	37.76	A
			B	1	1.2		1	1	5.009			
			C	1	1.2		1	1	5.009			
Sum Weight:	2596.49	14011.61						OTM	123.87 kip-ft	3016.58		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	59.90	181.41	A	1	0.65	10	1	1	5.791	40.65	8.13	C
98.00-93.00			B	1	0.65		1	1	5.791			
			C	1	0.65		1	1	5.791			
L2	95.63	206.73	A	1	0.65	10	1	1	6.584	45.70	9.14	C
93.00-88.00			B	1	0.65		1	1	6.584			
			C	1	0.65		1	1	6.584			
L3	119.45	170.19	A	1	0.65	10	1	1	7.191	49.32	9.86	C
88.00-83.00			B	1	0.65		1	1	7.191			
			C	1	0.65		1	1	7.191			
L4	118.01	161.76	A	1	0.732	9	1	1	6.830	52.31	11.63	C
83.00-78.50			B	1	0.735		1	1	6.830			
			C	1	0.735		1	1	6.830			
L5	7.52	9.23	A	1	1.2	9	1	1	0.389	7.38	29.52	C
78.50-78.25			B	1	1.2		1	1	0.389			
			C	1	1.2		1	1	0.389			
L6	7.52	9.25	A	1	1.2	9	1	1	0.390	7.39	29.55	C
78.25-78.00			B	1	1.2		1	1	0.390			
			C	1	1.2		1	1	0.390			
L7	7.52	23.71	A	1	1.2	9	1	1	0.392	7.39	29.58	C
78.00-77.75			B	1	1.2		1	1	0.392			
			C	1	1.2		1	1	0.392			
L8	150.45	472.20	A	1	1.2	9	1	1	8.051	149.54	29.91	C
77.75-72.75			B	1	1.2		1	1	8.051			
			C	1	1.2		1	1	8.051			
L9	82.75	265.97	A	1	1.2	9	1	1	4.607	83.52	30.37	C
72.75-70.00			B	1	1.2		1	1	4.607			
			C	1	1.2		1	1	4.607			
L10	151.55	623.71	A	1	1.2	9	1	1	8.702	154.00	30.80	C
70.00-65.00			B	1	1.2		1	1	8.702			
			C	1	1.2		1	1	8.702			
L11	151.55	640.84	A	1	1.2	9	1	1	9.123	156.51	31.30	C
65.00-60.00			B	1	1.2		1	1	9.123			
			C	1	1.2		1	1	9.123			
L12	151.55	657.95	A	1	1.2	9	1	1	9.543	158.69	31.74	C
60.00-55.00			B	1	1.2		1	1	9.543			
			C	1	1.2		1	1	9.543			
L13	45.47	202.04	A	1	1.2	9	1	1	2.945	59.66	39.77	B
55.00-53.50			B	1	1.2		1	1	2.945			
			C	1	1.2		1	1	2.945			
L14	7.58	43.53	A	1	1.2	9	1	1	0.495	9.95	39.81	B
53.50-53.25			B	1	1.2		1	1	0.495			
			C	1	1.2		1	1	0.495			
L15	138.52	794.91	A	1	1.2	9	1	1	9.225	182.25	39.88	B
53.25-48.68			B	1	1.2		1	1	9.225			
			C	1	1.2		1	1	9.225			
L16	151.55	885.31	A	1	1.2	8	1	1	10.496	199.78	39.96	B
48.68-43.68			B	1	1.2		1	1	10.496			
			C	1	1.2		1	1	10.496			
L17	151.55	902.52	A	1	1.2	8	1	1	10.917	199.58	39.92	B
43.68-38.68			B	1	1.2		1	1	10.917			
			C	1	1.2		1	1	10.917			
L18	151.55	919.69	A	1	1.2	8	1	1	11.338	198.67	39.73	B
38.68-33.68			B	1	1.2		1	1	11.338			
			C	1	1.2		1	1	11.338			
L19	151.55	936.84	A	1	1.2	8	1	1	11.760	196.85	39.37	B
33.68-28.68			B	1	1.2		1	1	11.760			
			C	1	1.2		1	1	11.760			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L20	151.55	953.96	A	1	1.2	7	1	1	12.181	193.89	38.78	B
28.68-23.68			B	1	1.2		1	1	12.181			
			C	1	1.2		1	1	12.181			
L21	111.54	714.62	A	1	1.2	7	1	1	9.234	139.93	38.02	B
23.68-20.00			B	1	1.2		1	1	9.234			
			C	1	1.2		1	1	9.234			
L22	151.55	1084.26	A	1	1.2	7	1	1	12.912	184.75	36.95	B
20.00-15.00			B	1	1.2		1	1	12.912			
			C	1	1.2		1	1	12.912			
L23	90.93	662.22	A	1	1.2	7	1	1	7.949	109.24	36.41	B
15.00-12.00			B	1	1.2		1	1	7.949			
			C	1	1.2		1	1	7.949			
L24	7.58	50.91	A	1	1.2	7	1	1	0.669	9.16	36.66	B
12.00-11.75			B	1	1.2		1	1	0.669			
			C	1	1.2		1	1	0.669			
L25	137.25	1023.10	A	1	1.2	7	1	1	13.606	173.46	34.69	B
11.75-6.75			B	1	1.2		1	1	13.606			
			C	1	1.2		1	1	13.606			
L26 6.75-1.75	44.92	1043.44	A	1	1.2	7	1	1	14.027	180.90	36.18	B
			B	1	1.2		1	1	14.027			
			C	1	1.2		1	1	14.027			
L27 1.75-0.00	0.00	371.31	A	1	1.2	7	1	1	5.009	66.09	37.76	B
			B	1	1.2		1	1	5.009			
			C	1	1.2		1	1	5.009			
Sum Weight:	2596.49	14011.61						OTM	123.87 kip-ft	3016.58		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	59.90	181.41	A	1	0.65	10	1	1	5.791	40.65	8.13	C
98.00-93.00			B	1	0.65		1	1	5.791			
			C	1	0.65		1	1	5.791			
L2	95.63	206.73	A	1	0.65	10	1	1	6.584	45.70	9.14	C
93.00-88.00			B	1	0.65		1	1	6.584			
			C	1	0.65		1	1	6.584			
L3	119.45	170.19	A	1	0.65	10	1	1	7.191	49.32	9.86	C
88.00-83.00			B	1	0.65		1	1	7.191			
			C	1	0.65		1	1	7.191			
L4	118.01	161.76	A	1	0.687	9	1	1	6.830	48.92	10.87	C
83.00-78.50			B	1	0.687		1	1	6.830			
			C	1	0.687		1	1	6.830			
L5	7.52	9.23	A	1	1.2	9	1	1	0.389	6.95	27.78	C
78.50-78.25			B	1	1.2		1	1	0.389			
			C	1	1.2		1	1	0.389			
L6	7.52	9.25	A	1	1.2	9	1	1	0.390	6.95	27.82	C
78.25-78.00			B	1	1.2		1	1	0.390			
			C	1	1.2		1	1	0.390			
L7	7.52	23.71	A	1	1.2	9	1	1	0.392	6.96	27.85	C
78.00-77.75			B	1	1.2		1	1	0.392			
			C	1	1.2		1	1	0.392			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L8	150.45	472.20	A	1	1.2	9	1	1	8.051	140.96	28.19	C
77.75-72.75			B	1	1.2		1	1	8.051			
			C	1	1.2		1	1	8.051			
L9	82.75	265.97	A	1	1.2	9	1	1	4.607	78.85	28.67	C
72.75-70.00			B	1	1.2		1	1	4.607			
			C	1	1.2		1	1	4.607			
L10	151.55	623.71	A	1	1.2	9	1	1	8.702	147.97	29.59	A
70.00-65.00			B	1	1.2		1	1	8.702			
			C	1	1.2		1	1	8.702			
L11	151.55	640.84	A	1	1.2	9	1	1	9.123	150.58	30.12	A
65.00-60.00			B	1	1.2		1	1	9.123			
			C	1	1.2		1	1	9.123			
L12	151.55	657.95	A	1	1.2	9	1	1	9.543	152.85	30.57	A
60.00-55.00			B	1	1.2		1	1	9.543			
			C	1	1.2		1	1	9.543			
L13	45.47	202.04	A	1	1.2	9	1	1	2.945	55.59	37.06	A
55.00-53.50			B	1	1.2		1	1	2.945			
			C	1	1.2		1	1	2.945			
L14	7.58	43.53	A	1	1.2	9	1	1	0.495	9.28	37.10	A
53.50-53.25			B	1	1.2		1	1	0.495			
			C	1	1.2		1	1	0.495			
L15	138.52	794.91	A	1	1.2	9	1	1	9.225	170.01	37.20	A
53.25-48.68			B	1	1.2		1	1	9.225			
			C	1	1.2		1	1	9.225			
L16	151.55	885.31	A	1	1.2	8	1	1	10.496	186.66	37.33	A
48.68-43.68			B	1	1.2		1	1	10.496			
			C	1	1.2		1	1	10.496			
L17	151.55	902.52	A	1	1.2	8	1	1	10.917	186.78	37.36	A
43.68-38.68			B	1	1.2		1	1	10.917			
			C	1	1.2		1	1	10.917			
L18	151.55	919.69	A	1	1.2	8	1	1	11.338	186.21	37.24	A
38.68-33.68			B	1	1.2		1	1	11.338			
			C	1	1.2		1	1	11.338			
L19	151.55	936.84	A	1	1.2	8	1	1	11.760	184.78	36.96	A
33.68-28.68			B	1	1.2		1	1	11.760			
			C	1	1.2		1	1	11.760			
L20	151.55	953.96	A	1	1.2	7	1	1	12.181	182.26	36.45	A
28.68-23.68			B	1	1.2		1	1	12.181			
			C	1	1.2		1	1	12.181			
L21	111.54	714.62	A	1	1.2	7	1	1	9.234	131.68	35.78	A
23.68-20.00			B	1	1.2		1	1	9.234			
			C	1	1.2		1	1	9.234			
L22	151.55	1084.26	A	1	1.2	7	1	1	12.912	174.06	34.81	A
20.00-15.00			B	1	1.2		1	1	12.912			
			C	1	1.2		1	1	12.912			
L23	90.93	662.22	A	1	1.2	7	1	1	7.949	103.03	34.34	A
15.00-12.00			B	1	1.2		1	1	7.949			
			C	1	1.2		1	1	7.949			
L24	7.58	50.91	A	1	1.2	7	1	1	0.669	8.65	34.58	A
12.00-11.75			B	1	1.2		1	1	0.669			
			C	1	1.2		1	1	0.669			
L25	137.25	1023.10	A	1	1.2	7	1	1	13.606	173.74	34.75	A
11.75-6.75			B	1	1.2		1	1	13.606			
			C	1	1.2		1	1	13.606			
L26 6.75-1.75	44.92	1043.44	A	1	1.2	7	1	1	14.027	176.84	35.37	A
			B	1	1.2		1	1	14.027			
			C	1	1.2		1	1	14.027			
L27 1.75-0.00	0.00	371.31	A	1	1.2	7	1	1	5.009	63.18	36.10	C
			B	1	1.2		1	1	5.009			
			C	1	1.2		1	1	5.009			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
Sum Weight:	2596.49	14011.61						OTM	117.78 kip-ft	2869.41		

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service

Comb. No.	Description
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 lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	98 - 93	Pole	Max Tension	26	0.00	0.00	-0.00
			Max. Compression	26	-5106.20	-0.01	-0.00
			Max. Mx	8	-1945.02	-17.05	-0.00
			Max. My	14	-1947.73	-0.01	-17.04
			Max. Vy	8	3825.69	-17.05	-0.00
			Max. Vx	14	3824.38	-0.01	-17.04
			Max. Torque	14			-0.00
L2	93 - 88	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-12468.92	-1.27	-0.53
			Max. Mx	8	-4987.49	-52.27	-0.31
			Max. My	14	-4998.57	-0.57	-51.79
			Max. Vy	8	9070.22	-52.27	-0.31
			Max. Vx	14	9002.79	-0.57	-51.79
			Max. Torque	4			-1.22
L3	88 - 83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-13115.98	-1.60	-0.35
			Max. Mx	8	-5421.06	-98.49	-0.44
			Max. My	14	-5431.46	-0.97	-97.41
			Max. Vy	8	9319.17	-98.49	-0.44
			Max. Vx	14	9251.79	-0.97	-97.41
			Max. Torque	4			-1.25
L4	83 - 78.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19809.04	-2.50	-0.27
			Max. Mx	8	-7383.64	-149.45	-0.54
			Max. My	2	-7398.91	-0.15	147.47
			Max. Vy	8	14540.57	-149.45	-0.54
			Max. Vx	14	14441.50	-1.42	-147.46
			Max. Torque	14			1.73
L5	78.5 - 78.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19851.75	-2.51	-0.27
			Max. Mx	8	-7417.77	-153.09	-0.54
			Max. My	2	-7432.61	-0.14	151.08
			Max. Vy	8	14567.56	-153.09	-0.54
			Max. Vx	14	14469.15	-1.43	-151.07
			Max. Torque	14			1.73
L6	78.25 - 78	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19894.50	-2.52	-0.27
			Max. Mx	8	-7441.86	-156.73	-0.55
			Max. My	2	-7456.48	-0.14	154.70
			Max. Vy	8	14598.17	-156.73	-0.55
			Max. Vx	14	14501.71	-1.44	-154.69
			Max. Torque	14			1.74
L7	78 - 77.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19954.62	-2.53	-0.27
			Max. Mx	8	-7481.22	-160.38	-0.55
			Max. My	2	-7495.66	-0.14	158.33
			Max. Vy	8	14630.86	-160.38	-0.55
			Max. Vx	14	14536.43	-1.45	-158.32
			Max. Torque	14			1.74
L8	77.75 - 72.75	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-21158.08	-2.68	-0.27
			Max. Mx	8	-8228.13	-235.21	-0.64
			Max. My	14	-8238.88	-1.67	-232.78
			Max. Vy	8	15310.82	-235.21	-0.64
			Max. Vx	14	15255.56	-1.67	-232.78
			Max. Torque	14			1.87
L9	72.75 - 70	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21830.19	-2.77	-0.26
			Max. Mx	8	-8652.19	-277.83	-0.69
			Max. My	14	-8661.57	-1.80	-275.27
			Max. Vy	8	15687.98	-277.83	-0.69
			Max. Vx	14	15653.40	-1.80	-275.27
			Max. Torque	14			1.94
L10	70 - 65	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23245.89	-2.92	-0.25
			Max. Mx	8	-9600.23	-357.98	-0.78
			Max. My	14	-9607.35	-2.02	-355.34
			Max. Vy	8	16386.93	-357.98	-0.78
			Max. Vx	14	16389.35	-2.02	-355.34
			Max. Torque	14			2.06
L11	65 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24687.57	-3.06	-0.24
			Max. Mx	8	-10577.03	-441.64	-0.87
			Max. My	14	-10582.25	-2.24	-439.11
			Max. Vy	8	17090.33	-441.64	-0.87
			Max. Vx	14	17129.18	-2.24	-439.11
			Max. Torque	14			2.19
L12	60 - 55	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26154.70	-3.21	-0.23
			Max. Mx	8	-11585.55	-528.82	-0.96
			Max. My	14	-11589.23	-2.45	-526.57
			Max. Vy	8	17794.26	-528.82	-0.96
			Max. Vx	14	17868.92	-2.45	-526.57
			Max. Torque	14			2.32
L13	55 - 53.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26649.07	-3.25	-0.16
			Max. Mx	8	-11889.45	-555.70	-0.98
			Max. My	14	-11894.81	-2.52	-553.53
			Max. Vy	8	18053.80	-555.70	-0.98
			Max. Vx	14	18093.36	-2.52	-553.53
			Max. Torque	14			2.34
L14	53.5 - 53.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26743.31	-3.27	-0.15
			Max. Mx	8	-11961.98	-560.22	-0.99
			Max. My	14	-11967.59	-2.53	-558.06
			Max. Vy	8	18093.77	-560.22	-0.99
			Max. Vx	14	18125.05	-2.53	-558.06
			Max. Torque	14			2.34
L15	53.25 - 48.68	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28466.03	-3.37	0.04
			Max. Mx	8	-13101.80	-644.70	-1.07
			Max. My	14	-13111.99	-2.73	-642.46
			Max. Vy	8	18892.85	-644.70	-1.07
			Max. Vx	14	18820.63	-2.73	-642.46
			Max. Torque	14			2.40
L16	48.68 - 43.68	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30371.04	-3.50	0.26
			Max. Mx	8	-14385.10	-741.28	-1.17
			Max. My	14	-14399.32	-2.95	-738.40
			Max. Vy	8	19757.66	-741.28	-1.17
			Max. Vx	14	19571.92	-2.95	-738.40

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	14			2.47
L17	43.68 - 38.68	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32297.27	-3.63	0.49
			Max. Mx	8	-15698.10	-842.17	-1.26
			Max. My	14	-15715.27	-3.17	-838.08
			Max. Vy	8	20612.45	-842.17	-1.26
			Max. Vx	14	20315.95	-3.17	-838.08
			Max. Torque	14			2.54
L18	38.68 - 33.68	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34243.14	-3.75	0.71
			Max. Mx	8	-17041.79	-947.28	-1.35
			Max. My	14	-17060.75	-3.38	-941.45
			Max. Vy	8	21452.74	-947.28	-1.35
			Max. Vx	14	21048.56	-3.38	-941.45
			Max. Torque	14			2.61
L19	33.68 - 28.68	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-36207.73	-3.87	0.93
			Max. Mx	8	-18416.27	-1056.55	-1.44
			Max. My	14	-18435.81	-3.59	-1048.44
			Max. Vy	8	22273.85	-1056.55	-1.44
			Max. Vx	14	21765.46	-3.59	-1048.44
			Max. Torque	14			2.68
L20	28.68 - 23.68	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38188.57	-3.99	1.16
			Max. Mx	8	-19820.20	-1169.86	-1.53
			Max. My	14	-19839.11	-3.80	-1158.96
			Max. Vy	8	23071.22	-1169.86	-1.53
			Max. Vx	14	22462.59	-3.80	-1158.96
			Max. Torque	14			2.75
L21	23.68 - 20	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39657.11	-4.07	1.33
			Max. Mx	8	-20871.74	-1255.77	-1.59
			Max. My	14	-20889.51	-3.96	-1242.51
			Max. Vy	8	23640.77	-1255.77	-1.59
			Max. Vx	14	22961.33	-3.96	-1242.51
			Max. Torque	14			2.80
L22	20 - 15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41779.46	-4.19	1.55
			Max. Mx	8	-22442.13	-1375.78	-1.68
			Max. My	14	-22457.41	-4.16	-1358.89
			Max. Vy	8	24384.49	-1375.78	-1.68
			Max. Vx	14	23613.32	-4.16	-1358.89
			Max. Torque	24			-2.88
L23	15 - 12	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43059.65	-4.26	1.69
			Max. Mx	8	-23400.02	-1449.55	-1.74
			Max. My	14	-23413.37	-4.29	-1430.27
			Max. Vy	8	24819.66	-1449.55	-1.74
			Max. Vx	14	23995.31	-4.29	-1430.27
			Max. Torque	24			-2.97
L24	12 - 11.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43160.89	-4.28	1.70
			Max. Mx	8	-23482.69	-1455.76	-1.74
			Max. My	14	-23495.50	-4.30	-1436.27
			Max. Vy	8	24850.90	-1455.76	-1.74
			Max. Vx	14	24020.09	-4.30	-1436.27
			Max. Torque	24			-2.98
L25	11.75 - 6.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45110.26	-4.34	1.84
			Max. Mx	8	-24974.46	-1581.55	-1.83
			Max. My	14	-24982.45	-4.50	-1557.92

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	8	25483.05	-1581.55	-1.83
			Max. Vx	14	24656.50	-4.50	-1557.92
			Max. Torque	24			-3.09
L26	6.75 - 1.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46947.49	-4.38	1.88
			Max. Mx	8	-26394.90	-1710.58	-1.91
			Max. My	14	-26397.50	-4.70	-1682.72
			Max. Vy	8	26154.71	-1710.58	-1.91
			Max. Vx	14	25289.10	-4.70	-1682.72
			Max. Torque	24			-3.14
L27	1.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47556.65	-4.40	1.88
			Max. Mx	8	-26872.41	-1756.55	-1.94
			Max. My	14	-26873.46	-4.77	-1727.15
			Max. Vy	8	26417.80	-1756.55	-1.94
			Max. Vx	14	25521.41	-4.77	-1727.15
			Max. Torque	24			-3.16

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	26	47556.65	1.62	-0.16
	Max. H_x	21	20169.81	26368.35	2.37
	Max. H_z	3	20169.82	13.43	25489.93
	Max. M_x	2	1726.32	13.43	25489.91
	Max. M_z	8	1756.55	-26396.76	-17.01
	Max. Torsion	12	3.15	-13060.73	-22480.49
	Min. Vert	9	20169.81	-26396.97	-17.01
	Min. H_x	9	20169.81	-26396.97	-17.01
	Min. H_z	15	20169.82	-40.78	-25500.75
	Min. M_x	14	-1727.15	-40.78	-25500.72
	Min. M_z	20	-1752.55	26368.14	2.37
	Min. Torsion	24	-3.16	13024.16	22457.43

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	22410.92	-0.08	-0.00	-0.03	-0.64	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	26893.10	-13.43	-25489.91	-1726.32	0.89	2.94
0.9 Dead+1.6 Wind 0 deg - No Ice	20169.82	-13.43	-25489.93	-1715.80	1.08	2.93
1.2 Dead+1.6 Wind 30 deg - No Ice	26893.10	13275.10	-22927.83	-1515.07	-878.76	2.15
0.9 Dead+1.6 Wind 30 deg - No Ice	20169.82	13275.10	-22927.82	-1505.91	-873.25	2.14
1.2 Dead+1.6 Wind 60 deg - No Ice	26893.10	23571.54	-13491.08	-883.32	-1549.10	0.65
0.9 Dead+1.6 Wind 60 deg - No	20169.82	23571.54	-13491.07	-878.00	-1539.58	0.64

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Ice						
1.2 Dead+1.6 Wind 90 deg - No Ice	26893.07	26396.76	17.01	1.94	-1756.55	-0.99
0.9 Dead+1.6 Wind 90 deg - No Ice	20169.81	26396.97	17.01	1.94	-1745.74	-1.00
1.2 Dead+1.6 Wind 120 deg - No Ice	26893.10	23618.62	13575.97	889.21	-1549.94	-2.96
0.9 Dead+1.6 Wind 120 deg - No Ice	20169.82	23618.61	13575.96	883.87	-1540.41	-2.96
1.2 Dead+1.6 Wind 150 deg - No Ice	26893.10	13060.73	22480.49	1500.83	-874.91	-3.15
0.9 Dead+1.6 Wind 150 deg - No Ice	20169.82	13060.73	22480.48	1491.74	-869.39	-3.14
1.2 Dead+1.6 Wind 180 deg - No Ice	26893.10	40.78	25500.72	1727.15	-4.77	-3.01
0.9 Dead+1.6 Wind 180 deg - No Ice	20169.82	40.78	25500.75	1716.64	-4.54	-2.99
1.2 Dead+1.6 Wind 210 deg - No Ice	26893.10	-13311.54	22917.90	1514.15	880.22	-2.16
0.9 Dead+1.6 Wind 210 deg - No Ice	20169.82	-13311.54	22917.90	1505.02	875.11	-2.15
1.2 Dead+1.6 Wind 240 deg - No Ice	26893.10	-23554.01	13523.16	885.93	1546.03	-0.56
0.9 Dead+1.6 Wind 240 deg - No Ice	20169.82	-23554.01	13523.16	880.62	1536.93	-0.56
1.2 Dead+1.6 Wind 270 deg - No Ice	26893.07	-26368.14	-2.37	-0.79	1752.55	0.99
0.9 Dead+1.6 Wind 270 deg - No Ice	20169.81	-26368.35	-2.37	-0.77	1742.16	0.99
1.2 Dead+1.6 Wind 300 deg - No Ice	26893.10	-23592.38	-13550.20	-887.11	1546.14	2.95
0.9 Dead+1.6 Wind 300 deg - No Ice	20169.82	-23592.38	-13550.20	-881.77	1537.04	2.94
1.2 Dead+1.6 Wind 330 deg - No Ice	26893.10	-13024.16	-22457.43	-1498.97	870.25	3.16
0.9 Dead+1.6 Wind 330 deg - No Ice	20169.82	-13024.16	-22457.43	-1489.87	865.16	3.15
1.2 Dead+1.0 Ice+1.0 Temp	47556.65	-1.62	0.16	-1.88	-4.40	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	47556.65	-12.55	-5622.73	-411.56	-3.35	0.65
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	47556.65	2931.88	-5064.41	-361.47	-212.89	0.45
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	47556.65	5179.19	-2953.83	-210.07	-370.95	0.11
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	47556.65	5818.91	13.45	-0.59	-420.84	-0.25
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	47556.65	5197.18	2987.70	209.07	-372.00	-0.65
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	47556.65	2874.19	4928.25	353.09	-212.27	-0.69
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	47556.65	17.94	5625.14	407.94	-6.32	-0.66
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	47556.65	-2939.99	5062.62	357.49	204.40	-0.45
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	47556.65	-5175.85	2960.89	206.85	361.46	-0.09
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	47556.65	-5813.27	-10.19	-2.96	411.15	0.25
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	47556.65	-5191.91	-2981.89	-212.40	362.34	0.65
1.2 Dead+1.0 Wind 330	47556.65	-2866.06	-4923.54	-356.51	202.37	0.69

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	22410.91	-2.87	-5453.49	-368.13	-0.31	0.35
Dead+Wind 30 deg - Service	22410.91	2840.29	-4905.55	-323.11	-187.89	0.34
Dead+Wind 60 deg - Service	22410.91	5043.07	-2886.38	-188.38	-330.83	0.29
Dead+Wind 90 deg - Service	22410.91	5646.96	3.64	0.39	-375.01	0.12
Dead+Wind 120 deg - Service	22410.91	5053.35	2904.66	189.60	-331.03	-0.08
Dead+Wind 150 deg - Service	22410.91	2794.42	4809.84	320.02	-187.06	-0.26
Dead+Wind 180 deg - Service	22410.91	8.72	5455.81	368.26	-1.51	-0.37
Dead+Wind 210 deg - Service	22410.91	-2847.97	4903.22	322.85	187.20	-0.34
Dead+Wind 240 deg - Service	22410.91	-5039.53	2893.37	188.91	329.20	-0.27
Dead+Wind 270 deg - Service	22410.91	-5640.85	-0.51	-0.19	373.17	-0.13
Dead+Wind 300 deg - Service	22410.91	-5047.74	-2899.15	-189.20	329.22	0.08
Dead+Wind 330 deg - Service	22410.91	-2786.48	-4804.70	-319.65	185.07	0.27

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-22410.92	0.00	0.08	22410.92	0.00	0.000%
2	-13.43	-26893.10	-25489.98	13.43	26893.10	25489.91	0.000%
3	-13.43	-20169.82	-25489.98	13.43	20169.82	25489.93	0.000%
4	13275.10	-26893.10	-22927.83	-13275.10	26893.10	22927.83	0.000%
5	13275.10	-20169.82	-22927.83	-13275.10	20169.82	22927.82	0.000%
6	23571.55	-26893.10	-13491.08	-23571.54	26893.10	13491.08	0.000%
7	23571.55	-20169.82	-13491.08	-23571.54	20169.82	13491.07	0.000%
8	26397.46	-26893.10	17.01	-26396.76	26893.07	-17.01	0.002%
9	26397.46	-20169.82	17.01	-26396.97	20169.81	-17.01	0.001%
10	23618.62	-26893.10	13575.97	-23618.62	26893.10	-13575.97	0.000%
11	23618.62	-20169.82	13575.97	-23618.61	20169.82	-13575.96	0.000%
12	13060.73	-26893.10	22480.49	-13060.73	26893.10	-22480.49	0.000%
13	13060.73	-20169.82	22480.49	-13060.73	20169.82	-22480.48	0.000%
14	40.78	-26893.10	25500.79	-40.78	26893.10	-25500.72	0.000%
15	40.78	-20169.82	25500.79	-40.78	20169.82	-25500.75	0.000%
16	-13311.54	-26893.10	22917.91	13311.54	26893.10	-22917.90	0.000%
17	-13311.54	-20169.82	22917.91	13311.54	20169.82	-22917.90	0.000%
18	-23554.02	-26893.10	13523.17	23554.01	26893.10	-13523.16	0.000%
19	-23554.02	-20169.82	13523.17	23554.01	20169.82	-13523.16	0.000%
20	-26368.83	-26893.10	-2.37	26368.14	26893.07	2.37	0.002%
21	-26368.83	-20169.82	-2.37	26368.35	20169.81	2.37	0.001%
22	-23592.39	-26893.10	-13550.20	23592.38	26893.10	13550.20	0.000%
23	-23592.39	-20169.82	-13550.20	23592.38	20169.82	13550.20	0.000%
24	-13024.16	-26893.10	-22457.44	13024.16	26893.10	22457.43	0.000%
25	-13024.16	-20169.82	-22457.44	13024.16	20169.82	22457.43	0.000%
26	0.00	-47556.65	0.00	1.62	47556.65	-0.16	0.003%
27	-12.55	-47556.65	-5622.78	12.55	47556.65	5622.73	0.000%
28	2931.90	-47556.65	-5064.45	-2931.88	47556.65	5064.41	0.000%
29	5179.23	-47556.65	-2953.85	-5179.19	47556.65	2953.83	0.000%
30	5818.96	-47556.65	13.45	-5818.91	47556.65	-13.45	0.000%
31	5197.22	-47556.65	2987.73	-5197.18	47556.65	-2987.70	0.000%
32	2874.22	-47556.65	4928.29	-2874.19	47556.65	-4928.25	0.000%
33	17.94	-47556.65	5625.19	-17.94	47556.65	-5625.14	0.000%
34	-2940.02	-47556.65	5062.66	2939.99	47556.65	-5062.62	0.000%
35	-5175.89	-47556.65	2960.92	5175.85	47556.65	-2960.89	0.000%
36	-5813.32	-47556.65	-10.19	5813.27	47556.65	10.19	0.000%
37	-5191.95	-47556.65	-2981.91	5191.91	47556.65	2981.89	0.000%
38	-2866.08	-47556.65	-4923.58	2866.06	47556.65	4923.54	0.000%
39	-2.87	-22410.92	-5453.86	2.87	22410.91	5453.49	0.002%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
40	2840.35	-22410.92	-4905.66	-2840.29	22410.91	4905.55	0.001%
41	5043.39	-22410.92	-2886.56	-5043.07	22410.91	2886.38	0.002%
42	5648.02	-22410.92	3.64	-5646.96	22410.91	-3.64	0.005%
43	5053.46	-22410.92	2904.73	-5053.35	22410.91	-2904.66	0.001%
44	2794.49	-22410.92	4809.95	-2794.42	22410.91	-4809.84	0.001%
45	8.73	-22410.92	5456.17	-8.72	22410.91	-5455.81	0.002%
46	-2848.15	-22410.92	4903.54	2847.97	22410.91	-4903.22	0.002%
47	-5039.64	-22410.92	2893.43	5039.53	22410.91	-2893.37	0.001%
48	-5641.90	-22410.92	-0.51	5640.85	22410.91	0.51	0.005%
49	-5047.85	-22410.92	-2899.21	5047.74	22410.91	2899.15	0.001%
50	-2786.66	-22410.92	-4805.01	2786.48	22410.91	4804.70	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	15	0.00000001	0.00009354
3	Yes	15	0.00000001	0.00007101
4	Yes	17	0.00000001	0.00006310
5	Yes	16	0.00000001	0.00014408
6	Yes	17	0.00000001	0.00005675
7	Yes	16	0.00000001	0.00012896
8	Yes	13	0.00000001	0.00008809
9	Yes	13	0.00000001	0.00006817
10	Yes	17	0.00000001	0.00005699
11	Yes	16	0.00000001	0.00012948
12	Yes	17	0.00000001	0.00006338
13	Yes	16	0.00000001	0.00014493
14	Yes	15	0.00000001	0.00010107
15	Yes	15	0.00000001	0.00007670
16	Yes	17	0.00000001	0.00005453
17	Yes	16	0.00000001	0.00012435
18	Yes	17	0.00000001	0.00006192
19	Yes	16	0.00000001	0.00014108
20	Yes	13	0.00000001	0.00008359
21	Yes	13	0.00000001	0.00006472
22	Yes	17	0.00000001	0.00006251
23	Yes	16	0.00000001	0.00014246
24	Yes	17	0.00000001	0.00005397
25	Yes	16	0.00000001	0.00012326
26	Yes	7	0.00000001	0.00006116
27	Yes	15	0.00000001	0.00010973
28	Yes	15	0.00000001	0.00012809
29	Yes	15	0.00000001	0.00012810
30	Yes	15	0.00000001	0.00011170
31	Yes	15	0.00000001	0.00012864
32	Yes	15	0.00000001	0.00012750
33	Yes	15	0.00000001	0.00010941
34	Yes	15	0.00000001	0.00012201
35	Yes	15	0.00000001	0.00012402
36	Yes	15	0.00000001	0.00010734
37	Yes	15	0.00000001	0.00012554
38	Yes	15	0.00000001	0.00012198
39	Yes	12	0.00000001	0.00009319
40	Yes	13	0.00000001	0.00008578

41	Yes	12	0.00000001	0.00014688
42	Yes	11	0.00000001	0.00011908
43	Yes	13	0.00000001	0.00006441
44	Yes	13	0.00000001	0.00008005
45	Yes	12	0.00000001	0.00009770
46	Yes	12	0.00000001	0.00014215
47	Yes	13	0.00000001	0.00008206
48	Yes	11	0.00000001	0.00011718
49	Yes	13	0.00000001	0.00007007
50	Yes	12	0.00000001	0.00014056

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
L1	98 - 93	10.396	43	0.9601	0.0056
L2	93 - 88	9.394	43	0.9510	0.0056
L3	88 - 83	8.410	43	0.9244	0.0050
L4	83 - 78.5	7.473	43	0.8593	0.0037
L5	78.5 - 78.25	6.700	43	0.7797	0.0027
L6	78.25 - 78	6.659	43	0.7746	0.0026
L7	78 - 77.75	6.618	43	0.7694	0.0026
L8	77.75 - 72.75	6.578	43	0.7679	0.0025
L9	72.75 - 70	5.793	43	0.7307	0.0022
L10	70 - 65	5.379	43	0.7063	0.0020
L11	65 - 60	4.661	43	0.6643	0.0017
L12	60 - 55	3.990	43	0.6173	0.0014
L13	55 - 53.5	3.370	43	0.5660	0.0012
L14	53.5 - 53.25	3.194	43	0.5503	0.0011
L15	53.25 - 48.68	3.166	43	0.5482	0.0011
L16	48.68 - 43.68	2.660	43	0.5077	0.0010
L17	43.68 - 38.68	2.153	43	0.4607	0.0008
L18	38.68 - 33.68	1.696	43	0.4118	0.0007
L19	33.68 - 28.68	1.292	43	0.3610	0.0006
L20	28.68 - 23.68	0.941	43	0.3086	0.0005
L21	23.68 - 20	0.646	43	0.2555	0.0004
L22	20 - 15	0.464	43	0.2159	0.0003
L23	15 - 12	0.264	43	0.1657	0.0002
L24	12 - 11.75	0.170	43	0.1353	0.0002
L25	11.75 - 6.75	0.163	43	0.1325	0.0002
L26	6.75 - 1.75	0.054	43	0.0761	0.0001
L27	1.75 - 0	0.004	43	0.0194	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	°	°	*ft*
98.00	(2) APX16DWV-16DWV-S-E-A20 W/ Mount PIpe	43	10.396	0.9601	0.0058	16393
97.00	Platform Mount [LP 601-1]	43	10.195	0.9588	0.0058	16393
91.00	7750.00	43	8.996	0.9440	0.0056	10457
88.00	6'x1/2" Lightning Rod	43	8.410	0.9244	0.0051	6302
82.00	A-ANT-18G-2-C	43	7.295	0.8429	0.0036	3509

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
80.00	LLPX310R-V1 w/ Pipe Mounts	43	6.949	0.8078	0.0032	3594

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	98 - 93	48.593	10	4.4798	0.0305
L2	93 - 88	43.925	10	4.4371	0.0305
L3	88 - 83	39.341	10	4.3154	0.0273
L4	83 - 78.5	34.973	10	4.0168	0.0215
L5	78.5 - 78.25	31.358	10	3.6481	0.0168
L6	78.25 - 78	31.168	10	3.6245	0.0164
L7	78 - 77.75	30.979	10	3.6006	0.0161
L8	77.75 - 72.75	30.791	10	3.5934	0.0160
L9	72.75 - 70	27.120	10	3.4202	0.0141
L10	70 - 65	25.184	10	3.3066	0.0130
L11	65 - 60	21.825	10	3.1108	0.0115
L12	60 - 55	18.683	10	2.8911	0.0100
L13	55 - 53.5	15.782	10	2.6513	0.0086
L14	53.5 - 53.25	14.961	10	2.5776	0.0083
L15	53.25 - 48.68	14.827	10	2.5678	0.0082
L16	48.68 - 43.68	12.461	10	2.3784	0.0073
L17	43.68 - 38.68	10.086	10	2.1584	0.0063
L18	38.68 - 33.68	7.946	10	1.9291	0.0054
L19	33.68 - 28.68	6.051	10	1.6915	0.0046
L20	28.68 - 23.68	4.408	10	1.4459	0.0038
L21	23.68 - 20	3.025	10	1.1969	0.0031
L22	20 - 15	2.174	10	1.0114	0.0026
L23	15 - 12	1.238	10	0.7761	0.0019
L24	12 - 11.75	0.795	10	0.6337	0.0016
L25	11.75 - 6.75	0.762	10	0.6207	0.0015
L26	6.75 - 1.75	0.251	10	0.3566	0.0009
L27	1.75 - 0	0.017	10	0.0908	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
98.00	(2) APX16DWV-16DWV-S-E-A20 W/ Mount PIpe	10	48.593	4.4798	0.0310	3581
97.00	Platform Mount [LP 601-1]	10	47.657	4.4732	0.0311	3581
91.00	7750.00	10	42.075	4.4050	0.0302	2309
88.00	6'x1/2" Lightning Rod	10	39.341	4.3154	0.0278	1398
82.00	A-ANT-18G-2-C	10	34.140	3.9410	0.0209	767
80.00	LLPX310R-V1 w/ Pipe Mounts	10	32.524	3.7785	0.0189	784

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	98 - 97	TP14.625x12.75x0.25	5.00	0.00	0.0	10.2163	-492.53	759021.00	0.001
	97 - 96					10.5139	-1773.11	781128.00	0.002
	96 - 95					10.8114	-1828.34	803236.00	0.002
	95 - 94					11.1090	-1884.95	825343.00	0.002
	94 - 93					11.4066	-1942.91	847451.00	0.002
L2	93 - 92	TP16.5x14.625x0.25	5.00	0.00	0.0	11.7041	-2010.78	869558.00	0.002
	92 - 91					12.0017	-2079.96	891665.00	0.002
	91 - 90					12.2992	-4830.40	913773.00	0.005
	90 - 89					12.5968	-4904.73	935880.00	0.005
	89 - 88					12.8944	-4980.98	957988.00	0.005
L3	88 - 87	TP17.4917x16.5x0.1875	5.00	0.00	0.0	9.8260	-5111.13	730023.00	0.007
	87 - 86					9.9440	-5184.88	738793.00	0.007
	86 - 85					10.0621	-5260.07	747562.00	0.007
	85 - 84					10.1801	-5336.65	756331.00	0.007
	84 - 83					10.2981	-5414.57	765101.00	0.007
L4	83 - 81.875	TP18.3842x17.4917x0.1875	4.50	0.00	0.0	10.4309	-5598.64	774966.00	0.007
	81.875 - 80.75					10.5637	-5692.72	784831.00	0.007
	80.75 - 79.625					10.6965	-7271.56	794697.00	0.009
	79.625 - 78.5					10.8293	-7376.90	804562.00	0.009
L5	78.5 - 78.25 (5)	TP18.4338x18.3842x0.1875	0.25	0.00	0.0	10.8588	-7410.89	806755.00	0.009
L6	78.25 - 78 (6)	TP18.4833x18.4338x0.1875	0.25	0.00	0.0	10.8883	-7434.84	808947.00	0.009
L7	78 - 77.75 (7)	TP18.5329x18.4833x0.6875	0.25	0.00	0.0	38.9409	-7474.05	2893120.00	0.003
L8	77.75 - 76.75	TP19.5246x18.5329x0.65	5.00	0.00	0.0	37.3034	-7617.10	2771460.00	0.003
	76.75 - 75.75					37.7126	-7764.81	2801860.00	0.003
	75.75 - 74.75					38.1218	-7914.23	2832260.00	0.003
	74.75 - 73.75					38.5310	-8065.37	2862660.00	0.003
	73.75 - 72.75					38.9402	-8218.19	2893060.00	0.003
L9	72.75 - 71.375	TP20.07x19.5246x0.625	2.75	0.00	0.0	38.0330	-8426.88	2825660.00	0.003
	71.375 - 70					38.5740	-8640.87	2865860.00	0.003
L10	70 - 69	TP21.0644x20.07x0.7375	5.00	0.00	0.0	45.7195	-8828.70	3396730.00	0.003
	69 - 68					46.1851	-9015.40	3431320.00	0.003
	68 - 67					46.6506	-9203.97	3465910.00	0.003
	67 - 66					47.1161	-9394.39	3500490.00	0.003
	66 - 65					47.5816	-9586.66	3535080.00	0.003
L11	65 - 64	TP22.0587x21.0644x0.7125	5.00	0.00	0.0	46.4750	-9777.89	3452860.00	0.003
	64 - 63					46.9247	-9971.12	3486270.00	0.003
	63 - 62					47.3745	-10166.20	3519690.00	0.003
	62 - 61					47.8242	-10363.00	3553100.00	0.003
	61 - 60					48.2740	-10561.60	3586520.00	0.003
L12	60 - 59	TP23.0531x22.0587x0.6875	5.00	0.00	0.0	47.0687	-10759.40	3496970.00	0.003
	59 - 58					47.5027	-10959.10	3529210.00	0.003
	58 - 57					47.9366	-11160.60	3561450.00	0.003
	57 - 56					48.3706	-11363.80	3593690.00	0.003
	56 - 55					48.8046	-11568.80	3625940.00	0.003
L13	55 - 53.5 (13)	TP23.3514x23.0531x0.675	1.50	0.00	0.0	48.5831	-11871.90	3609480.00	0.003
L14	53.5 - 53.25 (14)	TP23.4011x23.3514x0.8875	0.25	0.00	0.0	63.4192	-11944.50	4711730.00	0.003
L15	53.25 - 52.1075	TP24.31x23.4011x0.85	4.57	0.00	0.0	61.4537	-12220.40	4565710.00	0.003
	52.1075 - 50.965					62.0667	-12504.90	4611250.00	0.003
	50.965 - 49.8225					62.6797	-12792.20	4656790.00	0.003

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
	49.8225 - 48.68					63.2927	-13082.20	4702330.00	0.003
L16	48.68 - 47.68	TP25.3055x24.31x0.8125	5.00	0.00	0.0	61.1106	-13335.00	4540210.00	0.003
	47.68 - 46.68					61.6240	-13589.20	4578350.00	0.003
	46.68 - 45.68					62.1374	-13845.50	4616500.00	0.003
	45.68 - 44.68					62.6509	-14103.70	4654650.00	0.003
	44.68 - 43.68					63.1643	-14364.00	4692790.00	0.003
L17	43.68 - 42.68	TP26.3009x25.3055x0.7875	5.00	0.00	0.0	61.7809	-14622.30	4590010.00	0.003
	42.68 - 41.68					62.2785	-14882.80	4626990.00	0.003
	41.68 - 40.68					62.7762	-15145.30	4663960.00	0.003
	40.68 - 39.68					63.2738	-15409.80	4700930.00	0.003
	39.68 - 38.68					63.7715	-15676.30	4737900.00	0.003
L18	38.68 - 37.68	TP27.2964x26.3009x0.7625	5.00	0.00	0.0	62.2893	-15941.00	4627790.00	0.003
	37.68 - 36.68					62.7712	-16207.80	4663580.00	0.003
	36.68 - 35.68					63.2530	-16476.60	4699380.00	0.004
	35.68 - 34.68					63.7348	-16747.40	4735180.00	0.004
	34.68 - 33.68					64.2167	-17020.10	4770980.00	0.004
L19	33.68 - 32.68	TP28.2919x27.2964x0.7375	5.00	0.00	0.0	62.6358	-17291.10	4653530.00	0.004
	32.68 - 31.68					63.1018	-17564.30	4688150.00	0.004
	31.68 - 30.68					63.5679	-17839.50	4722780.00	0.004
	30.68 - 29.68					64.0339	-18116.60	4757400.00	0.004
	29.68 - 28.68					64.5000	-18395.60	4792020.00	0.004
L20	28.68 - 27.68	TP29.2873x28.2919x0.725	5.00	0.00	0.0	63.8936	-18672.80	4746980.00	0.004
	27.68 - 26.68					64.3518	-18952.10	4781020.00	0.004
	26.68 - 25.68					64.8099	-19233.20	4815050.00	0.004
	25.68 - 24.68					65.2681	-19516.30	4849090.00	0.004
	24.68 - 23.68					65.7262	-19801.30	4883130.00	0.004
L21	23.68 - 22.4533	TP30.02x29.2873x0.7125	3.68	0.00	0.0	65.1736	-20147.90	4842070.00	0.004
	22.4533 - 21.2267					65.7259	-20499.80	4883100.00	0.004
	21.2267 - 20					66.2782	-20854.50	4924140.00	0.004
L22	20 - 19	TP31.015x30.02x0.7625	5.00	0.00	0.0	71.2899	-21167.70	5296480.00	0.004
	19 - 18					71.7715	-21479.80	5332260.00	0.004
	18 - 17					72.2531	-21793.90	5368050.00	0.004
	17 - 16					72.7347	-22109.90	5403830.00	0.004
	16 - 15					73.2163	-22427.90	5439610.00	0.004
L23	15 - 14	TP31.612x31.015x0.75	3.00	0.00	0.0	72.5196	-22745.80	5387840.00	0.004
	14 - 13					72.9933	-23065.80	5423040.00	0.004
	13 - 12					73.4670	-23387.80	5458230.00	0.004
L24	12 - 11.75 (24)	TP31.6618x31.612x0.675	0.25	0.00	0.0	66.3876	-23471.00	4932260.00	0.005
L25	11.75 - 10.75	TP32.6568x31.6618x0.6625	5.00	0.00	0.0	65.6029	-23759.40	4873970.00	0.005
	10.75 - 9.75					66.0214	-24058.50	4905060.00	0.005
	9.75 - 8.75					66.4398	-24359.40	4936150.00	0.005
	8.75 - 7.75					66.8583	-24662.10	4967230.00	0.005
	7.75 - 6.75					67.2767	-24966.60	4998320.00	0.005
L26	6.75 - 5.75	TP33.6518x32.6568x0.65	5.00	0.00	0.0	66.4437	-25248.00	4936430.00	0.005
	5.75 - 4.75					66.8542	-25531.50	4966940.00	0.005
	4.75 - 3.75					67.2648	-25816.60	4997440.00	0.005
	3.75 - 2.75					67.6754	-26103.60	5027940.00	0.005
	2.75 - 1.75					68.0859	-26392.30	5058440.00	0.005
L27	1.75 - 0 (27)	TP34x33.6518x0.65	1.75	0.00	0.0	68.8044	-26871.40	5111820.00	0.005

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	98 - 97	TP14.625x12.75x0.25	2.09	198.67	0.011	0.00	198.67	0.000
	97 - 96		5.77	210.53	0.027	0.00	210.53	0.000
	96 - 95		9.49	222.73	0.043	0.00	222.73	0.000
	95 - 94		13.25	235.27	0.056	0.00	235.27	0.000
	94 - 93		17.05	248.16	0.069	0.00	248.16	0.000
L2	93 - 92	TP16.5x14.625x0.25	20.90	261.39	0.080	0.00	261.39	0.000
	92 - 91		24.80	274.96	0.090	0.00	274.96	0.000
	91 - 90		34.30	288.88	0.119	0.00	288.88	0.000
	90 - 89		43.32	303.14	0.143	0.00	303.14	0.000
	89 - 88		52.39	317.74	0.165	0.00	317.74	0.000
L3	88 - 87	TP17.4917x16.5x0.1875	61.67	247.00	0.250	0.00	247.00	0.000
	87 - 86		70.85	253.00	0.280	0.00	253.00	0.000
	86 - 85		80.07	259.08	0.309	0.00	259.08	0.000
	85 - 84		89.34	265.23	0.337	0.00	265.23	0.000
	84 - 83		98.66	271.44	0.363	0.00	271.44	0.000
L4	83 - 81.875	TP18.3842x17.4917x0.1875	109.18	278.53	0.392	0.00	278.53	0.000
	81.875 - 80.75		120.23	285.70	0.421	0.00	285.70	0.000
	80.75 - 79.625		133.26	292.97	0.455	0.00	292.97	0.000
	79.625 - 78.5		149.56	300.32	0.498	0.00	300.32	0.000
L5	78.5 - 78.25 (5)	TP18.4338x18.3842x0.1875	153.20	301.97	0.507	0.00	301.97	0.000
L6	78.25 - 78 (6)	TP18.4833x18.4338x0.1875	156.84	303.62	0.517	0.00	303.62	0.000
L7	78 - 77.75 (7)	TP18.5329x18.4833x0.6875	160.49	1030.31	0.156	0.00	1030.31	0.000
L8	77.75 - 76.75	TP19.5246x18.5329x0.65	175.18	1002.52	0.175	0.00	1002.52	0.000
	76.75 - 75.75		190.02	1025.02	0.185	0.00	1025.02	0.000
	75.75 - 74.75		205.00	1047.77	0.196	0.00	1047.77	0.000
	74.75 - 73.75		220.12	1070.77	0.206	0.00	1070.77	0.000
	73.75 - 72.75		235.39	1094.02	0.215	0.00	1094.02	0.000
L9	72.75 - 71.375	TP20.07x19.5246x0.625	256.63	1087.32	0.236	0.00	1087.32	0.000
	71.375 - 70		278.13	1118.96	0.249	0.00	1118.96	0.000
L10	70 - 69	TP21.0644x20.07x0.7375	293.94	1324.92	0.222	0.00	1324.92	0.000
	69 - 68		309.90	1352.53	0.229	0.00	1352.53	0.000
	68 - 67		326.01	1380.43	0.236	0.00	1380.43	0.000
	67 - 66		342.26	1408.62	0.243	0.00	1408.62	0.000
	66 - 65		358.67	1437.09	0.250	0.00	1437.09	0.000
L11	65 - 64	TP22.0587x21.0644x0.7125	375.22	1421.33	0.264	0.00	1421.33	0.000
	64 - 63		391.92	1449.44	0.270	0.00	1449.44	0.000
	63 - 62		408.77	1477.83	0.277	0.00	1477.83	0.000
	62 - 61		425.76	1506.48	0.283	0.00	1506.48	0.000
	61 - 60		442.91	1535.43	0.288	0.00	1535.43	0.000
L12	60 - 59	TP23.0531x22.0587x0.6875	460.20	1514.99	0.304	0.00	1514.99	0.000
	59 - 58		477.64	1543.49	0.309	0.00	1543.49	0.000
	58 - 57		495.23	1572.26	0.315	0.00	1572.26	0.000
	57 - 56		512.97	1601.29	0.320	0.00	1601.29	0.000
	56 - 55		530.86	1630.59	0.326	0.00	1630.59	0.000
L13	55 - 53.5 (13)	TP23.3514x23.0531x0.675	558.01	1647.30	0.339	0.00	1647.30	0.000
L14	53.5 - 53.25 (14)	TP23.4011x23.3514x0.8875	562.57	2115.08	0.266	0.00	2115.08	0.000
L15	53.25 - 52.1075	TP24.31x23.4011x0.85	583.59	2077.84	0.281	0.00	2077.84	0.000
	52.1075 - 50.965		604.84	2120.25	0.285	0.00	2120.25	0.000
	50.965 - 49.8225		626.35	2163.09	0.290	0.00	2163.09	0.000
	49.8225 - 48.68		648.10	2206.37	0.294	0.00	2206.37	0.000
L16	48.68 - 47.68	TP25.3055x24.31x0.8125	667.33	2155.82	0.310	0.00	2155.82	0.000
	47.68 - 46.68		686.75	2192.81	0.313	0.00	2192.81	0.000
	46.68 - 45.68		706.36	2230.10	0.317	0.00	2230.10	0.000
	45.68 - 44.68		726.15	2267.72	0.320	0.00	2267.72	0.000
	44.68 - 43.68		746.13	2305.64	0.324	0.00	2305.64	0.000

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L17	43.68 - 42.68	TP26.3009x25.3055x0.7875	766.29	2278.68	0.336	0.00	2278.68	0.000
	42.68 - 41.68		786.64	2316.10	0.340	0.00	2316.10	0.000
	41.68 - 40.68		807.17	2353.83	0.343	0.00	2353.83	0.000
	40.68 - 39.68		827.88	2391.88	0.346	0.00	2391.88	0.000
	39.68 - 38.68		848.78	2430.22	0.349	0.00	2430.22	0.000
L18	38.68 - 37.68	TP27.2964x26.3009x0.7625	869.86	2397.47	0.363	0.00	2397.47	0.000
	37.68 - 36.68		891.13	2435.24	0.366	0.00	2435.24	0.000
	36.68 - 35.68		912.56	2473.31	0.369	0.00	2473.31	0.000
	35.68 - 34.68		934.17	2511.68	0.372	0.00	2511.68	0.000
	34.68 - 33.68		955.98	2550.33	0.375	0.00	2550.33	0.000
L19	33.68 - 32.68	TP28.2919x27.2964x0.7375	977.96	2511.43	0.389	0.00	2511.43	0.000
	32.68 - 31.68		1000.12	2549.44	0.392	0.00	2549.44	0.000
	31.68 - 30.68		1022.44	2587.74	0.395	0.00	2587.74	0.000
	30.68 - 29.68		1044.95	2626.33	0.398	0.00	2626.33	0.000
	29.68 - 28.68		1067.63	2665.21	0.401	0.00	2665.21	0.000
L20	28.68 - 27.68	TP29.2873x28.2919x0.725	1090.48	2662.13	0.410	0.00	2662.13	0.000
	27.68 - 26.68		1113.51	2700.93	0.412	0.00	2700.93	0.000
	26.68 - 25.68		1136.71	2740.01	0.415	0.00	2740.01	0.000
	25.68 - 24.68		1160.08	2779.38	0.417	0.00	2779.38	0.000
	24.68 - 23.68		1183.62	2819.03	0.420	0.00	2819.03	0.000
L21	23.68 - 22.4533	TP30.02x29.2873x0.7125	1212.72	2822.26	0.430	0.00	2822.26	0.000
	22.4533 - 21.2267		1242.07	2870.88	0.433	0.00	2870.88	0.000
	21.2267 - 20		1271.67	2919.91	0.436	0.00	2919.91	0.000
L22	20 - 19	TP31.015x30.02x0.7625	1295.97	3151.82	0.411	0.00	3151.82	0.000
	19 - 18		1320.45	3195.10	0.413	0.00	3195.10	0.000
	18 - 17		1345.08	3238.66	0.415	0.00	3238.66	0.000
	17 - 16		1369.87	3282.53	0.417	0.00	3282.53	0.000
	16 - 15		1394.82	3326.68	0.419	0.00	3326.68	0.000
L23	15 - 14	TP31.612x31.015x0.75	1419.93	3319.95	0.428	0.00	3319.95	0.000
	14 - 13		1445.18	3363.99	0.430	0.00	3363.99	0.000
	13 - 12		1470.60	3408.32	0.431	0.00	3408.32	0.000
L24	12 - 11.75 (24)	TP31.6618x31.612x0.675	1476.97	3099.96	0.476	0.00	3099.96	0.000
L25	11.75 - 10.75	TP32.6568x31.6618x0.6625	1502.58	3085.88	0.487	0.00	3085.88	0.000
	10.75 - 9.75		1528.33	3125.79	0.489	0.00	3125.79	0.000
	9.75 - 8.75		1554.22	3165.95	0.491	0.00	3165.95	0.000
	8.75 - 7.75		1580.24	3206.37	0.493	0.00	3206.37	0.000
	7.75 - 6.75		1606.42	3247.04	0.495	0.00	3247.04	0.000
L26	6.75 - 5.75	TP33.6518x32.6568x0.65	1632.73	3229.69	0.506	0.00	3229.69	0.000
	5.75 - 4.75		1659.19	3270.13	0.507	0.00	3270.13	0.000
	4.75 - 3.75		1685.80	3310.81	0.509	0.00	3310.81	0.000
	3.75 - 2.75		1712.56	3351.75	0.511	0.00	3351.75	0.000
	2.75 - 1.75		1739.46	3392.93	0.513	0.00	3392.93	0.000
L27	1.75 - 0 (27)	TP34x33.6518x0.65	1786.90	3465.62	0.516	0.00	3465.62	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V_u	ϕV_n	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u	ϕT_n	Ratio $\frac{T_u}{\phi T_n}$
	ft		lb	lb		kip-ft	kip-ft	
L1	98 - 97	TP14.625x12.75x0.25	2112.87	379510.00	0.006	0.00	397.83	0.000
	97 - 96		3697.35	390564.00	0.009	0.00	421.57	0.000
	96 - 95		3739.54	401618.00	0.009	0.00	446.00	0.000
	95 - 94		3782.72	412672.00	0.009	0.00	471.12	0.000
	94 - 93		3826.91	423725.00	0.009	0.00	496.92	0.000

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L2	93 - 92	TP16.5x14.625x0.25	3872.32	434779.00	0.009	0.00	523.41	0.000
	92 - 91		3918.73	445833.00	0.009	0.00	550.59	0.000
	91 - 90		8998.82	456886.00	0.020	0.11	578.46	0.000
	90 - 89		9045.86	467940.00	0.019	0.11	607.02	0.000
	89 - 88		9093.55	478994.00	0.019	0.11	636.26	0.000
L3	88 - 87	TP17.4917x16.5x0.1875	9159.46	365012.00	0.025	0.16	494.60	0.000
	87 - 86		9205.37	369396.00	0.025	0.16	506.62	0.000
	86 - 85		9251.22	373781.00	0.025	0.16	518.79	0.000
	85 - 84		9297.01	378166.00	0.025	0.16	531.10	0.000
	84 - 83		9342.75	382550.00	0.024	0.16	543.55	0.000
L4	83 - 81.875	TP18.3842x17.4917x0.1875	9801.73	387483.00	0.025	0.38	557.74	0.001
	81.875 - 80.75		9859.56	392416.00	0.025	0.38	572.10	0.001
	80.75 - 79.625		14473.50	397348.00	0.036	0.38	586.65	0.001
	79.625 - 78.5		14528.60	402281.00	0.036	0.38	601.38	0.001
L5	78.5 - 78.25 (5)	TP18.4338x18.3842x0.1875	14557.20	403377.00	0.036	0.38	604.68	0.001
L6	78.25 - 78 (6)	TP18.4833x18.4338x0.1875	14589.90	404473.00	0.036	0.38	607.99	0.001
L7	78 - 77.75 (7)	TP18.5329x18.4833x0.6875	14627.30	1446560.00	0.010	0.39	2063.14	0.000
L8	77.75 - 76.75	TP19.5246x18.5329x0.65	14767.00	1385730.00	0.011	0.40	2007.48	0.000
	76.75 - 75.75		14910.00	1400930.00	0.011	0.41	2052.53	0.000
	75.75 - 74.75		15054.00	1416130.00	0.011	0.42	2098.09	0.000
	74.75 - 73.75		15199.30	1431330.00	0.011	0.44	2144.15	0.000
	73.75 - 72.75		15345.60	1446530.00	0.011	0.45	2190.70	0.000
L9	72.75 - 71.375	TP20.07x19.5246x0.625	15544.70	1412830.00	0.011	0.47	2177.29	0.000
	71.375 - 70		15744.70	1432930.00	0.011	0.48	2240.66	0.000
L10	70 - 69	TP21.0644x20.07x0.7375	15889.10	1698370.00	0.009	0.50	2653.08	0.000
	69 - 68		16036.00	1715660.00	0.009	0.51	2708.38	0.000
	68 - 67		16184.00	1732950.00	0.009	0.52	2764.25	0.000
	67 - 66		16333.20	1750250.00	0.009	0.53	2820.68	0.000
	66 - 65		16483.40	1767540.00	0.009	0.55	2877.70	0.000
L11	65 - 64	TP22.0587x21.0644x0.7125	16629.90	1726430.00	0.010	0.56	2846.15	0.000
	64 - 63		16777.30	1743140.00	0.010	0.57	2902.43	0.000
	63 - 62		16925.70	1759840.00	0.010	0.59	2959.28	0.000
	62 - 61		17075.20	1776550.00	0.010	0.60	3016.66	0.000
	61 - 60		17225.70	1793260.00	0.010	0.61	3074.60	0.000
L12	60 - 59	TP23.0531x22.0587x0.6875	17372.30	1748480.00	0.010	0.63	3033.69	0.000
	59 - 58		17519.80	1764610.00	0.010	0.64	3090.76	0.000
	58 - 57		17668.20	1780730.00	0.010	0.65	3148.37	0.000
	57 - 56		17817.50	1796850.00	0.010	0.67	3206.50	0.000
	56 - 55		17967.90	1812970.00	0.010	0.68	3265.17	0.000
L13	55 - 53.5 (13)	TP23.3514x23.0531x0.675	18247.50	1804740.00	0.010	0.75	3298.63	0.000
L14	53.5 - 53.25 (14)	TP23.4011x23.3514x0.8875	18291.60	2355870.00	0.008	0.76	4235.34	0.000
L15	53.25 - 52.1075	TP24.31x23.4011x0.85	18504.20	2282850.00	0.008	0.82	4160.76	0.000
	52.1075 - 50.965		18718.00	2305620.00	0.008	0.87	4245.68	0.000
	50.965 - 49.8225		18933.50	2328400.00	0.008	0.92	4331.48	0.000
	49.8225 - 48.68		19150.50	2351170.00	0.008	0.98	4418.13	0.000
L16	48.68 - 47.68	TP25.3055x24.31x0.8125	19333.70	2270100.00	0.009	1.02	4316.92	0.000
	47.68 - 46.68		19518.60	2289180.00	0.009	1.07	4390.98	0.000
	46.68 - 45.68		19704.60	2308250.00	0.009	1.12	4465.66	0.000
	45.68 - 44.68		19891.80	2327320.00	0.009	1.17	4540.98	0.000
	44.68 - 43.68		20080.10	2346400.00	0.009	1.22	4616.93	0.000
L17	43.68 - 42.68	TP26.3009x25.3055x0.7875	20261.60	2295010.00	0.009	1.26	4562.93	0.000
	42.68 - 41.68		20444.10	2313490.00	0.009	1.31	4637.87	0.000
	41.68 - 40.68		20627.70	2331980.00	0.009	1.36	4713.43	0.000
	40.68 - 39.68		20812.30	2350460.00	0.009	1.41	4789.60	0.000
	39.68 - 38.68		20998.00	2368950.00	0.009	1.46	4866.38	0.000

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L18	38.68 - 37.68	TP27.2964x26.3009x0.7625	21176.50	2313890.00	0.009	1.50	4800.80	0.000
	37.68 - 36.68		21355.80	2331790.00	0.009	1.55	4876.44	0.000
	36.68 - 35.68		21536.00	2349690.00	0.009	1.60	4952.67	0.000
	35.68 - 34.68		21717.30	2367590.00	0.009	1.65	5029.49	0.000
	34.68 - 33.68		21899.50	2385490.00	0.009	1.70	5106.90	0.000
L19	33.68 - 32.68	TP28.2919x27.2964x0.7375	22074.00	2326760.00	0.009	1.75	5028.99	0.000
	32.68 - 31.68		22249.10	2344080.00	0.009	1.80	5105.12	0.000
	31.68 - 30.68		22425.10	2361390.00	0.009	1.84	5181.82	0.000
	30.68 - 29.68		22602.00	2378700.00	0.010	1.89	5259.09	0.000
	29.68 - 28.68		22779.90	2396010.00	0.010	1.94	5336.93	0.000
L20	28.68 - 27.68	TP29.2873x28.2919x0.725	22949.10	2373490.00	0.010	1.99	5330.76	0.000
	27.68 - 26.68		23119.10	2390510.00	0.010	2.04	5408.46	0.000
	26.68 - 25.68		23289.90	2407530.00	0.010	2.09	5486.73	0.000
	25.68 - 24.68		23461.60	2424550.00	0.010	2.14	5565.55	0.000
	24.68 - 23.68		23634.10	2441560.00	0.010	2.18	5644.93	0.000
L21	23.68 - 22.4533	TP30.02x29.2873x0.7125	23837.60	2421040.00	0.010	2.24	5651.42	0.000
	22.4533 - 21.2267		24040.10	2441550.00	0.010	2.30	5748.77	0.000
	21.2267 - 20		24243.80	2462070.00	0.010	2.36	5846.97	0.000
L22	20 - 19	TP31.015x30.02x0.7625	24399.40	2648240.00	0.009	2.41	6311.36	0.000
	19 - 18		24558.40	2666130.00	0.009	2.45	6398.01	0.000
	18 - 17		24718.00	2684020.00	0.009	2.50	6485.24	0.000
	17 - 16		24878.30	2701910.00	0.009	2.55	6573.07	0.000
	16 - 15		25039.30	2719800.00	0.009	2.59	6661.49	0.000
L23	15 - 14	TP31.612x31.015x0.75	25193.80	2693920.00	0.009	2.64	6648.02	0.000
	14 - 13		25348.80	2711520.00	0.009	2.69	6736.21	0.000
	13 - 12		25504.50	2729120.00	0.009	2.73	6824.97	0.000
L24	12 - 11.75 (24)	TP31.6618x31.612x0.675	25535.80	2466130.00	0.010	2.75	6207.50	0.000
L25	11.75 - 10.75	TP32.6568x31.6618x0.6625	25685.20	2436980.00	0.011	2.78	6179.32	0.000
	10.75 - 9.75		25827.00	2452530.00	0.011	2.81	6259.22	0.000
	9.75 - 8.75		25969.30	2468070.00	0.011	2.83	6339.64	0.000
	8.75 - 7.75		26112.10	2483620.00	0.011	2.86	6420.57	0.000
	7.75 - 6.75		26255.40	2499160.00	0.011	2.90	6502.02	0.000
L26	6.75 - 5.75	TP33.6518x32.6568x0.65	26400.90	2468220.00	0.011	2.91	6467.28	0.000
	5.75 - 4.75		26546.70	2483470.00	0.011	2.92	6548.25	0.000
	4.75 - 3.75		26693.10	2498720.00	0.011	2.93	6629.72	0.000
	3.75 - 2.75		26840.00	2513970.00	0.011	2.94	6711.69	0.000
	2.75 - 1.75		26987.60	2529220.00	0.011	2.95	6794.17	0.000
L27	1.75 - 0 (27)	TP34x33.6518x0.65	27263.80	2555910.00	0.011	2.96	6939.72	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	98 - 97	0.001	0.011	0.000	0.006	0.000	0.011 ✔	1.000	4.8.2 ✔
	97 - 96	0.002	0.027	0.000	0.009	0.000	0.030 ✔	1.000	4.8.2 ✔
	96 - 95	0.002	0.043	0.000	0.009	0.000	0.045 ✔	1.000	4.8.2 ✔
	95 - 94	0.002	0.056	0.000	0.009	0.000	0.059 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	94 - 93	0.002	0.069	0.000	0.009	0.000	0.071 ✔	1.000	4.8.2 ✔
L2	93 - 92	0.002	0.080	0.000	0.009	0.000	0.082 ✔	1.000	4.8.2 ✔
	92 - 91	0.002	0.090	0.000	0.009	0.000	0.093 ✔	1.000	4.8.2 ✔
	91 - 90	0.005	0.119	0.000	0.020	0.000	0.124 ✔	1.000	4.8.2 ✔
	90 - 89	0.005	0.143	0.000	0.019	0.000	0.149 ✔	1.000	4.8.2 ✔
	89 - 88	0.005	0.165	0.000	0.019	0.000	0.170 ✔	1.000	4.8.2 ✔
L3	88 - 87	0.007	0.250	0.000	0.025	0.000	0.257 ✔	1.000	4.8.2 ✔
	87 - 86	0.007	0.280	0.000	0.025	0.000	0.288 ✔	1.000	4.8.2 ✔
	86 - 85	0.007	0.309	0.000	0.025	0.000	0.317 ✔	1.000	4.8.2 ✔
	85 - 84	0.007	0.337	0.000	0.025	0.000	0.345 ✔	1.000	4.8.2 ✔
	84 - 83	0.007	0.363	0.000	0.024	0.000	0.371 ✔	1.000	4.8.2 ✔
L4	83 - 81.875	0.007	0.392	0.000	0.025	0.001	0.400 ✔	1.000	4.8.2 ✔
	81.875 - 80.75	0.007	0.421	0.000	0.025	0.001	0.429 ✔	1.000	4.8.2 ✔
	80.75 - 79.625	0.009	0.455	0.000	0.036	0.001	0.465 ✔	1.000	4.8.2 ✔
	79.625 - 78.5	0.009	0.498	0.000	0.036	0.001	0.509 ✔	1.000	4.8.2 ✔
L5	78.5 - 78.25 (5)	0.009	0.507	0.000	0.036	0.001	0.518 ✔	1.000	4.8.2 ✔
L6	78.25 - 78 (6)	0.009	0.517	0.000	0.036	0.001	0.527 ✔	1.000	4.8.2 ✔
L7	78 - 77.75 (7)	0.003	0.156	0.000	0.010	0.000	0.158 ✔	1.000	4.8.2 ✔
L8	77.75 - 76.75	0.003	0.175	0.000	0.011	0.000	0.178 ✔	1.000	4.8.2 ✔
	76.75 - 75.75	0.003	0.185	0.000	0.011	0.000	0.188 ✔	1.000	4.8.2 ✔
	75.75 - 74.75	0.003	0.196	0.000	0.011	0.000	0.199 ✔	1.000	4.8.2 ✔
	74.75 - 73.75	0.003	0.206	0.000	0.011	0.000	0.209 ✔	1.000	4.8.2 ✔
	73.75 - 72.75	0.003	0.215	0.000	0.011	0.000	0.218 ✔	1.000	4.8.2 ✔
L9	72.75 - 71.375	0.003	0.236	0.000	0.011	0.000	0.239 ✔	1.000	4.8.2 ✔
	71.375 - 70	0.003	0.249	0.000	0.011	0.000	0.252 ✔	1.000	4.8.2 ✔
L10	70 - 69	0.003	0.222	0.000	0.009	0.000	0.225 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	69 - 68	0.003	0.229	0.000	0.009	0.000	0.232 ✔	1.000	4.8.2 ✔
	68 - 67	0.003	0.236	0.000	0.009	0.000	0.239 ✔	1.000	4.8.2 ✔
	67 - 66	0.003	0.243	0.000	0.009	0.000	0.246 ✔	1.000	4.8.2 ✔
	66 - 65	0.003	0.250	0.000	0.009	0.000	0.252 ✔	1.000	4.8.2 ✔
L11	65 - 64	0.003	0.264	0.000	0.010	0.000	0.267 ✔	1.000	4.8.2 ✔
	64 - 63	0.003	0.270	0.000	0.010	0.000	0.273 ✔	1.000	4.8.2 ✔
	63 - 62	0.003	0.277	0.000	0.010	0.000	0.280 ✔	1.000	4.8.2 ✔
	62 - 61	0.003	0.283	0.000	0.010	0.000	0.286 ✔	1.000	4.8.2 ✔
	61 - 60	0.003	0.288	0.000	0.010	0.000	0.292 ✔	1.000	4.8.2 ✔
L12	60 - 59	0.003	0.304	0.000	0.010	0.000	0.307 ✔	1.000	4.8.2 ✔
	59 - 58	0.003	0.309	0.000	0.010	0.000	0.313 ✔	1.000	4.8.2 ✔
	58 - 57	0.003	0.315	0.000	0.010	0.000	0.318 ✔	1.000	4.8.2 ✔
	57 - 56	0.003	0.320	0.000	0.010	0.000	0.324 ✔	1.000	4.8.2 ✔
	56 - 55	0.003	0.326	0.000	0.010	0.000	0.329 ✔	1.000	4.8.2 ✔
L13	55 - 53.5 (13)	0.003	0.339	0.000	0.010	0.000	0.342 ✔	1.000	4.8.2 ✔
L14	53.5 - 53.25 (14)	0.003	0.266	0.000	0.008	0.000	0.269 ✔	1.000	4.8.2 ✔
L15	53.25 - 52.1075	0.003	0.281	0.000	0.008	0.000	0.284 ✔	1.000	4.8.2 ✔
	52.1075 - 50.965	0.003	0.285	0.000	0.008	0.000	0.288 ✔	1.000	4.8.2 ✔
	50.965 - 49.8225	0.003	0.290	0.000	0.008	0.000	0.292 ✔	1.000	4.8.2 ✔
	49.8225 - 48.68	0.003	0.294	0.000	0.008	0.000	0.297 ✔	1.000	4.8.2 ✔
L16	48.68 - 47.68	0.003	0.310	0.000	0.009	0.000	0.313 ✔	1.000	4.8.2 ✔
	47.68 - 46.68	0.003	0.313	0.000	0.009	0.000	0.316 ✔	1.000	4.8.2 ✔
	46.68 - 45.68	0.003	0.317	0.000	0.009	0.000	0.320 ✔	1.000	4.8.2 ✔
	45.68 - 44.68	0.003	0.320	0.000	0.009	0.000	0.323 ✔	1.000	4.8.2 ✔
	44.68 - 43.68	0.003	0.324	0.000	0.009	0.000	0.327 ✔	1.000	4.8.2 ✔
L17	43.68 - 42.68	0.003	0.336	0.000	0.009	0.000	0.340 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	42.68 - 41.68	0.003	0.340	0.000	0.009	0.000	0.343 ✔	1.000	4.8.2 ✔
	41.68 - 40.68	0.003	0.343	0.000	0.009	0.000	0.346 ✔	1.000	4.8.2 ✔
	40.68 - 39.68	0.003	0.346	0.000	0.009	0.000	0.349 ✔	1.000	4.8.2 ✔
	39.68 - 38.68	0.003	0.349	0.000	0.009	0.000	0.353 ✔	1.000	4.8.2 ✔
L18	38.68 - 37.68	0.003	0.363	0.000	0.009	0.000	0.366 ✔	1.000	4.8.2 ✔
	37.68 - 36.68	0.003	0.366	0.000	0.009	0.000	0.369 ✔	1.000	4.8.2 ✔
	36.68 - 35.68	0.004	0.369	0.000	0.009	0.000	0.373 ✔	1.000	4.8.2 ✔
	35.68 - 34.68	0.004	0.372	0.000	0.009	0.000	0.376 ✔	1.000	4.8.2 ✔
	34.68 - 33.68	0.004	0.375	0.000	0.009	0.000	0.379 ✔	1.000	4.8.2 ✔
L19	33.68 - 32.68	0.004	0.389	0.000	0.009	0.000	0.393 ✔	1.000	4.8.2 ✔
	32.68 - 31.68	0.004	0.392	0.000	0.009	0.000	0.396 ✔	1.000	4.8.2 ✔
	31.68 - 30.68	0.004	0.395	0.000	0.009	0.000	0.399 ✔	1.000	4.8.2 ✔
	30.68 - 29.68	0.004	0.398	0.000	0.010	0.000	0.402 ✔	1.000	4.8.2 ✔
	29.68 - 28.68	0.004	0.401	0.000	0.010	0.000	0.405 ✔	1.000	4.8.2 ✔
L20	28.68 - 27.68	0.004	0.410	0.000	0.010	0.000	0.414 ✔	1.000	4.8.2 ✔
	27.68 - 26.68	0.004	0.412	0.000	0.010	0.000	0.416 ✔	1.000	4.8.2 ✔
	26.68 - 25.68	0.004	0.415	0.000	0.010	0.000	0.419 ✔	1.000	4.8.2 ✔
	25.68 - 24.68	0.004	0.417	0.000	0.010	0.000	0.422 ✔	1.000	4.8.2 ✔
	24.68 - 23.68	0.004	0.420	0.000	0.010	0.000	0.424 ✔	1.000	4.8.2 ✔
L21	23.68 - 22.4533	0.004	0.430	0.000	0.010	0.000	0.434 ✔	1.000	4.8.2 ✔
	22.4533 - 21.2267	0.004	0.433	0.000	0.010	0.000	0.437 ✔	1.000	4.8.2 ✔
	21.2267 - 20	0.004	0.436	0.000	0.010	0.000	0.440 ✔	1.000	4.8.2 ✔
L22	20 - 19	0.004	0.411	0.000	0.009	0.000	0.415 ✔	1.000	4.8.2 ✔
	19 - 18	0.004	0.413	0.000	0.009	0.000	0.417 ✔	1.000	4.8.2 ✔
	18 - 17	0.004	0.415	0.000	0.009	0.000	0.419 ✔	1.000	4.8.2 ✔
	17 - 16	0.004	0.417	0.000	0.009	0.000	0.422 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	16 - 15	0.004	0.419	0.000	0.009	0.000	0.423 ✔	1.000	4.8.2 ✔
L23	15 - 14	0.004	0.428	0.000	0.009	0.000	0.432 ✔	1.000	4.8.2 ✔
	14 - 13	0.004	0.430	0.000	0.009	0.000	0.434 ✔	1.000	4.8.2 ✔
	13 - 12	0.004	0.431	0.000	0.009	0.000	0.436 ✔	1.000	4.8.2 ✔
L24	12 - 11.75 (24)	0.005	0.476	0.000	0.010	0.000	0.481 ✔	1.000	4.8.2 ✔
L25	11.75 - 10.75	0.005	0.487	0.000	0.011	0.000	0.492 ✔	1.000	4.8.2 ✔
	10.75 - 9.75	0.005	0.489	0.000	0.011	0.000	0.494 ✔	1.000	4.8.2 ✔
	9.75 - 8.75	0.005	0.491	0.000	0.011	0.000	0.496 ✔	1.000	4.8.2 ✔
	8.75 - 7.75	0.005	0.493	0.000	0.011	0.000	0.498 ✔	1.000	4.8.2 ✔
	7.75 - 6.75	0.005	0.495	0.000	0.011	0.000	0.500 ✔	1.000	4.8.2 ✔
L26	6.75 - 5.75	0.005	0.506	0.000	0.011	0.000	0.511 ✔	1.000	4.8.2 ✔
	5.75 - 4.75	0.005	0.507	0.000	0.011	0.000	0.513 ✔	1.000	4.8.2 ✔
	4.75 - 3.75	0.005	0.509	0.000	0.011	0.000	0.514 ✔	1.000	4.8.2 ✔
	3.75 - 2.75	0.005	0.511	0.000	0.011	0.000	0.516 ✔	1.000	4.8.2 ✔
	2.75 - 1.75	0.005	0.513	0.000	0.011	0.000	0.518 ✔	1.000	4.8.2 ✔
L27	1.75 - 0 (27)	0.005	0.516	0.000	0.011	0.000	0.521 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	98 - 93	Pole	TP14.625x12.75x0.25	1	-1942.91	847451.00	7.1	Pass
L2	93 - 88	Pole	TP16.5x14.625x0.25	2	-4980.98	957988.00	17.0	Pass
L3	88 - 83	Pole	TP17.4917x16.5x0.1875	3	-5414.57	765101.00	37.1	Pass
L4	83 - 78.5	Pole	TP18.3842x17.4917x0.1875	4	-7376.90	804562.00	50.9	Pass
L5	78.5 - 78.25	Pole	TP18.4338x18.3842x0.1875	5	-7410.89	806755.00	51.8	Pass
L6	78.25 - 78	Pole	TP18.4833x18.4338x0.1875	6	-7434.84	808947.00	52.7	Pass
L7	78 - 77.75	Pole	TP18.5329x18.4833x0.6875	7	-7474.05	2893120.00	15.8	Pass
L8	77.75 - 72.75	Pole	TP19.5246x18.5329x0.65	8	-8218.19	2893060.00	21.8	Pass
L9	72.75 - 70	Pole	TP20.07x19.5246x0.625	9	-8640.87	2865860.00	25.2	Pass
L10	70 - 65	Pole	TP21.0644x20.07x0.7375	10	-9586.66	3535080.00	25.2	Pass
L11	65 - 60	Pole	TP22.0587x21.0644x0.7125	11	-10561.60	3586520.00	29.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L12	60 - 55	Pole	TP23.0531x22.0587x0.6875	12	-11568.80	3625940.00	32.9	Pass
L13	55 - 53.5	Pole	TP23.3514x23.0531x0.675	13	-11871.90	3609480.00	34.2	Pass
L14	53.5 - 53.25	Pole	TP23.4011x23.3514x0.8875	14	-11944.50	4711730.00	26.9	Pass
L15	53.25 - 48.68	Pole	TP24.31x23.4011x0.85	15	-13082.20	4702330.00	29.7	Pass
L16	48.68 - 43.68	Pole	TP25.3055x24.31x0.8125	16	-14364.00	4692790.00	32.7	Pass
L17	43.68 - 38.68	Pole	TP26.3009x25.3055x0.7875	17	-15676.30	4737900.00	35.3	Pass
L18	38.68 - 33.68	Pole	TP27.2964x26.3009x0.7625	18	-17020.10	4770980.00	37.9	Pass
L19	33.68 - 28.68	Pole	TP28.2919x27.2964x0.7375	19	-18395.60	4792020.00	40.5	Pass
L20	28.68 - 23.68	Pole	TP29.2873x28.2919x0.725	20	-19801.30	4883130.00	42.4	Pass
L21	23.68 - 20	Pole	TP30.02x29.2873x0.7125	21	-20854.50	4924140.00	44.0	Pass
L22	20 - 15	Pole	TP31.015x30.02x0.7625	22	-22427.90	5439610.00	42.3	Pass
L23	15 - 12	Pole	TP31.612x31.015x0.75	23	-23387.80	5458230.00	43.6	Pass
L24	12 - 11.75	Pole	TP31.6618x31.612x0.675	24	-23471.00	4932260.00	48.1	Pass
L25	11.75 - 6.75	Pole	TP32.6568x31.6618x0.6625	25	-24966.60	4998320.00	50.0	Pass
L26	6.75 - 1.75	Pole	TP33.6518x32.6568x0.65	26	-26392.30	5058440.00	51.8	Pass
L27	1.75 - 0	Pole	TP34x33.6518x0.65	27	-26871.40	5111820.00	52.1	Pass
							Summary	
						Pole (L6)	52.7	Pass
						RATING =	**52.7**	**Pass**

* Due to limitations of the TnxTower software when analyzing monopoles with additional bolted plates, the above output has not been used to determine the governing tower usage. Please see additional calculation results which are based on the section forces generated in this output.

Additional Calculations

CCIpole

per TIA-222- G

Site BU: _____

Work Order: _____

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	98	10	0	18	12.75	16.5	0.25	1	A572-65
2	88	18	0	18	16.50	20.07	0.1875	0.75	A572-65
3	70	21.32	0	18	20.07	24.31	0.3125	1.25	A572-65
4	48.68	28.68	0	18	24.31	30.02	0.3125	1.25	A572-65
5	20	20	0	18	30.02	34	0.375	1.5	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	78.5	channel	RSB-01 (top)	2	1						1											
2	0	53.5	channel	RSB-01 (top)	2											1				1			
3	12	78	channel	RSB-01 (both)	1													1					
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	6.1875	3.5	5.6646	2.0625	n/a	24.000	31.000	5.008	1.2500	A572-65
2	6.1875	3.5	5.6646	2.0625	n/a	24.000	31.000	5.008	1.2500	A572-65
3	6.1875	3.5	5.6646	2.0625	24.000	24.000	31.000	5.008	1.2500	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	98 - 93	5		18	12.750	14.625	0.25	A572-65	1.000
2	93 - 88	5	0	18	14.625	16.500	0.25	A572-65	1.000
3	88 - 83	5		18	16.500	17.492	0.1875	A572-65	1.000
4	83 - 78.5	4.5		18	17.492	18.384	0.1875	A572-65	1.000
5	78.5 - 78.25	0.25		18	18.384	18.434	0.1875	A572-65	1.000
6	78.25 - 78	0.25		18	18.434	18.483	0.1875	A572-65	1.000
7	78 - 77.75	0.25		18	18.483	18.533	0.6875	A572-65	0.717
8	77.75 - 72.75	5		18	18.533	19.525	0.65	A572-65	0.732
9	72.75 - 70	2.75	0	18	19.525	20.070	0.625	A572-65	0.747
10	70 - 65	5		18	20.070	21.064	0.7375	A572-65	0.790
11	65 - 60	5		18	21.064	22.059	0.7125	A572-65	0.799
12	60 - 55	5		18	22.059	23.053	0.6875	A572-65	0.810
13	55 - 53.5	1.5		18	23.053	23.351	0.675	A572-65	0.820
14	53.5 - 53.25	0.25		18	23.351	23.401	0.8875	A572-65	0.808
15	53.25 - 48.68	4.57	0	18	23.401	24.310	0.85	A572-65	0.824
16	48.68 - 43.68	5		18	24.310	25.305	0.8125	A572-65	0.841
17	43.68 - 38.68	5		18	25.305	26.301	0.7875	A572-65	0.848
18	38.68 - 33.68	5		18	26.301	27.296	0.7625	A572-65	0.858
19	33.68 - 28.68	5		18	27.296	28.292	0.7375	A572-65	0.869
20	28.68 - 23.68	5		18	28.292	29.287	0.725	A572-65	0.868
21	23.68 - 20	3.68	0	18	29.287	30.020	0.7125	A572-65	0.872
22	20 - 15	5		18	30.020	31.015	0.7625	A572-65	0.885
23	15 - 12	3		18	31.015	31.612	0.75	A572-65	0.892
24	12 - 11.75	0.25		18	31.612	31.662	0.675	A572-65	0.902
25	11.75 - 6.75	5		18	31.662	32.657	0.6625	A572-65	0.908
26	6.75 - 1.75	5		18	32.657	33.652	0.65	A572-65	0.915
27	1.75 - 0	1.75		18	33.652	34.000	0.65	A572-65	0.911

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	98 - 93	1.9429	17.053	3.8269
2	93 - 88	4.981	52.39	9.0936
3	88 - 83	5.4146	98.659	9.3427
4	83 - 78.5	7.3769	149.56	14.529
5	78.5 - 78.25	7.4109	153.2	14.557
6	78.25 - 78	7.4348	156.84	14.59
7	78 - 77.75	7.4741	160.49	14.627
8	77.75 - 72.75	8.2182	235.39	15.346
9	72.75 - 70	8.6409	278.13	15.745
10	70 - 65	9.5867	358.67	16.483
11	65 - 60	10.562	442.91	17.226
12	60 - 55	11.569	530.86	17.968
13	55 - 53.5	11.872	558.01	18.248
14	53.5 - 53.25	11.944	562.57	18.292
15	53.25 - 48.68	13.082	648.09	19.15
16	48.68 - 43.68	14.364	746.13	20.08
17	43.68 - 38.68	15.676	848.78	20.998
18	38.68 - 33.68	17.02	955.98	21.9
19	33.68 - 28.68	18.396	1067.6	22.78
20	28.68 - 23.68	19.801	1183.6	23.634
21	23.68 - 20	20.855	1271.7	24.244
22	20 - 15	22.428	1394.8	25.039
23	15 - 12	23.388	1470.6	25.504
24	12 - 11.75	23.471	1477	25.536
25	11.75 - 6.75	24.967	1606.4	26.255
26	6.75 - 1.75	26.392	1739.5	26.988
27	1.75 - 0	26.871	1786.9	27.264

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
98 - 93	Pole	TP14.625x12.75x0.25	Pole	7.1%	Pass
93 - 88	Pole	TP16.5x14.625x0.25	Pole	17.0%	Pass
88 - 83	Pole	TP17.492x16.5x0.1875	Pole	37.1%	Pass
83 - 78.5	Pole	TP18.384x17.492x0.1875	Pole	50.8%	Pass
78.5 - 78.25	Pole	TP18.434x18.384x0.1875	Pole	57.0%	Pass
78.25 - 78	Pole	TP18.483x18.434x0.1875	Pole	58.0%	Pass
78 - 77.75	Pole + Reinf.	TP18.533x18.483x0.6875	Reinf. 3 Bolt-Shaft Bearing	34.5%	Pass
77.75 - 72.75	Pole + Reinf.	TP19.525x18.533x0.65	Reinf. 3 Tension Rupture	40.6%	Pass
72.75 - 70	Pole + Reinf.	TP20.07x19.525x0.625	Reinf. 3 Tension Rupture	46.2%	Pass
70 - 65	Pole + Reinf.	TP21.064x20.07x0.7375	Reinf. 3 Tension Rupture	46.1%	Pass
65 - 60	Pole + Reinf.	TP22.059x21.064x0.7125	Reinf. 3 Tension Rupture	53.2%	Pass
60 - 55	Pole + Reinf.	TP23.053x22.059x0.6875	Reinf. 3 Tension Rupture	59.8%	Pass
55 - 53.5	Pole + Reinf.	TP23.351x23.053x0.675	Reinf. 3 Tension Rupture	61.6%	Pass
53.5 - 53.25	Pole + Reinf.	TP23.401x23.351x0.8875	Reinf. 1 Elastic	48.6%	Pass
53.25 - 48.68	Pole + Reinf.	TP24.31x23.401x0.85	Reinf. 1 Elastic	52.8%	Pass
48.68 - 43.68	Pole + Reinf.	TP25.305x24.31x0.8125	Reinf. 1 Elastic	57.1%	Pass
43.68 - 38.68	Pole + Reinf.	TP26.301x25.305x0.7875	Reinf. 1 Elastic	61.2%	Pass
38.68 - 33.68	Pole + Reinf.	TP27.296x26.301x0.7625	Reinf. 1 Elastic	65.1%	Pass
33.68 - 28.68	Pole + Reinf.	TP28.292x27.296x0.7375	Reinf. 1 Elastic	68.7%	Pass
28.68 - 23.68	Pole + Reinf.	TP29.287x28.292x0.725	Reinf. 1 Elastic	72.1%	Pass
23.68 - 20	Pole + Reinf.	TP30.02x29.287x0.7125	Reinf. 1 Elastic	74.4%	Pass
20 - 15	Pole + Reinf.	TP31.015x30.02x0.7625	Reinf. 1 Elastic	70.4%	Pass
15 - 12	Pole + Reinf.	TP31.612x31.015x0.75	Reinf. 1 Elastic	71.9%	Pass
12 - 11.75	Pole + Reinf.	TP31.662x31.612x0.675	Reinf. 1 Elastic	75.0%	Pass
11.75 - 6.75	Pole + Reinf.	TP32.657x31.662x0.6625	Reinf. 1 Elastic	77.3%	Pass
6.75 - 1.75	Pole + Reinf.	TP33.652x32.657x0.65	Reinf. 1 Elastic	79.5%	Pass
1.75 - 0	Pole + Reinf.	TP34x33.652x0.65	Reinf. 1 Elastic	80.2%	Pass
				Summary	
			Pole	67.6%	Pass
			Reinforcement	80.2%	Pass
			Overall	80.2%	Pass

Additional Calculations

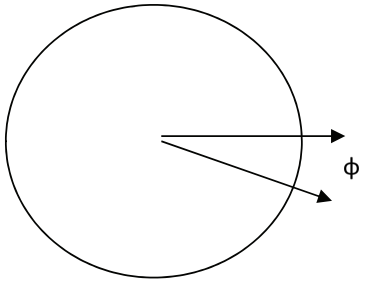
Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity			
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3
98 - 93	298	n/a	298	11.41	n/a	11.41	7.1%			
93 - 88	430	n/a	430	12.89	n/a	12.89	17.0%			
88 - 83	389	n/a	389	10.30	n/a	10.30	37.1%			
83 - 78.5	453	n/a	453	10.83	n/a	10.83	50.8%			
78.5 - 78.25	524	n/a	524	10.86	n/a	10.86	57.0%			
78.25 - 78	528	n/a	528	10.89	n/a	10.89	58.0%			
78 - 77.75	464	1104	1568	10.92	16.99	27.91	20.0%	28.1%		34.5%
77.75 - 72.75	543	1201	1745	11.51	16.99	28.50	27.6%	38.2%		40.6%
72.75 - 70	591	1257	1848	11.83	16.99	28.83	31.5%	43.4%		46.2%
70 - 65	1120	1361	2481	20.58	16.99	37.58	31.7%	43.0%		46.1%
65 - 60	1288	1470	2758	21.57	16.99	38.56	36.8%	49.4%		53.2%
60 - 55	1473	1582	3056	22.56	16.99	39.55	41.6%	55.2%		59.8%
55 - 53.5	1532	1617	3149	22.85	16.99	39.84	43.0%	56.8%		61.6%
53.5 - 53.25	1604	2503	4107	22.90	28.32	51.22	38.3%	48.6%	40.5%	39.2%
53.25 - 48.68	1798	2672	4470	23.80	28.32	52.12	42.0%	52.8%	44.1%	43.0%
48.68 - 43.68	2027	2864	4891	24.79	28.32	53.11	45.9%	57.1%	47.8%	47.0%
43.68 - 38.68	2276	3062	5337	25.78	28.32	54.10	49.5%	61.2%	51.4%	50.8%
38.68 - 33.68	2543	3267	5810	26.76	28.32	55.09	53.1%	65.1%	54.7%	54.5%
33.68 - 28.68	2831	3479	6310	27.75	28.32	56.07	56.4%	68.7%	57.8%	58.0%
28.68 - 23.68	3140	3698	6838	28.74	28.32	57.06	59.6%	72.1%	60.8%	61.3%
23.68 - 20	3381	3863	7244	29.47	28.32	57.79	61.8%	74.4%	62.9%	63.7%
20 - 15	4425	4114	8539	36.47	28.32	64.79	58.8%	70.4%	60.6%	62.1%
15 - 12	4668	4251	8919	37.18	28.32	65.50	60.1%	71.9%	62.0%	63.7%
12 - 11.75	4621	3496	8117	37.24	22.66	59.90	62.4%	75.0%	72.9%	
11.75 - 6.75	5076	3693	8768	38.42	22.66	61.08	64.7%	77.3%	75.2%	
6.75 - 1.75	5559	3895	9454	39.61	22.66	62.26	66.9%	79.5%	77.4%	
1.75 - 0	5735	3967	9702	40.02	22.66	62.68	67.6%	80.2%	78.1%	

Note: Section capacity checked in 5 degree increments.

BU#		
Site Name	CT2037	
App #		

Number Of Bolts (Ext + Mod)	11
Diameter Of Exist. Bolt Circle(inch)	42
Moment (ft. kips)	1787
Axial Compression (kips)	26.89
Outer Diamter of Mod. Bolt Circle(inch)	51.125

21444 in. kips



	Bolt Diameter (inch)	Grade	Allowable Axial (kips)	Capacity
Existing	2.25	A615 (Gr 75)	260	47.3%
Mod	**2.75**	**Fy = 95**	**453.6**	**49.1%**

Sum Ax_i^2 14289.30

T(+) C(-)

Bolt #	ϕ °	Bolt Circle	D (in)	Radians	Cos(ϕ °)	x_i(inch)	x_i^2	Area	Ax_i	Ax_i^2	Force (Kip)	Capacities
1	0	42.00	2.25	0.000	1.000	21.000	441.000	3.98	83.50	1753.45	122.9	47.3%
2	60	42.00	2.25	1.047	0.500	10.500	110.250	3.98	41.75	438.36	60.2	23.2%
3	120	42.00	2.25	2.094	-0.500	-10.500	110.250	3.98	-41.75	438.36	-65.1	25.0%
4	180	42.00	2.25	3.142	-1.000	-21.000	441.000	3.98	-83.50	1753.45	-127.7	49.1%
5	240	42.00	2.25	4.189	-0.500	-10.500	110.250	3.98	-41.75	438.36	-65.1	25.0%
6	300	42.00	2.25	5.236	0.500	10.500	110.250	3.98	41.75	438.36	60.2	23.2%
7	**50**	**51.13**	**2.75**	**0.873**	**0.643**	**16.431**	**269.986**	**5.94**	**97.59**	**1603.60**	**144.0**	**31.7%**
8	**130**	**51.13**	**2.75**	**2.269**	**-0.643**	**-16.431**	**269.986**	**5.94**	**-97.59**	**1603.60**	**-148.9**	**32.8%**
9	**210**	**51.13**	**2.75**	**3.665**	**-0.866**	**-22.138**	**490.081**	**5.94**	**-131.49**	**2910.87**	**-199.8**	**44.0%**
10	**270**	**51.13**	**2.75**	**4.712**	**0.000**	**0.000**	**0.000**	**5.94**	**0.00**	**0.00**	**-2.4**	**0.5%**
11	**330**	**51.13**	**2.75**	**5.760**	**0.866**	**22.138**	**490.081**	**5.94**	**131.49**	**2910.87**	**194.9**	**43.0%**

Monopole Pier and Pad Foundation

BU # : -
Site Name: CT2037
App. Number: -
TIA-222 Revision: G

Design Reactions		
Shear, **S**:	27.242	kips
Moment, **M**:	1787	ft-kips
Tower Height, **H**:	98	ft
Tower Weight, **Wt**:	26.182	kips
Base Diameter, **BD**:	2.83	ft

Foundation Dimensions		
Depth, **D**:	4.25	ft
Pad Width, **W**:	21.63	ft
Neglected Depth, **N**:	3.33	ft
Thickness, **T**:	3.25	ft
Pier Diameter, **Pd**:	6.00	ft
Ext. Above Grade, **E**:	1.00	ft
BP Dist. Above Pier:	3	in.
Clear Cover, **Cc**:	3.0	in

Soil Properties		
Soil Unit Weight, **γ**:	0.100	kcf
Ult. Bearing Capacity, Bc:	6.9	ksf
Angle of Friction, **Φ**:	30	deg
Cohesion, **Co**:	0.000	ksf
Passive Pressure, **Pp**:	0.000	ksf
Base Friction, **μ**:	0.35	

Material Properties		
Rebar Yield Strength, **Fy**:	60000	psi
Concrete Strength, **F'c**:	4000	psi
Concrete Unit Weight, **δc**:	0.150	kcf
Seismic Zone, **z**:	1	

Rebar Properties		
Pier Rebar Size, **Sp**:	8	
Pier Rebar Quanity, **mp**:	26	26
Pad Rebar Size, **Spad**:	8	
Pad Rebar Quanity, **mpad**:	23	12
Pier Tie Size, **St**:	3	3
Tie Quanity, **mt**:	4	4

Design Checks	Capacity/ Availability	Demand/ Limits	Check
Req'd Pier Diam.(ft)	6	4.333	**OK**
Overturning (ft-kips)	2515.80	1787.00	**71.0%**
Shear Capacity (kips)	81.18	27.24	**33.6%**
Bearing (ksf)	5.14	1.79	**34.9%**
Pad Shear - 1-way (kips)	874.15	180.17	**20.6%**
Pad Shear - 2-way (kips)	2274.77	48.45	**2.1%**
Pad Moment Capacity (k-ft)	2852.15	715.49	**25.1%**
Pier Moment Capacity (k-ft)	2915.32	1841.48	**63.2%**

PROJECT INFORMATION

SCOPE OF WORK:
- AT&T ANTENNAS: (1) NEW ANTENNA PER SECTOR, FOR A TOTAL (3) NEW ANTENNAS. (2) EXISTING ANTENNAS PER SECTOR FOR 3 SECTORS, FOR A TOTAL OF (6) EXISTING ANTENNAS TO REMAIN. (1) EXISTING ANTENNA PER SECTOR FOR (3) SECTORS, FOR A TOTAL OF (3) EXISTING ANTENNAS TO BE REMOVED.
- AT&T RRUs: (1) NEW RRUs PER SECTOR TO REPLACE EXISTING RRU WITH (3) SECTORS, FOR A TOTAL OF (3) NEW RRUs; (2) EXISTING RRU PER SECTOR TO BE REUSED, FOR A TOTAL OF (6) EXISTING RRUs.

SITE ADDRESS:	69 WHEELER STREET NEW HAVEN, CT 06512
LATITUDE:	41.2959919 41° 17' 45.57"N
LONGITUDE:	−72.897942 −72° 53' 52.59"W
USID:	61168
TOWER OWNER:	LANDMARK DIVIDEND, LLC
TYPE OF SITE:	MONOPOLE/INDOOR EQUIPMENT
MONOPOLE HEIGHT:	98'−0"±
RAD CENTER:	91'−0"±
CURRENT USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY
PROPOSED USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

DRAWING INDEX

		REV.
T−1	TITLE SHEET	0
GN−1	GROUNDING & GENERAL NOTES	0
A−1	COMPOUND LAYOUT	0
A−2	EQUIPMENT LAYOUTS	0
A−3	ANTENNA LAYOUTS & ELEVATIONS	0
A−4	DETAILS	0
G−1	GROUNDING, ONE−LINE DIAGRAM & DETAILS	0

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN, ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AMD MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

DISCIPLINE:	NAME:	
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

at&t MOBILITY

FA CODE: 10035247
SITE NUMBER: CT2037
SITE NAME: NEW HAVEN WHEELER ST
PROJECT: LTE BWE

VICINITY MAP

1.) START OUT GOING WEST ON COCHITUATE RD/MA−30 TOWARD BURR ST. (0.02 MI) 2.) MAKE A U−TURN AT BURR ST ONTO COCHITUATE RD/MA−30. (0.05 MI) 3.) MERGE ONTO I−90 W/MASSACHUSETTS TPKE W (PORTIONS TOLL). (38.8 MI) 4.) MERGE ONTO I−84 W/WILBUR CROSS HWY S VIA EXIT 9 TOWARD US−20/HARTFORD/NEW YORK CITY (PORTIONS TOLL) (CROSSING INTO CONNECTICUT). (41.7 MI) 5.) KEEP LEFT TO TAKE CT−15 S/WILBUR CROSS HWY S VIA EXIT 57 TOWARD I−91 S/CHARTER OAK BR/NY CITY. (2.0 MI) 6.) MERGE ONTO I−91 S VIA EXIT 86 TOWARD NEW HAVEN/NY CITY. (36.2 MI) 7.) TAKE THE HAMILTON ST EXIT, EXIT 2 (0.3 MI) 8.) STAY STRAIGHT TO GO ONTO IVES PL. (0.1 MI) 9.) TURN RIGHT ONTO EAST ST. 10.) TAKE THE 2ND LEFT ONTO WATER ST/US−1 N. 11.) CONTINUE TO FOLLOW US−1 N. (0.7 MI) 12.) TAKE THE 1ST LEFT ONTO WHEELER ST. 13.) ARRIVE 69 WHEELER ST ON THE RIGHT

PROJECT TEAM

CLIENT REPRESENTATIVE
COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD, BILLERICA, MA 01821
CONTACT: DAVID COOPER
PHONE: 617−639−4908
EMAIL: dcooper@empiretelecomm.com

SITE ACQUISITION:
COMPANY: EMPIRE TELECOM
ADDRESS: 16 ESQUIRE ROAD, BILLERICA, MA 01821
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ADDRESS: 16 ESQUIRE ROAD, BILLERICA, MA 01821
CONTACT: DAVID COOPER
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EMAIL: dcooper@empiretelecomm.com

ENGINEERING:
COMPANY: COM−EX CONSULTANTS, LLC
ADDRESS: 115 ROUTE 46, SUITE E39, MOUNTAIN LAKES, NJ 07046
CONTACT: NICHOLAS D. BARILE, P.E.
PHONE: 862−209−4300
EMAIL: nbarile@comexconsultants.com

RF ENGINEER:
COMPANY: AT&T MOBILITY − NEW ENGLAND
ADDRESS: 550 COCHITUATE ROAD, SUITE 550 13 & 14, FRAMINGHAM, MA 01701
CONTACT: CAMERON SYME
PHONE: 508−596−7146
EMAIL: cs6970@att.com

CONSTRUCTION MANAGEMENT:
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ADDRESS: 16 ESQUIRE ROAD, BILLERICA, MA 01821
CONTACT: GRZEGORZ "GREG" DORMAN
PHONE: 484−683−1750
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GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY, AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CONNECTICUT ONE CALL SYSTEM, INC. 1-800-922-4455 STOP · CALL BEFORE YOU DIG!

CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800−922−4455 OR DIAL 811

COM−EX Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CTU2037
SITE NAME: NEW HAVEN WHEELER ST
69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	1/20/17	ISSUED AS FINAL	KCD	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: CJT

SEAL: STATE OF CONNECTICUT · DOUGLAS S. BARILE · 28301 · REGISTERED PROFESSIONAL ENGINEER · CT PROFESSIONAL ENGINEER

AT&T

DRAWING TITLE: TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
16055−EMP	T−1	0

GROUNDING NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.

13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').

14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE ½" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   - CONTRACTOR – EMPIRE TELECOM
   - SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   - OWNER – AT&T MOBILITY
   - OEM – ORIGINAL EQUIPMENT MANUFACTURER

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR (EMPIRE TELECOM).

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR

9. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
   - CONNECTICUT BUILDING CODE: CBC 2016 WITH LOCAL & COUNTY AMENDMENTS
   - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
   - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS

20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
   - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
   - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
   - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
   - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
   - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
   - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
   - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
   - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

22. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

23. INFORMATION SHOWN ON THIS SET OF PLANS TAKEN FROM DRAWINGS PREPARED BY CENTEK ENGINEERING FOR A RECENT UPGRADE DATED 05/03/2012. CONTRACTOR TO NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.

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FAX: 862.209.4301

EMPIRE telecom
16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CTU2037
SITE NAME: NEW HAVEN WHEELER ST

69 WHEELER STREET
NEW HAVEN, CT 06512
NEW HAVEN COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	1/20/17	ISSUED AS FINAL	KCD	NDB	NDB

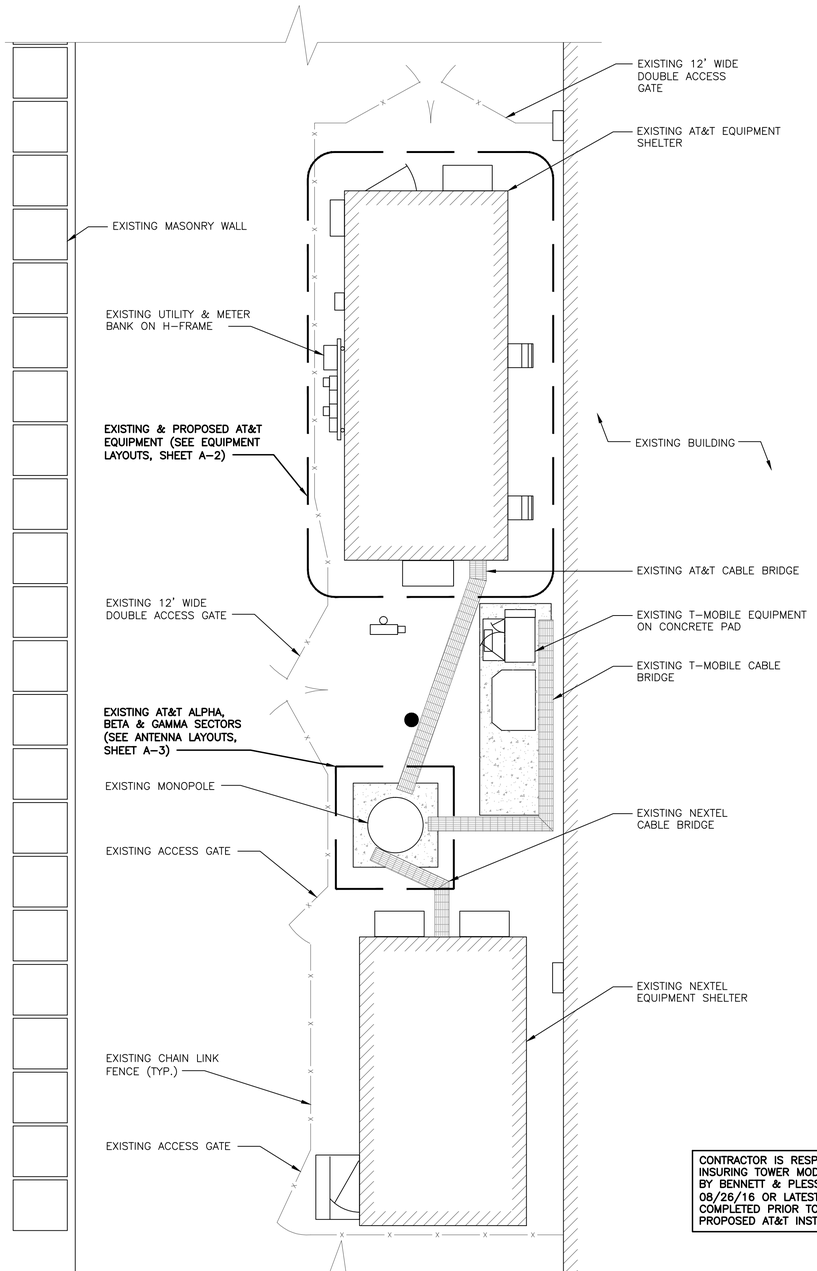
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: CJT

SEAL:
STATE OF CONNECTICUT
DOUGLAS G. BALL
REGISTERED
PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 23643

AT&T

DRAWING TITLE:
GROUNDING & GENERAL NOTES

JOB NUMBER	DRAWING NUMBER	REV
16055-EMP	GN-1	0



COMPOUND LAYOUT
SCALE: 1/8" = 1'-0"

0 4 8 16
GRAPHIC SCALE: 1/8"=1'-0"

CONTRACTOR IS RESPONSIBLE FOR INSURING TOWER MODIFICATIONS BY BENNETT & PLESS DATED 08/26/16 OR LATEST, IS COMPLETED PRIOR TO ANY PROPOSED AT&T INSTALLATION

NORTH

NOTE:
CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

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FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	1/20/17	ISSUED AS FINAL	KCD	NDB	NDB

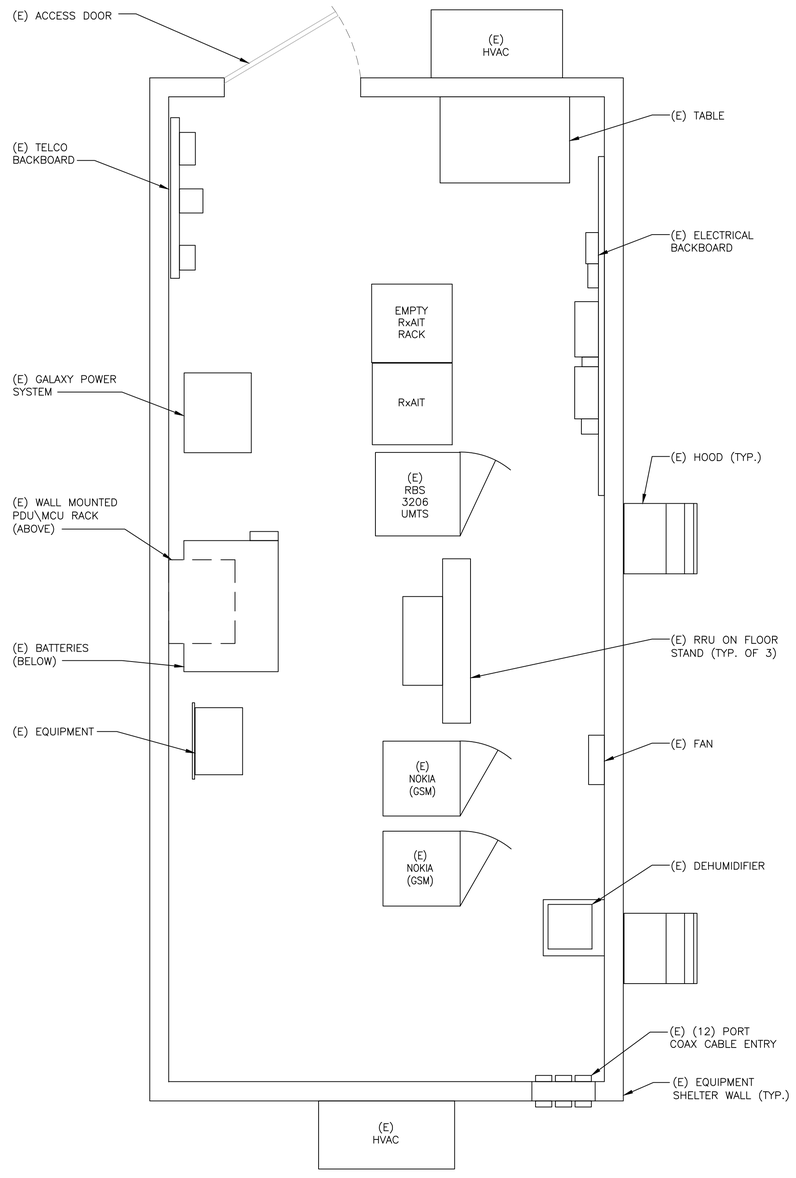
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: CJT

SEAL:
STATE OF CONNECTICUT
NICHOLAS D. BARTH
No. 28643
PROFESSIONAL ENGINEER
CT PROFESSIONAL ENGINEER No. 28643

AT&T

DRAWING TITLE:
COMPOUND LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
16055-EMP	A-1	0



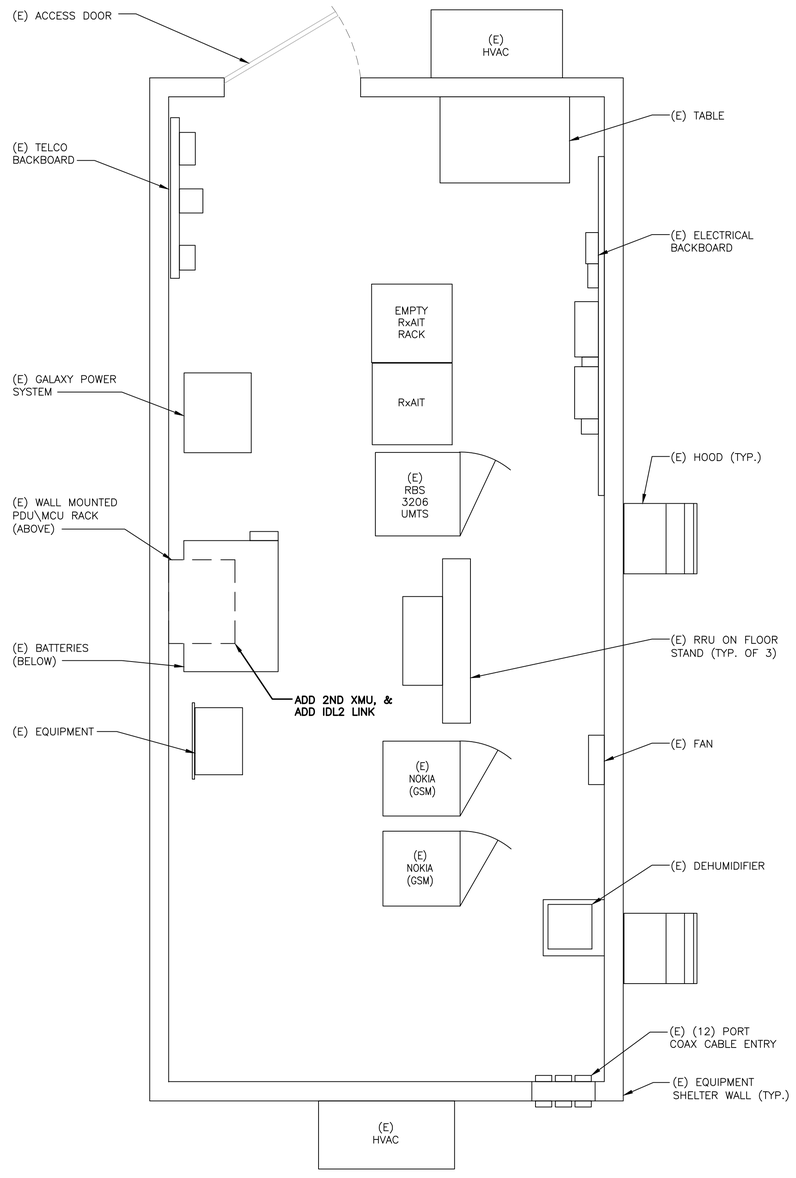
EXISTING EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot

NORTH



PROPOSED EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot

NORTH

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0	1/20/17	ISSUED AS FINAL	KCD	NDB	NDB

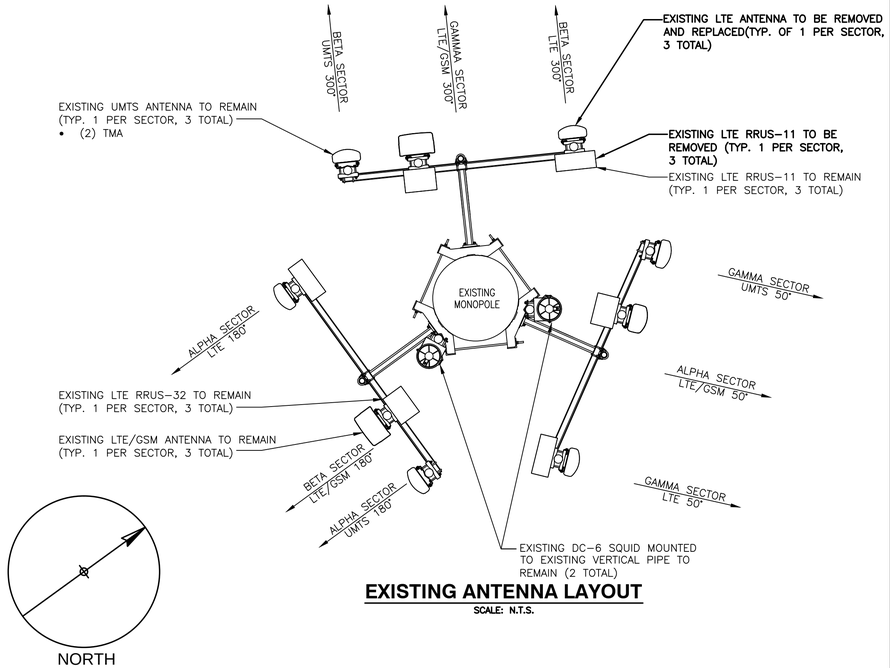
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: CJT

SEAL:
STATE OF CONNECTICUT
NICHOLAS D. BARTLETT
LICENSED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

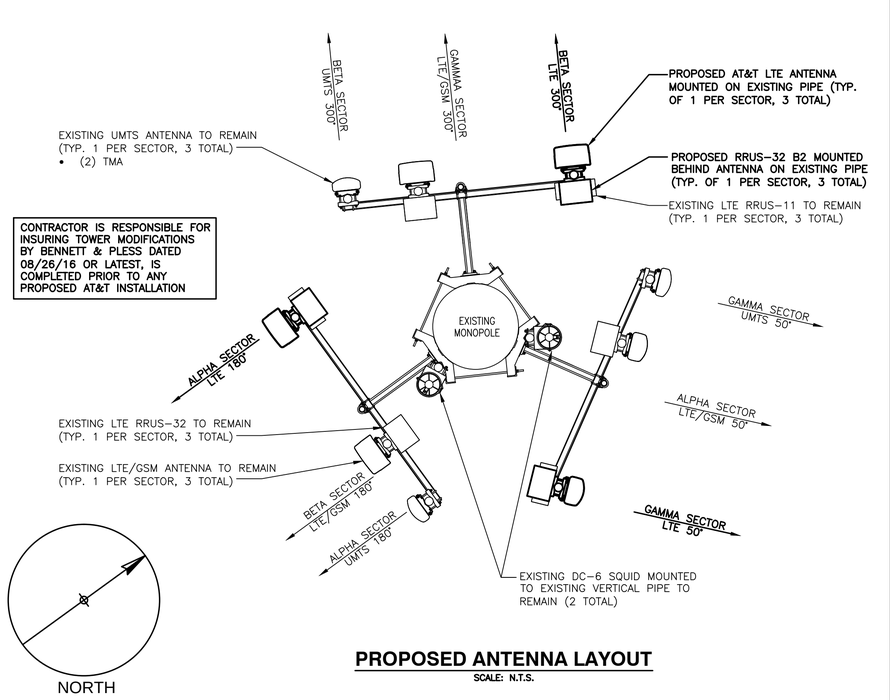
DRAWING TITLE:
EQUIPMENT LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
16055-EMP	A-2	0



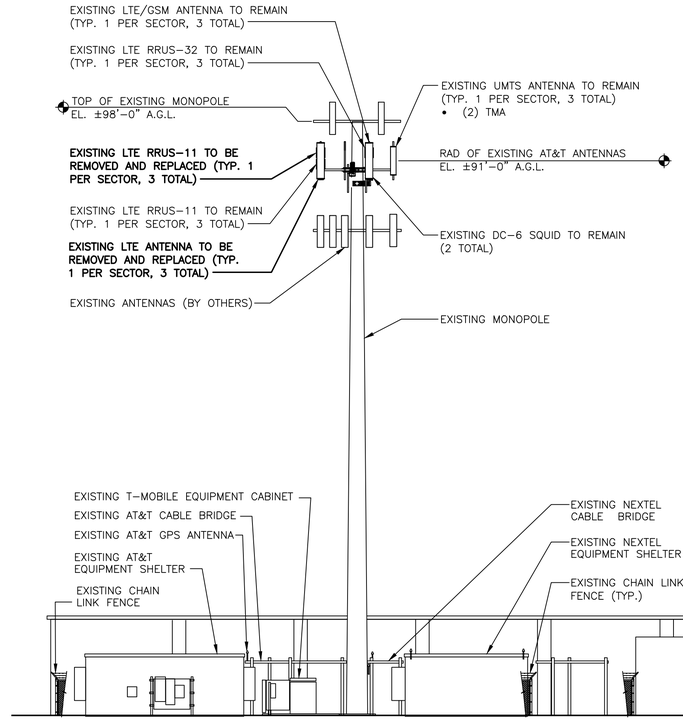
EXISTING ANTENNA LAYOUT

SCALE: N.T.S.



PROPOSED ANTENNA LAYOUT

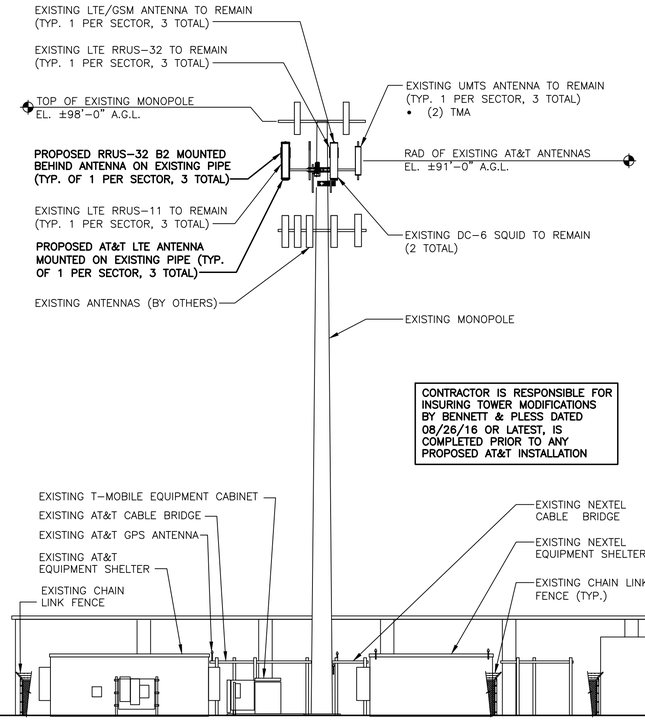
SCALE: N.T.S.



EXISTING TOWER ELEVATION

SCALE: NTS

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.



PROPOSED TOWER ELEVATION

SCALE: NTS

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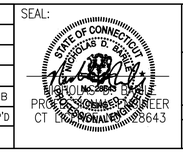
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: CJT

SEAL:

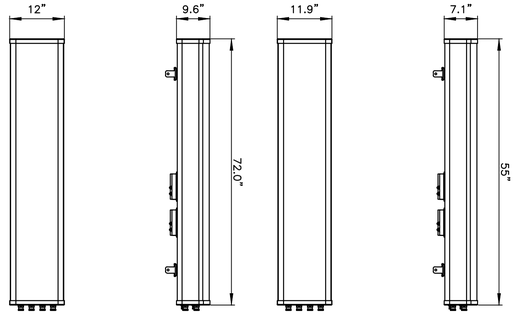


PROFESSIONAL ENGINEER
CT LICENSE NO. 23643

AT&T

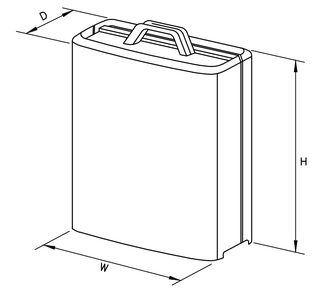
DRAWING TITLE:
ANTENNA LAYOUTS & ELEVATIONS

JOB NUMBER	DRAWING NUMBER	REV
16055-EMP	A-3	0



MANUFACTURER	QUINTEL	ANDREW
MODEL	QS66512-2	SBNHH-1D65A
WEIGHT	111 LBS	33.5 LBS

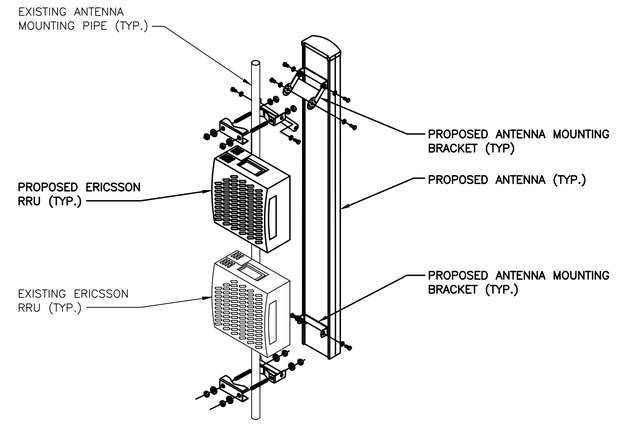
LTE ANTENNA DETAIL
SCALE: N.T.S.



MODEL	L x W x H	WEIGHT
*RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-32	29.9" x 13.3" x 9.5"	77 LBS
RRUS-32 B2	27.2" x 12.1" x 7"	60 LBS

*DENOTES EXISTING.

RRUS DETAIL
SCALE: N.T.S.



ANTENNA AND RRU MOUNTING DETAIL
SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7750	57"x11"x5"
	A2	ANDREW	SBNHH-1D65A	55"x11.9"x7.1"
	A3	-	-	-
	A4	KMW	AM-X-CD-14-65-00T-RET	48"x11.8"x5.9"
BETA	B1	POWERWAVE	7750	57"x11"x5"
	B2	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	B3	-	-	-
	B4	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
GAMMA	G1	POWERWAVE	7750	57"x11"x5"
	G2	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	G3	-	-	-
	G4	KMW	AM-X-CD-14-65-00T-RET	48"x11.8"x5.9"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7750	57"x11"x5"
	A2	ANDREW	SBNHH-1D65A	55"x11.9"x7.1"
	A3	-	-	-
	A4	**ANDREW**	**SBNHH-1D65A**	**55"x11.9"x7.1"**
BETA	B1	POWERWAVE	7750	57"x11"x5"
	B2	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	B3	-	-	-
	B4	**QUINTEL**	**QS66512-2**	**72"x12"x9.6"**
GAMMA	G1	POWERWAVE	7750	57"x11"x5"
	G2	CCI	HPA-65R-BUU-H6	72"x14.8"x9"
	G3	-	-	-
	G4	**QUINTEL**	**QS66512-2**	**72"x12"x9.6"**

PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	**ERICSSON**	**RRUS-32 B2**	**27.2"x12.1"x7"**	-	-
	ERICSSON	RRUS-32 (EXISTING)	29.9"x13.3"x9.5"	-	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
BETA	**ERICSSON**	**RRUS-32 B2**	**27.2"x12.1"x7"**	-	-
	ERICSSON	RRUS-32 (EXISTING)	29.9"x13.3"x9.5"	-	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
GAMMA	**ERICSSON**	**RRUS-32 B2**	**27.2"x12.1"x7"**	-	-
	ERICSSON	RRUS-32 (EXISTING)	29.9"x13.3"x9.5"	-	-
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

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FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	1/20/17	ISSUED AS FINAL	KCD	NDB	NDB

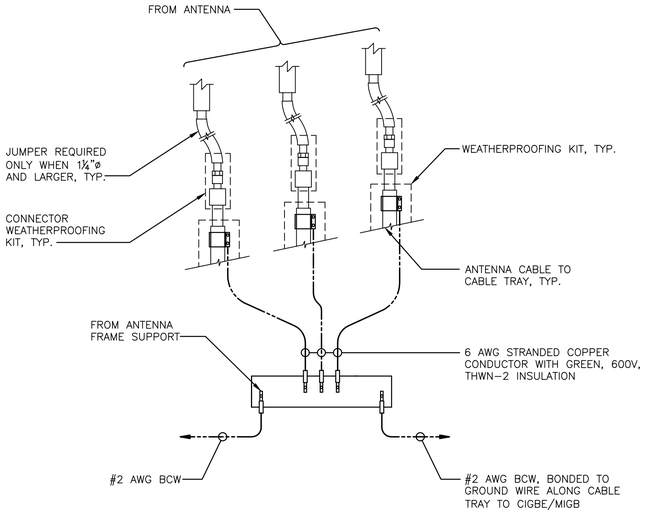
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: CJT

SEAL:
STATE OF CONNECTICUT
NICHOLAS E. BARTELL
LICENSED PROFESSIONAL ENGINEER
No. 28643
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643

AT&T

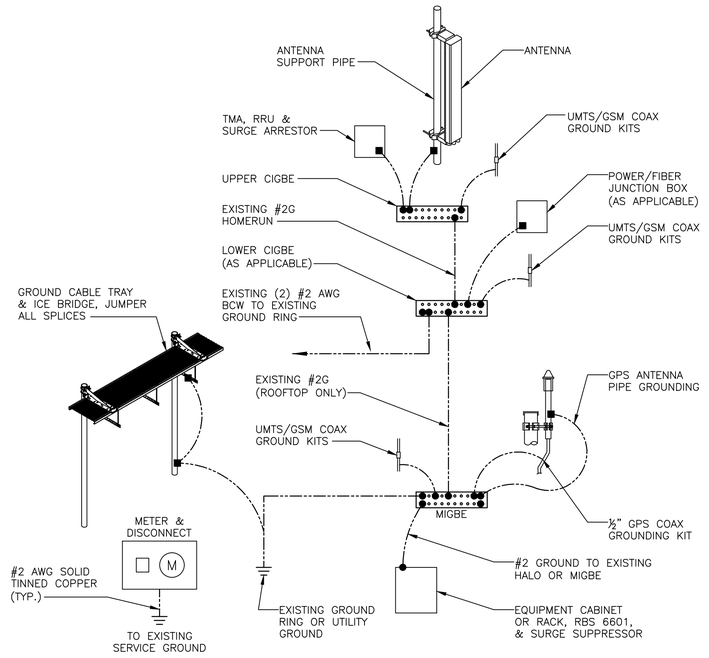
DRAWING TITLE:
DETAILS

JOB NUMBER	DRAWING NUMBER	REV
16055-EMP	A-4	0



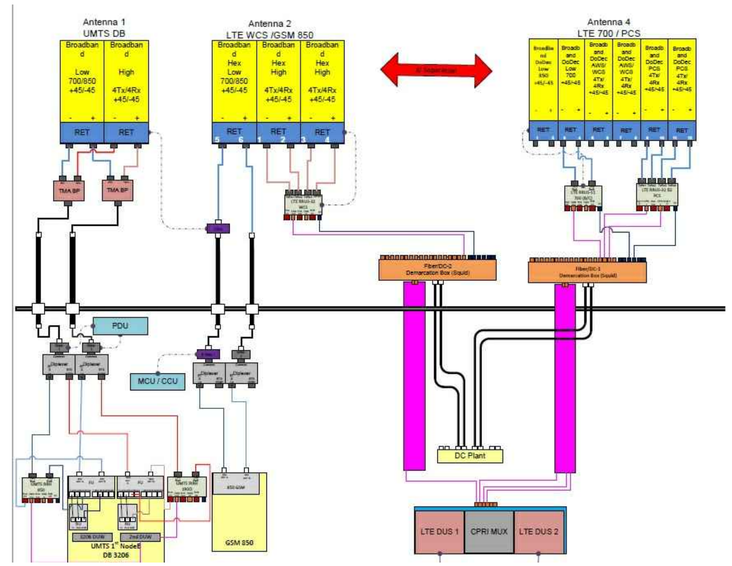
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



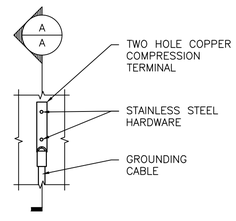
GROUNDING RISER DIAGRAM

SCALE: N.T.S.

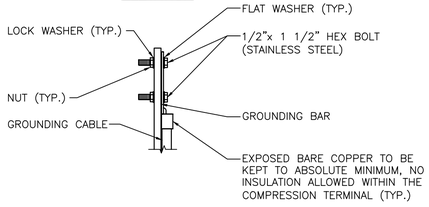


TYPICAL PLUMBING DIAGRAM (PER SECTOR)

SCALE: N.T.S.



ELEVATION



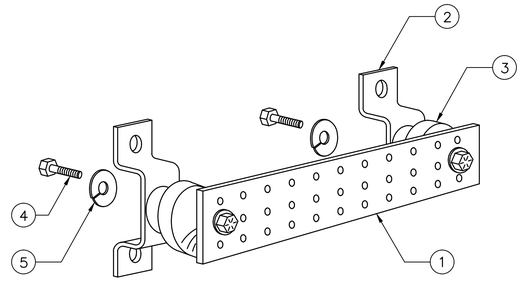
SECTION "A–A"

NOTE:

1. "DOUBLING UP" OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x ¼")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	⅝"–11x1" H.H.C.S.
5	4	⅝" LOCK WASHER

NOTES:

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION

SECTION "P" – SURGE PRODUCERS
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- +24V POWER SUPPLY RETURN BAR (#2)
- –48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES

SECTION "A" – SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)

GROUND BAR DETAIL

SCALE: N.T.S.

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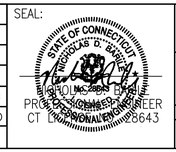
SEAL:



AT&T

DRAWING TITLE:
GROUNDING, ONE–LINE DIAGRAM & DETAILS

JOB NUMBER	DRAWING NUMBER	REV
16055–EMP	G–1	0