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

August 15, 2018

Mark Roberts
QC Development
P.O. Box 916
Storrs, CT 06268

RE: **EM-AT&T-034-180723** – AT&T notice of intent to modify an existing telecommunications facility located at 303 Boxwood Lane, Danbury, Connecticut.

Dear Mr. Roberts:

The Connecticut Siting Council (Council) is in receipt of your correspondence dated August 14, 2018 submitted in response to the Council's August 13, 2018 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/MP/emr

Robidoux, Evan

From: Mark Roberts <mark.roberts@qcdevelopment.net>
Sent: Tuesday, August 14, 2018 6:00 PM
To: CSC-DL Siting Council
Cc: Mark Roberts
Subject: RE: Council Incomplete Letter for EM-AT&T-034-180723-BoxwoodLn-Danbury
Attachments: 18027.00 - CT0968 Structural Analysis Rev2 18.08.14.pdf

Importance: High

Hello – in response to your incomplete letter from earlier today, please find attached a revised Tower Structural Analysis which reflects the most recent T-Mobile loading.

Please let me know if you have any further questions or concerns.

Thanks

Mark Roberts
QC Development
860-670-9068

From: Robidoux, Evan
Sent: Tuesday, August 14, 2018 2:02 PM
To: Mark Roberts
Cc: CSC-DL Siting Council
Subject: Council Incomplete Letter for EM-AT&T-034-180723-BoxwoodLn-Danbury

Please see the attached correspondence.

Evan Robidoux
Clerk Typist
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

100' Existing NUDD Lattice Tower

Project: LTE 1900 4T4R/4C/5C/6C

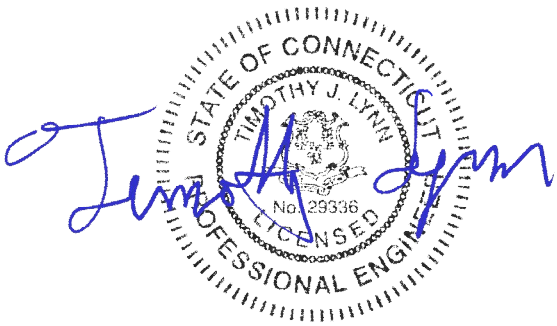
AT&T Site Ref: CT0968

303 Boxwood Lane,
Danbury, CT

CENTEK Project No. 18027.00

~~Date: March 16, 2018~~

Rev 2: August 14, 2018



Prepared for:

AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by AT&T on the existing self supporting lattice tower located in Danbury, Connecticut.

The host tower is a 100-ft, three-legged self-support lattice tower originally designed and manufactured by Fred A. Nudd Corporation; file no: 96-4992 dated January 21, 1997. Subsequent reinforcements were made to the tower per Centek job no. 361A dated November 28, 2001 and Centek job no. 10106 dated August 16, 2010. The tower geometry, structure member sizes and the foundation system information were taken from the aforementioned design documents.

Antenna and appurtenance information were obtained from a previous structural report prepared by Centek job no. 17012.37 dated April 21, 2017 and a AT&T RF data sheet.

The tower is made up of five (5) steel sections consisting of A500-42, A500-50, and A500-61ksi pipe legs. Diagonal lateral support bracing consists of A36 single angle and steel rod construction. The vertical tower sections are connected by bolted flange plates while the pipe legs and bracing are connected by welded connections (40'-100'), bolted and welded gusset connections (0'-40'). The tower face width is 7.5-ft at the bottom tapering to 3.5-ft at the top.

Antenna and Appurtenance Summary

The existing tower was designed to support several communication antennas. The existing, proposed and future loads considered in this analysis consist of the following:

- Unknown (Existing):
  Antennas: One (1) 3' parabolic grid antenna with a RAD center elevation of 96-ft above the existing tower base.
  Coax Cables: One (1) 1/2" ∅ coax cable.
- Sprint (Existing/Reserved):
  Antennas: Three (3) RFS APXVSPP18-C-A20 panel antennas, three (3) RFS APXVTM14 panel antennas, six (6) Alcatel-Lucent 1900 MHz RRH's, three (3) Alcatel-Lucent 800 MHz RRH's and three (3) Alcatel-Lucent TD-RRH8x20 remote radio heads mounted on three (3) sector frames with a RAD center elevation of 89-ft above the existing tower base.
  Coax Cables: Four (4) 1-1/4" ∅ fiber cables and one (1) RET cable.
- T-Mobile: (Existing to Remain):
  Antennas: Three (3) Ericsson AIR21 panel antennas, three (3) Andrew LNX-6515DS panel antennas, three (3) AIR32 panel antennas, three (3) TMAs and three (3) Ericsson RRUS-11 remote radio heads mounted on three (3) 10-ft T-Frames with RAD center elevations of 83-ft (AIR32 / AIR21) and 81.5-ft (LNX) above the existing tower base.
  Coax Cables: Six (6) 1 5/8" ∅ coax cables and two (2) 1 5/8" ∅ fiber cables running on a leg/face of the tower.
- WCSU FM (Existing):
  Antennas: One (1) 4-Bay Shively Labs 6810 FM Antenna w/ Radomes with a RAD center elevation of 65-ft above the existing tower base.
  Coax Cables: One (1) 1 5/8" ∅ coax cable.

- Sprint (Existing):
  Antennas: (1) GPS antenna mounted to a 2' standoff mount with a RAD center elevation of 30-ft above the existing tower base.
  Coax Cables: One (1) 1/2" ∅ coax cable.
- AT&T Mobility (Existing to Remain):
  Antennas: Six (6) CCI OPA-65R-LUCC-H4 panel antennas, six (6) Ericsson RRUS-11 remote radio heads, three (3) Ericsson RRUS-32 remote radio heads and two (2) Raycap DC6-48-60-18-8F surge arrestors mounted on three (3) existing sector frames with a RAD center elevation of 98-ft above the existing tower base.
  Coax Cables: Two (2) fiber cable, four (4) dc control cables and three (3) RET cables running on a face of the existing tower
- AT&T Mobility (Existing to Remove):
  Antennas: Three (3) Ericsson RRUS-12 remote radio heads and three (3) Ericsson A2 units mounted on three (3) existing sector frames with a RAD center elevation of 98-ft above the existing tower base.
- **AT&T Mobility (Proposed):**
  Antennas: Three (3) Commscope SBNHH-1D65A panel antennas, three (3) Ericsson RRUS-12 remote radio heads, three (3) Ericsson RRUS-E2 remote radio heads, three (3) Ericsson RRUS-32 B2 remote radio heads, three (3) Ericsson RRUS-32 B66 remote radio heads and one (1) Raycap DC6-48-60-18-8F surge arrestor mounted on three (3) existing sector frames with a RAD center elevation of 98-ft above the existing tower base.
  Coax Cables: One (1) fiber cable, two (2) dc control cables and three (3) RET cables running on a face of the existing tower
  Mount Modifications: Install (6) L2.5x2.5x3/16 angles, (6) L2x2x3/16 angles and (3) C3 channel assemblies attached to existing mount per the mount modification drawings prepared by Hudson Design Group dated June 17, 2018.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables shall be routed as specified on in Section 3 of this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 0.75" radial ice on the tower structure and its components.

Basic Wind Speed:	Fairfield; v = 90-110 mph (3-second gust)	*[Annex B of TIA-222-G-2005]*
	Danbury; v = 93 mph (3 second gust)	*[Appendix N of the 2016 CT Building Code]*
Load Cases:	Load Case 1; 93 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2016 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 0.75" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2012 International Building Code as amended by the 2016 Connecticut State Building Code (CSBC).

Tower Capacity

- Calculated stresses were found to be within allowable limits. In Load Case 2, per tnxtower "Section Capacity Table", this tower was found to be at **99.5%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T4)	40'-0"-53'-4"	99.5%	**PASS**
Diagonal (T2)	60'-0"-80'-0"	95.3%	**PASS**

Foundation and Anchors

The existing foundation consists of three (3) 2.0-ft ∅ x 4.25-ft long reinforced concrete piers on a 14.5-ft square x 3-ft thick reinforced concrete pad bearing directly on existing sub grade. The existing foundation dimensions and sub-grade conditions used in the analysis of the existing foundation were obtained from the aforementioned manufacturers original design documents; Fred A. Nudd Corporation; file no: 96-4992. Tower legs are connected to the foundation by means of (4) 1.5" ∅, ASTM A36 anchor bolts per leg, embedded into the concrete foundation structure.

- The tower reactions developed from the governing Load Case 1 were used in the verification of the foundation:

Reactions	Vector	Proposed Base Reactions
Base	Shear	**15 kips**
	Compression	**24 kips**
	Moment	**1001 kip-ft**
Leg	Shear	**11 kips**
	Compression	**162 kips**
	Uplift	**145 kips**

- The anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	62.5%	**PASS**

- The foundation was found to be within allowable limits.

Foundation	Design Limit	TIA-222-G Section 9.4 FS[(1)]	Proposed Loading (FS)[(1)]	Result
Reinforced Concrete Mat	OTM[(2)]	1.0	1.53	**PASS**

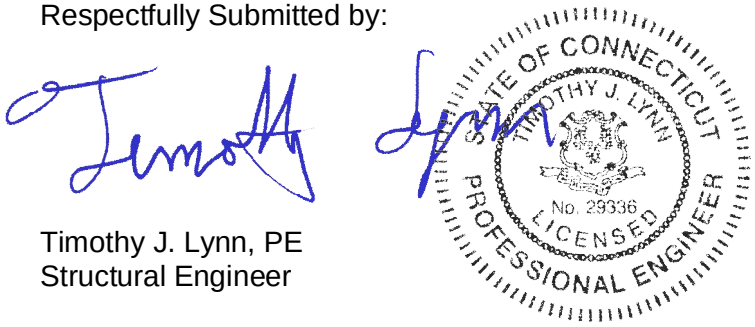
C o n c l u s i o n

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration with the below recommendations.

The analysis is based, in part, on the information provided to this office by AT&T. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of CENTEK engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provide to CENTEK engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. CENTEK engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

General Description of Structural Analysis Program

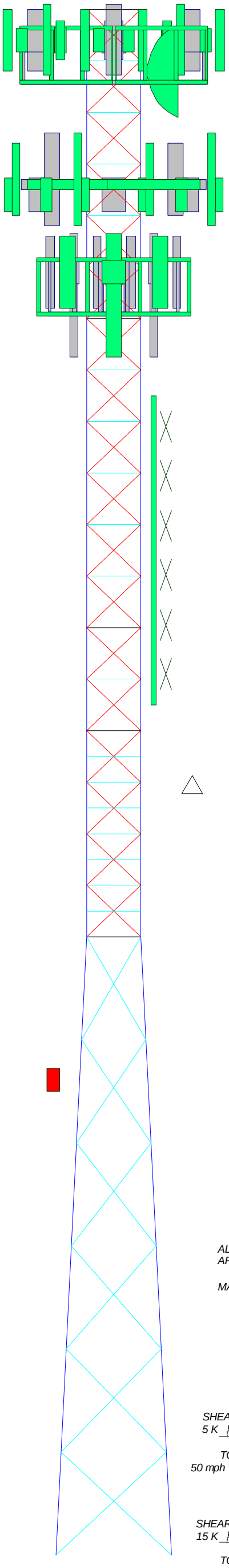
tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Section	T1	T2	T3	T4	T5	T6
Legs	P2.5x.276	P2.5x.276 (GR)	P3x.3 (GR)	P3x.3 (GR)	P5x.258 (GR)	P5x.258 (GR)
Leg Grade	A500-50	A500-50	A500M-61	A500M-61	A500-42	A500-42
Diagonals	SR 5/8	SR 5/8	SR 3/4	SR 3/4	L2x2x3/16	L2 1/2x2 1/2x3/16
Diagonal Grade			A36			
Top Girts	L1 1/2x1 1/2x3/16		2L1 1/2x1 1/2x3/16		N.A.	N.A.
Bottom Girts	N.A.		2L1 1/2x1 1/2x3/16	2L1 1/2x1 1/2x3/16	N.A.	N.A.
Horizontals	L1 1/2x1 1/2x3/16		2L1 1/2x1 1/2x3/16	2L1 1/2x1 1/2x3/16	N.A.	N.A.
Sec. Horizontals	N.A.		2L1 1/2x1 1/2x3/16	L2 1/2x2 1/2x5/16	N.A.	N.A.
Face Width (ft)	3.5	1.1	0.5	1.3	2.5	2.6
# Panels @ (ft)	12 @ 3.33333		2 @ 3.335	4 @ 3.3325	6 @ 6.66667	
Weight (K)	0.8					8.8

100.0 ft
80.0 ft
60.0 ft
53.3 ft
40.0 ft
20.0 ft
0.0 ft



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) OPA-65R-LCUU-H4 (ATI - Existing)	98	13-ft T-Frame (Sprint - Existing)	89
(2) OPA-65R-LCUU-H4 (ATI - Existing)	98	13-ft T-Frame (Sprint - Existing)	89
(2) OPA-65R-LCUU-H4 (ATI - Existing)	98	13-ft T-Frame (Sprint - Existing)	89
SBNHH-1D65A (ATI - Proposed)	98	FD-RRH 2x50 800 (Sprint - Existing)	88
SBNHH-1D65A (ATI - Proposed)	98	FD-RRH 2x50 800 (Sprint - Existing)	88
SBNHH-1D65A (ATI - Proposed)	98	FD-RRH 2x50 800 (Sprint - Existing)	88
(2) RRUS-11 (ATI - Existing)	98	TD-RRH8x20-25 (Sprint - Existing)	88
RRUS-12 (ATI - Proposed)	98	TD-RRH8x20-25 (Sprint - Existing)	88
RRUS-32 (ATI - Existing)	98	TD-RRH8x20-25 (Sprint - Existing)	88
(2) RRUS-32 (ATI - Proposed)	98	(2) FD-RRH 4x45 1900 (Sprint - Existing)	88
RRUS-E2 (ATI - Proposed)	98	(2) FD-RRH 4x45 1900 (Sprint - Existing)	88
(2) RRUS-11 (ATI - Existing)	98	(2) FD-RRH 4x45 1900 (Sprint - Existing)	88
RRUS-12 (ATI - Proposed)	98	AIR21 B2A/B4P (T-Mobile - Existing)	83
RRUS-32 (ATI - Existing)	98	AIR21 B2A/B4P (T-Mobile - Existing)	83
(2) RRUS-32 (ATI - Proposed)	98	AIR21 B2A/B4P (T-Mobile - Existing)	83
RRUS-E2 (ATI - Proposed)	98	AIR32 (T-Mobile - Existing)	83
(2) RRUS-11 (ATI - Existing)	98	AIR32 (T-Mobile - Existing)	83
RRUS-12 (ATI - Proposed)	98	AIR32 (T-Mobile - Existing)	83
RRUS-32 (ATI - Existing)	98	RRUS-11 (T-Mobile - Existing)	83
(2) RRUS-32 (ATI - Proposed)	98	RRUS-11 (T-Mobile - Existing)	83
RRUS-E2 (ATI - Proposed)	98	RRUS-11 (T-Mobile - Existing)	83
DC6-48-60-18-8F Surge Arrestor (ATI - Existing)	98	10-ft T-Frame (T-Mobile - Existing)	82
DC6-48-60-18-8F Surge Arrestor (ATI - Existing)	98	10-ft T-Frame (T-Mobile - Existing)	82
DC6-48-60-18-8F Surge Arrestor (ATI - Proposed)	98	10-ft T-Frame (T-Mobile - Existing)	82
12' Boom Starmount (ATI - Existing)	97	LNX-6515DS (T-Mobile - Existing)	81.5
Mount Mods (ATI - Proposed)	97	LNX-6515DS (T-Mobile - Existing)	81.5
12' Boom Starmount (ATI - Existing)	97	LNX-6515DS (T-Mobile - Existing)	81.5
Mount Mods (ATI - Proposed)	97	ATMAA1412D-1A20 Twin TMA (T-Mobile - Existing)	80
12' Boom Starmount (ATI - Existing)	97		
Mount Mods (ATI - Proposed)	97	ATMAA1412D-1A20 Twin TMA (T-Mobile - Existing)	80
Parabolic Grid	96		
APXVSPP18-C-A20 (Sprint - Existing)	89	ATMAA1412D-1A20 Twin TMA (T-Mobile - Existing)	80
APXVSPP18-C-A20 (Sprint - Existing)	89		
APXVSPP18-C-A20 (Sprint - Existing)	89	6810 4 Bay	65
APXVTM14 (Sprint - Existing)	89	2.5" Tube x 2' Standoff (Sprint)	30
APXVTM14 (Sprint - Existing)	89	GPS (Sprint)	30
APXVTM14 (Sprint - Existing)	89		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A500M-61	61 ksi	75 ksi
A36	36 ksi	58 ksi	A500-42	42 ksi	58 ksi

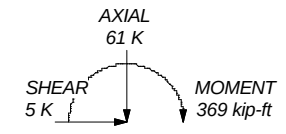
TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-G Standard.
2. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. Grouted pipe f'c is 5 ksi
8. 3/4" dia SR used for sections T3 _T4 to account for 5/8" SR with 1/4" bar
9. TOWER RATING: 99.5%

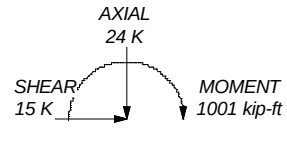
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 162 K
SHEAR: 11 K

UPLIFT: -145 K
SHEAR: 10 K



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



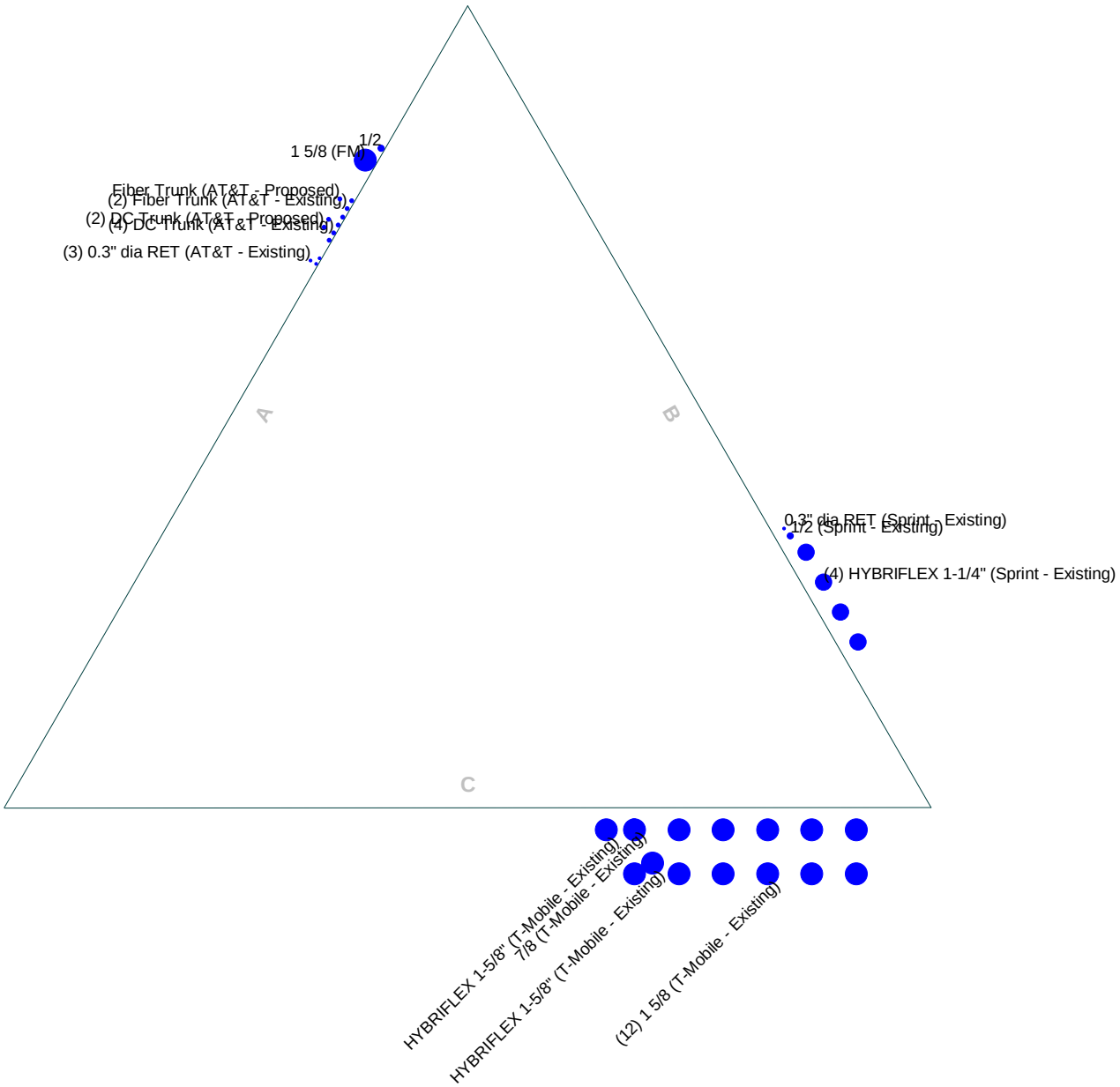
TORQUE 4 kip-ft
REACTIONS - 93 mph WIND

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: **18027.00 - CT0968**		
Project: **100' Nudd Lattice - 303 Boxwood Lane, Danbury, CT**		
Client: AT&T Mobility	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 08/14/18	Scale: NTS
Path: J:\Jobs\1802700.WI\04_Structural\Backup Documentation\Calcs\Rev 2\ERI Files\100-ft NUDD Lattice Tower Danbury, CT.eri		Dwg No. E-1

Feed Line Plan

Round Flat App In Face App Out Face



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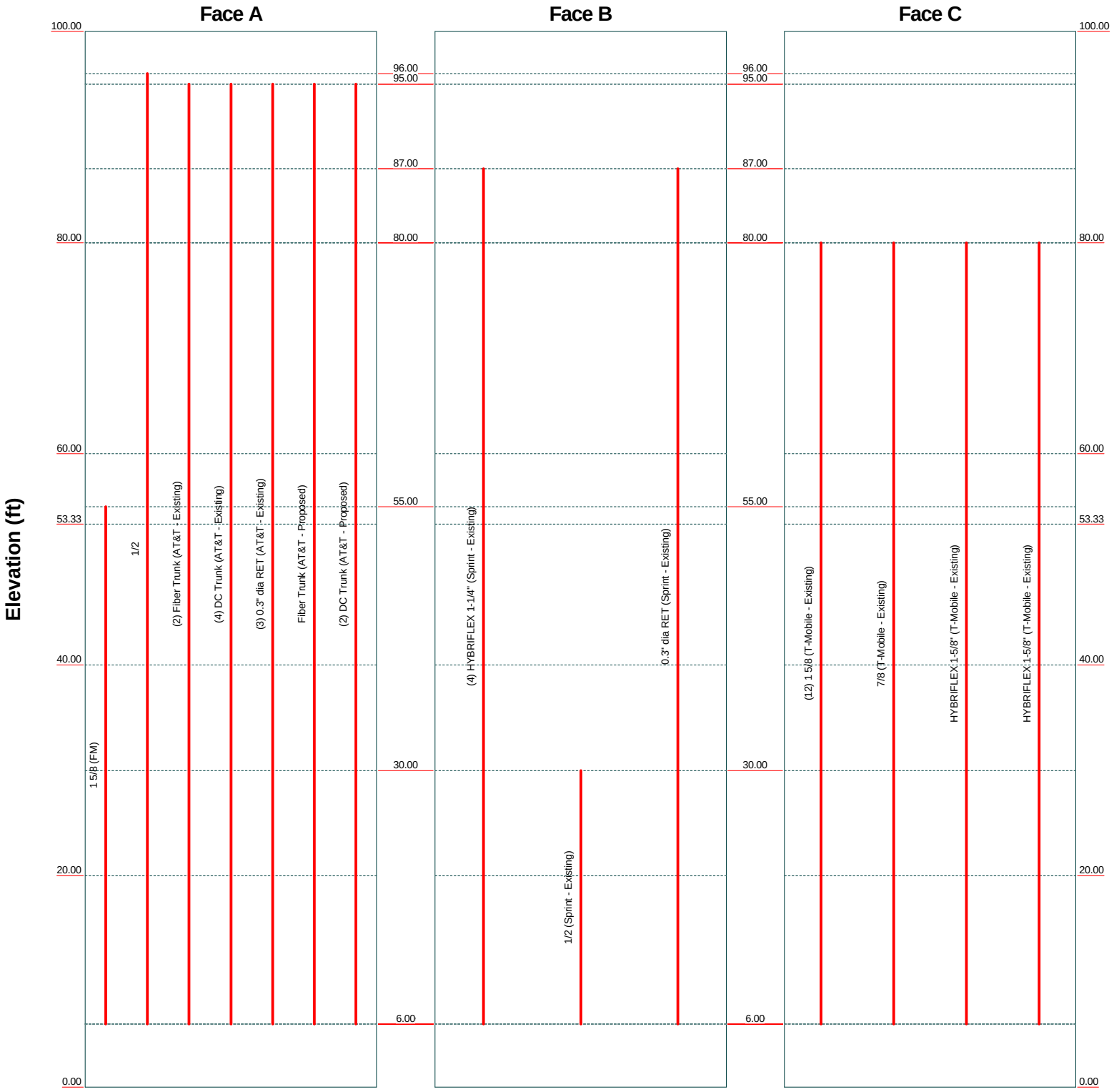
Path: J:\Jobs\1802700.W\04_Structural\Backup Documentation\Calcs\Rev (2)\ERI Files\100-ft NUDD Lattice Tower Danbury, CT.eri			Dwg No. E-7

Feed Line Distribution Chart
0' - 100'

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



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Client: AT&T Mobility		Drawn by: TJL	App'd:
Code: TIA-222-G		Date: 08/14/18	Scale: NTS
Path: J:\Jobs\1802700\WI04_Structural\Backup Documentation\Calcs\Rev (2)\ERI Files\100-ft NUDD Lattice Tower Danbury, CT.eri			Dwg No. E-7

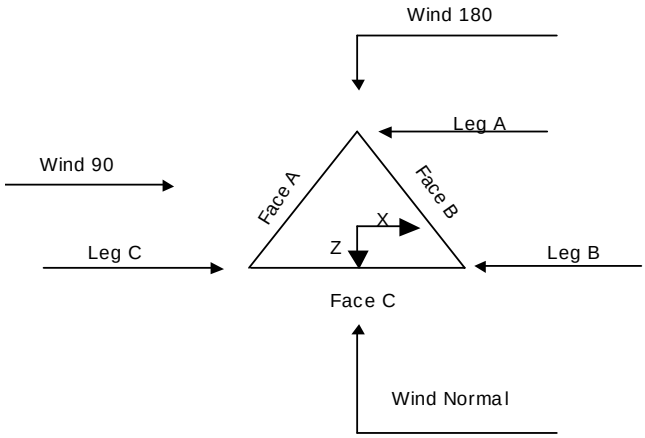
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 100.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.50 ft at the top and 7.50 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 93 mph.
Structure Class II.
Exposure Category B.
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.
3/4" dia SR used for sections T3 & T4 to account for 5/8" SR with 1/4" bar.
Tension only take-up is 0.0313 in.
A non-linear (P-delta) analysis was used.
Grouted pipe f'_c is 5 ksi.
Pressures are calculated at each section.
Stress ratio used in tower member 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		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	100.00-80.00			3.50	1	20.00
T2	80.00-60.00			3.50	1	20.00
T3	60.00-53.33			3.50	1	6.67
T4	53.33-40.00			3.50	1	13.33
T5	40.00-20.00			3.50	1	20.00
T6	20.00-0.00			5.50	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	100.00-80.00	3.33	TX Brace	No	Yes	0.0000	0.0000
T2	80.00-60.00	3.33	TX Brace	No	Yes	0.0000	0.0000
T3	60.00-53.33	3.34	TX Brace	No	Yes	0.0000	0.0000
T4	53.33-40.00	3.33	TX Brace	No	Yes	0.0000	0.0000
T5	40.00-20.00	6.67	X Brace	No	No	0.0000	0.0000
T6	20.00-0.00	6.67	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 100.00-80.00	Pipe	P2.5x.276	A500-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 80.00-60.00	Grouted Pipe	P2.5x.276	A500-50 (50 ksi)	Solid Round	5/8	A36 (36 ksi)
T3 60.00-53.33	Grouted Pipe	P3x.3	A500M-61 (61 ksi)	Solid Round	3/4	A36 (36 ksi)
T4 53.33-40.00	Grouted Pipe	P3x.3	A500M-61 (61 ksi)	Solid Round	3/4	A36 (36 ksi)
T5 40.00-20.00	Grouted Pipe	P5x.258	A500-42 (42 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T6 20.00-0.00	Grouted Pipe	P5x.258	A500-42 (42 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 100.00-80.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T2 80.00-60.00	Double Equal Angle	2L1 1/2x1 1/2x3/16	A36 (36 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 60.00-53.33	Double Equal Angle	2L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T4 53.33-40.00	Double Equal Angle	2L1 1/2x1 1/2x3/16	A36 (36 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 100.00-80.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 80.00-60.00	None	Single Angle		A36 (36 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 60.00-53.33	None	Single Angle		A36 (36 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 53.33-40.00	None	Single Angle		A36 (36 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T4 53.33-40.00	Equal Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

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
T1 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 60.00-53.33	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 53.33-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
60.00-53.33				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
53.33-40.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T6 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 60.00-53.33	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 53.33-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 100.00-80.00	Flange	0.7500 A325N	4	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.6250 A325N	0
T2 80.00-60.00	Flange	0.7500 A325N	4	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.6250 A325N	0
T3 60.00-53.33	Flange	0.7500 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.6250 A325N	0
T4 53.33-40.00	Flange	1.0000 A325N	4	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.7500 A325N	1
T5 40.00-20.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.6250 A325N	0
T6 20.00-0.00	Flange	1.5000 A36	4	0.6250 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.6250 A325N	0

Grouted Pipe Properties

Size	F_y ksi	A_s in^2	A_c in^2	Wt plf	E_c ksi	E_m ksi	F_{ym} ksi
P2.5x.276 (GR)	50	2.2535	4.2383	16.498	4031	35064	58
P3x.3 (GR)	55	3.0159	6.6052	24.023	4031	36062	64
P5x.258 (GR)	42	4.2999	20.0058	56.310	4031	44002	62

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (FM)	A	No	Ar (CaAa)	55.00 - 6.00	0.0000	0.3	1	1	1.9800	1.9800		1.04
1/2	A	No	Ar (CaAa)	96.00 - 6.00	0.0000	0.32	1	1	0.5800	0.5800		0.25

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
HYBRIFLEX 1-1/4" (Sprint - Existing)	B	No	Ar (CaAa)	87.00 - 6.00	1.0000	0.25	4	4	1.5400	1.5400		1.30
1/2 (Sprint - Existing)	B	No	Ar (CaAa)	30.00 - 6.00	1.0000	0.17	1	1	0.5800	0.5800		0.25
0.3" dia RET (Sprint - Existing)	B	No	Ar (CaAa)	87.00 - 6.00	1.0000	0.16	1	1	0.3000	0.3000		0.00
1 5/8 (T-Mobile - Existing)	C	No	Ar (CaAa)	80.00 - 6.00	1.0000	-0.3	12	6	1.9800	1.9800		1.04
7/8 (T-Mobile - Existing)	C	No	Ar (CaAa)	80.00 - 6.00	1.0000	-0.18	1	1	1.1100	1.1100		0.54
Fiber Trunk (AT&T - Existing)	A	No	Ar (CaAa)	95.00 - 6.00	0.0000	0.25	2	2	0.4000	0.4000		1.00
DC Trunk (AT&T - Existing)	A	No	Ar (CaAa)	95.00 - 6.00	0.0000	0.22	4	4	0.4000	0.4000		0.11
0.3" dia RET (AT&T - Existing)	A	No	Ar (CaAa)	95.00 - 6.00	0.0000	0.18	3	2	0.3000	0.3000		0.00
HYBRIFLEX 1-5/8" (T-Mobile - Existing)	C	No	Ar (CaAa)	80.00 - 6.00	1.0000	-0.15	1	1	1.9800	1.9800		1.90
Fiber Trunk (AT&T - Proposed)	A	No	Ar (CaAa)	95.00 - 6.00	1.0000	0.25	1	1	0.4000	0.4000		1.00
DC Trunk (AT&T - Proposed)	A	No	Ar (CaAa)	95.00 - 6.00	1.0000	0.22	2	2	0.4000	0.4000		0.11
HYBRIFLEX 1-5/8" (T-Mobile - Existing)	C	No	Ar (CaAa)	80.00 - 6.00	4.0000	-0.2	1	1	1.9800	1.9800		1.90

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	100.00-80.00	A	0.000	0.000	7.678	0.000	0.06
		B	0.000	0.000	4.522	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.00
T2	80.00-60.00	A	0.000	0.000	10.160	0.000	0.08
		B	0.000	0.000	12.920	0.000	0.10
		C	0.000	0.000	57.660	0.000	0.34
T3	60.00-53.33	A	0.000	0.000	3.719	0.000	0.03
		B	0.000	0.000	4.309	0.000	0.03
		C	0.000	0.000	19.230	0.000	0.11
T4	53.33-40.00	A	0.000	0.000	9.411	0.000	0.07
		B	0.000	0.000	8.611	0.000	0.07
		C	0.000	0.000	38.430	0.000	0.22

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T5	40.00-20.00	A	0.000	0.000	14.120	0.000	0.10
		B	0.000	0.000	13.500	0.000	0.11
		C	0.000	0.000	57.660	0.000	0.34
T6	20.00-0.00	A	0.000	0.000	9.884	0.000	0.07
		B	0.000	0.000	9.856	0.000	0.08
		C	0.000	0.000	40.362	0.000	0.24

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	100.00-80.00	A	1.658	0.000	0.000	58.345	0.000	0.55
		B		0.000	0.000	15.578	0.000	0.22
		C		0.000	0.000	0.000	0.000	0.00
T2	80.00-60.00	A	1.617	0.000	0.000	75.791	0.000	0.70
		B		0.000	0.000	44.082	0.000	0.60
		C		0.000	0.000	96.155	0.000	2.18
T3	60.00-53.33	A	1.583	0.000	0.000	25.730	0.000	0.24
		B		0.000	0.000	14.585	0.000	0.20
		C		0.000	0.000	31.860	0.000	0.72
T4	53.33-40.00	A	1.553	0.000	0.000	55.752	0.000	0.54
		B		0.000	0.000	28.938	0.000	0.39
		C		0.000	0.000	63.299	0.000	1.42
T5	40.00-20.00	A	1.486	0.000	0.000	80.966	0.000	0.76
		B		0.000	0.000	46.276	0.000	0.60
		C		0.000	0.000	93.737	0.000	2.07
T6	20.00-0.00	A	1.331	0.000	0.000	52.353	0.000	0.46
		B		0.000	0.000	33.334	0.000	0.40
		C		0.000	0.000	63.626	0.000	1.36

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	100.00-80.00	0.2536	-0.8467	0.1035	-0.5387
T2	80.00-60.00	2.0997	2.0021	1.0891	0.7925
T3	60.00-53.33	2.0020	1.8786	1.0490	0.7330
T4	53.33-40.00	1.8134	1.6175	0.8153	0.4953
T5	40.00-20.00	2.2438	1.8599	1.4362	0.7725
T6	20.00-0.00	2.6437	2.0387	1.8717	0.9197

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	1/2	80.00 - 96.00	0.6000	0.4243

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	4	HYBRIFLEX 1-1/4"	80.00 - 87.00	0.6000	0.4243
T1	6	0.3" dia RET	80.00 - 87.00	0.6000	0.4243
T1	9	Fiber Trunk	80.00 - 95.00	0.6000	0.4243
T1	10	DC Trunk	80.00 - 95.00	0.6000	0.4243
T1	11	0.3" dia RET	80.00 - 95.00	0.6000	0.4243
T1	13	Fiber Trunk	80.00 - 95.00	0.6000	0.4243
T1	14	DC Trunk	80.00 - 95.00	0.6000	0.4243
T2	2	1/2	60.00 - 80.00	0.6000	0.4331
T2	4	HYBRIFLEX 1-1/4"	60.00 - 80.00	0.6000	0.4331
T2	6	0.3" dia RET	60.00 - 80.00	0.6000	0.4331
T2	7	1 5/8	60.00 - 80.00	0.6000	0.4331
T2	8	7/8	60.00 - 80.00	0.6000	0.4331
T2	9	Fiber Trunk	60.00 - 80.00	0.6000	0.4331
T2	10	DC Trunk	60.00 - 80.00	0.6000	0.4331
T2	11	0.3" dia RET	60.00 - 80.00	0.6000	0.4331
T2	12	HYBRIFLEX 1-5/8"	60.00 - 80.00	0.6000	0.4331
T2	13	Fiber Trunk	60.00 - 80.00	0.6000	0.4331
T2	14	DC Trunk	60.00 - 80.00	0.6000	0.4331
T2	15	HYBRIFLEX 1-5/8"	60.00 - 80.00	0.6000	0.4331
T3	1	1 5/8	53.33 - 55.00	0.6000	0.4183
T3	2	1/2	53.33 - 60.00	0.6000	0.4183
T3	4	HYBRIFLEX 1-1/4"	53.33 - 60.00	0.6000	0.4183
T3	6	0.3" dia RET	53.33 - 60.00	0.6000	0.4183
T3	7	1 5/8	53.33 - 60.00	0.6000	0.4183
T3	8	7/8	53.33 - 60.00	0.6000	0.4183
T3	9	Fiber Trunk	53.33 - 60.00	0.6000	0.4183
T3	10	DC Trunk	53.33 - 60.00	0.6000	0.4183
T3	11	0.3" dia RET	53.33 - 60.00	0.6000	0.4183
T3	12	HYBRIFLEX 1-5/8"	53.33 - 60.00	0.6000	0.4183
T3	13	Fiber Trunk	53.33 - 60.00	0.6000	0.4183
T3	14	DC Trunk	53.33 - 60.00	0.6000	0.4183
T3	15	HYBRIFLEX 1-5/8"	53.33 - 60.00	0.6000	0.4183
T4	1	1 5/8	40.00 - 53.33	0.6000	0.2922
T4	2	1/2	40.00 - 53.33	0.6000	0.2922
T4	4	HYBRIFLEX 1-1/4"	40.00 - 53.33	0.6000	0.2922
T4	6	0.3" dia RET	40.00 - 53.33	0.6000	0.2922
T4	7	1 5/8	40.00 - 53.33	0.6000	0.2922
T4	8	7/8	40.00 - 53.33	0.6000	0.2922
T4	9	Fiber Trunk	40.00 - 53.33	0.6000	0.2922
T4	10	DC Trunk	40.00 - 53.33	0.6000	0.2922
T4	11	0.3" dia RET	40.00 - 53.33	0.6000	0.2922
T4	12	HYBRIFLEX 1-5/8"	40.00 - 53.33	0.6000	0.2922
T4	13	Fiber Trunk	40.00 - 53.33	0.6000	0.2922
T4	14	DC Trunk	40.00 - 53.33	0.6000	0.2922
T4	15	HYBRIFLEX 1-5/8"	40.00 - 53.33	0.6000	0.2922
T5	1	1 5/8	20.00 - 40.00	0.6000	0.5531
T5	2	1/2	20.00 - 40.00	0.6000	0.5531
T5	4	HYBRIFLEX 1-1/4"	20.00 - 40.00	0.6000	0.5531
T5	5	1/2	20.00 - 30.00	0.6000	0.5531
T5	6	0.3" dia RET	20.00 - 40.00	0.6000	0.5531
T5	7	1 5/8	20.00 - 40.00	0.6000	0.5531
T5	8	7/8	20.00 - 40.00	0.6000	0.5531
T5	9	Fiber Trunk	20.00 - 40.00	0.6000	0.5531
T5	10	DC Trunk	20.00 - 40.00	0.6000	0.5531
T5	11	0.3" dia RET	20.00 - 40.00	0.6000	0.5531
T5	12	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.5531
T5	13	Fiber Trunk	20.00 - 40.00	0.6000	0.5531
T5	14	DC Trunk	20.00 - 40.00	0.6000	0.5531
T5	15	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.5531
T6	1	1 5/8	6.00 - 20.00	0.6000	0.6000
T6	2	1/2	6.00 - 20.00	0.6000	0.6000
T6	4	HYBRIFLEX 1-1/4"	6.00 - 20.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T6	5	1/2	6.00 - 20.00	0.6000	0.6000
T6	6	0.3" dia RET	6.00 - 20.00	0.6000	0.6000
T6	7	1 5/8	6.00 - 20.00	0.6000	0.6000
T6	8	7/8	6.00 - 20.00	0.6000	0.6000
T6	9	Fiber Trunk	6.00 - 20.00	0.6000	0.6000
T6	10	DC Trunk	6.00 - 20.00	0.6000	0.6000
T6	11	0.3" dia RET	6.00 - 20.00	0.6000	0.6000
T6	12	HYBRIFLEX 1-5/8"	6.00 - 20.00	0.6000	0.6000
T6	13	Fiber Trunk	6.00 - 20.00	0.6000	0.6000
T6	14	DC Trunk	6.00 - 20.00	0.6000	0.6000
T6	15	HYBRIFLEX 1-5/8"	6.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

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 K
(2) OPA-65R-LCUU-H4	A	From Leg	3.00	0.0000	98.00	No Ice	5.94	3.36	0.06
(AT&T - Existing)			0.00			1/2" Ice	6.28	3.66	0.10
			0.00			1" Ice	6.62	3.97	0.14
(2) OPA-65R-LCUU-H4	B	From Leg	3.00	0.0000	98.00	No Ice	5.94	3.36	0.06
(AT&T - Existing)			0.00			1/2" Ice	6.28	3.66	0.10
			0.00			1" Ice	6.62	3.97	0.14
(2) OPA-65R-LCUU-H4	C	From Leg	3.00	0.0000	98.00	No Ice	5.94	3.36	0.06
(AT&T - Existing)			0.00			1/2" Ice	6.28	3.66	0.10
			0.00			1" Ice	6.62	3.97	0.14
SBNHH-1D65A	A	From Leg	3.00	0.0000	98.00	No Ice	5.88	3.86	0.04
(AT&T - Proposed)			0.00			1/2" Ice	6.25	4.22	0.08
			0.00			1" Ice	6.62	4.57	0.12
SBNHH-1D65A	B	From Leg	3.00	0.0000	98.00	No Ice	5.88	3.86	0.04
(AT&T - Proposed)			0.00			1/2" Ice	6.25	4.22	0.08
			0.00			1" Ice	6.62	4.57	0.12
SBNHH-1D65A	C	From Leg	3.00	0.0000	98.00	No Ice	5.88	3.86	0.04
(AT&T - Proposed)			0.00			1/2" Ice	6.25	4.22	0.08
			0.00			1" Ice	6.62	4.57	0.12
(2) RRUS-11	A	From Leg	2.00	0.0000	98.00	No Ice	2.57	1.07	0.05
(AT&T - Existing)			0.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
RRUS-12	A	From Leg	2.00	0.0000	98.00	No Ice	3.15	1.29	0.06
(AT&T - Proposed)			0.00			1/2" Ice	3.36	1.44	0.08
			0.00			1" Ice	3.59	1.60	0.11
RRUS-32	A	From Leg	2.00	0.0000	98.00	No Ice	3.31	2.42	0.08
(AT&T - Existing)			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
(2) RRUS-32	A	From Leg	2.00	0.0000	98.00	No Ice	0.00	2.42	0.08
(AT&T - Proposed)			0.00			1/2" Ice	0.00	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
RRUS-E2	A	From Leg	2.00	0.0000	98.00	No Ice	0.00	1.29	0.06
(AT&T - Proposed)			0.00			1/2" Ice	0.00	1.44	0.08
			0.00			1" Ice	3.59	1.60	0.11
(2) RRUS-11	B	From Leg	2.00	0.0000	98.00	No Ice	2.57	1.07	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(AT&T - Existing)			0.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
RRUS-12	B	From Leg	2.00	0.0000	98.00	No Ice	3.15	1.29	0.06
(AT&T - Proposed)			0.00			1/2" Ice	3.36	1.44	0.08
			0.00			1" Ice	3.59	1.60	0.11
RRUS-32	B	From Leg	2.00	0.0000	98.00	No Ice	3.31	2.42	0.08
(AT&T - Existing)			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
(2) RRUS-32	B	From Leg	2.00	0.0000	98.00	No Ice	0.00	2.42	0.08
(AT&T - Proposed)			0.00			1/2" Ice	0.00	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
RRUS-E2	B	From Leg	2.00	0.0000	98.00	No Ice	0.00	1.29	0.06
(AT&T - Proposed)			0.00			1/2" Ice	0.00	1.44	0.08
			0.00			1" Ice	3.59	1.60	0.11
(2) RRUS-11	C	From Leg	2.00	0.0000	98.00	No Ice	2.57	1.07	0.05
(AT&T - Existing)			0.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
RRUS-12	C	From Leg	2.00	0.0000	98.00	No Ice	3.15	1.29	0.06
(AT&T - Proposed)			0.00			1/2" Ice	3.36	1.44	0.08
			0.00			1" Ice	3.59	1.60	0.11
RRUS-32	C	From Leg	2.00	0.0000	98.00	No Ice	3.31	2.42	0.08
(AT&T - Existing)			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
(2) RRUS-32	C	From Leg	2.00	0.0000	98.00	No Ice	0.00	2.42	0.08
(AT&T - Proposed)			0.00			1/2" Ice	0.00	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
RRUS-E2	C	From Leg	2.00	0.0000	98.00	No Ice	0.00	1.29	0.06
(AT&T - Proposed)			0.00			1/2" Ice	0.00	1.44	0.08
			0.00			1" Ice	3.59	1.60	0.11
DC6-48-60-18-8F Surge	A	From Leg	0.00	0.0000	98.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T - Existing)			0.00			1" Ice	2.29	2.29	0.06
DC6-48-60-18-8F Surge	B	From Leg	0.00	0.0000	98.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T - Existing)			0.00			1" Ice	2.29	2.29	0.06
DC6-48-60-18-8F Surge	C	From Leg	0.00	0.0000	98.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T - Proposed)			0.00			1" Ice	2.29	2.29	0.06
12' Boom Starmount	A	From Leg	1.50	0.0000	97.00	No Ice	15.00	8.00	0.47
(AT&T - Existing)			0.00			1/2" Ice	20.00	11.00	0.68
			0.00			1" Ice	26.00	14.00	0.88
Mount Mods	A	From Leg	1.50	0.0000	97.00	No Ice	5.00	5.00	0.12
(AT&T - Proposed)			0.00			1/2" Ice	8.00	8.00	0.15
			0.00			1" Ice	11.00	11.00	0.18
12' Boom Starmount	B	From Leg	1.50	0.0000	97.00	No Ice	15.00	8.00	0.47
(AT&T - Existing)			0.00			1/2" Ice	20.00	11.00	0.68
			0.00			1" Ice	26.00	14.00	0.88
Mount Mods	B	From Leg	1.50	0.0000	97.00	No Ice	5.00	5.00	0.12
(AT&T - Proposed)			0.00			1/2" Ice	8.00	8.00	0.15
			0.00			1" Ice	11.00	11.00	0.18
12' Boom Starmount	C	From Leg	1.50	0.0000	97.00	No Ice	15.00	8.00	0.47
(AT&T - Existing)			0.00			1/2" Ice	20.00	11.00	0.68
			0.00			1" Ice	26.00	14.00	0.88
Mount Mods	C	From Leg	1.50	0.0000	97.00	No Ice	5.00	5.00	0.12
(AT&T - Proposed)			0.00			1/2" Ice	8.00	8.00	0.15
			0.00			1" Ice	11.00	11.00	0.18
Parabolic Grid	B	From Leg	0.50	0.0000	96.00	No Ice	1.20	1.20	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	2.00	2.00	0.04
			0.00			1" Ice	2.80	2.80	0.06
APXVSPP18-C-A20	A	From Leg	3.00	0.0000	89.00	No Ice	8.02	5.28	0.06
(Sprint - Existing)			-4.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
APXVSPP18-C-A20	B	From Leg	3.00	0.0000	89.00	No Ice	8.02	5.28	0.06
(Sprint - Existing)			-4.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
APXVSPP18-C-A20	C	From Leg	3.00	0.0000	89.00	No Ice	8.02	5.28	0.06
(Sprint - Existing)			-4.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
APXVTM14	A	From Leg	3.00	0.0000	89.00	No Ice	6.34	3.61	0.06
(Sprint - Existing)			4.00			1/2" Ice	6.72	3.97	0.10
			0.00			1" Ice	7.10	4.33	0.14
APXVTM14	B	From Leg	3.00	0.0000	89.00	No Ice	6.34	3.61	0.06
(Sprint - Existing)			4.00			1/2" Ice	6.72	3.97	0.10
			0.00			1" Ice	7.10	4.33	0.14
APXVTM14	C	From Leg	3.00	0.0000	89.00	No Ice	6.34	3.61	0.06
(Sprint - Existing)			4.00			1/2" Ice	6.72	3.97	0.10
			0.00			1" Ice	7.10	4.33	0.14
(2) FD-RRH 4x45 1900	A	From Leg	3.00	0.0000	88.00	No Ice	2.32	2.38	0.06
(Sprint - Existing)			0.00			1/2" Ice	2.52	2.59	0.08
			0.00			1" Ice	2.74	2.80	0.11
(2) FD-RRH 4x45 1900	B	From Leg	3.00	0.0000	88.00	No Ice	2.32	2.38	0.06
(Sprint - Existing)			0.00			1/2" Ice	2.52	2.59	0.08
			0.00			1" Ice	2.74	2.80	0.11
(2) FD-RRH 4x45 1900	C	From Leg	3.00	0.0000	88.00	No Ice	2.32	2.38	0.06
(Sprint - Existing)			0.00			1/2" Ice	2.52	2.59	0.08
			0.00			1" Ice	2.74	2.80	0.11
FD-RRH 2x50 800	A	From Leg	3.00	0.0000	88.00	No Ice	2.06	1.93	0.06
(Sprint - Existing)			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
FD-RRH 2x50 800	B	From Leg	3.00	0.0000	88.00	No Ice	2.06	1.93	0.06
(Sprint - Existing)			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
FD-RRH 2x50 800	C	From Leg	3.00	0.0000	88.00	No Ice	2.06	1.93	0.06
(Sprint - Existing)			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
TD-RRH8x20-25	A	From Leg	3.00	0.0000	88.00	No Ice	4.05	1.53	0.07
(Sprint - Existing)			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	B	From Leg	3.00	0.0000	88.00	No Ice	4.05	1.53	0.07
(Sprint - Existing)			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	C	From Leg	3.00	0.0000	88.00	No Ice	4.05	1.53	0.07
(Sprint - Existing)			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
13-ft T-Frame	A	From Leg	1.00	0.0000	89.00	No Ice	11.70	11.70	0.53
(Sprint - Existing)			0.00			1/2" Ice	16.40	16.40	0.74
			0.00			1" Ice	21.10	21.10	0.96
13-ft T-Frame	B	From Leg	1.00	0.0000	89.00	No Ice	11.70	11.70	0.53
(Sprint - Existing)			0.00			1/2" Ice	16.40	16.40	0.74
			0.00			1" Ice	21.10	21.10	0.96
13-ft T-Frame	C	From Leg	1.00	0.0000	89.00	No Ice	11.70	11.70	0.53
(Sprint - Existing)			0.00			1/2" Ice	16.40	16.40	0.74
			0.00			1" Ice	21.10	21.10	0.96
6810 4 Bay	B	From Leg	1.00	0.0000	65.00	No Ice	28.90	28.90	0.43

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 K
			0.00			1/2" Ice	34.00	34.00	1.01
			0.00			1" Ice	39.10	39.10	1.60
2.5" Tube x 2' Standoff (Sprint)	C	From Leg	1.00	0.0000	30.00	No Ice	1.11	0.63	0.12
			0.00			1/2" Ice	1.44	0.84	0.13
			0.00			1" Ice	1.79	1.06	0.14
GPS (Sprint)	C	From Leg	2.00	0.0000	30.00	No Ice	1.00	1.00	0.01
			0.00			1/2" Ice	1.50	1.50	0.01
			0.00			1" Ice	2.00	2.00	0.02
AIR21 B2A/B4P (T-Mobile - Existing)	A	From Face	2.00	0.0000	83.00	No Ice	6.05	4.36	0.08
			3.00			1/2" Ice	6.42	4.70	0.12
			0.00			1" Ice	6.80	5.06	0.17
AIR21 B2A/B4P (T-Mobile - Existing)	B	From Face	2.00	0.0000	83.00	No Ice	6.05	4.36	0.08
			3.00			1/2" Ice	6.42	4.70	0.12
			0.00			1" Ice	6.80	5.06	0.17
AIR21 B2A/B4P (T-Mobile - Existing)	C	From Face	2.00	0.0000	83.00	No Ice	6.05	4.36	0.08
			3.00			1/2" Ice	6.42	4.70	0.12
			0.00			1" Ice	6.80	5.06	0.17
LNX-6515DS (T-Mobile - Existing)	A	From Face	2.00	0.0000	81.50	No Ice	11.45	7.70	0.06
			0.00			1/2" Ice	12.06	8.29	0.12
			0.00			1" Ice	12.69	8.89	0.19
LNX-6515DS (T-Mobile - Existing)	B	From Face	2.00	0.0000	81.50	No Ice	11.45	7.70	0.06
			0.00			1/2" Ice	12.06	8.29	0.12
			0.00			1" Ice	12.69	8.89	0.19
LNX-6515DS (T-Mobile - Existing)	C	From Face	2.00	0.0000	81.50	No Ice	11.45	7.70	0.06
			0.00			1/2" Ice	12.06	8.29	0.12
			0.00			1" Ice	12.69	8.89	0.19
AIR32 (T-Mobile - Existing)	A	From Face	2.00	0.0000	83.00	No Ice	6.51	4.71	0.13
			-3.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
AIR32 (T-Mobile - Existing)	B	From Face	2.00	0.0000	83.00	No Ice	6.51	4.71	0.13
			-3.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
AIR32 (T-Mobile - Existing)	C	From Face	2.00	0.0000	83.00	No Ice	6.51	4.71	0.13
			-3.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
RRUS-11 (T-Mobile - Existing)	A	From Face	2.00	0.0000	83.00	No Ice	2.57	1.07	0.05
			0.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
RRUS-11 (T-Mobile - Existing)	B	From Face	2.00	0.0000	83.00	No Ice	2.57	1.07	0.05
			0.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
RRUS-11 (T-Mobile - Existing)	C	From Face	2.00	0.0000	83.00	No Ice	2.57	1.07	0.05
			0.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
ATMAA1412D-1A20 Twin TMA (T-Mobile - Existing)	A	From Face	1.00	0.0000	80.00	No Ice	0.00	0.33	0.01
			0.00			1/2" Ice	0.00	0.41	0.02
			0.00			1" Ice	0.00	0.50	0.03
ATMAA1412D-1A20 Twin TMA (T-Mobile - Existing)	B	From Face	1.00	0.0000	80.00	No Ice	0.00	0.33	0.01
			0.00			1/2" Ice	0.00	0.41	0.02
			0.00			1" Ice	0.00	0.50	0.03
ATMAA1412D-1A20 Twin TMA (T-Mobile - Existing)	C	From Face	1.00	0.0000	80.00	No Ice	0.00	0.33	0.01
			0.00			1/2" Ice	0.00	0.41	0.02
			0.00			1" Ice	0.00	0.50	0.03
10-ft T-Frame (T-Mobile - Existing)	A	From Face	1.00	0.0000	82.00	No Ice	13.60	13.60	0.38
			0.00			1/2" Ice	17.50	17.50	0.53
			0.00			1" Ice	21.40	21.40	0.68
10-ft T-Frame	B	From Face	1.00	0.0000	82.00	No Ice	13.60	13.60	0.38

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 K
(T-Mobile - Existing)			0.00			1/2" Ice	17.50	17.50	0.53
			0.00			1" Ice	21.40	21.40	0.68
10-ft T-Frame	C	From Face	1.00	0.0000	82.00	No Ice	13.60	13.60	0.38
(T-Mobile - Existing)			0.00			1/2" Ice	17.50	17.50	0.53
			0.00			1" Ice	21.40	21.40	0.68

Tower Pressures - No Ice

G_H = 0.850

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
T1	90.00	0.959	18	74.792	A	2.445	12.397	9.583	64.57	7.678	0.000
100.00-80.00					B	2.445	12.397		64.57	4.522	0.000
					C	2.445	12.397		64.57	0.000	0.000
T2 80.00-60.00	70.00	0.892	17	74.792	A	2.445	12.397	9.583	64.57	10.160	0.000
					B	2.445	12.397		64.57	12.920	0.000
					C	2.445	12.397		64.57	57.660	0.000
T3 60.00-53.33	56.67	0.84	16	25.290	A	0.809	5.003	3.891	66.95	3.719	0.000
					B	0.809	5.003		66.95	4.309	0.000
					C	0.809	5.003		66.95	19.230	0.000
T4 53.33-40.00	46.67	0.795	15	50.543	A	4.679	9.991	7.776	53.01	9.411	0.000
					B	4.679	9.991		53.01	8.611	0.000
					C	4.679	9.991		53.01	38.430	0.000
T5 40.00-20.00	30.00	0.701	13	99.283	A	7.278	18.574	18.574	71.85	14.120	0.000
					B	7.278	18.574		71.85	13.500	0.000
					C	7.278	18.574		71.85	57.660	0.000
T6 20.00-0.00	10.00	0.7	13	139.283	A	10.818	18.574	18.574	63.19	9.884	0.000
					B	10.818	18.574		63.19	9.856	0.000
					C	10.818	18.574		63.19	40.362	0.000

Tower Pressure - With Ice

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	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
T1 100.00-80.00	90.00	0.959	5	1.6583	80.319	A	2.445	43.792	20.639	44.64	58.345	0.000
						B	2.445	43.792		44.64	15.578	0.000
						C	2.445	43.792		44.64	0.000	0.000
T2 80.00-60.00	70.00	0.892	5	1.6171	80.182	A	2.445	43.013	20.364	44.80	75.791	0.000
						B	2.445	43.013		44.80	44.082	0.000
						C	2.445	43.013		44.80	96.155	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
T3 60.00-53.33	56.67	0.84	5	1.5833	27.051	A	0.809	14.927	7.411	47.10	25.730	0.000
						B	0.809	14.927		47.10	14.585	0.000
						C	0.809	14.927		47.10	31.860	0.000
T4 53.33-40.00	46.67	0.795	4	1.5529	53.993	A	4.679	33.537	14.676	38.40	55.752	0.000
						B	4.679	33.537		38.40	28.938	0.000
						C	4.679	33.537		38.40	63.299	0.000
T5 40.00-20.00	30.00	0.701	4	1.4858	104.242	A	7.278	39.309	28.496	61.17	80.966	0.000
						B	7.278	39.309		61.17	46.276	0.000
						C	7.278	39.309		61.17	93.737	0.000
T6 20.00-0.00	10.00	0.7	4	1.3312	143.726	A	10.818	38.984	27.464	55.15	52.353	0.000
						B	10.818	38.984		55.15	33.334	0.000
						C	10.818	38.984		55.15	63.626	0.000

Tower Pressure - Service

$G_H = 0.850$

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
T1	90.00	0.959	8	74.792	A	2.445	12.397	9.583	64.57	7.678	0.000
100.00-80.00					B	2.445	12.397		64.57	4.522	0.000
					C	2.445	12.397		64.57	0.000	0.000
T2 80.00-60.00	70.00	0.892	7	74.792	A	2.445	12.397	9.583	64.57	10.160	0.000
					B	2.445	12.397		64.57	12.920	0.000
					C	2.445	12.397		64.57	57.660	0.000
T3 60.00-53.33	56.67	0.84	7	25.290	A	0.809	5.003	3.891	66.95	3.719	0.000
					B	0.809	5.003		66.95	4.309	0.000
					C	0.809	5.003		66.95	19.230	0.000
T4 53.33-40.00	46.67	0.795	6	50.543	A	4.679	9.991	7.776	53.01	9.411	0.000
					B	4.679	9.991		53.01	8.611	0.000
					C	4.679	9.991		53.01	38.430	0.000
T5 40.00-20.00	30.00	0.701	5	99.283	A	7.278	18.574	18.574	71.85	14.120	0.000
					B	7.278	18.574		71.85	13.500	0.000
					C	7.278	18.574		71.85	57.660	0.000
T6 20.00-0.00	10.00	0.7	5	139.283	A	10.818	18.574	18.574	63.19	9.884	0.000
					B	10.818	18.574		63.19	9.856	0.000
					C	10.818	18.574		63.19	40.362	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.10	0.75	A	0.198	2.601	18	1	1	9.564	0.49	24.70	C
100.00-80.00			B	0.198	2.601		1	1	9.564			
			C	0.198	2.601		1	1	9.564			
T2	0.52	1.13	A	0.198	2.601	17	1	1	9.564	1.05	52.34	C
80.00-60.00			B	0.198	2.601		1	1	9.564			
			C	0.198	2.601		1	1	9.564			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T3	0.17	0.51	A	0.23	2.499	16	1	1	3.712	0.34	51.65	C
60.00-53.33			B	0.23	2.499		1	1	3.712			
			C	0.23	2.499		1	1	3.712			
T4	0.36	1.26	A	0.29	2.322	15	1	1	10.633	0.74	55.86	C
53.33-40.00			B	0.29	2.322		1	1	10.633			
			C	0.29	2.322		1	1	10.633			
T5	0.54	2.48	A	0.26	2.407	13	1	1	17.943	1.06	52.87	C
40.00-20.00			B	0.26	2.407		1	1	17.943			
			C	0.26	2.407		1	1	17.943			
T6 20.00-0.00	0.38	2.65	A	0.211	2.56	13	1	1	21.232	1.01	50.62	C
			B	0.211	2.56		1	1	21.232			
			C	0.211	2.56		1	1	21.232			
Sum Weight:	2.07	8.78						OTM	213.85 kip-ft	4.70		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.10	0.75	A	0.198	2.601	18	0.8	1	9.075	0.47	23.72	C
100.00-80.00			B	0.198	2.601		0.8	1	9.075			
			C	0.198	2.601		0.8	1	9.075			
T2	0.52	1.13	A	0.198	2.601	17	0.8	1	9.075	1.03	51.43	C
80.00-60.00			B	0.198	2.601		0.8	1	9.075			
			C	0.198	2.601		0.8	1	9.075			
T3	0.17	0.51	A	0.23	2.499	16	0.8	1	3.550	0.34	50.84	C
60.00-53.33			B	0.23	2.499		0.8	1	3.550			
			C	0.23	2.499		0.8	1	3.550			
T4	0.36	1.26	A	0.29	2.322	15	0.8	1	9.697	0.72	53.79	C
53.33-40.00			B	0.29	2.322		0.8	1	9.697			
			C	0.29	2.322		0.8	1	9.697			
T5	0.54	2.48	A	0.26	2.407	13	0.8	1	16.487	1.02	50.91	C
40.00-20.00			B	0.26	2.407		0.8	1	16.487			
			C	0.26	2.407		0.8	1	16.487			
T6 20.00-0.00	0.38	2.65	A	0.211	2.56	13	0.8	1	19.068	0.95	47.52	C
			B	0.211	2.56		0.8	1	19.068			
			C	0.211	2.56		0.8	1	19.068			
Sum Weight:	2.07	8.78						OTM	207.43 kip-ft	4.53		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.10	0.75	A	0.198	2.601	18	0.85	1	9.197	0.48	23.96	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
100.00-80.00			B	0.198	2.601		0.85	1	9.197			
			C	0.198	2.601		0.85	1	9.197			
T2	0.52	1.13	A	0.198	2.601	17	0.85	1	9.197	1.03	51.66	C
80.00-60.00			B	0.198	2.601		0.85	1	9.197			
			C	0.198	2.601		0.85	1	9.197			
T3	0.17	0.51	A	0.23	2.499	16	0.85	1	3.591	0.34	51.04	C
60.00-53.33			B	0.23	2.499		0.85	1	3.591			
			C	0.23	2.499		0.85	1	3.591			
T4	0.36	1.26	A	0.29	2.322	15	0.85	1	9.931	0.72	54.31	C
53.33-40.00			B	0.29	2.322		0.85	1	9.931			
			C	0.29	2.322		0.85	1	9.931			
T5	0.54	2.48	A	0.26	2.407	13	0.85	1	16.851	1.03	51.40	C
40.00-20.00			B	0.26	2.407		0.85	1	16.851			
			C	0.26	2.407		0.85	1	16.851			
T6 20.00-0.00	0.38	2.65	A	0.211	2.56	13	0.85	1	19.609	0.97	48.29	C
			B	0.211	2.56		0.85	1	19.609			
			C	0.211	2.56		0.85	1	19.609			
Sum Weight:	2.07	8.78						OTM	209.03 kip-ft	4.57		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.76	2.59	A	0.576	1.821	5	1	1	34.354	0.42	20.82	C
100.00-80.00			B	0.576	1.821		1	1	34.354			
			C	0.576	1.821		1	1	34.354			
T2	3.48	3.01	A	0.567	1.828	5	1	1	33.558	0.64	31.96	C
80.00-60.00			B	0.567	1.828		1	1	33.558			
			C	0.567	1.828		1	1	33.558			
T3	1.15	1.15	A	0.582	1.816	5	1	1	11.740	0.20	30.01	C
60.00-53.33			B	0.582	1.816		1	1	11.740			
			C	0.582	1.816		1	1	11.740			
T4	2.35	3.01	A	0.708	1.777	4	1	1	32.066	0.37	27.63	C
53.33-40.00			B	0.708	1.777		1	1	32.066			
			C	0.708	1.777		1	1	32.066			
T5	3.43	4.39	A	0.447	1.979	4	1	1	33.134	0.61	30.42	C
40.00-20.00			B	0.447	1.979		1	1	33.134			
			C	0.447	1.979		1	1	33.134			
T6 20.00-0.00	2.23	4.65	A	0.347	2.18	4	1	1	34.784	0.54	26.77	C
			B	0.347	2.18		1	1	34.784			
			C	0.347	2.18		1	1	34.784			
Sum Weight:	13.40	18.80						OTM	134.36 kip-ft	2.77		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.76	2.59	A	0.576	1.821	5	0.8	1	33.864	0.41	20.63	C
100.00-80.00			B	0.576	1.821		0.8	1	33.864			
			C	0.576	1.821		0.8	1	33.864			
T2	3.48	3.01	A	0.567	1.828	5	0.8	1	33.068	0.64	31.78	C
80.00-60.00			B	0.567	1.828		0.8	1	33.068			
			C	0.567	1.828		0.8	1	33.068			
T3	1.15	1.15	A	0.582	1.816	5	0.8	1	11.579	0.20	29.83	C
60.00-53.33			B	0.582	1.816		0.8	1	11.579			
			C	0.582	1.816		0.8	1	11.579			
T4	2.35	3.01	A	0.708	1.777	4	0.8	1	31.130	0.36	27.17	C
53.33-40.00			B	0.708	1.777		0.8	1	31.130			
			C	0.708	1.777		0.8	1	31.130			
T5	3.43	4.39	A	0.447	1.979	4	0.8	1	31.679	0.60	29.95	C
40.00-20.00			B	0.447	1.979		0.8	1	31.679			
			C	0.447	1.979		0.8	1	31.679			
T6 20.00-0.00	2.23	4.65	A	0.347	2.18	4	0.8	1	32.620	0.52	26.01	C
			B	0.347	2.18		0.8	1	32.620			
			C	0.347	2.18		0.8	1	32.620			
Sum Weight:	13.40	18.80						OTM	132.97 kip-ft	2.73		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.76	2.59	A	0.576	1.821	5	0.85	1	33.987	0.41	20.68	C
100.00-80.00			B	0.576	1.821		0.85	1	33.987			
			C	0.576	1.821		0.85	1	33.987			
T2	3.48	3.01	A	0.567	1.828	5	0.85	1	33.191	0.64	31.82	C
80.00-60.00			B	0.567	1.828		0.85	1	33.191			
			C	0.567	1.828		0.85	1	33.191			
T3	1.15	1.15	A	0.582	1.816	5	0.85	1	11.619	0.20	29.88	C
60.00-53.33			B	0.582	1.816		0.85	1	11.619			
			C	0.582	1.816		0.85	1	11.619			
T4	2.35	3.01	A	0.708	1.777	4	0.85	1	31.364	0.36	27.29	C
53.33-40.00			B	0.708	1.777		0.85	1	31.364			
			C	0.708	1.777		0.85	1	31.364			
T5	3.43	4.39	A	0.447	1.979	4	0.85	1	32.043	0.60	30.07	C
40.00-20.00			B	0.447	1.979		0.85	1	32.043			
			C	0.447	1.979		0.85	1	32.043			
T6 20.00-0.00	2.23	4.65	A	0.347	2.18	4	0.85	1	33.161	0.52	26.20	C
			B	0.347	2.18		0.85	1	33.161			
			C	0.347	2.18		0.85	1	33.161			
Sum Weight:	13.40	18.80						OTM	133.32 kip-ft	2.74		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.10	0.75	A	0.198	2.601	8	1	1	9.564	0.21	10.28	C
100.00-80.00			B	0.198	2.601		1	1	9.564			
			C	0.198	2.601		1	1	9.564			
T2	0.52	1.13	A	0.198	2.601	7	1	1	9.564	0.44	21.79	C
80.00-60.00			B	0.198	2.601		1	1	9.564			
			C	0.198	2.601		1	1	9.564			
T3	0.17	0.51	A	0.23	2.499	7	1	1	3.712	0.14	21.50	C
60.00-53.33			B	0.23	2.499		1	1	3.712			
			C	0.23	2.499		1	1	3.712			
T4	0.36	1.26	A	0.29	2.322	6	1	1	10.633	0.31	23.25	C
53.33-40.00			B	0.29	2.322		1	1	10.633			
			C	0.29	2.322		1	1	10.633			
T5	0.54	2.48	A	0.26	2.407	5	1	1	17.943	0.44	22.01	C
40.00-20.00			B	0.26	2.407		1	1	17.943			
			C	0.26	2.407		1	1	17.943			
T6 20.00-0.00	0.38	2.65	A	0.211	2.56	5	1	1	21.232	0.42	21.07	C
			B	0.211	2.56		1	1	21.232			
			C	0.211	2.56		1	1	21.232			
Sum Weight:	2.07	8.78						OTM	89.01 kip-ft	1.96		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.10	0.75	A	0.198	2.601	8	0.8	1	9.075	0.20	9.87	C
100.00-80.00			B	0.198	2.601		0.8	1	9.075			
			C	0.198	2.601		0.8	1	9.075			
T2	0.52	1.13	A	0.198	2.601	7	0.8	1	9.075	0.43	21.41	C
80.00-60.00			B	0.198	2.601		0.8	1	9.075			
			C	0.198	2.601		0.8	1	9.075			
T3	0.17	0.51	A	0.23	2.499	7	0.8	1	3.550	0.14	21.16	C
60.00-53.33			B	0.23	2.499		0.8	1	3.550			
			C	0.23	2.499		0.8	1	3.550			
T4	0.36	1.26	A	0.29	2.322	6	0.8	1	9.697	0.30	22.39	C
53.33-40.00			B	0.29	2.322		0.8	1	9.697			
			C	0.29	2.322		0.8	1	9.697			
T5	0.54	2.48	A	0.26	2.407	5	0.8	1	16.487	0.42	21.19	C
40.00-20.00			B	0.26	2.407		0.8	1	16.487			
			C	0.26	2.407		0.8	1	16.487			
T6 20.00-0.00	0.38	2.65	A	0.211	2.56	5	0.8	1	19.068	0.40	19.78	C
			B	0.211	2.56		0.8	1	19.068			
			C	0.211	2.56		0.8	1	19.068			
Sum Weight:	2.07	8.78						OTM	86.34 kip-ft	1.88		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.10	0.75	A	0.198	2.601	8	0.85	1	9.197	0.20	9.97	C
100.00-80.00			B	0.198	2.601		0.85	1	9.197			
			C	0.198	2.601		0.85	1	9.197			
T2	0.52	1.13	A	0.198	2.601	7	0.85	1	9.197	0.43	21.50	C
80.00-60.00			B	0.198	2.601		0.85	1	9.197			
			C	0.198	2.601		0.85	1	9.197			
T3	0.17	0.51	A	0.23	2.499	7	0.85	1	3.591	0.14	21.25	C
60.00-53.33			B	0.23	2.499		0.85	1	3.591			
			C	0.23	2.499		0.85	1	3.591			
T4	0.36	1.26	A	0.29	2.322	6	0.85	1	9.931	0.30	22.61	C
53.33-40.00			B	0.29	2.322		0.85	1	9.931			
			C	0.29	2.322		0.85	1	9.931			
T5	0.54	2.48	A	0.26	2.407	5	0.85	1	16.851	0.43	21.39	C
40.00-20.00			B	0.26	2.407		0.85	1	16.851			
			C	0.26	2.407		0.85	1	16.851			
T6 20.00-0.00	0.38	2.65	A	0.211	2.56	5	0.85	1	19.609	0.40	20.10	C
			B	0.211	2.56		0.85	1	19.609			
			C	0.211	2.56		0.85	1	19.609			
Sum Weight:	2.07	8.78						OTM	87.01 kip-ft	1.90		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	6.48					
Bracing Weight	2.30					
Total Member Self-Weight	8.78			2.31	-2.71	
Total Weight	19.96			2.31	-2.71	
Wind 0 deg - No Ice		0.00	-9.21	-607.57	-2.78	1.82
Wind 30 deg - No Ice		4.54	-7.87	-521.72	-305.35	2.20
Wind 60 deg - No Ice		7.83	-4.52	-299.48	-525.43	2.00
Wind 90 deg - No Ice		9.09	-0.00	2.24	-607.86	1.29
Wind 120 deg - No Ice		7.98	4.60	307.19	-530.92	0.22
Wind 150 deg - No Ice		4.54	7.86	526.28	-305.23	-0.91
Wind 180 deg - No Ice		-0.00	9.04	605.77	-2.64	-1.79
Wind 210 deg - No Ice		-4.54	7.87	526.34	299.92	-2.20
Wind 240 deg - No Ice		-7.98	4.61	307.31	525.56	-2.04
Wind 270 deg - No Ice		-9.09	0.00	2.38	602.43	-1.29
Wind 300 deg - No Ice		-7.83	-4.52	-299.36	519.93	-0.22
Wind 330 deg - No Ice		-4.54	-7.86	-521.66	299.80	0.91
Member Ice	10.02					
Total Weight Ice	57.07			11.44	-16.77	
Wind 0 deg - Ice		0.00	-4.94	-315.18	-16.81	0.73
Wind 30 deg - Ice		2.46	-4.26	-270.54	-179.62	0.86
Wind 60 deg - Ice		4.25	-2.45	-151.20	-298.49	0.76
Wind 90 deg - Ice		4.92	-0.00	11.41	-342.40	0.45
Wind 120 deg - Ice		4.28	2.47	174.73	-299.66	0.03
Wind 150 deg - Ice		2.46	4.26	293.39	-179.55	-0.40

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 180 deg - Ice		-0.00	4.91	336.68	-16.74	-0.73
Wind 210 deg - Ice		-2.46	4.26	293.42	146.07	-0.86
Wind 240 deg - Ice		-4.28	2.47	174.79	266.15	-0.76
Wind 270 deg - Ice		-4.92	0.00	11.48	308.85	-0.45
Wind 300 deg - Ice		-4.25	-2.45	-151.14	264.90	-0.03
Wind 330 deg - Ice		-2.46	-4.26	-270.50	146.01	0.40
Total Weight	19.96			2.31	-2.71	
Wind 0 deg - Service		0.00	-3.83	-252.94	-0.81	0.76
Wind 30 deg - Service		1.89	-3.27	-217.21	-126.74	0.91
Wind 60 deg - Service		3.26	-1.88	-124.70	-218.35	0.83
Wind 90 deg - Service		3.78	-0.00	0.88	-252.66	0.53
Wind 120 deg - Service		3.32	1.92	127.81	-220.63	0.09
Wind 150 deg - Service		1.89	3.27	219.00	-126.69	-0.38
Wind 180 deg - Service		-0.00	3.76	252.09	-0.75	-0.74
Wind 210 deg - Service		-1.89	3.27	219.03	125.19	-0.91
Wind 240 deg - Service		-3.32	1.92	127.86	219.11	-0.85
Wind 270 deg - Service		-3.78	0.00	0.94	251.10	-0.53
Wind 300 deg - Service		-3.26	-1.88	-124.65	216.76	-0.09
Wind 330 deg - Service		-1.89	-3.27	-217.18	125.14	0.38

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	1.2D+1.6W (pattern 1) 0 deg - No Ice
4	1.2D+1.6W (pattern 2) 0 deg - No Ice
5	0.9 Dead+1.6 Wind 0 deg - No Ice
6	1.2 Dead+1.6 Wind 30 deg - No Ice
7	1.2D+1.6W (pattern 1) 30 deg - No Ice
8	1.2D+1.6W (pattern 2) 30 deg - No Ice
9	0.9 Dead+1.6 Wind 30 deg - No Ice
10	1.2 Dead+1.6 Wind 60 deg - No Ice
11	1.2D+1.6W (pattern 1) 60 deg - No Ice
12	1.2D+1.6W (pattern 2) 60 deg - No Ice
13	0.9 Dead+1.6 Wind 60 deg - No Ice
14	1.2 Dead+1.6 Wind 90 deg - No Ice
15	1.2D+1.6W (pattern 1) 90 deg - No Ice
16	1.2D+1.6W (pattern 2) 90 deg - No Ice
17	0.9 Dead+1.6 Wind 90 deg - No Ice
18	1.2 Dead+1.6 Wind 120 deg - No Ice
19	1.2D+1.6W (pattern 1) 120 deg - No Ice
20	1.2D+1.6W (pattern 2) 120 deg - No Ice
21	0.9 Dead+1.6 Wind 120 deg - No Ice
22	1.2 Dead+1.6 Wind 150 deg - No Ice
23	1.2D+1.6W (pattern 1) 150 deg - No Ice
24	1.2D+1.6W (pattern 2) 150 deg - No Ice
25	0.9 Dead+1.6 Wind 150 deg - No Ice
26	1.2 Dead+1.6 Wind 180 deg - No Ice
27	1.2D+1.6W (pattern 1) 180 deg - No Ice
28	1.2D+1.6W (pattern 2) 180 deg - No Ice
29	0.9 Dead+1.6 Wind 180 deg - No Ice
30	1.2 Dead+1.6 Wind 210 deg - No Ice
31	1.2D+1.6W (pattern 1) 210 deg - No Ice
32	1.2D+1.6W (pattern 2) 210 deg - No Ice

Comb. No.	Description
33	0.9 Dead+1.6 Wind 210 deg - No Ice
34	1.2 Dead+1.6 Wind 240 deg - No Ice
35	1.2D+1.6W (pattern 1) 240 deg - No Ice
36	1.2D+1.6W (pattern 2) 240 deg - No Ice
37	0.9 Dead+1.6 Wind 240 deg - No Ice
38	1.2 Dead+1.6 Wind 270 deg - No Ice
39	1.2D+1.6W (pattern 1) 270 deg - No Ice
40	1.2D+1.6W (pattern 2) 270 deg - No Ice
41	0.9 Dead+1.6 Wind 270 deg - No Ice
42	1.2 Dead+1.6 Wind 300 deg - No Ice
43	1.2D+1.6W (pattern 1) 300 deg - No Ice
44	1.2D+1.6W (pattern 2) 300 deg - No Ice
45	0.9 Dead+1.6 Wind 300 deg - No Ice
46	1.2 Dead+1.6 Wind 330 deg - No Ice
47	1.2D+1.6W (pattern 1) 330 deg - No Ice
48	1.2D+1.6W (pattern 2) 330 deg - No Ice
49	0.9 Dead+1.6 Wind 330 deg - No Ice
50	1.2 Dead+1.0 Ice+1.0 Temp
51	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
52	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
53	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
54	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
55	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
56	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
57	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
58	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
59	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
60	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
61	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
62	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
63	Dead+Wind 0 deg - Service
64	Dead+Wind 30 deg - Service
65	Dead+Wind 60 deg - Service
66	Dead+Wind 90 deg - Service
67	Dead+Wind 120 deg - Service
68	Dead+Wind 150 deg - Service
69	Dead+Wind 180 deg - Service
70	Dead+Wind 210 deg - Service
71	Dead+Wind 240 deg - Service
72	Dead+Wind 270 deg - Service
73	Dead+Wind 300 deg - Service
74	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	100 - 80	Leg	Max Tension	13	15.30	-0.11	0.06
			Max. Compression	18	-30.86	-0.15	-0.09
			Max. Mx	14	-6.82	0.43	-0.00
			Max. My	2	-6.94	0.01	-0.43
			Max. Vy	14	0.73	-0.23	-0.02
			Max. Vx	2	-0.73	0.00	0.24
		Diagonal	Max Tension	22	7.08	0.00	0.00
		Horizontal	Max Tension	18	0.53	0.00	0.00
			Max. Compression	26	-5.94	0.00	0.00
			Max. Mx	50	0.25	-0.02	0.00
			Max. My	30	0.48	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	50	0.02	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
		Top Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-3.02	0.00	0.00
			Max. Mx	50	-2.93	-0.02	0.00
			Max. My	30	-2.94	0.00	0.00
			Max. Vy	50	0.02	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
T2	80 - 60	Leg	Max Tension	29	67.76	-0.04	-0.22
			Max. Compression	18	-88.39	-0.37	-0.21
			Max. Mx	17	-74.91	-0.44	0.01
			Max. My	5	-85.21	0.03	0.46
			Max. Vy	13	-0.19	-0.24	0.17
			Max. Vx	6	0.26	-0.16	0.27
		Diagonal	Max Tension	14	9.47	0.00	0.00
		Horizontal	Max Tension	18	1.53	0.00	0.00
			Max. Compression	20	-8.48	0.00	0.00
			Max. Mx	50	0.28	0.02	0.00
			Max. My	30	1.31	0.00	-0.00
			Max. Vy	50	-0.02	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Top Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	20	-6.68	0.00	0.00
			Max. Mx	50	-5.58	0.02	0.00
			Max. My	30	-5.94	0.00	-0.00
			Max. Vy	50	-0.02	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
T3	60 - 53.33	Leg	Max Tension	29	87.68	-0.00	-0.48
			Max. Compression	18	-111.80	-0.56	-0.32
			Max. Mx	14	-98.37	-0.67	-0.04
			Max. My	26	-62.60	-0.15	-0.67
			Max. Vy	6	-0.13	-0.29	0.39
			Max. Vx	26	-0.14	-0.00	-0.50
		Diagonal	Max Tension	10	11.47	0.00	0.00
		Horizontal	Max Tension	18	1.94	0.00	0.00
			Max. Compression	18	-11.60	0.00	0.00
			Max. Mx	50	0.32	0.02	0.00
			Max. My	33	1.62	0.00	-0.00
			Max. Vy	50	0.02	0.00	0.00
			Max. Vx	33	0.00	0.00	0.00
		Top Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-9.88	0.00	0.00
			Max. Mx	50	-6.80	0.02	0.00
			Max. My	33	-6.03	0.00	-0.00
			Max. Vy	50	0.02	0.00	0.00
			Max. Vx	33	0.00	0.00	0.00
T4	53.33 - 40	Leg	Max Tension	29	132.80	-0.00	0.49
			Max. Compression	18	-159.83	-2.09	-1.20
			Max. Mx	37	-155.56	2.30	-1.14
			Max. My	5	-155.50	0.16	2.56
			Max. Vy	46	1.29	1.33	0.85
			Max. Vx	26	-1.44	0.01	-1.70
		Diagonal	Max Tension	10	12.73	0.00	0.00
		Horizontal	Max Tension	18	2.77	0.00	0.00
			Max. Compression	18	-11.91	0.00	0.00
			Max. Mx	50	0.35	0.02	0.00
			Max. My	30	2.40	0.00	-0.00
			Max. Vy	50	-0.02	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	18	2.77	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	18	-2.77	0.00	0.00
			Max. Mx	50	0.35	-0.02	0.00
			Max. My	33	2.33	0.00	0.00
			Max. Vy	50	0.03	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
		Top Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-11.18	0.00	0.00
			Max. Mx	50	-7.55	0.02	0.00
			Max. My	33	-6.06	0.00	-0.00
			Max. Vy	50	-0.02	0.00	0.00
			Max. Vx	33	0.00	0.00	0.00
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	18	-6.24	0.00	0.00
			Max. Mx	50	-3.87	0.02	0.00
			Max. My	30	-4.26	0.00	-0.00
			Max. Vy	50	-0.02	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
T5	40 - 20	Leg	Max Tension	29	145.17	-1.17	0.02
			Max. Compression	18	-157.96	1.73	-0.01
			Max. Mx	21	-151.81	2.58	-0.01
			Max. My	30	-6.44	-0.27	2.97
			Max. Vy	37	0.30	2.56	0.17
			Max. Vx	6	-0.40	-0.27	-2.97
		Diagonal	Max Tension	37	3.61	0.00	0.00
			Max. Compression	10	-4.21	0.00	0.00
			Max. Mx	26	-0.57	0.07	-0.01
			Max. My	10	1.08	-0.03	-0.02
			Max. Vy	55	-0.02	0.05	-0.01
			Max. Vx	10	0.01	0.00	0.00
T6	20 - 0	Leg	Max Tension	29	144.53	-1.17	0.00
			Max. Compression	18	-160.14	0.00	0.00
			Max. Mx	18	-157.69	1.29	-0.00
			Max. My	30	-8.40	-0.09	1.98
			Max. Vy	42	-0.18	-0.97	0.00
			Max. Vx	30	0.33	-0.09	1.98
		Diagonal	Max Tension	9	1.86	0.00	0.00
			Max. Compression	6	-2.08	0.00	0.00
			Max. Mx	18	-0.14	0.10	-0.00
			Max. My	30	0.22	0.06	0.02
			Max. Vy	55	-0.03	0.06	-0.00
			Max. Vx	30	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	34	161.30	9.75	-5.33
	Max. H_x	34	161.30	9.75	-5.33
	Max. H_z	13	-145.28	-8.71	4.74
	Min. Vert	13	-145.28	-8.71	4.74
	Min. H_x	13	-145.28	-8.71	4.74
	Min. H_z	34	161.30	9.75	-5.33
Leg B	Max. Vert	18	162.16	-9.65	-5.53
	Max. H_x	45	-144.58	8.58	4.93
	Max. H_z	45	-144.58	8.58	4.93
	Min. Vert	45	-144.58	8.58	4.93

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg A	Min. H_x	18	162.16	-9.65	-5.53
	Min. H_z	18	162.16	-9.65	-5.53
	Max. Vert	2	161.06	0.23	11.10
	Max. H_x	16	7.56	0.90	0.52
	Max. H_z	2	161.06	0.23	11.10
	Min. Vert	29	-145.41	-0.22	-9.91
	Min. H_x	34	-69.23	-0.88	-4.74
	Min. H_z	29	-145.41	-0.22	-9.91

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	19.96	0.00	0.00	2.36	-2.79	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	23.96	0.00	-14.74	-994.25	-3.50	2.97
1.2D+1.6W (pattern 1) 0 deg - No Ice	23.96	0.00	-11.52	-696.32	-3.49	2.92
1.2D+1.6W (pattern 2) 0 deg - No Ice	23.96	0.00	-13.07	-925.60	-3.44	2.25
0.9 Dead+1.6 Wind 0 deg - No Ice	17.97	0.00	-14.74	-989.60	-2.64	2.95
1.2 Dead+1.6 Wind 30 deg - No Ice	23.96	7.27	-12.59	-853.92	-498.21	3.61
1.2D+1.6W (pattern 1) 30 deg - No Ice	23.96	5.67	-9.81	-596.77	-349.72	3.54
1.2D+1.6W (pattern 2) 30 deg - No Ice	23.96	6.48	-11.22	-796.67	-465.09	2.76
0.9 Dead+1.6 Wind 30 deg - No Ice	17.97	7.27	-12.59	-849.99	-494.60	3.56
1.2 Dead+1.6 Wind 60 deg - No Ice	23.96	12.53	-7.23	-490.58	-858.03	3.27
1.2D+1.6W (pattern 1) 60 deg - No Ice	23.96	9.76	-5.63	-342.27	-601.14	3.22
1.2D+1.6W (pattern 2) 60 deg - No Ice	23.96	11.18	-6.46	-457.93	-801.47	2.51
0.9 Dead+1.6 Wind 60 deg - No Ice	17.97	12.53	-7.23	-488.57	-852.44	3.26
1.2 Dead+1.6 Wind 90 deg - No Ice	23.96	14.54	-0.00	2.72	-992.75	2.08
1.2D+1.6W (pattern 1) 90 deg - No Ice	23.96	11.33	-0.00	2.73	-695.81	2.06
1.2D+1.6W (pattern 2) 90 deg - No Ice	23.96	12.95	-0.00	2.77	-926.61	1.62
0.9 Dead+1.6 Wind 90 deg - No Ice	17.97	14.54	-0.00	2.03	-986.48	2.10
1.2 Dead+1.6 Wind 120 deg - No Ice	23.96	12.77	7.37	501.28	-866.90	0.36
1.2D+1.6W (pattern 1) 120 deg - No Ice	23.96	9.98	5.76	352.33	-608.90	0.36
1.2D+1.6W (pattern 2) 120 deg - No Ice	23.96	11.32	6.54	467.01	-807.44	0.31
0.9 Dead+1.6 Wind 120 deg - No Ice	17.97	12.77	7.37	497.88	-861.40	0.36
1.2 Dead+1.6 Wind 150 deg - No Ice	23.96	7.26	12.58	859.52	-497.95	-1.47

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2D+1.6W (pattern 1) 150 deg - No Ice	23.96	5.66	9.81	602.36	-349.48	-1.45
1.2D+1.6W (pattern 2) 150 deg - No Ice	23.96	6.47	11.21	802.32	-464.92	-1.09
0.9 Dead+1.6 Wind 150 deg - No Ice	17.97	7.26	12.58	854.09	-494.42	-1.49
1.2 Dead+1.6 Wind 180 deg - No Ice	23.96	-0.00	14.46	989.52	-3.27	-2.92
1.2D+1.6W (pattern 1) 180 deg - No Ice	23.96	-0.00	11.26	692.90	-3.26	-2.87
1.2D+1.6W (pattern 2) 180 deg - No Ice	23.96	-0.00	12.91	924.30	-3.31	-2.21
0.9 Dead+1.6 Wind 180 deg - No Ice	17.97	-0.00	14.46	983.34	-2.41	-2.91
1.2 Dead+1.6 Wind 210 deg - No Ice	23.96	-7.27	12.59	859.66	491.40	-3.61
1.2D+1.6W (pattern 1) 210 deg - No Ice	23.96	-5.67	9.81	602.49	342.94	-3.54
1.2D+1.6W (pattern 2) 210 deg - No Ice	23.96	-6.48	11.22	802.40	458.29	-2.76
0.9 Dead+1.6 Wind 210 deg - No Ice	17.97	-7.27	12.59	854.23	489.59	-3.56
1.2 Dead+1.6 Wind 240 deg - No Ice	23.96	-12.77	7.37	501.51	860.31	-3.33
1.2D+1.6W (pattern 1) 240 deg - No Ice	23.96	-9.98	5.76	352.55	602.30	-3.27
1.2D+1.6W (pattern 2) 240 deg - No Ice	23.96	-11.33	6.54	467.14	800.79	-2.57
0.9 Dead+1.6 Wind 240 deg - No Ice	17.97	-12.77	7.37	498.10	856.51	-3.31
1.2 Dead+1.6 Wind 270 deg - No Ice	23.96	-14.54	0.00	2.95	986.04	-2.08
1.2D+1.6W (pattern 1) 270 deg - No Ice	23.96	-11.33	0.00	2.96	689.10	-2.06
1.2D+1.6W (pattern 2) 270 deg - No Ice	23.96	-12.95	0.00	2.90	919.90	-1.62
0.9 Dead+1.6 Wind 270 deg - No Ice	17.97	-14.54	0.00	2.27	981.49	-2.10
1.2 Dead+1.6 Wind 300 deg - No Ice	23.96	-12.53	-7.23	-490.40	851.19	-0.35
1.2D+1.6W (pattern 1) 300 deg - No Ice	23.96	-9.75	-5.63	-342.09	594.30	-0.35
1.2D+1.6W (pattern 2) 300 deg - No Ice	23.96	-11.18	-6.45	-457.83	794.68	-0.30
0.9 Dead+1.6 Wind 300 deg - No Ice	17.97	-12.53	-7.23	-488.39	847.32	-0.35
1.2 Dead+1.6 Wind 330 deg - No Ice	23.96	-7.26	-12.58	-853.83	491.25	1.47
1.2D+1.6W (pattern 1) 330 deg - No Ice	23.96	-5.66	-9.81	-596.67	342.77	1.46
1.2D+1.6W (pattern 2) 330 deg - No Ice	23.96	-6.47	-11.21	-796.63	458.23	1.09
0.9 Dead+1.6 Wind 330 deg - No Ice	17.97	-7.26	-12.58	-849.89	489.37	1.49
1.2 Dead+1.0 Ice+1.0 Temp	61.07	-0.00	-0.00	12.74	-18.67	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	61.07	0.00	-4.94	-333.37	-18.73	0.85
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	61.07	2.46	-4.26	-286.09	-191.27	1.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	61.07	4.25	-2.45	-159.67	-317.25	0.88

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	61.07	4.92	-0.00	12.71	-363.75	0.53
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	61.07	4.28	2.47	185.76	-318.42	0.04
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	61.07	2.46	4.26	311.55	-191.17	-0.47
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	61.07	-0.00	4.91	357.48	-18.60	-0.84
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	61.07	-2.46	4.26	311.62	153.90	-1.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	61.07	-4.28	2.47	185.86	281.12	-0.88
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	61.07	-4.92	0.00	12.80	326.42	-0.53
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	61.07	-4.25	-2.45	-159.58	279.88	-0.04
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	61.07	-2.46	-4.26	-286.05	153.83	0.47
Dead+Wind 0 deg - Service	19.96	0.00	-3.83	-256.11	-2.82	0.77
Dead+Wind 30 deg - Service	19.96	1.89	-3.27	-219.74	-131.05	0.93
Dead+Wind 60 deg - Service	19.96	3.26	-1.88	-125.55	-224.33	0.85
Dead+Wind 90 deg - Service	19.96	3.78	-0.00	2.33	-259.26	0.54
Dead+Wind 120 deg - Service	19.96	3.32	1.92	131.56	-226.64	0.08
Dead+Wind 150 deg - Service	19.96	1.89	3.27	224.43	-130.99	-0.39
Dead+Wind 180 deg - Service	19.96	-0.00	3.76	258.13	-2.75	-0.76
Dead+Wind 210 deg - Service	19.96	-1.89	3.27	224.46	125.48	-0.93
Dead+Wind 240 deg - Service	19.96	-3.32	1.92	131.63	221.10	-0.86
Dead+Wind 270 deg - Service	19.96	-3.78	0.00	2.39	253.69	-0.54
Dead+Wind 300 deg - Service	19.96	-3.26	-1.88	-125.50	218.73	-0.08
Dead+Wind 330 deg - Service	19.96	-1.89	-3.27	-219.71	125.43	0.39

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-19.96	0.00	0.00	19.96	0.00	0.000%
2	0.00	-23.96	-14.74	-0.00	23.96	14.74	0.000%
3	0.00	-23.96	-11.52	-0.00	23.96	11.52	0.000%
4	0.00	-23.96	-13.07	-0.00	23.96	13.07	0.000%
5	0.00	-17.97	-14.74	-0.00	17.97	14.74	0.000%
6	7.27	-23.96	-12.59	-7.27	23.96	12.59	0.000%
7	5.67	-23.96	-9.81	-5.67	23.96	9.81	0.000%
8	6.48	-23.96	-11.22	-6.48	23.96	11.22	0.000%
9	7.27	-17.97	-12.59	-7.27	17.97	12.59	0.000%
10	12.53	-23.96	-7.23	-12.53	23.96	7.23	0.000%
11	9.76	-23.96	-5.63	-9.76	23.96	5.63	0.000%
12	11.18	-23.96	-6.46	-11.18	23.96	6.46	0.000%
13	12.53	-17.97	-7.23	-12.53	17.97	7.23	0.000%
14	14.54	-23.96	-0.00	-14.54	23.96	0.00	0.000%
15	11.33	-23.96	-0.00	-11.33	23.96	0.00	0.000%
16	12.95	-23.96	-0.00	-12.95	23.96	0.00	0.000%
17	14.54	-17.97	-0.00	-14.54	17.97	0.00	0.000%
18	12.77	-23.96	7.37	-12.77	23.96	-7.37	0.000%
19	9.98	-23.96	5.76	-9.98	23.96	-5.76	0.000%
20	11.32	-23.96	6.54	-11.32	23.96	-6.54	0.000%
21	12.77	-17.97	7.37	-12.77	17.97	-7.37	0.000%
22	7.26	-23.96	12.58	-7.26	23.96	-12.58	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
23	5.66	-23.96	9.81	-5.66	23.96	-9.81	0.000%
24	6.47	-23.96	11.21	-6.47	23.96	-11.21	0.000%
25	7.26	-17.97	12.58	-7.26	17.97	-12.58	0.000%
26	-0.00	-23.96	14.46	0.00	23.96	-14.46	0.000%
27	-0.00	-23.96	11.26	0.00	23.96	-11.26	0.000%
28	-0.00	-23.96	12.91	0.00	23.96	-12.91	0.000%
29	-0.00	-17.97	14.46	0.00	17.97	-14.46	0.000%
30	-7.27	-23.96	12.59	7.27	23.96	-12.59	0.000%
31	-5.67	-23.96	9.81	5.67	23.96	-9.81	0.000%
32	-6.48	-23.96	11.22	6.48	23.96	-11.22	0.000%
33	-7.27	-17.97	12.59	7.27	17.97	-12.59	0.000%
34	-12.77	-23.96	7.37	12.77	23.96	-7.37	0.000%
35	-9.98	-23.96	5.76	9.98	23.96	-5.76	0.000%
36	-11.33	-23.96	6.54	11.33	23.96	-6.54	0.000%
37	-12.77	-17.97	7.37	12.77	17.97	-7.37	0.000%
38	-14.54	-23.96	0.00	14.54	23.96	-0.00	0.000%
39	-11.33	-23.96	0.00	11.33	23.96	-0.00	0.000%
40	-12.95	-23.96	0.00	12.95	23.96	-0.00	0.000%
41	-14.54	-17.97	0.00	14.54	17.97	-0.00	0.000%
42	-12.53	-23.96	-7.23	12.53	23.96	7.23	0.000%
43	-9.75	-23.96	-5.63	9.75	23.96	5.63	0.000%
44	-11.18	-23.96	-6.45	11.18	23.96	6.45	0.000%
45	-12.53	-17.97	-7.23	12.53	17.97	7.23	0.000%
46	-7.26	-23.96	-12.58	7.26	23.96	12.58	0.000%
47	-5.66	-23.96	-9.81	5.66	23.96	9.81	0.000%
48	-6.47	-23.96	-11.21	6.47	23.96	11.21	0.000%
49	-7.26	-17.97	-12.58	7.26	17.97	12.58	0.000%
50	0.00	-61.07	0.00	0.00	61.07	0.00	0.000%
51	0.00	-61.07	-4.94	-0.00	61.07	4.94	0.000%
52	2.46	-61.07	-4.26	-2.46	61.07	4.26	0.000%
53	4.25	-61.07	-2.45	-4.25	61.07	2.45	0.000%
54	4.92	-61.07	-0.00	-4.92	61.07	0.00	0.000%
55	4.28	-61.07	2.47	-4.28	61.07	-2.47	0.000%
56	2.46	-61.07	4.26	-2.46	61.07	-4.26	0.000%
57	-0.00	-61.07	4.91	0.00	61.07	-4.91	0.000%
58	-2.46	-61.07	4.26	2.46	61.07	-4.26	0.000%
59	-4.28	-61.07	2.47	4.28	61.07	-2.47	0.000%
60	-4.92	-61.07	0.00	4.92	61.07	-0.00	0.000%
61	-4.25	-61.07	-2.45	4.25	61.07	2.45	0.000%
62	-2.46	-61.07	-4.26	2.46	61.07	4.26	0.000%
63	0.00	-19.96	-3.83	-0.00	19.96	3.83	0.000%
64	1.89	-19.96	-3.27	-1.89	19.96	3.27	0.000%
65	3.26	-19.96	-1.88	-3.26	19.96	1.88	0.000%
66	3.78	-19.96	-0.00	-3.78	19.96	0.00	0.000%
67	3.32	-19.96	1.92	-3.32	19.96	-1.92	0.000%
68	1.89	-19.96	3.27	-1.89	19.96	-3.27	0.000%
69	-0.00	-19.96	3.76	0.00	19.96	-3.76	0.000%
70	-1.89	-19.96	3.27	1.89	19.96	-3.27	0.000%
71	-3.32	-19.96	1.92	3.32	19.96	-1.92	0.007%
72	-3.78	-19.96	0.00	3.78	19.96	-0.00	0.000%
73	-3.26	-19.96	-1.88	3.26	19.96	1.88	0.000%
74	-1.89	-19.96	-3.27	1.89	19.96	3.27	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00037920
3	Yes	4	0.00000001	0.00003956
4	Yes	4	0.00000001	0.00014304
5	Yes	4	0.00000001	0.00048806
6	Yes	4	0.00000001	0.00009023
7	Yes	4	0.00000001	0.00004223
8	Yes	4	0.00000001	0.00004035
9	Yes	4	0.00000001	0.00034577
10	Yes	4	0.00000001	0.00004191
11	Yes	4	0.00000001	0.00004392
12	Yes	4	0.00000001	0.00004202
13	Yes	4	0.00000001	0.00003201
14	Yes	4	0.00000001	0.00007923
15	Yes	4	0.00000001	0.00004162
16	Yes	4	0.00000001	0.00006940
17	Yes	4	0.00000001	0.00062050
18	Yes	4	0.00000001	0.00012955
19	Yes	4	0.00000001	0.00003936
20	Yes	4	0.00000001	0.00005959
21	Yes	4	0.00000001	0.00028004
22	Yes	4	0.00000001	0.00007790
23	Yes	4	0.00000001	0.00004166
24	Yes	4	0.00000001	0.00005673
25	Yes	4	0.00000001	0.00058002
26	Yes	4	0.00000001	0.00004179
27	Yes	4	0.00000001	0.00004387
28	Yes	4	0.00000001	0.00004192
29	Yes	4	0.00000001	0.00003105
30	Yes	4	0.00000001	0.00009051
31	Yes	4	0.00000001	0.00004222
32	Yes	4	0.00000001	0.00004031
33	Yes	4	0.00000001	0.00034581
34	Yes	4	0.00000001	0.00039208
35	Yes	4	0.00000001	0.00003961
36	Yes	4	0.00000001	0.00013395
37	Yes	4	0.00000001	0.00049725
38	Yes	4	0.00000001	0.00007985
39	Yes	4	0.00000001	0.00004167
40	Yes	4	0.00000001	0.00007012
41	Yes	4	0.00000001	0.00064148
42	Yes	4	0.00000001	0.00004180
43	Yes	4	0.00000001	0.00004380
44	Yes	4	0.00000001	0.00004196
45	Yes	4	0.00000001	0.00001653
46	Yes	4	0.00000001	0.00007852
47	Yes	4	0.00000001	0.00004172
48	Yes	4	0.00000001	0.00005720
49	Yes	4	0.00000001	0.00060075
50	Yes	4	0.00000001	0.00008261
51	Yes	4	0.00000001	0.00056600
52	Yes	4	0.00000001	0.00058194
53	Yes	4	0.00000001	0.00059331
54	Yes	4	0.00000001	0.00058964
55	Yes	4	0.00000001	0.00058510
56	Yes	4	0.00000001	0.00058997
57	Yes	4	0.00000001	0.00059361
58	Yes	4	0.00000001	0.00058242
59	Yes	4	0.00000001	0.00056667
60	Yes	4	0.00000001	0.00056330
61	Yes	4	0.00000001	0.00056633
62	Yes	4	0.00000001	0.00056301

63	Yes	4	0.00000001	0.00002263
64	Yes	4	0.00000001	0.00002326
65	Yes	4	0.00000001	0.00002376
66	Yes	4	0.00000001	0.00002322
67	Yes	4	0.00000001	0.00003880
68	Yes	4	0.00000001	0.00002323
69	Yes	4	0.00000001	0.00002376
70	Yes	4	0.00000001	0.00002327
71	Yes	4	0.00000001	0.00002583
72	Yes	4	0.00000001	0.00002309
73	Yes	4	0.00000001	0.00003219
74	Yes	4	0.00000001	0.00002308

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	100 - 80	5.915	67	0.4985	0.0637
T2	80 - 60	3.826	67	0.4777	0.0628
T3	60 - 53.33	1.956	67	0.3694	0.0512
T4	53.33 - 40	1.457	67	0.3219	0.0423
T5	40 - 20	0.696	67	0.1923	0.0234
T6	20 - 0	0.152	67	0.0779	0.0054

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
98.00	(2) OPA-65R-LCUU-H4	67	5.704	0.4986	0.0637	123186
97.00	12' Boom Starmount	67	5.598	0.4986	0.0638	123186
96.00	Parabolic Grid	67	5.492	0.4985	0.0638	123186
89.00	APXVSPP18-C-A20	67	4.756	0.4954	0.0638	55994
88.00	(2) FD-RRH 4x45 1900	67	4.652	0.4944	0.0637	51328
83.00	AIR21 B2A/B4P	67	4.133	0.4860	0.0633	35969
82.00	10-ft T-Frame	67	4.030	0.4835	0.0632	33441
81.50	LNX-6515DS	67	3.979	0.4822	0.0631	32140
80.00	ATMAA1412D-1A20 Twin TMA	67	3.826	0.4777	0.0628	28078
65.00	6810 4 Bay	67	2.379	0.4017	0.0561	8539
30.00	2.5" Tube x 2' Standoff	67	0.349	0.1230	0.0125	7957

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	100 - 80	22.581	18	1.9030	0.3352
T2	80 - 60	14.618	21	1.8227	0.3333
T3	60 - 53.33	7.475	21	1.4074	0.2800
T4	53.33 - 40	5.569	21	1.2269	0.2312

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T5	40 - 20	2.657	18	0.7330	0.0907
T6	20 - 0	0.582	18	0.2971	0.0209

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) OPA-65R-LCUU-H4	18	21.774	1.9033	0.3359	31696
97.00	12' Boom Starmount	18	21.371	1.9033	0.3362	31696
96.00	Parabolic Grid	18	20.968	1.9031	0.3365	31696
89.00	APXVSPP18-C-A20	18	18.158	1.8911	0.3374	14407
88.00	(2) FD-RRH 4x45 1900	18	17.760	1.8871	0.3374	13206
83.00	AIR21 B2A/B4P	21	15.786	1.8546	0.3356	9255
82.00	10-ft T-Frame	21	15.396	1.8451	0.3350	8605
81.50	LNX-6515DS	21	15.201	1.8400	0.3346	8271
80.00	ATMAA1412D-1A20 Twin TMA	21	14.618	1.8227	0.3333	7230
65.00	6810 4 Bay	21	9.092	1.5303	0.2973	2208
30.00	2.5" Tube x 2' Standoff	18	1.331	0.4689	0.0474	2040

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	100	Leg	A325N	0.7500	4	3.83	29.82	0.128 ✓	1	Bolt Tension
T2	80	Leg	A325N	0.7500	4	16.94	29.82	0.568 ✓	1	Bolt Tension
T4	53.33	Leg	A325N	1.0000	4	33.19	53.01	0.626 ✓	1	Bolt Tension
		Secondary Horizontal	A325N	0.7500	1	2.77	15.77	0.176 ✓	1	Member Bearing
T5	40	Leg	A325N	1.0000	6	23.92	53.01	0.451 ✓	1	Bolt Tension
		Diagonal	A325N	0.6250	1	3.61	7.83	0.461 ✓	1	Member Bearing
T6	20	Leg	A36	1.5000	4	36.06	57.65	0.625 ✓	1	Bolt Tension
		Diagonal	A325N	0.6250	1	1.86	7.83	0.237 ✓	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	P2.5x.276	20.00	3.33	43.3 K=1.00	2.2535	-30.86	88.43	0.349 [1] ✔
T2	80 - 60	P2.5x.276 (GR)	20.00	3.33	43.3 K=1.00	2.2535	-88.39	96.20	0.919 [1] ✔
T3	60 - 53.33	P3x.3 (GR)	6.67	3.34	35.2 K=1.00	3.0159	-111.81	148.57	0.753 [1] ✔
T4	53.33 - 40	P3x.3 (GR)	13.33	1.67	17.6 K=1.00	3.0159	-159.83	160.63	0.995 [1] ✔
T5	40 - 20	P5x.258 (GR)	20.03	6.68	42.7 K=1.00	4.2999	-157.96	198.12	0.797 [1] ✔
T6	20 - 0	P5x.258 (GR)	20.03	6.68	42.7 K=1.00	4.2999	-160.14	198.12	0.808 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	40 - 20	L2x2x3/16	7.69	3.68	114.1 K=1.02	0.7150	-4.21	11.67	0.361 [1] ✔
T6	20 - 0	L2 1/2x2 1/2x3/16	9.79	4.69	115.2 K=1.01	0.9020	-2.08	14.53	0.143 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-5.94	7.19	0.826 [1] ✔
T2	80 - 60	2L1 1/2x1 1/2x3/16	3.50	3.26	85.7 K=1.00	1.0547	-8.48	23.22	0.365 [1] ✔
T3	60 - 53.33	2L1 1/2x1 1/2x3/16	3.50	3.21	84.3 K=1.00	1.0547	-11.60	23.51	0.493 [1] ✔
T4	53.33 - 40	2L1 1/2x1 1/2x3/16	3.50	3.21	84.3 K=1.00	1.0547	-11.91	23.51	0.507 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	53.33 - 40	L2 1/2x2 1/2x5/16	3.50	2.94	96.0 K=1.33	1.4600	-2.77	29.11	0.095 [1] ✔

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.02	7.19	0.421 [1] ✔
T2	80 - 60	2L1 1/2x1 1/2x3/16	3.50	3.26	85.7 K=1.00	1.0547	-6.68	23.22	0.288 [1] ✔
T3	60 - 53.33	2L1 1/2x1 1/2x3/16	3.50	3.26	85.7 K=1.00	1.0547	-9.88	23.22	0.425 [1] ✔
T4	53.33 - 40	2L1 1/2x1 1/2x3/16	3.50	3.21	84.3 K=1.00	1.0547	-11.18	23.51	0.476 [1] ✔

[1] $P_u / \phi P_n$ controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	53.33 - 40	2L1 1/2x1 1/2x3/16	3.50	3.21	84.3 K=1.00	1.0547	-6.24	23.51	0.265 [1] ✔

[1] $P_u / \phi P_n$ controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	P2.5x.276	20.00	3.33	43.3	2.2535	15.30	101.41	0.151 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	80 - 60	P2.5x.276 (GR)	20.00	3.33	43.3	2.2535	67.76	101.41	0.668 [1]
T3	60 - 53.33	P3x.3 (GR)	6.67	3.34	35.2	3.0159	87.68	165.57	0.530 [1]
T4	53.33 - 40	P3x.3 (GR)	13.33	1.67	17.6	3.0159	132.79	165.57	0.802 [1]
T5	40 - 20	P5x.258 (GR)	20.03	6.68	42.7	4.2999	145.17	162.54	0.893 [1]
T6	20 - 0	P5x.258 (GR)	20.03	6.68	42.7	4.2999	144.53	162.54	0.889 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	5/8	4.83	4.50	345.8	0.3068	7.08	9.94	0.712 [1]
T2	80 - 60	5/8	4.83	4.50	345.8	0.3068	9.47	9.94	0.953 [1]
T3	60 - 53.33	3/4	4.83	4.43	283.6	0.4418	11.47	14.31	0.801 [1]
T4	53.33 - 40	3/4	4.83	4.43	283.5	0.4418	12.73	14.31	0.890 [1]
T5	40 - 20	L2x2x3/16	7.69	3.68	74.0	0.7150	3.61	23.17	0.156 [1]
T6	20 - 0	L2 1/2x2 1/2x3/16	9.79	4.69	74.1	0.9020	1.86	29.22	0.064 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	0.53	17.09	0.031 [1]
T2	80 - 60	2L1 1/2x1 1/2x3/16	3.50	3.26	85.7	1.0547	1.53	34.17	0.045 [1]
T3	60 - 53.33	2L1 1/2x1 1/2x3/16	3.50	3.21	84.3	1.0547	1.94	34.17	0.057 [1]
T4	53.33 - 40	2L1 1/2x1 1/2x3/16	3.50	3.21	84.3	1.0547	2.77	34.17	0.081 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
									✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	53.33 - 40	L2 1/2x2 1/2x5/16	3.50	2.94	50.6	1.4600	2.77	47.30	0.059 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	100 - 80	Leg	P2.5x.276	2	-30.86	88.43	34.9	Pass
T2	80 - 60	Leg	P2.5x.276 (GR)	59	-88.39	96.20	91.9	Pass
T3	60 - 53.33	Leg	P3x.3 (GR)	119	-111.81	148.57	75.3	Pass
T4	53.33 - 40	Leg	P3x.3 (GR)	137	-159.83	160.63	99.5	Pass
T5	40 - 20	Leg	P5x.258 (GR)	192	145.17	162.54	89.3	Pass
T6	20 - 0	Leg	P5x.258 (GR)	213	144.53	162.54	88.9	Pass
T1	100 - 80	Diagonal	5/8	10	7.08	9.94	71.2	Pass
T2	80 - 60	Diagonal	5/8	67	9.47	9.94	95.3	Pass
T3	60 - 53.33	Diagonal	3/4	121	11.47	14.31	80.1	Pass
T4	53.33 - 40	Diagonal	3/4	145	12.73	14.31	89.0	Pass
T5	40 - 20	Diagonal	L2x2x3/16	208	-4.21	11.67	36.1 46.1 (b)	Pass
T6	20 - 0	Diagonal	L2 1/2x2 1/2x3/16	217	-2.08	14.53	14.3 23.7 (b)	Pass
T1	100 - 80	Horizontal	L1 1/2x1 1/2x3/16	49	-5.94	7.19	82.6	Pass
T2	80 - 60	Horizontal	2L1 1/2x1 1/2x3/16	75	-8.48	23.22	36.5	Pass
T3	60 - 53.33	Horizontal	2L1 1/2x1 1/2x3/16	129	-11.60	23.51	49.3	Pass
T4	53.33 - 40	Horizontal	2L1 1/2x1 1/2x3/16	153	-11.91	23.51	50.7	Pass
T4	53.33 - 40	Secondary Horizontal	L2 1/2x2 1/2x5/16	155	-2.77	29.11	9.5 17.6 (b)	Pass
T1	100 - 80	Top Girt	L1 1/2x1 1/2x3/16	4	-3.02	7.19	42.1	Pass
T2	80 - 60	Top Girt	2L1 1/2x1 1/2x3/16	63	-6.68	23.22	28.8	Pass
T3	60 - 53.33	Top Girt	2L1 1/2x1 1/2x3/16	66	-9.88	23.22	42.5	Pass
T4	53.33 - 40	Top Girt	2L1 1/2x1 1/2x3/16	141	-11.18	23.51	47.6	Pass
T4	53.33 - 40	Bottom Girt	2L1 1/2x1 1/2x3/16	144	-6.24	23.51	26.5	Pass
							Summary	
							Leg (T4) 99.5	Pass
							Diagonal (T2) 95.3	Pass
							Horizontal (T1) 82.6	Pass
							Secondary Horizontal 17.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						(T4) Top Girt	47.6	Pass
						(T4) Bottom Girt	26.5	Pass
						(T4) Bolt Checks	62.6	Pass
						RATING =	**99.5**	**Pass**

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Subject:	FOUNDATION ANALYSIS
Location:	Danbury, CT
Rev. 2: 8/14/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 18027.00

Pier and Mat Foundation Analysis:

Input Data:

Tower Data

Overturning Moment =	$OM := 1001 \cdot ft \cdot kips$	(User Input from tnxTower)	
Shear Force =	$S_t := 15 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$WT_t := 24 \cdot kip$	(User Input from tnxTower)	
Max Compression Force =	$C_t := 162 \cdot kip$	(User Input from tnxTower)	
Max Uplift Force =	$U_t := 145 \cdot kip$	(User Input from tnxTower)	
Tower Height =	$H_t := 100 \cdot ft$	(User Input)	
Tower Width =	$W_t := 7.5 \cdot ft$	(User Input)	
Tower Position on Foundation (1=offset, 2=centered) =	$Pos_t := 2$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 7.0 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 4.25 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0.25 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 2.0 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 3.0 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 14.5 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 4000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Allowable Soil Bearing Capacity =	$q_s := 10000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 120 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Pier Reinforcement:

Bar Size =	$BS_{pier} := 8$	(User Input)	
Bar Diameter =	$d_{bpier} := 1.0 \cdot in$	(User Input)	
Number of Bars =	$NB_{pier} := 8$	(User Input)	
Clear Cover of Reinforcement =	$Cvr_{pier} := 3 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Diameter of Tie =	$d_{Tie} := 4 \cdot in$	(User Input)	

Pad Reinforcement:

Bar Size =	$BS_{top} := 6$	(User Input)	(Top of Pad)
Bar Diameter =	$d_{btop} := 0.750 \cdot in$	(User Input)	(Top of Pad)
Number of Bars =	$NB_{top} := 15$	(User Input)	(Top of Pad)
Bar Size =	$BS_{bot} := 8$	(User Input)	(Bottom of Pad)
Bar Diameter =	$d_{bbot} := 1.000 \cdot in$	(User Input)	(Bottom of Pad)
Number of Bars =	$NB_{bot} := 15$	(User Input)	(Bottom of Pad)
Clear Cover of Reinforcement =	$Cvr_{pad} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Pier Reinforcement Bar Area = $A_{bpier} := \frac{\pi \cdot d_{bpier}^2}{4} = 0.785 \cdot in^2$

Pad Top Reinforcement Bar Area = $A_{btop} := \frac{\pi \cdot d_{btop}^2}{4} = 0.442 \cdot in^2$

Pad Bottom Reinforcement Bar Area = $A_{bbot} := \frac{\pi \cdot d_{bbot}^2}{4} = 0.785 \cdot in^2$

Coefficient of Lateral Soil Pressure = $K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$

Load Factor = $LF := 1$

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 150 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 120 \cdot pcf$

Passive Pressure = $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p} = 0 \cdot ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 1.44 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 1.44 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 2.52 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.98 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 3 \cdot ft$

$A_p := W_f \cdot T_p = 43.5 \cdot ft^2$

Ultimate Shear = $S_u := P_{ave} \cdot A_p = 86.13 \cdot kip$

Weight of Concrete = $WT_c := \left[\left(W_f^2 \cdot T_f\right) + (3) \cdot \left(\frac{d_p^2 \cdot \pi}{4} L_p\right)\right] \cdot \gamma_c = 100.621 \cdot kip$

Weight of Soil Above Footing = $WT_{s1} := \left[\left[W_f^2 - (3) \cdot \left(\frac{d_p^2 \cdot \pi}{4}\right)\right] \cdot \left(\left|L_p - L_{pag} - n\right|\right)\right] \cdot \gamma_s = 96.4 \cdot kip$

Weight of Soil Wedge at Back Face = $WT_{s2} := \left[\frac{(D_f - n)^2 \cdot \tan(\Phi_s)}{2} \cdot W_f\right] \cdot \gamma_s = 24.612 \cdot kip$

Foundation has undercut toe per Fred A. Nudd dwg 96-4992-1

Tower Offset = $X_{t1} := \left[\frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{2}\right]$ $X_{t2} := \frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{3}$

$X_t := if(Pos_t = 1, X_{t1}, X_{t2}) = 5.085$

$X_{off1} := \frac{W_f}{2} - \left[\frac{(W_t \cdot \cos(30 \cdot deg))}{3} + X_t\right] = 0$ $X_{off2} := 0$

$X_{off} := if(Pos_t = 1, X_{off1}, X_{off2})$ $X_{off} = 0 \cdot ft$

Total Weight = $WT_{tot} := 0.9WT_c + 0.75WT_{s1} = 162.9 \cdot kip$

Resisting Moment = $M_r := (WT_{tot}) \cdot \frac{W_f}{2} + 0.9WT_t \cdot \left(\frac{W_f}{2} - X_{off}\right) + 0.75\left(S_u \cdot \frac{T_p}{3}\right) + 0.75WT_{s2} \cdot \left[W_f + \frac{(D_f - n) \cdot \tan(\Phi_s)}{3}\right] = 1694 \cdot kip \cdot ft$

Overturning Moment = $M_{ot} := OM + S_t \cdot (L_p + T_f) = 1109.8 \cdot kip \cdot ft$

Foundation has undercut toe per Fred A. Nudd dwg 96-4992-1

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 1.53$

Factor of Safety Required = $FS_{req} := 1$ $OverTurning\_Moment\_Check := if(FS \geq FS_{req}, "Okay", "No Good")$

OverTurning_Moment_Check = "Okay"

Shear Capacity in Pier:

Shear Resistance of Pier = $S_p := \frac{P_{ave} \cdot A_p + \mu \cdot WT_{tot}}{FS_{req}} = 159.415 \cdot kips$

$Shear\_Check := if(S_p > S_t, "Okay", "No Good")$

$Shear\_Check = "Okay"$

Bearing Pressure Caused by Footing:

Total Load = $Load_{tot} := WT_c + WT_{s1} + WT_t = 221 \cdot kip$

Area of the Mat = $A_{mat} := W_f^2 = 210.25$

Section Modulus of Mat = $S := \frac{W_f^3}{6} = 508.1 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 3.235 \cdot ksf$

$Max\_Pressure\_Check := if(P_{max} < 0.75q_s, "Okay", "No Good")$

$Max\_Pressure\_Check = "Okay"$

Minimum Pressure in Mat = $P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -1.133 \cdot ksf$

$Min\_Pressure\_Check := if[(P_{min} \geq 0) \cdot (P_{min} < 0.75q_s), "Okay", "No Good"]$

$Min\_Pressure\_Check = "No Good"$

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 3.58$

Distance to Kern = $X_k := \frac{W_f}{6} = 2.417$

Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity = $e := \frac{M_{ot}}{Load_{tot}} = 5.021$

Adjusted Soil Pressure = $P_a := \frac{2 \cdot Load_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} = 4.559 \cdot ksf$

$q_{adj} := if(P_{min} < 0, P_a, P_{max}) = 4.559 \cdot ksf$

$Pressure\_Check := if(q_{adj} < 0.75q_s, "Okay", "No Good")$

$Pressure\_Check = "Okay"$

Concrete Bearing Capacity:

Strength Reduction Factor = $\Phi_c := 0.65$ (ACI-2008 9.3.2.2)

Bearing Strength Between Pier and Pad = $P_b := \Phi_c \cdot 0.85 \cdot f_c \cdot \frac{\pi \cdot d_p^2}{4} = 999.78 \cdot kips$ (ACI-2008 10.14)

$Bearing\_Check := if(P_b > LF \cdot C_t, "Okay", "No Good")$

Bearing_Check = "Okay"

Shear Strength of Concrete:

Beam Shear: (Critical section located at a distance d from the face of Pier) (ACI 11.3.1.1)

$\phi_c := 0.85$ (ACI 9.3.2.5)

$d := T_f - Cvr_{pad} - d_{bbot} = 32 \cdot in$

$FL := LF \cdot \frac{C_t}{W_f^2} = 0.771 \cdot ksf$

$V_{req} := FL \cdot (X_t - .5 \cdot d_p - d) \cdot W_f = 15.845 \cdot kips$

$V_{Avail} := \phi_c \cdot 2 \cdot \sqrt{f_c \cdot psi} \cdot W_f \cdot d = 599 \cdot kip$ (ACI-2008 11.2.1.1)

$Beam\_Shear\_Check := if(V_{req} < V_{Avail}, "Okay", "No Good")$

Beam_Shear_Check = "Okay"

Punching Shear: (Critical Section Located at a distance of d/2 from the face of pier) (ACI 11.11.1.2)

Critical Perimeter of Punching Shear = $b_o := (d_p + d) \cdot \pi = 14.7$

Area Included Inside Perimeter = $A_{bo} := \frac{\pi \cdot (d_p + d)^2}{4} = 17.1$

Required Shear Strength = $V_{req} := FL \cdot (W_f^2 - A_{bo}) = 149 \cdot kips$

Available Shear Strength = $V_{Avail} := \phi_c \cdot 4 \cdot \sqrt{f_c \cdot psi} \cdot b_o \cdot d = 1210.6 \cdot kip$ (ACI-2008 11.11.2.1)

$Punching\_Shear\_Check := if(V_{req} < V_{Avail}, "Okay", "No Good")$

Punching_Shear_Check = "Okay"

Steel Reinforcement in Pad:

Required Reinforcement for Bending:

Strength Reduction Factor = $\phi_m := .90$ (ACI-2008 9.3.2.1)

Maximum Moment in Pad = $M_{max} := 352 \cdot kip \cdot ft$ (User Input)

Design Moment = $M_n := \frac{LF \cdot M_{max}}{\phi_m} = 391.111 \cdot kips \cdot ft$

$$\beta := \begin{cases} 0.85 & \text{if } 2500 \cdot psi \le f_c \le 4000 \cdot psi \\ 0.65 & \text{if } f_c > 8000 \cdot psi \\ \left[0.85 - \left[\frac{\left(\frac{f_c}{psi} - 4000\right)}{1000}\right] \cdot 0.5\right] & \text{otherwise} \end{cases} = 0.85 \quad \text{(ACI-200810.2.7.3)}$$

$b_{eff} := W_t \cdot \cos(30 \cdot deg) + d_p = 101.942 \cdot in$

$A_s := \frac{M_n}{(f_y \cdot d)} = 2.444 \cdot in^2$

$a := \frac{A_s \cdot f_y}{\beta \cdot f_c \cdot b_{eff}} = 0.423 \cdot in$

$A_s := \frac{M_n}{f_y \cdot \left(d - \frac{a}{2}\right)} = 2.461 \cdot in^2$

$\rho := \frac{A_s}{b_{eff} d} = 0.00905 \cdot in$

Required Reinforcement for Temperature and Shrinkage:

$$\rho_{sh} := \begin{cases} .0018 & \text{if } f_y \geq 60000 \cdot psi \\ .0020 & \text{otherwise} \end{cases} = 0.0018$$ (ACI-2008 7.12.2.1)

Check Bottom Bars:

$$As := if\left(\rho \geq \rho_{sh}, A_s, \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d\right) = 2.9 \cdot in^2$$

$$As_{prov} := A_{bbot} \cdot NB_{bot} = 11.8 \cdot in^2$$

$$Pad\_Reinforcement\_Bot := if\left(As_{prov} > As, "Okay", "No Good"\right)$$

Pad_Reinforcement_Bot = "Okay"

Check top Bars:

$$As := if\left(\rho \geq \rho_{sh}, A_s, \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d\right) = 2.9 \cdot in^2$$

$$As_{prov} := A_{btop} \cdot NB_{top} = 6.6 \cdot in^2$$

$$Pad\_Reinforcement\_Top := if\left(As_{prov} > As, "Okay", "No Good"\right)$$

Pad_Reinforcement_Top = "Okay"

Developement Length Pad Reinforcement:

Bar Spacing =

$$B_{sPad} := \frac{W_f - 2 \cdot Cvr_{pad} - NB_{bot} \cdot d_{bbot}}{NB_{bot} - 1} = 10.93 \cdot in$$

Spacing or Cover Dimension =

$$c := if\left(Cvr_{pad} < \frac{B_{sPad}}{2}, Cvr_{pad}, \frac{B_{sPad}}{2}\right) = 3 \cdot in$$

Transverse Reinforcement Index =

$$k_{tr} := 0$$ (ACI-2008 12.2.3)

$$L_{dbt} := \frac{3 \cdot f_y \alpha_{pad} \cdot \beta_{pad} \cdot \gamma_{pad} \cdot \lambda_{pad}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \frac{c + k_{tr}}{d_{bbot}}} \cdot d_{bbot} = 23.7 \cdot in$$

Minimum Development Length =

$$L_{dbmin} := 12 \cdot in$$ (ACI-2008 12.2.1)

$$L_{dbtCheck} := if\left(L_{dbt} \geq L_{dbmin}, "Use\ L.dbt", "Use\ L.dbmin"\right) = "Use\ L.dbt"$$

Available Length in Pad =

$$L_{Pad} := \frac{W_f}{2} - \frac{W_t}{2} - Cvr_{pad} = 39 \cdot in$$

$$Lpad\_Check := if\left(L_{Pad} > L_{dbt}, "Okay", "No Good"\right)$$

Lpad_Check = "Okay"

Steel Reinforcement in Pier:

Area of Pier = $A_p := \frac{\pi \cdot d_p^2}{4} = 452.39 \cdot in^2$

$A_{smin} := 0.01 \cdot 0.5 \cdot A_p = 2.26 \cdot in^2$ (ACI-2008 10.8.4 & 10.9.1)

$A_{sprov} := NB_{pier} \cdot A_{bpier} = 6.28 \cdot in^2$

$Steel\_Area\_Check := if\left(A_{sprov} > A_{smin}, "Okay", "No Good"\right)$

Steel_Area_Check = "Okay"

Bar Spacing In Pier = $B_{sPier} := \frac{d_p \cdot \pi}{NB_{pier}} - d_{bpier} = 8.425 \cdot in$

Diameter of Reinforcement Cage = $Diam_{cage} := d_p - 2 \cdot Cvr_{pier} = 18 \cdot in$

Maximum Moment in Pier = $M_p := S_t \cdot \left(L_p\right) \cdot LF = 765 \cdot in \cdot kips$

Pier Check evaluated from outside program and results are listed below;

$\left(D \;\; N \;\; n \;\; P_u \;\; M_{xu}\right) := \left(d_p \cdot 12 \;\; NB_{pier} \;\; BS_{pier} \;\; \frac{C_t \cdot 1.333}{kips} \;\; \frac{M_p}{in \cdot kips}\right)$

$\left(D \;\; N \;\; n \;\; P_u \;\; M_{xu}\right) = (24 \;\; 8 \;\; 8 \;\; 215.946 \;\; 765)$

$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) := (0 \;\; 0 \;\; 0 \;\; 0)$

$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) := \phi P'_n\left(D, N, n, P_u, M_{xu}\right)^T$

$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) = \left(682.565 \;\; 2.418 \times 10^3 \;\; -18.025 \;\; 0.014\right)$

$Axial\_Load\_Check := if\left(\phi P_n \geq P_u, "Okay", "No Good"\right)$

Axial_Load_Check = "Okay"

$Bending\_Check := if\left(\phi M_{xn} \geq M_{xu}, "Okay", "No Good"\right)$

Bending_Check = "Okay"

Development Length Pier Reinforcement:

Available Length in Foundation:

$L_{pier} := L_p - Cvr_{pier} = 48 \cdot in$

$L_{pad} := T_f - Cvr_{pad} = 33 \cdot in$

Tension: (ACI-2008 12.2.3)

Spacing or Cover Dimension =

$c := if\left(Cvr_{pier} < \frac{B_{sPier}}{2}, Cvr_{pier}, \frac{B_{sPier}}{2}\right) = 3 \cdot in$

Transverse Reinforcement =

$k_{tr} := 0$ (ACI-2008 12.2.3)

$L_{dbt} := \frac{3 \cdot f_y \cdot \alpha_{pier} \cdot \beta_{pier} \cdot \gamma_{pier} \cdot \lambda_{pier}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \left(\frac{c + k_{tr}}{d_{bpier}}\right)} \cdot d_{bpier} = 23.72 \cdot in$

Minimum Development Length =

$L_{dh} := \frac{1200 \cdot d_{bpier}}{\sqrt{\frac{f_c}{psi}}} \cdot .7 = 13.282 \cdot in$ (ACI 12.2.1)

Pier reinforcement bars are standard 90 degree hooks and therefore developement in the pad is computed as follows:

$L_{db} := \max\left(L_{dbt}, L_{dbmin}\right) = 23.717 \cdot in$

$L_{tension\_Check} := if\left(L_{pier} + L_{pad} > L_{dbt}, "Okay", "No Good"\right)$

$L_{tension\_Check} = "Okay"$

Compression: (ACI-2008 12.3.2)

$L_{dbc1} := \frac{.02 \cdot d_{bpier} \cdot f_y}{\sqrt{f_c \cdot psi}} = 18.974 \cdot in$

$L_{dbmin} := 0.0003 \cdot \frac{in^2}{lb} \cdot \left(d_{bpier} \cdot f_y\right) = 18 \cdot in$

$L_{dbc} := if\left(L_{dbc1} \geq L_{dbmin}, L_{dbc1}, L_{dbmin}\right) = 18.974 \cdot in$

$L_{compression\_Check} := if\left(L_{pier} + L_{pad} > L_{dbc}, "Okay", "No Good"\right)$

$L_{compression\_Check} = "Okay"$

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CT0968	DATE:	10/26/2017	RF DESIGN ENG:	Md Mateen	RF PERF ENG:		RFDS PROGRAM TYPE:	2018 LTE Next Carrier
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:		RF PERF PHONE:		RFDS TECHNOLOGY:	LTE
REVISION:	Preliminary	RF MANAGER:	JOHN BENNEDETTO	RF DESIGN EMAIL:	mm093q@att.com	RF PERF EMAIL:		STATE/STATUS:	Preliminary/Approved
INITIATIVE / PROJECT:	LTE 1900 4T4R A3-A4 & E, LTE 4C AWS J, LTE 5C 850, LTE 6C 700 DE,					RFDS VERSION	1.00	RFDS ID:	2046143
						GSM FREQUENCY:		Created By: mm093q	Updated By: dr701e
						UMTS FREQUENCY:	850	Created: 10/26/2017	Updated: 10/31/2017
						LTE FREQUENCY:	700,850,1900,AWS,WCS		
						IPLAN JOB # 1:	NER-RCTB-16-03077	PRD || SUB GRP #1:	LTE Multi Carrier || 1xBBU XMU
						IPLAN JOB # 2:	NER-RCTB-17-07004	PRD || SUB GRP #2:	LTE Next Carrier || LTE 4C
						IPLAN JOB # 3:	NER-RCTB-17-07032	PRD || SUB GRP #3:	LTE Next Carrier || LTE 5C
						IPLAN JOB # 4:	NER-RCTB-17-07082	PRD || SUB GRP #4:	LTE Next Carrier || LTE 6C
						IPLAN JOB # 5:	NER-RCTB-17-07377	PRD || SUB GRP #5:	Antenna Modifications || 4TXRX Antenna Retrofit
						IPLAN JOB # 6:		PRD || SUB GRP #6:	
						IPLAN JOB # 7:		PRD || SUB GRP #7:	
						IPLAN JOB # 8:		PRD || SUB GRP #8:	

Section 2 - LOCATION INFORMATION

USID:	170551	FA LOCATION CODE:	12684103	LOCATION NAME:	DANBURY BOXWOOD LANE	ORACLE PRJT # 1:	2051A07NGJ	PACE JOB #1:	MRCTB020084
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT	ORACLE PRJT # 2:	2051A0EFW8	PACE JOB #2:	MRCTB026993
ADDRESS:	303 BOXWOOD LANE	CITY:	DANBURY	STATE:	CT	ORACLE PRJT # 3:	2051A0EFWX	PACE JOB #3:	MRCTB026995
ZIP CODE:	06811	COUNTY:	FAIRFIELD	LONG (DEC DEG.):	-73.4866670	ORACLE PRJT # 4:	2051A0EFV9	PACE JOB #4:	MRCTB027001
LATITUDE (D-M-S):	41d 23m40.9992s	LONGITUDE (D-M-S):	-73d -29m-12.0012s	LAT (DEC. DEG.):	41.3947220	ORACLE PRJT # 5:	2051A0EK0D	PACE JOB #5:	MRCTB027255
						ORACLE PRJT # 6:		PACE JOB #6:	
						ORACLE PRJT # 7:		PACE JOB #7:	
						ORACLE PRJT # 8:		PACE JOB #8:	
						BORDER CELL WITH CONTOUR COORD:		SEARCH RING NAME:	
						AM STUDY REQ'D (Y/N):	No	SEARCH RING ID:	
						FREQ COORD:		BTA:	MSA / RSA:
						OPS DISTRICT:	CT-South	LAC(GSM):	
						OPS ZONE:	NE_CT_S_FRFD_NW_CS	LAC(UMTS):	05995
						RF DISTRICT:	NPO Triage	BSC(GSM):	
						RF ZONE:	Hotseat	RNC(UMTS):	BRPTCT04CR0R03
						PARENT NAME(GSM):		MME POOL ID(LTE):	FF01
						PARENT NAME(UMTS):	BRIDGEPORT RNC03		

DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:

START OUT GOING WEST ON COCHITUATE RD/MA-30 TOWARD BURR ST.
THEN 0.10 MILES
MAKE A U-TURN AT BURR ST ONTO COCHITUATE RD/MA-30.
IF YOU REACH WHITTIER ST YOUVE GONE ABOUT 0.2 MILES TOO FAR
THEN 0.05 MILES
MERGE ONTO I-90 W/MASSACHUSETTS TPKE W TOWARD SPRINGFIELD/BOSTON (PORTIONS TOLL).
THEN 38.83 MILES
MERGE ONTO I-84 W/WILBUR CROSS HWY S VIA EXIT 9 TOWARD US-20/HARTFORD/NEW YORK CITY (PORTIONS TOLL) (CROSSING INTO CONNECTICUT).
THEN 41.73 MILES
KEEP LEFT TO TAKE CT-15 S/WILBUR CROSS HWY S VIA EXIT 57 TOWARD I-91 S/CHARTER OAK BR/NY CITY.
THEN 1.99 MILES
MERGE ONTO I-91 S VIA EXIT 86 TOWARD NEW HAVEN/NY CITY.
THEN 16.54 MILES
MERGE ONTO I-691 W VIA EXIT 18 TOWARD MERIDEN/WATERBURY.
THEN 7.98 MILES
MERGE ONTO I-84 W VIA EXIT 1 ON THE LEFT TOWARD WATERBURY/DANBURY.
THEN 36.90 MILES
TAKE THE US-6 W/US-202 W/LAKE AVE EXIT, EXIT 4.
THEN 0.36 MILES
TURN RIGHT ONTO US-6 W/US-202 W/LAKE AVENUE EXT.
THEN 0.08 MILES
TAKE THE 1ST RIGHT ONTO MILL RIDGE RD.
THEN 0.37 MILES
TAKE THE 3RD RIGHT ONTO HIGH RIDGE RD.
IF YOU REACH MIDFIELD RD YOUVE GONE ABOUT 0.2 MILES TOO FAR.

Section 3 - LICENSE COVERAGE/FILING INFORMATION

CGSA - NO FILING TRIGGERED (Yes/No):	No	CGSA LOSS:		PCS REDUCED - UPS ZIP:		CGSA CALL SIGNS:
CGSA - MINOR FILING NEEDED (Yes/No):	No	CGSA EXT AGMT NEEDED:		PCS POPS REDUCED:		
CGSA - MAJOR FILING NEEDED (Yes/No):	Yes	CGSA SCORECARD UPDATED:				

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	No	GROUND ELEVATION (ft):		STRUCTURE TYPE:	SELF SUPPORT	MARKET LOCATION 700 MHz Band:	
ADDITIONAL REGULATORY?:	No	HEIGHT OVERALL (ft):	0.00	FCC ASR NUMBER:		MARKET LOCATION 850 MHz Band:	
SUB-LEASE RIGHTS?:	No	STRUCTURE HEIGHT (ft):	100.01			MARKET LOCATION 1900 MHz Band:	
LIGHTING TYPE:	NOT REQUIRED					MARKET LOCATION AWS Band:	
						MARKET LOCATION WCS Band:	
						MARKET LOCATION Future Band:	

Section 5 - E-911 INFORMATION - existing

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A E-911						0		
SECTOR B						0		
SECTOR C						0		
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 5 - E-911 INFORMATION - final

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A E-911						0		
SECTOR B						0		
SECTOR C						0		
SECTOR D								
SECTOR E								
SECTOR F								

OMNI									

Section 6 - RBS GENERAL INFORMATION - existing			
	UMTS 1ST RBS	LTE 1ST RBS	LTE 2ND RBS
RBS ID:	555234	555235	
CTS COMMON ID:	CTU0968	CTL00968	
CELL ID / BCF:	CTU0968	CTL00968	
BTA/TID:	321W	321L	
4-9 DIGIT SITE ID:	0968	0968	
COW OR TOY?:	No	No	
CELL SITE TYPE:	SECTORIZED	SECTORIZED	
SITE TYPE:	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	
BTS LOCATION ID:	INTERNAL	INTERNAL	
BASE STATION TYPE:	BASE	BASE	
EQUIPMENT NAME:	DANBURY CT	DANBURY CT	
DISASTER PRIORITY:	0	0	

Section 6 - RBS GENERAL INFORMATION - final			
	UMTS 1ST RBS	LTE 1ST RBS	LTE 2ND RBS
RBS ID:	555234	555235	RFDS_30824805
CTS COMMON ID:	CTU0968	CTL00968	CTL01968R
CELL ID / BCF:	CTU0968	CTL00968	CTL01968R
BTA/TID:	321W	321L	321L
4-9 DIGIT SITE ID:	0968	0968	1968
COW OR TOY?:	No	No	No
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED
SITE TYPE:	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL
BTS LOCATION ID:	INTERNAL	INTERNAL	INTERNAL
BASE STATION TYPE:	BASE	BASE	OVERLAY
EQUIPMENT NAME:	DANBURY CT	DANBURY CT	DANBURY CT
DISASTER PRIORITY:	0	0	0

Section 7 - RBS SPECIFIC INFORMATION - existing																					
	UMTS 1ST RBS	LTE 1ST RBS	LTE 2ND RBS																		
RAC:																					
EQUIPMENT VENDOR:	ERICSSON	ERICSSON																			
EQUIPMENT TYPE:	6601 MAIN UNIT UMTS	6601 INDOOR MU																			
BASEBAND CONFIGURATION:																					
LOCATION:																					
CABINET LOCATION:																					
MARKET STATE CODE:	CT	CT																			
AGPS:	Yes	Yes																			
NODE B NUMBER:	968	968																			

Section 7 - RBS SPECIFIC INFORMATION - final																					
	UMTS 1ST RBS	LTE 1ST RBS	LTE 2ND RBS																		
RAC:																					
EQUIPMENT VENDOR:	ERICSSON	ERICSSON	ERICSSON																		
EQUIPMENT TYPE:	6601 MAIN UNIT UMTS	6601 INDOOR MU	6601 INDOOR MU																		
BASEBAND CONFIGURATION:		2x6601 / 2x5216 / 2xXMU03 + IDLe	2x6601 / 2x5216 / 2xXMU03 + IDLe																		
LOCATION:																					
CABINET LOCATION:																					
MARKET STATE CODE:	CT	CT	CT																		
AGPS:	Yes	Yes	Yes																		
NODE B NUMBER:	968	968	1968																		

Section 8 - RBS/SECTOR ASSOCIATION - existing																						
	UMTS 1ST RBS	LTE 1ST RBS	LTE 2ND RBS																			
CTS Common ID	CTU0968	CTL00968																				
Soft Sector IDs	CTV09681	CTL00968_3A_1																				
	CTV09682	CTL00968_3B_1																				
	CTV09683	CTL00968_3C_1																				
		CTL00968_7A_1																				
		CTL00968_7B_1																				
		CTL00968_7C_1																				
		CTL00968_9A_1																				
		CTL00968_9B_1																				
		CTL00968_9C_1																				

Section 8 - RBS/SECTOR ASSOCIATION - final																						
	UMTS 1ST RBS	LTE 1ST RBS	LTE 2ND RBS																			
CTS Common ID	CTU0968	CTL00968	CTL01968R																			
Soft Sector IDs	CTV09681	CTL00968_3A_1	CTL01968_2A_2																			
	CTV09682	CTL00968_3B_1	CTL01968_2B_2																			
	CTV09683	CTL00968_3C_1	CTL00968_2C_2																			
		CTL00968_7A_1	CTL01968_7A_2_E																			
		CTL00968_7B_1	CTL01968_7B_2_E																			
		CTL00968_7C_1	CTL01968_7C_2_E																			
		CTL00968_9A_1	CTL01968_8A_1																			
		CTL00968_9A_2	CTL01968_8B_1																			
		CTL00968_9B_1	CTL01968_8C_1																			
		CTL00968_9B_2																				
		CTL00968_9C_1																				
		CTL00968_9C_2																				

Section 9 - SOFT SECTOR ID - existing

	UMTS 1ST 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 4TH 700	LTE 4TH 1900	LTE 4TH AWS
USEID (excluding Hard Sector)	170551.850.3G.1							
SECTOR A SOFT SECTOR ID	CTV09681	CTL00968_7A_1		CTL00968_9A_1	CTL00968_3A_1			
SECTOR B	CTV09682	CTL00968_7B_1		CTL00968_9B_1	CTL00968_3B_1			
SECTOR C	CTV09683	CTL00968_7C_1		CTL00968_9C_1	CTL00968_3C_1			
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 9 - SOFT SECTOR ID - final

	UMTS 1ST 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 4TH 700	LTE 4TH 1900	LTE 4TH AWS
USEID (excluding Hard Sector)	170551.850.3G.1							
SECTOR A SOFT SECTOR ID	CTV09681	CTL00968_7A_1	CTL01968_8A_1	CTL00968_9A_1	CTL00968_3A_1	CTL01968_7A_2_E	CTL00968_9A_2	CTL01968_2A_2
SECTOR B	CTV09682	CTL00968_7B_1	CTL01968_8B_1	CTL00968_9B_1	CTL00968_3B_1	CTL01968_7B_2_E	CTL00968_9B_2	CTL01968_2B_2
SECTOR C	CTV09683	CTL00968_7C_1	CTL01968_8C_1	CTL00968_9C_1	CTL00968_3C_1	CTL01968_7C_2_E	CTL00968_9C_2	CTL00968_2C_2
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 9 - Cell Number - existing																									
	UMTS 1ST 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 4TH 700	LTE 4TH 1900	LTE 4TH AWS																	
USEID (excluding Hard Sector)	170551.850.3G.1																								
SECTOR A CELL NUMBER		15		8	149																				
SECTOR B		16		9	150																				
SECTOR C		17		10	151																				
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 9 - Cell Number - final																									
	UMTS 1ST 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 4TH 700	LTE 4TH 1900	LTE 4TH AWS																	
USEID (excluding Hard Sector)	170551.850.3G.1																								
SECTOR A CELL NUMBER		15	1	8	149	185	178	192																	
SECTOR B		16	2	9	150	186	179	193																	
SECTOR C		17	3	10	151	187	180	194																	
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 10 - CID/SAC - existing																								
	UMTS 1ST 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 4TH 700	LTE 4TH 1900	LTE 4TH AWS																
SECTOR A CID/SAC	09681																							
SECTOR B	09682																							
SECTOR C	09683																							
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 10 - CID/SAC - final																								
	UMTS 1ST 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 4TH 700	LTE 4TH 1900	LTE 4TH AWS																
SECTOR A CID/SAC	09681																							
SECTOR B	09682																							
SECTOR C	09683																							
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 11 - CURRENT RADIO COUNTS existing																									
	UMTS 1ST 850	LTE 1ST 700	LTE 1ST 1900	LTE 1ST WCS																					
SECTOR A RADIO COUNTS	1	1	1	1																					
SECTOR B	1	1	1	1																					
SECTOR C	1	1	1	1																					
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 12 - CURRENT T1 COUNTS existing																						
	UMTS 1ST Cabinet	LTE 1ST Cabinet																				
# T1s	1	1																				
LINK PROFILE																						
RF COMBINING																						
FIBER or ETHERNET?	ETHERNET	ETHERNET																				
Tx Board Model																						
Tx Board QTY																						
RAX/ECU Board Model																						
RAX/ECU Board QTY																						
BBU Board Model																						
BBU Board QTY																						
RRU - location	Top	Top																				
FIBER JUMPER	FIBER	FIBER																				
DC CABLE	DC	DC																				
DC/Fiber Dem. Box	RAYCAP	RAYCAP																				
Bundled Fiber Cable	YES	YES																				
Bundled DC Cable	YES	YES																				

Section 13 - NEW/PROPOSED RADIO COUNTS																									
	UMTS 1ST 850	LTE 1ST 700	LTE 1ST 1900	LTE 1ST WCS																					
SECTOR A RADIO COUNTS	1	1	1	1																					
SECTOR B	1	1	1	1																					
SECTOR C	1	1	1	1																					
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 14 - NEW/PROPOSED T1 COUNTS																						
	UMTS 1ST Cabinet	LTE 1ST Cabinet																				
# T1s	1	1																				
LINK PROFILE																						
RF COMBINING																						
FIBER or ETHERNET?	ETHERNET	ETHERNET																				
Tx Board Model																						
Tx Board QTY																						
RAX/ECU Board Model																						
RAX/ECU Board QTY																						
BBU Board Model																						
BBU Board QTY																						
RRU - location	Top	Top																				
FIBER JUMPER	FIBER	FIBER																				
DC CABLE	DC	DC																				
DC/Fiber Dem. Box	RAYCAP	RAYCAP																				
Bundled Fiber Cable	YES	YES																				
Bundled DC Cable	YES	YES																				

Section 15A - CURRENT TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	OPA-65R-LCUU-H4		OPA-65R-LCUU-H4											
ANTENNA VENDOR	CCI Products		CCI Products											
ANTENNA SIZE (H x W x D)	48X15X7		48X15X7											
ANTENNA WEIGHT	57		57											
AZIMUTH	60		60											
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	98		98											
ANTENNA TIP HEIGHT	100		100											
MECHANICAL DOWNTILT	0		0											
FEEDER AMOUNT														
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Built-In		Built-In										
SURGE ARRESTOR (QTY/MODEL)	1	FIBER DC SQUID	1	FIBER DC SQUID										
DIPLEXER (QTY/MODEL)														
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein 860 10006		RRH Controlled										
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)														
CURRENT INJECTORS FOR TMA (QTY/MODEL)														
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
REPEATER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-11										
RRH - 850 band (QTY/MODEL)	1	RRUS-11												
RRH - 1900 band (QTY/MODEL)			1	RRUS-12+RRUS-A2										
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)	1	RRUS-32												
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	4 DC and 2 Fiber lines													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	**PORT 1**	170551.A.850.3G.1		CTV09681	CTV09681	TxRx/TxRx	UMTS 850	H4_849MHz_04DT	13.3		4	TOP	FIBER	0	0			No					
	PORT 3	170551.A.WCS.4G.1		CTL00968_3A_1	CTL00968_3A_1	TxRx/TxRx	LTE WCS	H4_2350MHz_04DT	17.1		4	TOP	FIBER	0	0			No					
ANTENNA POSITION 2	**PORT 1**	170551.A.700.4G.1		CTL00968_7A_1	CTL00968_7A_1	TxRx/TxRx	LTE 700	H4_719MHz_04DT	12.7		4	TOP	FIBER	0	0			No					
	PORT 3	170551.A.1900.4G.1		CTL00968_9A_1	CTL00968_9A_1	TxRx/TxRx	LTE 1900	H4_1930MHz_04DT	16		4	TOP	FIBER	0	0			No					

Section 15B - CURRENT TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	OPA-65R-LCUU-H4		OPA-65R-LCUU-H4											
ANTENNA VENDOR	CCI Products		CCI Products											
ANTENNA SIZE (H x W x D)	48X15X7		48X15X7											
ANTENNA WEIGHT	57		57											
AZIMUTH	170		170											
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	98		98											
ANTENNA TIP HEIGHT	100		100											
MECHANICAL DOWNTILT	0		0											
FEEDER AMOUNT														
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Built-In		Built-In										
SURGE ARRESTOR (QTY/MODEL)	1	FIBER DC SQUID	1	FIBER DC SQUID										
DIPLEXER (QTY/MODEL)														
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		Kathrein 860 10006		RRH Controlled										
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)														
CURRENT INJECTORS FOR TMA (QTY/MODEL)														
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
REPEATER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-11										
RRH - 850 band (QTY/MODEL)	1	RRUS-11												
RRH - 1900 band (QTY/MODEL)			1	RRUS-12+RRUS-A2										
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)	1	RRUS-32												
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	4 DC and 2 Fiber lines													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	**PORT 1**	170551.B.850.3G.1		CTV09682	CTV09682	TxRx/TxRx	UMTS 850	H4_849MHz_04 DT	13.3		4	TOP	FIBER	0	0			No					
	PORT 3	170551.B.WCS.4G.1		CTL00968_3B_1	CTL00968_3B_1	TxRx/TxRx	LTE WCS	H4_2350MHz_04 DT	17.1		4	TOP	FIBER	0	0			No					
ANTENNA POSITION 2	**PORT 1**	170551.B.700.4G.1		CTL00968_7B_1	CTL00968_7B_1	TxRx/TxRx	LTE 700	H4_719MHz_04 DT	12.7		4	TOP	FIBER	0	0			No					
	PORT 3	170551.B.1900.4G.1		CTL00968_9B_1	CTL00968_9B_1	TxRx/TxRx	LTE 1900	H4_1930MHz_04 DT	16		4	TOP	FIBER	0	0			No					

Section 15C - CURRENT TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	OPA-65R-LCUU-H4		OPA-65R-LCUU-H4											
ANTENNA VENDOR	CCI Products		CCI Products											
ANTENNA SIZE (H x W x D)	48X15X7		48X15X7											
ANTENNA WEIGHT	57		57											
AZIMUTH	300		300											
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	98		98											
ANTENNA TIP HEIGHT	100		100											
MECHANICAL DOWNTILT	0		0											
FEEDER AMOUNT														
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Built-In		Built-In										
SURGE ARRESTOR (QTY/MODEL)	1	FIBER DC SQUID	1	FIBER DC SQUID										
DIPLEXER (QTY/MODEL)														
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		Kathrein 860 10006		RRH Controlled										
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)														
CURRENT INJECTORS FOR TMA (QTY/MODEL)														
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
REPEATER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-11										
RRH - 850 band (QTY/MODEL)	1	RRUS-11												
RRH - 1900 band (QTY/MODEL)			1	RRUS-12+RRUS-A2										
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)	1	RRUS-32												
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	4 DC and 2 Fiber lines													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	**PORT 1**	170551.C.850.3G.1		CTV09683	CTV09683	TxRx/TxRx	UMTS 850	H4_849MHz_02 DT	13.3		2	TOP	FIBER	0	0			No					
	PORT 3	170551.C.WCS.4G.1		CTL00968_3C_1	CTL00968_3C_1	TxRx/TxRx	LTE WCS	H4_2350MHz_02 DT	17.1		2	TOP	FIBER	0	0			No					
ANTENNA POSITION 2	**PORT 1**	170551.C.700.4G.1		CTL00968_7C_1	CTL00968_7C_1	TxRx/TxRx	LTE 700	H4_719MHz_02 DT	12.7		2	TOP	FIBER	0	0			No					
	PORT 3	170551.C.1900.4G.1		CTL00968_9C_1	CTL00968_9C_1	TxRx/TxRx	LTE 1900	H4_1930MHz_02 DT	16		2	TOP	FIBER	0	0			No					

Section 16A - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				SBNHH-1D65A			
ANTENNA VENDOR				Andrew			
ANTENNA SIZE (H x W x D)				55X11.9X7.1			
ANTENNA WEIGHT				33.5			
AZIMUTH				60			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				98			
ANTENNA TIP HEIGHT				100			
MECHANICAL DOWNTILT		0		0			
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)				Built in			
SURGE ARRESTOR (QTY/MODEL)				1 Fiber DC Squid			
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		RRH Controlled		RRH Controlled			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 RRUS-E2			
RRH - 850 band (QTY/MODEL)		1 RRUS-12					
RRH - 1900 band (QTY/MODEL)		1 RRUS-32 B2					
RRH - AWS band (QTY/MODEL)				1 RRUS-32 B66			
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Add 4' Hex port position 4. Add 700DE RRUS-E2 & AWS RRUS-32 B66 both up top on new hex port pos. 4. Add 850 RRUS-12 up top on Octo port pos. 2. Replace existing PCS RRUS-12/A2 with RRUS-32 B2 up top also existing Octo port on Position 2. Add new fiber DC squid. Replace 2X DUS with 2X 5216 add 2nd XMU & add IDLe.						
Local Market Note 2	Note Antenna spacing						
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 2	PORT 2	G.tmp1, 170551.B.850.4	170551.A.850.4 G.1	CTL00968_8A_1	CTL00968_8A_1	TxRx/TxRx	LTE 850	H4_719MHz_04 DT	12.7	60	4	TOP	FIBER	0	0			No		1475.7065		5	
	PORT 3	G.tmp4, 170551.B.1900.4	170551.A.1900.4 G.1	CTL00968_9A_1	CTL00968_9A_1	TxRx/TxRx	LTE 1900	H4_1930MHz_04 DT	16	60	4	TOP	FIBER	0	0			No		4842.058		6	
ANTENNA POSITION 4	PORT 1	170551.A.700.4 G.tmp4	170551.A.700.4 G.2	CTL00968_7A_2 _E	CTL00968_7A_2 _E	TxRx/TxRx	LTE 700	1D65A_722MHz _06DT	15.8	60	6	TOP	FIBER	0	0			No		1475.71			
	PORT 3	170551.A.AWS.4 G.tmp4	170551.A.2100.4 G.1	CTL00968_2A_1	CTL00968_2A_1	TxRx/TxRx	LTE AWS	1D65A_2130MH z_04DT	16.7	60	4	TOP	FIBER	0	0			No		4842.06			

Section 16B - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				SBNHH-1D65A			
ANTENNA VENDOR				Andrew			
ANTENNA SIZE (H x W x D)				55X11.9X7.1			
ANTENNA WEIGHT				33.5			
AZIMUTH				170			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				98			
ANTENNA TIP HEIGHT				100			
MECHANICAL DOWNTILT		0		0			
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)				Built in			
SURGE ARRESTOR (QTY/MODEL)				1 Fiber DC Squid			
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		RRH Controlled		RRH Controlled			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 RRUS-E2			
RRH - 850 band (QTY/MODEL)		1 RRUS-12					
RRH - 1900 band (QTY/MODEL)		1 RRUS-32 B2					
RRH - AWS band (QTY/MODEL)				1 RRUS-32 B66			
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Add 4' Hex port position 4. Add 700DE RRUS-E2 & AWS RRUS-32 B66 both up top on new hex port pos. 4. Add 850 RRUS-12 up top on Octo port pos. 2. Replace existing PCS RRUS-12/A2 with RRUS-32 B2 up top also existing Octo port on Position 2. Add new fiber DC squid. Replace 2X DUS with 2X 5216 add 2nd XMU & add IDLe.						
Local Market Note 2	Note Antenna spacing						
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 2	PORT 2	170551.B.850.4G.tmp1	170551.B.850.4G.1	CTL00968_8B_1	CTL00968_8B_1	TxRx/TxRx	LTE 850	H4_719MHz_04DT	12.7	170	4	TOP	FBER	0	0			No		1475.71			
	PORT 3	170551.B.1900.4G.tmp4	170551.B.1900.4G.1	CTL00968_9B_1	CTL00968_9B_1	TxRx/TxRx	LTE 1900	H4_1930MHz_04DT	16	170	4	TOP	FBER	0	0			No		4842.06			
ANTENNA POSITION 4	PORT 1	170551.B.700.4G.tmp4	170551.B.700.4G.2	CTL00968_7B_2_E	CTL00968_7B_2_E	TxRx/TxRx	LTE 700	1D65A_722MHz_06DT	15.8	170	6	TOP	FBER	0	0			No		1475.71			
	PORT 3	170551.B.AWS.4G.tmp4	170551.B.2100.4G.1	CTL00968_2B_1	CTL00968_2B_1	TxRx/TxRx	LTE AWS	1D65A_2130MHz_04DT	16.7	170	4	TOP	FBER	0	0			No		4842.06			

Section 16C - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
Existing Antenna?														
ANTENNA MAKE - MODEL							SBNHH-1D65A							
ANTENNA VENDOR							Andrew							
ANTENNA SIZE (H x W x D)							55X11.9X7.1							
ANTENNA WEIGHT							33.5							
AZIMUTH							300							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)							98							
ANTENNA TIP HEIGHT							100							
MECHANICAL DOWNTILT			0				0							
FEEDER AMOUNT														
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)								Built in						
SURGE ARRESTOR (QTY/MODEL)							1	Fiber DC Squid						
DIPLEXER (QTY/MODEL)														
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				RRH Controlled				RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)														
CURRENT INJECTORS FOR TMA (QTY/MODEL)														
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
REPEATER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-E2						
RRH - 850 band (QTY/MODEL)			1	RRUS-12										
RRH - 1900 band (QTY/MODEL)			1	RRUS-32 B2										
RRH - AWS band (QTY/MODEL)							1	RRUS-32 B66						
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	Add 4' Hex port position 4. Add 700DE RRUS-E2 & AWS RRUS-32 B66 both up top on new hex port pos. 4. Add 850 RRUS-12 up top on Octo port pos. 2. Replace existing PCS RRUS-12/A2 with RRUS-32 B2 up top also existing Octo port on Position 2. Add new fiber DC squid. Replace 2X DUS with 2X 5216 add 2nd XMU & add IDLe.													
Local Market Note 2	Note Antenna spacing													
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 2	PORT 2	170551.C.850.4G.tmp1	170551.C.850.4G.1	CTL00968_8C_1	CTL00968_8C_1	TxRx/TxRx	LTE 850	H4_719MHz_04DT	12.7	300	4	TOP	FIBER	0	0			No		1475.71			
	PORT 3	170551.C.1900.4G.tmp4	170551.C.1900.4G.1	CTL00968_9C_1	CTL00968_9C_1	TxRx/TxRx	LTE 1900	H4_1930MHz_04DT	16	300	4	TOP	FIBER	0	0			No		4842.06			
ANTENNA POSITION 4	PORT 1	170551.C.700.4G.tmp4	170551.C.700.4G.2	CTL00968_7C_2_E	CTL00968_7C_2_E	TxRx/TxRx	LTE 700	1D65A_722MHz_06DT	15.8	300	6	TOP	FIBER	0	0			No		1475.71			
	PORT 3	170551.C.AWS.4G.tmp4	170551.C.2100.4G.1	CTL00968_2C_1	CTL00968_2C_1	TxRx/TxRx	LTE AWS	1D65A_2130MHz_04DT	16.7	300	4	TOP	FIBER	0	0			No		4842.06			

Section 16.5A - SCOPING TOWER CONFIGURATION - SECTOR A (OR OMNI)

Section 17A - FINAL TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	OPA-65R-LCUU-H4		OPA-65R-LCUU-H4				SBNHH-1D65A							
ANTENNA VENDOR	CCI Products		CCI Products				Andrew							
ANTENNA SIZE (H x W x D)	48X15X7		48X15X7				55X11.9X7.1							
ANTENNA WEIGHT	57		57				33.5							
AZIMUTH	60		60				60							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	98		98				98							
ANTENNA TIP HEIGHT	100		100				100							
MECHANICAL DOWNTILT	0		0				0							
FEEDER AMOUNT														
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Built-In		Built-In				Built in						
SURGE ARRESTOR (QTY/MODEL)	1	FIBER DC SQUID	1	FIBER DC SQUID			1	Fiber DC Squid						
DIPLEXER (QTY/MODEL)														
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein 860 10006		RRH Controlled				RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)														
CURRENT INJECTORS FOR TMA (QTY/MODEL)														
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
REPEATER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-11			1	RRUS-E2						
RRH - 850 band (QTY/MODEL)	1	RRUS-11	1	RRUS-12										
RRH - 1900 band (QTY/MODEL)			1	RRUS-32 B2										
RRH - AWS band (QTY/MODEL)							1	RRUS-32 B66						
RRH - WCS band (QTY/MODEL)	1	RRUS-32												
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	Add 4' Hex port position 4. Add 700DE RRUS-E2 & AWS RRUS-32 B66 both up top on new hex port pos. 4. Add 850 RRUS-12 up top on Octo port pos. 2. Replace existing PCS RRUS-12/A2 with RRUS-32 B2 up top also existing Octo port on Position 2. Add new fiber DC squid. Replace 2X DUS with 2X 5216 add 2nd XMU & add IDLe.													
Local Market Note 2	Note Antenna spacing													
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	**PORT 1**	170551.A.850.3G.1	170551.A.850.3G.1	CTV09681	CTV09681	TxRx/TxRx	UMTS 850	H4_849MHz_04DT	13.3	60	4	TOP	FIBER	0	0			No		309			
	PORT 3	170551.A.WCS.4G.1	170551.A.2300.4G.1	CTL00968_3A_1	CTL00968_3A_1	TxRx/TxRx	LTE WCS	H4_2350MHz_04DT	17.1	60	4	TOP	FIBER	0	0			No		4842.058			
ANTENNA POSITION 2	**PORT 1**	170551.A.700.4G.1	170551.A.700.4G.1	CTL00968_7A_1	CTL00968_7A_1	TxRx/TxRx	LTE 700	H4_719MHz_04DT	12.7	60	4	TOP	FIBER	0	0			No		1475.7065			
	PORT 2	170551.A.850.4G.tmp1	170551.A.850.4G.1	CTL01968_8A_1	CTL01968_8A_1	TxRx/TxRx	LTE 850	H4_719MHz_04DT	12.7	60	4	TOP	FIBER	0	0			No		1475.7065		5	

	PORT 3	G.1, 170551.A.1900.4	170551.A.1900.4 G.1	CTL00968_9A_1	CTL00968_9A_1	TxRx/TxRx	LTE 1900	H4_1930MHz_04 DT	16	60	4	TOP	FIBER	0	0			No		4842.058		6	
ANTENNA POSITION 4	PORT 1	170551.A.700.4 G.tmp4	170551.A.700.4 G.2	CTL01968_7A_2 _E	CTL01968_7A_2 _E	TxRx/TxRx	LTE 700	1D65A_722MHz _06DT	15.8	60	6	TOP	FIBER	0	0			No		1475.71			
	PORT 3	170551.A.AWS.4 G.tmp4	170551.A.2100.4 G.1	CTL01968_2A_1	CTL01968_2A_1	TxRx/TxRx	LTE AWS	1D65A_2130MH z_04DT	16.7	60	4	TOP	FIBER	0	0			No		4842.06			

Section 17B - FINAL TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	OPA-65R-LCUU-H4		OPA-65R-LCUU-H4				SBNHH-1D65A							
ANTENNA VENDOR	CCI Products		CCI Products				Andrew							
ANTENNA SIZE (H x W x D)	48X15X7		48X15X7				55X11.9X7.1							
ANTENNA WEIGHT	57		57				33.5							
AZIMUTH	170		170				170							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	98		98				98							
ANTENNA TIP HEIGHT	100		100				100							
MECHANICAL DOWNTILT	0		0				0							
FEEDER AMOUNT														
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Built-In		Built-In				Built in						
SURGE ARRESTOR (QTY/MODEL)	1	FIBER DC SQUID	1	FIBER DC SQUID			1	Fiber DC Squid						
DIPLEXER (QTY/MODEL)														
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		Kathrein 860 10006		RRH Controlled				RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)														
CURRENT INJECTORS FOR TMA (QTY/MODEL)														
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
REPEATER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-11			1	RRUS-E2						
RRH - 850 band (QTY/MODEL)	1	RRUS-11	1	RRUS-12										
RRH - 1900 band (QTY/MODEL)			1	RRUS-32 B2										
RRH - AWS band (QTY/MODEL)							1	RRUS-32 B66						
RRH - WCS band (QTY/MODEL)	1	RRUS-32												
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	Add 4' Hex port position 4. Add 700DE RRUS-E2 & AWS RRUS-32 B66 both up top on new hex port pos. 4. Add 850 RRUS-12 up top on Octo port pos. 2. Replace existing PCS RRUS-12/A2 with RRUS-32 B2 up top also existing Octo port on Position 2. Add new fiber DC squid. Replace 2X DUS with 2X 5216 add 2nd XMU & add IDLe.													
Local Market Note 2	Note Antenna spacing													
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1	170551.B.850.3G.1	170551.B.850.3G.1	CTV09682	CTV09682	TxRx/TxRx	UMTS 850	H4_849MHz_04DT	13.3	170	4	TOP	FIBER	0	0			No		300			
	PORT 3	170551.B.WCS.4G.1	170551.B.2300.4G.1	CTL00968_3B_1	CTL00968_3B_1	TxRx/TxRx	LTE WCS	H4_2350MHz_04DT	17.1	170	4	TOP	FIBER	0	0			No		1475.71			
ANTENNA POSITION 2	PORT 1	170551.B.700.4G.1	170551.B.700.4G.1	CTL00968_7B_1	CTL00968_7B_1	TxRx/TxRx	LTE 700	H4_719MHz_04DT	12.7	170	4	TOP	FIBER	0	0			No		1475.71			
	PORT 2	170551.B.850.4G.tmp1	170551.B.850.4G.1	CTL01968_8B_1	CTL01968_8B_1	TxRx/TxRx	LTE 850	H4_719MHz_04DT	12.7	170	4	TOP	FIBER	0	0			No		1475.71			
	PORT 3	G.1, 170551.B.1900.4G.1	170551.B.1900.4G.1	CTL00968_9B_1	CTL00968_9B_1	TxRx/TxRx	LTE 1900	H4_1930MHz_04DT	16	170	4	TOP	FIBER	0	0			No		4842.06			

ANTENNA POSITION 4	PORT 1	170551.B.700.4G.tmp4	170551.B.700.4G.2	CTL01968_7B_2_E	CTL01968_7B_2_E	TxRx/TxRx	LTE 700	1D65A_722MHz_06DT	15.8	170	6	TOP	FIBER	0	0			No		1475.71			
	PORT 3	170551.B.AWS.4G.tmp4	170551.B.2100.4G.1	CTL01968_2B_1	CTL01968_2B_1	TxRx/TxRx	LTE AWS	1D65A_2130MHz_04DT	16.7	170	4	TOP	FIBER	0	0			No		4842.06			

Section 17C - FINAL TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	OPA-65R-LCUU-H4		OPA-65R-LCUU-H4				SBNHH-1D65A							
ANTENNA VENDOR	CCI Products		CCI Products				Andrew							
ANTENNA SIZE (H x W x D)	48X15X7		48X15X7				55X11.9X7.1							
ANTENNA WEIGHT	57		57				33.5							
AZIMUTH	300		300				300							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	98		98				98							
ANTENNA TIP HEIGHT	100		100				100							
MECHANICAL DOWNTILT	0		0				0							
FEEDER AMOUNT														
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)		Built-In		Built-In				Built in						
SURGE ARRESTOR (QTY/MODEL)	1	FIBER DC SQUID	1	FIBER DC SQUID			1	Fiber DC Squid						
DIPLEXER (QTY/MODEL)														
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)		Kathrein 860 10006		RRH Controlled				RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)														
CURRENT INJECTORS FOR TMA (QTY/MODEL)														
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
REPEATER (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-11			1	RRUS-E2						
RRH - 850 band (QTY/MODEL)	1	RRUS-11	1	RRUS-12										
RRH - 1900 band (QTY/MODEL)			1	RRUS-32 B2										
RRH - AWS band (QTY/MODEL)							1	RRUS-32 B66						
RRH - WCS band (QTY/MODEL)	1	RRUS-32												
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	Add 4' Hex port position 4. Add 700DE RRUS-E2 & AWS RRUS-32 B66 both up top on new hex port pos. 4. Add 850 RRUS-12 up top on Octo port pos. 2. Replace existing PCS RRUS-12/A2 with RRUS-32 B2 up top also existing Octo port on Position 2. Add new fiber DC squid. Replace 2X DUS with 2X 5216 add 2nd XMU & add IDLe.													
Local Market Note 2	Note Antenna spacing													
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	**PORT 1**	170551.C.850.3G.1	170551.C.850.3G.1	CTV09683	CTV09683	TxRx/TxRx	UMTS 850	H4_849MHz_02DT	13.3	300	2	TOP	FIBER	0	0			No		300			
	PORT 3	170551.C.WCS.4G.1	170551.C.2100.4G.1	CTL00968_3C_1	CTL00968_3C_1	TxRx/TxRx	LTE WCS	H4_2350MHz_02DT	17.1	300	2	TOP	FIBER	0	0			No		4842.06			
ANTENNA POSITION 2	**PORT 1**	170551.C.700.4G.1	170551.C.700.4G.1	CTL00968_7C_1	CTL00968_7C_1	TxRx/TxRx	LTE 700	H4_719MHz_02DT	12.7	300	2	TOP	FIBER	0	0			No		1475.71			
	PORT 2	170551.C.850.4G.tmp1	170551.C.850.4G.1	CTL01968_8C_1	CTL01968_8C_1	TxRx/TxRx	LTE 850	H4_719MHz_04DT	12.7	300	4	TOP	FIBER	0	0			No		1475.71			
	PORT 3	G.1, 170551.C.1900.4G.1	170551.C.1900.4G.1	CTL00968_9C_1	CTL00968_9C_1	TxRx/TxRx	LTE 1900	H4_1930MHz_04DT	16	300	4	TOP	FIBER	0	0			No		4842.06			

ANTENNA POSITION 4	**PORT 1**	170551.C.700.4G.tmp4	170551.C.700.4G.2	CTL01968_7C_2_E	CTL01968_7C_2_E	TxRx/TxRx	LTE 700	1D65A_722MHz_06DT	15.8	300	6	TOP	FIBER	0	0			No		1475.71			
	PORT 3	170551.C.AWS.4G.tmp4	170551.C.2100.4G.1	CTL01968_2C_1	CTL01968_2C_1	TxRx/TxRx	LTE AWS	1D65A_2130MHz_04DT	16.7	300	4	TOP	FIBER	0	0			No		4842.06			

Product Specifications

COMMSCOPE®

POWERED BY ANDREW

SBNHH-1D65A

Andrew® Tri-band Antenna, 698–896 and 2x 1695–2360 MHz, 65° horizontal beamwidth, internal RET. Both high bands share the same electrical tilt.

- Interleaved dipole technology providing for attractive, low wind load mechanical package

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2180	2300–2360
Gain, dBi	13.6	13.7	16.5	16.9	17.1	17.6
Beamwidth, Horizontal, degrees	66	61	70	65	62	61
Beamwidth, Vertical, degrees	17.6	15.9	7.1	6.6	6.2	5.5
Beam Tilt, degrees	0–18	0–18	0–10	0–10	0–10	0–10
USLS, dB	16	13	13	13	12	12
Front-to-Back Ratio at 180°, dB	25	27	28	28	27	29
CPR at Boresight, dB	20	16	20	23	17	20
CPR at Sector, dB	10	5	11	6	1	4
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2180	2300–2360
Gain by all Beam Tilts, average, dBi	13.1	13.1	16.1	16.5	16.7	17.2
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.5	±0.5	±0.3	±0.5	±0.4
	0 ° | 13.4	0 ° | 13.4	0 ° | 16.0	0 ° | 16.3	0 ° | 16.5	0 ° | 17.0
Gain by Beam Tilt, average, dBi	9 ° | 13.1	9 ° | 13.1	5 ° | 16.2	5 ° | 16.5	5 ° | 16.8	5 ° | 17.3
	18 ° | 12.7	18 ° | 12.7	10 ° | 16.1	10 ° | 16.5	10 ° | 16.6	10 ° | 16.9
Beamwidth, Horizontal Tolerance, degrees	±3.1	±5.4	±2.8	±4	±6.6	±4.6
Beamwidth, Vertical Tolerance, degrees	±1.8	±1.4	±0.3	±0.4	±0.5	±0.3
USLS, dB	15	14	15	15	15	14
Front-to-Back Total Power at 180° ± 30°, dB	22	21	26	26	24	25
CPR at Boresight, dB	22	16	22	25	21	22
CPR at Sector, dB	10	6	12	8	5	4

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® multiband with internal RET
Band	Multiband
Brand	DualPol® | Teletilt®
Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz

Product Specifications

SBNHH-1D65A

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, maximum	445.0 N @ 150 km/h 100.0 lbf @ 150 km/h
Wind Speed, maximum	241.4 km/h | 150.0 mph

Dimensions

Depth	180.0 mm | 7.1 in
Length	1409.0 mm | 55.5 in
Width	301.0 mm | 11.9 in
Net Weight	15.2 kg | 33.5 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	13.0 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male
RET System	Teletilt®

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

BSAMNT-1 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.