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

VIA ELECTRONIC MAIL

September 13, 2019

Lucia Chiocchio, Esq.
Cuddy & Feder, LLP
445 Hamilton Avenue, 14th Floor
White Plains, New York 10601

RE: **TS-CING-105-190808 –** New Cingular Wireless PCS, LLC (AT&T) request for an order to approve tower sharing at an existing telecommunications facility located at 232 Shore Road, Old Lyme, Connecticut.

Dear Attorney Chiocchio:

The Connecticut Siting Council (Council) is in receipt of your correspondence of September 11, 2019 submitted in response to the Council's August 12, 2019 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

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

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/IN/emr

Robidoux, Evan

From: Durkin, Julie <jdurkin@cuddyfeder.com>
Sent: Wednesday, September 11, 2019 2:20 PM
To: CSC-DL Siting Council
Cc: Bachman, Melanie; Fontaine, Lisa; Chiocchio, Lucia; Patrick, Daniel; Medico, Cynthia
Subject: TS-CING-105-190808- AT&T Response to Tower Share Incompleteness
Attachments: 9_11_19 TS-CING-105-190808 CSC re_ Response to Tower Share incompleteness(4225164.1).pdf

Dear Executive Director Bachman,

Please see the attached response to the letter of incompleteness we received on September 6, 2019.

A hard copy is being Federal Expressed today.

Please do not hesitate to contact me with any questions or concerns.

Thank you,
Julie

CUDDY +FEDER LLP

Julie Durkin
Paralegal
Cuddy & Feder LLP
445 Hamilton Avenue, 14th Floor
White Plains, New York 10601
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Lucia Chiocchio
lchiocchio@cuddyfedder.com

September 11, 2019

VIA EMAIL AND OVERNIGHT DELIVERY
Members of the Connecticut Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Tower Sharing Request by New Cingular Wireless PCS, LLC
TS-CING-105-190808
Premises: 232 Shore Road, Old Lyme, Connecticut, 06371

Dear Members of the Siting Council:

This letter is respectfully submitted on behalf of our client, New Cingular Wireless PCS, LLC ("AT&T"), in connection with the request dated August 7, 2019 for an order from the Connecticut Siting Council (the "Council") to approve the proposed shared use of a communications tower and associated compound at the parcel identified as 232 Shore Road in the Town of Old Lyme.

The Council issued a notice of incompletion dated August 12, 2019 requesting revision of the Structural Analysis utilizing the 2015 International Building Code and requesting proof of notice of this tower share request to the underlying property owner, the chief elected official of the host municipality, and the respective Planning and Zoning Department. With this letter, AT&T hereby submits an electronic version, one original and fifteen hard copies of the following in response to the Council's request:

- Structural Analysis Report utilizing the 2015 International Building Code prepared by Master Consulting dated September 10, 2019 signed and sealed by Petros E. Tsoukalas, P.E. (CT License No. PEN.32557) demonstrating that the existing tower facility can structurally accommodate AT&T's facility;
- Proof of notice of the tower share request to the underlying property owner, ATSSLSS LLC;
- Proof of notice of the tower share request to the Town of Old Lyme First Selectwoman Bonnie Reemsnyder; and

CUDDY +FEDER LLP

- Proof of notice of the tower share request to the Town of Old Lyme Land Use Department (Planning and Zoning Department).

Thank you for your consideration of this request. Should the Council members or Staff have any questions regarding the foregoing, please do not hesitate to contact me.

Very truly yours,

Lucia Chiocchio

Lucia Chiocchio

Attachments

cc: AT&T
Daniel Patrick, Esq.
Julie Durkin

MASER CONSULTING
— CONNECTICUT —

Engineers Planners Surveyors Landscape Architects Environmental Scientists

Tower Analysis

FOR

NSB – Old Lyme Shore Road - CT1273

FA Number: 10133919
232 Shore Road
Old Lyme, CT 06371
New London County

Monopole Utilization: 57.8%

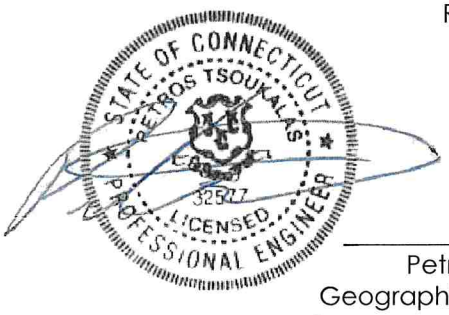
September 10, 2019

Prepared For

AT&T
550 Cochituate Road
Framingham, MA 01701

Prepared By

Maser Consulting Connecticut
331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
T: 732.383.1950



Petros E. Tsoukalas, P.E.
Geographic Discipline Leader
Connecticut License No. 32557

MC Project No. 18946101A

Objective:

The objective of this report is to determine the capacity of the existing monopole at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

Introduction:

Maser Consulting Connecticut has reviewed the following documents in completing this report:

Document Type	Remarks	Source
Structural Design Report	*Sabre Towers & Poles Job #: 41153 Dated April 28, 2011*	*Sabre Towers & Poles*
T-Mobile Loading	*Site #: CT0009*	*Smartlink, LLC*
Verizon Loading	-	*Smartlink, LLC*
Radio Frequency Data Sheet (RFDS)	*RFDS ID 2591275 Dated January 22, 2019*	*Smartlink, LLC*
Site Visit	*Dated October 24, 2018*	*Maser Consulting Connecticut*
Mount Assembly Drawing	*Sabre Industries Drawing #: C10857001A*	*Sabre Industries*

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2018 Connecticut State Building Code, incorporating the 2015 IBC.
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Ultimate Wind Speed – 135 (3 Second Gust)
    - Exposure Category – C
    - Structural Class – II
    - Topographic Category – 1
    - Ice Wind – 50 mph
    - Ice Thickness – 3/4"

Maser Consulting Connecticut understands the final **AT&T** loading to the following:

LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
6	KMW	EPBQ-654L8H8-L2	Proposed	Alpha, Beta, & Gamma
3	CCI	HPA65R-BU8A	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS 4478 B14	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS 4415 B30	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS 4449 B5/B12	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS 8843 B2 B66A	Proposed	Alpha, Beta, & Gamma
3	ERICSSON	RRUS E2 B29	Proposed	Alpha, Beta, & Gamma
3	RAYCAP	DC6-48-60-18-8F	Proposed	Alpha, Beta, & Gamma

See the Material Take-Off sheet in Appendix A for final appurtenance loading.

Monopole Member Information:

See the Material Take-Off sheet in Appendix A for monopole information.

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing monopole is structurally adequate to support the existing and proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure are deemed to be negligible or acceptable, then the proposed equipment can be installed as intended. Tower Numerics, tnx Tower, a tower analysis and design program, designed specifically for the telecommunications industry and for all applicable codes and standards was used for this structural analysis.

General Site Design Assumption:

- All engineering services are performed on the basis that the information used is current and correct.
- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes, prior to the proposed modifications listed within this report, if any.
- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct.
- It is the responsibility of the client to ensure that the information provided to Maser Consulting Connecticut and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that the original design, material production, fabrication, and erection of the existing structure was performed in accordance with accepted industry design standards and in accordance with all applicable codes. Further, it is assumed that the existing structure and appurtenances have been properly maintained in accordance with all applicable codes and manufacturer's specifications and no structural defects and/or deterioration to the structural members has occurred.

- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.
- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Maser Consulting Connecticut is not responsible for the conclusion, opinions, and recommendations made by others based on the information we supply.

Calculations:
The calculations are found in Appendix A of this report.

Conclusion:
The existing monopole was analyzed for the loading in the applicable codes and standards. The monopole has been determined to be structurally **ADEQUATE** to support the proposed and existing loading, based upon the aforementioned assumptions. The monopole and its baseplate have been determined to be stressed to a maximum of **57.8%** and **49.7%** of their structural capacity. The foundation has been determined to be stressed to **29.0%** of its structural capacity. Therefore, the proposed **AT&T** installation **CAN** be installed as intended in all sectors.

Maser Consulting Connecticut reserves the right to amend this report if additional information about the existing members is provided. The conclusions reached by Maser Consulting Connecticut in this report are only valid for the appurtenances listed in this report. Any change to the installation will require a revision to this structural analysis.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.

Sincerely,

Maser Consulting Connecticut

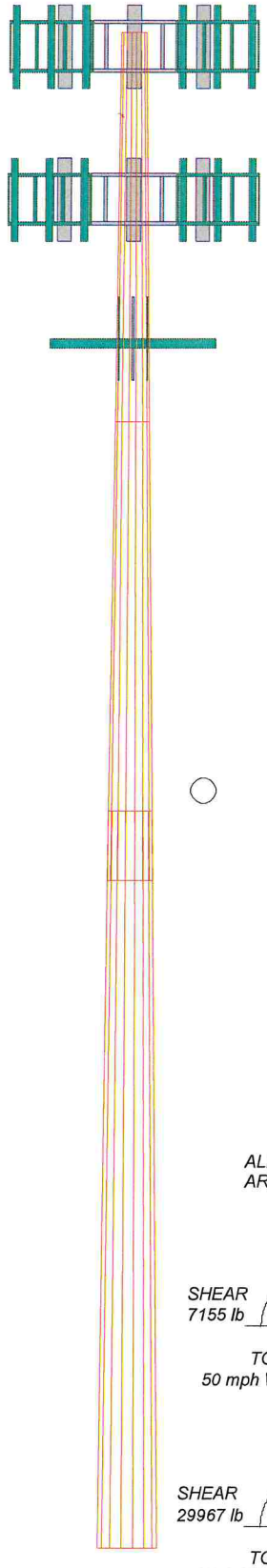
Petros E. Tsoukalas, P.E.
Geographic Discipline Leader

Carol Luengas
Engineer

MASER
CONSULTING P.A.

APPENDIX A

Section	1	2	3
Length (ft)	28.00	33.00	53.00
Number of Sides	18	18	18
Thickness (in)	0.1875	0.3125	0.3750
Socket Length (ft)		5.00	
Top Dia (in)	22.2500	30.0900	37.3050
Bot Dia (in)	30.0900	39.3300	52.4000
Grade	A572-65		
Weight (lb) 14852.0	1473.3	3831.2	9547.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Sabre C10857001C (ATI)	109	LNX-6515DS-VTM (T-Mobile)	98
Sabre C10857001C (ATI)	109	LNX-6515DS-VTM (T-Mobile)	98
Sabre C10857001C (ATI)	109	LNX-6515DS-VTM (T-Mobile)	98
(2) EPBQ-654L8H8-L2 (ATI)	109	RRUS-11 (T-Mobile)	98
(2) EPBQ-654L8H8-L2 (ATI)	109	RRUS-11 (T-Mobile)	98
(2) EPBQ-654L8H8-L2 (ATI)	109	RRUS-11 (T-Mobile)	98
HPA65R-BU8A (ATI)	109	12' T-Arm (T-Mobile)	98
HPA65R-BU8A (ATI)	109	12' T-Arm (T-Mobile)	98
HPA65R-BU8A (ATI)	109	12' T-Arm (T-Mobile)	98
(3) 8' x 2" Mount Pipe (ATI)	109	(2) AIR 21 B2A/B4P With mount Pipe (T-Mobile)	98
(3) 8' x 2" Mount Pipe (ATI)	109		
(3) 8' x 2" Mount Pipe (ATI)	109	8' x 2" Mount Pipe (T-Mobile)	98
RRU B14 4478 (ATI)	109	8' x 2" Mount Pipe (T-Mobile)	98
RRU B14 4478 (ATI)	109	8' x 2" Mount Pipe (T-Mobile)	98
RRU B14 4478 (ATI)	109	(2) SBNHH-1D45B (Verizon)	88
RRUS 4415 (ATI)	109	(2) SBNHH-1D45B (Verizon)	88
RRUS 4415 (ATI)	109	(2) SBNHH-1D45B (Verizon)	88
RRUS 4415 (ATI)	109	(4) 6' x 2" Pipe Mount (Verizon)	88
RRUS E2 (ATI)	109	(4) 6' x 2" Pipe Mount (Verizon)	88
RRUS E2 (ATI)	109	(4) 6' x 2" Pipe Mount (Verizon)	88
RRUS E2 (ATI)	109	RRH2x40-07-U (Verizon)	88
RRUS 4449 B5/12 (ATI)	109	RRH2x40-07-U (Verizon)	88
RRUS 4449 B5/12 (ATI)	109	RRH2x40-07-U (Verizon)	88
RRUS 4449 B5/12 (ATI)	109	(2) RRH2X40-AWS (Verizon)	88
RRUS 8843 B2 B66A (ATI)	109	(2) RRH2X40-AWS (Verizon)	88
RRUS 8843 B2 B66A (ATI)	109	(2) RRH2X40-AWS (Verizon)	88
RRUS 8843 B2 B66A (ATI)	109	(2) DB-T1-6Z-8AB-0Z (Verizon)	88
DC6-48-06-18-8F (ATI)	109	Small Platform 10' (Verizon)	88
DC6-48-06-18-8F (ATI)	109	BXA-70063-6CF (Verizon)	88
DC6-48-06-18-8F (ATI)	109	BXA-70063-6CF (Verizon)	88
(2) AIR 21 B2A/B4P With mount Pipe (T-Mobile)	98	BXA-70063-6CF (Verizon)	88
(2) AIR 21 B2A/B4P With mount Pipe (T-Mobile)	98		

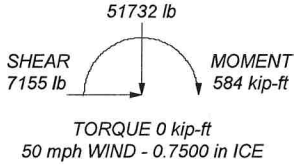
MATERIAL STRENGTH

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

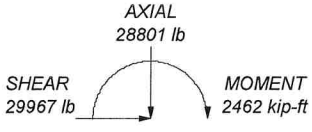
TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 135 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 Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Weld together tower sections have flange connections.
9. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
10. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
11. Welds are fabricated with ER-70S-6 electrodes.
12. TOWER RATING: 57.8%

ALL RE
ARE FACT
A



TORQUE 0 kip-ft
50 mph WIND - 0.7500 in ICE



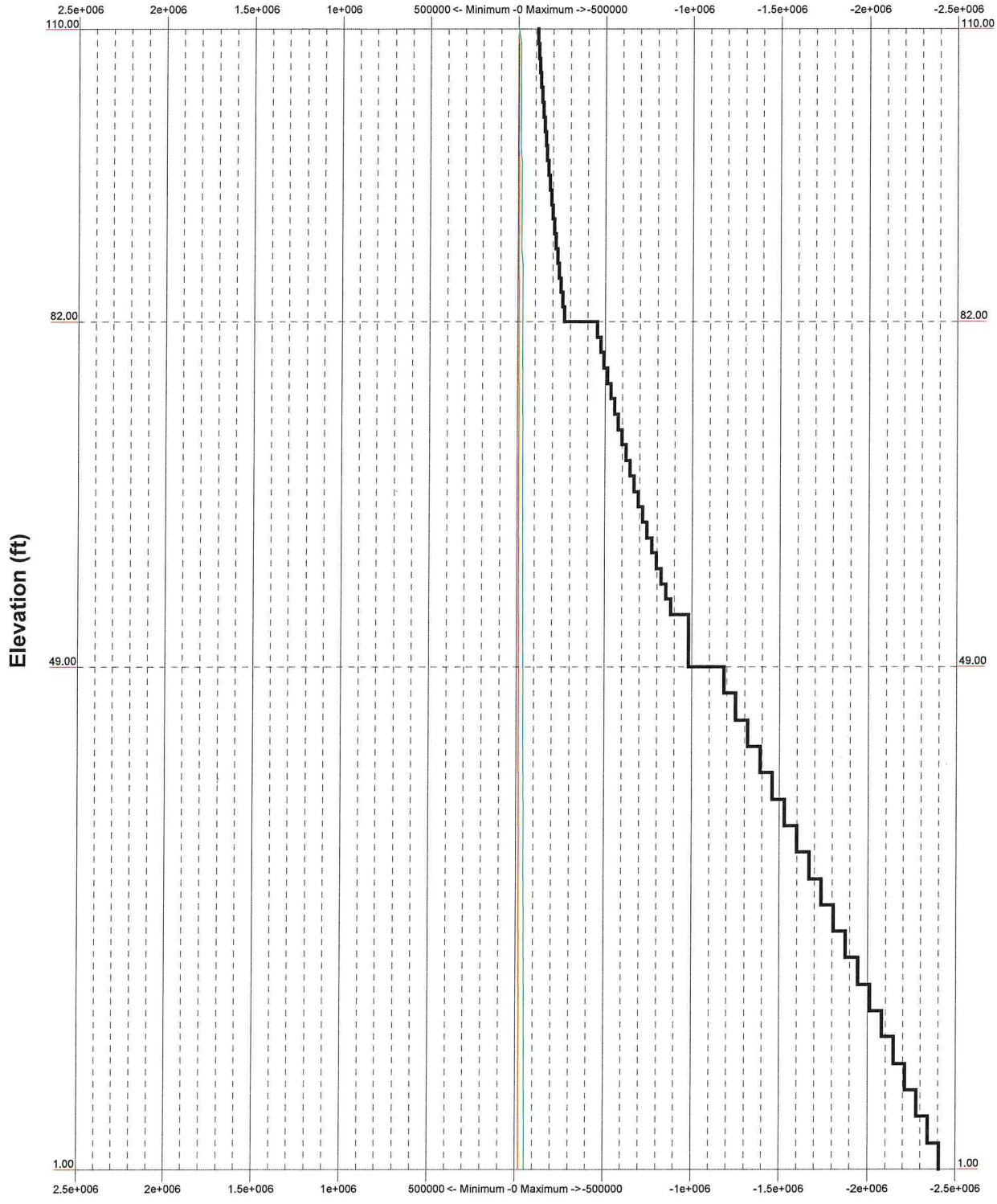
TORQUE 0 kip-ft
REACTIONS - 135 mph WIND

Maser Consulting
2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ 08054
Phone: (856) 797-0412
FAX:

Job: **18946101A**		
Project: **CTL01273**		
Client: AT&T	Drawn by: CLuengas	App'd:
Code: TIA-222-G	Date: 06/05/19	Scale: NTS
Path: R:\Projects\2018\18946000A\18946101A\Structural\Tower Analysis\Rev 1\TNX Tower\Tower.eri		Dwg No. E-1

TIA-222-G - 135 mph/50 mph 0.7500 in Ice Exposure C

Leg Capacity ——— **Leg Compression (lb)**



Maser Consulting 2000 Midlantic Drive, Suite 100 Mt. Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job: ***18946101A***		
	Project: ***CTL01273***		
	Client: AT&T	Drawn by: CLuengas	App'd:
	Code: TIA-222-G	Date: 06/05/19	Scale: NTS
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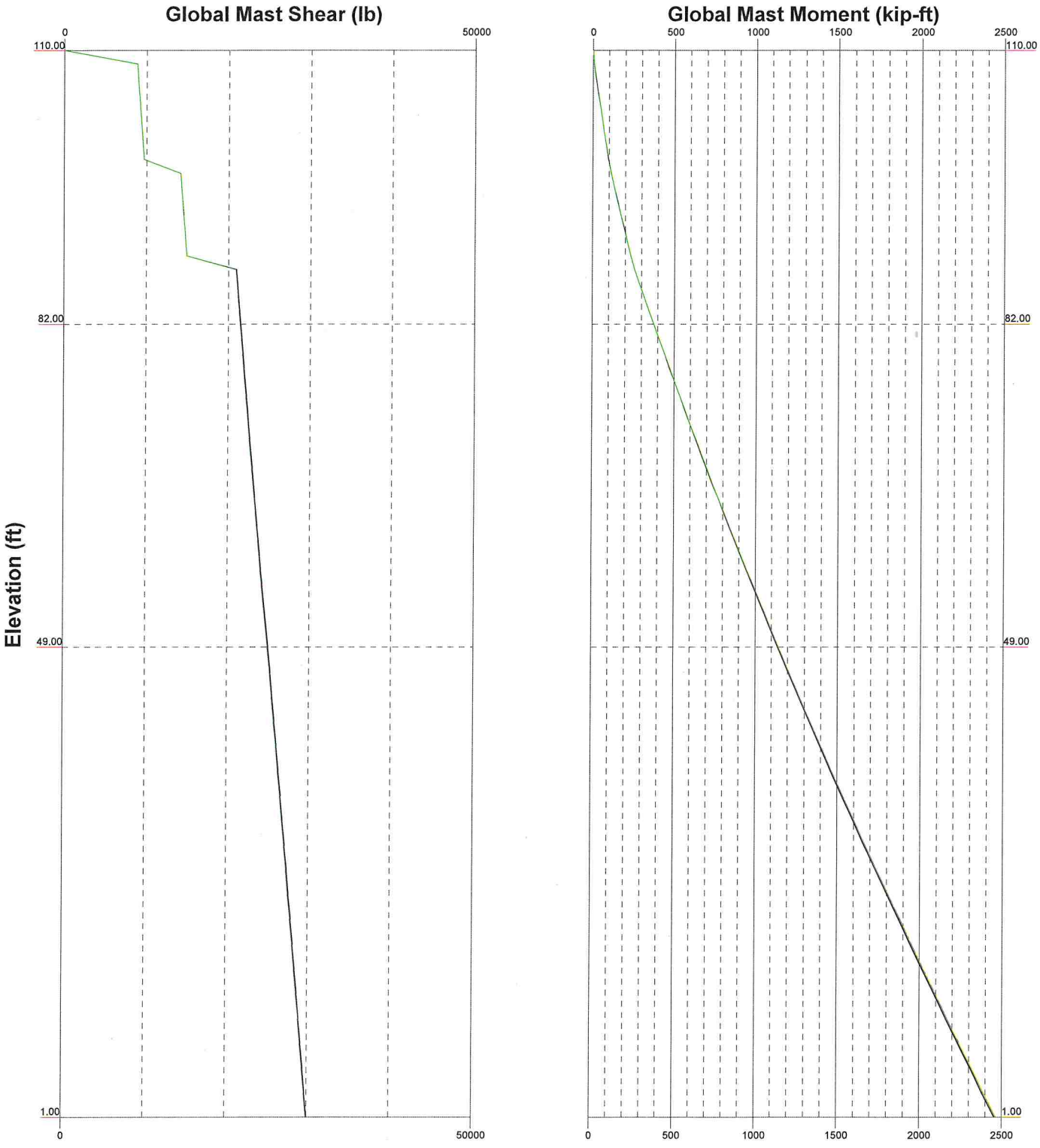
TIA-222-G - 135 mph/50 mph 0.7500 in Ice Exposure C

Maximum Values

Vx Vz Mx Mz



Maser Consulting 2000 Midlantic Drive, Suite 100 Mt. Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job: ***18946101A***		
	Project: ***CTL01273***		
	Client: AT&T	Drawn by: CLuengas	App'd:
	Code: TIA-222-G	Date: 06/05/19	Scale: NTS
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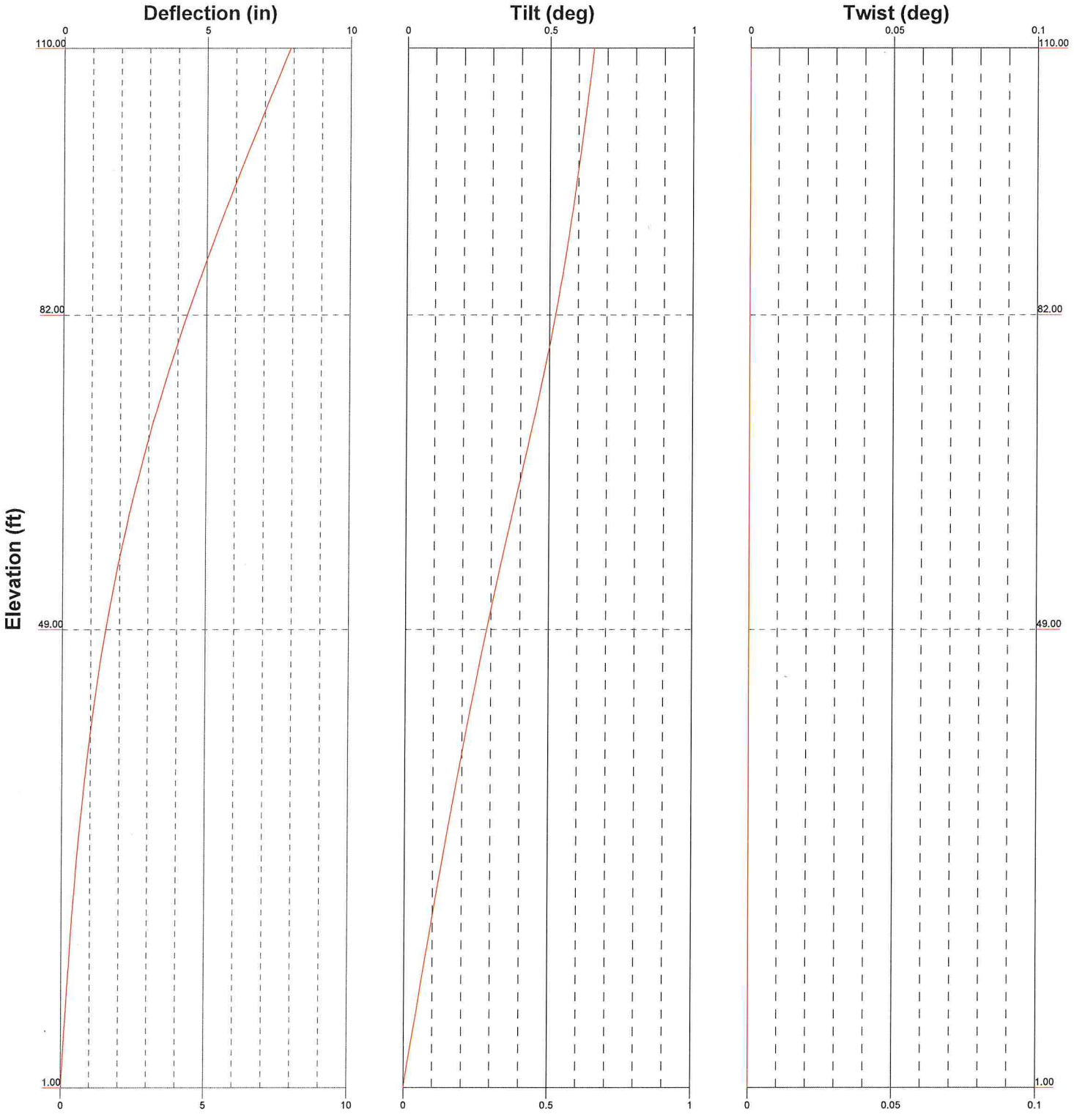
TIA-222-G - Service - 60 mph

Maximum Values



Maser Consulting
2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ 08054
Phone: (856) 797-0412
FAX:

Job: ***18946101A***		
Project: ***CTL01273***		
Client: AT&T	Drawn by: CLuengas	App'd:
Code: TIA-222-G	Date: 06/05/19	Scale: NTS
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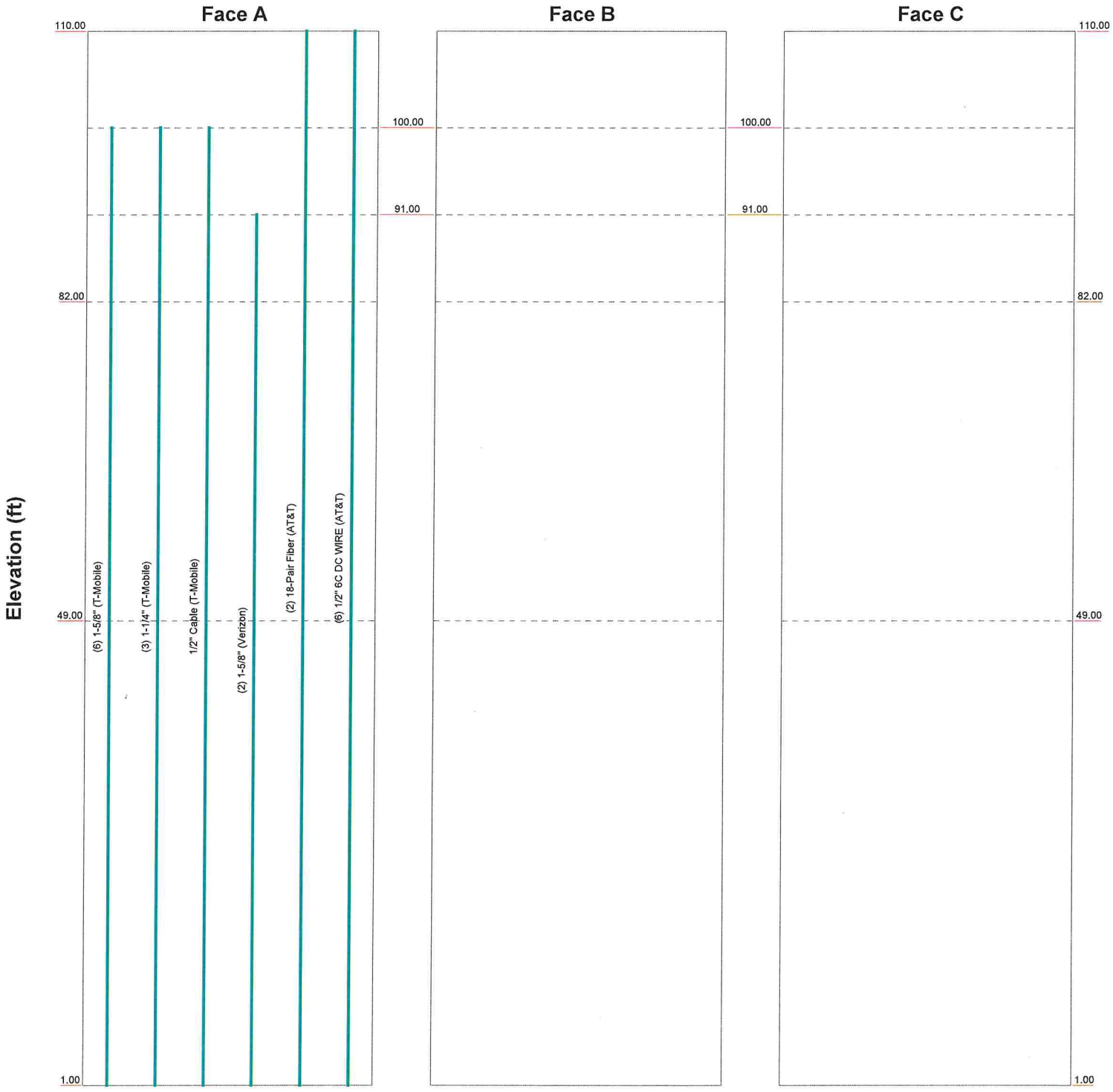
Feed Line Distribution Chart
1' - 110'

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



Maser Consulting 2000 Midlantic Drive, Suite 100 Mt. Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	Job: ***18946101A***		
	Project: ***CTL01273***		
	Client: AT&T	Drawn by: CLuengas	App'd:
	Code: TIA-222-G	Date: 06/05/19	Scale: NTS
	Path: R:\Projects\2018\18946000A\18946101A\Structural\Tower Analysis\Rev 1\TNX Tower\Tower.eri		Dwg No. E-7

tnxTower	Job	Page
	18946101A	1 of 17
Maser Consulting 2000 Midlantic Drive, Suite 100 Mt. Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	**Project** CTL01273	**Date** 12:17:19 06/05/19
	Client AT&T	**Designed by** CLuengas

Tower Input Data

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

Tower is located in New London County, Connecticut.
ASCE 7-10 Wind Data is used.
Basic wind speed of 135 mph.
Risk Category 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.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
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	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	Elevation 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	110.00-82.00	28.00	0.00	18	22.2500	30.0900	0.1875	0.7500	A572-65 (65 ksi)
L2	82.00-49.00	33.00	5.00	18	30.0900	39.3300	0.3125	1.2500	A572-65 (65 ksi)
L3	49.00-1.00	53.00		18	37.3050	52.4000	0.3750	1.5000	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	22.5643	13.1299	807.4392	7.8322	11.3030	71.4358	1615.9408	6.5662	3.5860	19.125
	30.5253	17.7957	2010.3336	10.6154	15.2857	131.5171	4023.3125	8.8996	4.9658	26.484
L2	30.5060	29.5356	3308.7130	10.5710	15.2857	216.4578	6621.7796	14.7706	4.7458	15.187
	39.8885	38.7005	7443.4232	13.8512	19.9796	372.5504	14896.6406	19.3539	6.3721	20.391
L3	39.2687	43.9559	7573.7953	13.1101	18.9509	399.6528	15157.5564	21.9821	5.9057	15.748
	53.1505	61.9228	21174.4387	18.4689	26.6192	795.4574	42376.7393	30.9673	8.5624	22.833

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 110.00-82.00				1	1	1			
L2 82.00-49.00				1	1	1			
L3 49.00-1.00				1	1	1			

Monopole Base Plate Data

Base Plate Data	
Base plate is square	√
Base plate is grouted	
Anchor bolt grade	A615
Anchor bolt size	2.2500 in
Number of bolts	24
Embedment length	45.0000 in
f'_c	5 ksi
Grout space	12.0000 in
Base plate grade	A572-50
Base plate thickness	2.7500 in
Bolt circle diameter	58.7500 in
Outer diameter	62.7500 in
Inner diameter	52.4000 in
Corner clipped	16.0000 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1-5/8" (T-Mobile)	A	No	Yes	Inside Pole	100.00 - 1.00	6	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
1-1/4" (T-Mobile)	A	No	Yes	Inside Pole	100.00 - 1.00	3	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
1/2" Cable (T-Mobile)	A	No	Yes	Inside Pole	100.00 - 1.00	1	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
1-5/8" (Verizon)	A	No	Yes	Inside Pole	91.00 - 1.00	2	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
18-Pair Fiber (AT&T)	A	No	Yes	Inside Pole	110.00 - 1.00	2	No Ice	0.00	3.00
							1/2" Ice	0.00	3.00
							1" Ice	0.00	3.00
1/2" 6C DC WIRE (AT&T)	A	No	Yes	Inside Pole	110.00 - 1.00	6	No Ice	0.00	1.00
							1/2" Ice	0.00	1.00
							1" Ice	0.00	1.00

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	110.00-82.00	A	0.000	0.000	0.000	0.000	502.68
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	82.00-49.00	A	0.000	0.000	0.000	0.000	735.90
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L3	49.00-1.00	A	0.000	0.000	0.000	0.000	1070.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	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	110.00-82.00	A	1.668	0.000	0.000	0.000	0.000	502.68
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	82.00-49.00	A	1.605	0.000	0.000	0.000	0.000	735.90
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L3	49.00-1.00	A	1.458	0.000	0.000	0.000	0.000	1070.40
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) AIR 21 B2A/B4P With mount Pipe (T-Mobile)	A	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	6.41 6.89 7.35	5.69 6.54 7.27	113.40 170.95 235.30
(2) AIR 21 B2A/B4P With mount Pipe (T-Mobile)	B	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	6.41 6.89 7.35	5.69 6.54 7.27	113.40 170.95 235.30
(2) AIR 21 B2A/B4P With mount Pipe (T-Mobile)	C	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	6.41 6.89 7.35	5.69 6.54 7.27	113.40 170.95 235.30
LNX-6515DS-VTM (T-Mobile)	A	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	11.45 12.06 12.69	9.60 11.02 12.29	79.50 166.47 263.19
LNX-6515DS-VTM (T-Mobile)	B	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	11.45 12.06 12.69	9.60 11.02 12.29	79.50 166.47 263.19
LNX-6515DS-VTM (T-Mobile)	C	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	11.45 12.06 12.69	9.60 11.02 12.29	79.50 166.47 263.19
RRUS-11 (T-Mobile)	A	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.02 1.16 1.30	55.00 74.32 96.56
RRUS-11 (T-Mobile)	B	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.02 1.16 1.30	55.00 74.32 96.56
RRUS-11 (T-Mobile)	C	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.02 1.16 1.30	55.00 74.32 96.56
12' T-Arm (T-Mobile)	A	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	4.20 5.40 6.60	1.10 2.70 4.30	150.00 225.00 300.00
12' T-Arm (T-Mobile)	B	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	4.20 5.40 6.60	1.10 2.70 4.30	150.00 225.00 300.00
12' T-Arm (T-Mobile)	C	From Leg	0.00 0.00 0.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice	4.20 5.40 6.60	1.10 2.70 4.30	150.00 225.00 300.00
**********									
Small Platform 10' (Verizon)	A	None		0.0000	88.00	No Ice 1/2" Ice 1" Ice	15.00 22.50 33.75	15.00 22.50 33.75	400.00 450.00 500.00
BXA-70063-6CF (Verizon)	A	From Leg	0.00 0.00	0.0000	88.00	No Ice 1/2" Ice	7.62 8.07	4.62 5.06	36.00 80.90

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00				1" Ice	8.52	5.51	131.71
BXA-70063-6CF (Verizon)	B	From Leg	0.00		0.0000	88.00	No Ice	7.62	4.62	36.00
			0.00				1/2" Ice	8.07	5.06	80.90
			0.00				1" Ice	8.52	5.51	131.71
BXA-70063-6CF (Verizon)	C	From Leg	0.00		0.0000	88.00	No Ice	7.62	4.62	36.00
			0.00				1/2" Ice	8.07	5.06	80.90
			0.00				1" Ice	8.52	5.51	131.71
(2) SBNHH-1D45B (Verizon)	A	From Leg	0.00		0.0000	88.00	No Ice	11.40	5.28	64.40
			0.00				1/2" Ice	11.89	5.74	129.99
			0.00				1" Ice	12.38	6.20	202.07
(2) SBNHH-1D45B (Verizon)	B	From Leg	0.00		0.0000	88.00	No Ice	11.40	5.28	64.40
			0.00				1/2" Ice	11.89	5.74	129.99
			0.00				1" Ice	12.38	6.20	202.07
(2) SBNHH-1D45B (Verizon)	C	From Leg	0.00		0.0000	88.00	No Ice	11.40	5.28	64.40
			0.00				1/2" Ice	11.89	5.74	129.99
			0.00				1" Ice	12.38	6.20	202.07
(4) 6' x 2" Pipe Mount (Verizon)	A	From Leg	0.00		0.0000	88.00	No Ice	1.20	1.20	20.00
			0.00				1/2" Ice	1.80	1.80	29.39
			0.00				1" Ice	2.17	2.17	42.81
(4) 6' x 2" Pipe Mount (Verizon)	B	From Leg	0.00		0.0000	88.00	No Ice	1.20	1.20	20.00
			0.00				1/2" Ice	1.80	1.80	29.39
			0.00				1" Ice	2.17	2.17	42.81
(4) 6' x 2" Pipe Mount (Verizon)	C	From Leg	0.00		0.0000	88.00	No Ice	1.20	1.20	20.00
			0.00				1/2" Ice	1.80	1.80	29.39
			0.00				1" Ice	2.17	2.17	42.81
RRH2x40-07-U (Verizon)	A	From Leg	0.00		0.0000	88.00	No Ice	1.82	1.52	60.00
			0.00				1/2" Ice	1.99	1.69	77.37
			0.00				1" Ice	2.18	1.86	97.53
RRH2x40-07-U (Verizon)	B	From Leg	0.00		0.0000	88.00	No Ice	1.82	1.52	60.00
			0.00				1/2" Ice	1.99	1.69	77.37
			0.00				1" Ice	2.18	1.86	97.53
RRH2x40-07-U (Verizon)	C	From Leg	0.00		0.0000	88.00	No Ice	1.82	1.52	60.00
			0.00				1/2" Ice	1.99	1.69	77.37
			0.00				1" Ice	2.18	1.86	97.53
(2) RRH2X40-AWS (Verizon)	A	From Leg	0.00		0.0000	88.00	No Ice	2.16	1.42	50.00
			0.00				1/2" Ice	2.36	1.59	67.40
			0.00				1" Ice	2.57	1.77	87.69
(2) RRH2X40-AWS (Verizon)	B	From Leg	0.00		0.0000	88.00	No Ice	2.16	1.42	50.00
			0.00				1/2" Ice	2.36	1.59	67.40
			0.00				1" Ice	2.57	1.77	87.69
(2) RRH2X40-AWS (Verizon)	C	From Leg	0.00		0.0000	88.00	No Ice	2.16	1.42	50.00
			0.00				1/2" Ice	2.36	1.59	67.40
			0.00				1" Ice	2.57	1.77	87.69
(2) DB-T1-6Z-8AB-0Z (Verizon)	B	From Leg	0.00		0.0000	88.00	No Ice	3.80	2.51	32.00
			0.00				1/2" Ice	4.05	2.73	63.52
			0.00				1" Ice	4.31	2.95	98.80
**********										
Sabre C10857001C (AT&T)	A	From Leg	0.00		0.0000	109.00	No Ice	9.12	5.23	462.00
			0.00				1/2" Ice	15.94	8.82	700.00
			0.00				1" Ice	22.76	12.41	938.00
Sabre C10857001C (AT&T)	B	From Leg	0.00		0.0000	109.00	No Ice	9.12	5.23	462.00
			0.00				1/2" Ice	15.94	8.82	700.00
			0.00				1" Ice	22.76	12.41	938.00
Sabre C10857001C (AT&T)	C	From Leg	0.00		0.0000	109.00	No Ice	9.12	5.23	462.00
			0.00				1/2" Ice	15.94	8.82	700.00
			0.00				1" Ice	22.76	12.41	938.00
(2) EPBQ-654L8H8-L2	A	From Leg	0.00		0.0000	109.00	No Ice	18.09	7.03	97.00

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft ft ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* *ft²*	C_AA_A *Side* *ft²*	*Weight* *lb*
(AT&T)			0.00			1/2" Ice	18.72	7.62	190.25
			0.00			1" Ice	19.36	8.21	291.68
(2) EPBQ-654L8H8-L2	B	From Leg	0.00	0.0000	109.00	No Ice	18.09	7.03	97.00
(AT&T)			0.00			1/2" Ice	18.72	7.62	190.25
			0.00			1" Ice	19.36	8.21	291.68
(2) EPBQ-654L8H8-L2	C	From Leg	0.00	0.0000	109.00	No Ice	18.09	7.03	97.00
(AT&T)			0.00			1/2" Ice	18.72	7.62	190.25
			0.00			1" Ice	19.36	8.21	291.68
HPA65R-BU8A	A	From Leg	0.00	0.0000	109.00	No Ice	11.23	9.94	86.50
(AT&T)			0.00			1/2" Ice	11.85	11.37	174.29
			0.00			1" Ice	12.47	12.64	271.84
HPA65R-BU8A	B	From Leg	0.00	0.0000	109.00	No Ice	11.23	9.94	86.50
(AT&T)			0.00			1/2" Ice	11.85	11.37	174.29
			0.00			1" Ice	12.47	12.64	271.84
HPA65R-BU8A	C	From Leg	0.00	0.0000	109.00	No Ice	11.23	9.94	86.50
(AT&T)			0.00			1/2" Ice	11.85	11.37	174.29
			0.00			1" Ice	12.47	12.64	271.84
(3) 8' x 2" Mount Pipe	A	From Leg	0.00	0.0000	109.00	No Ice	1.60	1.60	30.00
(AT&T)			0.00			1/2" Ice	2.42	2.42	42.45
			0.00			1" Ice	3.24	3.24	60.14
(3) 8' x 2" Mount Pipe	A	From Leg	0.00	0.0000	109.00	No Ice	1.60	1.60	30.00
(AT&T)			0.00			1/2" Ice	2.42	2.42	42.45
			0.00			1" Ice	3.24	3.24	60.14
(3) 8' x 2" Mount Pipe	A	From Leg	0.00	0.0000	109.00	No Ice	1.60	1.60	30.00
(AT&T)			0.00			1/2" Ice	2.42	2.42	42.45
			0.00			1" Ice	3.24	3.24	60.14
RRU B14 4478	A	From Leg	0.00	0.0000	109.00	No Ice	1.86	0.82	47.40
(AT&T)			0.00			1/2" Ice	2.03	0.94	61.55
			0.00			1" Ice	2.20	1.07	78.22
RRU B14 4478	B	From Leg	0.00	0.0000	109.00	No Ice	1.86	0.82	47.40
(AT&T)			0.00			1/2" Ice	2.03	0.94	61.55
			0.00			1" Ice	2.20	1.07	78.22
RRU B14 4478	C	From Leg	0.00	0.0000	109.00	No Ice	1.86	0.82	47.40
(AT&T)			0.00			1/2" Ice	2.03	0.94	61.55
			0.00			1" Ice	2.20	1.07	78.22
RRUS 4415	A	From Leg	0.00	0.0000	109.00	No Ice	1.86	0.82	62.40
(AT&T)			0.00			1/2" Ice	2.03	0.94	76.55
			0.00			1" Ice	2.20	1.07	93.22
RRUS 4415	B	From Leg	0.00	0.0000	109.00	No Ice	1.86	0.82	62.40
(AT&T)			0.00			1/2" Ice	2.03	0.94	76.55
			0.00			1" Ice	2.20	1.07	93.22
RRUS 4415	C	From Leg	0.00	0.0000	109.00	No Ice	1.86	0.82	62.40
(AT&T)			0.00			1/2" Ice	2.03	0.94	76.55
			0.00			1" Ice	2.20	1.07	93.22
RRUS E2	A	From Leg	0.00	0.0000	109.00	No Ice	3.15	1.29	60.00
(AT&T)			0.00			1/2" Ice	3.36	1.44	83.22
			0.00			1" Ice	3.59	1.60	109.64
RRUS E2	B	From Leg	0.00	0.0000	109.00	No Ice	3.15	1.29	60.00
(AT&T)			0.00			1/2" Ice	3.36	1.44	83.22
			0.00			1" Ice	3.59	1.60	109.64
RRUS E2	C	From Leg	0.00	0.0000	109.00	No Ice	3.15	1.29	60.00
(AT&T)			0.00			1/2" Ice	3.36	1.44	83.22
			0.00			1" Ice	3.59	1.60	109.64
RRUS 4449 B5/12	A	From Leg	0.00	0.0000	109.00	No Ice	1.64	1.30	73.00
(AT&T)			0.00			1/2" Ice	1.80	1.45	90.19
			0.00			1" Ice	1.97	1.60	110.08
RRUS 4449 B5/12	B	From Leg	0.00	0.0000	109.00	No Ice	1.64	1.30	73.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			0.00			1/2" Ice	1.80	1.45	90.19
			0.00			1" Ice	1.97	1.60	110.08
RRUS 4449 B5/12	C	From Leg	0.00	0.0000	109.00	No Ice	1.64	1.30	73.00
(AT&T)			0.00			1/2" Ice	1.80	1.45	90.19
			0.00			1" Ice	1.97	1.60	110.08
RRUS 8843 B2 B66A	A	From Leg	0.00	0.0000	109.00	No Ice	1.64	1.35	72.00
(AT&T)			0.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
RRUS 8843 B2 B66A	B	From Leg	0.00	0.0000	109.00	No Ice	1.64	1.35	72.00
(AT&T)			0.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
RRUS 8843 B2 B66A	C	From Leg	0.00	0.0000	109.00	No Ice	1.64	1.35	72.00
(AT&T)			0.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
DC6-48-06-18-8F	A	From Leg	0.00	0.0000	109.00	No Ice	1.20	1.20	32.00
(AT&T)			0.00			1/2" Ice	1.88	1.88	53.81
			0.00			1" Ice	2.09	2.09	78.48
DC6-48-06-18-8F	B	From Leg	0.00	0.0000	109.00	No Ice	1.20	1.20	32.00
(AT&T)			0.00			1/2" Ice	1.88	1.88	53.81
			0.00			1" Ice	2.09	2.09	78.48
DC6-48-06-18-8F	C	From Leg	0.00	0.0000	109.00	No Ice	1.20	1.20	32.00
(AT&T)			0.00			1/2" Ice	1.88	1.88	53.81
			0.00			1" Ice	2.09	2.09	78.48
8' x 2" Mount Pipe	A	From Leg	0.00	0.0000	98.00	No Ice	1.60	1.60	30.00
(T-Mobile)			0.00			1/2" Ice	2.42	2.42	42.45
			0.00			1" Ice	3.24	3.24	60.14
8' x 2" Mount Pipe	B	From Leg	0.00	0.0000	98.00	No Ice	1.60	1.60	30.00
(T-Mobile)			0.00			1/2" Ice	2.42	2.42	42.45
			0.00			1" Ice	3.24	3.24	60.14
8' x 2" Mount Pipe	C	From Leg	0.00	0.0000	98.00	No Ice	1.60	1.60	30.00
(T-Mobile)			0.00			1/2" Ice	2.42	2.42	42.45
			0.00			1" Ice	3.24	3.24	60.14

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	95.30	1.253	56	61.938	A	0.000	61.938	61.938	100.00	0.000	0.000
110.00-82.00					B	0.000	61.938		100.00	0.000	0.000
					C	0.000	61.938		100.00	0.000	0.000
L2 82.00-49.00	64.99	1.156	51	96.792	A	0.000	96.792	96.792	100.00	0.000	0.000
					B	0.000	96.792		100.00	0.000	0.000
					C	0.000	96.792		100.00	0.000	0.000
L3 49.00-1.00	24.92	0.945	41	184.838	A	0.000	184.838	184.838	100.00	0.000	0.000
					B	0.000	184.838		100.00	0.000	0.000
					C	0.000	184.838		100.00	0.000	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 110.00-82.00	95.30	1.253	8	1.6678	69.721	A	0.000	69.721	69.721	100.00	0.000	0.000
						B	0.000	69.721		100.00	0.000	0.000
						C	0.000	69.721		100.00	0.000	0.000
L2 82.00-49.00	64.99	1.156	7	1.6052	105.621	A	0.000	105.621	105.621	100.00	0.000	0.000
						B	0.000	105.621		100.00	0.000	0.000
						C	0.000	105.621		100.00	0.000	0.000
L3 49.00-1.00	24.92	0.945	6	1.4584	197.680	A	0.000	197.680	197.680	100.00	0.000	0.000
						B	0.000	197.680		100.00	0.000	0.000
						C	0.000	197.680		100.00	0.000	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	95.30	1.253	10	61.938	A	0.000	61.938	61.938	100.00	0.000	0.000
110.00-82.00					B	0.000	61.938		100.00	0.000	0.000
					C	0.000	61.938		100.00	0.000	0.000
L2 82.00-49.00	64.99	1.156	9	96.792	A	0.000	96.792	96.792	100.00	0.000	0.000
					B	0.000	96.792		100.00	0.000	0.000
					C	0.000	96.792		100.00	0.000	0.000
L3 49.00-1.00	24.92	0.945	7	184.838	A	0.000	184.838	184.838	100.00	0.000	0.000
					B	0.000	184.838		100.00	0.000	0.000
					C	0.000	184.838		100.00	0.000	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	502.68	1473.27	A	1	0.65	56	1	1	61.938	2459.21	87.83	C
110.00-82.00			B	1	0.65		1	1	61.938			
			C	1	0.65		1	1	61.938			
L2	735.90	3831.19	A	1	0.65	51	1	1	96.792	3538.24	107.22	C
82.00-49.00			B	1	0.65		1	1	96.792			
			C	1	0.65		1	1	96.792			
L3 49.00-1.00	1070.40	9547.50	A	1	0.65	41	1	1	184.838	5452.28	113.59	C
			B	1	0.65		1	1	184.838			
			C	1	0.65		1	1	184.838			
Sum Weight:	2308.98	14851.96						OTM	588.70	11449.73		

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
									kip-ft			

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 ft^2	F lb	w plf	Ctrl. Face
L1	502.68	1473.27	A	1	0.65	56	1	1	61.938	2459.21	87.83	C
110.00-82.00			B	1	0.65		1	1	61.938			
			C	1	0.65		1	1	61.938			
L2	735.90	3831.19	A	1	0.65	51	1	1	96.792	3538.24	107.22	C
82.00-49.00			B	1	0.65		1	1	96.792			
			C	1	0.65		1	1	96.792			
L3 49.00-1.00	1070.40	9547.50	A	1	0.65	41	1	1	184.838	5452.28	113.59	C
			B	1	0.65		1	1	184.838			
			C	1	0.65		1	1	184.838			
Sum Weight:	2308.98	14851.96						OTM	588.70 kip-ft	11449.73		

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 ft^2	F lb	w plf	Ctrl. Face
L1	502.68	1473.27	A	1	0.65	56	1	1	61.938	2459.21	87.83	C
110.00-82.00			B	1	0.65		1	1	61.938			
			C	1	0.65		1	1	61.938			
L2	735.90	3831.19	A	1	0.65	51	1	1	96.792	3538.24	107.22	C
82.00-49.00			B	1	0.65		1	1	96.792			
			C	1	0.65		1	1	96.792			
L3 49.00-1.00	1070.40	9547.50	A	1	0.65	41	1	1	184.838	5452.28	113.59	C
			B	1	0.65		1	1	184.838			
			C	1	0.65		1	1	184.838			
Sum Weight:	2308.98	14851.96						OTM	588.70 kip-ft	11449.73		

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 ft^2	F lb	w plf	Ctrl. 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	502.68	3077.90	A	1	1.2	8	1	1	69.721	701.04	25.04	C
110.00-82.00			B	1	1.2		1	1	69.721			
			C	1	1.2		1	1	69.721			
L2	735.90	6205.60	A	1	1.2	7	1	1	105.621	977.77	29.63	C
82.00-49.00			B	1	1.2		1	1	105.621			
			C	1	1.2		1	1	105.621			
L3 49.00-1.00	1070.40	13610.73	A	1	1.2	6	1	1	197.680	1476.69	30.76	C
			B	1	1.2		1	1	197.680			
			C	1	1.2		1	1	197.680			
Sum Weight:	2308.98	22894.23						OTM	163.99 kip-ft	3155.50		

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	502.68	3077.90	A	1	1.2	8	1	1	69.721	701.04	25.04	C
110.00-82.00			B	1	1.2		1	1	69.721			
			C	1	1.2		1	1	69.721			
L2	735.90	6205.60	A	1	1.2	7	1	1	105.621	977.77	29.63	C
82.00-49.00			B	1	1.2		1	1	105.621			
			C	1	1.2		1	1	105.621			
L3 49.00-1.00	1070.40	13610.73	A	1	1.2	6	1	1	197.680	1476.69	30.76	C
			B	1	1.2		1	1	197.680			
			C	1	1.2		1	1	197.680			
Sum Weight:	2308.98	22894.23						OTM	163.99 kip-ft	3155.50		

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	502.68	3077.90	A	1	1.2	8	1	1	69.721	701.04	25.04	C
110.00-82.00			B	1	1.2		1	1	69.721			
			C	1	1.2		1	1	69.721			
L2	735.90	6205.60	A	1	1.2	7	1	1	105.621	977.77	29.63	C
82.00-49.00			B	1	1.2		1	1	105.621			
			C	1	1.2		1	1	105.621			
L3 49.00-1.00	1070.40	13610.73	A	1	1.2	6	1	1	197.680	1476.69	30.76	C
			B	1	1.2		1	1	197.680			
			C	1	1.2		1	1	197.680			
Sum Weight:	2308.98	22894.23						OTM	163.99 kip-ft	3155.50		

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	502.68	1473.27	A	1	0.65	10	1	1	61.938	434.64	15.52	C
110.00-82.00			B	1	0.65		1	1	61.938			
			C	1	0.65		1	1	61.938			
L2	735.90	3831.19	A	1	0.65	9	1	1	96.792	625.34	18.95	C
82.00-49.00			B	1	0.65		1	1	96.792			
			C	1	0.65		1	1	96.792			
L3 49.00-1.00	1070.40	9547.50	A	1	0.65	7	1	1	184.838	963.63	20.08	C
			B	1	0.65		1	1	184.838			
			C	1	0.65		1	1	184.838			
Sum Weight:	2308.98	14851.96						OTM	104.05 kip-ft	2023.60		

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	502.68	1473.27	A	1	0.65	10	1	1	61.938	434.64	15.52	C
110.00-82.00			B	1	0.65		1	1	61.938			
			C	1	0.65		1	1	61.938			
L2	735.90	3831.19	A	1	0.65	9	1	1	96.792	625.34	18.95	C
82.00-49.00			B	1	0.65		1	1	96.792			
			C	1	0.65		1	1	96.792			
L3 49.00-1.00	1070.40	9547.50	A	1	0.65	7	1	1	184.838	963.63	20.08	C
			B	1	0.65		1	1	184.838			
			C	1	0.65		1	1	184.838			
Sum Weight:	2308.98	14851.96						OTM	104.05 kip-ft	2023.60		

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	502.68	1473.27	A	1	0.65	10	1	1	61.938	434.64	15.52	C
110.00-82.00			B	1	0.65		1	1	61.938			
			C	1	0.65		1	1	61.938			
L2	735.90	3831.19	A	1	0.65	9	1	1	96.792	625.34	18.95	C
82.00-49.00			B	1	0.65		1	1	96.792			
			C	1	0.65		1	1	96.792			

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
L3 49.00-1.00	1070.40	9547.50	A	1	0.65	7	1	1	184.838	963.63	20.08	C
			B	1	0.65		1	1	184.838			
			C	1	0.65		1	1	184.838			
Sum Weight:	2308.98	14851.96						OTM	104.05 kip-ft	2023.60		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	14851.96					
Bracing Weight	0.00					
Total Member Self-Weight	14851.96			-0.22	-0.07	
Total Weight	24001.14			-0.22	-0.07	
Wind 0 deg - No Ice		-66.88	-29891.39	-2413.62	5.75	0.31
Wind 90 deg - No Ice		29968.62	66.88	5.60	-2420.19	-0.50
Wind 180 deg - No Ice		66.88	29891.39	2413.19	-5.88	-0.31
Member Ice	8042.28					
Total Weight Ice	46508.78			-0.63	-0.31	
Wind 0 deg - Ice		-10.06	-7143.67	-559.90	0.56	0.05
Wind 90 deg - Ice		7155.29	10.06	0.25	-560.59	-0.20
Wind 180 deg - Ice		10.06	7143.67	558.64	-1.19	-0.05
Total Weight	24001.14			-0.22	-0.07	
Wind 0 deg - Service		-11.82	-5282.95	-426.76	0.96	0.05
Wind 90 deg - Service		5296.60	11.82	0.81	-427.79	-0.09
Wind 180 deg - Service		11.82	5282.95	426.33	-1.09	-0.05

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 90 deg - No Ice
5	0.9 Dead+1.0 Wind 90 deg - No Ice
6	1.2 Dead+1.0 Wind 180 deg - No Ice
7	0.9 Dead+1.0 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 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	110 - 82	Pole	Max Tension	6	0.01	0.00	0.00
			Max. Compression	8	-26649.38	-0.33	0.68
			Max. Mx	4	-9473.17	-374.72	-0.17
			Max. My	2	-9479.83	0.35	374.42
			Max. Vy	4	21499.55	-374.72	-0.17
			Max. Vx	2	-21421.25	0.35	374.42
			Max. Torque	5			0.67
L2	82 - 49	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-33234.77	-0.33	0.68
			Max. Mx	4	-14362.42	-1016.71	-2.07
			Max. My	2	-14367.04	2.25	1014.21
			Max. Vy	4	24417.33	-1016.71	-2.07
			Max. Vx	2	-24338.90	2.25	1014.21
			Max. Torque	5			0.50
L3	49 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-51732.26	-0.33	0.67
			Max. Mx	4	-28779.22	-2461.76	-5.65
			Max. My	2	-28779.33	5.83	2455.13
			Max. Vy	4	29987.98	-2461.76	-5.65
			Max. Vx	2	-29910.69	5.83	2455.13
			Max. Torque	5			0.50

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	8	51732.26	0.01	-0.03
	Max. H_x	3	21600.98	66.88	29890.07
	Max. H_z	3	21600.98	66.88	29890.07
	Max. M_x	2	2455.13	66.88	29889.54
	Max. M_z	4	2461.76	-29966.76	-66.88
	Max. Torsion	5	0.49	-29967.29	-66.88
	Min. Vert	5	21600.98	-29967.29	-66.88
	Min. H_x	5	21600.98	-29967.29	-66.88
	Min. H_z	7	21600.98	-66.88	-29890.07
	Min. M_x	6	-2454.59	-66.88	-29889.54
	Min. M_z	2	-5.83	66.88	29889.54
	Min. Torsion	3	-0.31	66.88	29890.07

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	24001.14	0.00	-0.00	-0.22	-0.07	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	28801.31	-66.88	-29889.54	-2455.13	5.83	0.31
0.9 Dead+1.0 Wind 0 deg - No Ice	21600.98	-66.88	-29890.07	-2444.18	5.83	0.31

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
1.2 Dead+1.0 Wind 90 deg - No Ice	28801.31	29966.76	66.88	5.65	-2461.76	-0.49
0.9 Dead+1.0 Wind 90 deg - No Ice	21600.98	29967.29	66.88	5.69	-2450.84	-0.49
1.2 Dead+1.0 Wind 180 deg - No Ice	28801.31	66.88	29889.54	2454.59	-5.99	-0.31
0.9 Dead+1.0 Wind 180 deg - No Ice	21600.98	66.88	29890.07	2443.78	-5.95	-0.31
1.2 Dead+1.0 Ice+1.0 Temp	51732.26	-0.01	0.03	-0.67	-0.33	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	51732.26	-10.06	-7143.40	-583.13	0.56	0.05
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	51732.26	7155.02	10.06	0.17	-583.79	-0.19
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	51732.26	10.06	7143.40	581.65	-1.26	-0.05
Dead+Wind 0 deg - Service	24001.13	-11.82	-5281.90	-432.98	0.98	0.05
Dead+Wind 90 deg - Service	24001.13	5295.54	11.82	0.82	-434.03	-0.09
Dead+Wind 180 deg - Service	24001.13	11.82	5281.90	432.54	-1.11	-0.05

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	-24001.14	0.00	-0.00	24001.14	0.00	0.000%
2	-66.88	-28801.37	-29891.39	66.88	28801.31	29889.54	0.004%
3	-66.88	-21601.03	-29891.39	66.88	21600.98	29890.07	0.004%
4	29968.62	-28801.37	66.88	-29966.76	28801.31	-66.88	0.004%
5	29968.62	-21601.03	66.88	-29967.29	21600.98	-66.88	0.004%
6	66.88	-28801.37	29891.39	-66.88	28801.31	-29889.54	0.004%
7	66.88	-21601.03	29891.39	-66.88	21600.98	-29890.07	0.004%
8	0.00	-51732.26	0.00	0.01	51732.26	-0.03	0.000%
9	-10.06	-51732.26	-7143.67	10.06	51732.26	7143.40	0.001%
10	7155.29	-51732.26	10.06	-7155.02	51732.26	-10.06	0.001%
11	10.06	-51732.26	7143.67	-10.06	51732.26	-7143.40	0.001%
12	-11.82	-24001.14	-5282.95	11.82	24001.13	5281.90	0.004%
13	5296.60	-24001.14	11.82	-5295.54	24001.13	-11.82	0.004%
14	11.82	-24001.14	5282.95	-11.82	24001.13	-5281.90	0.004%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	10	0.00000001	0.00013745
3	Yes	10	0.00000001	0.00011162
4	Yes	10	0.00000001	0.00014769
5	Yes	10	0.00000001	0.00011942
6	Yes	10	0.00000001	0.00014257
7	Yes	10	0.00000001	0.00011551
8	Yes	6	0.00000001	0.00000001
9	Yes	11	0.00000001	0.00012436
10	Yes	11	0.00000001	0.00012440

11	Yes	11	0.00000001	0.00012355
12	Yes	9	0.00000001	0.00013453
13	Yes	9	0.00000001	0.00013493
14	Yes	9	0.00000001	0.00013421

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 82	7.895	13	0.6550	0.0003
L2	82 - 49	4.324	13	0.5194	0.0002
L3	54 - 1	1.827	13	0.3234	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
109.00	Sabre C10857001C	13	7.760	0.6507	0.0012	41339
98.00	(2) AIR 21 B2A/B4P With mount Pipe	13	6.290	0.6026	0.0008	17224
88.00	Small Platform 10'	13	5.025	0.5535	0.0005	9395

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 82	44.778	4	3.7142	0.0014
L2	82 - 49	24.527	4	2.9473	0.0011
L3	54 - 1	10.364	4	1.8348	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
109.00	Sabre C10857001C	4	44.012	3.6902	0.0064	7368
98.00	(2) AIR 21 B2A/B4P With mount Pipe	4	35.680	3.4194	0.0042	3069
88.00	Small Platform 10'	4	28.506	3.1407	0.0025	1673

Base Plate Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension	Actual Allowable Ratio Bolt Compression	Actual Allowable Ratio Plate Stress	Actual Allowable Ratio Stiffener Stress	Controlling Condition	Ratio
in		in	lb	lb	ksi	ksi		
2.7500	24	2.2500	82053.30 201288.96 0.50	84451.57 334139.67 0.34	20.676 45.000 0.46		Bolt T	0.50 ✔

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
L1	110 - 82 (1)	TP30.09x22.25x0.1875	28.00	109.00	123.2	17.7957	-9473.17	264796.00	0.036
L2	82 - 49 (2)	TP39.33x30.09x0.3125	33.00	109.00	97.9	37.3119	-14362.40	878634.00	0.016
L3	49 - 1 (3)	TP52.4x37.305x0.375	53.00	109.00	70.8	61.9228	-28779.20	2404660.00	0.012

Pole Bending Design Data

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	
L1	110 - 82 (1)	TP30.09x22.25x0.1875	374.72	692.93	0.541	0.00	692.93	0.000
L2	82 - 49 (2)	TP39.33x30.09x0.3125	1016.72	2034.18	0.500	0.00	2034.18	0.000
L3	49 - 1 (3)	TP52.4x37.305x0.375	2461.78	4447.30	0.554	0.00	4447.30	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	110 - 82 (1)	TP30.09x22.25x0.1875	21499.70	562570.00	0.038	0.50	1388.88	0.000
L2	82 - 49 (2)	TP39.33x30.09x0.3125	24417.40	1315440.00	0.019	0.49	4078.44	0.000
L3	49 - 1 (3)	TP52.4x37.305x0.375	29988.10	2077210.00	0.014	0.49	8915.17	0.000

Pole Interaction Design Data

tnxTower	Job	Page
	18946101A	17 of 17
Maser Consulting 2000 Midlantic Drive, Suite 100 Mt. Laurel, NJ 08054 Phone: (856) 797-0412 FAX:	**Project** CTL01273	**Date** 12:17:19 06/05/19
	Client AT&T	**Designed by** CLuengas

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	110 - 82 (1)	0.036	0.541	0.000	0.038	0.000	0.578 ✔	1.000	4.8.2 ✔
L2	82 - 49 (2)	0.016	0.500	0.000	0.019	0.000	0.517 ✔	1.000	4.8.2 ✔
L3	49 - 1 (3)	0.012	0.554	0.000	0.014	0.000	0.566 ✔	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	110 - 82	Pole	TP30.09x22.25x0.1875	1	-9473.17	264796.00	57.8	Pass
L2	82 - 49	Pole	TP39.33x30.09x0.3125	2	-14362.40	878634.00	51.7	Pass
L3	49 - 1	Pole	TP52.4x37.305x0.375	3	-28779.20	2404660.00	56.6	Pass
							Summary	
							Pole (L1) 57.8	Pass
							Base Plate 49.7	Pass
							RATING = **57.8**	**Pass**

Site Information:

Location: **Old Lyme, CT**

Tower Reactions (Factored from tnx Tower):

Compression: $P_c := 28.8kip$

Shear: $V_F := 30.0kip$

Moment: $M_F := 2462kip \cdot ft$

Material Parameters:

Unit Weight of Concrete: $\gamma_{conc} := 150pcf$

Concrete Compressive Strength: $f_c := 5ksi$

Steel Yield Strength: $f_y := 60ksi$

Strength Reduction Factor:

$\phi_{s\_bearing} := 0.75$ as per 9.4.1 from TIA-222-G code for bearing

$\phi_{s\_friction} := 0.75$ as per 9.4.1 from TIA-222-G code for skin friction resistance

$\phi_{s\_lateral} := 0.75$ as per 9.4.1 from TIA-222-G code for lateral resistance

Soil Parameters:

Ultimate Net Bearing Capacity: $q_{net} := 8000psf \cdot 2 = 16000 \cdot psf$ (assumed for Statrum I fill soil)

Foundation Parameters:

Length of Spread Footing Pad: $L_{pad} := 19ft$

Width of Spread Footing Pad: $W_{pad} := 19ft$

Thickness of Spread Footing Pad: $T_{pad} := 3.5ft$

Above Grade Level: $E_g := 0ft$

Proof load of rock anchors: $P_L := 389kip$

Reinforcement Parameters:

Typical concrete cover $cc := 3in$

Vertical rebar size $d_{bar} := 11$

Tie bar size $d_{tie} := 5$

Spread Footing Foundation Resist Moment Calculation:

1) Resistance Moment - Concrete Weight:

$Wt_{conc} := L_{pad} \cdot W_{pad} \cdot T_{pad} \cdot \gamma_{conc} = 189.5 \cdot kip$

$Arm_{conc} := \frac{L_{pad}}{2} = 9.5\,ft$

$ROTM_c := Wt_{conc} \cdot Arm_{conc} = 1800.5 \cdot kip \cdot ft$

2) Resistance Moment - Tower Vertical load

$F_{tower} := P_c = 28.8 \cdot kip$

$Arm_{vert} := \frac{L_{pad}}{2} = 9.5\,ft$

$ROTM_{vert} := F_{tower} \cdot Arm_{vert} = 273.6 \cdot kip \cdot ft$

3) Resistance Moment - Rock Anchor

$F_{ranchor} := 2P_L = 778 \cdot kip$

$Arm_{ranchor} := \frac{L_{pad}}{2} = 9.5\,ft$

$ROTM_{ranchor} := F_{ranchor} \cdot Arm_{ranchor} = 7391 \cdot kip \cdot ft$

Total Resistance Moment:

$Mr_{total} := 0.9ROTM_c + \frac{0.9}{1.2} \cdot ROTM_{vert} + 0.9ROTM_{ranchor} = 8477.5 \cdot kip \cdot ft$

Spread Footing Foundation Overturning Moment Calculation:

$OTM := M_F + V_F \cdot E_g = 2462 \cdot kip \cdot ft$

Spread Footing Foundation Overturning Moment Check:

Overturning Check:

$$Check := \begin{cases} \text{"OK"} & \text{if } Mr_{total} \geq OTM \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases} = \text{"OK"}$$

Check = "OK"

Usage:

$$Usage := \frac{OTM}{Mr_{total}}$$

Usage = 29·%

Spread Footing Foundation Bearing Check: (0.9D + 1.6W + 1.6H)

Vertical Force:

$F_1 := 0.9Wt_{conc} + F_{tower} = 199.4 \cdot kip$

$$e := \frac{L_{pad}}{2} - \frac{OTM}{F_1} = -2.8\,ft \qquad L_{loc} := \frac{L_{pad}}{6} = 3.2\,ft$$

$$P_{max1} := if\left[e \leq L_{loc}, \frac{F_1}{L_{pad} \cdot W_{pad}} \cdot \left[1 + \left(6 \cdot \frac{e}{L_{pad}}\right)\right], 4 \cdot \frac{F_1}{3 \cdot W_{pad} \cdot (L_{pad} - 2 \cdot e)}\right] = 55.4 \cdot psf$$

$$P_{min1} := if\left[e \leq L_{loc}, \frac{F_1}{L_{pad} \cdot W_{pad}} \cdot \left[1 - \left(6 \cdot \frac{e}{L_{pad}}\right)\right], 0\right] = 1049.1 \cdot psf$$

Bearing Check:

$$Check := \begin{cases} \text{"OK"} & \text{if } \phi_{s\_bearing} \cdot q_{net} \geq P_{max1} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases} = \text{"OK"}$$

Check = "OK"

Usage:

$$Usage := \frac{P_{max1}}{\phi_{s\_bearing} \cdot q_{net}}$$

Usage = 0.5·%

Spread Footing Foundation Reinforcement Design:

Reduction factors as per respective ACI sections

$\phi_{shear} := 0.75$ as per ACI 9.3.2.3

$\phi_{compr} := 0.65$ as per ACI 9.3.2.2, for compression-controlled section (other reinforced members)

$\phi_{axten} := 0.9$ as per ACI 9.3.2.1 for tension-controlled section

Pad Rebars Check in Spread Footing:

Bending Moment on Spread Footing Foundation:

Effective Depth of Mat: $d_{mat} := T_{pad} - cc = 3.3\,ft$

$M_{matapp} := M_F = 2462 \cdot kip \cdot ft$

Rebar Check:

Rebar Size: #11

Rebar Area: $A_{bmat} := 1.56in^2$

Rebar Diameter: $d_{bmat} := 1.41in$

Number of Rebar Required: $n_{rebar} := 34$

$Area_{stlmin} := 0.0018 \cdot W_{pad} \cdot T_{pad}$

$Area_{stlmin} = 17.2 \cdot in^2$

Minimum Rebar Check:

$$Check := \begin{cases} \text{"OK"} & \text{if } n_{rebar} \cdot A_{bmat} \geq Area_{stlmin} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases} = \text{"OK"}$$

Check = "OK"

Moment Capacity:

$$a_{mat} := \frac{\left(n_{rebar} \cdot A_{bmat}\right) \cdot f_y}{0.85 \cdot f_c \cdot W_{pad}} = 3.3 \cdot in$$

$$M_{matcap} := \phi_{axten} \cdot \left(n_{rebar} \cdot A_{bmat}\right) \cdot f_y \cdot \left(d_{mat} - \frac{a_{mat}}{2}\right) = 8916.6 \cdot kip \cdot ft$$

Bending Check:

$$Check := \begin{cases} \text{"OK"} & \text{if } M_{matcap} \geq M_{matapp} \\ \text{"NOT GOOD"} & \text{otherwise} \end{cases} = \text{"OK"}$$

Check = "OK"

Usage:

$$Usage := \frac{M_{matapp}}{M_{matcap}}$$

Usage = 27.6 %

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Sent: Thursday, August 8, 2019 10:14 AM
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Subject: FedEx Shipment 775927972697 Delivered

Your package has been delivered

Tracking # 775927972697

Ship date:		Delivery date:
Wed, 8/7/2019		Thu, 8/8/2019 10:09 am
Lucia Chiocchio, Esq. Cuddy & Feder LLP White Plains, NY 10601 US	Delivered	**Bonnie Reemsnyder** First Selectwoman 52 Lyme Street Town of Old Lyme OLD LYME, CT 06371 US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	775927972697
Status:	Delivered: 08/08/2019 10:09 AM Signed for By: M.HAYES
Reference:	1844-3272
Signed for by:	M.HAYES
Delivery location:	OLD LYME, CT
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Priority Overnight®
Packaging type:	FedEx® Pak
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday
Standard transit:	8/8/2019 by 10:30 am

FedEx Shipment Receipt

Address Information

Ship to:	**Ship from:**
Kim Burrows	Lucia Chiocchio, Esq.
Land Use Department	Cuddy & Feder LLP
Old Lyme Memorial Town Hall	445 Hamilton Avenue
52 Lyme Street	Suite 1400
OLD LYME, CT	White Plains, NY
06371	10601
US	US
914 761 1300	9147611300

Shipment Information:
Tracking no.: 776204866169
Ship date: 09/10/2019
Estimated shipping charges: 18.22 USD

Package Information
Pricing option: FedEx Standard Rate
Service type: Priority Overnight
Package type: FedEx Pak
Number of packages: 1
Total weight: 1 LBS
Declared Value: 0.00 USD
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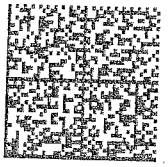

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