NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

May 30, 2017

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

RE: Notice of Exempt Modification
280 Elm Street, Naugatuck CT 06770
Latitude: 41.48125000
Longitude: -73.05316000
T-Mobile Site#: CTNH312A_L1900

Dear Ms. Bachman:

T-Mobile is requesting to file an exempt modification for an existing 80-foot wood pole located at 280 Elm Street, Naugatuck CT 06770. T-Mobile currently maintains nine (9) antennas at the 120-foot level of the existing 150-foot tower. The tower is owned by Crown Castle. The property is owned by Chemtura Corporation. 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 120-foot and level of the tower.

Planned Modifications:

Remove: (1) 1-5/8" Coax

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

Install New: (1) Hybrid Line

Existing to Remain:
(11) 1-5/8" Coax
(1) Hybrid line
(3) AIR21 Antenna
(3) RRU
(3) Commscope LNX6515DS Antenna
(3) TMA

This facility was approved by the Town of Naugatuck PZC. The tower was approved in 1997 for a 150-foot monopole tower – See attached approval from the Town Planner.

NORTHEAST SITE SOLUTIONS
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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 N. Warren "Pete" Hess III, Mayor, as Elected Official for the Town of Naugatuck and Sue Goggin, Town Planner 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: N. Warren "Pete" Hess III – Mayor - as elected official
Sue Goggin – Town Planner
Crown Castle - Tower owner
Chemtura Corporation - Property owner

Exhibit A

APPLICATION FOR SITE PLAN OR SPECIAL PERMIT APPROVAL

SITE PLAN _____ SPECIAL PERMIT X FEE $200

NAME OF PROPOSED DEVELOPMENT PCS telecommunications facility

APPLICANT:

NAME Sprint PCS

ADDRESS 9 Barnes

Wallingford, CT

PHONE (203) 294-5600

PLANS PREPARED BY:

NAME O'Brien & Gere Engineers

ADDRESS 282 Main Street Extension

Middletown, CT

PHONE (860) 346-1934

OWNER (IF DIFFERENT)

(IF MORE THAN ONE OWNER, PROVIDE INFORMATION FOR EACH)

NAME Uniroyal Chemical Co., Inc PHONE (203) 573-3331

ADDRESS Corporate Headquarters

Middlebury, CT

OWNERSHIP INTENTIONS, IE: PURCHASE OPTIONS? leased 25'x35' parcel

LOCATION OF SITE 280 Elm Street, Naugatuck, CT

TAX MAP DESCRIPTION _____

MAP 5 & 5½ BLOCK 20.W20 & 21 PARCEL _____

CURRENT ZONING CLASSIFICATION Industrial I-1

OTHER PERMITS NEEDED (LIST) _____

PROPOSED USE OF THE SITE Construction, operation & maintenance of a 150 monopole and related base station equipment to provide wireless communication service.

IF A SITE PLAN, IS IT FOR A CHANGE OF USE OF EXISTING BUILDING OR STRUCTURE?

TOTAL SITE AREA (IN SQ FEET OR ACRES)

1600 sq. ft.

ANTICIPATED CONSTRUCTION TIME 45 days

WILL DEVELOPMENT BE STAGED? no, continuous process

CURRENT LAND USE OF SITE (AGRICULTURE, COMMERCIAL, UNDEVELOPED ?)

parking lot

CURRENT CONDITION OF SITE (BUILDINGS, BRUSH, ETC.)

abandoned

CHARACTER OF SURROUNDING LANDS (SUBURBAN, AGRICULTURE, WETLANDS ?) industrial (chemical plant)

ESTIMATED COST OF PROPOSED IMPROVEMENT $ 77,000

ANTICIPATED INCREASE IN NUMBER OF RESIDENTS, SHOPPERS, EMPLOYEES ? (AS APPLICABLE) n/a

DESCRIBE PROPOSED USE, INCLUDING PRIMARY AND SECONDARY USES; GROUND FLOOR AREA; HEIGHT; AND NUMBER OF STORIES FOR EACH BUILDING; - FOR RESIDENTIAL BUILDINGS INCLUDE NUMBER OF DWELLING UNITS BY SIZE (EFFICIENCY, ONE-BEDROOM, TWO-BEDROOM, THREE OR MORE BEDROOMS) AND NUMBER OF PARKING SPACES TO BE PROVIDED. - FOR NONRESIDENTIAL BUILDINGS, INCLUDE TOTAL FLOOR AREA AND TOTAL SALES AREA; NUMBER OF AUTO AND TRUCK PARKING SPACES.

The leased area shall be used to construct, operate and maintain a 150 foot monopole and related base station equipment in order to provide wireless communication service to the area

LOT HAS FRONTAGE ON ONE (1) OR MORE OF THE FOLLOWING:

____ STATE HIGHWAY
X TOWN ACCEPTED STREET
____ UNACCEPTED STREET
____ A. IN A FILED SUBDIVISION APPROVED BY PLANNING WITH COMPLETION BOND
____ B. IN A FILED SUBDIVISION APPROVED BY PLANNING WITH NO BOND IN EFFECT
____ C. OTHER - SPECIFY

11-5-93

Lewis A. Hurwitz as authorized agent for Sprint PCS

LETTER OF AUTHORIZATION

Municipality: Naugatuck

RE: Building Permits and Land Use Approvals

UNIROYAL CHEMICAL COMPANY, INC., the Owner of Elm Street, Naugatuck, Connecticut, does hereby authorize SPRINT SPECTRUM L.P. ("Sprint") and its representatives, to complete and/or file any application, form, map, drawing, site plan or any other document, useful or necessary in obtaining any zoning approval, variance, special permit or other land use approval or building permit (collectively, the "Approvals"), required to provide Sprint with lawful access to, and the ability to use of the Site (as defined in that certain PCS Site Agreement of even date herewith between Owner and Sprint) which is comprised of 1600 square feet leased from Owner to Sprint, together with certain rights of non-exclusive access thereto, to the Property for the purpose of installing, erecting or otherwise placing antennas, support structures and related equipment on the Property. Owner shall cooperate with Sprint and its agents in obtaining any required Approvals. Sprint shall be responsible for all cost, filing fees, or any other expense incurred in connection with securing any Approvals.

Assessor's Parcel Number: Map/Section _____, Block _____, Lot _____

Property Owner:

UNIROYAL CHEMICAL COMPANY, INC.

By: J J Prior

Name: John J Prior

Title: Fac Mgr

STATE OF CONNECTICUT :

: ss:

COUNTY OF :

Signed and Sworn to before me this 6 day of May, 1997.

L. B. Zitzmann

Notary Public

My Commission expires:

L.B. ZITZMANN
NOTARY PUBLIC
MY COMMISSION EXPIRES NOVEMBER 30, 1999

BOROUGH OF NAUGATUCK

INLAND WETLANDS COMMISSION
PLANNING COMMISSION
ZONING BOARD OF APPEALS
ZONING COMMISSION

LAND USE OFFICE
213 CHURCH STREET
NAUGATUCK, CT 06770
203/729-4571

I HEREBY CERTIFY THAT Sprint PCS Communications, WAS GRANTED A SPECIAL PERMIT UNDER SECTION 32 OF THE ZONING REGULATIONS, BOROUGH OF NAUGATUCK AT THE MEETING OF THE ZONING COMMISSION HELD ON: DAY: Wednesday, DATE: September 17, 1997, FOR PROPERTY LOCATED AT: 280 Elm Street (Uniroyal Chemical)

PURPOSE OF: constructing a 150 foot tower for Sprint P.C.S. Communications

SIGNED:

Jack Valinko (c/m)
ZONING CHAIRMAN

Carol Miner, Assistant
ZONING ENFORCEMENT OFFICER

PLEASE HAVE THIS RECORDED IN THE TOWN CLERK'S OFFICE BEFORE A ZONING COMPLIANCE WILL BE ISSUED.

Exhibit B

Borough of Naugatuck, CT

Property Listing Report

Map Block Lot 5.5-20W20 | Account 068-7770

Property Information

Property Location	0 ELM ST
Owner	CHEMTURA CORPORATION
Co-Owner	
Mailing Address	199 BENSON RD MIDDLEBURY CT 06749
Land Use	4400 VACANT IND
Land Class	I
Zoning Code	
Census Tract	
Sub Lot	

Neighborhood	J
Acreage	86.56
Utilities	
Lot Setting/Desc	
Survey Map	
Additional Info	

Photo

Sketch

Primary Construction Details

Year Built	
Stories	
Building Style	
Building Use	
Building Condition	
Floors	
Total Rooms	

Bedrooms	
Full Bathrooms	
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	
Roof Cover	

Exterior Walls	
Interior Walls	
Heating Type	
Heating Fuel	
AC Type	
Gross Bldg Area	
Total Living Area	

Report Created On 5/8/2017

Borough of Naugatuck, CT

Property Listing Report | **Map Block Lot** 5.5-20W20 | **Account** 068-7770

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings		
Extras		
Outbuildings		
Land		
Total		

Outbuilding and Extra Items

Type	Description
CELL TOWER	150 HEIGHT
Patio	60 S.F.

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area		0

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
CHEMTURA CORPORATION	842/ 475	2/17/2009	
UNIROYAL CHEMICAL CO INC	601/ 217	3/31/2003	
UNIROYAL CHEMICAL CO INC	601/ 216	3/31/2003	
CROMPTON MANUFACTURING	584/ 275	11/27/2002	
UNIROYAL CHEMICAL CO INC	271/ 213	10/25/1985	

Report Created On 5/8/2017

Full Extent | Zoom In | Zoom Out | Prev Extent | Next Extent | Pan | **Parcel Information** | Simple Measure | Path Measure | Area Measure

Town of Naugatuck - NEGEO MapXpress v1.2

Scale: 1 in = 400 ft

CT State Plane NAD 1983 - X,Y 913944 737168

Exhibit C

ANTENNA UPGRADES
BY

T-Mobile

T-MOBILE NORTHEAST LLC

SITE NUMBER: CTNH312A
SITE NAME: NH312/CROWNNAUGATUCK
SITE ADDRESS: 280 ELM STREET
NAUGATUCK, CT 06770
(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:

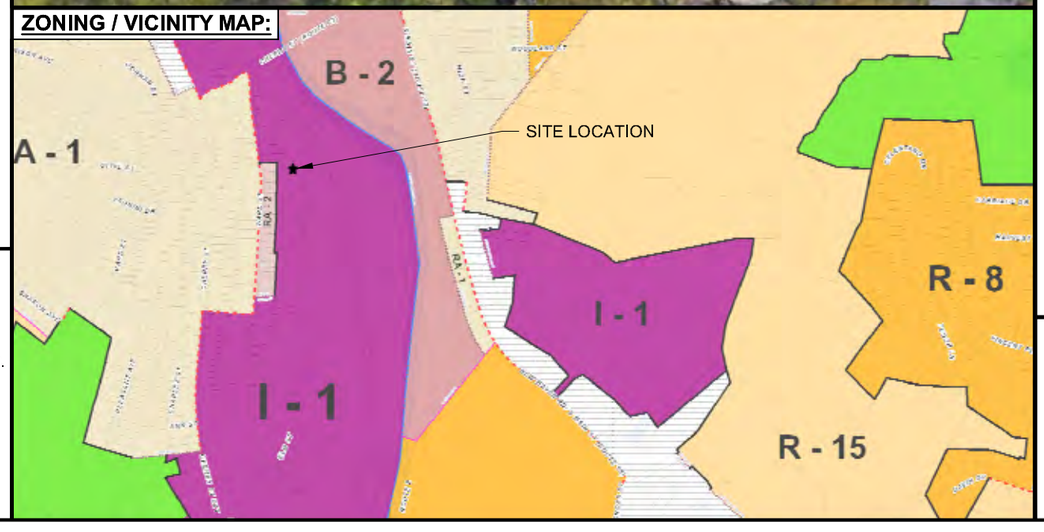
2016 CONNECTICUT STATE BUILDING CODE (CSBC).

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

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

SATELLITE IMAGE:

ZONING / VICINITY MAP:



PROJECT INFORMATION:

ADDRESS:	280 ELM STREET NAUGATUCK, CT 06770
STRUCTURE TYPE:	MONOPOLE
ZONING DISTRICT:	I-1
COORDINATES:	N 41.48125000 / W -73.05316000
ANTENNA HEIGHT:	120'

PROJECT TEAM:

APPLICANT:	T-MOBILE NORTHEAST, LLC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 860-692-7100
LANDLORD:	CHEMTURA CORPORATION 199 BENSON RD MIDDLEBURY, CT 06749
TOWER OWNER :	CROWN CASTLE 3 CORPORATE PARK DRIVE SUITE 101, CLIFTON PARK NY 12065
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
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	05/05/17
0	ISSUED FOR PERMIT	05/05/17

SITE NUMBER: CTNH312A
SITE NAME: NH312/CROWNNAUGATUCK
SITE ADDRESS: 280 ELM STREET
NAUGATUCK, CT 06770

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

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

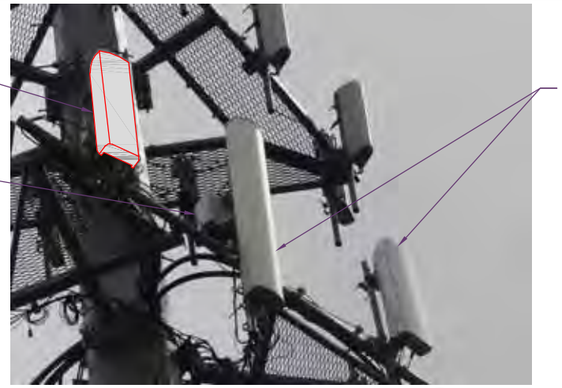
CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL

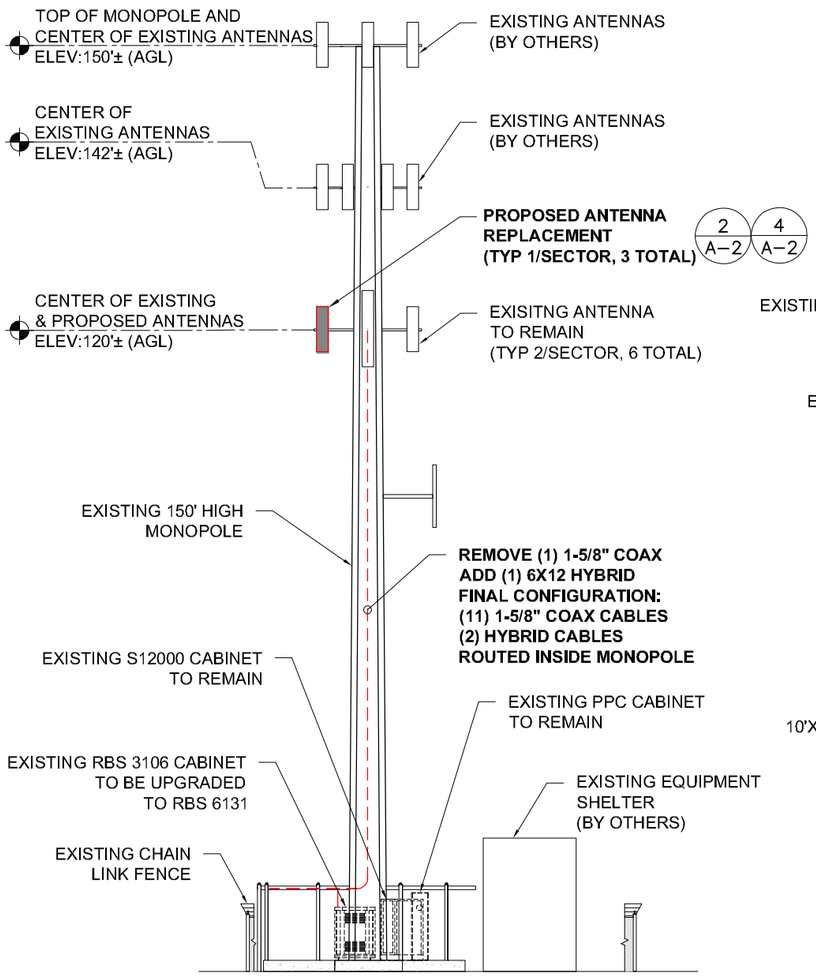
REV	DESCRIPTION	DATE
A	PRELIMINARY	05/05/17
0	ISSUED FOR PERMIT	05/05/17

SITE NUMBER: CTNH312A
SITE NAME: NH312/CROWNNAUGATUCK
SITE ADDRESS: 280 ELM STREET
NAUGATUCK, CT 06770

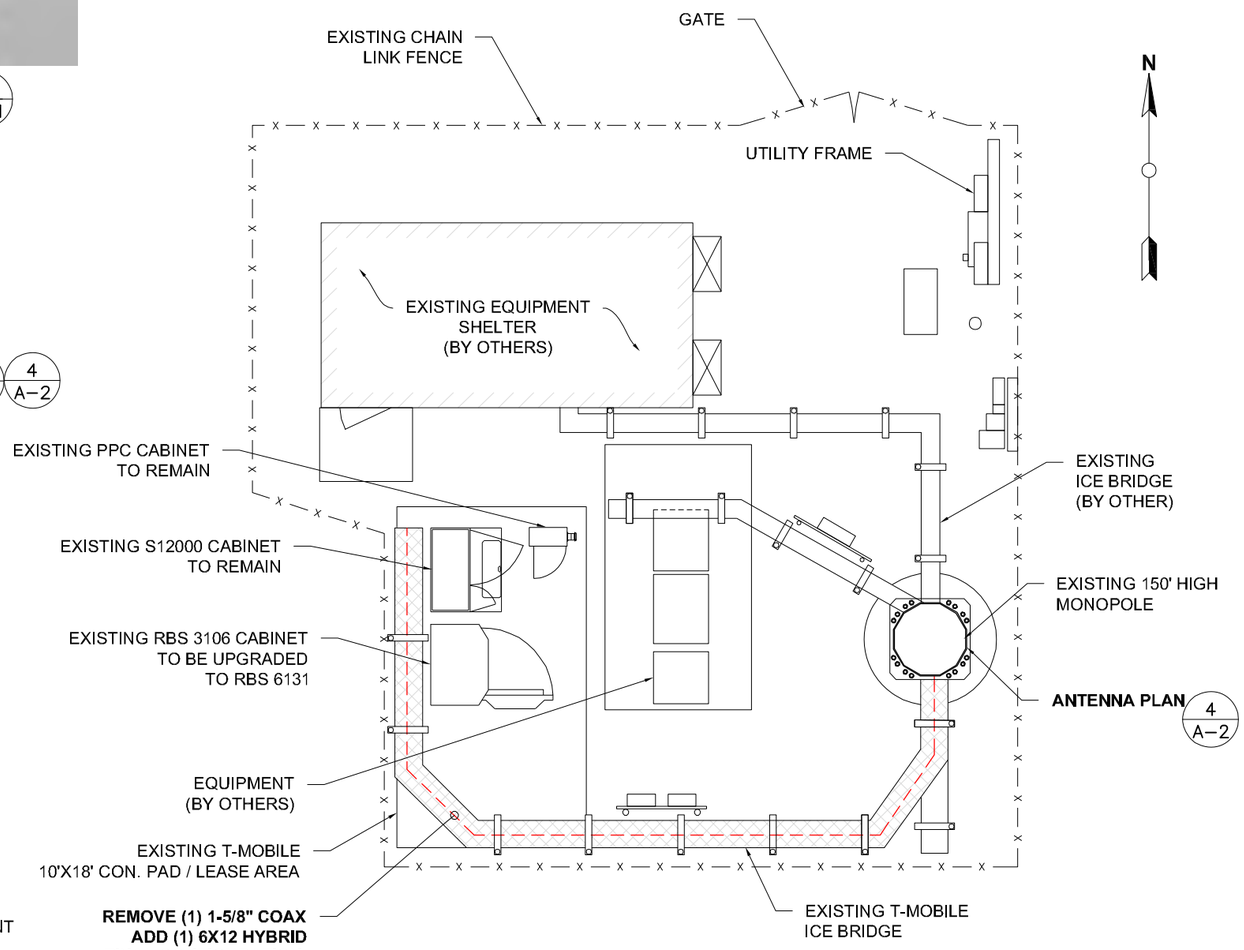
SHEET TITLE:
N-1: NOTES AND DISCLAIMERS



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



ELEVATION (1 / A–1)
SCALE 3/4"=1'-0"



SITE PLAN (3 / A–1)
SCALE 1-1/2"=1'-0"

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

PROJECT MANGER
NSS NORTHEAST SITE SOLUTIONS
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
NO. ARI. 11162
LICENSED ARCHITECT

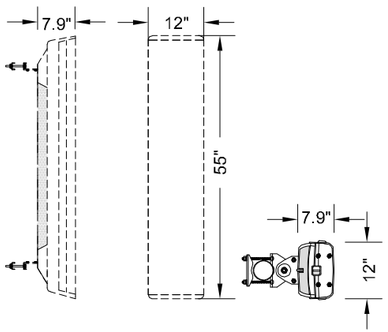
REV	DESCRIPTION	DATE
A	PRELIMINARY	05/05/17
0	ISSUED FOR PERMIT	05/05/17

SITE NUMBER: CTNH312A
SITE NAME: NH312/CROWNNAUGATUCK
SITE ADDRESS: 280 ELM STREET
NAUGATUCK, CT 06770

SHEET TITLE:
A-1: PLANS AND ELEVATIONS

REMOVE:
(3) ANTENNAS

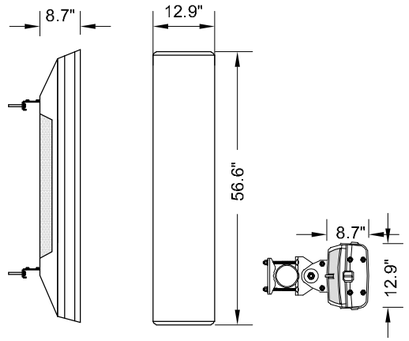
MANUFACTURER: ERICSSON
MODEL AIR-21 KRC118046-1_B2P_B4A
FOOTPRINT: 55"HX12"WX7.9"D
WEIGHT: 83 LBS
FREQUENCY BAND: 1700-2100 MHZ



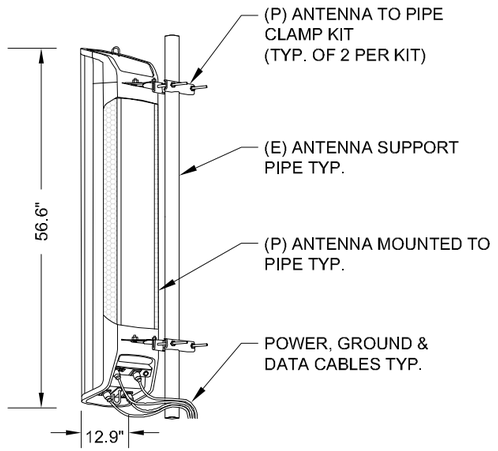
ANTENNA TO BE REMOVED 1 A-2
SCALE: N.T.S

ADD:
(3) ANTENNAS

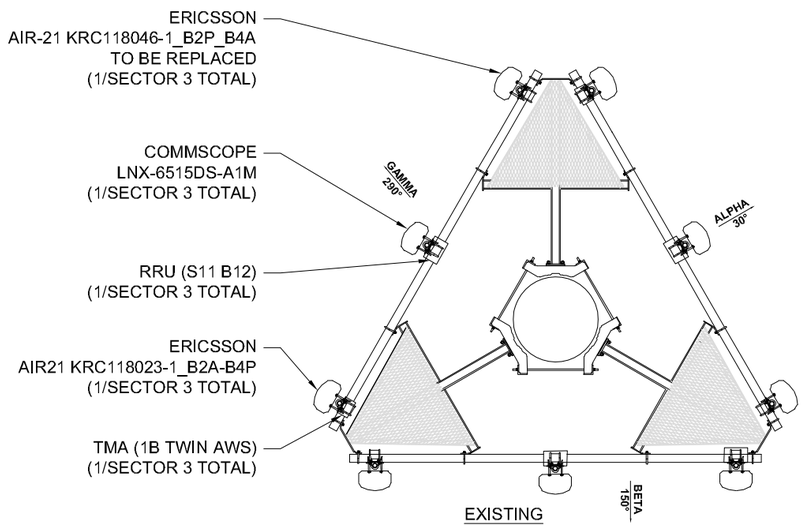
MANUFACTURER: ERICSSON
MODEL AIR32 KRD901146-1_B66A_B2A
FOOTPRINT: 56.6"HX12.9"WX8.7"D
WEIGHT: 132.2 LBS
FREQUENCY BAND: 1710-1755
ANTENNA TYPE: SINGLE BAND
WIND LOADING LATERAL: 300N
WIND LOADING REAR: 660N
WIND LOADING MAXIMUM: 640N



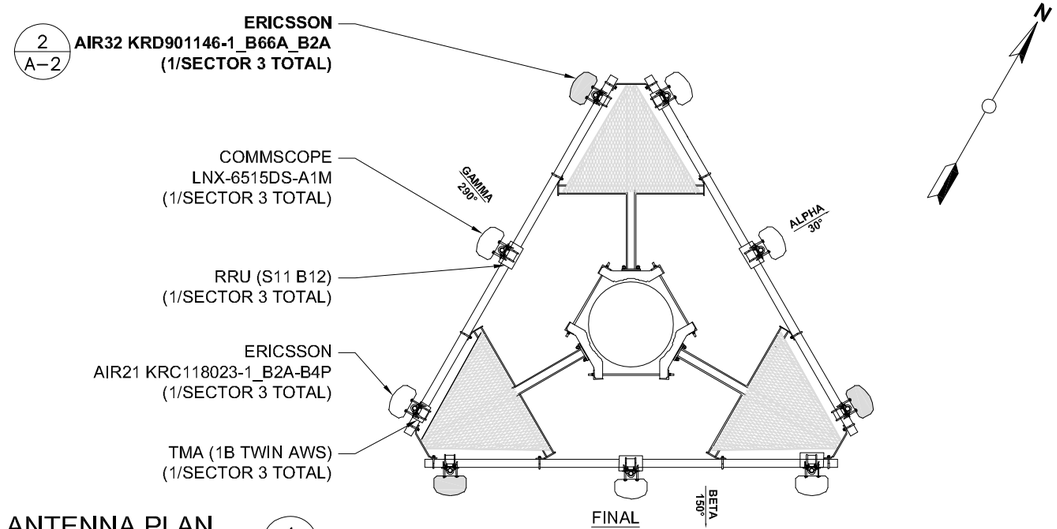
ANTENNA TO BE ADDED 2 A-2
SCALE: N.T.S



ANTENNA MOUNT DETAILS 3 A-2
SCALE: N.T.S



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
NSS NORTHEAST SITE SOLUTIONS
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
NO. ARI. 11162
LICENSED ARCHITECT

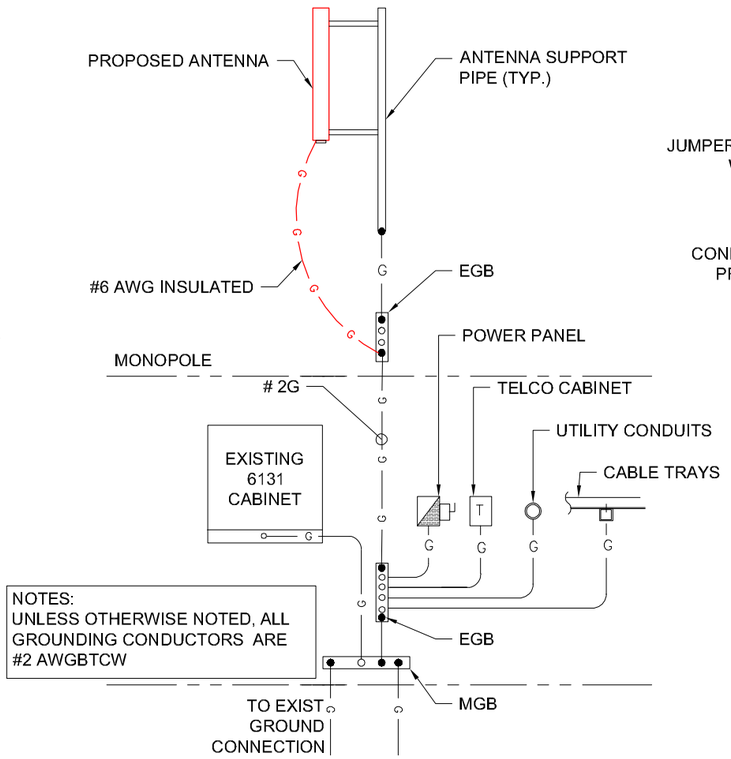
REV	DESCRIPTION	DATE
A	PRELIMINARY	05/05/17
0	ISSUED FOR PERMIT	05/05/17

SITE NUMBER: CTNH312A
SITE NAME: NH312/CROWNNAUGATUCK
SITE ADDRESS: 280 ELM STREET
NAUGATUCK, CT 06770

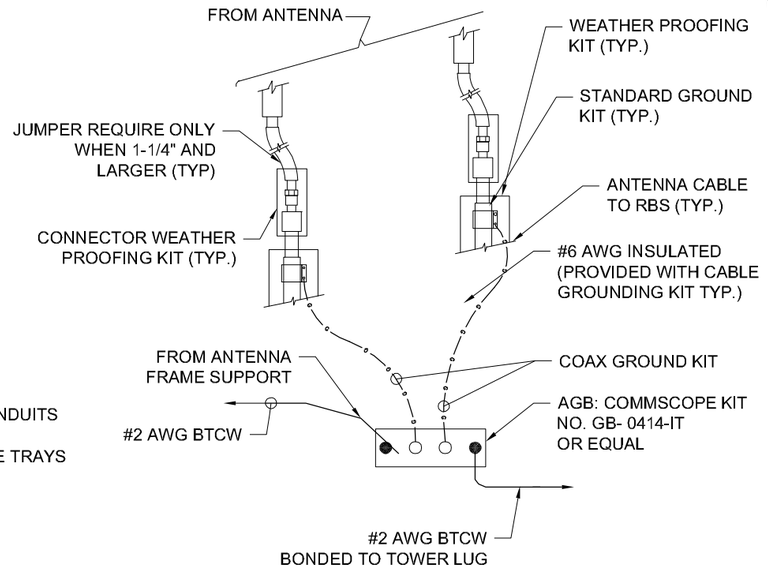
SHEET TITLE:
A-2 ANTENNA DETAILS

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.

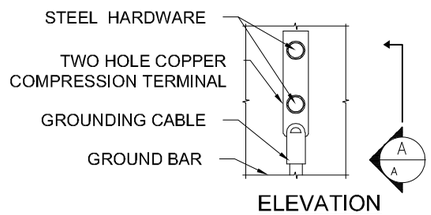


GROUNDING RISER DIAGRAM (1 / E–1)
SCALE: N.T.S

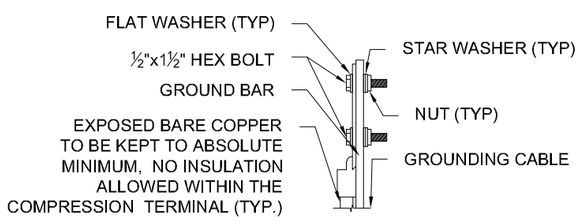


NOTES:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB

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



ELEVATION

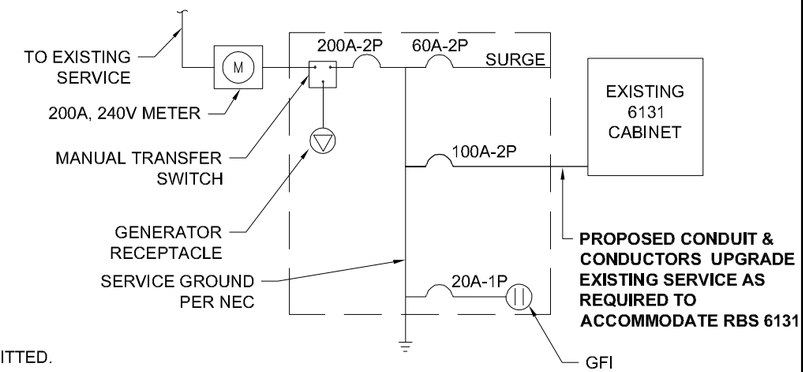


SECTION A-A

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

PROJECT MANGER
NSS NORTHEAST SITE SOLUTIONS
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
NO. ARI. 11162
LICENSED ARCHITECT

REV	DESCRIPTION	DATE
A	PRELIMINARY	05/05/17
0	ISSUED FOR PERMIT	05/05/17

SITE NUMBER: CTNH312A
SITE NAME: NH312/CROWNNAUGATUCK
SITE ADDRESS: 280 ELM STREET
NAUGATUCK, CT 06770

SHEET TITLE:

Exhibit D

Date: **May 11, 2017**

Charles Trask
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Velocitel, Inc. d.b.a. FDH Velocitel
6521 Meridien Drive, Suite 107
Raleigh, NC 27616
(919) 755-1012

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CTNH312A
	Carrier Site Name:	NH312/Crown-Naugatuck
Crown Castle Designation:	**Crown Castle BU Number:**	876319
	Crown Castle Site Name:	NAUGATUCK 2 UNIROYAL
	Crown Castle JDE Job Number:	438163
	Crown Castle Work Order Number:	1404151
	Crown Castle Application Number:	390366 Rev. 0
Engineering Firm Designation:	**FDH Velocitel Project Number:**	17QESU1400
Site Data:	**280 Elm Street, NAUGATUCK, New Haven County, CT** **Latitude *41° 28' 52.54"*, Longitude *-73° 3' 11.67"*** **150 Foot - Monopole Tower**	

Dear Charles Trask,

FDH Velocitel is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1035572, in accordance with application 390366, revision 0.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 121 mph converted to a nominal 3-second gust wind speed of 94 mph per section 1609.3.1 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, K_{zt}, of 1.000 and Risk Category II were used in this analysis.

We at *FDH Velocitel* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Jesse E. Fabish, EI
Project Engineer

Reviewed by:

Dennis D. Abel, PE
Director
CT PE License No. 23247

STATE OF CONNECTICUT
DENNIS D. ABEL
No. 23247
LICENSED
PROFESSIONAL ENGINEER

05-11-2017

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by Summit Manufacturing, Inc. in August of 1997. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 94 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
119.0	120.0	3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	1	1-1/2	--

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150.0	153.0	1	dragonwave	A-ANT-23G-1-C	3 3 3 3 2	1-1/4 1/4 5/16 1/2 2” Conduit	1
	152.0	3	dragonwave	A-ANT-23G-2-C			
	150.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		3	alcatel lucent	TME-1900MHz RRH (65MHz)			
		1	crown mounts	Platform Mount [LP 1201-1]			
		9	rfs celwave	ACU-A20-N			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	2
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
	148.0	3	argus technologies	LLPX310R w/ Mount Pipe	--	--	1
		3	samsung telecommunications	FDD_R6_RRH			
142.0	142.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	--	--	3
134.0	135.0	12	decibel	844G90VTA-SX w/ Mount Pipe	12	1-1/4	1
	134.0	1	crown mounts	Platform Mount [LP 1201-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
119.0	120.0	3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	1	1-5/8	3
		3	andrew	LNX-6515DS-VTM w/ Mount Pipe	12	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	RRUS 11 B12			
	119.0	1	crown mounts	Platform Mount [LP 303-1]			
		3	ericsson	KRY 112 144/1			
99.0	100.0	1	lucent	KS24019-L112A	1	1/2	1
	99.0	1	crown mounts	Side Arm Mount [SO 702-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed; Not considered in this analysis.

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150.0	150.0	1	--	14' Low Profile Mount	--	--
		1	--	5/8" Lighning Rod		
		12	--	DB980H PCS		
130.0	130.0	1	--	14' Low Profile Mount	--	--
		12	--	DB980H PCS		
110.0	110.0	1	--	14' Low Profile Mount	--	--
		12	--	DB980H PCS		
100.0	100.0	1	--	GPS Antenna with Mount	--	--

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, PE, PC, Dated: 07/22/1997	1529732	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit, Job# 2249, Dated: 08/14/1997	1447037	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit, Job# 2249, Dated: 08/14/1997	1446973	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. FDH Velocitel should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 108	Pole	TP30.401x22x0.25	1	-13.44	1459.26	41.1	Pass
L2	108 - 69.75	Pole	TP37.553x29.1509x0.3125	2	-20.37	2264.07	58.9	Pass
L3	69.75 - 32.5	Pole	TP44.379x35.9778x0.375	3	-29.89	3445.83	57.8	Pass
L4	32.5 - 0	Pole	TP50.13x42.5288x0.4375	4	-43.02	4671.47	56.4	Pass
							Summary	
						Pole (L2)	58.9	Pass
						RATING =	**58.9**	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0.0	54.5	Pass
1	Base Plate		55.5	Pass
1	Base Foundation		37.0	Pass
1	Base Foundation Soil Interaction		27.8	Pass

Structure Rating (max from all components) =	**58.9%**

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

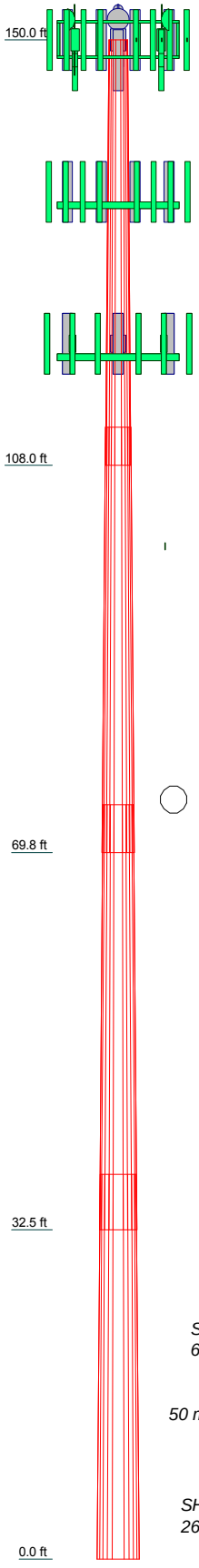
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	42.00	12	0.2500	3.75	22.0000	30.4010		3.0
2	42.00	12	0.3125	4.75	29.1509	37.5530	A607-60	4.8
3	42.00	12	0.3750	5.50	35.9778	44.3790		6.9
4	38.00	12	0.4375		42.5288	50.1300	A607-65	8.4
								23.0



ALL REACTIONS ARE FACTORED

AXIAL 68 K

SHEAR 6 K

MOMENT 681 kip-ft

TORQUE 0 kip-ft

50 mph WIND - 0.7500 in ICE

AXIAL 43 K

SHEAR 26 K

MOMENT 2623 kip-ft

TORQUE 0 kip-ft

REACTIONS - 94 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVTM14-C-120 w/ Mount Pipe	150	Platform Mount [LP 1201-1]	150
APXVTM14-C-120 w/ Mount Pipe	150	A-ANT-23G-1-C	150
APXVTM14-C-120 w/ Mount Pipe	150	A-ANT-23G-2-C	150
TD-RRH8x20-25	150	A-ANT-23G-2-C	150
TD-RRH8x20-25	150	A-ANT-23G-2-C	150
TD-RRH8x20-25	150	(4) 844G90VTA-SX w/ Mount Pipe	134
APXVSPP18-C-A20 w/ Mount Pipe	150	(4) 844G90VTA-SX w/ Mount Pipe	134
APXVSPP18-C-A20 w/ Mount Pipe	150	(4) 844G90VTA-SX w/ Mount Pipe	134
APXVSPP18-C-A20 w/ Mount Pipe	150	Platform Mount [LP 1201-1]	134
TME-1900MHz RRH (65MHz)	150	LNX-6515DS-VTM w/ Mount Pipe	119
TME-1900MHz RRH (65MHz)	150	LNX-6515DS-VTM w/ Mount Pipe	119
TME-1900MHz RRH (65MHz)	150	KRY 112 144/1	119
(3) ACU-A20-N	150	KRY 112 144/1	119
(3) ACU-A20-N	150	KRY 112 144/1	119
(3) ACU-A20-N	150	RRUS 11 B12	119
800 EXTERNAL NOTCH FILTER	150	RRUS 11 B12	119
800 EXTERNAL NOTCH FILTER	150	RRUS 11 B12	119
800 EXTERNAL NOTCH FILTER	150	AIR -32 B2A/B66AA w/ Mount Pipe	119
800MHZ RRH	150	AIR -32 B2A/B66AA w/ Mount Pipe	119
800MHZ RRH	150	AIR -32 B2A/B66AA w/ Mount Pipe	119
800MHZ RRH	150	Platform Mount [LP 303-1]	119
LLPX310R w/ Mount Pipe	150	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	119
LLPX310R w/ Mount Pipe	150		
LLPX310R w/ Mount Pipe	150	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	119
FDD_R6_RRH	150		
FDD_R6_RRH	150	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	119
FDD_R6_RRH	150		
(2) Empty Mount Pipe	150	LNX-6515DS-VTM w/ Mount Pipe	119
(2) Empty Mount Pipe	150	KS24019-L112A	99
(2) Empty Mount Pipe	150	Side Arm Mount [SO 702-1]	99

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 94 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 58.9%

FDH Velocitel
6521 Meridien Drive, Suite 107
Raleigh, NC 27616
Phone: (919) 755-1012
FAX:

Job: ***BU 876319 NAUGATUCK 2 UNIROYAL***
Project: ***17QESU1400***
Client: Crown Castle | Drawn by: JF | App'd:
Code: TIA-222-G | Date: 05/11/17 | Scale: NTS
Path: | Dwg No. E-1

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 94 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	150.00-108.00	42.00	3.75	12	22.0000	30.4010	0.2500	1.0000	A607-60 (60 ksi)
L2	108.00-69.75	42.00	4.75	12	29.1509	37.5530	0.3125	1.2500	A607-60

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	69.75-32.50	42.00	5.50	12	35.9778	44.3790	0.3750	1.5000	(60 ksi) A607-65 (65 ksi)
L4	32.50-0.00	38.00		12	42.5288	50.1300	0.4375	1.7500	A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.7761	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	31.4734	24.2716	2816.3524	10.7941	15.7477	178.8419	5706.6935	11.9457	7.4775	29.91
L2	30.9559	29.0187	3080.3908	10.3242	15.1002	203.9971	6241.7070	14.2821	6.9749	22.32
	38.8777	37.4733	6633.4331	13.3321	19.4525	341.0075	13441.1339	18.4432	9.2267	29.525
L3	38.2306	42.9903	6955.4340	12.7458	18.6365	373.2160	14093.5951	21.1585	8.6370	23.032
	45.9445	53.1348	13132.5650	15.7534	22.9883	571.2711	26610.1370	26.1513	10.8886	29.036
L4	45.1681	59.2962	13409.0519	15.0687	22.0299	608.6741	27170.3746	29.1838	10.2252	23.372
	51.8984	70.0043	22064.4151	17.7899	25.9673	849.6987	44708.4869	34.4540	12.2623	28.028

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.00-108.00				1	1	1			
L2 108.00-69.75				1	1	1			
L3 69.75-32.50				1	1	1			
L4 32.50-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	B	Surface Ar (CaAa)	150.00 - 8.00	1	1	0.000 0.000	0.5800		0.22
***									
***									

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***								
7983A(1/2")	A	No	Inside Pole	150.00 - 0.00	3	No Ice 1/2" Ice	0.00 0.00	0.08 0.08

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	0.08
9207(5/16")	A	No	Inside Pole	150.00 - 0.00	3	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
9258(1/4)	A	No	Inside Pole	150.00 - 0.00	3	No Ice	0.00	0.04
						1/2" Ice	0.00	0.04
						1" Ice	0.00	0.04
HB114-1-0813U4-M5J(1 1/4")	A	No	Inside Pole	150.00 - 0.00	3	No Ice	0.00	1.20
						1/2" Ice	0.00	1.20
						1" Ice	0.00	1.20
HB114-21U3M12-XXX F(1-1/4")	A	No	Inside Pole	150.00 - 0.00	1	No Ice	0.00	1.22
						1/2" Ice	0.00	1.22
						1" Ice	0.00	1.22
2" Rigid Conduit	A	No	Inside Pole	150.00 - 0.00	2	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
***								
***								
LDF6-50A(1-1/4")	B	No	Inside Pole	134.00 - 0.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
***								
LDF7-50A(1-5/8")	C	No	Inside Pole	119.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
MLC Hybrid 6Power/12Fiber(1-1/2")	C	No	Inside Pole	119.00 - 0.00	1	No Ice	0.00	0.98
						1/2" Ice	0.00	0.98
						1" Ice	0.00	0.98
***								
LDF4-50A(1/2")	A	No	Inside Pole	99.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
***								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-108.00	A	0.000	0.000	0.000	0.000	0.53
		B	0.000	0.000	2.436	0.000	0.22
		C	0.000	0.000	0.000	0.000	0.12
L2	108.00-69.75	A	0.000	0.000	0.000	0.000	0.49
		B	0.000	0.000	2.219	0.000	0.31
		C	0.000	0.000	0.000	0.000	0.41
L3	69.75-32.50	A	0.000	0.000	0.000	0.000	0.47
		B	0.000	0.000	2.160	0.000	0.30
		C	0.000	0.000	0.000	0.000	0.40
L4	32.50-0.00	A	0.000	0.000	0.000	0.000	0.41
		B	0.000	0.000	1.421	0.000	0.26
		C	0.000	0.000	0.000	0.000	0.35

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-108.00	A	1.718	0.000	0.000	0.000	0.000	0.53
		B		0.000	0.000	16.866	0.000	0.42
		C		0.000	0.000	0.000	0.000	0.12
L2	108.00-69.75	A	1.655	0.000	0.000	0.000	0.000	0.49
		B		0.000	0.000	15.361	0.000	0.50
		C		0.000	0.000	0.000	0.000	0.41
L3	69.75-32.50	A	1.567	0.000	0.000	0.000	0.000	0.47
		B		0.000	0.000	14.493	0.000	0.47
		C		0.000	0.000	0.000	0.000	0.40
L4	32.50-0.00	A	1.394	0.000	0.000	0.000	0.000	0.41
		B		0.000	0.000	9.099	0.000	0.36
		C		0.000	0.000	0.000	0.000	0.35

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-108.00	0.0725	-0.0419	0.3949	-0.2280
L2	108.00-69.75	0.0726	-0.0419	0.4146	-0.2393
L3	69.75-32.50	0.0726	-0.0419	0.4163	-0.2403
L4	32.50-0.00	0.0540	-0.0312	0.3084	-0.1780

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	Safety Line 3/8	108.00 - 150.00	1.0000	1.0000
L2	1	Safety Line 3/8	69.75 - 108.00	1.0000	1.0000
L3	1	Safety Line 3/8	32.50 - 69.75	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	150.00	No Ice 1/2" Ice	6.58 7.03	4.96 5.75	0.08 0.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	7.47	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
TD-RRH8x20-25	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8x20-25	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8x20-25	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
TME-1900MHz RRH (65MHz)	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	0.06 0.08 0.11
TME-1900MHz RRH (65MHz)	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	0.06 0.08 0.11
TME-1900MHz RRH (65MHz)	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	0.06 0.08 0.11
(3) ACU-A20-N	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.15	0.12 0.16 0.21	0.00 0.00 0.00
(3) ACU-A20-N	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.15	0.12 0.16 0.21	0.00 0.00 0.00
(3) ACU-A20-N	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.15	0.12 0.16 0.21	0.00 0.00 0.00
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.66 0.76 0.87	0.32 0.40 0.48	0.01 0.02 0.02
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.66 0.76 0.87	0.32 0.40 0.48	0.01 0.02 0.02
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.66 0.76 0.87	0.32 0.40 0.48	0.01 0.02 0.02
800MHZ RRH	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
800MHZ RRH	B	From Leg	4.00 0.00	0.0000	150.00	No Ice 1/2" Ice	2.13 2.32	1.77 1.95	0.05 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	2.51	2.13	0.10
800MHZ RRH	C	From Leg	4.00	0.0000	150.00	No Ice	2.13	1.77	0.05
			0.00			1/2" Ice	2.32	1.95	0.07
			0.00			1" Ice	2.51	2.13	0.10
LLPX310R w/ Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	4.54	2.98	0.05
			0.00			1/2" Ice	4.89	3.53	0.08
			-2.00			1" Ice	5.25	4.09	0.13
LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	4.54	2.98	0.05
			0.00			1/2" Ice	4.89	3.53	0.08
			-2.00			1" Ice	5.25	4.09	0.13
LLPX310R w/ Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	4.54	2.98	0.05
			0.00			1/2" Ice	4.89	3.53	0.08
			-2.00			1" Ice	5.25	4.09	0.13
FDD_R6_RRH	A	From Leg	4.00	0.0000	150.00	No Ice	1.53	0.68	0.03
			0.00			1/2" Ice	1.69	0.80	0.04
			-2.00			1" Ice	1.85	0.92	0.06
FDD_R6_RRH	B	From Leg	4.00	0.0000	150.00	No Ice	1.53	0.68	0.03
			0.00			1/2" Ice	1.69	0.80	0.04
			-2.00			1" Ice	1.85	0.92	0.06
FDD_R6_RRH	C	From Leg	4.00	0.0000	150.00	No Ice	1.53	0.68	0.03
			0.00			1/2" Ice	1.69	0.80	0.04
			-2.00			1" Ice	1.85	0.92	0.06
(2) Empty Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	1.40	1.40	0.03
			0.00			1/2" Ice	2.13	2.13	0.04
			0.00			1" Ice	2.68	2.68	0.06
(2) Empty Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	1.40	1.40	0.03
			0.00			1/2" Ice	2.13	2.13	0.04
			0.00			1" Ice	2.68	2.68	0.06
(2) Empty Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	1.40	1.40	0.03
			0.00			1/2" Ice	2.13	2.13	0.04
			0.00			1" Ice	2.68	2.68	0.06
Platform Mount [LP 1201-1]	C	None		0.0000	150.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50
						1" Ice	30.50	30.50	2.90
***									
***									
(4) 844G90VTA-SX w/ Mount Pipe	A	From Leg	4.00	0.0000	134.00	No Ice	3.30	4.80	0.03
			0.00			1/2" Ice	3.67	5.42	0.07
			1.00			1" Ice	4.03	6.04	0.11
(4) 844G90VTA-SX w/ Mount Pipe	B	From Leg	4.00	0.0000	134.00	No Ice	3.30	4.80	0.03
			0.00			1/2" Ice	3.67	5.42	0.07
			1.00			1" Ice	4.03	6.04	0.11
(4) 844G90VTA-SX w/ Mount Pipe	C	From Leg	4.00	0.0000	134.00	No Ice	3.30	4.80	0.03
			0.00			1/2" Ice	3.67	5.42	0.07
			1.00			1" Ice	4.03	6.04	0.11
Platform Mount [LP 1201-1]	C	None		0.0000	134.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50
						1" Ice	30.50	30.50	2.90
***									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.0000	119.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			1.00			1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	119.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			1.00			1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	119.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.00			1" Ice	7.21	7.13	0.23
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	11.63 12.35 13.07	9.79 11.31 12.85	0.07 0.16 0.26
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	11.63 12.35 13.07	9.79 11.31 12.85	0.07 0.16 0.26
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	11.63 12.35 13.07	9.79 11.31 12.85	0.07 0.16 0.26
KRY 112 144/1	A	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
KRY 112 144/1	B	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
KRY 112 144/1	C	From Leg	4.00 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
RRUS 11 B12	A	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	B	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	C	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	6.75 7.20 7.65	6.07 6.87 7.58	0.15 0.21 0.28
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	6.75 7.20 7.65	6.07 6.87 7.58	0.15 0.21 0.28
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	6.75 7.20 7.65	6.07 6.87 7.58	0.15 0.21 0.28
Platform Mount [LP 303-1]	C	None		0.0000	119.00	No Ice 1/2" Ice 1" Ice	14.66 18.87 23.08	14.66 18.87 23.08	1.25 1.48 1.71
***									
KS24019-L112A	B	From Leg	4.00 0.00 1.00	0.0000	99.00	No Ice 1/2" Ice 1" Ice	0.14 0.20 0.26	0.14 0.20 0.26	0.01 0.01 0.01
Side Arm Mount [SO 702-1]	B	None		0.0000	99.00	No Ice 1/2" Ice 1" Ice	1.00 1.25 1.50	1.43 2.05 2.67	0.03 0.04 0.05
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-23G-1-C	A	Paraboloid w/o Radome	From Leg	4.00 0.00 3.00	5.0000		150.00	1.13	No Ice 1/2" Ice 1" Ice	0.99 1.15 1.30	0.03 0.04 0.05
A-ANT-23G-2-C	A	Paraboloid w/o Radome	From Leg	4.00 0.00 2.00	5.0000		150.00	2.17	No Ice 1/2" Ice 1" Ice	3.72 4.01 4.30	0.03 0.05 0.07
A-ANT-23G-2-C	B	Paraboloid w/o Radome	From Leg	4.00 0.00 2.00	-15.0000		150.00	2.17	No Ice 1/2" Ice 1" Ice	3.72 4.01 4.30	0.03 0.05 0.07
A-ANT-23G-2-C	C	Paraboloid w/o Radome	From Leg	4.00 0.00 2.00	-10.0000		150.00	2.17	No Ice 1/2" Ice 1" Ice	3.72 4.01 4.30	0.03 0.05 0.07
***											

Load Combinations

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

Comb. No.	Description
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 108	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29.09	-0.19	0.42
			Max. Mx	20	-13.46	345.38	0.08
			Max. My	2	-13.45	-2.12	348.16
			Max. Vy	20	-14.51	345.38	0.08
			Max. Vx	14	14.58	-0.39	-347.91
			Max. Torque	14			-0.37
L2	108 - 69.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.03	-0.49	0.51
			Max. Mx	20	-20.38	958.79	-0.02
			Max. My	2	-20.38	-4.15	964.03
			Max. Vy	20	-18.40	958.79	-0.02
			Max. Vx	14	18.47	-0.77	-963.90
			Max. Torque	15			-0.37
L3	69.75 - 32.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.74	-0.75	0.66
			Max. Mx	20	-29.90	1698.56	-0.10
			Max. My	2	-29.90	-6.08	1706.17
			Max. Vy	20	-22.04	1698.56	-0.10
			Max. Vx	14	22.11	-1.13	-1706.11
			Max. Torque	15			-0.35
L4	32.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.18	-0.97	0.78
			Max. Mx	20	-43.02	2602.15	-0.18
			Max. My	14	-43.02	-1.48	-2612.16
			Max. Vy	20	-25.47	2602.15	-0.18
			Max. Vx	14	25.54	-1.48	-2612.16
			Max. Torque	15			-0.35

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	68.18	-0.01	6.22
	Max. H_x	20	43.03	25.45	-0.00
	Max. H_z	2	43.03	-0.05	25.51

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M_x	2	2612.13	-0.05	25.51
	Max. M_z	8	2600.76	-25.44	0.19
	Max. Torsion	25	0.33	12.78	22.01
	Min. Vert	25	32.27	12.78	22.01
	Min. H_x	8	43.03	-25.44	0.19
	Min. H_z	14	43.03	-0.01	-25.52
	Min. M_x	14	-2612.16	-0.01	-25.52
	Min. M_z	20	-2602.15	25.45	-0.00
	Min. Torsion	15	-0.35	-0.01	-25.52

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	35.86	0.00	0.00	-0.16	-0.06	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	43.03	0.05	-25.51	-2612.13	-8.02	-0.13
0.9 Dead+1.6 Wind 0 deg - No Ice	32.27	0.05	-25.51	-2582.98	-7.89	-0.13
1.2 Dead+1.6 Wind 30 deg - No Ice	43.03	12.87	-22.03	-2250.97	-1324.02	-0.13
0.9 Dead+1.6 Wind 30 deg - No Ice	32.27	12.87	-22.03	-2225.86	-1309.20	-0.12
1.2 Dead+1.6 Wind 60 deg - No Ice	43.03	22.05	-12.81	-1314.23	-2255.36	-0.30
0.9 Dead+1.6 Wind 60 deg - No Ice	32.27	22.05	-12.81	-1299.51	-2230.22	-0.30
1.2 Dead+1.6 Wind 90 deg - No Ice	43.03	25.44	-0.19	-30.75	-2600.76	-0.31
0.9 Dead+1.6 Wind 90 deg - No Ice	32.27	25.44	-0.19	-30.27	-2571.79	-0.31
1.2 Dead+1.6 Wind 120 deg - No Ice	43.03	22.06	12.81	1313.71	-2256.06	-0.03
0.9 Dead+1.6 Wind 120 deg - No Ice	32.27	22.06	12.81	1299.10	-2230.91	-0.03
1.2 Dead+1.6 Wind 150 deg - No Ice	43.03	12.54	22.16	2272.89	-1270.67	0.29
0.9 Dead+1.6 Wind 150 deg - No Ice	32.27	12.54	22.16	2247.58	-1256.57	0.29
1.2 Dead+1.6 Wind 180 deg - No Ice	43.03	0.01	25.52	2612.16	-1.48	0.35
0.9 Dead+1.6 Wind 180 deg - No Ice	32.27	0.01	25.52	2583.10	-1.44	0.35
1.2 Dead+1.6 Wind 210 deg - No Ice	43.03	-12.79	22.13	2266.78	1310.59	-0.11
0.9 Dead+1.6 Wind 210 deg - No Ice	32.27	-12.79	22.13	2241.56	1295.99	-0.12
1.2 Dead+1.6 Wind 240 deg - No Ice	43.03	-22.11	12.86	1322.13	2264.93	-0.10
0.9 Dead+1.6 Wind 240 deg - No Ice	32.27	-22.11	12.86	1307.40	2239.70	-0.10
1.2 Dead+1.6 Wind 270 deg - No Ice	43.03	-25.45	0.00	0.18	2602.15	-0.14
0.9 Dead+1.6 Wind 270 deg - No Ice	32.27	-25.45	0.00	0.23	2573.20	-0.14
1.2 Dead+1.6 Wind 300 deg -	43.03	-22.09	-12.67	-1292.55	2260.61	-0.21

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
No Ice 0.9 Dead+1.6 Wind 300 deg - No Ice	32.27	-22.09	-12.67	-1278.12	2235.43	-0.21
1.2 Dead+1.6 Wind 330 deg - No Ice	43.03	-12.78	-22.01	-2248.96	1309.16	-0.32
0.9 Dead+1.6 Wind 330 deg - No Ice	32.27	-12.78	-22.01	-2223.87	1294.58	-0.33
1.2 Dead+1.0 Ice+1.0 Temp	68.18	0.00	0.00	-0.78	-0.97	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	68.18	0.01	-6.22	-680.89	-2.96	-0.02
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	68.18	3.13	-5.37	-587.10	-345.30	-0.03
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	68.18	5.37	-3.12	-342.78	-588.25	-0.07
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	68.18	6.20	-0.04	-8.20	-678.19	-0.07
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	68.18	5.37	3.12	341.34	-588.32	-0.02
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	68.18	3.06	5.40	590.86	-332.46	0.06
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	68.18	0.00	6.22	679.39	-1.35	0.07
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	68.18	-3.11	5.39	589.41	339.90	-0.03
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	68.18	-5.39	3.13	343.37	588.35	-0.02
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	68.18	-6.20	0.00	-0.69	676.41	-0.03
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	68.18	-5.38	-3.09	-337.66	587.35	-0.04
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	68.18	-3.11	-5.36	-586.59	339.65	-0.06
Dead+Wind 0 deg - Service	35.86	0.01	-5.81	-591.39	-1.86	-0.03
Dead+Wind 30 deg - Service	35.86	2.93	-5.02	-509.64	-299.74	-0.03
Dead+Wind 60 deg - Service	35.86	5.02	-2.92	-297.60	-510.55	-0.07
Dead+Wind 90 deg - Service	35.86	5.80	-0.04	-7.07	-588.74	-0.07
Dead+Wind 120 deg - Service	35.86	5.03	2.92	297.24	-510.71	-0.01
Dead+Wind 150 deg - Service	35.86	2.86	5.05	514.34	-287.67	0.06
Dead+Wind 180 deg - Service	35.86	0.00	5.81	591.15	-0.38	0.08
Dead+Wind 210 deg - Service	35.86	-2.91	5.04	512.97	296.61	-0.03
Dead+Wind 240 deg - Service	35.86	-5.04	2.93	299.14	512.63	-0.02
Dead+Wind 270 deg - Service	35.86	-5.80	0.00	-0.08	588.95	-0.03
Dead+Wind 300 deg - Service	35.86	-5.03	-2.89	-292.70	511.64	-0.05
Dead+Wind 330 deg - Service	35.86	-2.91	-5.02	-509.18	296.28	-0.07

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-35.86	0.00	0.00	35.86	0.00	0.000%
2	0.05	-43.03	-25.51	-0.05	43.03	25.51	0.000%
3	0.05	-32.27	-25.51	-0.05	32.27	25.51	0.000%
4	12.87	-43.03	-22.03	-12.87	43.03	22.03	0.000%
5	12.87	-32.27	-22.03	-12.87	32.27	22.03	0.000%
6	22.05	-43.03	-12.81	-22.05	43.03	12.81	0.000%
7	22.05	-32.27	-12.81	-22.05	32.27	12.81	0.000%
8	25.44	-43.03	-0.19	-25.44	43.03	0.19	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
9	25.44	-32.27	-0.19	-25.44	32.27	0.19	0.000%
10	22.06	-43.03	12.81	-22.06	43.03	-12.81	0.000%
11	22.06	-32.27	12.81	-22.06	32.27	-12.81	0.000%
12	12.54	-43.03	22.16	-12.54	43.03	-22.16	0.000%
13	12.54	-32.27	22.16	-12.54	32.27	-22.16	0.000%
14	0.01	-43.03	25.52	-0.01	43.03	-25.52	0.000%
15	0.01	-32.27	25.52	-0.01	32.27	-25.52	0.000%
16	-12.79	-43.03	22.13	12.79	43.03	-22.13	0.000%
17	-12.79	-32.27	22.13	12.79	32.27	-22.13	0.000%
18	-22.11	-43.03	12.86	22.11	43.03	-12.86	0.000%
19	-22.11	-32.27	12.86	22.11	32.27	-12.86	0.000%
20	-25.45	-43.03	0.00	25.45	43.03	-0.00	0.000%
21	-25.45	-32.27	0.00	25.45	32.27	-0.00	0.000%
22	-22.09	-43.03	-12.67	22.09	43.03	12.67	0.000%
23	-22.09	-32.27	-12.67	22.09	32.27	12.67	0.000%
24	-12.78	-43.03	-22.01	12.78	43.03	22.01	0.000%
25	-12.78	-32.27	-22.01	12.78	32.27	22.01	0.000%
26	0.00	-68.18	0.00	0.00	68.18	0.00	0.000%
27	0.01	-68.18	-6.22	-0.01	68.18	6.22	0.000%
28	3.13	-68.18	-5.37	-3.13	68.18	5.37	0.000%
29	5.37	-68.18	-3.12	-5.37	68.18	3.12	0.000%
30	6.20	-68.18	-0.04	-6.20	68.18	0.04	0.000%
31	5.37	-68.18	3.12	-5.37	68.18	-3.12	0.000%
32	3.06	-68.18	5.40	-3.06	68.18	-5.40	0.000%
33	0.00	-68.18	6.22	-0.00	68.18	-6.22	0.000%
34	-3.11	-68.18	5.39	3.11	68.18	-5.39	0.000%
35	-5.39	-68.18	3.13	5.39	68.18	-3.13	0.000%
36	-6.20	-68.18	0.00	6.20	68.18	-0.00	0.000%
37	-5.38	-68.18	-3.09	5.38	68.18	3.09	0.000%
38	-3.11	-68.18	-5.36	3.11	68.18	5.36	0.000%
39	0.01	-35.86	-5.81	-0.01	35.86	5.81	0.000%
40	2.93	-35.86	-5.02	-2.93	35.86	5.02	0.000%
41	5.02	-35.86	-2.92	-5.02	35.86	2.92	0.000%
42	5.80	-35.86	-0.04	-5.80	35.86	0.04	0.000%
43	5.03	-35.86	2.92	-5.03	35.86	-2.92	0.000%
44	2.86	-35.86	5.05	-2.86	35.86	-5.05	0.000%
45	0.00	-35.86	5.81	-0.00	35.86	-5.81	0.000%
46	-2.91	-35.86	5.04	2.91	35.86	-5.04	0.000%
47	-5.04	-35.86	2.93	5.04	35.86	-2.93	0.000%
48	-5.80	-35.86	0.00	5.80	35.86	-0.00	0.000%
49	-5.03	-35.86	-2.89	5.03	35.86	2.89	0.000%
50	-2.91	-35.86	-5.02	2.91	35.86	5.02	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00043435
3	Yes	4	0.00000001	0.00015966
4	Yes	5	0.00000001	0.00094341
5	Yes	5	0.00000001	0.00043691
6	Yes	5	0.00000001	0.00094791
7	Yes	5	0.00000001	0.00043953
8	Yes	4	0.00000001	0.00091976
9	Yes	4	0.00000001	0.00054904

10	Yes	5	0.00000001	0.00093971
11	Yes	5	0.00000001	0.00043557
12	Yes	5	0.00000001	0.00090679
13	Yes	5	0.00000001	0.00042097
14	Yes	4	0.00000001	0.00050257
15	Yes	4	0.00000001	0.00023299
16	Yes	5	0.00000001	0.00094313
17	Yes	5	0.00000001	0.00043677
18	Yes	5	0.00000001	0.00095685
19	Yes	5	0.00000001	0.00044298
20	Yes	4	0.00000001	0.00044235
21	Yes	4	0.00000001	0.00017336
22	Yes	5	0.00000001	0.00092000
23	Yes	5	0.00000001	0.00042675
24	Yes	5	0.00000001	0.00093902
25	Yes	5	0.00000001	0.00043593
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00038905
28	Yes	5	0.00000001	0.00046333
29	Yes	5	0.00000001	0.00046294
30	Yes	5	0.00000001	0.00038708
31	Yes	5	0.00000001	0.00046081
32	Yes	5	0.00000001	0.00045550
33	Yes	5	0.00000001	0.00038758
34	Yes	5	0.00000001	0.00046051
35	Yes	5	0.00000001	0.00046273
36	Yes	5	0.00000001	0.00038564
37	Yes	5	0.00000001	0.00045732
38	Yes	5	0.00000001	0.00045901
39	Yes	4	0.00000001	0.00004502
40	Yes	4	0.00000001	0.00024628
41	Yes	4	0.00000001	0.00025342
42	Yes	4	0.00000001	0.00004897
43	Yes	4	0.00000001	0.00024591
44	Yes	4	0.00000001	0.00023351
45	Yes	4	0.00000001	0.00004738
46	Yes	4	0.00000001	0.00024614
47	Yes	4	0.00000001	0.00025258
48	Yes	4	0.00000001	0.00004490
49	Yes	4	0.00000001	0.00023846
50	Yes	4	0.00000001	0.00025094

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 108	18.853	47	1.0913	0.0011
L2	111.75 - 69.75	10.588	47	0.9183	0.0004
L3	74.5 - 32.5	4.583	47	0.5924	0.0002
L4	38 - 0	1.177	47	0.2809	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.00	A-ANT-23G-1-C	47	18.853	1.0913	0.0011	52989
152.00	A-ANT-23G-2-C	47	18.853	1.0913	0.0011	52989
150.00	APXVTM14-C-120 w/ Mount Pipe	47	18.853	1.0913	0.0011	52989
134.00	(4) 844G90VTA-SX w/ Mount Pipe	47	15.250	1.0340	0.0008	16559
119.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	47	12.037	0.9632	0.0005	8546
99.00	KS24019-L112A	47	8.257	0.8190	0.0003	6820

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 108	83.400	18	4.8369	0.0049
L2	111.75 - 69.75	46.842	18	4.0682	0.0018
L3	74.5 - 32.5	20.274	18	2.6228	0.0007
L4	38 - 0	5.202	18	1.2423	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.00	A-ANT-23G-1-C	18	83.400	4.8369	0.0049	12110
152.00	A-ANT-23G-2-C	18	83.400	4.8369	0.0049	12110
150.00	APXVTM14-C-120 w/ Mount Pipe	18	83.400	4.8369	0.0049	12110
134.00	(4) 844G90VTA-SX w/ Mount Pipe	18	67.463	4.5821	0.0034	3783
119.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	18	53.251	4.2677	0.0022	1950
99.00	KS24019-L112A	18	36.526	3.6278	0.0012	1551

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 147.987	TP30.401x22x0.25	42.00	0.00	0.0	17.8329	-4.21	1213.35	0.003
	147.987 - 145.974					18.1571	-4.39	1235.41	0.004
	145.974 - 143.961					18.4812	-4.58	1250.60	0.004
	143.961 - 141.947					18.8054	-4.77	1265.47	0.004
	141.947 -					19.1295	-4.96	1280.10	0.004

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	139.934								
	139.934 - 137.921					19.4537	-5.15	1294.48	0.004
	137.921 - 135.908					19.7778	-5.35	1308.62	0.004
	135.908 - 133.895					20.1020	-8.29	1322.51	0.006
	133.895 - 131.882					20.4262	-8.50	1336.16	0.006
	131.882 - 129.868					20.7503	-8.71	1349.57	0.006
	129.868 - 127.855					21.0745	-8.92	1362.73	0.007
	127.855 - 125.842					21.3986	-9.14	1375.65	0.007
	125.842 - 123.829					21.7228	-9.36	1388.33	0.007
	123.829 - 121.816					22.0469	-9.58	1400.76	0.007
	121.816 - 119.803					22.3711	-9.81	1412.95	0.007
	119.803 - 117.789					22.6953	-12.71	1424.89	0.009
	117.789 - 115.776					23.0194	-12.95	1436.59	0.009
	115.776 - 113.763					23.3436	-13.19	1448.05	0.009
	113.763 - 111.75					23.6677	-13.44	1459.26	0.009
	111.75 - 108					24.2716	-6.46	1479.50	0.004
L2	111.75 - 108	TP37.553x29.1509x0.3125	42.00	0.00	0.0	29.7735	-7.88	1994.93	0.004
	108 - 106.139					30.1482	-14.64	2011.66	0.007
	106.139 - 104.278					30.5228	-14.95	2028.17	0.007
	104.278 - 102.417					30.8975	-15.26	2044.48	0.007
	102.417 - 100.556					31.2721	-15.57	2060.57	0.008
	100.556 - 98.6944					31.6467	-15.92	2076.46	0.008
	98.6944 - 96.8333					32.0214	-16.24	2092.14	0.008
	96.8333 - 94.9722					32.3960	-16.57	2107.62	0.008
	94.9722 - 93.1111					32.7707	-16.89	2122.88	0.008
	93.1111 - 91.25					33.1453	-17.22	2137.94	0.008
	91.25 - 89.3889					33.5199	-17.56	2152.79	0.008
	89.3889 - 87.5278					33.8946	-17.90	2167.43	0.008
	87.5278 - 85.6667					34.2692	-18.24	2181.86	0.008
	85.6667 - 83.8056					34.6439	-18.59	2196.08	0.008
	83.8056 - 81.9444					35.0185	-18.94	2210.09	0.009
	81.9444 - 80.0833					35.3932	-19.29	2223.90	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	80.0833 - 78.2222					35.7678	-19.65	2237.50	0.009
	78.2222 - 76.3611					36.1424	-20.01	2250.89	0.009
	76.3611 - 74.5					36.5171	-20.37	2264.07	0.009
	74.5 - 69.75					37.4733	-10.20	2296.77	0.004
L3	74.5 - 69.75	TP44.379x35.9778x0.375	42.00	0.00	0.0	44.1376	-11.92	3132.39	0.004
	69.75 - 67.9861					44.5637	-22.52	3151.60	0.007
	67.9861 - 66.2222					44.9897	-22.93	3170.59	0.007
	66.2222 - 64.4583					45.4158	-23.34	3189.38	0.007
	64.4583 - 62.6944					45.8418	-23.75	3207.95	0.007
	62.6944 - 60.9306					46.2678	-24.16	3226.31	0.007
	60.9306 - 59.1667					46.6939	-24.58	3244.46	0.008
	59.1667 - 57.4028					47.1199	-25.01	3262.40	0.008
	57.4028 - 55.6389					47.5460	-25.43	3280.13	0.008
	55.6389 - 53.875					47.9720	-25.86	3297.65	0.008
	53.875 - 52.1111					48.3980	-26.30	3314.96	0.008
	52.1111 - 50.3472					48.8241	-26.73	3332.06	0.008
	50.3472 - 48.5833					49.2501	-27.17	3348.94	0.008
	48.5833 - 46.8194					49.6762	-27.62	3365.62	0.008
	46.8194 - 45.0556					50.1022	-28.07	3382.08	0.008
	45.0556 - 43.2917					50.5283	-28.52	3398.33	0.008
	43.2917 - 41.5278					50.9543	-28.97	3414.37	0.008
	41.5278 - 39.7639					51.3803	-29.43	3430.21	0.009
	39.7639 - 38					51.8064	-29.89	3445.83	0.009
	38 - 32.5					53.1348	-15.27	3493.18	0.004
L4	38 - 32.5	TP50.13x42.5288x0.4375	38.00	0.00	0.0	60.8460	-17.37	4298.18	0.004
	32.5 - 30.7895					61.3280	-33.17	4319.61	0.008
	30.7895 - 29.0789					61.8101	-33.69	4340.84	0.008
	29.0789 - 27.3684					62.2921	-34.21	4361.88	0.008
	27.3684 - 25.6579					62.7741	-34.73	4382.72	0.008
	25.6579 - 23.9474					63.2561	-35.26	4403.35	0.008
	23.9474 - 22.2368					63.7381	-35.79	4423.79	0.008
	22.2368 - 20.5263					64.2201	-36.32	4444.04	0.008
	20.5263 - 18.8158					64.7021	-36.86	4464.08	0.008
	18.8158 -					65.1842	-37.40	4483.93	0.008

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	17.1053								
	17.1053 - 15.3947					65.6662	-37.95	4503.57	0.008
	15.3947 - 13.6842					66.1482	-38.50	4523.02	0.009
	13.6842 - 11.9737					66.6302	-39.05	4542.27	0.009
	11.9737 - 10.2632					67.1122	-39.61	4561.32	0.009
	10.2632 - 8.55263					67.5942	-40.17	4580.18	0.009
	8.55263 - 6.84211					68.0762	-40.73	4598.83	0.009
	6.84211 - 5.13158					68.5583	-41.30	4617.29	0.009
	5.13158 - 3.42105					69.0403	-41.87	4635.55	0.009
	3.42105 - 1.71053					69.5223	-42.44	4653.61	0.009
	1.71053 - 0					70.0043	-43.02	4671.47	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 147.987	TP30.401x22x0.25	10.51	545.78	0.019	0.00	545.78	0.000
	147.987 - 145.974		21.29	565.91	0.038	0.00	565.91	0.000
	145.974 - 143.961		32.43	583.21	0.056	0.00	583.21	0.000
	143.961 - 141.947		43.93	600.61	0.073	0.00	600.61	0.000
	141.947 - 139.934		55.81	618.13	0.090	0.00	618.13	0.000
	139.934 - 137.921		68.05	635.78	0.107	0.00	635.78	0.000
	137.921 - 135.908		80.67	653.54	0.123	0.00	653.54	0.000
	135.908 - 133.895		95.55	671.41	0.142	0.00	671.41	0.000
	133.895 - 131.882		114.48	689.39	0.166	0.00	689.39	0.000
	131.882 - 129.868		133.79	707.47	0.189	0.00	707.47	0.000
	129.868 - 127.855		153.49	725.63	0.212	0.00	725.63	0.000
	127.855 - 125.842		173.58	743.89	0.233	0.00	743.89	0.000
	125.842 - 123.829		194.06	762.22	0.255	0.00	762.22	0.000
	123.829 - 121.816		214.94	780.63	0.275	0.00	780.63	0.000
	121.816 - 119.803		236.21	799.10	0.296	0.00	799.10	0.000
	119.803 -		264.10	817.64	0.323	0.00	817.64	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	117.789							
	117.789 - 115.776		292.58	836.23	0.350	0.00	836.23	0.000
	115.776 - 113.763		321.46	854.88	0.376	0.00	854.88	0.000
	113.763 - 111.75		350.74	873.56	0.402	0.00	873.56	0.000
	111.75 - 108		186.46	908.46	0.205	0.00	908.46	0.000
L2	111.75 - 108	TP37.553x29.1509x0.3125	219.98	1199.40	0.183	0.00	1199.40	0.000
	108 - 106.139		434.66	1224.83	0.355	0.00	1224.83	0.000
	106.139 - 104.278		463.23	1250.39	0.370	0.00	1250.39	0.000
	104.278 - 102.417		492.14	1276.08	0.386	0.00	1276.08	0.000
	102.417 - 100.556		521.40	1301.88	0.400	0.00	1301.88	0.000
	100.556 - 98.6944		551.01	1327.78	0.415	0.00	1327.78	0.000
	98.6944 - 96.8333		581.08	1353.81	0.429	0.00	1353.81	0.000
	96.8333 - 94.9722		611.50	1379.93	0.443	0.00	1379.93	0.000
	94.9722 - 93.1111		642.26	1406.15	0.457	0.00	1406.15	0.000
	93.1111 - 91.25		673.38	1432.47	0.470	0.00	1432.47	0.000
	91.25 - 89.3889		704.85	1458.88	0.483	0.00	1458.88	0.000
	89.3889 - 87.5278		736.67	1485.37	0.496	0.00	1485.37	0.000
	87.5278 - 85.6667		768.84	1511.93	0.509	0.00	1511.93	0.000
	85.6667 - 83.8056		801.37	1538.58	0.521	0.00	1538.58	0.000
	83.8056 - 81.9444		834.24	1565.29	0.533	0.00	1565.29	0.000
	81.9444 - 80.0833		867.48	1592.07	0.545	0.00	1592.07	0.000
	80.0833 - 78.2222		901.06	1618.91	0.557	0.00	1618.91	0.000
	78.2222 - 76.3611		935.00	1645.81	0.568	0.00	1645.81	0.000
	76.3611 - 74.5		969.29	1672.75	0.579	0.00	1672.75	0.000
	74.5 - 69.75		496.19	1741.72	0.285	0.00	1741.72	0.000
L3	74.5 - 69.75	TP44.379x35.9778x0.375	562.42	2327.23	0.242	0.00	2327.23	0.000
	69.75 - 67.9861		1092.44	2364.33	0.462	0.00	2364.33	0.000
	67.9861 - 66.2222		1126.58	2401.56	0.469	0.00	2401.56	0.000
	66.2222 - 64.4583		1161.03	2438.89	0.476	0.00	2438.89	0.000
	64.4583 - 62.6944		1195.78	2476.33	0.483	0.00	2476.33	0.000
	62.6944 - 60.9306		1230.84	2513.88	0.490	0.00	2513.88	0.000
	60.9306 - 59.1667		1266.21	2551.53	0.496	0.00	2551.53	0.000
	59.1667 - 57.4028		1301.88	2589.27	0.503	0.00	2589.27	0.000
	57.4028 -		1337.86	2627.10	0.509	0.00	2627.10	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	55.6389							
	55.6389 - 53.875		1374.13	2665.02	0.516	0.00	2665.02	0.000
	53.875 - 52.1111		1410.71	2703.03	0.522	0.00	2703.03	0.000
	52.1111 - 50.3472		1447.59	2741.10	0.528	0.00	2741.10	0.000
	50.3472 - 48.5833		1484.77	2779.25	0.534	0.00	2779.25	0.000
	48.5833 - 46.8194		1522.23	2817.47	0.540	0.00	2817.47	0.000
	46.8194 - 45.0556		1560.00	2855.76	0.546	0.00	2855.76	0.000
	45.0556 - 43.2917		1598.07	2894.10	0.552	0.00	2894.10	0.000
	43.2917 - 41.5278		1636.43	2932.50	0.558	0.00	2932.50	0.000
	41.5278 - 39.7639		1675.07	2970.94	0.564	0.00	2970.94	0.000
	39.7639 - 38		1714.01	3009.43	0.570	0.00	3009.43	0.000
	38 - 32.5		874.13	3129.70	0.279	0.00	3129.70	0.000
L4	38 - 32.5	TP50.13x42.5288x0.4375	963.39	3773.82	0.255	0.00	3773.82	0.000
	32.5 - 30.7895		1876.57	3822.97	0.491	0.00	3822.97	0.000
	30.7895 - 29.0789		1915.86	3872.27	0.495	0.00	3872.27	0.000
	29.0789 - 27.3684		1955.40	3921.68	0.499	0.00	3921.68	0.000
	27.3684 - 25.6579		1995.20	3971.20	0.502	0.00	3971.20	0.000
	25.6579 - 23.9474		2035.24	4020.83	0.506	0.00	4020.83	0.000
	23.9474 - 22.2368		2075.54	4070.57	0.510	0.00	4070.57	0.000
	22.2368 - 20.5263		2116.08	4120.43	0.514	0.00	4120.43	0.000
	20.5263 - 18.8158		2156.89	4170.37	0.517	0.00	4170.37	0.000
	18.8158 - 17.1053		2197.94	4220.41	0.521	0.00	4220.41	0.000
	17.1053 - 15.3947		2239.25	4270.54	0.524	0.00	4270.54	0.000
	15.3947 - 13.6842		2280.82	4320.76	0.528	0.00	4320.76	0.000
	13.6842 - 11.9737		2322.63	4371.06	0.531	0.00	4371.06	0.000
	11.9737 - 10.2632		2364.71	4421.43	0.535	0.00	4421.43	0.000
	10.2632 - 8.55263		2407.04	4471.89	0.538	0.00	4471.89	0.000
	8.55263 - 6.84211		2449.63	4522.41	0.542	0.00	4522.41	0.000
	6.84211 - 5.13158		2492.48	4573.00	0.545	0.00	4573.00	0.000
	5.13158 - 3.42105		2535.59	4623.65	0.548	0.00	4623.65	0.000
	3.42105 - 1.71053		2578.96	4674.36	0.552	0.00	4674.36	0.000
	1.71053 - 0		2622.58	4725.12	0.555	0.00	4725.12	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 147.987	TP30.401x22x0.25	5.27	606.68	0.009	0.07	1106.66	0.000
	147.987 - 145.974		5.45	617.70	0.009	0.07	1147.49	0.000
	145.974 - 143.961		5.63	625.30	0.009	0.07	1182.57	0.000
	143.961 - 141.947		5.81	632.74	0.009	0.07	1217.84	0.000
	141.947 - 139.934		5.99	640.05	0.009	0.07	1253.38	0.000
	139.934 - 137.921		6.18	647.24	0.010	0.07	1289.16	0.000
	137.921 - 135.908		6.37	654.31	0.010	0.07	1325.18	0.000
	135.908 - 133.895		9.31	661.26	0.014	0.07	1361.42	0.000
	133.895 - 131.882		9.50	668.08	0.014	0.07	1397.88	0.000
	131.882 - 129.868		9.69	674.78	0.014	0.07	1434.53	0.000
	129.868 - 127.855		9.89	681.37	0.015	0.07	1471.36	0.000
	127.855 - 125.842		10.08	687.83	0.015	0.07	1508.38	0.000
	125.842 - 123.829		10.28	694.16	0.015	0.07	1545.55	0.000
	123.829 - 121.816		10.48	700.38	0.015	0.07	1582.87	0.000
	121.816 - 119.803		10.67	706.47	0.015	0.07	1620.33	0.000
	119.803 - 117.789		14.06	712.45	0.020	0.07	1657.92	0.000
	117.789 - 115.776		14.26	718.30	0.020	0.07	1695.62	0.000
	115.776 - 113.763		14.45	724.02	0.020	0.07	1733.42	0.000
	113.763 - 111.75		14.65	729.63	0.020	0.07	1771.31	0.000
	111.75 - 108		7.02	739.75	0.009	0.03	1842.08	0.000
L2	111.75 - 108	TP37.553x29.1509x0.3125	8.06	997.47	0.008	0.04	2432.02	0.000
	108 - 106.139		15.27	1005.83	0.015	0.07	2483.58	0.000
	106.139 - 104.278		15.45	1014.09	0.015	0.07	2535.41	0.000
	104.278 - 102.417		15.64	1022.24	0.015	0.07	2587.48	0.000
	102.417 - 100.556		15.83	1030.29	0.015	0.07	2639.79	0.000
	100.556 - 98.6944		16.08	1038.23	0.015	0.10	2692.33	0.000
	98.6944 - 96.8333		16.26	1046.07	0.016	0.10	2745.10	0.000
	96.8333 - 94.9722		16.45	1053.81	0.016	0.10	2798.07	0.000
	94.9722 - 93.1111		16.64	1061.44	0.016	0.10	2851.24	0.000
	93.1111 - 91.25		16.83	1068.97	0.016	0.10	2904.60	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	91.25 - 89.3889		17.02	1076.39	0.016	0.10	2958.14	0.000
	89.3889 - 87.5278		17.21	1083.71	0.016	0.10	3011.86	0.000
	87.5278 - 85.6667		17.40	1090.93	0.016	0.10	3065.73	0.000
	85.6667 - 83.8056		17.59	1098.04	0.016	0.10	3119.76	0.000
	83.8056 - 81.9444		17.78	1105.05	0.016	0.10	3173.93	0.000
	81.9444 - 80.0833		17.97	1111.95	0.016	0.10	3228.22	0.000
	80.0833 - 78.2222		18.16	1118.75	0.016	0.10	3282.64	0.000
	78.2222 - 76.3611		18.35	1125.44	0.016	0.10	3337.18	0.000
	76.3611 - 74.5		18.54	1132.04	0.016	0.10	3391.82	0.000
	74.5 - 69.75		9.10	1148.39	0.008	0.04	3531.67	0.000
L3	74.5 - 69.75	TP44.379x35.9778x0.375	10.01	1566.20	0.006	0.05	4718.91	0.000
	69.75 - 67.9861		19.28	1575.80	0.012	0.10	4794.13	0.000
	67.9861 - 66.2222		19.46	1585.30	0.012	0.10	4869.60	0.000
	66.2222 - 64.4583		19.63	1594.69	0.012	0.10	4945.30	0.000
	64.4583 - 62.6944		19.81	1603.98	0.012	0.10	5021.23	0.000
	62.6944 - 60.9306		19.98	1613.16	0.012	0.10	5097.36	0.000
	60.9306 - 59.1667		20.15	1622.23	0.012	0.10	5173.69	0.000
	59.1667 - 57.4028		20.33	1631.20	0.012	0.10	5250.23	0.000
	57.4028 - 55.6389		20.50	1640.07	0.012	0.10	5326.93	0.000
	55.6389 - 53.875		20.67	1648.83	0.013	0.10	5403.82	0.000
	53.875 - 52.1111		20.84	1657.48	0.013	0.10	5480.88	0.000
	52.1111 - 50.3472		21.01	1666.03	0.013	0.10	5558.10	0.000
	50.3472 - 48.5833		21.18	1674.47	0.013	0.10	5635.46	0.000
	48.5833 - 46.8194		21.35	1682.81	0.013	0.10	5712.96	0.000
	46.8194 - 45.0556		21.51	1691.04	0.013	0.10	5790.58	0.000
	45.0556 - 43.2917		21.68	1699.17	0.013	0.10	5868.33	0.000
	43.2917 - 41.5278		21.85	1707.19	0.013	0.10	5946.18	0.000
	41.5278 - 39.7639		22.01	1715.10	0.013	0.10	6024.14	0.000
	39.7639 - 38		22.18	1722.91	0.013	0.10	6102.19	0.000
	38 - 32.5		11.00	1746.59	0.006	0.05	6346.05	0.000
L4	38 - 32.5	TP50.13x42.5288x0.4375	11.79	2149.09	0.005	0.05	7652.12	0.000
	32.5 - 30.7895		22.92	2159.80	0.011	0.10	7751.81	0.000
	30.7895 - 29.0789		23.06	2170.42	0.011	0.10	7851.75	0.000
	29.0789 -		23.21	2180.94	0.011	0.10	7951.93	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	27.3684							
	27.3684 - 25.6579		23.36	2191.36	0.011	0.10	8052.35	0.000
	25.6579 - 23.9474		23.50	2201.68	0.011	0.10	8152.99	0.000
	23.9474 - 22.2368		23.65	2211.90	0.011	0.10	8253.86	0.000
	22.2368 - 20.5263		23.80	2222.02	0.011	0.10	8354.92	0.000
	20.5263 - 18.8158		23.95	2232.04	0.011	0.10	8456.17	0.000
	18.8158 - 17.1053		24.10	2241.96	0.011	0.10	8557.67	0.000
	17.1053 - 15.3947		24.24	2251.79	0.011	0.10	8659.33	0.000
	15.3947 - 13.6842		24.39	2261.51	0.011	0.10	8761.17	0.000
	13.6842 - 11.9737		24.54	2271.14	0.011	0.10	8863.17	0.000
	11.9737 - 10.2632		24.69	2280.66	0.011	0.10	8965.33	0.000
	10.2632 - 8.55263		24.84	2290.09	0.011	0.10	9067.58	0.000
	8.55263 - 6.84211		25.00	2299.42	0.011	0.10	9170.00	0.000
	6.84211 - 5.13158		25.15	2308.65	0.011	0.10	9272.58	0.000
	5.13158 - 3.42105		25.30	2317.77	0.011	0.10	9375.33	0.000
	3.42105 - 1.71053		25.45	2326.80	0.011	0.10	9478.17	0.000
	1.71053 - 0		25.60	2335.74	0.011	0.10	9581.08	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 147.987	0.003	0.019	0.000	0.009	0.000	0.023 ✔	1.000	4.8.2 ✔
	147.987 - 145.974	0.004	0.038	0.000	0.009	0.000	0.041 ✔	1.000	4.8.2 ✔
	145.974 - 143.961	0.004	0.056	0.000	0.009	0.000	0.059 ✔	1.000	4.8.2 ✔
	143.961 - 141.947	0.004	0.073	0.000	0.009	0.000	0.077 ✔	1.000	4.8.2 ✔
	141.947 - 139.934	0.004	0.090	0.000	0.009	0.000	0.094 ✔	1.000	4.8.2 ✔
	139.934 - 137.921	0.004	0.107	0.000	0.010	0.000	0.111 ✔	1.000	4.8.2 ✔
	137.921 - 135.908	0.004	0.123	0.000	0.010	0.000	0.128 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	135.908 - 133.895	0.006	0.142	0.000	0.014	0.000	0.149 ✔	1.000	4.8.2 ✔
	133.895 - 131.882	0.006	0.166	0.000	0.014	0.000	0.173 ✔	1.000	4.8.2 ✔
	131.882 - 129.868	0.006	0.189	0.000	0.014	0.000	0.196 ✔	1.000	4.8.2 ✔
	129.868 - 127.855	0.007	0.212	0.000	0.015	0.000	0.218 ✔	1.000	4.8.2 ✔
	127.855 - 125.842	0.007	0.233	0.000	0.015	0.000	0.240 ✔	1.000	4.8.2 ✔
	125.842 - 123.829	0.007	0.255	0.000	0.015	0.000	0.262 ✔	1.000	4.8.2 ✔
	123.829 - 121.816	0.007	0.275	0.000	0.015	0.000	0.282 ✔	1.000	4.8.2 ✔
	121.816 - 119.803	0.007	0.296	0.000	0.015	0.000	0.303 ✔	1.000	4.8.2 ✔
	119.803 - 117.789	0.009	0.323	0.000	0.020	0.000	0.332 ✔	1.000	4.8.2 ✔
	117.789 - 115.776	0.009	0.350	0.000	0.020	0.000	0.359 ✔	1.000	4.8.2 ✔
	115.776 - 113.763	0.009	0.376	0.000	0.020	0.000	0.386 ✔	1.000	4.8.2 ✔
	113.763 - 111.75	0.009	0.402	0.000	0.020	0.000	0.411 ✔	1.000	4.8.2 ✔
	111.75 - 108	0.004	0.205	0.000	0.009	0.000	0.210 ✔	1.000	4.8.2 ✔
L2	111.75 - 108	0.004	0.183	0.000	0.008	0.000	0.187 ✔	1.000	4.8.2 ✔
	108 - 106.139	0.007	0.355	0.000	0.015	0.000	0.362 ✔	1.000	4.8.2 ✔
	106.139 - 104.278	0.007	0.370	0.000	0.015	0.000	0.378 ✔	1.000	4.8.2 ✔
	104.278 - 102.417	0.007	0.386	0.000	0.015	0.000	0.393 ✔	1.000	4.8.2 ✔
	102.417 - 100.556	0.008	0.400	0.000	0.015	0.000	0.408 ✔	1.000	4.8.2 ✔
	100.556 - 98.6944	0.008	0.415	0.000	0.015	0.000	0.423 ✔	1.000	4.8.2 ✔
	98.6944 - 96.8333	0.008	0.429	0.000	0.016	0.000	0.437 ✔	1.000	4.8.2 ✔
	96.8333 - 94.9722	0.008	0.443	0.000	0.016	0.000	0.451 ✔	1.000	4.8.2 ✔
	94.9722 - 93.1111	0.008	0.457	0.000	0.016	0.000	0.465 ✔	1.000	4.8.2 ✔
	93.1111 - 91.25	0.008	0.470	0.000	0.016	0.000	0.478 ✔	1.000	4.8.2 ✔
	91.25 - 89.3889	0.008	0.483	0.000	0.016	0.000	0.492 ✔	1.000	4.8.2 ✔
	89.3889 - 87.5278	0.008	0.496	0.000	0.016	0.000	0.504 ✔	1.000	4.8.2 ✔
	87.5278 - 85.6667	0.008	0.509	0.000	0.016	0.000	0.517 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	85.6667 - 83.8056	0.008	0.521	0.000	0.016	0.000	0.530 ✔	1.000	4.8.2 ✔
	83.8056 - 81.9444	0.009	0.533	0.000	0.016	0.000	0.542 ✔	1.000	4.8.2 ✔
	81.9444 - 80.0833	0.009	0.545	0.000	0.016	0.000	0.554 ✔	1.000	4.8.2 ✔
	80.0833 - 78.2222	0.009	0.557	0.000	0.016	0.000	0.566 ✔	1.000	4.8.2 ✔
	78.2222 - 76.3611	0.009	0.568	0.000	0.016	0.000	0.577 ✔	1.000	4.8.2 ✔
	76.3611 - 74.5	0.009	0.579	0.000	0.016	0.000	0.589 ✔	1.000	4.8.2 ✔
	74.5 - 69.75	0.004	0.285	0.000	0.008	0.000	0.289 ✔	1.000	4.8.2 ✔
L3	74.5 - 69.75	0.004	0.242	0.000	0.006	0.000	0.246 ✔	1.000	4.8.2 ✔
	69.75 - 67.9861	0.007	0.462	0.000	0.012	0.000	0.469 ✔	1.000	4.8.2 ✔
	67.9861 - 66.2222	0.007	0.469	0.000	0.012	0.000	0.476 ✔	1.000	4.8.2 ✔
	66.2222 - 64.4583	0.007	0.476	0.000	0.012	0.000	0.484 ✔	1.000	4.8.2 ✔
	64.4583 - 62.6944	0.007	0.483	0.000	0.012	0.000	0.490 ✔	1.000	4.8.2 ✔
	62.6944 - 60.9306	0.007	0.490	0.000	0.012	0.000	0.497 ✔	1.000	4.8.2 ✔
	60.9306 - 59.1667	0.008	0.496	0.000	0.012	0.000	0.504 ✔	1.000	4.8.2 ✔
	59.1667 - 57.4028	0.008	0.503	0.000	0.012	0.000	0.511 ✔	1.000	4.8.2 ✔
	57.4028 - 55.6389	0.008	0.509	0.000	0.012	0.000	0.517 ✔	1.000	4.8.2 ✔
	55.6389 - 53.875	0.008	0.516	0.000	0.013	0.000	0.524 ✔	1.000	4.8.2 ✔
	53.875 - 52.1111	0.008	0.522	0.000	0.013	0.000	0.530 ✔	1.000	4.8.2 ✔
	52.1111 - 50.3472	0.008	0.528	0.000	0.013	0.000	0.536 ✔	1.000	4.8.2 ✔
	50.3472 - 48.5833	0.008	0.534	0.000	0.013	0.000	0.543 ✔	1.000	4.8.2 ✔
	48.5833 - 46.8194	0.008	0.540	0.000	0.013	0.000	0.549 ✔	1.000	4.8.2 ✔
	46.8194 - 45.0556	0.008	0.546	0.000	0.013	0.000	0.555 ✔	1.000	4.8.2 ✔
	45.0556 - 43.2917	0.008	0.552	0.000	0.013	0.000	0.561 ✔	1.000	4.8.2 ✔
	43.2917 - 41.5278	0.008	0.558	0.000	0.013	0.000	0.567 ✔	1.000	4.8.2 ✔
	41.5278 - 39.7639	0.009	0.564	0.000	0.013	0.000	0.573 ✔	1.000	4.8.2 ✔
	39.7639 - 38	0.009	0.570	0.000	0.013	0.000	0.578 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	38 - 32.5	0.004	0.279	0.000	0.006	0.000	0.284 ✔	1.000	4.8.2 ✔
L4	38 - 32.5	0.004	0.255	0.000	0.005	0.000	0.259 ✔	1.000	4.8.2 ✔
	32.5 - 30.7895	0.008	0.491	0.000	0.011	0.000	0.499 ✔	1.000	4.8.2 ✔
	30.7895 - 29.0789	0.008	0.495	0.000	0.011	0.000	0.503 ✔	1.000	4.8.2 ✔
	29.0789 - 27.3684	0.008	0.499	0.000	0.011	0.000	0.507 ✔	1.000	4.8.2 ✔
	27.3684 - 25.6579	0.008	0.502	0.000	0.011	0.000	0.510 ✔	1.000	4.8.2 ✔
	25.6579 - 23.9474	0.008	0.506	0.000	0.011	0.000	0.514 ✔	1.000	4.8.2 ✔
	23.9474 - 22.2368	0.008	0.510	0.000	0.011	0.000	0.518 ✔	1.000	4.8.2 ✔
	22.2368 - 20.5263	0.008	0.514	0.000	0.011	0.000	0.522 ✔	1.000	4.8.2 ✔
	20.5263 - 18.8158	0.008	0.517	0.000	0.011	0.000	0.526 ✔	1.000	4.8.2 ✔
	18.8158 - 17.1053	0.008	0.521	0.000	0.011	0.000	0.529 ✔	1.000	4.8.2 ✔
	17.1053 - 15.3947	0.008	0.524	0.000	0.011	0.000	0.533 ✔	1.000	4.8.2 ✔
	15.3947 - 13.6842	0.009	0.528	0.000	0.011	0.000	0.537 ✔	1.000	4.8.2 ✔
	13.6842 - 11.9737	0.009	0.531	0.000	0.011	0.000	0.540 ✔	1.000	4.8.2 ✔
	11.9737 - 10.2632	0.009	0.535	0.000	0.011	0.000	0.544 ✔	1.000	4.8.2 ✔
	10.2632 - 8.55263	0.009	0.538	0.000	0.011	0.000	0.547 ✔	1.000	4.8.2 ✔
	8.55263 - 6.84211	0.009	0.542	0.000	0.011	0.000	0.551 ✔	1.000	4.8.2 ✔
	6.84211 - 5.13158	0.009	0.545	0.000	0.011	0.000	0.554 ✔	1.000	4.8.2 ✔
	5.13158 - 3.42105	0.009	0.548	0.000	0.011	0.000	0.558 ✔	1.000	4.8.2 ✔
	3.42105 - 1.71053	0.009	0.552	0.000	0.011	0.000	0.561 ✔	1.000	4.8.2 ✔
	1.71053 - 0	0.009	0.555	0.000	0.011	0.000	0.564 ✔	1.000	4.8.2 ✔

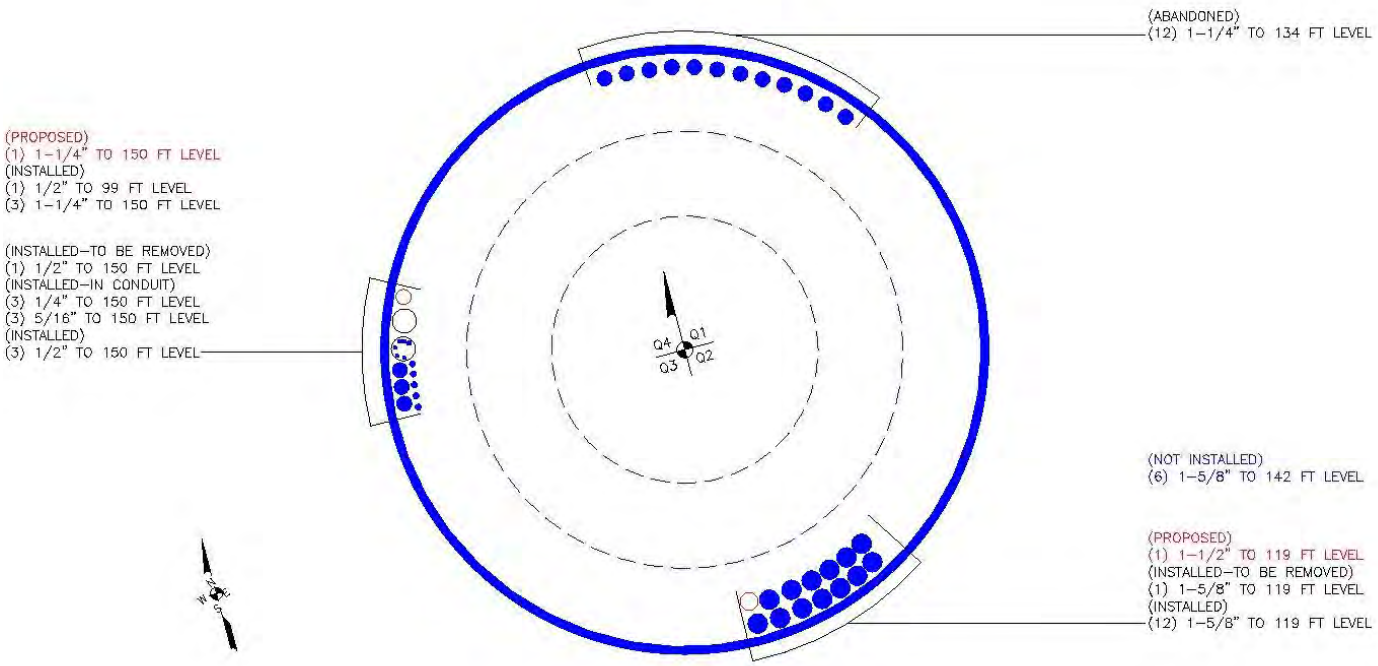
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 108	Pole	TP30.401x22x0.25	1	-13.44	1459.26	41.1	Pass
L2	108 - 69.75	Pole	TP37.553x29.1509x0.3125	2	-20.37	2264.07	58.9	Pass
L3	69.75 - 32.5	Pole	TP44.379x35.9778x0.375	3	-29.89	3445.83	57.8	Pass
L4	32.5 - 0	Pole	TP50.13x42.5288x0.4375	4	-43.02	4671.47	56.4	Pass
							Summary	
						Pole (L2)	58.9	Pass
						RATING =	**58.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(ABANDONED)
(12) 1-1/4" TO 134 FT LEVEL
(PROPOSED)
(1) 1-1/4" TO 150 FT LEVEL
(INSTALLED)
(1) 1/2" TO 99 FT LEVEL
(3) 1-1/4" TO 150 FT LEVEL
(INSTALLED-TO BE REMOVED)
(1) 1/2" TO 150 FT LEVEL
(INSTALLED-IN CONDUIT)
(3) 1/4" TO 150 FT LEVEL
(3) 5/16" TO 150 FT LEVEL
(INSTALLED)
(3) 1/2" TO 150 FT LEVEL
Q4
Q1
Q3
Q2
(NOT INSTALLED)
(6) 1-5/8" TO 142 FT LEVEL
(PROPOSED)
(1) 1-1/2" TO 119 FT LEVEL
(INSTALLED-TO BE REMOVED)
(1) 1-5/8" TO 119 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 119 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

Site ID: *876319*
Site Name: *NAUGATUCK 2 UNIROYAL*
Job No.

Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	58	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	57	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	2	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:		**
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	50.13	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Base Reactions		
TIA Revision:	G	
Factored Moment, Mu:	2623	ft-kips
Factored Axial, Pu:	43	kips
Factored Shear, Vu:	26	kips

Anchor Rod Results

TIA G --> Max Rod (Cu+ Vu/η):	141.6	Kips
Axial Design Strength, Φ*Fu*Anet:	260.0	Kips
Anchor Rod Stress Ratio:	54.5%	**Pass**

Base Plate Results	Flexural Check	
Base Plate Stress:	25.0	ksi
PL Design Bending Strength, Φ*Fy:	45.0	ksi
Base Plate Stress Ratio:	55.5%	**Pass**

PL Ref. Data
Yield Line (in):
30.48
Max PL Length:
30.48

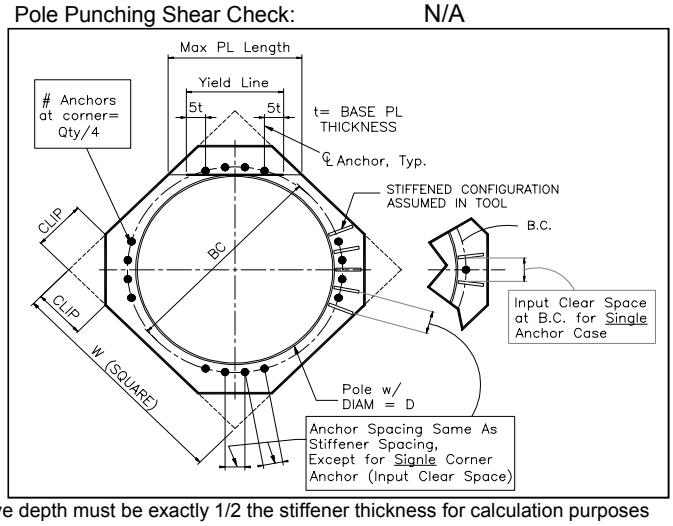
N/A - Unstiffened

Stiffener Results

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A



** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

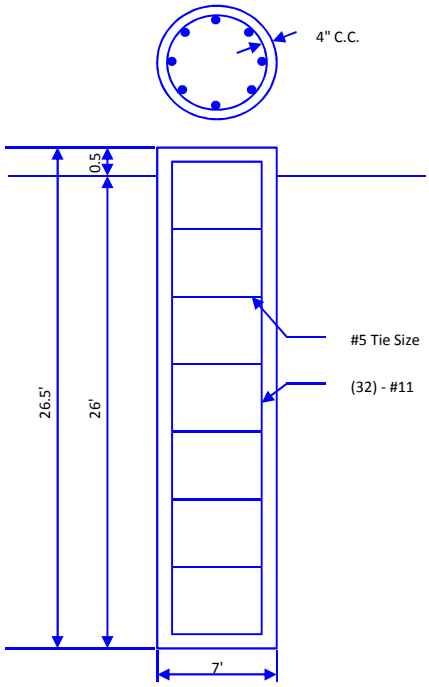
CCI Foundation Tool Suite - Monopole Pier

CCIFTS 1.2.108.14286 - Phase 1-2 Date: 5/11/2017

BU:	876319
Site Name:	Naugatuck 2 Uniroyal
App Number:	
Work Order:	

Monopole Drilled Pier

Input



Criteria

TIA Revision:	G
ACI 318 Revision:	2008
Seismic Category:	B

Forces

Compression	43	kips
Shear	26	kips
Moment	2623	k-ft
Swelling Force	0	kips

Foundation Dimensions

Pier Diameter:	7	ft
Ext. above grade:	0.5	ft
Depth below grade:	26	ft

Material Properties

Number of Rebar:	32	
Rebar Size:	11	
Tie Size	5	
Rebar tensile strength:	60	ksi
Concrete Strength:	3000	psi
Ultimate Concrete Strain	0.003	in/in
Clear Cover to Ties:	4	in

Soil Profile: soil

Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	3.5	0	3.5	125	0	0	0	0	0	
2	4.5	3.5	8	125	0	34			0	
3	15	8	23	125	0	34			0	
4	3	23	26	62.6	0	34				57

Analysis Results

Soil Lateral Capacity

Depth to Zero Shear:	6.25	ft
Max Moment, Mu:	2758.91	k-ft
Soil Safety Factor:	4.78	
Safety Factor Req'd:	1.33	
RATING:	27.8%	

Soil Axial Capacity

Skin Friction (k):	275.03	kips
End Bearing (k):	893.12	kips
Comp. Capacity (k), ϕCn:	1168.15	kips
Comp. (k), Cu:	55.41	kips
RATING:	4.7%	

Concrete/Steel Check

Mu (from soil analysis)	2758.91	k-ft
ϕMn	7457.48	k-ft
RATING:	37.0%	

rho provided	0.90	
rho required	0.33	OK

Rebar Spacing	5.79	
Spacing required	22.56	OK

Dev. Length required	19.42	
Dev. Length provided	61.78	OK

Overall Foundation Rating: 37.0%

Exhibit E

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

T-Mobile Existing Facility

Site ID: CTNH312A

NH312 / Crown Naugatuck
280 Elm Street
Naugatuck, CT 06770

May 13, 2017

EBI Project Number: 6217002053

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	6.78 %

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: **CTNH312A – NH312/CrownNaugatuck**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **280 Elm Street, Naugatuck, 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 **280 Elm Street, Naugatuck, 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 (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 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.

4) 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.

5) 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

6) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

7) Since the 2100 MHz UMTS radios are ground mounted there are additional cabling losses accounted for. For each ground mounted 2100 MHz UMTS RF an additional 1.48 dB of cable loss was factored into the calculations used for this analysis. This is based on manufacturers Specifications for 140 feet of 1-5/8" coax cable on each path.

8) 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.

9) 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.

10) 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.

11) The antenna mounting height centerline of the proposed antennas is **120 feet** above ground level (AGL).

12) 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.

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

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):	120	Height (AGL):	120	Height (AGL):	120
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%	2.58	Antenna B1 MPE%	2.58	Antenna C1 MPE%	2.58
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):	120	Height (AGL):	120	Height (AGL):	120
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	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	6,328.71	ERP (W):	6,328.71	ERP (W):	6,328.71
Antenna A2 MPE%	1.75	Antenna B2 MPE%	1.75	Antenna C2 MPE%	1.75
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):	120	Height (AGL):	120	Height (AGL):	120
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%	0.51	Antenna B3 MPE%	0.51	Antenna C3 MPE%	0.51

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**4.85 %**
Nextel	0.37 %
Verizon Wireless	1.08 %
Clearwire	0.09 %
Sprint	0.39 %
Site Total MPE %:	**6.78 %**

T-Mobile Sector A Total:	4.85 %
T-Mobile Sector B Total:	4.85 %
T-Mobile Sector C Total:	4.85 %
Site Total:	6.78 %

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	120	12.91	AWS - 2100 MHz	1000	1.29%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	120	12.91	PCS - 1900 MHz	1000	1.29%
T-Mobile AWS - 2100 MHz UMTS	2	830.08	120	4.59	AWS - 2100 MHz	1000	0.46%
T-Mobile PCS - 1900 MHz UMTS	2	1,167.14	120	6.46	PCS - 1900 MHz	1000	0.65%
T-Mobile PCS - 1900 MHz GSM	2	1,167.14	120	6.46	PCS - 1900 MHz	1000	0.65%
T-Mobile 700 MHz LTE	1	865.21	120	2.39	700 MHz	467	0.51%
						Total:*	**4.85%**

*

NOTE: Totals may vary by 0.01% due to summing of remainders

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:	4.85 %
Sector B:	4.85 %
Sector C:	4.85 %
T-Mobile Per Sector Maximum:	4.85 %
Site Total:	6.78 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **6.78%** 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.