NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
199 Brickyard Rd Farmington, CT 06032
860-209-4690
denise@northeastsitesolutions.com

June 7, 2017

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
900 Longbrook Road, Stratford CT 06614
Latitude: 41.20177000
Longitude: -73.12885000
T-Mobile Site#: CT11872D_L1900

Dear Ms. Bachman:

T-Mobile is requesting to file an exempt modification for an existing 82-foot guyed tower located at 900 Longbrook Road, Stratford CT 06614. T-Mobile currently maintains nine (9) antennas at the 74-foot level of the existing 82-foot tower. The guyed tower is owned by the Town of Stratford. The property is owned by Town of Stratford –Police Station. T-Mobile now intends to replace three (3) existing antenna with three (3) new 1900/2100 MHz antenna. The new antennas would be installed at the 74-foot and level of the tower.

Planned Modifications:

Remove:
NONE

Remove and Replace:
(3) AIR21 Antenna **(Remove) –** (3) AIR32DB B66Aa B2a Antenna **(Replace)**

Install New:
(1) 1-5/8" Hybrid

Existing to Remain:
(24) 7/8" Coax
(1) 1-5/8" Hybrid
(3) RRU
(3) Commscope LNX6515DS Antenna
(3) AIR21 Antenna
(3) TMA

This facility was approved by the Town of Stratford PZC – Dated August 16, 2005. Please see attached.

NORTHEAST SITE SOLUTIONS

Turnkey Wireless Development

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mayor John A Harkins, Elected Official for the Town of Stratford and John Rusatsky, Town Zoning Enforcement Officer as well as the property owner and the tower owner.

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

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

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

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

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

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

6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Denise Sabo
Mobile: 860-209-4690
Fax: 413-521-0558
Office: 199 Brickyard Rd, Farmington, CT 06032
Email: denise@northeastsitesolutions.com

Attachments
cc: John A. Harkins- Mayor - as elected official
John Rusatsky- Zoning Enforcement Officer
Town of Stratford- Town Manger- as tower owner
Town of Stratford –Police Dept. - as property owner

Exhibit A

TOWN OF STRATFORD

ZONING-SPECIAL EXCEPTION OR VARIANCE, RECORDING, GEN. STATUTES

1. NAME OF RECORD OWNER Town of Stratford / Police Bldg.

   NAME OF APPLICANT (IF OTHER THAN OWNER) *Omnipoint Facilities Network 2 LLC*

2. DESCRIPTION OF PREMISES

   A. Street Address 900 Longbrook Ave.

   B. Lot No. 4.193 AC N/S *Name of record* N/S

   C. Description of Property (If lot number is not available)

DEED REFERENCE – VOLUME 437 Page 504 Zone RS-4

3. NATURE OF VARIANCE

NATURE OF SPECIAL CASE/SPECIAL EXCEPT to install telecommunication antennas & eqip.

NATURE OF ADMINISTRATIVE APPROVAL

4. BY-LAW, ORDINANCE OR REGULATION WHICH IS VARIED OR APPROVAL

   GRANTED HEREUNDER – Section 3.28.2 & 20 of the Zoning Regulations.

   CONDITIONS ATTACHED TO DECISION NO

* All new owners of accessory or affordable residential apartments approve under Section 4.1.6.14 of the Zoning Regulations shall notify the Zoning Office within 60 days of the sale of their intention to continue the accessory residential use.

5. DATE OF PUBLIC HEARING/ADMINISTRATIVE SESSION 8/16/05

6. DATE OF DECISION 8/16/05 DATE OF PUBLICATION 8/23/05

7. APPROVED BY: BOARD OF ZONING APPEALS
   ZONING COMMISSION
   SECRETARY/PLANNING & ZONING ADMINISTRATOR

   DATE 8/29/05

NOTE: In accordance with Section 20.3 and /or 21.2 of the Zoning Regulations of the Town of Stratford, if a building permit is not obtained within eighteen months from the date of decision, this approval is null and void.

Received for record _____ at _____ ATTEST _____

TOWN OF STRATFORD

CONNECTICUT
06615

ZONING COMMISSION
2725 MAIN STREET
STRATFORD, CT 06615
203-385-4017

August 19, 2005

Omnipoint Facilities Network 2 LLC
C/o Jennifer Young Gaudet
100 Filley St.
Bloomfield, CT 06002

Re: 900 Longbrook Ave. – Petition of Omnipoint Facilities Network 2 LLC

Dear Sir:

This is to officially notify you that at a meeting of the Zoning Commission held August 16, 2005 it was voted to grant your petition, for approval of a Special Case under Sections 3.28.2 and 20 of the Zoning Regulations in order to install telecommunication antennas and equipment on property located in an RS-4 District.

In accordance with the State Statutes the appeal period will expire on September 8, 2005.

If a building permit is not obtained within eighteen months this approval shall be considered null and void.

Regards,

GARY LORENTSON
Planning & Zoning Administrator
ZONING COMMISSION
GL/ej

Exhibit B

TOWN OF STRATFORD

Recent Sales in Neighborhood | Previous Parcel | Next Parcel | Field Definitions | Return to Main Search | Stratford Home

Owner and Parcel Information

Owner Name	TOWN OF STRATFORD POLICE STATION	**Today's Date**	May 8, 2017
Mailing Address	900 LONGBROOK AVE	**Account #**	0991600
	STRATFORD, CT 06615-5007		
Location Address	900 LONGBROOK AVE	**Census Tract**	0808
Map / Block / Lot	40 /11 / 12 / 8/ Dev Lot: 4.193 ACRES N/S	**Acreage**	4.46
Use Class / Description	931 Police Dept	**Parcel Map**	Show Parcel Map Owner List By Radius

Current Appraised Value Information

Building Value	OB Value	Land Value	Special Land Value	Total Appraised Value	Net Appraised Value	Current Assessment
No Appraisal Information available for this parcel						

Assessment History

Year	Building	OB/Misc	Land	Total Assessment
2016	$ 2,700,600	$ 134,610	$ 691,320	$ 3,526,530
2015	$ 2,700,600	$ 134,610	$ 691,320	$ 3,526,530

Land Information

Use	Class	Zoning	Area	Value
Police Dept	E	RS-4	3 AC	$ 900,000
Police Dept	E		1.46 AC	$ 87,600

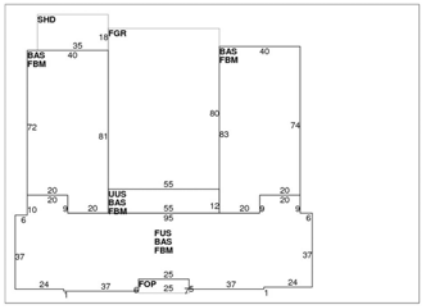
Commercial Building Information

Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
Police Station	1969	1988	37,069	2.00	B	Brick Veneer	Drywall/Sheet	10	1
Roof Cover	**Roof Structure**	**Floor Type**	**Heat Type**	**Heat Fuel**	**AC Type**	**Sprinkler**	**Construction**	**Plumbing**	**Comm Walls**
Built Up	Flat	Quarry Tile	Gas	Forced Air-Duc	Heat/AC Split	%	Masonry	Average	0%

Building Sub Areas

Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	12,688	12,688	
FBM	Finished Basement	12,688	12,688	
FGR	Garage	0	4,400	
FOP	Finished Open Porch	0	175	
FUS	Finished Upper Story	5,828	5,828	
SHD	Shed	0	630	
UUS	Unfin Upper Story	0	660	
	Totals	**31,204**	**37,069**	**29,721**

Building Sketch Enlarge



Building Photo Enlarge

Out Buildings / Extra Features

Description	Sub Description	Area	Year Built	Value
Paving	Asphalt	20,000 S.F.	1969	$ 16,500
Shed	Frame	180 S.F.	1969	$ 1,300
Gas Canopy		816 S.F.	1987	$ 20,800
Elevator, Pass		1 Units	1987	$ 50,900
Cell Tower - Pole		1 Units	2006	$ 174,500

Sale Information

Sale Date	Sale Price	Deed Book/Page	Sale Qualification	Reason	Vacant or Improved	Owner
01/02/1968		0437/0504	Unqualified	WD	Improved	TOWN OF STRATFORD POLICE STATION

Permit Information

Permit ID	Issue Date	Type	Description	Amount	Inspection Date	% Complete	Date Complete	Comments
21688	09/08/2015	EL	Electrical Per	$ 2,000		100		RELOCATE SERVICE
21745	10/01/2014	BP	Building Permi	$ 15,000		100		1 ANTENNA TRANSCEND WIRELESS
20439	01/28/2014	EL	Electrical Per	$ 51,500		100		NEW ALARM SYS
20343	12/07/2012	BP	Building Permi	$ 216,000		100		RENOV LOCKER RM, FITNESS RM
20232	11/27/2012	EL	Electrical Per	$ 119,000		100		RENOVATIONS

Reports

Parcel

View as: Google Earth | Bird's Eye | Google Maps & Street View

Selected Parcel	0991600 (Click for Card)
Property Class	931
Taxing District	(16)
Acreage	4.46
Physical Address	900 LONGBROOK AVE
Owner	TOWN OF STRATFORD POLICE STATION 900 LONGBROOK AVE STRATFORD, CT 06615-5007
Land Value	$ 987,600
Improvement Value	$ 3,786,300
Accessory Value	$ 71,700
Total Value	$ 5,037,900
Improvements on Parcel	1
Total Improvement Area (sq ft)	37,069

Two most recent parcel sales

Date	Price	Qual	Reason
01/02/1968		U	WD

Website last updated May 7, 2017
GIS Maps last updated December 04, 2014

19493	07/30/2012	EL	Electrical Per	$ 159,190		100		INSTL GENERATOR
20079	07/27/2012	BP	Building Permi	$ 5,000		100		REPL 6 ANTENNAS
19371	05/09/2012	EL	Electrical Per	$ 98,500		100		WIRE BOILER
19559	10/24/2011	BP	Building Permi	$ 74,000		100		31 WINDOW REPL
13564	02/26/2009	EL	Electrical Per	$ 10,000		100		ELECTRICAL
17754	01/20/2009	BP	Building Permi	$ 233,741		100		TANK REMOV/INSTALL
12030	05/08/2006	EL	Electrical Per	$ 2,000		100		INSTALL SERVICE ON STORAGE SHED IN REAR
11770	11/16/2005	EL	Electrical Per	$ 15,000	06/27/2006	100		ELECTRICAL
15095	09/09/2005	BP	Building Permi	$ 105,000	06/27/2006	100		INSTALL NEW ANTENNA
13154	06/11/2003				06/27/2006	100		ADDN $1,645,000

Recent Sales in Neighborhood | Previous Parcel | Next Parcel | Field Definitions | Return to Main Search Page | Stratford Home

Exhibit C

ANTENNA UPGRADES
BY

T-Mobile

T-MOBILE NORTHEAST LLC

SITE NUMBER: CT11872D
SITE NAME: CT872/Stratford PD_GT
SITE ADDRESS: 900 LONGBROOK AVE
STRATFORD, CT 06615
(792DB CONFIGURATION)

PROJECT SCOPE:

T-MOBILE, A WIRELESS TELECOMMUNICATIONS PROVIDER PROPOSES TO UPGRADE THEIR EXISTING FACILITY AS FOLLOWS:

REPLACE (3) EXISTING ANTENNAS AND ADD (1) HYBRID CABLE.

PROJECT NOTES:

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION: HANDICAPPED ACCESS IS NOT REQUIRED. POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED. NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACES THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. DEVELOPMENT AND USE OF THE SITE WILL CONFORM TO ALL APPLICABLE CODES, ORDINANCES AND SPECIFICATIONS.

APPLICABLE STATE ADOPTION CODES:

2016 CONNECTICUT STATE BUILDING CODE (CSBC).

ANSI/TIA-222-G-2005 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

2014 NATIONAL ELECTRICAL CODE (NFPA 70) FOR POWER AND GROUNDING REQUIREMENTS.

SITE IMAGE:

VICINITY MAP:

PROJECT INFORMATION:

ADDRESS:	900 LONGBROOK AVE STRATFORD, CT 06615
STRUCTURE TYPE:	GUY TOWER ON ROOF TOP
ZONING DISTRICT:	RS-4
PARCEL ID:	0991600
COORDINATES:	N 41.20177000 / W 73.12885000
ANTENNA HEIGHT:	74'

PROJECT TEAM:

APPLICANT:	T-MOBILE NORTHEAST, LLC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 860-692-7100
LANDLORD:	TOWN OF STRATFORD POLICE STATION 900 LONGBROOK AVE STRATFORD, CT 06615
PROJECT MANGER:	NORTHEAST SITE SOLUTIONS 420 MAIN STREET, BLDG 4 STURBRIDGE, MA 01566 SHELDON FREINCLE SHELDON@NORTHEASTSITE SOLUTIONS.COM 201-776-8521
CONSULTANTS:	FORESITE LLC 462 WALNUT ST NEWTON, MA 02460 SAEED MOSSAVAT SMOSSAVAT@FORESITELLC.COM 617-212-3123

SHEET INDEX:

APPLICANT:

T-Mobile

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANGER

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

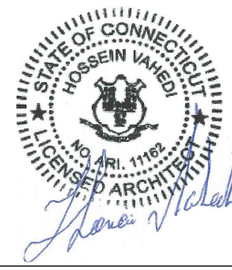
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:

FORESITE LLC
Architects . Engineers . Surveyors

462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL



REV	DESCRIPTION	DATE
A	PRELIMINARY	05/08/17
0	ISSUED FOR PERMITTING	05/18/17

SITE NUMBER: CT11872D
SITE NAME: CT872/STRATFORD PD_GT
SITE ADDRESS: 900 LONGBROOK AVE
STRATFORD, CT 06615

SHEET TITLE:
T-1: TITLE SHEET

NOTES AND DISCLAIMERS:

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.

2. THE ARCHITECT/ENGINEER HAS MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.

3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE CLIENT'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.

4. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.

5. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

6. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS DURING CONSTRUCTION.

7. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE BASIC STATE BUILDING CODE, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJEC

8. THE CONTRACTOR SHALL NOTIFY THE CLIENT'S REPRESENTATIVE IN WRITING WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE CLIENT'S REPRESENTATIVE.

9. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:

A. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS, AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS BUILDING CODES" OR LATEST EDITION.

B. AWS: AMERICAN WELDING SOCIETY INC. AS PUBLISHED IN "STANDARD D1.1-08, STRUCTURAL WELDING CODE" OR LATEST EDITION.

C. AISC: AMERICAN INSTITUTE FOR STEEL CONSTRUCTION AS PUBLISHED IN "CODE FOR STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"; "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" (LATEST EDITION).

10. BOLTING:

A. BOLTS SHALL BE CONFORMING TO ASTM A325 HIGH STRENGTH, HOT DIP GALVANIZED WITH ASTM A153 HEAVY HEX TYPE NUTS.
B. BOLTS SHALL BE 3/4"Ø MINIMUM (UNLESS OTHERWISE NOTED)
C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.

11. FABRICATION:

A. FABRICATION OF STEEL SHALL CONFORM TO THE AISC AND AWS STANDARDS AND CODES (LATEST EDITION).
B. ALL STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 (LATEST EDITION), UNLESS OTHERWISE NOTED.

12. ERECTION OF STEEL:

A. PROVIDE ALL ERECTION EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF THE COMPLETED CONSTRUCTION BUT ARE NECESSARY FOR ITS PROPER ERECTION.
B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISHED LINES AND ELEVATIONS AND RIGIDLY FASTENED IN PLACE WITH SUITABLE ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING.
C. TEMPORARY BRACING, GUYING AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SAFE AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.

13. ANTENNA INSTALLATION:

A. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND CLIENT'S REPRESENTATIVE SPECIFICATIONS.

B. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

C. INSTALL COAXIAL / FIBER CABLES AND TERMINATIONS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS.

14. ANTENNA AND COAXIAL / FIBER CABLE GROUNDING:

A. ALL EXTERIOR #6 GREEN GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH ANDREWS CONNECTOR/SPLICE WEATHERPROOFING KIT TYPE #221213 OR EQUAL.

B. ALL COAXIAL / FIBER CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL / FIBER CABLE (NOT WITHIN BENDS).

15. RELATED WORK, FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO BID:

A. FLASHING OF OPENING INTO OUTSIDE WALLS
B. SEALING AND CAULKING ALL OPENINGS
C. PAINTING
D. CUTTING AND PATCHING

16. REQUIREMENTS OF REGULATORY AGENCIES:

A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE. INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.
B. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, AND SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:
C. TIA-EIA - 222 (LATEST EDITION). STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.
D. FAA - FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460-IH, OBSTRUCTION MARKING AND LIGHTING.
E. FCC - FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES AND FORM 715A, HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES.
F. AISC - AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 BOLTS (LATEST EDITION).
G. NEC - NATIONAL ELECTRICAL CODE - ON TOWER LIGHTING KITS.
H. UL - UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.
I. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.
J. 2009 LIFE SAFETY CODE NFPA - 101.

APPLICANT:
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T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
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860-692-7100

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A	PRELIMINARY	05/08/17
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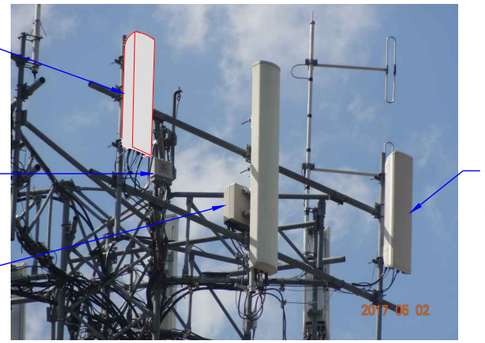
SITE ADDRESS: 900 LONGBROOK AVE
STRATFORD, CT 06615

SHEET TITLE:
N-1: NOTES AND DISCLAIMERS

2 A–2 **PROPOSED ANTENNA REPLACEMENT (TYP 1/SECTOR, 3 TOTAL)**

EXISTING TMA TO REMAIN (TYP 1/SECTOR, 3 TOTAL)

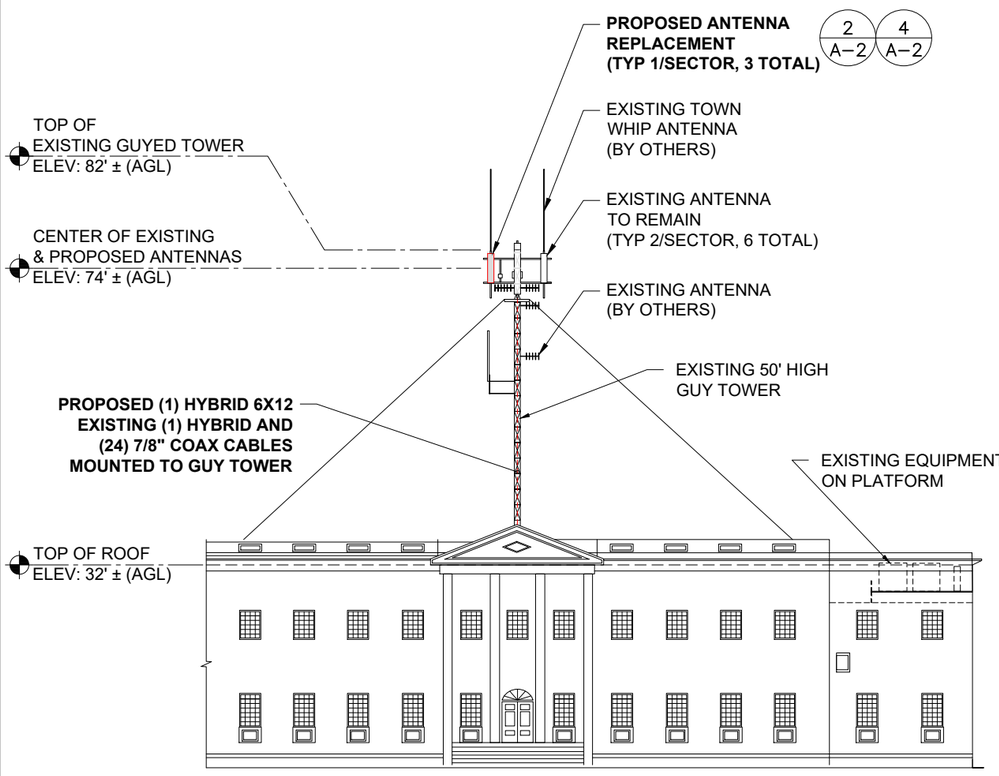
EXISTING RRU TO REMAIN (TYP 1/SECTOR, 3 TOTAL)



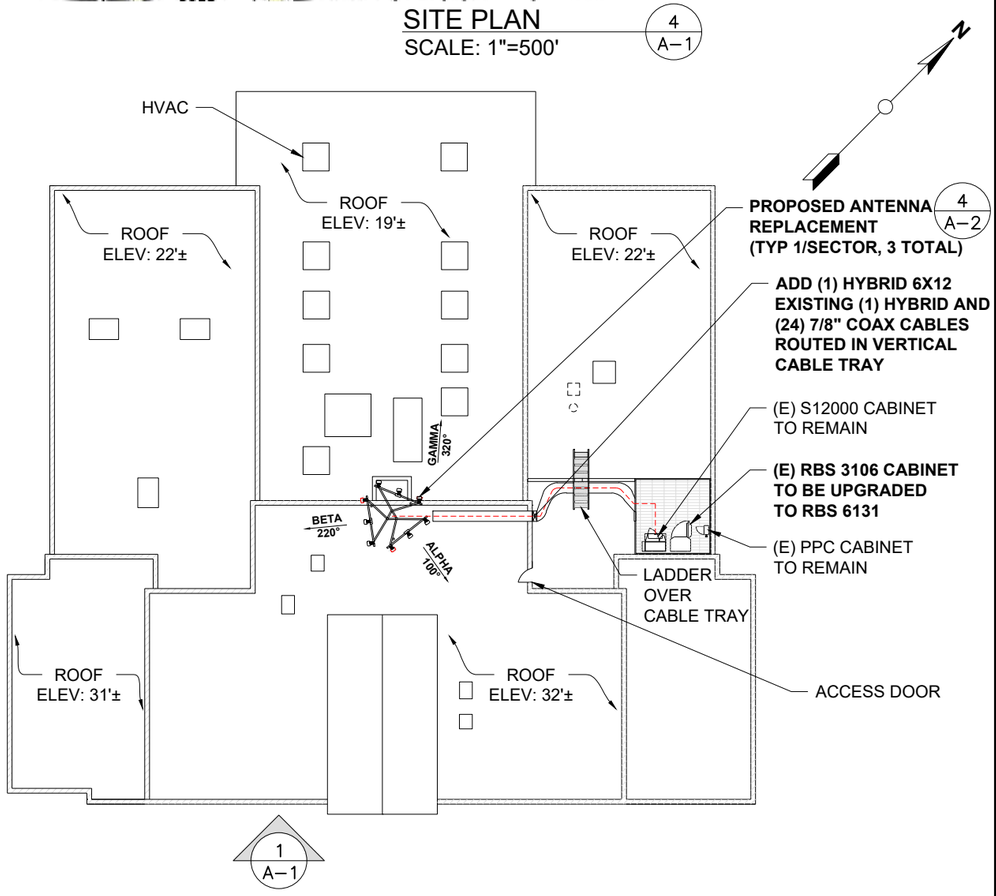
EXISTING ANTENNA TO REMAIN (TYP 2/SECTOR, 6 TOTAL)

ELEVATION PHOTO DETAIL 2 A–1
SCALE: N.T.S

SITE PLAN 4 A–1
SCALE: 1"=500'



ELEVATION 1 A–1
SCALE: 1/2"=1'-0"



1 A–1

ROOF TOP PLAN 3 A–1
SCALE: 3/8"=1'-0"

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANGER
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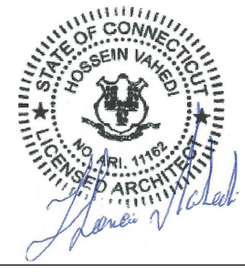
PROFESSIONAL SEAL



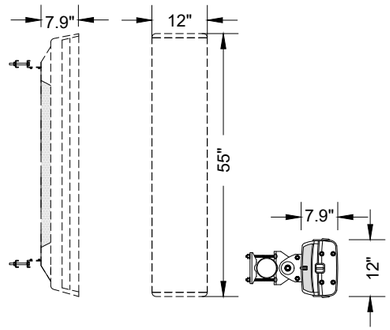
REV	DESCRIPTION	DATE
A	PRELIMINARY	05/08/17
0	ISSUED FOR PERMITTING	05/18/17

SITE NUMBER: CT11872D
SITE NAME: CT872/STRATFORD PD_GT
SITE ADDRESS: 900 LONGBROOK AVE
STRATFORD, CT 06615

SHEET TITLE:
A-1: PLANS AND ELEVATIONS

REMOVE:
(3) ANTENNAS

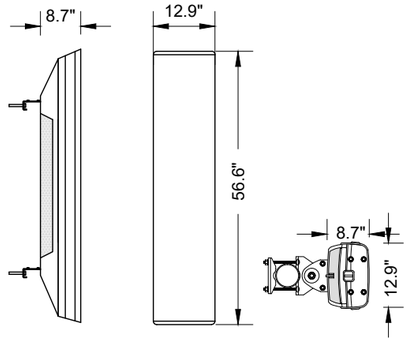
MANUFACTURER:	ERICSSON
MODEL	AIR21 KRC118046-1_B4A-B2P
FOOTPRINT:	55"HX12"WX7.9"D
WEIGHT:	83 LBS
FREQUENCY BAND:	1700-2100 MHZ



ANTENNA TO BE REMOVED (1 / A–2)
SCALE: N.T.S

ADD:
(3) ANTENNAS

MANUFACTURER:	ERICSSON
MODEL	AIR32 KRD901146-1_B66A_B2A
FOOTPRINT:	56.6"HX12.9"WX8.7"D
WEIGHT:	132.2 LBS
FREQUENCY BAND:	1710-2155 MHZ
ANTENNA TYPE:	DUAL BAND
WIND LOADING LATERAL:	300N
WIND LOADING REAR:	660N
WIND LOADING MAXIMUM:	640N



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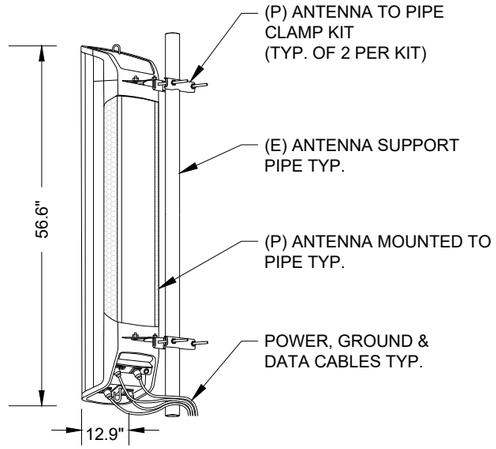

ANTENNA MOUNT DETAILS (3 / A–2)
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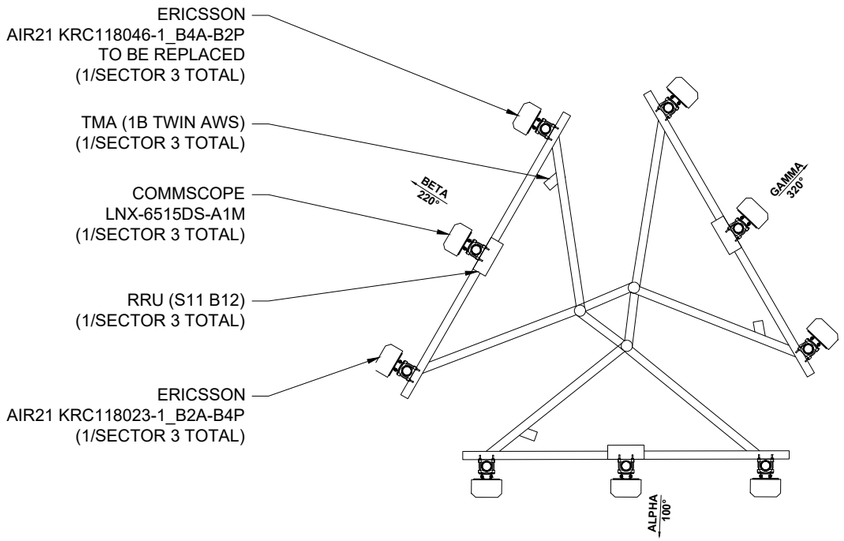
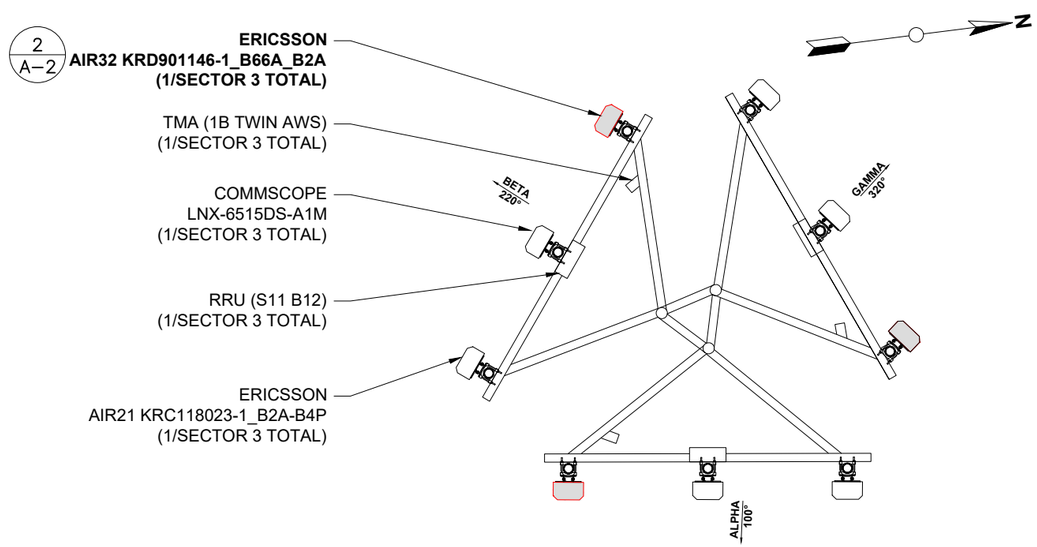


EXISTING



FINAL

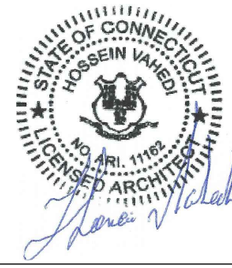
ANTENNA PLAN (4 / A–2)
N.T.S

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANGER
NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL



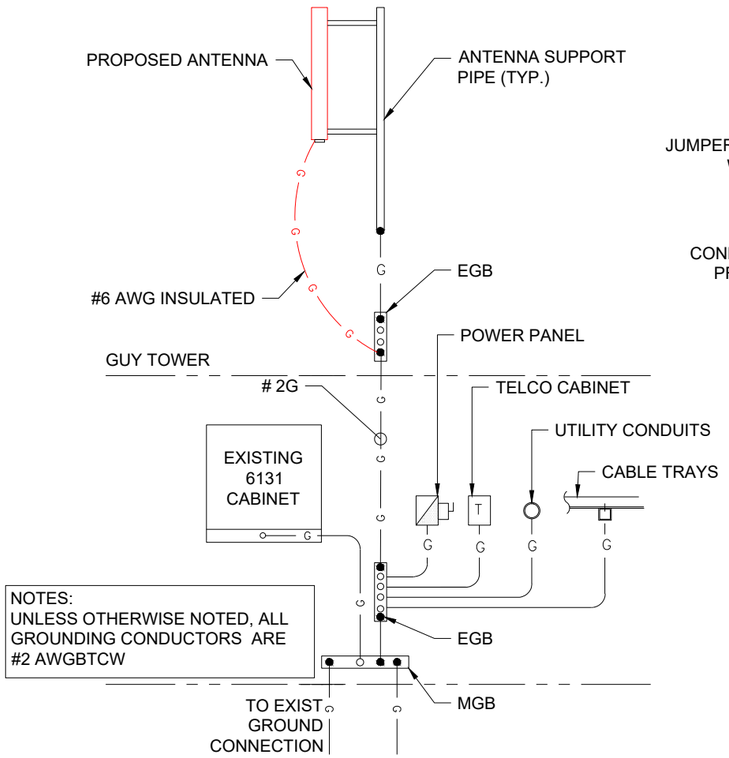
REV	DESCRIPTION	DATE
A	PRELIMINARY	05/08/17
0	ISSUED FOR PERMITTING	05/18/17

SITE NUMBER: CT11872D
SITE NAME: CT872/STRATFORD PD_GT
SITE ADDRESS: 900 LONGBROOK AVE
STRATFORD, CT 06615

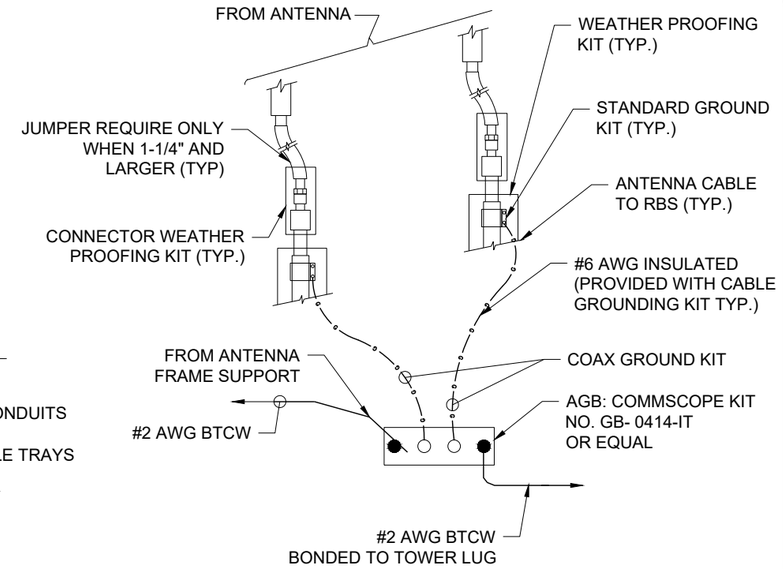
SHEET TITLE:
A-2: ANTENNAS DETAILS

ELECTRICAL & GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PRODUCED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) ND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLING BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE ARE PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELECOM CABINET AND RBS CABINET AS INDICATED ON DRAWING A -1. PROVIDE FULL LENGTH PULL ROPE INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NAME 3R ENCLOSURE.
11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
12. GROUNDING COAX CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURES COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
13. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSTALLATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE GROUND.
14. ALL GROUND CONNECTION TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
15. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AS RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY BOND ANY METER OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
16. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PROCEDURES (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN RBS UNIT).
17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTION.
19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
20 BOND ANTENNA EGB'S AND MGB TO WATER MAIN.
21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
22. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
23. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

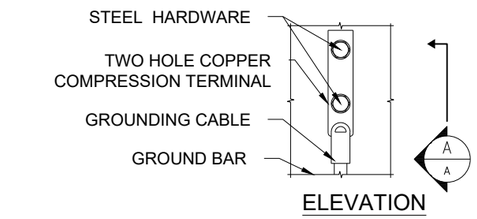


GROUNDING RISER DIAGRAM (1 / E−1)
SCALE: N.T.S

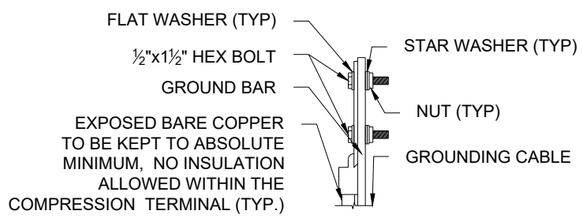


NOTES:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB

TOWER TOP CABLE GROUNDING DETAIL (2 / E−1)
SCALE: N.T.S



ELEVATION

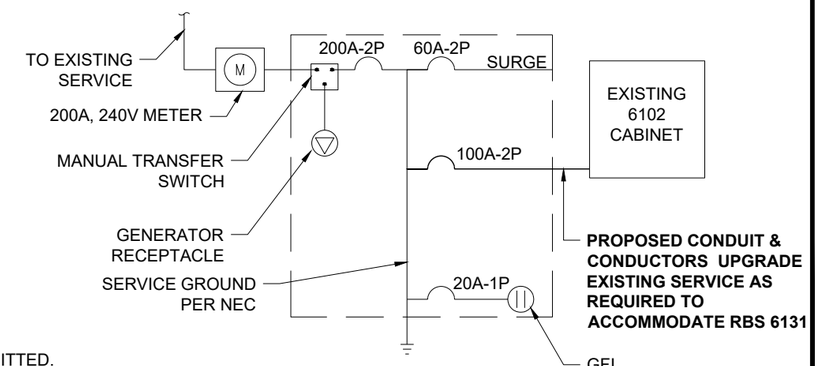


SECTION A-A

NOTES:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR CONNECTIOS DETAIL (3 / E−1)
SCALE: N.T.S

NOTES:
G.C TO VERIFY THAT THE EXISTING CONDUCTS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORKS AS REQUIRED



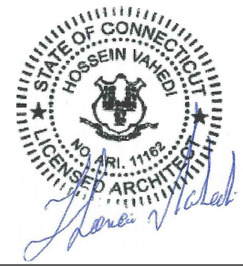
ONE LINE POWER DIAGRAM (4 / E−1)
SCALE: N.T.S

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL



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SITE NAME: CT872/STRATFORD PD_GT
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STRATFORD, CT 06615

SHEET TITLE:
E-1: GROUNDING AND ELECTRICAL DETAILS

Exhibit D

STRUCTURAL ANALYSIS REPORT – REV. 1
GUYED TOWER

Prepared For:

T-Mobile Northeast, LLC
35 Griffin Road South
Bloomfield, CT 06002

Structure Rating

Guyed Tower:	**Pass (50.7%)**

Sincerely,
Destek Engineering, LLC
License No: PEC0001429

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED
PROFESSIONAL ENGINEER

05/09/2017

Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

Site ID: CT11872D
Site Name: CT872/Stratford PD_GT
900 Longbrook Road
Stratford, CT 06614

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

CONTENTS

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

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the existing 50 feet high guyed tower, located at 900 Longbrook Road, Stratford, CT 06614, for the alteration and addition of wireless telecommunication appurtenances proposed by T-Mobile.

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

- RFDS provided by T-Mobile, dated 04/25/2017.
- Structural Analysis Report prepared by Hudson Design Group, LLC, dated 09/12/2014.
- Construction Drawings prepared by Hudson Design Group, LLC, dated 09/15/2014.

1.1 STRUCTURE

The guyed tower is a 50 feet high, triangular based tower which is supported on the roof of a 2-story building. The 3-side tower has a constant width of 3.42 feet from elevation of 82 feet to 37 feet above ground level (AGL) and a tapered base from elevation of 37 feet to 32 feet. The pipe tower legs are X-braced at upper sections and K-braced at lower sections by pipe diagonals. The tower is guyed at 69.8 feet AGL. The guys are anchored at various elevations and distances from the tower. Please refer to the tower elevation drawing in Appendix A for details about the tower geometry, member sizes, etc.

2.0 EXISTING AND PROPOSED APPURTENANCES

Existing Configuration of T-Mobile Appurtenances:

Rad Center (ft.)	Antennas & Equipment	Feedlines	Mount
74	(3) Ericsson AIR21 KRC118023-1_B2A_B4P (3) Andrew LNX-6515DS-A1M (3) Ericsson AIR21 KRC118046-1_B2P_B4A (3) Generic Style 1B – Twin AWS (3) RRUS11 B12	(24) 7/8'' Coax (1) 1-5/8'' Hybrid	T-Frame

Proposed and Final Configuration of T-Mobile Appurtenances:

Rad Center (ft.)	Antennas & Equipment	Feedlines	Mount
74	(3) Ericsson AIR21 KRC118023-1_B2A_B4P (3) Ericsson AIR32 KRD901146-1_B66A_B2A (3) Andrew LNX-6515DS-A1M (3) Generic Style 1B – Twin AWS (3) RRUS11 B12	(24) 7/8'' Coax (1) 1-5/8'' Hybrid + (1) 1-5/8'' Hybrid	T-Frame

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Existing Configuration of Others:

Rad Center (ft.)	Antennas & Equipment	Feedlines	Mount
92	(1) 20’ Omni	(7) 7/8’’ Coax	T-Frame
90	(1) 16’ Omni		T-Frame
80	(1) 6’ Dipole		T-Frame
74	(2) 3’ Yagi		Tower Leg
68	(1) 3’ Yagi		Tower Leg
64	(1) Ground Plane Omni		Side Mount Standoff
62	(1) 3’ Yagi		Tower Leg

3.0 CODES AND LOADING

The tower was analyzed per *TIA-222-G* as referenced by the *2016 Connecticut State Building Code* with all of the adopted Addendums and Supplements. The following wind loading was used:

- Ultimate wind speed 135 mph converted to a Basic wind speed 105 mph without ice (V)
- Basic wind speed 50 mph with 0.75" escalating ice (V_i)
- Exposure Category B
- Topographic Category 1
- Risk Category III

The following load combinations were used with wind blowing at 0^o, 30°, 45°, 60^o, and 90^o, measured from a line normal to the face of the tower:

- $1.2\ D + 1.0\ D_g + 1.6\ W_o$
- $0.9\ D + 1.0\ D_g + 1.6\ W_o$
- $1.2\ D + 1.0\ D_g + 1.0\ D_i + 1.0\ W_i + 1.0\ T_i$

D: Dead load of structures and appurtenances, excluding guy assemblies
D_g: Dead load of guy assemblies
D_i: Weight of ice due to factored ice thickness (based upon ti)
T_i: Load effects due to temperature
W_o: Wind load without ice (based upon V)
W_i: Wind load with ice (based upon V_i)

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

4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

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

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

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

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

5.0 ANALYSIS AND ASSUMPTIONS

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

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

6.0 CONCLUSION AND RESULTS

Based on an analysis per TIA-222-G, the existing tower has **adequate** structural capacity for the proposed changes by T-Mobile. For the code specified load combinations and as a maximum, the guys will be stressed to **50.7%** of capacity. Maximum usage of tower legs and diagonals is 19.5% and 20.5%, respectively.

Information regarding the existing roof structure, base connections and guy connections were not available at the time of this analysis, thus a qualification of those elements could not be completed.

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

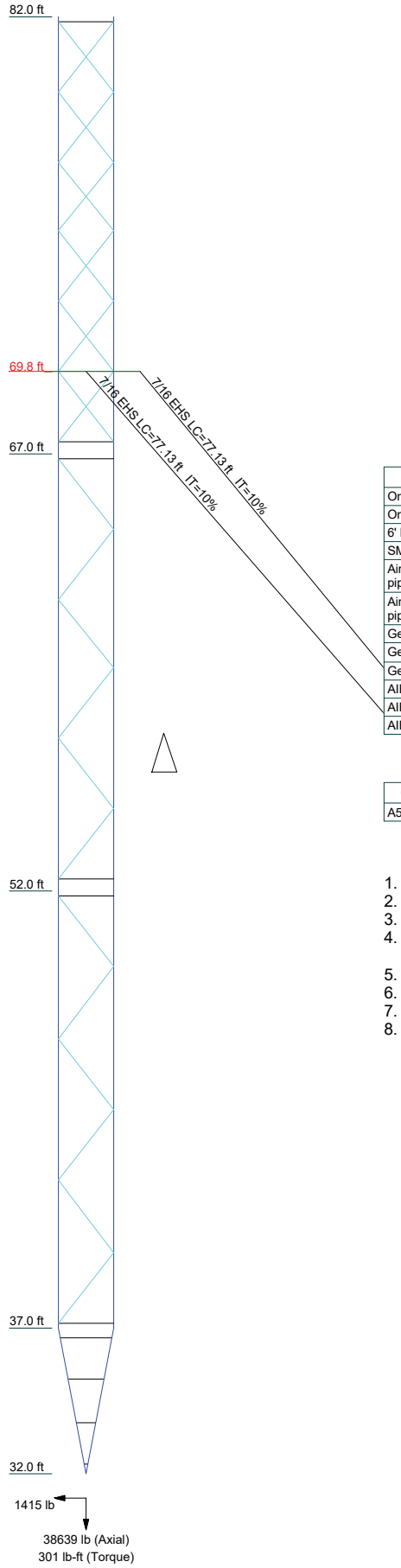
Should you have any questions about this report or require any additional information, please contact Ahmet Colakoglu at (770) 693-0835 or acolakoglu@destekengineering.com.

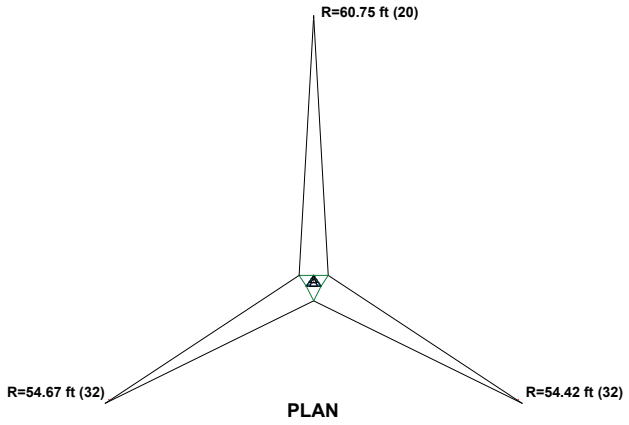
DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Suite 100, Marietta, GA 30066 -Tel: (770) 693-0835

APPENDIX A
SOFTWARE OUTPUT

Section	T1	T2	T3	T4
Legs		P2.5x.276		
Leg Grade		A572-42		
Diagonals		P1.5x.120		N.A.
Diagonal Grade		A36		N.A.
Top Girts		P1.5x.120		L3x3x3/16
Mid Girts		N.A.		L3x3x3/16
Bottom Girts		P1.5x.120		L3x3x3/16
Face Width (ft)	3.42			
# Panels @ (ft)	12 @ 2.40278		6 @ 2.44444	3 @ 1.44444
Weight (lb)	1072.4	514.6	515.4	199.8

2302.1





PLAN

DESIGNED APPURTENANCE LOADING

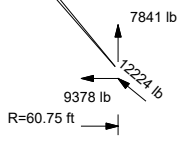
TYPE	ELEVATION	TYPE	ELEVATION
Omni 2-1/2"x20'	82	Generic Style 1B - Twin AWS	74
Omni 2-1/2"x16'	82	Generic Style 1B - Twin AWS	74
6' Dipole	80	Generic Style 1B - Twin AWS	74
SM 409-3	79	Ericsson RRUS-11 B12	74
Air 21 B2A_B4P antenna w/ mount pipe	74	Ericsson RRUS-11 B12	74
		Ericsson RRUS-11 B12	74
Air 21 B2A_B4P antenna w/ mount pipe	74	Air 21 B2A_B4P antenna w/ mount pipe	74
Generic Low-Band Dual Port Antenna	74	3' Yagi antenna	74
Generic Low-Band Dual Port Antenna	74	3' Yagi antenna	74
Generic Low-Band Dual Port Antenna	74	3' Yagi antenna	68
AIR 32 B2a/B66Aa w/ Mount Pipe	74	3' Yagi antenna	62
AIR 32 B2a/B66Aa w/ Mount Pipe	74	Ground Plane Omni	61
AIR 32 B2a/B66Aa w/ Mount Pipe	74	Pirod 6' Side Mount Standoff	61

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-42	42 ksi	60 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 50.7%



ALL REACTIONS ARE FACTORED

DESTEK ENGINEERING

Destek Engineering, LLC
1281 Kennestone Circle, Suite 100
Marietta, GA 30066
Phone: (770) 693-0835
FAX:

Job: *CT11872D - CT872/Stratford PD_GT*			
Project: *1775025*			
Client: T-Mobile	Drawn by: Ahmet Colakoglu	App'd:	
Code: TIA-222-G	Date: 05/09/17	Scale: NTS	
Path: Z:\Projects\2017\75 - Foresite LLC\025 - CT11872D\tnxTower\050917_Rev_1\CT11872D_Rev_1.er		Dwg No. E-1	

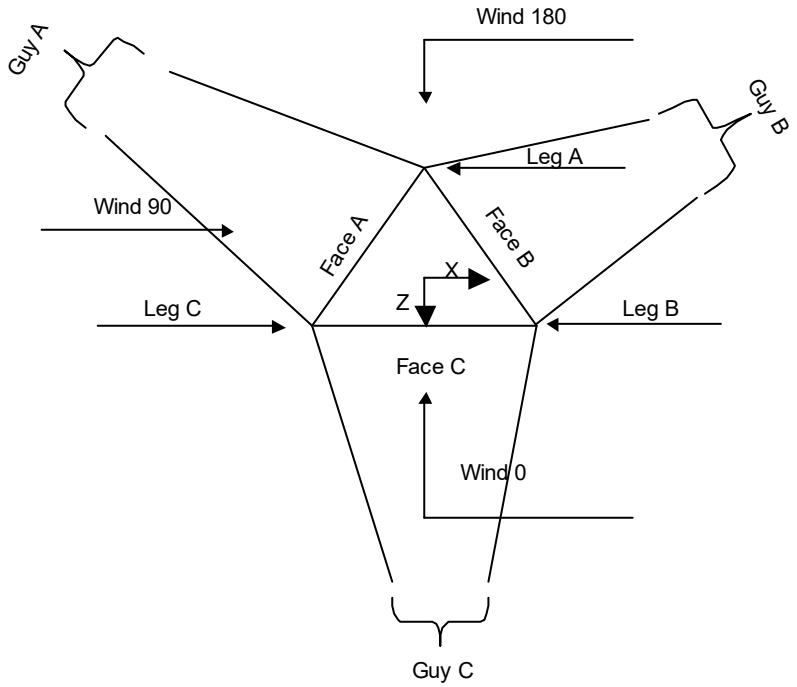
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 82.00 ft above the ground line.
The base of the tower is set at an elevation of 32.00 ft above the ground line.
The face width of the tower is 3.42 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 105 mph.
Structure Class III.
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.
Pressures are calculated at each section.
Safety factor used in guy design is 1.
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				



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	82.00-67.00			3.42	1	15.00
T2	67.00-52.00			3.42	1	15.00
T3	52.00-37.00			3.42	1	15.00
T4	37.00-32.00			3.42	1	5.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	82.00-67.00	2.40	X Brace	No	No	2.0000	5.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T2	67.00-52.00	2.40	K Brace Left	No	No	2.0000	5.0000
T3	52.00-37.00	2.44	K Brace Left	No	No	2.0000	2.0000
T4	37.00-32.00	1.44	X Brace	No	Yes	4.0000	4.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 82.00-67.00	Pipe	P2.5x.276	A572-42 (42 ksi)	Pipe	P1.5x.120	A36 (36 ksi)
T2 67.00-52.00	Pipe	P2.5x.276	A572-42 (42 ksi)	Pipe	P1.5x.120	A36 (36 ksi)
T3 52.00-37.00	Pipe	P2.5x.276	A572-42 (42 ksi)	Pipe	P1.5x.120	A36 (36 ksi)
T4 37.00-32.00	Pipe	P2.5x.276	A572-42 (42 ksi)	Pipe		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 82.00-67.00	Pipe	P1.5x.120	A36 (36 ksi)	Pipe	P1.5x.120	A36 (36 ksi)
T2 67.00-52.00	Pipe	P1.5x.120	A36 (36 ksi)	Pipe	P1.5x.120	A36 (36 ksi)
T3 52.00-37.00	Pipe	P1.5x.120	A36 (36 ksi)	Pipe	P1.5x.120	A36 (36 ksi)
T4 37.00-32.00	Equal Angle	L3x3x3/16	A36 (36 ksi)	Equal Angle	L3x3x3/16	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
T4 37.00-32.00	2	Equal Angle	L3x3x3/16	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 82.00-67.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	0.0000	36.0000
T2 67.00-52.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	0.0000	36.0000
T3 52.00-37.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	0.0000	36.0000
T4 37.00-32.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	0.0000	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	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
82.00-67.00				1	1	1	1	1	1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
67.00-52.00				1	1	1	1	1	1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
52.00-37.00				1	1	1	1	1	1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
37.00-32.00				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 Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 82.00-67.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 67.00-52.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 52.00-37.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 37.00-32.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
69.8194	EHS	A	7/16	2080.00	10%	21000	0.399	77.06	60.75	0.0000	20.00	100%
		B	7/16	2080.00	10%	21000	0.399	64.70	54.42	0.0000	32.00	100%
		C	7/16	2080.00	10%	21000	0.399	64.90	54.67	0.0000	32.00	100%

Guy Data*(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
69.8194	Torque Arm	6.83	0.0000	Channel	A36 (36 ksi)	Channel	C12x20.7

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
69.82	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Flat Bar	

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
69.8194	30.75	25.81	25.89		0.57 1.3 sec/pulse	0.40 1.1 sec/pulse	0.40 1.1 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
69.8194	No	No	1	1	1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
69.8194	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
69.8194	A	44.91	22	4	1.9337
	B	50.91	22	4	1.9581
	C	50.91	22	4	1.9581

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension lb	0 F Intercept ft	20 F Initial Tension lb	20 F Intercept ft	40 F Initial Tension lb	40 F Intercept ft	60 F Initial Tension lb	60 F Intercept ft	80 F Initial Tension lb	80 F Intercept ft	100 F Initial Tension lb	100 F Intercept ft	120 F Initial Tension lb	120 F Intercept ft
69.8194	A	58.88	49.82	2628	0.45	2445	0.48	2262	0.52	2080	0.57	1898	0.62	1718	0.69	1538	0.77
	B	52.56	37.82	2700	0.31	2493	0.33	2286	0.36	2080	0.40	1874	0.44	1669	0.50	1466	0.57
	C	52.81	37.82	2702	0.31	2495	0.34	2287	0.37	2080	0.40	1874	0.45	1668	0.50	1464	0.57

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
7/8	A	No	Ar (CaAa)	61.00 - 32.00	1	1	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	62.00 - 32.00	1	1	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	68.00 - 32.00	1	1	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	74.00 - 32.00	1	1	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	74.00 - 32.00	1	1	1.1100	1.1100		0.54
7/8	A	No	Ar (CaAa)	74.00 - 32.00	24	12	1.1100	1.1100		0.54
1-5/8 Fiber Cable	A	No	Ar (CaAa)	74.00 - 32.00	1	1	1.9800	1.9800		1.04
7/8	A	No	Ar (CaAa)	82.00 - 32.00	2	2	1.1100	1.1100		0.54
Safety Line 3/8	A	No	Ar (CaAa)	82.00 - 32.00	1	1	0.3750	0.3750		0.22
1-5/8 Fiber Cable	A	No	Ar (CaAa)	74.00 - 32.00	1	1	1.9800	1.9800		1.04

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	82.00-67.00	A	0.000	0.000	26.977	0.000	132.88

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	67.00-52.00	A	0.000	0.000	56.896	0.000	279.66
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T3	52.00-37.00	A	0.000	0.000	58.118	0.000	285.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T4	37.00-32.00	A	0.000	0.000	19.372	0.000	95.20
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	82.00-67.00	A	2.034	0.000	0.000	66.526	0.000	1175.35
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	67.00-52.00	A	1.989	0.000	0.000	130.657	0.000	2400.19
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T3	52.00-37.00	A	1.932	0.000	0.000	134.332	0.000	2416.24
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T4	37.00-32.00	A	1.883	0.000	0.000	44.231	0.000	785.06
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	82.00-67.00	-1.7435	-1.0066	-0.8104	-0.4679
T2	67.00-52.00	-2.3099	-1.3336	-1.7291	-0.9983
T3	52.00-37.00	-2.3157	-1.3369	-1.7706	-1.0223
T4	37.00-32.00	-2.2570	-1.3031	-1.2982	-0.7495

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	3	7/8	67.00 - 68.00	0.6000	0.3006
T1	4	7/8	67.00 - 74.00	0.6000	0.3006
T1	5	7/8	67.00 - 74.00	0.6000	0.3006
T1	6	7/8	67.00 - 74.00	0.6000	0.3006

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	7	1-5/8 Fiber Cable	67.00 - 74.00	0.6000	0.3006
T1	8	7/8	67.00 - 82.00	0.6000	0.3006
T1	9	Safety Line 3/8	67.00 - 82.00	0.6000	0.3006
T1	10	1-5/8 Fiber Cable	67.00 - 74.00	0.6000	0.3006
T2	1	7/8	52.00 - 61.00	0.6000	0.4875
T2	2	7/8	52.00 - 62.00	0.6000	0.4875
T2	3	7/8	52.00 - 67.00	0.6000	0.4875
T2	4	7/8	52.00 - 67.00	0.6000	0.4875
T2	5	7/8	52.00 - 67.00	0.6000	0.4875
T2	6	7/8	52.00 - 67.00	0.6000	0.4875
T2	7	1-5/8 Fiber Cable	52.00 - 67.00	0.6000	0.4875
T2	8	7/8	52.00 - 67.00	0.6000	0.4875
T2	9	Safety Line 3/8	52.00 - 67.00	0.6000	0.4875
T2	10	1-5/8 Fiber Cable	52.00 - 67.00	0.6000	0.4875
T3	1	7/8	37.00 - 52.00	0.6000	0.4948
T3	2	7/8	37.00 - 52.00	0.6000	0.4948
T3	3	7/8	37.00 - 52.00	0.6000	0.4948
T3	4	7/8	37.00 - 52.00	0.6000	0.4948
T3	5	7/8	37.00 - 52.00	0.6000	0.4948
T3	6	7/8	37.00 - 52.00	0.6000	0.4948
T3	7	1-5/8 Fiber Cable	37.00 - 52.00	0.6000	0.4948
T3	8	7/8	37.00 - 52.00	0.6000	0.4948
T3	9	Safety Line 3/8	37.00 - 52.00	0.6000	0.4948
T3	10	1-5/8 Fiber Cable	37.00 - 52.00	0.6000	0.4948
T4	1	7/8	32.00 - 37.00	0.5875	0.1918
T4	2	7/8	32.00 - 37.00	0.5875	0.1918
T4	3	7/8	32.00 - 37.00	0.5875	0.1918
T4	4	7/8	32.00 - 37.00	0.5875	0.1918
T4	5	7/8	32.00 - 37.00	0.5875	0.1918
T4	6	7/8	32.00 - 37.00	0.5875	0.1918
T4	7	1-5/8 Fiber Cable	32.00 - 37.00	0.5875	0.1918
T4	8	7/8	32.00 - 37.00	0.5875	0.1918
T4	9	Safety Line 3/8	32.00 - 37.00	0.5875	0.1918
T4	10	1-5/8 Fiber Cable	32.00 - 37.00	0.5875	0.1918

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 lb
Omni 2-1/2"x20'	B	From Leg	4.00 0.00 10.00	0.0000	82.00	No Ice 1/2" Ice 1" Ice	5.00 7.03 9.06	5.00 7.03 9.06	40.00 76.96 113.92
Omni 2-1/2"x16'	B	From Leg	4.00 0.00 8.00	0.0000	82.00	No Ice 1/2" Ice 1" Ice	4.00 5.63 7.26	4.00 5.63 7.26	35.00 64.63 94.26
6' Dipole	A	From Leg	4.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	0.90 1.52 2.14	0.98 1.52 2.06	15.00 22.49 29.98
**********									
Air 21 B2A_B4P antenna w/	A	From Leg	4.00	0.0000	74.00	No Ice	6.74	5.60	101.90

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
mount pipe			0.00			1/2" Ice	7.30	6.50	158.52
			0.00			1" Ice	7.86	7.40	215.14
Air 21 B2A_B4P antenna w/ mount pipe	B	From Leg	4.00	0.0000	74.00	No Ice	6.74	5.60	101.90
			0.00			1/2" Ice	7.30	6.50	158.52
			0.00			1" Ice	7.86	7.40	215.14
Air 21 B2A_B4P antenna w/ mount pipe	C	From Leg	4.00	0.0000	74.00	No Ice	6.74	5.60	101.90
			0.00			1/2" Ice	7.30	6.50	158.52
			0.00			1" Ice	7.86	7.40	215.14
Generic Low-Band Dual Port Antenna	A	From Leg	4.00	0.0000	74.00	No Ice	11.72	10.28	102.41
			0.00			1/2" Ice	12.44	11.81	196.22
			0.00			1" Ice	13.16	13.34	290.03
Generic Low-Band Dual Port Antenna	B	From Leg	4.00	0.0000	74.00	No Ice	11.72	10.28	102.41
			0.00			1/2" Ice	12.44	11.81	196.22
			0.00			1" Ice	13.16	13.34	290.03
Generic Low-Band Dual Port Antenna	C	From Leg	4.00	0.0000	74.00	No Ice	11.72	10.28	102.41
			0.00			1/2" Ice	12.44	11.81	196.22
			0.00			1" Ice	13.16	13.34	290.03
AIR 32 B2a/B66Aa w/ Mount Pipe	A	From Leg	4.00	0.0000	74.00	No Ice	6.75	6.07	153.07
			0.00			1/2" Ice	7.20	6.87	214.04
			0.00			1" Ice	7.65	7.58	281.89
AIR 32 B2a/B66Aa w/ Mount Pipe	B	From Leg	4.00	0.0000	74.00	No Ice	6.75	6.07	153.07
			0.00			1/2" Ice	7.20	6.87	214.04
			0.00			1" Ice	7.65	7.58	281.89
AIR 32 B2a/B66Aa w/ Mount Pipe	C	From Leg	4.00	0.0000	74.00	No Ice	6.75	6.07	153.07
			0.00			1/2" Ice	7.20	6.87	214.04
			0.00			1" Ice	7.65	7.58	281.89
Generic Style 1B - Twin AWS	A	From Leg	4.00	0.0000	74.00	No Ice	0.78	0.21	11.30
			0.00			1/2" Ice	0.90	0.30	15.86
			0.00			1" Ice	1.02	0.39	20.42
Generic Style 1B - Twin AWS	B	From Leg	4.00	0.0000	74.00	No Ice	0.78	0.21	11.30
			0.00			1/2" Ice	0.90	0.30	15.86
			0.00			1" Ice	1.02	0.39	20.42
Generic Style 1B - Twin AWS	C	From Leg	4.00	0.0000	74.00	No Ice	0.78	0.21	11.30
			0.00			1/2" Ice	0.90	0.30	15.86
			0.00			1" Ice	1.02	0.39	20.42
Ericsson RRUS-11 B12	A	From Leg	3.00	0.0000	74.00	No Ice	3.26	1.38	50.70
			0.00			1/2" Ice	3.50	1.56	71.57
			0.00			1" Ice	3.74	1.74	92.44
Ericsson RRUS-11 B12	B	From Leg	3.00	0.0000	74.00	No Ice	3.26	1.38	50.70
			0.00			1/2" Ice	3.50	1.56	71.57
			0.00			1" Ice	3.74	1.74	92.44
Ericsson RRUS-11 B12	C	From Leg	3.00	0.0000	74.00	No Ice	3.26	1.38	50.70
			0.00			1/2" Ice	3.50	1.56	71.57
			0.00			1" Ice	3.74	1.74	92.44
SM 409-3	A	None		0.0000	79.00	No Ice	22.47	22.47	1035.00
						1/2" Ice	31.99	31.99	1500.00
						1" Ice	41.51	41.51	1965.00
**********									
3' Yagi antenna	A	From Leg	2.00	0.0000	74.00	No Ice	0.70	0.35	10.00
			0.00			1/2" Ice	0.95	0.48	36.35
			0.00			1" Ice	1.20	0.61	62.70
3' Yagi antenna	B	From Leg	2.00	0.0000	74.00	No Ice	0.70	0.35	10.00
			0.00			1/2" Ice	0.95	0.48	36.35
			0.00			1" Ice	1.20	0.61	62.70
3' Yagi antenna	C	From Leg	2.00	0.0000	68.00	No Ice	0.70	0.35	10.00
			0.00			1/2" Ice	0.95	0.48	36.35
			0.00			1" Ice	1.20	0.61	62.70

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
3' Yagi antenna	C	From Leg	2.00	0.0000	62.00	No Ice	0.70	0.35	10.00
			0.00			1/2" Ice	0.95	0.48	36.35
			0.00			1" Ice	1.20	0.61	62.70
Ground Plane Omni	B	From Leg	6.00	0.0000	61.00	No Ice	1.90	1.90	25.00
			0.00			1/2" Ice	2.70	2.70	39.00
			3.00			1" Ice	3.50	3.50	53.00
Pirod 6' Side Mount Standoff	B	From Leg	3.00	0.0000	61.00	No Ice	4.97	4.97	70.00
			0.00			1/2" Ice	6.12	6.12	130.00
			0.00			1" Ice	7.27	7.27	190.00

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 82.00-67.00	74.50	0.909	25	54.894	A	0.000	13.813	7.188	52.03	26.977	0.000
					B	0.000	13.813		52.03	0.000	0.000
					C	0.000	13.813		52.03	0.000	0.000
T2 67.00-52.00	59.50	0.852	24	54.894	A	0.000	10.898	7.188	65.95	56.896	0.000
					B	0.000	10.898		65.95	0.000	0.000
					C	0.000	10.898		65.95	0.000	0.000
T3 52.00-37.00	44.50	0.784	22	54.894	A	0.000	10.915	7.188	65.85	58.118	0.000
					B	0.000	10.915		65.85	0.000	0.000
					C	0.000	10.915		65.85	0.000	0.000
T4 37.00-32.00	34.50	0.729	20	9.816	A	1.473	2.576	2.576	63.61	19.372	0.000
					B	1.473	2.576		63.61	0.000	0.000
					C	1.473	2.576		63.61	0.000	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 82.00-67.00	74.50	0.909	5	2.0341	59.979	A	0.000	41.952	17.358	41.38	66.526	0.000
						B	0.000	41.952		41.38	0.000	0.000
						C	0.000	41.952		41.38	0.000	0.000
T2 67.00-52.00	59.50	0.852	5	1.9888	59.866	A	0.000	30.681	17.132	55.84	130.657	0.000
						B	0.000	30.681		55.84	0.000	0.000
						C	0.000	30.681		55.84	0.000	0.000
T3 52.00-37.00	44.50	0.784	4	1.9319	59.724	A	0.000	30.175	16.847	55.83	134.332	0.000
						B	0.000	30.175		55.83	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	0.000	30.175		55.83	0.000	0.000
T4 37.00-32.00	34.50	0.729	4	1.8834	11.475	A	1.473	7.801	5.951	64.17	44.231	0.000
						B	1.473	7.801		64.17	0.000	0.000
						C	1.473	7.801		64.17	0.000	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 82.00-67.00	74.50	0.909	7	54.894	A	0.000	13.813	7.188	52.03	26.977	0.000
					B	0.000	13.813		52.03	0.000	0.000
					C	0.000	13.813		52.03	0.000	0.000
T2 67.00-52.00	59.50	0.852	7	54.894	A	0.000	10.898	7.188	65.95	56.896	0.000
					B	0.000	10.898		65.95	0.000	0.000
					C	0.000	10.898		65.95	0.000	0.000
T3 52.00-37.00	44.50	0.784	6	54.894	A	0.000	10.915	7.188	65.85	58.118	0.000
					B	0.000	10.915		65.85	0.000	0.000
					C	0.000	10.915		65.85	0.000	0.000
T4 37.00-32.00	34.50	0.729	6	9.816	A	1.473	2.576	2.576	63.61	19.372	0.000
					B	1.473	2.576		63.61	0.000	0.000
					C	1.473	2.576		63.61	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	132.88	647.77	A	0.252	2.433	25	1	1	8.086	763.94	50.93	A
82.00-67.00		TA 424.61	B	0.252	2.433		1	1	8.086			
			C	0.252	2.433		1	1	8.086			
T2	279.66	514.59	A	0.199	2.601	24	1	1	6.258	1007.25	67.15	A
67.00-52.00			B	0.199	2.601		1	1	6.258			
			C	0.199	2.601		1	1	6.258			
T3	285.60	515.36	A	0.199	2.6	22	1	1	6.268	940.87	62.72	A
52.00-37.00			B	0.199	2.6		1	1	6.268			
			C	0.199	2.6		1	1	6.268			
T4	95.20	199.78	A	0.413	2.04	20	1	1	3.126	303.64	60.73	A
37.00-32.00			B	0.413	2.04		1	1	3.126			
			C	0.413	2.04		1	1	3.126			
Sum Weight:	793.34	2302.11								3015.71		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	132.88	647.77	A	0.252	2.433	25	0.8	1	8.086	763.94	50.93	B
82.00-67.00		TA 424.61	B	0.252	2.433		0.8	1	8.086			
			C	0.252	2.433		0.8	1	8.086			
T2	279.66	514.59	A	0.199	2.601	24	0.8	1	6.258	1007.25	67.15	B
67.00-52.00			B	0.199	2.601		0.8	1	6.258			
			C	0.199	2.601		0.8	1	6.258			
T3	285.60	515.36	A	0.199	2.6	22	0.8	1	6.268	940.87	62.72	B
52.00-37.00			B	0.199	2.6		0.8	1	6.268			
			C	0.199	2.6		0.8	1	6.268			
T4	95.20	199.78	A	0.413	2.04	20	0.8	1	2.832	293.36	58.67	B
37.00-32.00			B	0.413	2.04		0.8	1	2.832			
			C	0.413	2.04		0.8	1	2.832			
Sum Weight:	793.34	2302.11								3005.43		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	132.88	647.77	A	0.252	2.433	25	0.85	1	8.086	749.04	49.94	C
82.00-67.00		TA 424.61	B	0.252	2.433		0.85	1	8.086			
			C	0.252	2.433		0.85	1	8.086			
T2	279.66	514.59	A	0.199	2.601	24	0.85	1	6.258	977.32	65.15	C
67.00-52.00			B	0.199	2.601		0.85	1	6.258			
			C	0.199	2.601		0.85	1	6.258			
T3	285.60	515.36	A	0.199	2.6	22	0.85	1	6.268	913.32	60.89	C
52.00-37.00			B	0.199	2.6		0.85	1	6.268			
			C	0.199	2.6		0.85	1	6.268			
T4	95.20	199.78	A	0.413	2.04	20	0.85	1	2.905	287.57	57.51	C
37.00-32.00			B	0.413	2.04		0.85	1	2.905			
			C	0.413	2.04		0.85	1	2.905			
Sum Weight:	793.34	2302.11								2927.25		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1175.35	2698.45	A	0.699	1.776	5	1	1	34.010	332.87	22.19	A
82.00-67.00		TA	B	0.699	1.776		1	1	34.010			
		1157.31	C	0.699	1.776		1	1	34.010			
T2	2400.19	1858.15	A	0.512	1.884	5	1	1	21.226	399.54	26.64	A
67.00-52.00			B	0.512	1.884		1	1	21.226			
			C	0.512	1.884		1	1	21.226			
T3	2416.24	1805.05	A	0.505	1.893	4	1	1	20.755	375.32	25.02	A
52.00-37.00			B	0.505	1.893		1	1	20.755			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.505	1.893		1	1	20.755			
T4	785.06	665.59	A	0.808	1.822	4	1	1	8.431	79.44	15.89	A
37.00-32.00			B	0.808	1.822		1	1	8.431			
			C	0.808	1.822		1	1	8.431			
Sum Weight:	6776.84	8184.56								1187.18		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1175.35	2698.45	A	0.699	1.776	5	0.8	1	34.010	332.87	22.19	B
82.00-67.00		TA	B	0.699	1.776		0.8	1	34.010			
		1157.31	C	0.699	1.776		0.8	1	34.010			
T2	2400.19	1858.15	A	0.512	1.884	5	0.8	1	21.226	399.54	26.64	B
67.00-52.00			B	0.512	1.884		0.8	1	21.226			
			C	0.512	1.884		0.8	1	21.226			
T3	2416.24	1805.05	A	0.505	1.893	4	0.8	1	20.755	375.32	25.02	B
52.00-37.00			B	0.505	1.893		0.8	1	20.755			
			C	0.505	1.893		0.8	1	20.755			
T4	785.06	665.59	A	0.808	1.822	4	0.8	1	8.136	77.63	15.53	B
37.00-32.00			B	0.808	1.822		0.8	1	8.136			
			C	0.808	1.822		0.8	1	8.136			
Sum Weight:	6776.84	8184.56								1185.37		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1175.35	2698.45	A	0.699	1.776	5	0.85	1	34.010	325.42	21.69	C
82.00-67.00		TA	B	0.699	1.776		0.85	1	34.010			
		1157.31	C	0.699	1.776		0.85	1	34.010			
T2	2400.19	1858.15	A	0.512	1.884	5	0.85	1	21.226	377.56	25.17	C
67.00-52.00			B	0.512	1.884		0.85	1	21.226			
			C	0.512	1.884		0.85	1	21.226			
T3	2416.24	1805.05	A	0.505	1.893	4	0.85	1	20.755	354.79	23.65	C
52.00-37.00			B	0.505	1.893		0.85	1	20.755			
			C	0.505	1.893		0.85	1	20.755			
T4	785.06	665.59	A	0.808	1.822	4	0.85	1	8.210	75.62	15.12	C
37.00-32.00			B	0.808	1.822		0.85	1	8.210			
			C	0.808	1.822		0.85	1	8.210			
Sum Weight:	6776.84	8184.56								1133.39		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	132.88	647.77	A	0.252	2.433	7	1	1	8.086	216.91	14.46	A
82.00-67.00		TA 424.61	B	0.252	2.433		1	1	8.086			
			C	0.252	2.433		1	1	8.086			
T2	279.66	514.59	A	0.199	2.601	7	1	1	6.258	286.00	19.07	A
67.00-52.00			B	0.199	2.601		1	1	6.258			
			C	0.199	2.601		1	1	6.258			
T3	285.60	515.36	A	0.199	2.6	6	1	1	6.268	267.15	17.81	A
52.00-37.00			B	0.199	2.6		1	1	6.268			
			C	0.199	2.6		1	1	6.268			
T4	95.20	199.78	A	0.413	2.04	6	1	1	3.126	86.22	17.24	A
37.00-32.00			B	0.413	2.04		1	1	3.126			
			C	0.413	2.04		1	1	3.126			
Sum Weight:	793.34	2302.11								856.28		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	132.88	647.77	A	0.252	2.433	7	0.8	1	8.086	216.91	14.46	B
82.00-67.00		TA 424.61	B	0.252	2.433		0.8	1	8.086			
			C	0.252	2.433		0.8	1	8.086			
T2	279.66	514.59	A	0.199	2.601	7	0.8	1	6.258	286.00	19.07	B
67.00-52.00			B	0.199	2.601		0.8	1	6.258			
			C	0.199	2.601		0.8	1	6.258			
T3	285.60	515.36	A	0.199	2.6	6	0.8	1	6.268	267.15	17.81	B
52.00-37.00			B	0.199	2.6		0.8	1	6.268			
			C	0.199	2.6		0.8	1	6.268			
T4	95.20	199.78	A	0.413	2.04	6	0.8	1	2.832	83.30	16.66	B
37.00-32.00			B	0.413	2.04		0.8	1	2.832			
			C	0.413	2.04		0.8	1	2.832			
Sum Weight:	793.34	2302.11								853.36		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	132.88	647.77	A	0.252	2.433	7	0.85	1	8.086	212.68	14.18	C
82.00-67.00		TA 424.61	B	0.252	2.433		0.85	1	8.086			
			C	0.252	2.433		0.85	1	8.086			
T2	279.66	514.59	A	0.199	2.601	7	0.85	1	6.258	277.50	18.50	C
67.00-52.00			B	0.199	2.601		0.85	1	6.258			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
			C	0.199	2.601		0.85	1	6.258			
T3	285.60	515.36	A	0.199	2.6	6	0.85	1	6.268	259.33	17.29	C
52.00-37.00			B	0.199	2.6		0.85	1	6.268			
			C	0.199	2.6		0.85	1	6.268			
T4	95.20	199.78	A	0.413	2.04	6	0.85	1	2.905	81.65	16.33	C
37.00-32.00			B	0.413	2.04		0.85	1	2.905			
			C	0.413	2.04		0.85	1	2.905			
Sum Weight:	793.34	2302.11								831.16		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	1158.89			
Bracing Weight	1143.21			
Total Member Self-Weight	2302.11			
Guy Weight	164.91			
Total Weight	5778.50			
Wind 0 deg - No Ice		2.39	-4996.49	1273.02
Wind 30 deg - No Ice		2310.01	-3994.92	1504.92
Wind 60 deg - No Ice		4323.13	-2495.18	1194.72
Wind 90 deg - No Ice		5674.22	-2.39	571.05
Wind 120 deg - No Ice		4989.44	2877.11	-80.23
Wind 150 deg - No Ice		2835.04	4909.08	-710.01
Wind 180 deg - No Ice		-2.39	4986.21	-1274.95
Wind 210 deg - No Ice		-2310.01	3994.92	-1504.92
Wind 240 deg - No Ice		-4332.03	2500.31	-1192.79
Wind 270 deg - No Ice		-5674.22	2.39	-571.05
Wind 300 deg - No Ice		-4980.54	-2871.97	80.23
Wind 330 deg - No Ice		-2835.04	-4909.08	710.01
Member Ice	5882.45			
Guy Ice	2348.72			
Total Weight Ice	25952.64			
Wind 0 deg - Ice		1.11	-1994.67	697.39
Wind 30 deg - Ice		971.56	-1681.41	782.03
Wind 60 deg - Ice		1726.70	-997.39	643.10
Wind 90 deg - Ice		2098.50	-1.11	331.76
Wind 120 deg - Ice		1863.39	1075.02	-54.49
Wind 150 deg - Ice		1048.29	1816.52	-426.14
Wind 180 deg - Ice		-1.11	1992.86	-697.58
Wind 210 deg - Ice		-971.56	1681.41	-782.03
Wind 240 deg - Ice		-1728.27	998.30	-642.90
Wind 270 deg - Ice		-2098.50	1.11	-331.76
Wind 300 deg - Ice		-1861.82	-1074.12	54.49
Wind 330 deg - Ice		-1048.29	-1816.52	426.14
Total Weight	5778.50			
Wind 0 deg - Service		0.68	-1418.70	361.46
Wind 30 deg - Service		655.90	-1134.32	427.31
Wind 60 deg - Service		1227.51	-708.48	339.23
Wind 90 deg - Service		1611.14	-0.68	162.14
Wind 120 deg - Service		1416.70	816.93	-22.78
Wind 150 deg - Service		804.98	1393.88	-201.60

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Wind 180 deg - Service		-0.68	1415.78	-362.01
Wind 210 deg - Service		-655.90	1134.32	-427.31
Wind 240 deg - Service		-1230.03	709.94	-338.68
Wind 270 deg - Service		-1611.14	0.68	-162.14
Wind 300 deg - Service		-1414.17	-815.47	22.78
Wind 330 deg - Service		-804.98	-1393.88	201.60

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	82 - 67	Leg	Max Tension	4	8334.32	-219.50	147.85
			Max. Compression	2	-11993.58	-29.45	665.59
			Max. Mx	5	-1248.81	-1001.23	-38.50
			Max. My	9	-1404.66	580.07	-926.38
			Max. Vy	4	-1510.00	-603.31	258.62
			Max. Vx	2	1636.08	-29.40	665.58
		Diagonal	Max Tension	3	2846.85	20.32	6.36
			Max. Compression	3	-2780.65	14.02	-5.84
			Max. Mx	4	2349.37	-25.72	-0.17
			Max. My	13	-1694.21	4.62	12.97
			Max. Vy	25	16.81	-15.63	0.13
			Max. Vx	13	-6.21	3.25	12.97
		Top Girt	Max Tension	8	37.50	0.00	0.00
			Max. Compression	6	-62.82	0.00	0.00
			Max. Mx	14	-29.77	15.95	0.00
			Max. My	9	-7.21	0.00	-0.00
			Max. Vy	14	-18.65	0.00	0.00
			Max. Vx	9	0.00	0.00	0.00
		Bottom Girt	Max Tension	10	1261.00	0.00	0.00
			Max. Compression	8	-1048.94	0.00	0.00
			Max. Mx	14	194.30	15.95	0.00
			Max. My	9	18.18	0.00	-0.00
			Max. Vy	14	-18.65	0.00	0.00
			Max. Vx	9	0.00	0.00	0.00
		Guy A	Bottom Tension	9	6308.94		
			Top Tension	9	6328.65		
			Top Cable Vert	9	4106.77		
			Top Cable Norm	9	4815.19		
			Top Cable Tan	9	10.34		
			Bot Cable Vert	9	-4044.47		
			Bot Cable Norm	9	4841.90		
			Bot Cable Tan	9	31.74		
		Guy B	Bottom Tension	13	5982.57		
			Top Tension	13	5997.54		
			Top Cable Vert	13	3517.84		
			Top Cable Norm	13	4857.50		
			Top Cable Tan	13	4.05		
			Bot Cable Vert	13	-3466.80		
			Bot Cable Norm	13	4875.65		
			Bot Cable Tan	13	22.22		
		Guy C	Bottom Tension	3	6073.75		
			Top Tension	3	6088.72		
			Top Cable Vert	3	3561.52		
			Top Cable Norm	3	4938.42		
			Top Cable Tan	3	7.47		
			Bot Cable Vert	3	-3510.45		
			Bot Cable Norm	3	4956.45		
			Bot Cable Tan	3	28.02		
		Torque Arm Top	Max Tension	13	5440.09	0.00	0.00
			Max. Compression	11	-2868.89	0.00	0.00
			Max. Mx	7	-71.88	-13509.31	0.00
			Max. My	9	-1437.97	-6206.74	-0.00
			Max. Vy	7	3998.33	-13509.31	0.00
			Max. Vx	9	-0.00	-6206.74	-0.00
T2	67 - 52	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-12034.61	-29.72	35.48
			Max. Mx	11	-1975.07	-305.95	-76.10
			Max. My	8	-902.12	41.96	327.96
			Max. Vy	4	-1507.03	25.42	-48.33
			Max. Vx	2	1633.56	-24.00	-15.47
		Diagonal	Max Tension	5	2104.21	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	11	-2144.42	0.00	0.00
			Max. Mx	22	-235.88	18.96	0.00
			Max. My	15	71.68	0.00	-0.02
			Max. Vy	22	-18.14	0.00	0.00
			Max. Vx	15	0.01	0.00	0.00
		Top Girt	Max Tension	8	1050.82	0.00	0.00
			Max. Compression	2	-1033.20	0.00	0.00
			Max. Mx	14	3.76	15.50	0.00
			Max. My	9	-652.41	0.00	-0.00
			Max. Vy	14	-18.13	0.00	0.00
			Max. Vx	9	0.00	0.00	0.00
		Bottom Girt	Max Tension	8	283.87	0.00	0.00
			Max. Compression	2	-254.54	0.00	0.00
			Max. Mx	14	65.26	15.50	0.00
			Max. My	9	259.90	0.00	-0.00
			Max. Vy	14	-18.13	0.00	0.00
			Max. Vx	9	0.00	0.00	0.00
T3	52 - 37	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-12959.04	-10.13	4.63
			Max. Mx	26	-12873.19	481.95	259.35
			Max. My	22	-12700.56	27.43	-504.94
			Max. Vy	17	2487.71	-426.71	283.91
			Max. Vx	21	2857.65	24.32	-504.89
		Diagonal	Max Tension	4	737.04	0.00	0.00
			Max. Compression	8	-792.36	0.00	0.00
			Max. Mx	22	158.57	18.39	0.00
			Max. My	21	67.08	0.00	0.01
			Max. Vy	22	17.50	0.00	0.00
			Max. Vx	21	-0.01	0.00	0.00
		Top Girt	Max Tension	3	219.65	0.00	0.00
			Max. Compression	9	-168.08	0.00	0.00
			Max. Mx	14	1.80	14.95	0.00
			Max. My	9	-168.08	0.00	-0.00
			Max. Vy	14	-17.48	0.00	0.00
			Max. Vx	9	0.00	0.00	0.00
		Bottom Girt	Max Tension	21	1664.91	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1571.35	14.95	0.00
			Max. My	9	566.02	0.00	-0.00
			Max. Vy	14	-17.48	0.00	0.00
			Max. Vx	9	0.00	0.00	0.00
T4	37 - 32	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-14360.97	-3.19	-36.86
			Max. Mx	26	-13114.54	547.05	-15.32
			Max. My	8	-4549.88	-2.39	-114.79
			Max. Vy	24	2217.57	539.04	-8.94
			Max. Vx	8	281.40	-114.17	-109.23
		Top Girt	Max Tension	23	1446.06	7.97	-0.04
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	21	1434.61	93.12	-20.57
			Max. My	8	431.30	16.36	-39.89
			Max. Vy	21	-56.68	93.12	-20.57
			Max. Vx	8	-20.94	18.90	22.46
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-766.87	102.31	-48.00
			Max. Mx	8	-315.54	159.47	-14.29
			Max. My	6	-424.88	102.52	-49.88
			Max. Vy	8	-1033.04	159.47	-14.29
			Max. Vx	6	-204.14	-17.21	-3.36
		Mid Girt	Max Tension	18	58.92	0.00	0.00
			Max. Compression	21	-100.66	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	23	-96.32	-11.05	0.00
			Max. My	16	-83.05	0.00	-2.18
			Max. Vy	23	20.05	0.00	0.00
			Max. Vx	16	3.96	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	23	38638.86	159.58	-215.55
	Max. H_x	11	17906.54	1309.00	-11.50
	Max. H_z	2	18668.77	17.88	1346.53
	Max. M_x	1	0.00	2.29	-20.49
	Max. M_z	1	0.00	2.29	-20.49
	Max. Torsion	8	301.28	19.59	-1414.96
	Min. Vert	33	13166.50	2.22	-269.75
	Min. H_x	5	17876.97	-1303.39	-9.58
	Min. H_z	8	16042.82	19.59	-1414.96
	Min. M_x	1	0.00	2.29	-20.49
	Min. M_z	1	0.00	2.29	-20.49
	Min. Torsion	3	-279.38	-640.20	1117.36
Guy C @ 54.67 ft Elev 32 ft Azimuth 240 deg	Max. Vert	10	-46.30	-43.70	25.26
	Max. H_x	10	-46.30	-43.70	25.26
	Max. H_z	3	-6807.30	-8295.85	4824.44
	Min. Vert	3	-6807.30	-8295.85	4824.44
	Min. H_x	3	-6807.30	-8295.85	4824.44
	Min. H_z	10	-46.30	-43.70	25.26
Guy B @ 54.42 ft Elev 32 ft Azimuth 120 deg	Max. Vert	6	-47.44	44.61	25.68
	Max. H_x	13	-6834.85	8275.29	4846.21
	Max. H_z	13	-6834.85	8275.29	4846.21
	Min. Vert	13	-6834.85	8275.29	4846.21
	Min. H_x	6	-47.44	44.61	25.68
	Min. H_z	6	-47.44	44.61	25.68
Guy A @ 60.75 ft Elev 20 ft Azimuth 0 deg	Max. Vert	2	-145.41	0.24	-143.77
	Max. H_x	24	-4218.43	121.71	-5517.48
	Max. H_z	2	-145.41	0.24	-143.77
	Min. Vert	7	-7841.19	-62.32	-9377.53
	Min. H_x	18	-4208.22	-121.25	-5505.36
	Min. H_z	7	-7841.19	-62.32	-9377.53

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	13251.36	-2.29	20.49	0.00	0.00	9.51

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	18668.77	-17.88	-1346.53	0.00	0.00	209.31
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	17651.76	640.20	-1117.36	0.00	0.00	279.38
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	16019.52	1183.01	-679.37	0.00	0.00	197.12
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	17876.97	1303.39	9.58	0.00	0.00	27.26
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	19442.00	1159.00	711.47	0.00	0.00	-64.51
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	18388.36	624.60	1181.06	0.00	0.00	-131.94
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	16042.82	-19.59	1414.96	0.00	0.00	-301.28
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	18394.26	-645.43	1155.41	0.00	0.00	-246.91
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	19460.70	-1172.91	696.96	0.00	0.00	-134.92
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	17906.54	-1309.00	11.50	0.00	0.00	-2.64
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	16035.26	-1193.69	-669.41	0.00	0.00	44.10
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	17665.83	-670.22	-1114.99	0.00	0.00	90.54
1.2 Dead+1.0 Ice+1.0 Temp+Guy	38361.51	79.09	76.86	0.00	0.00	23.90
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	38635.67	78.09	-201.55	0.00	0.00	104.73
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	38530.10	203.68	-145.45	0.00	0.00	111.20
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	38452.53	314.61	-60.99	0.00	0.00	90.93
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	38529.87	332.00	78.27	0.00	0.00	53.49
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	38606.97	318.07	216.43	0.00	0.00	8.20
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	38492.58	206.28	297.15	0.00	0.00	-33.41
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	38407.06	78.70	350.75	0.00	0.00	-61.94
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	38510.64	-48.43	296.30	0.00	0.00	-67.23
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	38638.86	-159.58	215.55	0.00	0.00	-45.38
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	38560.81	-173.44	78.39	0.00	0.00	-5.90
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	38477.09	-156.87	-60.03	0.00	0.00	38.08
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	38543.75	-46.89	-144.51	0.00	0.00	76.76
Dead+Wind 0 deg - Service+Guy	13350.75	-2.39	-232.91	0.00	0.00	34.82
Dead+Wind 30 deg - Service+Guy	13333.75	116.50	-189.02	0.00	0.00	42.20
Dead+Wind 60 deg - Service+Guy	13299.80	211.32	-105.27	0.00	0.00	29.98
Dead+Wind 90 deg - Service+Guy	13259.00	235.64	19.72	0.00	0.00	12.66
Dead+Wind 120 deg - Service+Guy	13217.61	213.97	146.10	0.00	0.00	4.20
Dead+Wind 150 deg -	13181.54	116.79	228.50	0.00	0.00	-2.86

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Service+Guy						
Dead+Wind 180 deg - Service+Guy	13166.50	-2.22	269.75	0.00	0.00	-16.65
Dead+Wind 210 deg - Service+Guy	13184.25	-121.24	228.68	0.00	0.00	-23.68
Dead+Wind 240 deg - Service+Guy	13222.40	-218.46	146.41	0.00	0.00	-11.13
Dead+Wind 270 deg - Service+Guy	13264.45	-240.21	20.09	0.00	0.00	5.99
Dead+Wind 300 deg - Service+Guy	13304.59	-216.00	-104.93	0.00	0.00	14.51
Dead+Wind 330 deg - Service+Guy	13336.51	-121.24	-188.81	0.00	0.00	21.47

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-5778.49	0.00	0.08	5778.49	0.78	0.014%
2	3.55	-6912.43	-9531.44	-3.58	6911.99	9528.12	0.028%
3	4704.35	-6888.01	-8133.61	-4704.41	6887.80	8131.64	0.017%
4	8253.47	-6866.74	-4762.31	-8251.40	6866.55	4758.42	0.038%
5	9402.27	-6901.21	-3.65	-9397.88	6900.60	7.04	0.048%
6	8264.19	-6935.66	4764.40	-8262.13	6935.24	-4762.89	0.022%
7	4698.20	-6914.41	8130.26	-4696.68	6914.13	-8129.17	0.016%
8	-3.55	-6889.99	9514.99	4.05	6889.67	-9510.79	0.036%
9	-4704.35	-6914.41	8133.61	4702.82	6914.13	-8132.55	0.016%
10	-8267.71	-6935.69	4770.53	8265.64	6935.26	-4769.04	0.022%
11	-9402.27	-6901.21	3.65	9397.89	6900.59	-0.27	0.048%
12	-8249.95	-6866.76	-4756.18	8247.89	6866.57	4752.44	0.036%
13	-4698.20	-6888.01	-8130.26	4698.23	6887.80	8128.29	0.017%
14	0.00	-27075.29	0.00	-0.61	27075.29	0.89	0.004%
15	0.77	-27089.92	-2541.28	-0.76	27089.88	2539.76	0.006%
16	1247.45	-27059.98	-2154.45	-1247.55	27059.91	2150.27	0.015%
17	2205.10	-27033.63	-1272.38	-2201.17	27033.58	1269.92	0.017%
18	2492.52	-27075.29	-0.90	-2489.41	27075.25	3.58	0.015%
19	2205.92	-27116.92	1271.97	-2204.74	27116.89	-1270.83	0.006%
20	1246.10	-27090.60	2153.93	-1242.78	27090.53	-2150.29	0.018%
21	-0.77	-27060.65	2539.47	0.22	27060.60	-2536.18	0.012%
22	-1247.45	-27090.60	2154.45	1246.41	27090.56	-2153.44	0.005%
23	-2206.66	-27116.95	1273.29	2205.23	27116.90	-1271.91	0.007%
24	-2492.52	-27075.28	0.90	2491.68	27075.27	0.00	0.005%
25	-2204.35	-27033.66	-1271.06	2199.60	27033.59	1270.36	0.018%
26	-1246.10	-27059.98	-2153.93	1246.20	27059.91	2150.02	0.014%
27	0.63	-5780.48	-1691.47	-0.63	5780.48	1691.15	0.005%
28	834.85	-5776.15	-1443.41	-834.83	5776.15	1443.18	0.004%
29	1464.68	-5772.38	-845.13	-1464.57	5772.37	845.09	0.002%
30	1668.55	-5778.49	-0.65	-1668.35	5778.49	0.81	0.004%
31	1466.58	-5784.61	845.50	-1466.31	5784.61	-845.28	0.006%
32	833.75	-5780.84	1442.82	-833.57	5780.83	-1442.61	0.005%
33	-0.63	-5776.50	1688.55	0.63	5776.50	-1688.33	0.004%
34	-834.85	-5780.84	1443.41	834.65	5780.83	-1443.20	0.005%
35	-1467.21	-5784.61	846.59	1466.93	5784.61	-846.36	0.006%
36	-1668.55	-5778.49	0.65	1668.34	5778.49	-0.49	0.004%
37	-1464.06	-5772.38	-844.04	1463.95	5772.38	844.00	0.002%
38	-833.75	-5776.15	-1442.82	833.74	5776.15	1442.58	0.004%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00014279
2	Yes	10	0.00049915	0.00085927
3	Yes	10	0.00000001	0.00054604
4	Yes	7	0.00000001	0.00082177
5	Yes	10	0.00105945	0.00127723
6	Yes	11	0.00000001	0.00063294
7	Yes	11	0.00000001	0.00049400
8	Yes	8	0.00000001	0.00099534
9	Yes	11	0.00000001	0.00050884
10	Yes	11	0.00000001	0.00064160
11	Yes	10	0.00105852	0.00127694
12	Yes	7	0.00000001	0.00079226
13	Yes	10	0.00000001	0.00052359
14	Yes	6	0.00000001	0.00005753
15	Yes	8	0.00000001	0.00015506
16	Yes	7	0.00000001	0.00030972
17	Yes	6	0.00000001	0.00028843
18	Yes	7	0.00000001	0.00032006
19	Yes	8	0.00000001	0.00017123
20	Yes	7	0.00000001	0.00038051
21	Yes	7	0.00000001	0.00026567
22	Yes	8	0.00000001	0.00015470
23	Yes	8	0.00000001	0.00020333
24	Yes	8	0.00000001	0.00012841
25	Yes	6	0.00000001	0.00030405
26	Yes	7	0.00000001	0.00028785
27	Yes	6	0.00000001	0.00006130
28	Yes	6	0.00000001	0.00004554
29	Yes	6	0.00000001	0.00002625
30	Yes	6	0.00000001	0.00005631
31	Yes	6	0.00000001	0.00007688
32	Yes	6	0.00000001	0.00005967
33	Yes	6	0.00000001	0.00004465
34	Yes	6	0.00000001	0.00006049
35	Yes	6	0.00000001	0.00007764
36	Yes	6	0.00000001	0.00005698
37	Yes	6	0.00000001	0.00002669
38	Yes	6	0.00000001	0.00004527

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	82 - 67	0.413	33	0.0421	0.0198
T2	67 - 52	0.286	33	0.0370	0.0135
T3	52 - 37	0.175	33	0.0384	0.0133
T4	37 - 32	0.046	33	0.0426	0.0107

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
82.00	Omni 2-1/2"x20'	33	0.413	0.0421	0.0198	193596
80.00	6' Dipole	33	0.396	0.0412	0.0187	193596
79.00	SM 409-3	33	0.387	0.0407	0.0181	193596
74.00	Air 21 B2A_B4P antenna w/ mount pipe	33	0.343	0.0387	0.0156	120998
69.82	Guy	33	0.308	0.0375	0.0141	80693
68.00	3' Yagi antenna	33	0.294	0.0371	0.0137	75273
62.00	3' Yagi antenna	33	0.249	0.0368	0.0133	145873
61.00	Ground Plane Omni	33	0.241	0.0369	0.0133	194959

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	82 - 67	3.598	6	0.3631	0.1627
T2	67 - 52	2.482	6	0.3334	0.1295
T3	52 - 37	1.479	10	0.3361	0.1126
T4	37 - 32	0.382	10	0.3586	0.0799

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
82.00	Omni 2-1/2"x20'	6	3.598	0.3631	0.1627	37172
80.00	6' Dipole	6	3.445	0.3582	0.1576	37172
79.00	SM 409-3	6	3.368	0.3558	0.1550	37172
74.00	Air 21 B2A_B4P antenna w/ mount pipe	6	2.990	0.3444	0.1428	23233
69.82	Guy	6	2.682	0.3369	0.1342	15505
68.00	3' Yagi antenna	6	2.553	0.3345	0.1310	14514
62.00	3' Yagi antenna	10	2.144	0.3306	0.1235	30939
61.00	Ground Plane Omni	10	2.078	0.3306	0.1226	44160

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T1	69.82 (A) (123)	7/16 EHS	2080.00	20800.02	6328.65	12480.00	1.000	1.972
	69.82 (A) (124)	7/16 EHS	2080.00	20800.02	6082.86	12480.00	1.000	2.052

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
	69.82 (B) (119)	7/16 EHS	2080.00	20800.02	5872.79	12480.00	1.000	2.125
	69.82 (B) (120)	7/16 EHS	2080.00	20800.02	5997.54	12480.00	1.000	2.081
	69.82 (C) (115)	7/16 EHS	2080.00	20800.02	5769.42	12480.00	1.000	2.163
	69.82 (C) (116)	7/16 EHS	2080.00	20800.02	6088.72	12480.00	1.000	2.050

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	82 - 67	P2.5x.276	15.00	2.40	31.2 K=1.00	2.2535	-11993.60	80239.20	0.149 [1]
T2	67 - 52	P2.5x.276	15.00	2.40	62.4 K=2.00	2.2535	-11847.10	67061.80	0.177 [1]
T3	52 - 37	P2.5x.276	15.00	2.44	63.5 K=2.00	2.2535	-12959.00	66503.00	0.195 [1]
T4	37 - 32	P2.5x.276	5.38	1.55	20.2 K=1.00	2.2535	-14361.00	83082.20	0.173 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	82 - 67	P1.5x.120	4.18	1.94	47.6 K=1.00	0.5202	-2780.65	14959.30	0.186 [1]
T2	67 - 52	P1.5x.120	4.18	3.89	95.2 K=1.00	0.5202	-2144.42	10456.30	0.205 [1]
T3	52 - 37	P1.5x.120	4.20	3.91	95.8 K=1.00	0.5202	-792.36	10398.70	0.076 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	82 - 67	P1.5x.120	3.42	3.18	77.9 K=1.00	0.5202	-62.82	12243.70	0.005 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	67 - 52	P1.5x.120	3.42	3.18	77.9 K=1.00	0.5202	-1033.20	12243.70	0.084 [1]
T3	52 - 37	P1.5x.120	3.42	3.18	77.9 K=1.00	0.5202	-168.08	12243.70	0.014 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	82 - 67	P1.5x.120	3.42	3.18	77.9 K=1.00	0.5202	-1048.94	12243.70	0.086 [1]
T2	67 - 52	P1.5x.120	3.42	3.18	77.9 K=1.00	0.5202	-254.54	12243.70	0.021 [1]
T4	37 - 32	L3x3x3/16	0.23	0.00	0.0 K=1.00	1.0900	-766.87	34120.60	0.022 [1]

[1] $P_u / \phi P_n$ controls

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	37 - 32	L3x3x3/16	2.20	1.96	79.8 K=2.02	1.0900	-100.66	24685.10	0.004 [1]

[1] $P_u / \phi P_n$ controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	82 - 67 (117)	C12x20.7	3.41	3.30	49.5 K=1.00	6.0900	-159.74	173446.00	0.001
T1	82 - 67 (118)	C12x20.7	3.41	3.30	49.5 K=1.00	6.0900	-71.88	173446.00	0.000
T1	82 - 67 (121)	C12x20.7	3.41	3.30	49.5 K=1.00	6.0900	-89.50	173446.00	0.001
T1	82 - 67 (122)	C12x20.7	3.41	3.30	49.5 K=1.00	6.0900	-2867.54	173446.00	0.017
T1	82 - 67 (125)	C12x20.7	3.41	3.30	49.5 K=1.00	6.0900	-2848.36	173446.00	0.016
T1	82 - 67 (126)	C12x20.7	3.41	3.30	49.5	6.0900	-2825.82	173446.00	0.016

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
					K=1.00				

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	82 - 67 (117)	C12x20.7	-11653.83	58050.00	0.201	-0.00	9423.00	0.000
T1	82 - 67 (118)	C12x20.7	-13509.33	58050.00	0.233	0.00	9423.00	0.000
T1	82 - 67 (121)	C12x20.7	-11783.42	58050.00	0.203	-0.00	9423.00	0.000
T1	82 - 67 (122)	C12x20.7	-11241.75	58050.00	0.194	-0.00	9423.00	0.000
T1	82 - 67 (125)	C12x20.7	-11411.00	58050.00	0.197	0.00	9423.00	0.000
T1	82 - 67 (126)	C12x20.7	-13177.33	58050.00	0.227	-0.00	9423.00	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	82 - 67 (117)	C12x20.7	0.001	0.201	0.000	0.201	1.000	4.8.1
T1	82 - 67 (118)	C12x20.7	0.000	0.233	0.000	0.233	1.000	4.8.1
T1	82 - 67 (121)	C12x20.7	0.001	0.203	0.000	0.203	1.000	4.8.1
T1	82 - 67 (122)	C12x20.7	0.017	0.194	0.000	0.202	1.000	4.8.1
T1	82 - 67 (125)	C12x20.7	0.016	0.197	0.000	0.205	1.000	4.8.1
T1	82 - 67 (126)	C12x20.7	0.016	0.227	0.000	0.235	1.000	4.8.1

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	82 - 67	P2.5x.276	15.00	2.40	31.2	2.2535	8334.32	85183.80	0.098 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	82 - 67	P1.5x.120	4.18	1.94	47.6	0.5202	2846.85	16856.00	0.169 [1]
T2	67 - 52	P1.5x.120	4.18	3.89	95.2	0.5202	2104.21	16856.00	0.125 [1]
T3	52 - 37	P1.5x.120	4.20	3.91	95.8	0.5202	737.04	16856.00	0.044 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	82 - 67	P1.5x.120	3.42	3.18	77.9	0.5202	37.50	16856.00	0.002 [1]
T2	67 - 52	P1.5x.120	3.42	3.18	77.9	0.5202	1050.82	16856.00	0.062 [1]
T3	52 - 37	P1.5x.120	3.42	3.18	77.9	0.5202	219.65	16856.00	0.013 [1]
T4	37 - 32	L3x3x3/16	3.19	2.95	37.7	1.0900	1446.06	35316.00	0.041 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	82 - 67	P1.5x.120	3.42	3.18	77.9	0.5202	1261.00	16856.00	0.075 [1]
T2	67 - 52	P1.5x.120	3.42	3.18	77.9	0.5202	283.87	16856.00	0.017 [1]
T3	52 - 37	P1.5x.120	3.42	3.18	77.9	0.5202	1664.91	16856.00	0.099 [1]

[1] P_u / ϕP_n controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	37 - 32	L3x3x3/16	1.22	0.98	12.5	1.0900	58.92	35316.00	0.002 [1]

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	82 - 67 (117)	C12x20.7	3.41	3.30	49.5	6.0900	1993.38	197316.00	0.010
T1	82 - 67 (118)	C12x20.7	3.41	3.30	49.5	6.0900	2088.17	197316.00	0.011
T1	82 - 67 (121)	C12x20.7	3.41	3.30	49.5	6.0900	2274.44	197316.00	0.012
T1	82 - 67 (122)	C12x20.7	3.41	3.30	49.5	6.0900	1811.74	197316.00	0.009
T1	82 - 67 (125)	C12x20.7	3.41	3.30	49.5	6.0900	2216.84	197316.00	0.011
T1	82 - 67 (126)	C12x20.7	3.41	3.30	49.5	6.0900	1841.61	197316.00	0.009

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	82 - 67 (117)	C12x20.7	-10244.33	58050.00	0.176	0.00	9423.00	0.000
T1	82 - 67 (118)	C12x20.7	-11811.17	58050.00	0.203	0.00	9423.00	0.000
T1	82 - 67 (121)	C12x20.7	-10555.50	58050.00	0.182	-0.00	9423.00	0.000
T1	82 - 67 (122)	C12x20.7	-9855.25	58050.00	0.170	-0.00	9423.00	0.000
T1	82 - 67 (125)	C12x20.7	-10528.67	58050.00	0.181	0.00	9423.00	0.000
T1	82 - 67 (126)	C12x20.7	-11511.42	58050.00	0.198	0.00	9423.00	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	82 - 67 (117)	C12x20.7	0.010	0.176	0.000	0.182	1.000	4.8.1
T1	82 - 67 (118)	C12x20.7	0.011	0.203	0.000	0.209	1.000	4.8.1
T1	82 - 67 (121)	C12x20.7	0.012	0.182	0.000	0.188	1.000	4.8.1
T1	82 - 67 (122)	C12x20.7	0.009	0.170	0.000	0.174	1.000	4.8.1
T1	82 - 67 (125)	C12x20.7	0.011	0.181	0.000	0.187	1.000	4.8.1
T1	82 - 67 (126)	C12x20.7	0.009	0.198	0.000	0.203	1.000	4.8.1

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	82 - 67	Leg	P2.5x.276	3	-11993.60	80239.20	14.9	Pass
T2	67 - 52	Leg	P2.5x.276	47	-11847.10	67061.80	17.7	Pass
T3	52 - 37	Leg	P2.5x.276	74	-12959.00	66503.00	19.5	Pass
T4	37 - 32	Leg	P2.5x.276	102	-14361.00	83082.20	17.3	Pass
T1	82 - 67	Diagonal	P1.5x.120	10	-2780.65	14959.30	18.6	Pass
T2	67 - 52	Diagonal	P1.5x.120	70	-2144.42	10456.30	20.5	Pass
T3	52 - 37	Diagonal	P1.5x.120	83	-792.36	10398.70	7.6	Pass
T1	82 - 67	Top Girt	P1.5x.120	6	-62.82	12243.70	0.5	Pass
T2	67 - 52	Top Girt	P1.5x.120	50	-1033.20	12243.70	8.4	Pass
T3	52 - 37	Top Girt	P1.5x.120	78	-168.08	12243.70	1.4	Pass
T4	37 - 32	Top Girt	L3x3x3/16	104	1446.06	35316.00	4.1	Pass
T1	82 - 67	Bottom Girt	P1.5x.120	7	-1048.94	12243.70	8.6	Pass
T2	67 - 52	Bottom Girt	P1.5x.120	54	-254.54	12243.70	2.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T3	52 - 37	Bottom Girt	P1.5x.120	80	1664.91	16856.00	9.9	Pass
T4	37 - 32	Bottom Girt	L3x3x3/16	107	-765.55	34120.60	9.4	Pass
T4	37 - 32	Mid Girt	L3x3x3/16	113	-100.66	24685.10	0.4	Pass
T1	82 - 67	Guy A@69.8194	7/16	123	6328.65	12480.00	50.7	Pass
T1	82 - 67	Guy B@69.8194	7/16	120	5997.54	12480.00	48.1	Pass
T1	82 - 67	Guy C@69.8194	7/16	116	6088.72	12480.00	48.8	Pass
T1	82 - 67	Torque Arm Top@69.8194	C12x20.7	126	-2825.82	173446.00	23.5	Pass

Summary		
Leg (T3)	19.5	Pass
Diagonal (T2)	20.5	Pass
Top Girt (T2)	8.4	Pass
Bottom Girt (T3)	9.9	Pass
Mid Girt (T4)	0.4	Pass
Guy A (T1)	50.7	Pass
Guy B (T1)	48.1	Pass
Guy C (T1)	48.8	Pass
Torque Arm Top (T1)	23.5	Pass
RATING =	**50.7**	**Pass**

Exhibit E

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11872D

CT872/Stratford PD_GT
900 Longbrook Avenue
Stratford, CT 06615

May 13, 2017

EBI Project Number: 6217002054

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	26.62 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

May 13, 2017

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11872D – CT872/Stratford PD_GT**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **900 Longbrook Avenue, Stratford, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **900 Longbrook Avenue, Stratford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel

5) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

6) Since the 2100 MHz UMTS radios are ground mounted there are additional cabling losses accounted for. For each ground mounted 2100 MHz UMTS RF path an additional 2.68 dB of cable loss was factored into the calculations used for this analysis. This is based on manufacturers Specifications for 155 feet of 7/8" coax cable on each path.

7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

8) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antennas used in this modeling are the **Ericsson AIR32 B66A/B2A** & **Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-A1M** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR32 B66A/B2A** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-A1M** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerlines of the proposed antennas are **79 & 77 feet** above ground level (AGL).

11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

12) All calculations were done with respect to uncontrolled / general public threshold limits.

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	79	Height (AGL):	79	Height (AGL):	79
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE%	6.30	Antenna B1 MPE%	6.30	Antenna C1 MPE%	6.30
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	79	Height (AGL):	79	Height (AGL):	79
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	3,593.63	ERP (W):	3,593.63	ERP (W):	3,593.63
Antenna A2 MPE%	2.42	Antenna B2 MPE%	2.42	Antenna C2 MPE%	2.42
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	77	Height (AGL):	77	Height (AGL):	77
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	1.32	Antenna B3 MPE%	1.32	Antenna C3 MPE%	1.32

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**10.04 %**
SPD - Omni	1.70 %
SPD - Yagi	1.36 %
SPD - Yagi	1.36 %
SPD - 63fta	2.88 %
SPD - 63ftb	6.40 %
SPD - 53ft	2.88 %
Site Total MPE %:	**26.62 %**

T-Mobile Sector A Total:	10.04 %
T-Mobile Sector B Total:	10.04 %
T-Mobile Sector C Total:	10.04 %
Site Total:	26.62 %

T-Mobile _Max Values per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	79	31.49	AWS - 2100 MHz	1000	3.15%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	79	31.49	PCS - 1900 MHz	1000	3.15%
T-Mobile AWS - 2100 MHz UMTS	2	629.68	79	8.50	AWS - 2100 MHz	1000	0.85%
T-Mobile PCS - 1900 MHz GSM	2	1,167.14	79	15.75	PCS - 1900 MHz	1000	1.57%
T-Mobile 700 MHz LTE	1	865.21	77	6.17	700 MHz	467	1.32%
						Total:	**10.04%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	10.04 %
Sector B:	10.04 %
Sector C:	10.04 %
T-Mobile Per Sector Maximum:	10.04 %
Site Total:	26.62 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **26.62%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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