Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

July 29, 2020

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

RE: Notice of Exempt Modification
76 East Ride Road, Ridgefield, CT 06877
Latitude: 41.28080844
Longitude: -73.49290060
T-Mobile Site#: CT11103A – Anchor

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 100-foot level of the existing 130-foot monopole at 76 East Ridge Road, Ridgefield, CT. The 130-foot monopole and property are owned by the Town of Ridgefield. T-Mobile now intends to replace (3) existing antennas with (3) new 2500 MHz antennas. The new antennas will be installed at the same 100-foot level of the tower.

Planned Modifications:
Tower:

Remove
(6) 7/8" coax
(1) 1-5/8" hybrid/fiber

Remove and Replace:
(3) AIR 21 antennas with (3) AIR 6449 B41 2500 MHz antennas

Install New:
(3) Commscope SDX1926Q-43 diplexers
(3) Ericsson Radio 4415 B25
(1) 1-5/8" hybrid/fiber

Existing to Remain:
(3) AIR 32 1900/2100 MHz
(3) APXVARR24_43 600/700/1900/2100 MHz
(3) Radio 4449 B71B85
(3) TMA
(6) 7/8" coax

(2) 1-5/8" hybrid/fiber

Ground:
Install New:

- 4' X 6' concrete slab (within existing compound)
- 6160 cabinet
- B160 battery cabinet

This tower was originally approved by the Connecticut Siting Council on September 8, 1989 in Docket No. 113. The approval did not come with conditions that would be violated by the proposed modification.

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 First Selectman - Rudy Marconi, Elected Official, and Richard Baldelli, Director of Planning and Zoning for the Town of Ridgefield.

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,

Kyle Richers
Transcend Wireless
Cell: 908-447-4716
Email: krichers@transcendwireless.com

Attachments
cc: Rudy Marconi – First Selectman of Town of Ridgefield
Richard Baldelli– Director of Planning & Zoning for Town of Ridgefield

UPS Internet Shipping: View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   Customers with a Daily Pickup
   Your driver will pickup your shipment(s) as usual.

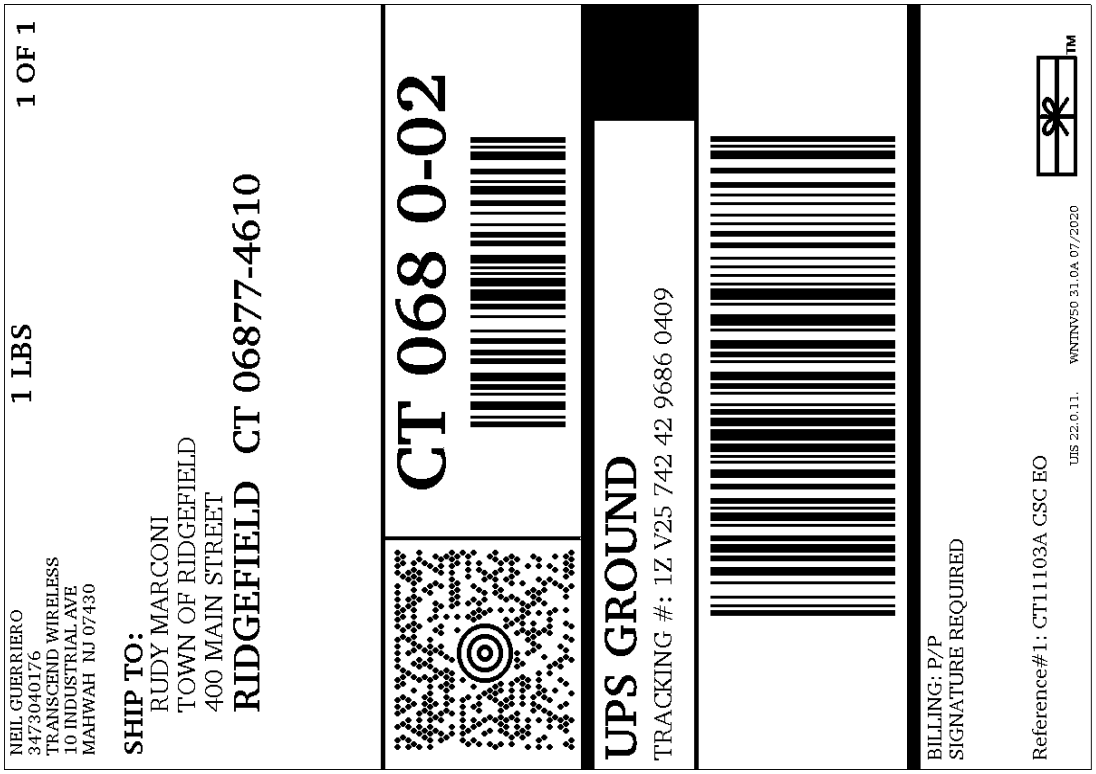
   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the 'Find Locations' Quick link at ups.com.
   Schedule a same day or future day Pickup to have a UPS driver pickup all of your Internet Shipping packages.
   Hand the package to any UPS driver in your area.

UPS Access Point™
MICHAELS STORE # 7773
75 INTERSTATE SHOP CTR
RAMSEY ,NJ 07446

UPS Access Point™
THE UPS STORE
115 FRANKLIN TPKE
MAHWAH ,NJ 07430

UPS Access Point™
THE UPS STORE
120 E MAIN ST
RAMSEY ,NJ 07446

FOLD HERE



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   Customers with a Daily Pickup
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   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the 'Find Locations' Quick link at ups.com.
   Schedule a same day or future day Pickup to have a UPS driver pickup all of your Internet Shipping packages.
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THE UPS STORE
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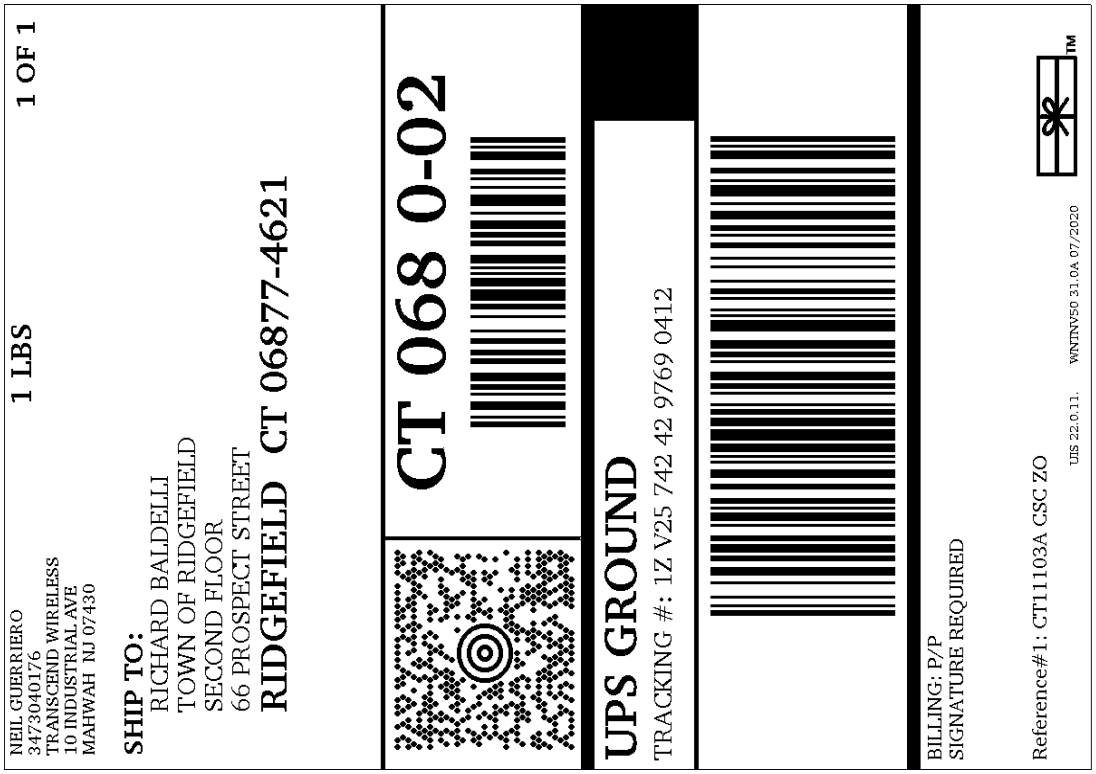


The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2012.

Information on the Property Records for the Municipality of Ridgefield was last updated on 8/6/2014.

Parcel Information

Location:	76 EAST RIDGE	Property Use:	Office	Primary Use:	Office Building
Unique ID:	E150204	Map Block Lot:	E15-0204	Acres:	1.90
490 Acres:	0.00	Zone:	RA	Volume / Page:	0182/0240
Developers Map / Lot:		Census:	2453		

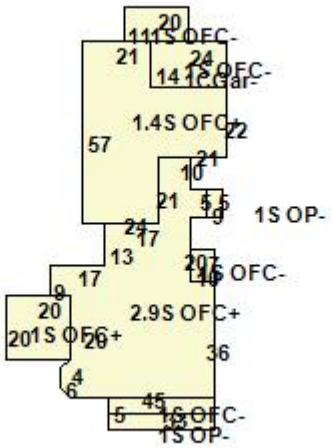
Value Information

	Appraised Value	70% Assessed Value
Land	1,600,000	1,120,010

	Appraised Value	70% Assessed Value
Buildings	1,037,348	726,140
Detached Outbuildings	293,220	205,250
Total	2,930,568	2,051,400

Building 1

Photo Not Available



Category:	Office	Use:	Office Building	Stories:	2.90

Above Grade:	10,921	Below Grade:	4,678	Below Grade Finish:	3,566
Construction:	Good	Year Built:	1930	Heating:	Hot Water
Fuel:	Oil	Cooling Percent:	100%	Siding:	Wood Shingles/Vinyl
Roof Material:	Asphalt Reg3 Tab				

Special Features

Attached Components

Type:	Construction:	Year Built:	Area:
Garage	Concrete Block/Frame	1930	336
Porch	Open	1930	330
Porch	Open	1930	45

Detached Outbuildings

Type:	Construction:	Year Built:	Length:	Width:	Area:
Garage	Detatched 1 Story Masonry	1930	0.00	0.00	4,320
Paving	Paving	1930	0.00	0.00	6,000
Shed	Average Shed	1930	0.00	0.00	144

MAP / LOT E15-0204 STREET 76 EAST RIDGE ZONING RA CARD NO. 1 OF 1 TYPE COMM./IND.

OWNER RIDGEFIELD TOWN OF

TRANSFER OF OWNERSHIP

	Deed Reference	Date Mo Day Year	Selling Price
RIDGEFIELD TOWN OF	0182/240		

REMARKS

98-A-344, 8-17-98; POUR CONC. FOR EQUIP. CABINET FOR WIRELESS COMM.
ATTCHMNT OF ADDTN ANTENNAS ON EXIST COMM TOWER 97-A-119,4/10/97
INSTALL 9 TELECOM. ATENNAS 01-A-152;5/2/01;EMERGENCY GENERATOR
GP-11-115-8/23/11:AT PD REMOVE OIL BURNER AND REPLACE WITH GAS.

ASSESSED VALUE	NO	CODE	2007	NO	CODE		NO	CODE		NO	CODE		NO	CODE	
COMM. LAND	1.90	21	269,720												
COMM. BLDG	1	22	1,132,300												
COMM. OUT BUILDING	3	25	72,200												
TOTAL			1,474,220												

Census Tract 2453 Dev. Lot

Survey No.'s

LAND VALUATION

	SIZE	LAND UNIT	SIZE ADJUSTMENT	TOPO / AMN	ESTIMATED LAND MARKET VALUE
PRIMARY SITE	1.90	650000	0.80	0.61	385320
COMM / IND. ACRES					
FRONT ACRES					
EXCESS ACRES					
TOTAL ACRES	1.90				385320

Inspection Date

Prior Assessment 1,327,130

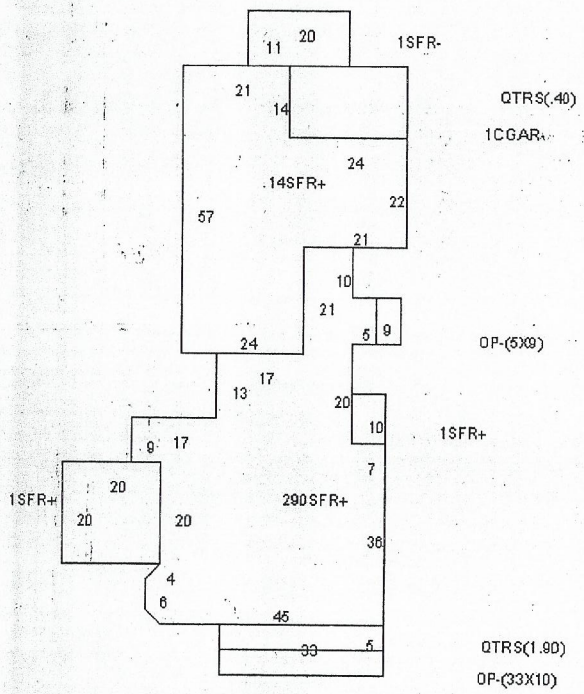
ESTIMATED MARKET VALUE

LAND VALUE	385,320
IMPROVEMENT VALUE	1,720,710
ESTIMATED MARKET VALUE	**2,106,030**

Town of Ridgefield

COMMENTS

POLICE STATION;BSMT=LOCKER RMS,1ST FLR=RECEPTION OFFICE+4 HOLDING CELLS,2ND FLR=CLASSRM+OFFICES & 3RD FLR=STORAGE;
01-R-15, 8/28/01; ACCENT PANELS. CO 8/29/02



PROPERTY FACTORS	
OCCUPANCY	OFFICE
CONSTRUCTION	WOOD FRAME
QUALITY	GOOD
STORY HEIGHT	2.75
SIDING TYPE	WOOD SHINGLE
FOUNDATION TYPE	STONE-BRICK
ROOF TYPE	HIP
ROOFING	ASPHALT
WALL FINISH	
FLOOR FINISH	
ELEVATOR / STOPS	
PLUMBING FIXTURES	41
HEATING	HOT WATER / OIL
% INSULATION	0
% AIR CONDITIONED	100%
% SPRINKLER	0
REMODEL YEAR	1989
ADDITION YEAR	
ECONOMIC LIFE	50
EFFECTIVE AGE	9
CONDITION	AVERAGE
FINISH PERCENT	100%

COMPUTATIONS			
DESCRIPTION	AREA	RATE	COST
MAIN	7,241	122	879,780
ADDITION	165	116	19,180
ADDITION	70	116	8,140
ADDITION	400	116	46,500
ADDITION	2,503	122	304,110
ADDITION	134	116	15,580
FINISH BSMT	3,566	40	143,210
UNFIN BSMT	1,189	22	25,990
ATT GARAGE	336	57	19,300
OP	330	49	16,040
OP	45	62	2,780
CLASS FACTOR			15
REPLACEMENT COST			1702720

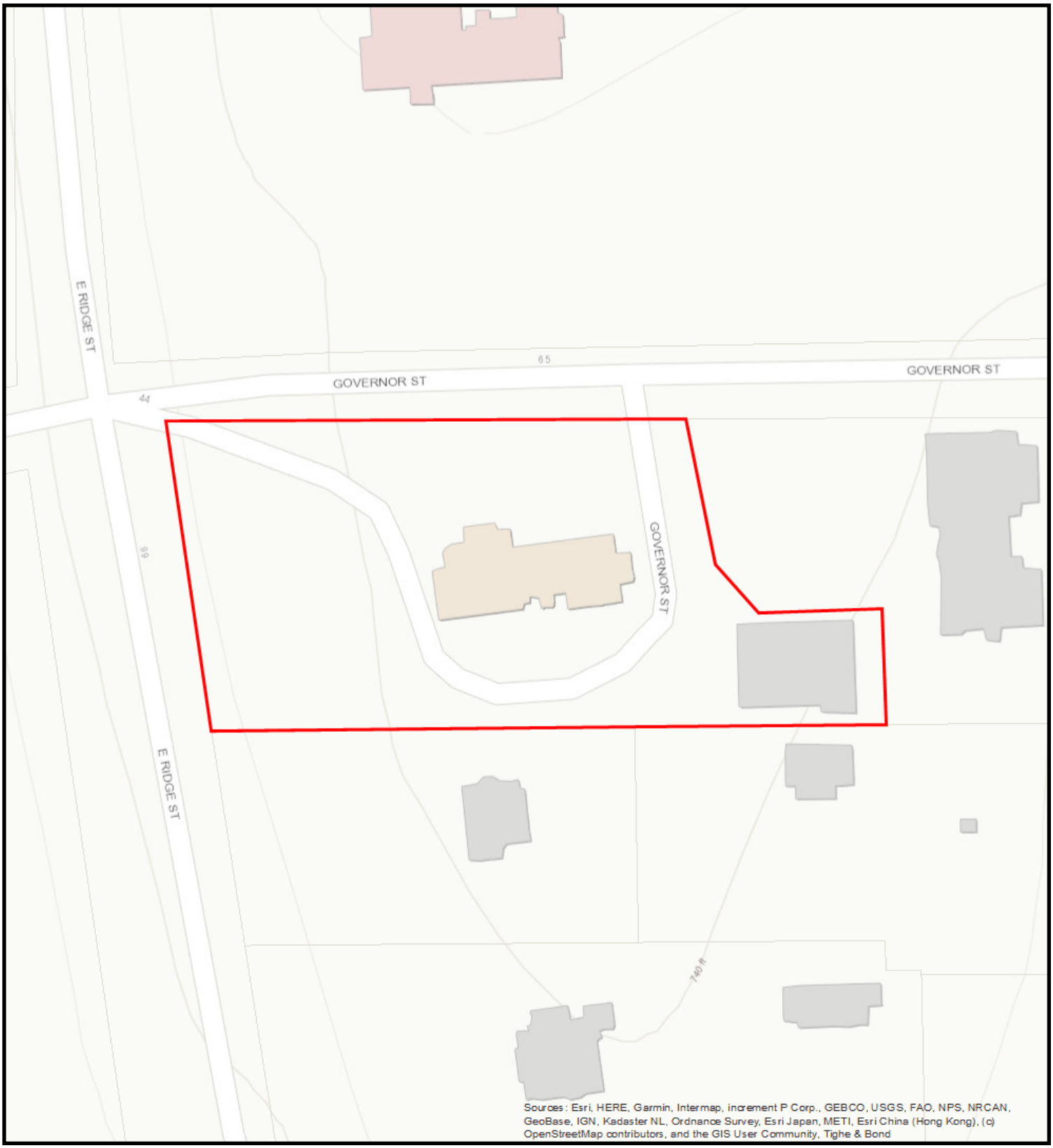
SUMMARY OF IMPROVEMENTS

USE	STRY HGT	CONST	YR BLT	CONDITION	SIZE	AREA	REPLACEMENT COST	ACCUMLTD DEP NORM	ACCUMLTD DEP OBSOL	ESTIMATED VALUE
OFFICE	2.75	WOOD FRAME	1930	AVERAGE	SEE SKETCH	10,513	1,702,720	5		1,617,590
PAVING			1930	AVERAGE		6,000	34,740	50		17,370
GARAGE	1.0	RUBBLE/BRICK	1930	FAIR	80 X 54	4,320	211,330	60		84,530
SHED	1.0	AVERAGE SHED	1930	FAIR	18 X 8	144	4,430	60	30	1,240

GROSS LEASABLE AREA	10513	S.F.
BSMT UNFINISHED AREA	1189	S.F.
BSMT FINISHED AREA	3566	S.F.
UNFINISHED MEZZ. AREA		
FINISHED MEZZ. AREA		
MAIN BODY WALL HEIGHT	8	L.F.
MAIN BODY PERIMETER	264	L.F.

INSPECTOR KC DATE

TOTAL ESTIMATED IMPROVEMENT VALUE 103140



7/28/2020 7:27:07 PM

Scale: 1"=94'

Scale is approximate

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.

DOCKET NO. 113 - An application of Metro Mobile CTS of Fairfield County, Inc., for a Certificate of Environmental Compatibility and Public Need for cellular telephone antennas and associated equipment in the Town of Ridgefield, Connecticut.	: Connecticut : : Siting : Council :September 8, 1989

DECISION AND ORDER

Pursuant to the foregoing Opinion, the Connecticut Siting Council finds that the effects associated with the construction, operation, and maintenance of a cellular monopole tower and associated equipment at the proposed Ridgefield site, including effects on the natural environment; ecological balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife, are not significant either alone or cumulatively with other effects, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by Section 16-50k of the Connecticut General Statutes (CGS) be issued to Metro Mobile CTS of Fairfield County, Inc., for the construction, operation,and maintenance of a cellular telephone tower site and associated equipment at the proposed site on Governor Street in Ridgefield, Connecticut.

The facility shall be substantially constructed, operated, and maintained as specified in the Council's record on this matter, and subject to the following conditions:

1. The tower shall be a monopole no taller than necessary to provide the proposed service, and in no event shall the structure exceed a total height of 143 feet, including antennas.

2. The facility shall be constructed in accordance with applicable sections of the State of Connecticut Basic Building Code.
3. Unless necessary to comply with conditions of the Federal Aviation Administration, no lights shall be installed on this tower.
4. The Certificate Holder or its successor shall not oppose public or private entities who seek to share space on the tower unless technical reasons preclude such tower sharing.
5. The Certificate Holder or its successor shall notify the Council for acknowledgement or approval if and when directional antennas or any equipment other than that listed in this application are added to this facility.
6. If this facility does not provide, or permanently ceases to provide, cellular service following the completion of construction, this Decision and Order shall be void, and the tower and all associated equipment in this application shall be dismantled and removed or reapplication for any new use shall be made to the Council and a Certificate granted before any such new use is made.
7. The Certificate Holder shall comply with any future radio frequency (RF) standard, promulgated by State or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted in this Decision and Order shall be brought into compliance with such standards.
8. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the issuance of this Decision and Order, or within three years of the completion of any appeal taken in this Decision and Order.

Pursuant to Section 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below. A notice of issuance shall be published in the Danbury News-Times, the Stamford Advocate, and the White Plains Reporter Dispatch.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of State Agencies.

The parties or intervenors to this proceeding are:

PARTY	ITS REPRESENTATIVE
Metro Mobile CTS of Fairfield County, Inc. 50 Rockland Road South Norwalk, CT 06854 ATTN: Phillip Mayberry General Manager	Jennifer Young Gaudet, Esq. David W. Bogan, Esq. Bryne, Slater, Sandler Shulman & Rouse, P.C. 330 Main Street P.O. Box 3216 Hartford, CT 06103 Fleischman and Walsh, P.C. 1400 16th Street, N.W. Suite 600 Washington, D.C. 20036 ATTN: Richard Rubin, Esq.
INTERVENOR	ITS REPRESENTATIVE
SNET Cellular, Inc. 227 Church Street New Haven, CT 06506	Peter J. Tyrrell Senior Attorney SNET Cellular, Inc. Room 1021 227 Church Street New Haven, CT 06506

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case in Docket No. 113 or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut the 8th day of September, 1989.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	YES
Commissioner Peter Boucher Designee: Robert A. Pulito	YES
Commissioner Leslie Carothers Designee: Brian Emerick	ABSENT
Harry E. Covey	ABSTAIN
Mortimer A. Gelston	YES
Daniel P. Lynch, Jr.	YES
Paulann H. Sheets	YES
William H. Smith	YES
Colin C. Tait	YES

3441E-2

WIRELESS COMMUNICATIONS FACILITY

RIDGEFIELD / DOWNTOWN 1

SITE ID: CT11103A

76 EAST RIDGE RD

RIDGEFIELD, CT 06877

T-MOBILE RF CONFIGURATION

67D5997DB_2xAIR+1OP

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTON, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

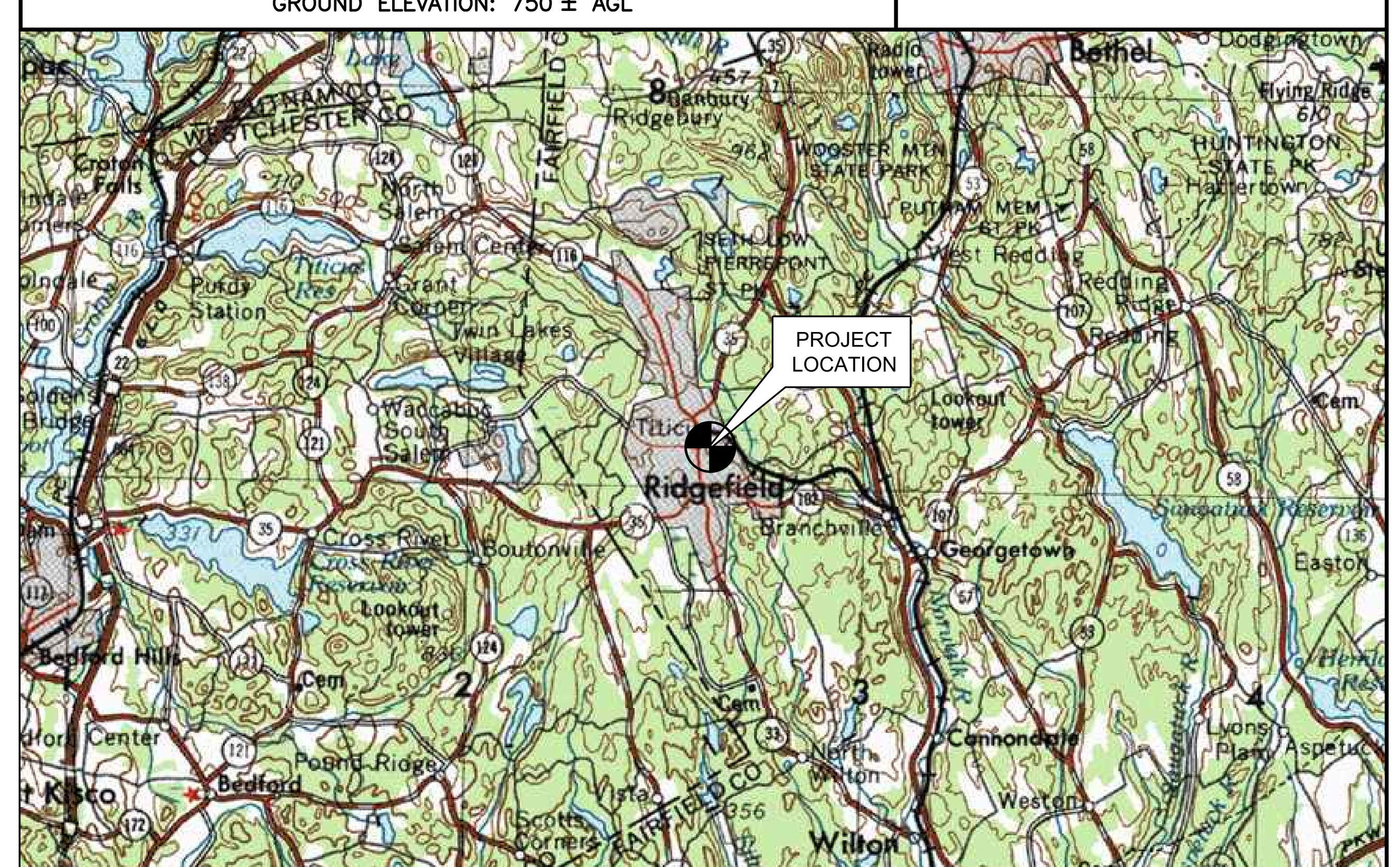
SITE DIRECTIONS

FROM: 35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002
TO: 76 EAST RIDGE RD, RIDGEFIELD, CT 06877

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	
2.	TAKE THE 2ND RIGHT ONTO DAY HILL RD.	0.30 MI.
3.	TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187. CONTINUE TO FOLLOW CT-187.	0.14 MI.
4.	TURN LEFT ONTO CT-305/OLD WINDSOR RD. CONTINUE TO FOLLOW CT-305.	1.89 MI.
5.	MERGE ONTO I-91 S TOWARD HARTFORD.	2.33 MI.
6.	MERGE ONTO I-84 W VIA EXIT 32A TOWARD WATERBURY.	5.66 MI.
7.	KEEP LEFT TO TAKE I-84 W TOWARD WATERBURY.	13.29 MI.
8.	MERGE ONTO US-7 S VIA EXIT 3 ON THE LEFT TOWARD NORWALK.	45.83 MI.
9.	TURN RIGHT ONTO DANBURY RD/CT-35.	4.72 MI.
10.	TURN LEFT ONTO GROVE ST.	2.58 MI.
11.	TURN LEFT ONTO PROSPECT ST.	0.49 MI.
12.	TAKE THE 1ST RIGHT ONTO E RIDGE RD.	0.02 MI.
13.	76 E RIDGE RD, RIDGEFIELD, CT 06877-5022, 76 E RIDGE RD IS ON THE LEFT.	0.23 MI.

SITE COORDINATES: LATITUDE: 41°-16'-50.93" N
LONGITUDE: 73°-29'-34.11" W
GROUND ELEVATION: 750'± AGL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH



VICINITY MAP

PROJECT SUMMARY

THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

1. REMOVE XMU FROM RBS6131
2. REPLACE BB5216 WITH (1) BB6630
3. INSTALL (1) ENCLOSURE 6160
4. INSTALL (1) IXRe ROUTER
5. INSTALL (1) BB6630 FOR L2500
6. INSTALL (1) BB6648 FOR N2500
7. REMOVE (6) COAX
8. REMOVE (1) 9x18 HCS
9. INSTALL (1) 6x12 HCS
10. REPLACE (3) AIR21 ANTENNAS AND INSTALL (3) AIR6449 B41
11. INSTALL (3) RRUS4415 B25
12. REMOVE (6) EXISTING COAX
13. REMOVE (1) 9x18 HCS
14. RELOCATE (3) TMA'S
15. INSTALL (3) COMMSCOPE SDX1926Q-43
16. INSTALL NEW CONCRETE PAD FOR NEW CABINETS

PROJECT INFORMATION

SITE NAME:	RIDGEFIELD/DOWNTOWN 1
SITE ID:	CT11103A
SITE ADDRESS:	76 EAST RIDGE ROAD RIDGEFIELD, CT 06877
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	DAN REID (PROJECT MANAGER) TRANSCEND WIRELESS, LLC (203) 592-8291
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
PROJECT COORDINATES:	LATITUDE: 41°-16'-50.93" N LONGITUDE: 73°-29'-34.11" W GROUND ELEVATION: 750'± AGL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	GENERAL NOTES AND SPECIFICATIONS	0
C-1	SITE LOCATION PLAN	0
C-2	COMPOUND PLAN AND ELEVATION	0
C-3	EQUIPMENT PLANS	0
C-4	ANTENNA PLANS AND ELEVATIONS	0
C-5	TYPICAL EQUIPMENT DETAILS	0
E-1	TYPICAL ELECTRICAL DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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RIDGEFIELD / DOWNTOWN 1
SITE ID: CT11103A
76 EAST RIDGE RD
RIDGEFIELD, CT 06877

DATE: 07/15/20
SCALE: AS NOTED
JOB NO. 20074.48

TITLE SHEET

T-1

Sheet No. 1 of 8

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- ULTIMATE DESIGN SPEED (OTHER STRUCTURE): 93 MPH (Vasd) (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND IT'S COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS, ARE TO BE BROUGHT TO THE ATTENTION OF THE SITE OWNER'S CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT "DIG SAFE" (DIAL 811) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
20. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
21. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

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GENERAL NOTES AND SPECIFICATIONS

N-1

NOTE:
ALL COAX LENGTHS TO BE MEASURED
AND VERIFIED IN FIELD BEFORE ORDERING

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) DIPLEXER (QTY)	(E/P) TMA (QTY)	(QTY) PROPOSED COAX (LENGTH)
A1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	100'	110°				(1) 6x12 HYBRID CABLE (±100')
A2	EXISTING	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	100'	110°	(E) RADIO 4449 B71 (1), (P) RADIO 4415 B25 (1)	(P) COMMSCOPE SDX1926Q-43 (1)	(E) GENERIC TWIN STYLE 1B (1)	
A3	EXISTING	ERICCSON (AIR32 KRD901146-1_B66A_B2A)	56.6 x 12.9 x 8.7	100'	110°				
B1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	100'	230°				
B2	EXISTING	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	100'	230°	(E) RADIO 4449 B71 (1), (P) RADIO 4415 B25 (1)	(P) COMMSCOPE SDX1926Q-43 (1)	(E) GENERIC TWIN STYLE 1B (1)	
B3	EXISTING	ERICCSON (AIR32 KRD901146-1_B66A_B2A)	56.6 x 12.9 x 8.7	100'	230°				
C1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	100'	350°				
C2	EXISTING	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	100'	350°	(E) RADIO 4449 B71 (1), (P) RADIO 4415 B25 (1)	(P) COMMSCOPE SDX1926Q-43 (1)	(E) GENERIC TWIN STYLE 1B (1)	
C3	EXISTING	ERICCSON (AIR32 KRD901146-1_B66A_B2A)	56.6 x 12.9 x 8.7	100'	350°				

1 C-1 SITE LOCATION PLAN
SCALE: NOT TO SCALE

TRUE NORTH

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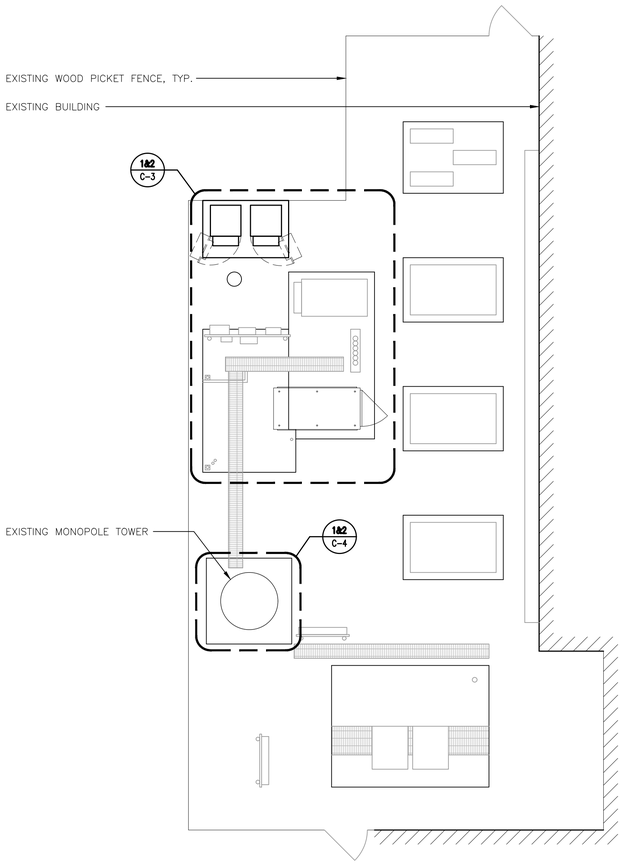
SITE LOCATION PLAN

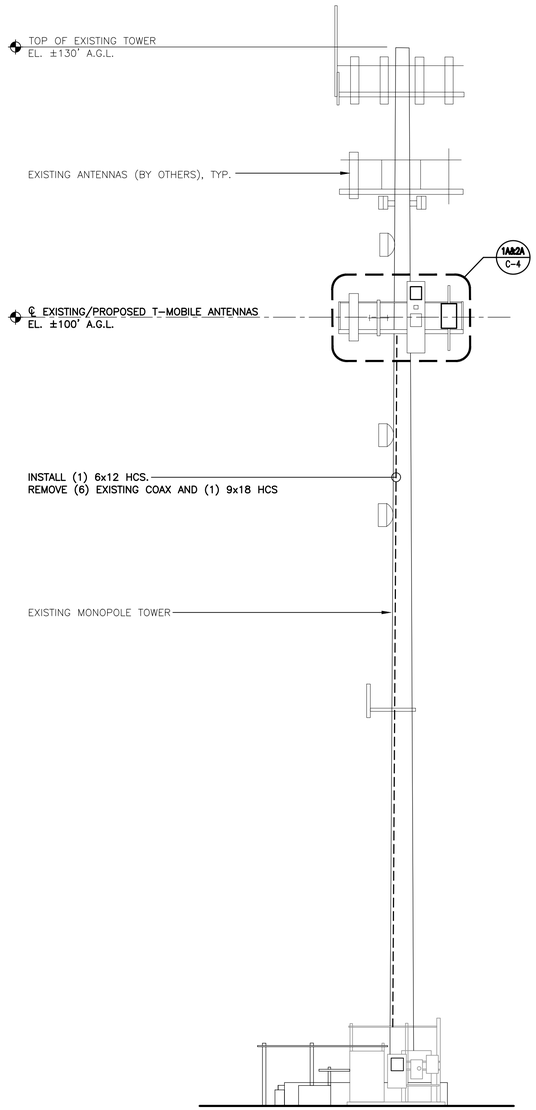
C-1

Sheet No. 3 of 8



2 / C-2 **PARTIAL COMPOUND PLAN - PROPOSED**
SCALE: 1" = 5'

APPROXIMATE NORTH



1 / C-2 **TOWER ELEVATION - PROPOSED**
SCALE: 1" = 8'

GRAPHIC SCALE
8 0 4 8 16 32
1" = 8'-0"

STRUCTURAL COMPLIANCE NOTES:

TOWER AND FOUNDATION

A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION. THE TOWER AND TOWER FOUNDATION WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 20074.48) DATED 07/15/20 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

ANTENNA MOUNTS

A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION. THE MOUNTS WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 20074.48) DATED 07/15/20 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

NOTE:
NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.

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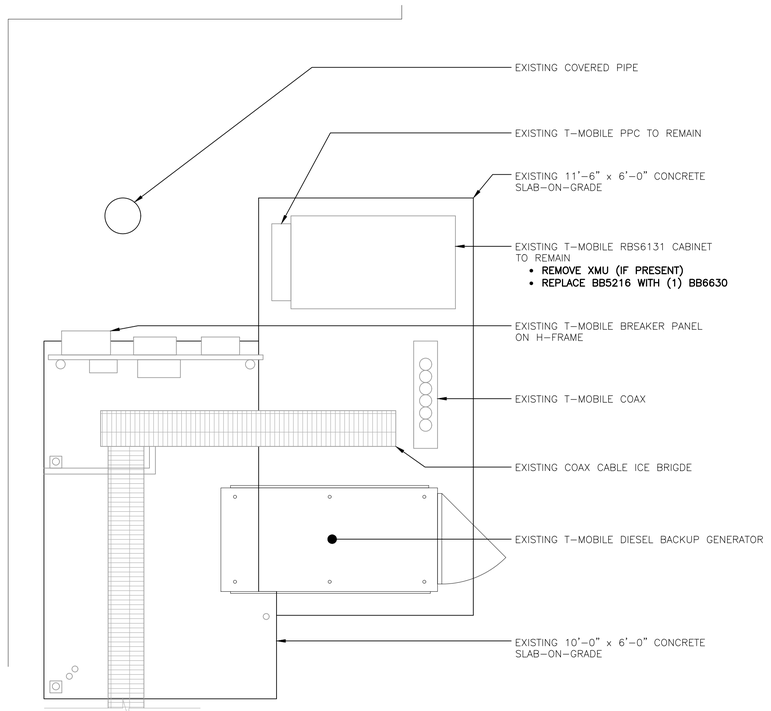
JOB NO.	20074.48

COMPOUND PLAN AND ELEVATION

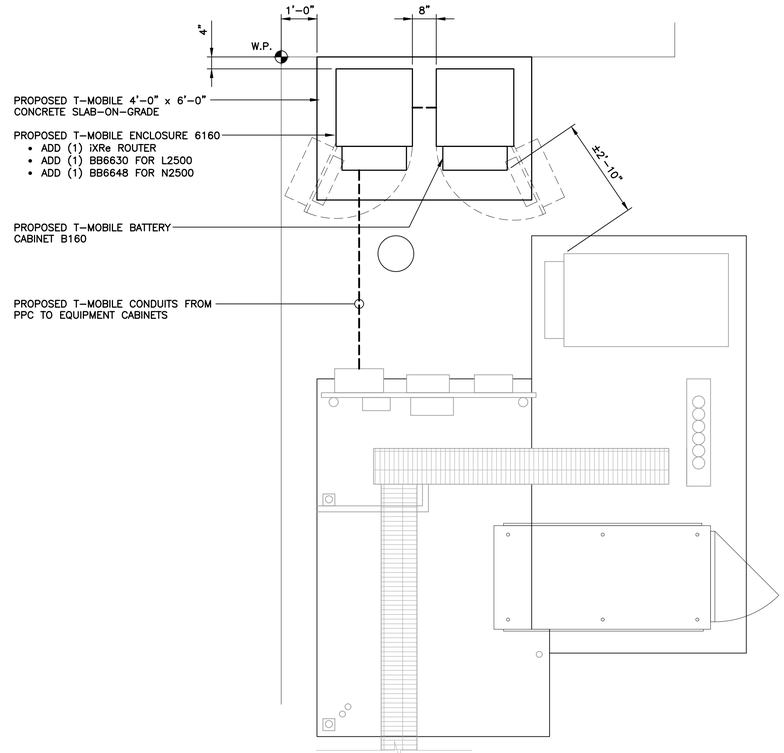
C-2

Sheet No. 4 of 8



1 C-3 **EXISTING EQUIPMENT PLAN**
SCALE: 1/2" = 1'

APPROXIMATE NORTH

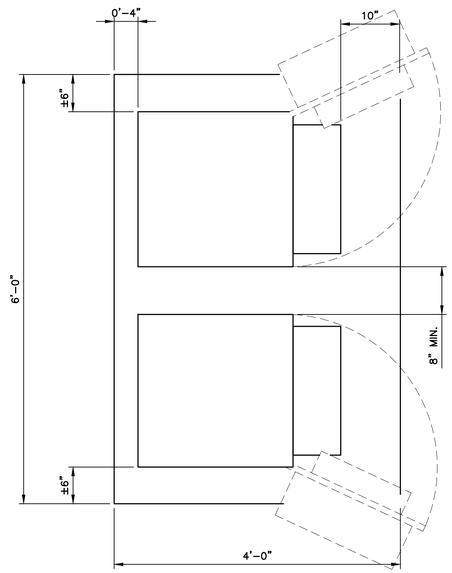


2 C-3 **PROPOSED EQUIPMENT PLAN**
SCALE: 1/2" = 1'

APPROXIMATE NORTH

LEGEND

W.P. DENOTES WORKING POINT.



3 C-3 **PROPOSED EQUIPMENT SLAB-ON-GRADE**
SCALE: 1" = 1'

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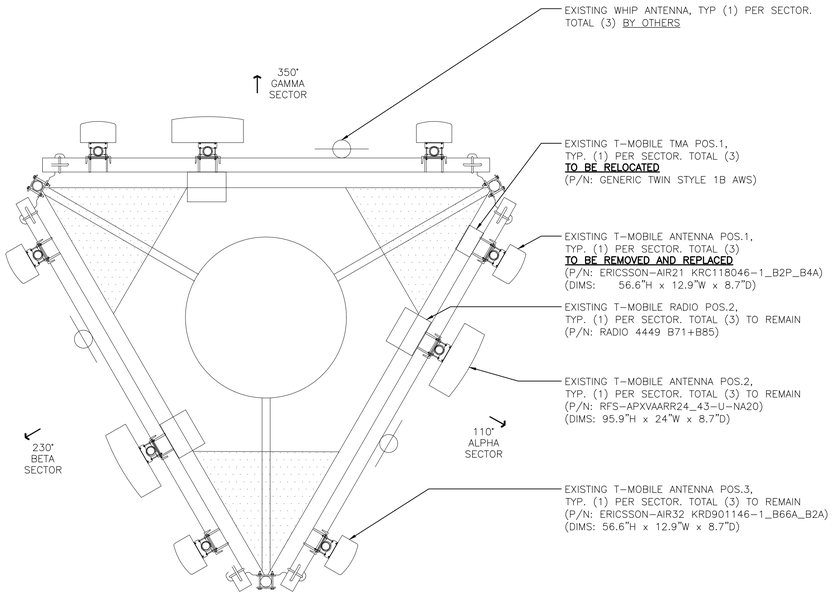
EQUIPMENT PLANS

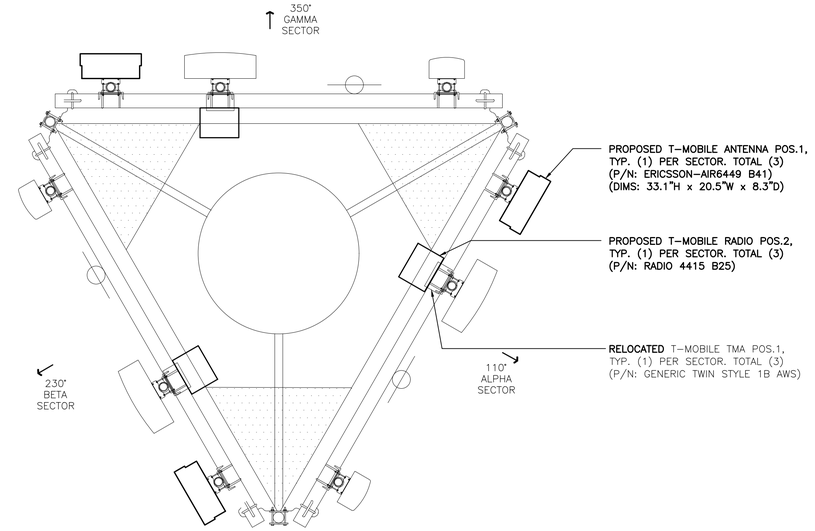
C-3

Sheet No. 5 of 8



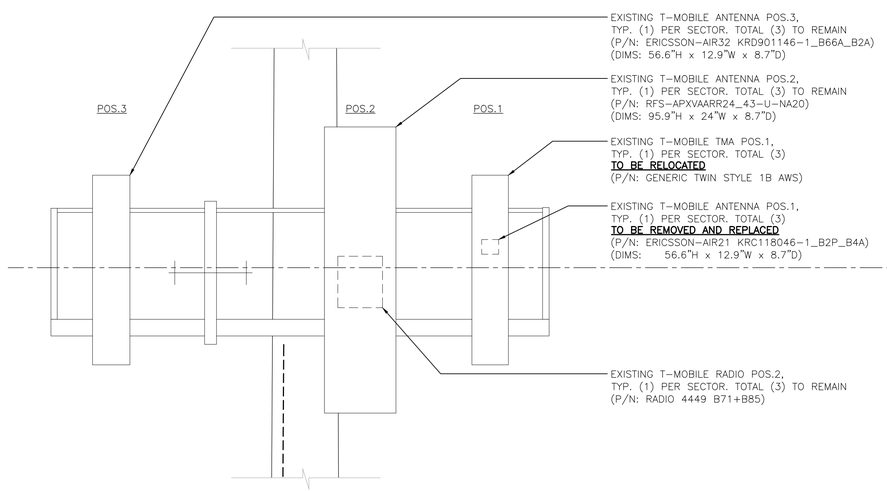
1 C-4 **EQUIPMENT AND ANTENNA PLAN - EXISTING**
SCALE: 1/2" = 1'

APPROXIMATE NORTH

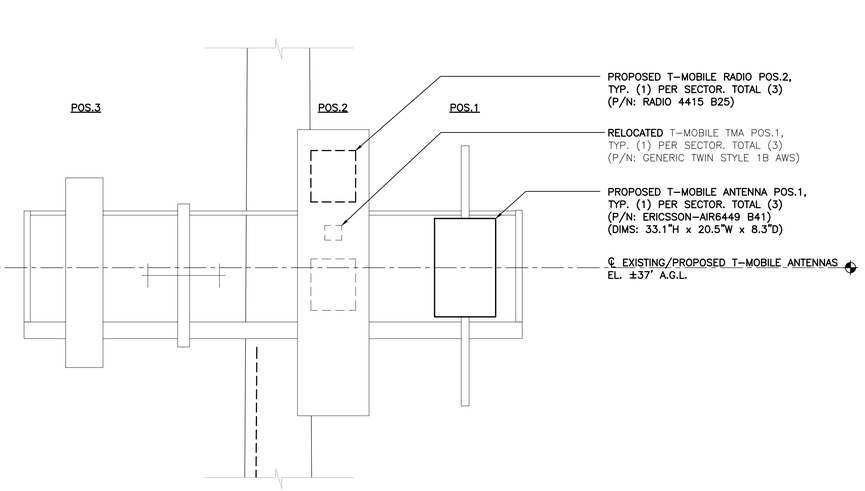


2 C-4 **EQUIPMENT AND ANTENNA PLAN - PROPOSED**
SCALE: 1/2" = 1'

APPROXIMATE NORTH



1A C-4 **ANTENNA ELEVATION - EXISTING**
SCALE: 1/2" = 1'



2A C-4 **ANTENNA ELEVATION - PROPOSED**
SCALE: 1/2" = 1'

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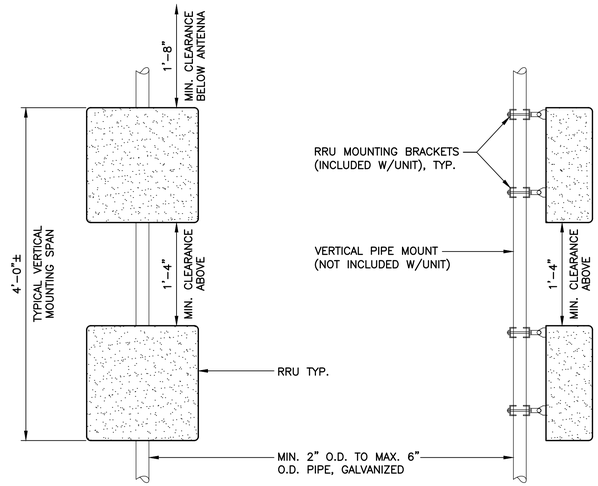
ANTENNA PLANS AND ELEVATIONS

C-4

Sheet No. 6 of 8

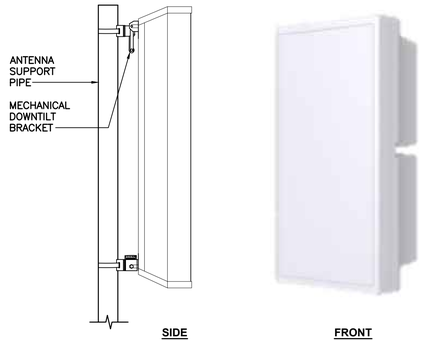


FRONT ELEVATION SIDE ELEVATION

NOTES:

1. T–MOBILE SHALL SUPPLY RRU, AND RRU POLE–MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE–MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

1 / C-5 **TYPICAL RRUS MOUNTING DETAILS**
SCALE: NOT TO SCALE

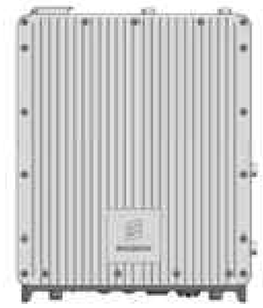


SIDE

FRONT

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR6449 B41	33.1"L x 20.6"W x 8.6"D	±104 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

2 / C-5 **PROPOSED ANTENNA DETAIL**
SCALE: NOT TO SCALE



FRONT VIEW

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4415 B25	14.9"L x 13.2"W x 5.4"D	±46 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.			

3 / C-5 **PROPOSED RRU DETAIL**
SCALE: NOT TO SCALE

EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: ENCLOSURE 6160	62.0"H x 26.0"W x 26.0"D	±1200 LBS

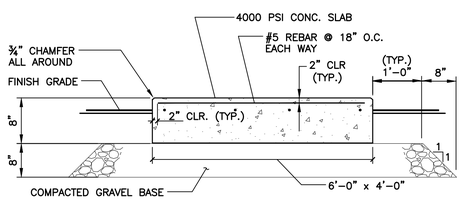
4 / C-5 **ENCLOSURE 6160 (OUTDOOR)**
SCALE: NOT TO SCALE

EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: BATTERY CABINET B160	62.0"H x 26.0"W x 26.0"D	±1883 LBS

5 / C-5 **BATTERY CABINET DETAIL**
NOT TO SCALE

DIPLEXER		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: SDZ1926Q–43(E14F05P86)	4.2"L x 7.0"W x 3.0"D	–
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

6 / C-5 **PROPOSED DIPLEXER DETAIL**
SCALE: NOT TO SCALE



7 / C-5 **TYPICAL CONCRETE PAD DETAIL**
NOT TO SCALE

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www.CentekEng.com

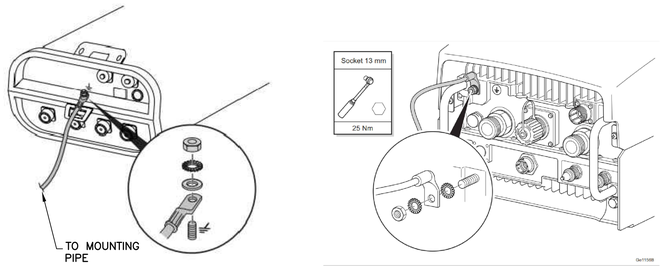
T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
RIDGEFIELD / DOWNTOWN 1
SITE ID: CT11103A
76 EAST RIDGE RD
RIDGEFIELD, CT 06877

DATE: 07/15/20
SCALE: AS NOTED
JOB NO. 20074.48

TYPICAL EQUIPMENT DETAILS

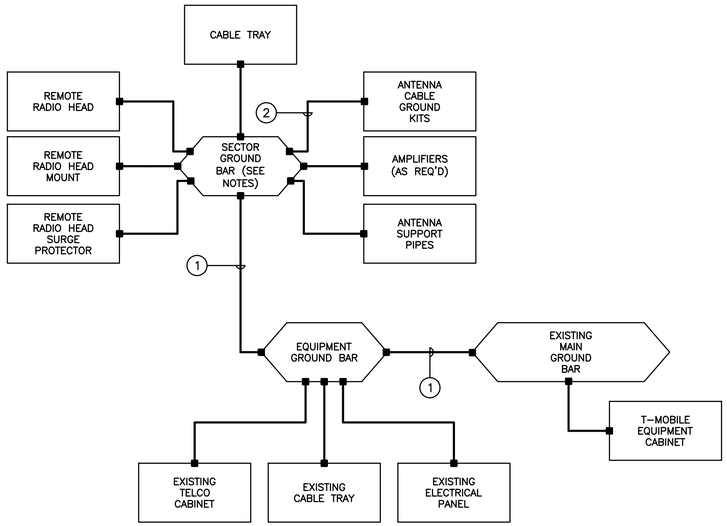
C-5

Sheet No. 7 of 8



1 E-1 TYPICAL ANTENNA/RRU GROUNDING DETAILS

SCALE: NOT TO SCALE



GROUNDING SCHEMATIC NOTES

(1) #2 AWG

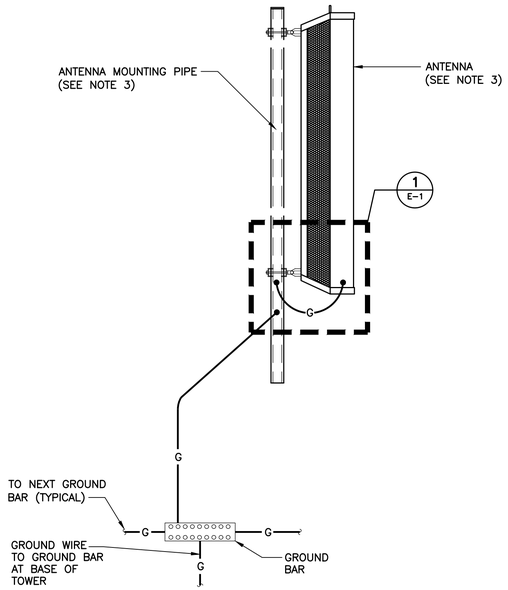
(2) #6 AWG

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
3. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
4. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
5. COORDINATE ALL ROOF MOUNTED EQUIPMENT WITH OWNER.
6. ALL ROOF MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
7. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

4 E-1 TYPICAL GROUNDING SCHEMATIC DETAIL

SCALE: NOT TO SCALE



NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

2 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE

RISER DIAGRAM NOTES

(1) EXISTING 200A, 120/240V, SINGLE PHASE PANEL TO REMAIN.

(2) EXISTING CONDUITS AND CONDUCTORS TO REMAIN.

(3) EXISTING EQUIPMENT CABINET TO REMAIN.

(4) EXISTING 150A/2P CIRCUIT BREAKER SERVING EXISTING EQUIPMENT CABINET TO BE REMOVED AND REPLACED WITH NEW 100A/2P CIRCUIT BREAKER. COORDINATE CABINET DOWNGRADE WITH CONSTRUCTION MANAGER.

(5) NEW 100A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.

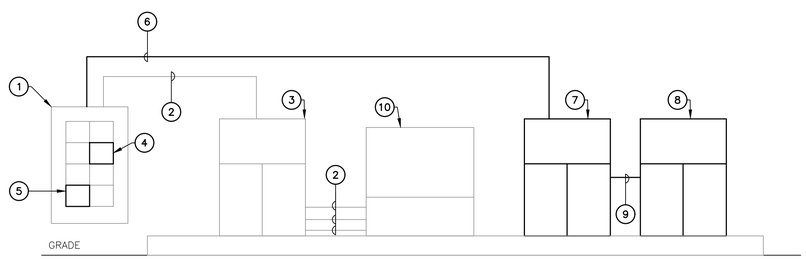
(6) (3) #1 AWG, (1) #8 AWG GROUND, 1–1/4" CONDUIT.

(7) NEW RADIO EQUIPMENT CABINET.

(8) NEW BATTERY CABINET.

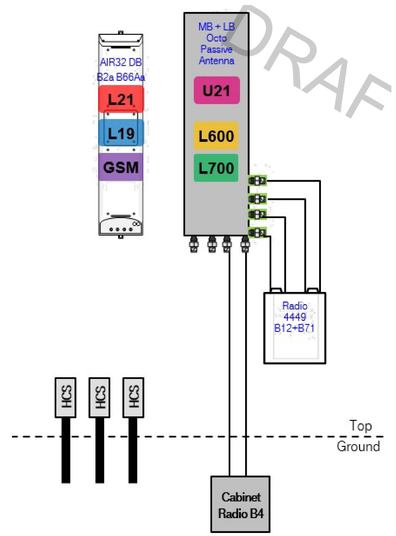
(9) DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.

(10) 15 KW DC GENERATOR TO REMAIN.



5 E-1 ELECTRICAL POWER RISER DIAGRAM

SCALE: NOT TO SCALE



3 E-1 PROPOSED PLUMBING DIAGRAM

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/27/20	BSP	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

Transcend Wireless

CENTEK engineering
Centered on Solutions℠
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T-MOBILE NORTHEAST LLC

WIRELESS COMMUNICATIONS FACILITY

RIDGEFIELD / DOWNTOWN 1

SITE ID: CT11103A

76 EAST RIDGE RD

RIDGEFIELD, CT 06877

DATE:	07/15/20
SCALE:	AS NOTED
JOB NO.	20074.48

TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 8 of 8

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

130-ft Existing Valmont Monopole

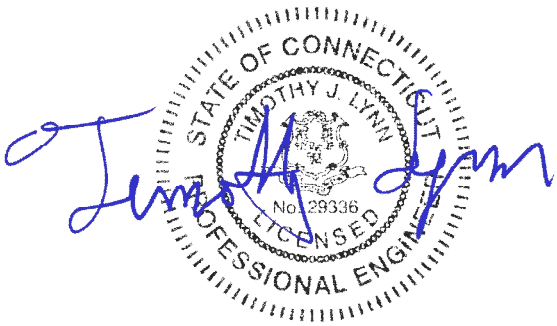
Proposed T-Mobile
Antenna Upgrade

Site Ref: CT11103A

76 East Ridge Road
Ridgefield, CT

Centek Project No. 20074.48

Date: July 15, 2020



Max Stress Ratio = 92.7%

Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by T-Mobile on the existing monopole (tower) located in Ridgefield, CT.

The host tower is a 130-ft tall, three-section, twelve sided, tapered monopole, originally designed and manufactured by Valmont Industries Inc.; order no. 10533-89 dated October 24, 1989. The tower geometry, structure member sizes and foundation system information were obtained from the original manufacturers design documents.

Antenna and appurtenance information were obtained from a previous structural analysis report prepared by Infinigy dated September 13, 2019 and a T-Mobile RF data sheet.

The tower is made up of three (3) tapered vertical sections consisting of A572-65 pole sections. The vertical tower sections are slip joint connected. The diameter of the pole (flat-flat) is 16.26-in at the top and 43.80-in at the base.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- UNKNOWN (EXISTING):
  Antennas: One (1) RFS PD 440 dipole antenna mounted on the Verizon 13-ft platform with handrails with an elevation of 130-ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the inside of the existing tower.
- VERIZON (EXISTING):
  Antennas: Two (2) Commscope SBNHH-1D65B panel antennas, four (4) Commscope SBNHH-1D85B panel antennas, three (3) Antel BXA-80080/4CF panel antennas, three (3) Quintel QUAD656C0000 panel antennas, three (3) Samsung CBRS panel antennas, nine (6) RRHS and three (3) Commscope combiners mounted on the existing 13-ft platform with handrails with a RAD center elevation of 128-ft above grade level.
  Coax Cables: Twelve (12) 7/8" ∅ coax cables running on the inside of the existing tower and two (2) 1-5/8" ∅ fiber cable running on the exterior of the existing tower.
- SPRINT (EXISTING):
  Antennas: Three (3) RFS APXVSPP18-C-A20 panel antennas, three (3) RFS APXVTM-14 panel antennas, three (3) 1900MHz 4X45W RRH's, three (3) 800MHz 2X50W RRH's and three (3) TD-RRH8x20-25 RRH's mounted on a 13-ft platform with handrails with a RAD center elevation of 118-ft above grade level.
  Coax Cables: Three (3) 1-5/8" ∅ and one (1) 1-1/4" ∅ fiber cables running on the exterior of the existing tower.
- TOWN (EXISTING):
  Antennas: One (1) 3-ft mounted pipe mounted with an elevation of 107-ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the inside of the existing tower.

- UNKNOWN (EXISTING):
  Antennas: One (1) RFS PD 440 dipole antenna and two (2) RFS PD 1142 Omni-directional whip antennas mounted on the T-Mobile 13-ft platform with handrails with an elevation of 100-ft above grade level.
  Coax Cables: Three (3) 1/2" ∅ coax cables running on the inside of the existing tower.
- TOWN (EXISTING):
  Antennas: One (1) 3-ft mounted pipe mounted with an elevation of 87-ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the inside of the existing tower.
- UNKNOWN (EXISTING):
  Antennas: One (1) RFS PD 1121-6 dipole antenna and one (1) RFS PD 1142 Omni-directional whip antenna mounted on one (1) 3-ft standoff with an elevation of 86-ft above grade level.
  Coax Cables: Two (2) 1/2" ∅ coax cables running on the inside of the existing tower.
- TOWN (EXISTING):
  Antennas: One (1) 3-ft mounted pipe mounted with an elevation of 83-ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the inside of the existing tower.
- UNKNOWN (EXISTING):
  Antennas: One (1) RFS PD 1142 and one (1) RFS PD 1167 Omni-directional whip antennas mounted on two (2) 3-ft standoffs with an elevation of 58-ft above grade level.
  Coax Cables: Two (2) 1/2" ∅ coax cables running on the inside of the existing tower.
- VERIZON (EXISTING):
  Antennas: One (1) GPS antenna mounted on a 3-ft standoff with an elevation of 50-ft above grade level.
  Coax Cables: One (1) 1/2" ∅ coax cable running on the inside of the existing tower.
- T-MOBILE (EXISTING TO REMAIN):
  Antennas: Three (3) Ericsson AIR32 panel antennas, three (3) RFS APXVAARR24_43 panel antennas, three (3) Ericsson 4449 remote radio units and three (3) TMAs mounted on a 13-ft platform with handrails with a RAD center elevation of 100-ft above grade level.
  Coax Cables: Six (6) 7/8" ∅ coax cables and two (2) 6x12 fiber cables running on the inside of the existing tower.
- **T-MOBILE (EXISTING TO REMOVE):**
  Antennas: Three (3) Ericsson AIR21 panel antennas mounted on a 13-ft platform with handrails with a RAD center elevation of 100-ft above grade level.
  Coax Cables: Six (6) 7/8" ∅ coax cables and one (1) 9x18 fiber cable running on the inside of the existing tower.

- **T-MOBILE (PROPOSED):**
  Misc. Equipment: Three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson 4415 remote radio units and three (3) Commscope SDX1926Q-43 diplexers mounted on a 13-ft platform with handrails with a RAD center elevation of 100-ft above grade level.
  Coax Cables: One (1) 6x12 fiber line running on the exterior of the monopole.

Primary Assumptions Used in the Analysis

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

Analysis

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

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

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

Tower Loading

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

Basic Wind Speed:	Fairfield; v = 90-110 mph	*[Annex B of TIA-222-G-2005]*
	Ridgefield; v = 93 mph	*[Appendix N of the 2018 CT Building Code]*
Load Cases:	Load Case 1; 93 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2018 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 0.75" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2015 International Building Code as amended by the 2018 Connecticut State Building Code (CSBC).

Tower Capacity

- Calculated stresses were found to be within allowable limits. This tower was found to be at **92.7%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L3)	0.00'-44.84'	92.7%	**PASS**

Foundation and Anchors

The existing foundation consists of a 6-ft ∅ x 21.0-ft long reinforced concrete caisson. The base of the tower is connected to the foundation by means of (12) 2.25"∅, ASTM A615-75 anchor bolts embedded approximately 8.5-ft into the concrete foundation structure.

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

Location	Vector	Proposed Reactions
Base	Shear	31 kips
	Compression	32 kips
	Moment	2813 kip-ft

- The foundation was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading	Result
Reinforced Concrete Caisson	Moment Capacity	58.8%	**PASS**
	Lateral Deflection	0.23 in.(1)	**PASS**

(1) Lateral deflection limited to 0.75 in under service load combination per TIA-222-G section 9.5.

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

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Combined Axial and Shear	72.8%	**PASS**
Base Plate	Bending	62.1%	**PASS**

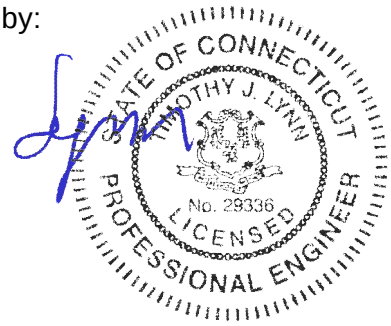
Conclusion

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

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

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

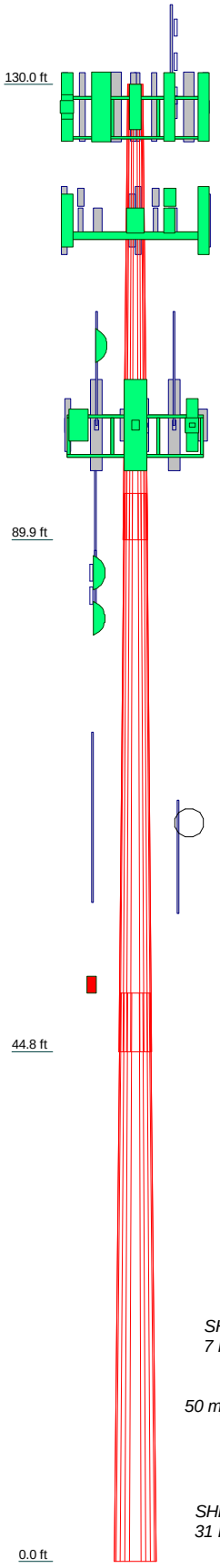
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

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

tnxTower Features:

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

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	40.08	12	0.2190	4.08	16.2600	25.0800		2.0
2	49.17	12	0.3130	5.17	23.7435	34.5600	A572-65	4.9
3	50.00	12	0.3750		32.7973	43.8000		7.8
								14.6



ALL REACTIONS ARE FACTORED

AXIAL 68 K

SHEAR 7 K

MOMENT 748 kip-ft

TORQUE 2 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 32 K

SHEAR 31 K

MOMENT 2813 kip-ft

TORQUE 6 kip-ft
REACTIONS - 93 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
440-3 (Town - Existing)	130	APXVSPP18-C-A20 (Sprint - Existing)	118
SBNHH-1D65B (Verizon - Existing)	128	Valmont 13' Low Profile Platform (Sprint - Existing)	117
BXA-80080/4CF (Verizon - Existing)	128	3-ft Dish (Town)	107
QUAD656C0000 (Verizon - Existing)	128	AIR6449 (T-Mobile - Proposed)	100
CBRS Antenna (Verizon - Existing)	128	AIR32 (T-Mobile - Existing)	100
SBNHH-1D85B (Verizon - Existing)	128	AIR32 (T-Mobile - Existing)	100
SBNHH-1D85B (Verizon - Existing)	128	AIR32 (T-Mobile - Existing)	100
BXA-80080/4CF (Verizon - Existing)	128	APXVAARR24-43 (T-Mobile - Existing)	100
QUAD656C0000 (Verizon - Existing)	128	APXVAARR24-43 (T-Mobile - Existing)	100
CBRS Antenna (Verizon - Existing)	128	APXVAARR24-43 (T-Mobile - Existing)	100
SBNHH-1D85B (Verizon - Existing)	128	TMA 10"x8"x3" (T-Mobile - Existing)	100
SBNHH-1D85B (Verizon - Existing)	128	TMA 10"x8"x3" (T-Mobile - Existing)	100
BXA-80080/4CF (Verizon - Existing)	128	TMA 10"x8"x3" (T-Mobile - Existing)	100
QUAD656C0000 (Verizon - Existing)	128	Radio 4449 B71 B12 (T-Mobile - Existing)	100
CBRS Antenna (Verizon - Existing)	128	Radio 4449 B71 B12 (T-Mobile - Existing)	100
B2/B66A RRH (Verizon - Existing)	128	Radio 4449 B71 B12 (T-Mobile - Existing)	100
B2/B66A RRH (Verizon - Existing)	128	4415 B25 (T-Mobile - Proposed)	100
B2/B66A RRH (Verizon - Existing)	128	4415 B25 (T-Mobile - Proposed)	100
B5/B15 RRH -BRO4C (Verizon - Existing)	128	4415 B25 (T-Mobile - Proposed)	100
B5/B15 RRH -BRO4C (Verizon - Existing)	128	SDX1926Q-43 (T-Mobile - Proposed)	100
B5/B15 RRH -BRO4C (Verizon - Existing)	128	SDX1926Q-43 (T-Mobile - Proposed)	100
RRU (Verizon - Existing)	128	SDX1926Q-43 (T-Mobile - Proposed)	100
RRU (Verizon - Existing)	128	PD1142-1 (Town - Existing)	100
RRU (Verizon - Existing)	128	PD1142-1 (Town - Existing)	100
DB-T1-6Z-8AB-0Z (Verizon - Existing)	128	440-3 (Town - Existing)	100
DB-T1-6Z-8AB-0Z (Verizon - Existing)	128	AIR6449 (T-Mobile - Proposed)	100
SBNHH-1D65B (Verizon - Existing)	128	AIR6449 (T-Mobile - Proposed)	100
Valmont 13' Platform w/Rails (Verizon - Existing)	127	Valmont 13' Platform w/Rails (T-Mobile - Existing)	99
APXVSPP18-C-A20 (Sprint - Existing)	118	3-ft Dish (Town)	87
APXVSPP18-C-A20 (Sprint - Existing)	118	3' Stand-off Mount (Town - Existing)	86
APXVTM14 (Sprint - Existing)	118	PD1142-1 (Town - Existing)	86
APXVTM14 (Sprint - Existing)	118	PD1121-6 (Town - Existing)	86
APXVTM14 (Sprint - Existing)	118	3-ft Dish (Town)	83
FD-RRH 4x45 1900 (Sprint - Existing)	118	3' Stand-off Mount (Town - Existing)	58
FD-RRH 4x45 1900 (Sprint - Existing)	118	PD1167 (Town - Existing)	58
FD-RRH 4x45 1900 (Sprint - Existing)	118	PD1142-1 (Town - Existing)	58
FD-RRH 2x50 800 (Sprint - Existing)	118	3' Stand-off Mount (Town - Existing)	58
FD-RRH 2x50 800 (Sprint - Existing)	118	3' GPS Stand-off Mount (Verizon - Existing)	50
FD-RRH 2x50 800 (Sprint - Existing)	118	GPS (Verizon - Existing)	50
TD-RRH8x20-25 (Sprint - Existing)	118		
TD-RRH8x20-25 (Sprint - Existing)	118		
TD-RRH8x20-25 (Sprint - Existing)	118		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 92.7%

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

Job: **20074.48 - CT11103A**		
Project: **130' Valmont Monopole - 76 East Ridge Rd., Ridgefield, CT**		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 07/15/20	Scale: NTS
Path:		Dwg No. E-1

Tower Input Data

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

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 93 mph.
Structure Class III.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification		Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz		Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	130.00-89.92	40.08	4.08	12	16.2600	25.0800	0.2190	0.8760	A572-65

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
L2	89.92-44.84	49.17	5.17	12	23.7435	34.5600	0.3130	1.2520	(65 ksi) A572-65 (65 ksi)
L3	44.84-0.00	50.00		12	32.7973	43.8000	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.7563	11.3118	371.5183	5.7427	8.4227	44.1093	752.7969	5.5673	3.7708	17.218
	25.8875	17.5315	1383.0622	8.9002	12.9914	106.4595	2802.4590	8.6285	6.1345	28.012
L2	25.4006	23.6147	1654.7432	8.3881	12.2991	134.5415	3352.9584	11.6224	5.5244	17.65
	35.6687	34.5162	5167.1820	12.2604	17.9021	288.6358	10470.1117	16.9878	8.4232	26.911
L3	34.9990	39.1499	5252.9582	11.6072	16.9890	309.1977	10643.9175	19.2684	7.7847	20.759
	45.2128	52.4357	12620.9652	15.5461	22.6884	556.2739	25573.4973	25.8073	10.7334	28.622

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 130.00-89.92				1	1	1			
L2 89.92-44.84				1	1	1			
L3 44.84-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
HYBRIFLEX 1-5/8" (Verizon - Existing)	A	No	Surface Ar (CaAa)	130.00 - 10.00	2	2	0.000 0.000	1.9800		1.90
HYBRIFLEX 1-5/8" (T-Mobile - Existing)	A	No	Surface Ar (CaAa)	100.00 - 10.00	3	3	0.000 0.000	1.9800		1.90

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
7/8 (Verizon - Existing)	A	No	No	Inside Pole	130.00 - 10.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.54 0.54 0.54
1/2 (Verizon - Existing)	A	No	No	Inside Pole	50.00 - 10.00	1	No Ice 1/2" Ice	0.00 0.00	0.25 0.25

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
							1" Ice	0.00	0.25
HYBRIFLEX 1-5/8" (Sprint - Existing)	C	No	No	Inside Pole	118.00 - 10.00	3	No Ice	0.00	1.90
							1/2" Ice	0.00	1.90
							1" Ice	0.00	1.90
HYBRIFLEX 1-1/4" (Sprint - Existing)	C	No	No	Inside Pole	118.00 - 10.00	1	No Ice	0.00	1.30
							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30
LCF78-50J (7/8 FOAM) (T-Mobile - Existing)	C	No	No	Inside Pole	100.00 - 10.00	6	No Ice	0.00	0.53
							1/2" Ice	0.00	0.53
							1" Ice	0.00	0.53
1/2 (Town)	A	No	No	Inside Pole	130.00 - 28.00	1	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
1/2 (Town)	A	No	No	Inside Pole	107.00 - 28.00	1	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
1/2 (Town)	A	No	No	Inside Pole	100.00 - 28.00	4	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
1/2 (Town)	A	No	No	Inside Pole	87.00 - 28.00	3	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
1/2 (Town)	A	No	No	Inside Pole	83.00 - 28.00	1	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
1/2 (Town)	A	No	No	Inside Pole	58.00 - 28.00	2	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25

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	130.00-89.92	A	0.000	0.000	21.859	0.000	0.49
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.23
L2	89.92-44.84	A	0.000	0.000	44.633	0.000	0.84
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.46
L3	44.84-0.00	A	0.000	0.000	34.488	0.000	0.62
		B	0.000	0.000	0.000	0.000	0.00
		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	130.00-89.92	A	2.113	0.000	0.000	53.815	0.000	1.24

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
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.23
L2	89.92-44.84	A	2.012	0.000	0.000	103.413	0.000	2.27
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.46
L3	44.84-0.00	A	1.798	0.000	0.000	78.147	0.000	1.66
		B		0.000	0.000	0.000	0.000	0.00
		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	130.00-89.92	-2.3954	-1.3830	-2.7990	-1.6160
L2	89.92-44.84	-3.8302	-2.2114	-4.2845	-2.4737
L3	44.84-0.00	-3.2200	-1.8591	-4.0970	-2.3654

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	4	HYBRIFLEX 1-5/8"	89.92 - 130.00	1.0000	1.0000
L1	8	HYBRIFLEX 1-5/8"	89.92 - 100.00	1.0000	1.0000
L2	4	HYBRIFLEX 1-5/8"	44.84 - 89.92	1.0000	1.0000
L2	8	HYBRIFLEX 1-5/8"	44.84 - 89.92	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
SBNHH-1D65B	A	From Face	3.00	0.0000	128.00	No Ice	8.08	5.34	0.04
(Verizon - Existing)			-6.00			1/2" Ice	8.53	5.79	0.09
			0.00			1" Ice	9.00	6.26	0.15
SBNHH-1D65B	A	From Face	3.00	0.0000	128.00	No Ice	8.08	5.34	0.04
(Verizon - Existing)			-3.00			1/2" Ice	8.53	5.79	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	9.00	6.26	0.15
BXA-80080/4CF	A	From Face	3.00	0.0000	128.00	No Ice	4.80	2.84	0.01
(Verizon - Existing)			0.00			1/2" Ice	5.12	3.15	0.05
			0.00			1" Ice	5.45	3.47	0.08
QUAD656C0000	A	From Face	3.00	0.0000	128.00	No Ice	13.24	5.62	0.06
(Verizon - Existing)			3.00			1/2" Ice	13.75	6.09	0.13
			0.00			1" Ice	14.27	6.56	0.22
CBRS Antenna	A	From Face	3.00	0.0000	128.00	No Ice	1.72	1.17	0.03
(Verizon - Existing)			6.00			1/2" Ice	1.93	1.44	0.05
			0.00			1" Ice	2.14	1.71	0.07
SBNHH-1D85B	B	From Face	3.00	0.0000	128.00	No Ice	8.20	5.42	0.04
(Verizon - Existing)			-6.00			1/2" Ice	8.66	5.88	0.09
			0.00			1" Ice	9.13	6.35	0.15
SBNHH-1D85B	B	From Face	3.00	0.0000	128.00	No Ice	8.20	5.42	0.04
(Verizon - Existing)			-3.00			1/2" Ice	8.66	5.88	0.09
			0.00			1" Ice	9.13	6.35	0.15
BXA-80080/4CF	B	From Face	3.00	0.0000	128.00	No Ice	4.80	2.84	0.01
(Verizon - Existing)			0.00			1/2" Ice	5.12	3.15	0.05
			0.00			1" Ice	5.45	3.47	0.08
QUAD656C0000	B	From Face	3.00	0.0000	128.00	No Ice	13.24	5.62	0.06
(Verizon - Existing)			3.00			1/2" Ice	13.75	6.09	0.13
			0.00			1" Ice	14.27	6.56	0.22
CBRS Antenna	B	From Face	3.00	0.0000	128.00	No Ice	1.72	1.17	0.03
(Verizon - Existing)			6.00			1/2" Ice	1.93	1.44	0.05
			0.00			1" Ice	2.14	1.71	0.07
SBNHH-1D85B	C	From Face	3.00	0.0000	128.00	No Ice	8.20	5.42	0.04
(Verizon - Existing)			-6.00			1/2" Ice	8.66	5.88	0.09
			0.00			1" Ice	9.13	6.35	0.15
SBNHH-1D85B	C	From Face	3.00	0.0000	128.00	No Ice	8.20	5.42	0.04
(Verizon - Existing)			-3.00			1/2" Ice	8.66	5.88	0.09
			0.00			1" Ice	9.13	6.35	0.15
BXA-80080/4CF	C	From Face	3.00	0.0000	128.00	No Ice	4.80	2.84	0.01
(Verizon - Existing)			0.00			1/2" Ice	5.12	3.15	0.05
			0.00			1" Ice	5.45	3.47	0.08
QUAD656C0000	C	From Face	3.00	0.0000	128.00	No Ice	13.24	5.62	0.06
(Verizon - Existing)			3.00			1/2" Ice	13.75	6.09	0.13
			0.00			1" Ice	14.27	6.56	0.22
CBRS Antenna	C	From Face	3.00	0.0000	128.00	No Ice	1.72	1.17	0.03
(Verizon - Existing)			6.00			1/2" Ice	1.93	1.44	0.05
			0.00			1" Ice	2.14	1.71	0.07
B2/B66A RRH	A	From Face	3.00	0.0000	128.00	No Ice	2.54	1.61	0.06
(Verizon - Existing)			6.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
B2/B66A RRH	B	From Face	3.00	0.0000	128.00	No Ice	2.54	1.61	0.06
(Verizon - Existing)			6.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
B2/B66A RRH	C	From Face	3.00	0.0000	128.00	No Ice	2.54	1.61	0.06
(Verizon - Existing)			6.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
B5/B15 RRH -BRO4C	A	From Face	3.00	0.0000	128.00	No Ice	1.87	1.02	0.07
(Verizon - Existing)			6.00			1/2" Ice	2.03	1.15	0.09
			0.00			1" Ice	2.21	1.29	0.11
B5/B15 RRH -BRO4C	B	From Face	3.00	0.0000	128.00	No Ice	1.87	1.02	0.07
(Verizon - Existing)			6.00			1/2" Ice	2.03	1.15	0.09
			0.00			1" Ice	2.21	1.29	0.11
B5/B15 RRH -BRO4C	C	From Face	3.00	0.0000	128.00	No Ice	1.87	1.02	0.07
(Verizon - Existing)			6.00			1/2" Ice	2.03	1.15	0.09

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	2.21	1.29	0.11
RRU	A	From Face	3.00	0.0000	128.00	No Ice	1.80	0.78	0.03
(Verizon - Existing)			6.00			1/2" Ice	2.00	0.92	0.04
			0.00			1" Ice	2.20	1.06	0.06
RRU	B	From Face	3.00	0.0000	128.00	No Ice	1.80	0.78	0.03
(Verizon - Existing)			6.00			1/2" Ice	2.00	0.92	0.04
			0.00			1" Ice	2.20	1.06	0.06
RRU	C	From Face	3.00	0.0000	128.00	No Ice	1.80	0.78	0.03
(Verizon - Existing)			6.00			1/2" Ice	2.00	0.92	0.04
			0.00			1" Ice	2.20	1.06	0.06
DB-T1-6Z-8AB-0Z	A	From Face	3.00	0.0000	128.00	No Ice	4.80	2.00	0.04
(Verizon - Existing)			0.00			1/2" Ice	5.07	2.19	0.08
			0.00			1" Ice	5.35	2.39	0.12
DB-T1-6Z-8AB-0Z	B	From Face	3.00	0.0000	128.00	No Ice	4.80	2.00	0.04
(Verizon - Existing)			0.00			1/2" Ice	5.07	2.19	0.08
			0.00			1" Ice	5.35	2.39	0.12
Valmont 13' Platform w/Rails	C	None		0.0000	127.00	No Ice	53.00	53.00	2.00
(Verizon - Existing)						1/2" Ice	68.00	68.00	3.00
						1" Ice	83.00	83.00	4.00
APXVSPP18-C-A20	A	From Face	3.00	0.0000	118.00	No Ice	8.02	5.28	0.06
(Sprint - Existing)			-6.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
APXVSPP18-C-A20	B	From Face	3.00	0.0000	118.00	No Ice	8.02	5.28	0.06
(Sprint - Existing)			-6.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
APXVSPP18-C-A20	C	From Face	3.00	0.0000	118.00	No Ice	8.02	5.28	0.06
(Sprint - Existing)			-6.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
APXVTM14	A	From Face	3.00	0.0000	118.00	No Ice	6.34	3.61	0.06
(Sprint - Existing)			6.00			1/2" Ice	6.72	3.97	0.10
			0.00			1" Ice	7.10	4.33	0.14
APXVTM14	B	From Face	3.00	0.0000	118.00	No Ice	6.34	3.61	0.06
(Sprint - Existing)			6.00			1/2" Ice	6.72	3.97	0.10
			0.00			1" Ice	7.10	4.33	0.14
APXVTM14	C	From Face	3.00	0.0000	118.00	No Ice	6.34	3.61	0.06
(Sprint - Existing)			6.00			1/2" Ice	6.72	3.97	0.10
			0.00			1" Ice	7.10	4.33	0.14
FD-RRH 4x45 1900	A	From Face	3.00	0.0000	118.00	No Ice	2.32	2.38	0.06
(Sprint - Existing)			-3.00			1/2" Ice	2.52	2.59	0.08
			0.00			1" Ice	2.74	2.80	0.11
FD-RRH 4x45 1900	B	From Face	3.00	0.0000	118.00	No Ice	2.32	2.38	0.06
(Sprint - Existing)			-3.00			1/2" Ice	2.52	2.59	0.08
			0.00			1" Ice	2.74	2.80	0.11
FD-RRH 4x45 1900	C	From Face	3.00	0.0000	118.00	No Ice	2.32	2.38	0.06
(Sprint - Existing)			-3.00			1/2" Ice	2.52	2.59	0.08
			0.00			1" Ice	2.74	2.80	0.11
FD-RRH 2x50 800	A	From Face	3.00	0.0000	118.00	No Ice	2.06	1.93	0.06
(Sprint - Existing)			-3.00			1/2" Ice	2.24	2.11	0.09
			2.00			1" Ice	2.43	2.29	0.11
FD-RRH 2x50 800	B	From Face	3.00	0.0000	118.00	No Ice	2.06	1.93	0.06
(Sprint - Existing)			-3.00			1/2" Ice	2.24	2.11	0.09
			2.00			1" Ice	2.43	2.29	0.11
FD-RRH 2x50 800	C	From Face	3.00	0.0000	118.00	No Ice	2.06	1.93	0.06
(Sprint - Existing)			-3.00			1/2" Ice	2.24	2.11	0.09
			2.00			1" Ice	2.43	2.29	0.11
TD-RRH8x20-25	A	From Face	3.00	0.0000	118.00	No Ice	4.05	1.53	0.07
(Sprint - Existing)			0.00			1/2" Ice	4.30	1.71	0.10

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	4.56	1.90	0.13
TD-RRH8x20-25	B	From Face	3.00	0.0000	118.00	No Ice	4.05	1.53	0.07
(Sprint - Existing)			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	C	From Face	3.00	0.0000	118.00	No Ice	4.05	1.53	0.07
(Sprint - Existing)			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
Valmont 13' Low Profile	C	None		0.0000	117.00	No Ice	15.70	15.70	1.30
Platform						1/2" Ice	20.10	20.10	1.76
(Sprint - Existing)						1" Ice	24.50	24.50	2.23
AIR6449	A	From Face	3.00	0.0000	100.00	No Ice	5.65	2.42	0.10
(T-Mobile - Proposed)			5.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
AIR6449	B	From Face	3.00	0.0000	100.00	No Ice	5.65	2.42	0.10
(T-Mobile - Proposed)			5.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
AIR6449	C	From Face	3.00	0.0000	100.00	No Ice	5.65	2.42	0.10
(T-Mobile - Proposed)			5.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
AIR32	A	From Face	3.00	0.0000	100.00	No Ice	6.51	4.71	0.13
(T-Mobile - Existing)			-5.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
AIR32	B	From Face	3.00	0.0000	100.00	No Ice	6.51	4.71	0.13
(T-Mobile - Existing)			-5.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
AIR32	C	From Face	3.00	0.0000	100.00	No Ice	6.51	4.71	0.13
(T-Mobile - Existing)			-5.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
APXVAARR24-43	A	From Face	3.00	0.0000	100.00	No Ice	20.24	8.89	0.15
(T-Mobile - Existing)			0.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
APXVAARR24-43	B	From Face	3.00	0.0000	100.00	No Ice	20.24	8.89	0.15
(T-Mobile - Existing)			0.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
APXVAARR24-43	C	From Face	3.00	0.0000	100.00	No Ice	20.24	8.89	0.15
(T-Mobile - Existing)			0.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
TMA 10"x8"x3"	A	From Face	3.00	0.0000	100.00	No Ice	0.67	0.26	0.02
(T-Mobile - Existing)			0.00			1/2" Ice	0.77	0.33	0.02
			0.00			1" Ice	0.88	0.41	0.03
TMA 10"x8"x3"	B	From Face	3.00	0.0000	100.00	No Ice	0.67	0.26	0.02
(T-Mobile - Existing)			0.00			1/2" Ice	0.77	0.33	0.02
			0.00			1" Ice	0.88	0.41	0.03
TMA 10"x8"x3"	C	From Face	3.00	0.0000	100.00	No Ice	0.67	0.26	0.02
(T-Mobile - Existing)			0.00			1/2" Ice	0.77	0.33	0.02
			0.00			1" Ice	0.88	0.41	0.03
Radio 4449 B71 B12	A	From Face	3.00	0.0000	100.00	No Ice	1.64	1.29	0.07
(T-Mobile - Existing)			-5.00			1/2" Ice	1.80	1.44	0.09
			0.00			1" Ice	1.97	1.59	0.11
Radio 4449 B71 B12	B	From Face	3.00	0.0000	100.00	No Ice	1.64	1.29	0.07
(T-Mobile - Existing)			-5.00			1/2" Ice	1.80	1.44	0.09
			0.00			1" Ice	1.97	1.59	0.11
Radio 4449 B71 B12	C	From Face	3.00	0.0000	100.00	No Ice	1.64	1.29	0.07
(T-Mobile - Existing)			-5.00			1/2" Ice	1.80	1.44	0.09
			0.00			1" Ice	1.97	1.59	0.11
4415 B25	A	From Face	3.00	0.0000	100.00	No Ice	1.84	0.82	0.05
(T-Mobile - Proposed)			-5.00			1/2" Ice	2.01	0.94	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	2.19	1.07	0.08
4415 B25	B	From Face	3.00	0.0000	100.00	No Ice	1.84	0.82	0.05
(T-Mobile - Proposed)			-5.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
4415 B25	C	From Face	3.00	0.0000	100.00	No Ice	1.84	0.82	0.05
(T-Mobile - Proposed)			-5.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
SDX1926Q-43	A	From Face	3.00	0.0000	100.00	No Ice	0.24	0.10	0.03
(T-Mobile - Proposed)			-5.00			1/2" Ice	0.31	0.14	0.03
			0.00			1" Ice	0.38	0.19	0.04
SDX1926Q-43	B	From Face	3.00	0.0000	100.00	No Ice	0.24	0.10	0.03
(T-Mobile - Proposed)			-5.00			1/2" Ice	0.31	0.14	0.03
			0.00			1" Ice	0.38	0.19	0.04
SDX1926Q-43	C	From Face	3.00	0.0000	100.00	No Ice	0.24	0.10	0.03
(T-Mobile - Proposed)			-5.00			1/2" Ice	0.31	0.14	0.03
			0.00			1" Ice	0.38	0.19	0.04
Valmont 13' Platform w/Rails	C	None		0.0000	99.00	No Ice	40.00	40.00	1.70
(T-Mobile - Existing)						1/2" Ice	51.00	51.00	2.55
						1" Ice	62.00	62.00	3.40
3' GPS Stand-off Mount	A	From Face	0.00	0.0000	50.00	No Ice	2.45	2.45	0.05
(Verizon - Existing)			0.00			1/2" Ice	3.98	3.98	0.07
			0.00			1" Ice	5.51	5.51	0.10
GPS	A	From Face	3.00	0.0000	50.00	No Ice	1.00	1.00	0.01
(Verizon - Existing)			0.00			1/2" Ice	1.50	1.50	0.01
			0.00			1" Ice	2.00	2.00	0.02
3' Stand-off Mount	B	From Face	0.00	0.0000	58.00	No Ice	2.45	2.45	0.05
(Town - Existing)			0.00			1/2" Ice	3.98	3.98	0.07
			0.00			1" Ice	5.51	5.51	0.10
PD1167	B	From Face	3.00	0.0000	58.00	No Ice	1.06	1.06	0.01
(Town - Existing)			0.00			1/2" Ice	2.26	2.26	0.02
			4.00			1" Ice	3.47	3.47	0.04
3' Stand-off Mount	A	From Face	0.00	0.0000	58.00	No Ice	2.45	2.45	0.05
(Town - Existing)			0.00			1/2" Ice	3.98	3.98	0.07
			0.00			1" Ice	5.51	5.51	0.10
PD1142-1	A	From Face	3.00	0.0000	58.00	No Ice	1.32	1.32	0.01
(Town - Existing)			0.00			1/2" Ice	3.21	3.21	0.02
			7.50			1" Ice	5.12	5.12	0.05
3' Stand-off Mount	A	From Face	0.00	0.0000	86.00	No Ice	2.45	2.45	0.05
(Town - Existing)			0.00			1/2" Ice	3.98	3.98	0.07
			0.00			1" Ice	5.51	5.51	0.10
PD1142-1	A	From Face	3.00	0.0000	86.00	No Ice	1.32	1.32	0.01
(Town - Existing)			0.00			1/2" Ice	3.21	3.21	0.02
			5.00			1" Ice	5.12	5.12	0.05
PD1121-6	A	From Face	3.00	0.0000	86.00	No Ice	0.23	0.23	0.00
(Town - Existing)			0.00			1/2" Ice	0.41	0.41	0.00
			0.00			1" Ice	0.60	0.60	0.00
PD1142-1	A	From Face	3.00	0.0000	100.00	No Ice	1.32	1.32	0.01
(Town - Existing)			0.00			1/2" Ice	3.21	3.21	0.02
			5.00			1" Ice	5.12	5.12	0.05
PD1142-1	B	From Face	3.00	0.0000	100.00	No Ice	1.32	1.32	0.01
(Town - Existing)			0.00			1/2" Ice	3.21	3.21	0.02
			5.00			1" Ice	5.12	5.12	0.05
440-3	C	From Face	3.00	0.0000	100.00	No Ice	1.48	1.48	0.02
(Town - Existing)			0.00			1/2" Ice	2.66	2.66	0.03
			5.00			1" Ice	3.85	3.85	0.03
440-3	B	From Face	3.00	0.0000	130.00	No Ice	1.48	1.48	0.02
(Town - Existing)			0.00			1/2" Ice	2.66	2.66	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2.00			1" Ice	3.85	3.85	0.03

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
3-ft Dish (Town)	C	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	Worst		107.00	3.00	No Ice 1/2" Ice 1" Ice	7.07 7.47 7.86	0.06 0.10 0.14
3-ft Dish (Town)	C	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	Worst		87.00	3.00	No Ice 1/2" Ice 1" Ice	7.07 7.47 7.86	0.06 0.10 0.14
3-ft Dish (Town)	C	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	Worst		83.00	3.00	No Ice 1/2" Ice 1" Ice	7.07 7.47 7.86	0.06 0.10 0.14

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	108.79	1.012	24	71.215	A	0.000	71.215	71.215	100.00	21.859	0.000
130.00-89.92					B	0.000	71.215		100.00	0.000	0.000
					C	0.000	71.215		100.00	0.000	0.000
L2 89.92-44.84	66.66	0.88	21	114.719	A	0.000	114.719	114.719	100.00	44.633	0.000
					B	0.000	114.719		100.00	0.000	0.000
					C	0.000	114.719		100.00	0.000	0.000
L3 44.84-0.00	21.64	0.7	17	149.849	A	0.000	149.849	149.849	100.00	34.488	0.000
					B	0.000	149.849		100.00	0.000	0.000
					C	0.000	149.849		100.00	0.000	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 130.00-89.92	108.79	1.012	6	2.1126	85.327	A	0.000	85.327	85.327	100.00	53.815	0.000
						B	0.000	85.327		100.00	0.000	0.000
						C	0.000	85.327		100.00	0.000	0.000
L2 89.92-44.84	66.66	0.88	5	2.0116	130.592	A	0.000	130.592	130.592	100.00	103.413	0.000
						B	0.000	130.592		100.00	0.000	0.000
						C	0.000	130.592		100.00	0.000	0.000
L3 44.84-0.00	21.64	0.7	4	1.7975	164.881	A	0.000	164.881	164.881	100.00	78.147	0.000
						B	0.000	164.881		100.00	0.000	0.000
						C	0.000	164.881		100.00	0.000	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	108.79	1.012	8	71.215	A	0.000	71.215	71.215	100.00	21.859	0.000
130.00-89.92					B	0.000	71.215		100.00	0.000	0.000
					C	0.000	71.215		100.00	0.000	0.000
L2 89.92-44.84	66.66	0.88	7	114.719	A	0.000	114.719	114.719	100.00	44.633	0.000
					B	0.000	114.719		100.00	0.000	0.000
					C	0.000	114.719		100.00	0.000	0.000
L3 44.84-0.00	21.64	0.7	6	149.849	A	0.000	149.849	149.849	100.00	34.488	0.000
					B	0.000	149.849		100.00	0.000	0.000
					C	0.000	149.849		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.72	1.97	A	1	1	24	1	1	71.215	1.92	47.79	C
130.00-89.92			B	1	1		1	1	71.215			
			C	1	1		1	1	71.215			
L2	1.30	4.86	A	1	1	21	1	1	114.719	2.67	59.28	C
89.92-44.84			B	1	1		1	1	114.719			
			C	1	1		1	1	114.719			
L3 44.84-0.00	0.97	7.79	A	1	1	17	1	1	149.849	2.83	63.18	C
			B	1	1		1	1	149.849			
			C	1	1		1	1	149.849			
Sum Weight:	2.99	14.62						OTM	447.80 kip-ft	7.42		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.72	1.97	A	1	1	24	1	1	71.215	2.30	57.34	C
130.00-89.92			B	1	1		1	1	71.215			
			C	1	1.2		1	1	71.215			
L2	1.30	4.86	A	1	1	21	1	1	114.719	3.95	87.65	C
89.92-44.84			B	1	1		1	1	114.719			
			C	1	1.2		1	1	114.719			
L3 44.84-0.00	0.97	7.79	A	1	1	17	1	1	149.849	3.15	70.26	C
			B	1	1		1	1	149.849			
			C	1	1.112		1	1	149.849			
Sum Weight:	2.99	14.62						OTM	581.60 kip-ft	9.40		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.72	1.97	A	1	1	24	1	1	71.215	1.92	47.79	C
130.00-89.92			B	1	1		1	1	71.215			
			C	1	1		1	1	71.215			
L2	1.30	4.86	A	1	1	21	1	1	114.719	2.67	59.28	C
89.92-44.84			B	1	1		1	1	114.719			
			C	1	1		1	1	114.719			
L3 44.84-0.00	0.97	7.79	A	1	1	17	1	1	149.849	2.83	63.18	C
			B	1	1		1	1	149.849			
			C	1	1		1	1	149.849			
Sum Weight:	2.99	14.62						OTM	447.80 kip-ft	7.42		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.72	1.97	A	1	1.2	24	1	1	71.215	2.89	72.01	A
130.00-89.92			B	1	1		1	1	71.215			
			C	1	1		1	1	71.215			
L2	1.30	4.86	A	1	1.2	21	1	1	114.719	4.25	94.19	A
89.92-44.84			B	1	1		1	1	114.719			
			C	1	1		1	1	114.719			
L3 44.84-0.00	0.97	7.79	A	1	1.2	17	1	1	149.849	3.40	75.81	A
			B	1	1		1	1	149.849			
			C	1	1		1	1	149.849			
Sum Weight:	2.99	14.62						OTM	670.62 kip-ft	10.53		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	1.47	4.38	A	1	1.2	6	1	1	85.327	0.69	17.27	C
130.00-89.92			B	1	1.2		1	1	85.327			
			C	1	1.2		1	1	85.327			
L2	2.73	8.45	A	1	1.2	5	1	1	130.592	0.92	20.35	C
89.92-44.84			B	1	1.2		1	1	130.592			
			C	1	1.2		1	1	130.592			
L3 44.84-0.00	2.01	11.90	A	1	1.2	4	1	1	164.881	0.94	20.97	C
			B	1	1.2		1	1	164.881			
			C	1	1.2		1	1	164.881			
Sum Weight:	6.21	24.73						OTM	156.81 kip-ft	2.55		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	1.47	4.38	A	1	1.2	6	1	1	85.327	0.69	17.27	C
130.00-89.92			B	1	1.2		1	1	85.327			
			C	1	1.2		1	1	85.327			
L2	2.73	8.45	A	1	1.2	5	1	1	130.592	1.38	30.69	C
89.92-44.84			B	1	1.2		1	1	130.592			
			C	1	1.2		1	1	130.592			
L3 44.84-0.00	2.01	11.90	A	1	1.2	4	1	1	164.881	0.94	20.97	C
			B	1	1.2		1	1	164.881			
			C	1	1.2		1	1	164.881			
Sum Weight:	6.21	24.73						OTM	187.87 kip-ft	3.02		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	1.47	4.38	A	1	1.2	6	1	1	85.327	0.69	17.27	C
130.00-89.92			B	1	1.2		1	1	85.327			
			C	1	1.2		1	1	85.327			
L2	2.73	8.45	A	1	1.2	5	1	1	130.592	0.92	20.35	C
89.92-44.84			B	1	1.2		1	1	130.592			
			C	1	1.2		1	1	130.592			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L3 44.84-0.00	2.01	11.90	A	1	1.2	4	1	1	164.881	0.94	20.97	C
			B	1	1.2		1	1	164.881			
			C	1	1.2		1	1	164.881			
Sum Weight:	6.21	24.73						OTM	156.81 kip-ft	2.55		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	1.47	4.38	A	1	1.2	6	1	1	85.327	1.00	24.89	A
130.00-89.92			B	1	1.2		1	1	85.327			
			C	1	1.2		1	1	85.327			
L2	2.73	8.45	A	1	1.2	5	1	1	130.592	1.46	32.33	A
89.92-44.84			B	1	1.2		1	1	130.592			
			C	1	1.2		1	1	130.592			
L3 44.84-0.00	2.01	11.90	A	1	1.2	4	1	1	164.881	0.94	20.97	C
			B	1	1.2		1	1	164.881			
			C	1	1.2		1	1	164.881			
Sum Weight:	6.21	24.73						OTM	226.04 kip-ft	3.40		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.72	1.97	A	1	1	8	1	1	71.215	0.62	15.48	C
130.00-89.92			B	1	1		1	1	71.215			
			C	1	1		1	1	71.215			
L2	1.30	4.86	A	1	1	7	1	1	114.719	0.87	19.20	C
89.92-44.84			B	1	1		1	1	114.719			
			C	1	1		1	1	114.719			
L3 44.84-0.00	0.97	7.79	A	1	1	6	1	1	149.849	0.92	20.46	C
			B	1	1		1	1	149.849			
			C	1	1		1	1	149.849			
Sum Weight:	2.99	14.62						OTM	145.02 kip-ft	2.40		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.72	1.97	A	1	1	8	1	1	71.215	0.74	18.57	C
130.00-89.92			B	1	1		1	1	71.215			
			C	1	1.2		1	1	71.215			
L2	1.30	4.86	A	1	1	7	1	1	114.719	1.28	28.38	C
89.92-44.84			B	1	1		1	1	114.719			
			C	1	1.2		1	1	114.719			
L3 44.84-0.00	0.97	7.79	A	1	1	6	1	1	149.849	1.02	22.75	C
			B	1	1		1	1	149.849			
			C	1	1.112		1	1	149.849			
Sum Weight:	2.99	14.62						OTM	188.35 kip-ft	3.04		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.72	1.97	A	1	1	8	1	1	71.215	0.62	15.48	C
130.00-89.92			B	1	1		1	1	71.215			
			C	1	1		1	1	71.215			
L2	1.30	4.86	A	1	1	7	1	1	114.719	0.87	19.20	C
89.92-44.84			B	1	1		1	1	114.719			
			C	1	1		1	1	114.719			
L3 44.84-0.00	0.97	7.79	A	1	1	6	1	1	149.849	0.92	20.46	C
			B	1	1		1	1	149.849			
			C	1	1		1	1	149.849			
Sum Weight:	2.99	14.62						OTM	145.02 kip-ft	2.40		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.72	1.97	A	1	1.2	8	1	1	71.215	0.93	23.32	A
130.00-89.92			B	1	1		1	1	71.215			
			C	1	1		1	1	71.215			
L2	1.30	4.86	A	1	1.2	7	1	1	114.719	1.38	30.50	A
89.92-44.84			B	1	1		1	1	114.719			
			C	1	1		1	1	114.719			
L3 44.84-0.00	0.97	7.79	A	1	1.2	6	1	1	149.849	1.10	24.55	A
			B	1	1		1	1	149.849			
			C	1	1		1	1	149.849			
Sum Weight:	2.99	14.62						OTM	217.17 kip-ft	3.41		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	14.62					
Bracing Weight	0.00					
Total Member Self-Weight	14.62			-0.75	1.75	
Total Weight	26.79			-0.75	1.75	
Wind 0 deg - No Ice		0.00	-16.40	-1453.47	1.65	-2.57
Wind 30 deg - No Ice		9.79	-16.89	-1451.86	-840.10	-3.80
Wind 45 deg - No Ice		13.04	-12.99	-1122.66	-1125.81	-2.24
Wind 60 deg - No Ice		14.25	-8.20	-727.20	-1263.30	-0.65
Wind 90 deg - No Ice		16.46	-0.00	-0.85	-1458.95	0.73
Wind 120 deg - No Ice		14.25	8.20	725.52	-1263.20	1.92
Wind 135 deg - No Ice		11.64	11.59	1026.41	-1031.05	2.33
Wind 150 deg - No Ice		8.23	14.20	1257.29	-728.52	2.59
Wind 180 deg - No Ice		-0.00	16.40	1451.97	1.84	2.57
Wind 210 deg - No Ice		-9.79	16.89	1450.36	843.59	3.80
Wind 225 deg - No Ice		-13.04	12.99	1121.16	1129.30	2.24
Wind 240 deg - No Ice		-14.25	8.20	725.69	1266.80	0.65
Wind 270 deg - No Ice		-16.46	0.00	-0.65	1462.44	-0.73
Wind 300 deg - No Ice		-14.25	-8.20	-727.02	1266.70	-1.92
Wind 315 deg - No Ice		-11.64	-11.59	-1027.91	1034.55	-2.33
Wind 330 deg - No Ice		-8.23	-14.20	-1258.79	732.01	-2.59
Member Ice	10.11					
Total Weight Ice	62.12			-4.60	7.30	
Wind 0 deg - Ice		0.00	-6.39	-583.81	7.27	-1.02
Wind 30 deg - Ice		3.63	-6.27	-566.18	-318.07	-1.63
Wind 45 deg - Ice		4.86	-4.85	-436.14	-425.84	-1.29
Wind 60 deg - Ice		5.55	-3.20	-294.22	-496.27	-0.77
Wind 90 deg - Ice		6.41	-0.00	-4.62	-574.16	-0.31
Wind 120 deg - Ice		5.55	3.20	284.99	-496.25	0.24
Wind 135 deg - Ice		4.53	4.52	404.95	-403.84	0.50
Wind 150 deg - Ice		3.21	5.54	497.00	-283.41	0.73
Wind 180 deg - Ice		-0.00	6.39	574.61	7.32	1.02
Wind 210 deg - Ice		-3.63	6.27	556.98	332.66	1.63
Wind 225 deg - Ice		-4.86	4.85	426.95	440.43	1.29
Wind 240 deg - Ice		-5.55	3.20	285.03	510.87	0.77
Wind 270 deg - Ice		-6.41	0.00	-4.57	588.76	0.31
Wind 300 deg - Ice		-5.55	-3.20	-294.18	510.84	-0.24
Wind 315 deg - Ice		-4.53	-4.52	-414.14	418.43	-0.50
Wind 330 deg - Ice		-3.21	-5.54	-506.19	298.01	-0.73
Total Weight	26.79			-0.75	1.75	
Wind 0 deg - Service		0.00	-5.31	-470.54	0.57	-0.83
Wind 30 deg - Service		3.17	-5.47	-470.02	-272.02	-1.23
Wind 45 deg - Service		4.22	-4.21	-363.41	-364.54	-0.73
Wind 60 deg - Service		4.62	-2.66	-235.35	-409.07	-0.21
Wind 90 deg - Service		5.33	-0.00	-0.12	-472.43	0.24
Wind 120 deg - Service		4.62	2.65	235.11	-409.04	0.62
Wind 135 deg - Service		3.77	3.75	332.55	-333.86	0.76
Wind 150 deg - Service		2.66	4.60	407.32	-235.89	0.84
Wind 180 deg - Service		-0.00	5.31	470.36	0.64	0.83
Wind 210 deg - Service		-3.17	5.47	469.84	273.23	1.23
Wind 225 deg - Service		-4.22	4.21	363.23	365.75	0.73
Wind 240 deg - Service		-4.62	2.66	235.16	410.28	0.21
Wind 270 deg - Service		-5.33	0.00	-0.06	473.64	-0.24
Wind 300 deg - Service		-4.62	-2.65	-235.29	410.25	-0.62

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 315 deg - Service		-3.77	-3.75	-332.73	335.07	-0.76
Wind 330 deg - Service		-2.66	-4.60	-407.50	237.10	-0.84

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 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	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	130 - 89.92	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	34	-37.29	1.52	1.89
			Max. Mx	26	-11.69	360.11	0.13
			Max. My	2	-11.71	0.32	356.42
			Max. Vy	26	-17.01	360.11	0.13
			Max. Vx	2	-16.90	0.32	356.42
			Max. Torque	4			1.50
L2	89.92 - 44.836	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	34	-50.49	6.20	4.01
			Max. Mx	26	-19.53	1235.87	0.43
			Max. My	2	-19.55	1.27	1226.67
			Max. Vy	26	-22.20	1235.87	0.43
			Max. Vx	4	-22.51	-687.39	1186.08
			Max. Torque	21			-5.47
L3	44.836 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	34	-68.27	9.06	5.68
			Max. Mx	26	-32.12	2454.86	0.80
			Max. My	2	-32.12	2.00	2440.16
			Max. Vy	26	-26.37	2454.86	0.80
			Max. Vx	4	-27.07	-1409.10	2433.40
			Max. Torque	21			-6.01

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	47	68.27	6.41	-0.00
	Max. H_x	27	24.11	26.33	-0.00
	Max. H_z	5	24.11	-15.66	27.03
	Max. M_x	2	2440.16	-0.00	26.23
	Max. M_z	10	2450.44	-26.33	0.00

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. Torsion	5	5.99	-15.66	27.03
	Min. Vert	21	24.11	15.66	-27.03
	Min. H_x	11	24.11	-26.33	0.00
	Min. H_z	20	32.15	15.66	-27.03
	Min. M_x	18	-2438.27	0.00	-26.23
	Min. M_z	26	-2454.86	26.33	-0.00
	Min. Torsion	21	-5.99	15.66	-27.03

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	26.79	0.00	0.00	-0.76	1.78	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	32.15	0.00	-26.23	-2440.16	2.00	-4.05
0.9 Dead+1.6 Wind 0 deg - No Ice	24.11	0.00	-26.23	-2408.49	1.44	-4.05
1.2 Dead+1.6 Wind 30 deg - No Ice	32.15	15.66	-27.03	-2433.40	-1409.10	-5.99
0.9 Dead+1.6 Wind 30 deg - No Ice	24.11	15.66	-27.03	-2402.58	-1391.90	-5.99
1.2 Dead+1.6 Wind 45 deg - No Ice	32.15	20.86	-20.79	-1882.36	-1888.81	-3.55
0.9 Dead+1.6 Wind 45 deg - No Ice	24.11	20.86	-20.79	-1858.37	-1865.48	-3.55
1.2 Dead+1.6 Wind 60 deg - No Ice	32.15	22.81	-13.12	-1220.66	-2121.95	-1.04
0.9 Dead+1.6 Wind 60 deg - No Ice	24.11	22.81	-13.12	-1204.70	-2095.14	-1.04
1.2 Dead+1.6 Wind 90 deg - No Ice	32.15	26.33	-0.00	-1.13	-2450.44	1.13
0.9 Dead+1.6 Wind 90 deg - No Ice	24.11	26.33	-0.00	-0.88	-2419.39	1.14
1.2 Dead+1.6 Wind 120 deg - No Ice	32.15	22.80	13.12	1218.46	-2121.81	3.01
0.9 Dead+1.6 Wind 120 deg - No Ice	24.11	22.80	13.12	1203.00	-2094.99	3.01
1.2 Dead+1.6 Wind 135 deg - No Ice	32.15	18.62	18.55	1723.67	-1732.02	3.66
0.9 Dead+1.6 Wind 135 deg - No Ice	24.11	18.62	18.55	1701.70	-1710.23	3.67
1.2 Dead+1.6 Wind 150 deg - No Ice	32.15	13.17	22.72	2111.36	-1224.05	4.07
0.9 Dead+1.6 Wind 150 deg - No Ice	24.11	13.17	22.72	2084.39	-1208.80	4.08
1.2 Dead+1.6 Wind 180 deg - No Ice	32.15	-0.00	26.23	2438.27	2.34	4.05
0.9 Dead+1.6 Wind 180 deg - No Ice	24.11	-0.00	26.23	2407.09	1.77	4.05
1.2 Dead+1.6 Wind 210 deg - No Ice	32.15	-15.66	27.03	2431.58	1413.40	5.99
0.9 Dead+1.6 Wind 210 deg - No Ice	24.11	-15.66	27.03	2401.24	1395.08	5.99
1.2 Dead+1.6 Wind 225 deg - No Ice	32.15	-20.86	20.79	1880.51	1893.18	3.55
0.9 Dead+1.6 Wind 225 deg -	24.11	-20.86	20.79	1857.00	1868.71	3.55

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						
1.2 Dead+1.6 Wind 240 deg - No Ice	32.15	-22.81	13.12	1218.78	2126.37	1.04
0.9 Dead+1.6 Wind 240 deg - No Ice	24.11	-22.81	13.12	1203.31	2098.40	1.04
1.2 Dead+1.6 Wind 270 deg - No Ice	32.15	-26.33	0.00	-0.80	2454.86	-1.13
0.9 Dead+1.6 Wind 270 deg - No Ice	24.11	-26.33	0.00	-0.55	2422.65	-1.14
1.2 Dead+1.6 Wind 300 deg - No Ice	32.15	-22.80	-13.12	-1220.41	2126.19	-3.01
0.9 Dead+1.6 Wind 300 deg - No Ice	24.11	-22.80	-13.12	-1204.45	2098.22	-3.01
1.2 Dead+1.6 Wind 315 deg - No Ice	32.15	-18.62	-18.55	-1725.61	1736.38	-3.66
0.9 Dead+1.6 Wind 315 deg - No Ice	24.11	-18.62	-18.55	-1703.14	1713.44	-3.67
1.2 Dead+1.6 Wind 330 deg - No Ice	32.15	-13.17	-22.72	-2113.29	1228.39	-4.07
0.9 Dead+1.6 Wind 330 deg - No Ice	24.11	-13.17	-22.72	-2085.82	1212.00	-4.08
1.2 Dead+1.0 Ice+1.0 Temp	68.27	-0.00	-0.00	-5.68	9.06	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	68.27	0.00	-6.40	-674.78	9.08	-1.01
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	68.27	3.63	-6.27	-652.90	-365.91	-1.64
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	68.27	4.86	-4.85	-503.00	-490.07	-1.30
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	68.27	5.55	-3.20	-340.31	-572.72	-0.79
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	68.27	6.41	-0.00	-5.74	-662.62	-0.33
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	68.27	5.55	3.20	328.83	-572.69	0.22
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	68.27	4.53	4.52	467.42	-465.92	0.49
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	68.27	3.21	5.54	573.77	-326.78	0.72
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	68.27	-0.00	6.40	663.35	9.14	1.02
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	68.27	-3.63	6.27	641.48	384.12	1.64
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	68.27	-4.86	4.85	491.58	508.30	1.30
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	68.27	-5.55	3.20	328.89	590.95	0.79
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	68.27	-6.41	0.00	-5.69	680.85	0.33
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	68.27	-5.55	-3.20	-340.27	590.92	-0.22
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	68.27	-4.53	-4.52	-478.86	484.15	-0.49
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	68.27	-3.21	-5.54	-585.20	345.00	-0.71
Dead+Wind 0 deg - Service	26.79	0.00	-5.31	-491.34	1.80	-0.83
Dead+Wind 30 deg - Service	26.79	3.17	-5.47	-490.32	-282.18	-1.23
Dead+Wind 45 deg - Service	26.79	4.22	-4.21	-379.32	-378.62	-0.73
Dead+Wind 60 deg - Service	26.79	4.62	-2.66	-246.09	-425.36	-0.21
Dead+Wind 90 deg - Service	26.79	5.33	-0.00	-0.82	-491.43	0.23
Dead+Wind 120 deg - Service	26.79	4.62	2.65	244.46	-425.33	0.62
Dead+Wind 135 deg - Service	26.79	3.77	3.75	346.06	-346.93	0.75

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 150 deg - Service	26.79	2.66	4.60	424.03	-244.77	0.84
Dead+Wind 180 deg - Service	26.79	-0.00	5.31	489.77	1.87	0.83
Dead+Wind 210 deg - Service	26.79	-3.17	5.47	488.75	285.85	1.23
Dead+Wind 225 deg - Service	26.79	-4.22	4.21	377.75	382.29	0.73
Dead+Wind 240 deg - Service	26.79	-4.62	2.66	244.52	429.04	0.21
Dead+Wind 270 deg - Service	26.79	-5.33	0.00	-0.75	495.11	-0.23
Dead+Wind 300 deg - Service	26.79	-4.62	-2.65	-246.03	429.01	-0.62
Dead+Wind 315 deg - Service	26.79	-3.77	-3.75	-347.64	350.61	-0.75
Dead+Wind 330 deg - Service	26.79	-2.66	-4.60	-425.60	248.44	-0.84

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-26.79	0.00	0.00	26.79	0.00	0.000%
2	0.00	-32.15	-26.23	-0.00	32.15	26.23	0.000%
3	0.00	-24.11	-26.23	-0.00	24.11	26.23	0.000%
4	15.66	-32.15	-27.03	-15.66	32.15	27.03	0.000%
5	15.66	-24.11	-27.03	-15.66	24.11	27.03	0.000%
6	20.86	-32.15	-20.79	-20.86	32.15	20.79	0.000%
7	20.86	-24.11	-20.79	-20.86	24.11	20.79	0.000%
8	22.81	-32.15	-13.12	-22.81	32.15	13.12	0.000%
9	22.81	-24.11	-13.12	-22.81	24.11	13.12	0.000%
10	26.33	-32.15	-0.00	-26.33	32.15	0.00	0.000%
11	26.33	-24.11	-0.00	-26.33	24.11	0.00	0.000%
12	22.80	-32.15	13.12	-22.80	32.15	-13.12	0.000%
13	22.80	-24.11	13.12	-22.80	24.11	-13.12	0.000%
14	18.62	-32.15	18.55	-18.62	32.15	-18.55	0.000%
15	18.62	-24.11	18.55	-18.62	24.11	-18.55	0.000%
16	13.17	-32.15	22.72	-13.17	32.15	-22.72	0.000%
17	13.17	-24.11	22.72	-13.17	24.11	-22.72	0.000%
18	-0.00	-32.15	26.23	0.00	32.15	-26.23	0.000%
19	-0.00	-24.11	26.23	0.00	24.11	-26.23	0.000%
20	-15.66	-32.15	27.03	15.66	32.15	-27.03	0.000%
21	-15.66	-24.11	27.03	15.66	24.11	-27.03	0.000%
22	-20.86	-32.15	20.79	20.86	32.15	-20.79	0.000%
23	-20.86	-24.11	20.79	20.86	24.11	-20.79	0.000%
24	-22.81	-32.15	13.12	22.81	32.15	-13.12	0.000%
25	-22.81	-24.11	13.12	22.81	24.11	-13.12	0.000%
26	-26.33	-32.15	0.00	26.33	32.15	-0.00	0.000%
27	-26.33	-24.11	0.00	26.33	24.11	-0.00	0.000%
28	-22.80	-32.15	-13.12	22.80	32.15	13.12	0.000%
29	-22.80	-24.11	-13.12	22.80	24.11	13.12	0.000%
30	-18.62	-32.15	-18.55	18.62	32.15	18.55	0.000%
31	-18.62	-24.11	-18.55	18.62	24.11	18.55	0.000%
32	-13.17	-32.15	-22.72	13.17	32.15	22.72	0.000%
33	-13.17	-24.11	-22.72	13.17	24.11	22.72	0.000%
34	0.00	-68.27	0.00	0.00	68.27	0.00	0.000%
35	0.00	-68.27	-6.39	-0.00	68.27	6.40	0.001%
36	3.63	-68.27	-6.27	-3.63	68.27	6.27	0.000%
37	4.86	-68.27	-4.85	-4.86	68.27	4.85	0.000%
38	5.55	-68.27	-3.20	-5.55	68.27	3.20	0.000%
39	6.41	-68.27	-0.00	-6.41	68.27	0.00	0.001%
40	5.55	-68.27	3.20	-5.55	68.27	-3.20	0.000%
41	4.53	-68.27	4.52	-4.53	68.27	-4.52	0.000%
42	3.21	-68.27	5.54	-3.21	68.27	-5.54	0.000%
43	-0.00	-68.27	6.39	0.00	68.27	-6.40	0.001%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
44	-3.63	-68.27	6.27	3.63	68.27	-6.27	0.000%
45	-4.86	-68.27	4.85	4.86	68.27	-4.85	0.000%
46	-5.55	-68.27	3.20	5.55	68.27	-3.20	0.000%
47	-6.41	-68.27	0.00	6.41	68.27	-0.00	0.001%
48	-5.55	-68.27	-3.20	5.55	68.27	3.20	0.000%
49	-4.53	-68.27	-4.52	4.53	68.27	4.52	0.000%
50	-3.21	-68.27	-5.54	3.21	68.27	5.54	0.000%
51	0.00	-26.79	-5.31	-0.00	26.79	5.31	0.000%
52	3.17	-26.79	-5.47	-3.17	26.79	5.47	0.000%
53	4.22	-26.79	-4.21	-4.22	26.79	4.21	0.000%
54	4.62	-26.79	-2.66	-4.62	26.79	2.66	0.000%
55	5.33	-26.79	-0.00	-5.33	26.79	0.00	0.000%
56	4.62	-26.79	2.65	-4.62	26.79	-2.65	0.000%
57	3.77	-26.79	3.75	-3.77	26.79	-3.75	0.000%
58	2.66	-26.79	4.60	-2.66	26.79	-4.60	0.000%
59	-0.00	-26.79	5.31	0.00	26.79	-5.31	0.000%
60	-3.17	-26.79	5.47	3.17	26.79	-5.47	0.000%
61	-4.22	-26.79	4.21	4.22	26.79	-4.21	0.000%
62	-4.62	-26.79	2.66	4.62	26.79	-2.66	0.000%
63	-5.33	-26.79	0.00	5.33	26.79	-0.00	0.000%
64	-4.62	-26.79	-2.65	4.62	26.79	2.65	0.000%
65	-3.77	-26.79	-3.75	3.77	26.79	3.75	0.000%
66	-2.66	-26.79	-4.60	2.66	26.79	4.60	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	5	0.00000001	0.00022092
3	Yes	5	0.00000001	0.00009823
4	Yes	6	0.00000001	0.00012765
5	Yes	5	0.00000001	0.00089329
6	Yes	6	0.00000001	0.00013775
7	Yes	5	0.00000001	0.00097345
8	Yes	6	0.00000001	0.00012456
9	Yes	5	0.00000001	0.00088581
10	Yes	5	0.00000001	0.00006939
11	Yes	4	0.00000001	0.00081383
12	Yes	6	0.00000001	0.00012937
13	Yes	5	0.00000001	0.00092192
14	Yes	6	0.00000001	0.00013122
15	Yes	5	0.00000001	0.00093628
16	Yes	6	0.00000001	0.00011494
17	Yes	5	0.00000001	0.00081607
18	Yes	5	0.00000001	0.00022169
19	Yes	5	0.00000001	0.00009858
20	Yes	6	0.00000001	0.00014943
21	Yes	6	0.00000001	0.00004161
22	Yes	6	0.00000001	0.00013769
23	Yes	5	0.00000001	0.00097277
24	Yes	6	0.00000001	0.00012122
25	Yes	5	0.00000001	0.00086107
26	Yes	5	0.00000001	0.00007029
27	Yes	4	0.00000001	0.00082212
28	Yes	6	0.00000001	0.00011714

29	Yes	5	0.00000001	0.00083088
30	Yes	6	0.00000001	0.00013140
31	Yes	5	0.00000001	0.00093677
32	Yes	6	0.00000001	0.00013178
33	Yes	5	0.00000001	0.00093909
34	Yes	4	0.00000001	0.00008398
35	Yes	5	0.00019055	0.00080122
36	Yes	6	0.00000001	0.00028957
37	Yes	6	0.00000001	0.00029851
38	Yes	6	0.00000001	0.00026078
39	Yes	5	0.00019052	0.00076277
40	Yes	6	0.00000001	0.00024730
41	Yes	6	0.00000001	0.00027173
42	Yes	6	0.00000001	0.00023994
43	Yes	5	0.00019040	0.00078273
44	Yes	6	0.00000001	0.00032494
45	Yes	6	0.00000001	0.00030260
46	Yes	6	0.00000001	0.00025094
47	Yes	5	0.00019046	0.00078917
48	Yes	6	0.00000001	0.00026399
49	Yes	6	0.00000001	0.00029449
50	Yes	6	0.00000001	0.00027242
51	Yes	4	0.00000001	0.00020357
52	Yes	4	0.00000001	0.00051511
53	Yes	4	0.00000001	0.00060676
54	Yes	4	0.00000001	0.00045380
55	Yes	4	0.00000001	0.00008424
56	Yes	4	0.00000001	0.00051833
57	Yes	4	0.00000001	0.00052536
58	Yes	4	0.00000001	0.00037547
59	Yes	4	0.00000001	0.00020295
60	Yes	4	0.00000001	0.00077341
61	Yes	4	0.00000001	0.00061144
62	Yes	4	0.00000001	0.00041831
63	Yes	4	0.00000001	0.00008542
64	Yes	4	0.00000001	0.00039093
65	Yes	4	0.00000001	0.00053607
66	Yes	4	0.00000001	0.00056040

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 89.92	24.805	60	1.6832	0.0085
L2	94.003 - 44.836	12.987	60	1.3421	0.0067
L3	50.003 - 0	3.542	60	0.6625	0.0026

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	440-3	60	24.805	1.6832	0.0085	26931
128.00	SBNHH-1D65B	60	24.110	1.6671	0.0085	26931
127.00	Valmont 13' Platform w/Rails	60	23.763	1.6591	0.0084	26931

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	APXVSPP18-C-A20	60	20.660	1.5852	0.0081	11221
117.00	Valmont 13' Low Profile Platform	60	20.320	1.5768	0.0080	10358
107.00	3-ft Dish	60	16.992	1.4860	0.0075	5854
100.00	AIR6449	60	14.780	1.4130	0.0071	4487
99.00	Valmont 13' Platform w/Rails	60	14.474	1.4018	0.0071	4342
87.00	3-ft Dish	60	11.037	1.2481	0.0061	3628
86.00	3' Stand-off Mount	60	10.771	1.2339	0.0060	3613
83.00	3-ft Dish	60	9.995	1.1899	0.0058	3567
58.00	3' Stand-off Mount	60	4.742	0.7894	0.0033	3223
50.00	3' GPS Stand-off Mount	60	3.541	0.6624	0.0026	3189

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 89.92	122.943	20	8.3735	0.0405
L2	94.003 - 44.836	64.454	20	6.6746	0.0323
L3	50.003 - 0	17.598	20	3.2940	0.0125

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	440-3	20	122.943	8.3735	0.0419	5649
128.00	SBNHH-1D65B	20	119.505	8.2943	0.0415	5649
127.00	Valmont 13' Platform w/Rails	20	117.787	8.2546	0.0413	5649
118.00	APXVSPP18-C-A20	20	102.437	7.8886	0.0395	2352
117.00	Valmont 13' Low Profile Platform	20	100.752	7.8464	0.0393	2170
107.00	3-ft Dish	20	84.286	7.3929	0.0369	1223
100.00	AIR6449	20	73.332	7.0284	0.0349	936
99.00	Valmont 13' Platform w/Rails	20	71.816	6.9723	0.0345	905
87.00	3-ft Dish	20	54.790	6.2067	0.0299	750
86.00	3' Stand-off Mount	20	53.474	6.1356	0.0295	747
83.00	3-ft Dish	20	49.626	5.9168	0.0281	735
58.00	3' Stand-off Mount	20	23.557	3.9249	0.0160	654
50.00	3' GPS Stand-off Mount	20	17.596	3.2938	0.0125	645

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 $\frac{P_u}{\phi P_n}$

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	130 - 89.92 (1)	TP25.08x16.26x0.219	40.08	0.00	0.0	16.8979	-11.34	1146.13	0.010
L2	89.92 - 44.836 (2)	TP34.56x23.7435x0.313	49.17	0.00	0.0	33.3705	-19.16	2295.32	0.008
L3	44.836 - 0 (3)	TP43.8x32.7973x0.375	50.00	0.00	0.0	52.4357	-32.11	3468.51	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	130 - 89.92 (1)	TP25.08x16.26x0.219	383.12	558.84	0.686	0.00	558.84	0.000
L2	89.92 - 44.836 (2)	TP34.56x23.7435x0.313	1371.44	1545.95	0.887	0.00	1545.95	0.000
L3	44.836 - 0 (3)	TP43.8x32.7973x0.375	2812.52	3066.37	0.917	0.00	3066.37	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	130 - 89.92 (1)	TP25.08x16.26x0.219	18.43	573.07	0.032	1.50	1136.67	0.001
L2	89.92 - 44.836 (2)	TP34.56x23.7435x0.313	26.01	1147.66	0.023	5.46	3144.73	0.002
L3	44.836 - 0 (3)	TP43.8x32.7973x0.375	31.28	1734.26	0.018	5.99	6235.82	0.001

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	130 - 89.92 (1)	0.010	0.686	0.000	0.032	0.001	0.697 ✔	1.000	4.8.2 ✔
L2	89.92 - 44.836 (2)	0.008	0.887	0.000	0.023	0.002	0.896 ✔	1.000	4.8.2 ✔
L3	44.836 - 0 (3)	0.009	0.917	0.000	0.018	0.001	0.927 ✔	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
L1	130 - 89.92	Pole	TP25.08x16.26x0.219	1	-11.34	1146.13	69.7	Pass
L2	89.92 - 44.836	Pole	TP34.56x23.7435x0.313	2	-19.16	2295.32	89.6	Pass
L3	44.836 - 0	Pole	TP43.8x32.7973x0.375	3	-32.11	3468.51	92.7	Pass
							Summary	
						Pole (L3)	92.7	Pass
						RATING =	**92.7**	**Pass**

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Subject:	Anchor Bolt and Baseplate Analysis
Location:	130-FT Valmont Monopole Ridgefield, CT
Rev. 0: 7/15/20	Prepared by: T.J.L. Checked by: C.F.C. Job No. 20074.48

Anchor Bolt and Base Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	$M_u := 2813 \cdot ft \cdot kips$	(Input From tnxTower)
Shear Force =	$Shear := 31 \cdot kips$	(Input From tnxTower)
Axial Force =	$R_u := 32 \cdot kips$	(Input From tnxTower)

Anchor Bolt Data:

ASTMA615 Grade 75

Number of Anchor Bolts =	$N := 12$	(User Input)
Diameter of Bolt Circle =	$D_{BC} := 49.75 \cdot in$	(User Input)
Bolt Ultimate Strength =	$F_u := 100 \cdot ksi$	(User Input)
Bolt Yield Strength =	$F_y := 75 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Anchor Bolts =	$D := 2.25 \cdot in$	(User Input)
Threads per Inch =	$n := 4.5$	(User Input)
Top of Concrete to Bot Leveling Nut =	$l_{ar} := 2 \cdot in$	(User Input)
Anchor Rod Force Correction Factor =	$n_c = 1.02$	Table 2-1 Addendum 3

Base Plate Data:

ASTMA572 Grade 60

Plate Yield Strength =	$F_{yf} := 60 \cdot ksi$	(User Input)
Base Plate Thickness =	$t_{TP} := 2.5 \cdot in$	(User Input)
Base Plate Diameter =	$D_{OD} := 56.5 \cdot in$	(User Input)
Outer Pole Diameter =	$D_T := 43.8 \cdot in$	(User Input)
Pole Wall Thickness =	$t_T := 0.375 \cdot in$	(User Input)
Pole Design Yield Strength =	$F_{yp} := 65 \cdot ksi$	(User Input)
	$\eta := 0.5$	For Ungrouted Base Plate per TIA-222-G Section 4.9.9

Anchor Bolt Analysis:

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 3.976 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 = 3.248 \cdot in^2$

Tensile Root Diameter = $d_{rt} := D - \frac{0.9743 \cdot in}{n} = 2.033 \cdot in$

Plastic Section Modulus = $Z := \frac{d_{rt}^3}{6} = 1.401 \cdot in^3$

Maximum Anchor Rod Force = $P_u := \frac{n_c \cdot \pi \cdot M_u}{N \cdot D_{BC}} + \frac{R_u}{N} = 183.9 \cdot kips$

Maximum Shear Force = $V_u := \frac{Shear}{N} = 2.6 \cdot kips$

Design Tensile Strength = $\Phi R_{nt} := 0.8 \cdot F_u \cdot A_n = 259.815 \cdot k$

Bolt % of Capacity = $\frac{\left(P_u + \frac{V_u}{\eta} \right)}{\Phi R_{nt}} \cdot 100 = 72.8$

Condition1 = $Condition1 := if\left[\frac{\left(P_u + \frac{V_u}{\eta} \right)}{\Phi R_{nt}} \le 1.00, "OK", "Overstressed" \right]$

Condition1 = "OK"

Design Shear Strength = $\Phi R_{nv} := 0.75 \cdot 0.45 \cdot F_u \cdot A_g = 134.193 \cdot k$

Design Flexural Strength = $\Phi R_{nm} := 0.9 \cdot F_y \cdot Z = 94.597 \cdot in \cdot k$

$M_u := \begin{cases} 0 & \text{if } l_{ar} < D \\ 0.65 \cdot l_{ar} \cdot V_u & \text{otherwise} \end{cases} = 0 \cdot in \cdot k$

Bolt % of Capacity = $\left[\left(\frac{V_u}{\Phi R_{nv}} \right)^2 + \left(\frac{P_u}{\Phi R_{nt}} + \frac{M_u}{\Phi R_{nm}} \right)^2 \right] \cdot 100 = 50.1$

Condition2 = $Condition2 := if\left[\left(\frac{V_u}{\Phi R_{nv}} \right)^2 + \left(\frac{P_u}{\Phi R_{nt}} + \frac{M_u}{\Phi R_{nm}} \right)^2 \le 1.00, "OK", "Overstressed" \right]$

Condition2 = "OK"

Base Plate Analysis:

Strength Resistance Factor for Yielding due to Bending = $\phi_b := 0.9$

Strength Resistance Factor for Yielding due to Shear = $\phi_v := 1.0$

Outside Fillet Horizontal Leg Dimension = $w_1 := 0.25 \cdot in$

Effective Pole Outside Diameter = $D_e := D_T + w_1 = 44.05 \cdot in$

Effective Base Plate Outside Diameter = $D_{oe} := \begin{cases} D_{OD} & \text{if } D_{OD} \le \left(D_{BC} + 6 \cdot t_{TP}\right) \\ \left(D_{BC} + 6 \cdot t_{TP}\right) & \text{otherwise} \end{cases} = 56.5 \cdot in$

Half-Angle Between Radial Lines Extending from Pole Centerline Through Midpoints Between Adjacent Anchor Rods = $\theta_1 := \frac{\pi}{N} = 0.262$

Angle Defining Limiting Effective Base Plate Width Based on Plate Thickness = $\theta_2 := \operatorname{asin}\left(\frac{12 \cdot t_{TP}}{D_{BC}}\right) = 0.647$

Angle Defining Limiting Effective Base Plate Width Based on Distance Between Anchor Rod Bolt Circle and Effective Pole Outside Diameter = $\theta_3 := \operatorname{acos}\left(\frac{D_{BC} + D_e}{2 \cdot D_{BC}}\right) = 0.34$

Governing Angle Defining Effective Base Plate Width Resisting Bending = $\theta := \min\left(\theta_1, \theta_2, \theta_3\right) = 0.262$

Effective Moment Arm of Anchor Rod Force = $x := 0.5 \cdot \left(D_{BC} - D_e\right) = 2.85 \cdot in$

Effective Base Plate Width Resisting Bending from Transverse Bend Line = $B_{et} := D_{BC} \cdot \sin(\theta) = 12.876 \cdot in$

Effective Base Plate Width Resisting Bending from Radial Bend Lines = $B_{er} := \left(D_{oe} - D_e\right) \cdot \sin(\theta) = 3.222 \cdot in$

Total Effective Base Plate Width Resisting Bending = $B_{eff} := B_{et} + B_{er} = 16.099 \cdot in$

Required Base Plate Thickness = $t_{TP.Req} := \sqrt{\frac{4 \cdot P_u \cdot x}{\phi_b \cdot F_{yf} \cdot B_{eff}}} = 1.553 \cdot in$

Plate Bending Stress % of Capacity = $\frac{t_{TP.Req}}{t_{TP}} = 62.1 \cdot \%$

Condition2 = $Condition3 := \text{if}\left(\frac{t_{TP.Req}}{t_{TP}} < 1.00, \text{"Ok"}, \text{"Overstressed"}\right)$

Condition3 = "Ok"

Required Base Plate Thickness = $t_{TP.Req} := \frac{\phi_b \cdot t_T \cdot F_{yp}}{\phi_v \cdot 0.6 \cdot F_{yf}} = 0.609 \cdot in$

Plate Bending Stress % of Capacity = $\frac{t_{TP.Req}}{t_{TP}} = 24.4 \cdot \%$

Condition2 = $Condition4 := \text{if}\left(\frac{t_{TP.Req}}{t_{TP}} < 1.00, \text{"Ok"}, \text{"Overstressed"}\right)$

Condition4 = "Ok"

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Subject:	CAISSON FOUNDATION
Location:	130-ft Valmont Monopole Ridgefield, CT
Rev. 0: 7/15/20	Prepared by: TJL Checked by: C.F.C. Job No. 20074.48

Caisson Foundation:

Input Data:

Shear Force =	$S := 31k$	*USER INPUT-FROM tnxTower*
Overturning Moment =	$M := 2813ft \cdot k$	*USER INPUT-FROM tnxTower*
Applied Axial Load =	$A1 := 32k$	*USER INPUT-FROM tnxTower*
Bending Moment =	$Mu := 2934ft \cdot k$	*USER INPUT--FROM LPILE*
Moment Capacity =	$Mn := 5687ft \cdot k$	*USER INPUT--FROM LPILE*
Foundation Diameter =	$d := 6.0ft$	*USER INPUT*
Overall Length of Caisson =	$L_c := 21.0ft$	*USER INPUT*
Depth From Top of Caisson to Grade =	$L_{pag} := 0.5ft$	*USER INPUT*
Number of Rebar =	$n := 26$	*USER INPUT*
Area of Rebar =	$Ar := 1.56in^2$	*USER INPUT*
Rebar Yield Strength =	$fy := 60ksi$	*USER INPUT*
Concrete Comp Strength =	$f'c := 3ksi$	*USER INPUT*

Check Moment Capacity:

Factor of Safety = $FS := \frac{0.9Mn}{Mu} = 1.7$

Factor of Safety Required = $FS_{reqd} := 1$

$FOSCheck := if(FS \geq FS_{reqd}, "OK", "NO GOOD")$

$FOSCheck = "OK"$

This program is licensed to:

TJL
Centek Engineering

Files Used for Analysis

Path to file locations: J:\Jobs\2007400.WI\48_CT11103A\05_Structural\Tower Analysis\Backup Documentation\L-Pile\
Name of input data file: Ridgefield Caisson Analysis.lpd
Name of output file: Ridgefield Caisson Analysis.lpo
Name of plot output file: Ridgefield Caisson Analysis.lpp
Name of runtime file: Ridgefield Caisson Analysis.lpr

Time and Date of Analysis

Date: July 15, 2020 Time: 10:03:16

Problem Title

20074.48 - Ridgefield

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment
  Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- Analysis includes computation of foundation stiffness matrix elements
- Output summary table of values for pile-head deflection, maximum
bending moment, and shear force only
- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 100
- Deflection tolerance for convergence = 1.0000E-04 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Only summary tables of pile-head deflection, maximum bending moment,
  and maximum shear force are to be printed in output file.

Pile Structural Properties and Geometry

Pile Length = 252.00 in

Depth of ground surface below top of pile = 6.00 in

Slope angle of ground surface = 0.00 deg.

Structural properties of pile defined using 2 points

Point No.	Point Depth in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	72.00000000	1319167.	4071.5000	3122018.
2	252.0000	72.00000000	1319167.	4071.5000	3122018.

Please note that because this analysis makes computations of ultimate
moment capacity and pile response using nonlinear bending stiffness
that the above values of moment of inertia and modulus of are not used
for any computations other than total stress due to combined axial
loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 3 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 6.000 in
Distance from top of pile to bottom of layer = 46.000 in
p-y subgrade modulus k for top of soil layer = 0.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 0.000 lbs/in**3

NOTE: Internal default values for p-y subgrade modulus will be computed for the above soil layer.

Layer 2 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 46.000 in
Distance from top of pile to bottom of layer = 102.000 in
p-y subgrade modulus k for top of soil layer = 0.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 0.000 lbs/in**3

NOTE: Internal default values for p-y subgrade modulus will be computed for the above soil layer.

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 102.000 in
Distance from top of pile to bottom of layer = 282.000 in
p-y subgrade modulus k for top of soil layer = 0.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 0.000 lbs/in**3

NOTE: Internal default values for p-y subgrade modulus will be computed for the above soil layer.

(Depth of lowest layer extends 30.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 6 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	6.00	0.06700
2	46.00	0.06700
3	46.00	0.06700
4	102.00	0.06700

5	102.00	0.06700
6	282.00	0.05400

Shear Strength of Soils

Shear strength parameters with depth defined using 6 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	6.000	0.00000	30.00	------	------
2	46.000	0.00000	30.00	------	------
3	46.000	0.00000	30.00	------	------
4	102.000	0.00000	38.00	------	------
5	102.000	0.00000	38.00	------	------
6	282.000	0.00000	45.00	------	------

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.
(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Loading Type

Static loading criteria was used for computation of p-y curves.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 2

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 32000.000 lbs
Bending moment at pile head = 33756000.000 in-lbs
Axial load at pile head = 32000.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head
may rotate under the applied pile-head loading, but is not a free-head
(zero moment) condition.

Load Case Number 2

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head   =   13000.000 lbs
Bending moment at pile head =   14088000.000 in-lbs
Axial load at pile head   =   32000.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head
may rotate under the applied pile-head loading, but is not a free-head
(zero moment) condition.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Number of sections = 1

Pile Section No. 1

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter   =   72.0000 in

Material Properties:

Compressive Strength of Concrete   =   3.000 kip/in**2
Yield Stress of Reinforcement   =   60. kip/in**2
Modulus of Elasticity of Reinforcement =   29000. kip/in**2
Number of Reinforcing Bars   =   26
Area of Single Bar   =   1.56000 in**2
Number of Rows of Reinforcing Bars   =   13
Area of Steel   =   40.560 in**2
Area of Shaft   =   4071.504 in**2
Percentage of Steel Reinforcement   =   0.996 percent
Cover Thickness (edge to bar center)   =   5.000 in

Unfactored Axial Squash Load Capacity   =   12712.51 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement	Distance to Centroidal Axis

	in**2	in
1	3.120	30.774
2	3.120	28.986
3	3.120	25.512
4	3.120	20.557
5	3.120	14.406
6	3.120	7.419
7	3.120	0.000
8	3.120	-7.419
9	3.120	-14.406
10	3.120	-20.557
11	3.120	-25.512
12	3.120	-28.986
13	3.120	-30.774

Axial Thrust Force = 32000.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
3919913.	4.703896E+12	8.333333E-07	0.00003241	38.89416897	99.51291308	813.64682
7796334.	4.677800E+12	0.00000167	0.00006252	37.51491702	190.08575	1560.62979
11629605.	4.651842E+12	0.00000250	0.00009268	37.07130325	279.07299	2308.78268
15418678.	4.625603E+12	0.00000333	0.00012279	36.83731163	366.23170	3055.75772
15418678.	3.700483E+12	0.00000417	0.00008724	20.93710148	259.89149	5538.62223
15418678.	3.083736E+12	0.00000500	0.00010320	20.63981831	305.80447	6689.45273
15418678.	2.643202E+12	0.00000583	0.00011918	20.43154800	351.32204	7839.59392
15418678.	2.312802E+12	0.00000667	0.00013540	20.30971777	397.03646	8983.08975
15418678.	2.055824E+12	0.00000750	0.00015140	20.18689620	441.66790	10132.68966
15418678.	1.850241E+12	0.00000833	0.00016743	20.09172928	485.90484	11281.54274
15418678.	1.682038E+12	0.00000917	0.00018349	20.01669824	529.74556	12429.64276
15418678.	1.541868E+12	0.00001000	0.00019957	19.95679271	573.18834	13576.98289

15418678.	1.423263E+12	0.00001083	0.00021568	19.90854299	616.23143
14723.55659					
15418678.	1.321601E+12	0.00001167	0.00023181	19.86947286	658.87309
15869.35659					
15418678.	1.233494E+12	0.00001250	0.00024797	19.83776271	701.11145
17014.37699					
15756410.	1.181731E+12	0.00001333	0.00026416	19.81205213	742.94473
18158.61021					
16693776.	1.178384E+12	0.00001417	0.00028038	19.79129827	784.37104
19302.04973					
17629623.	1.175308E+12	0.00001500	0.00029662	19.77469218	825.38854
20444.68807					
18563939.	1.172459E+12	0.00001583	0.00031289	19.76159656	865.99540
21586.51714					
19496713.	1.169803E+12	0.00001667	0.00032919	19.75149858	906.18964
22727.53032					
20427932.	1.167310E+12	0.00001750	0.00034552	19.74398410	945.96928
23867.72043					
21357587.	1.164959E+12	0.00001833	0.00036188	19.73871839	985.33249
25007.07815					
22285662.	1.162730E+12	0.00001917	0.00037826	19.73541820	1024.27709
26145.59787					
23212148.	1.160607E+12	0.00002000	0.00039468	19.73385394	1062.80117
27283.27027					
24137032.	1.158578E+12	0.00002083	0.00041112	19.73383033	1100.90266
28420.08746					
25060301.	1.156629E+12	0.00002167	0.00042760	19.73518217	1138.57946
29556.04156					
25981942.	1.154753E+12	0.00002250	0.00044410	19.73776996	1175.82949
30691.12385					
26901943.	1.152940E+12	0.00002333	0.00046063	19.74147356	1212.65059
31825.32604					
27820291.	1.151184E+12	0.00002417	0.00047720	19.74618995	1249.04060
32958.63942					
28736973.	1.149479E+12	0.00002500	0.00049380	19.75183117	1284.99739
34091.05434					
29651971.	1.147818E+12	0.00002583	0.00051042	19.75831568	1320.51850
35222.56484					
30565278.	1.146198E+12	0.00002667	0.00052708	19.76558125	1355.60195
36353.15791					
31476875.	1.144614E+12	0.00002750	0.00054377	19.77356565	1390.24528
37482.82653					
32386754.	1.143062E+12	0.00002833	0.00056050	19.78221953	1424.44631
38611.55916					
33294892.	1.141539E+12	0.00002917	0.00057725	19.79149354	1458.20247
39739.34899					
34201276.	1.140043E+12	0.00003000	0.00059404	19.80134690	1491.51135
40866.18653					
35105897.	1.138570E+12	0.00003083	0.00061086	19.81174743	1524.37072
41992.05857					
36008734.	1.137118E+12	0.00003167	0.00062772	19.82266080	1556.77797

43116.95696
   36909779. 1.135685E+12   0.00003250   0.00064461   19.83406126   1588.73076
44240.86879
   38706402. 1.132870E+12   0.00003417   0.00067849   19.85821187   1651.26191
46485.70206
   40495646. 1.130111E+12   0.00003583   0.00071251   19.88403189   1711.94362
48726.46598
   42277368. 1.127396E+12   0.00003750   0.00074668   19.91137755   1770.75399
50963.07483
   44051438. 1.124718E+12   0.00003917   0.00078099   19.94014156   1827.67105
53195.42926
   45817700. 1.122066E+12   0.00004083   0.00081545   19.97022736   1882.67135
55423.43794
   47576013. 1.119436E+12   0.00004250   0.00085007   20.00156629   1935.73134
57646.99385
   49326218. 1.116820E+12   0.00004417   0.00088484   20.03409827   1986.82625
59865.99224
   50760859. 1.107510E+12   0.00004583   0.00091770   20.02255189   2032.99528
60000.00000
   51884139. 1.092298E+12   0.00004750   0.00094855   19.96944416   2074.45668
60000.00000
   52967919. 1.077314E+12   0.00004917   0.00097926   19.91723335   2114.01229
60000.00000
   53853913. 1.059421E+12   0.00005083   0.00100860   19.84124529   2150.12800
60000.00000
   54639861. 1.040759E+12   0.00005250   0.00103728   19.75767839   2183.90584
60000.00000
   55422104. 1.023177E+12   0.00005417   0.00106605   19.68095005   2216.29807
60000.00000
   56200574. 1.006577E+12   0.00005583   0.00109492   19.61047018   2247.29118
60000.00000
   56757573. 9.870882E+11   0.00005750   0.00112193   19.51178420   2274.85650
60000.00000
   57289169. 9.682676E+11   0.00005917   0.00114881   19.41655076   2300.98344
60000.00000
   57817911. 9.504314E+11   0.00006083   0.00117578   19.32781255   2325.87980
60000.00000
   58343757. 9.335001E+11   0.00006250   0.00120282   19.24506533   2349.53465
60000.00000
   58819246. 9.166636E+11   0.00006417   0.00123200   19.19999993   2373.64920
60000.00000
   59406952. 9.023841E+11   0.00006583   0.00126029   19.14365637   2395.52775
60000.00000
   59771790. 8.855080E+11   0.00006750   0.00128545   19.04365504   2413.68476
60000.00000
   60099506. 8.689085E+11   0.00006917   0.00131025   18.94341767   2430.46863
60000.00000
   60425142. 8.530608E+11   0.00007083   0.00133513   18.84886444   2446.19380
60000.00000
   60748678. 8.379128E+11   0.00007250   0.00136007   18.75961769   2460.85134
60000.00000

61070078. 8.234168E+11 0.00007417 0.00138509 18.67532980 2474.43195
60000.00000
61389328. 8.095296E+11 0.00007583 0.00141017 18.59568965 2486.92636
60000.00000
61706396. 7.962116E+11 0.00007750 0.00143533 18.52040970 2498.32497
60000.00000
62021249. 7.834263E+11 0.00007917 0.00146056 18.44922602 2508.61793
60000.00000
62333867. 7.711406E+11 0.00008083 0.00148587 18.38190043 2517.79529
60000.00000
62639351. 7.592649E+11 0.00008250 0.00151118 18.31728065 2525.82325
60000.00000
62822730. 7.464087E+11 0.00008417 0.00153465 18.23349917 2532.22483
60000.00000
63004429. 7.340322E+11 0.00008583 0.00155819 18.15370238 2537.65757
60000.00000
63184440. 7.221079E+11 0.00008750 0.00158180 18.07767355 2542.11339
60000.00000
63362727. 7.106100E+11 0.00008917 0.00160546 18.00520670 2545.58396
60000.00000
63572781. 6.998838E+11 0.00009083 0.00163500 17.99999893 2548.53208
60000.00000
63748861. 6.891769E+11 0.00009250 0.00165834 17.92802775 2549.73497
60000.00000
63916787. 6.787623E+11 0.00009417 0.00168161 17.85778391 2548.99081
60000.00000
64081853. 6.686802E+11 0.00009583 0.00170494 17.79069650 2545.07331
60000.00000
64245783. 6.589311E+11 0.00009750 0.00172834 17.72660887 2545.69855
60000.00000
64408575. 6.494982E+11 0.00009917 0.00175182 17.66538370 2547.93915
60000.00000
64730660. 6.315186E+11 0.00010250 0.00179898 17.55099928 2549.97695
60000.00000
65046230. 6.146100E+11 0.00010583 0.00184651 17.44732010 2543.57073
60000.00000
65357696. 5.986965E+11 0.00010917 0.00189431 17.35241926 2547.31493
60000.00000
65585970. 5.829864E+11 0.00011250 0.00194026 17.24679816 2549.73247
60000.00000
65742241. 5.675589E+11 0.00011583 0.00198470 17.13413680 2546.86905
60000.00000
65895526. 5.529695E+11 0.00011917 0.00202938 17.02976453 2542.04033
60000.00000
66046931. 5.391586E+11 0.00012250 0.00207423 16.93249476 2546.54318
60000.00000
66196388. 5.260640E+11 0.00012583 0.00211926 16.84178674 2549.20491
60000.00000
66540151. 5.151496E+11 0.00012917 0.00217000 16.80000007 2548.57123
60000.00000
66540151. 5.021898E+11 0.00013250 0.00222034 16.75730789 2542.19637

60000.00000
66664390. 4.907808E+11 0.00013583 0.00226472 16.67277539 2542.44647
60000.00000
66799867. 4.799990E+11 0.00013917 0.00230924 16.59331763 2546.30811
60000.00000
66934144. 4.697133E+11 0.00014250 0.00235390 16.51859987 2548.81203
60000.00000
67067190. 4.598893E+11 0.00014583 0.00239871 16.44831741 2549.93563
60000.00000
67197878. 4.504886E+11 0.00014917 0.00244378 16.38288867 2546.68019
60000.00000
67327246. 4.414901E+11 0.00015250 0.00248901 16.32137167 2541.90417
60000.00000
67455824. 4.328716E+11 0.00015583 0.00253435 16.26319349 2537.47170
60000.00000
67583605. 4.246090E+11 0.00015917 0.00257980 16.20815885 2542.11377
60000.00000
67710574. 4.166805E+11 0.00016250 0.00262536 16.15608752 2545.70112
60000.00000
67836716. 4.090656E+11 0.00016583 0.00267105 16.10681427 2548.21816
60000.00000
67891309. 4.013279E+11 0.00016917 0.00271304 16.03767550 2549.49396
60000.00000
67945048. 3.938843E+11 0.00017250 0.00275510 15.97158158 2549.99269
60000.00000
67997499. 3.867156E+11 0.00017583 0.00279736 15.90917194 2546.92894
60000.00000
68049606. 3.798118E+11 0.00017917 0.00283971 15.84951961 2543.36067
60000.00000
68101499. 3.731589E+11 0.00018250 0.00288211 15.79235637 2539.78247
60000.00000
68153167. 3.667435E+11 0.00018583 0.00292456 15.73754919 2536.19432
60000.00000
68204636. 3.605531E+11 0.00018917 0.00296708 15.68498218 2534.12308
60000.00000
68255871. 3.545760E+11 0.00019250 0.00300965 15.63453519 2537.97436
60000.00000
68255871. 3.485406E+11 0.00019583 0.00305500 15.59999907 2541.79558
60000.00000
68255871. 3.427073E+11 0.00019917 0.00310700 15.59999907 2545.78292
60000.00000
68325876. 3.374117E+11 0.00020250 0.00315900 15.59999907 2548.45554
60000.00000
68466455. 3.326306E+11 0.00020583 0.00320903 15.59043109 2549.75660
60000.00000
68494675. 3.274646E+11 0.00020917 0.00325311 15.55270851 2549.60469
60000.00000
68521829. 3.224557E+11 0.00021250 0.00329744 15.51737416 2546.38882
60000.00000
68548832. 3.176008E+11 0.00021583 0.00334183 15.48337662 2543.16365
60000.00000

```
     68575682.  3.128928E+11    0.00021917    0.00338627   15.45065796    2539.92908
  60000.00000
     68602368.  3.083253E+11    0.00022250    0.00343076   15.41916239    2536.68503
  60000.00000
     68628903.  3.038918E+11    0.00022583    0.00347531   15.38884270    2533.43124
  60000.00000
     68655278.  2.995867E+11    0.00022917    0.00351992   15.35964954    2530.16761
  60000.00000
     68681481.  2.954042E+11    0.00023250    0.00356458   15.33153570    2528.90918
  60000.00000
     68733391.  2.873870E+11    0.00023917    0.00365408   15.27838719    2536.51211
  60000.00000
     68784622.  2.798019E+11    0.00024583    0.00374382   15.22909033    2542.46350
  60000.00000
     68835154.  2.726145E+11    0.00025250    0.00383380   15.18337047    2546.72289
  60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 =   68244.25971
in-kip



Axial Thrust Force =     32000.00  lbs

    Bending       Bending       Bending       Maximum     Neutral Axis Max. Concrete
 Max. Steel
    Moment       Stiffness     Curvature      Strain       Position       Stress
   Stress
    in-lbs        lb-in2        rad/in        in/in         inches         psi
    psi
 ------------- ------------- ------------- ------------- ------------- -------------
-------------
      3919913.  4.703896E+12  8.333333E-07    0.00003241   38.89416897   99.51291308
    813.64682
      7796334.  4.677800E+12    0.00000167    0.00006252   37.51491702     190.08575
   1560.62979
     11629605.  4.651842E+12    0.00000250    0.00009268   37.07130325     279.07299
   2308.78268
     15418678.  4.625603E+12    0.00000333    0.00012279   36.83731163     366.23170
   3055.75772
     15418678.  3.700483E+12    0.00000417    0.00008724   20.93710148     259.89149
   5538.62223
     15418678.  3.083736E+12    0.00000500    0.00010320   20.63981831     305.80447
   6689.45273
     15418678.  2.643202E+12    0.00000583    0.00011918   20.43154800     351.32204
   7839.59392
     15418678.  2.312802E+12    0.00000667    0.00013540   20.30971777     397.03646
   8983.08975
     15418678.  2.055824E+12    0.00000750    0.00015140   20.18689620     441.66790
  10132.68966
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15418678.	1.850241E+12	0.00000833	0.00016743	20.09172928	485.90484
11281.54274					
15418678.	1.682038E+12	0.00000917	0.00018349	20.01669824	529.74556
12429.64276					
15418678.	1.541868E+12	0.00001000	0.00019957	19.95679271	573.18834
13576.98289					
15418678.	1.423263E+12	0.00001083	0.00021568	19.90854299	616.23143
14723.55659					
15418678.	1.321601E+12	0.00001167	0.00023181	19.86947286	658.87309
15869.35659					
15418678.	1.233494E+12	0.00001250	0.00024797	19.83776271	701.11145
17014.37699					
15756410.	1.181731E+12	0.00001333	0.00026416	19.81205213	742.94473
18158.61021					
16693776.	1.178384E+12	0.00001417	0.00028038	19.79129827	784.37104
19302.04973					
17629623.	1.175308E+12	0.00001500	0.00029662	19.77469218	825.38854
20444.68807					
18563939.	1.172459E+12	0.00001583	0.00031289	19.76159656	865.99540
21586.51714					
19496713.	1.169803E+12	0.00001667	0.00032919	19.75149858	906.18964
22727.53032					
20427932.	1.167310E+12	0.00001750	0.00034552	19.74398410	945.96928
23867.72043					
21357587.	1.164959E+12	0.00001833	0.00036188	19.73871839	985.33249
25007.07815					
22285662.	1.162730E+12	0.00001917	0.00037826	19.73541820	1024.27709
26145.59787					
23212148.	1.160607E+12	0.00002000	0.00039468	19.73385394	1062.80117
27283.27027					
24137032.	1.158578E+12	0.00002083	0.00041112	19.73383033	1100.90266
28420.08746					
25060301.	1.156629E+12	0.00002167	0.00042760	19.73518217	1138.57946
29556.04156					
25981942.	1.154753E+12	0.00002250	0.00044410	19.73776996	1175.82949
30691.12385					
26901943.	1.152940E+12	0.00002333	0.00046063	19.74147356	1212.65059
31825.32604					
27820291.	1.151184E+12	0.00002417	0.00047720	19.74618995	1249.04060
32958.63942					
28736973.	1.149479E+12	0.00002500	0.00049380	19.75183117	1284.99739
34091.05434					
29651971.	1.147818E+12	0.00002583	0.00051042	19.75831568	1320.51850
35222.56484					
30565278.	1.146198E+12	0.00002667	0.00052708	19.76558125	1355.60195
36353.15791					
31476875.	1.144614E+12	0.00002750	0.00054377	19.77356565	1390.24528
37482.82653					
32386754.	1.143062E+12	0.00002833	0.00056050	19.78221953	1424.44631
38611.55916					
33294892.	1.141539E+12	0.00002917	0.00057725	19.79149354	1458.20247

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40866.18653
   35105897. 1.138570E+12   0.00003083   0.00061086   19.81174743   1524.37072
41992.05857
   36008734. 1.137118E+12   0.00003167   0.00062772   19.82266080   1556.77797
43116.95696
   36909779. 1.135685E+12   0.00003250   0.00064461   19.83406126   1588.73076
44240.86879
   38706402. 1.132870E+12   0.00003417   0.00067849   19.85821187   1651.26191
46485.70206
   40495646. 1.130111E+12   0.00003583   0.00071251   19.88403189   1711.94362
48726.46598
   42277368. 1.127396E+12   0.00003750   0.00074668   19.91137755   1770.75399
50963.07483
   44051438. 1.124718E+12   0.00003917   0.00078099   19.94014156   1827.67105
53195.42926
   45817700. 1.122066E+12   0.00004083   0.00081545   19.97022736   1882.67135
55423.43794
   47576013. 1.119436E+12   0.00004250   0.00085007   20.00156629   1935.73134
57646.99385
   49326218. 1.116820E+12   0.00004417   0.00088484   20.03409827   1986.82625
59865.99224
   50760859. 1.107510E+12   0.00004583   0.00091770   20.02255189   2032.99528
60000.00000
   51884139. 1.092298E+12   0.00004750   0.00094855   19.96944416   2074.45668
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   52967919. 1.077314E+12   0.00004917   0.00097926   19.91723335   2114.01229
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   53853913. 1.059421E+12   0.00005083   0.00100860   19.84124529   2150.12800
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   54639861. 1.040759E+12   0.00005250   0.00103728   19.75767839   2183.90584
60000.00000
   55422104. 1.023177E+12   0.00005417   0.00106605   19.68095005   2216.29807
60000.00000
   56200574. 1.006577E+12   0.00005583   0.00109492   19.61047018   2247.29118
60000.00000
   56757573. 9.870882E+11   0.00005750   0.00112193   19.51178420   2274.85650
60000.00000
   57289169. 9.682676E+11   0.00005917   0.00114881   19.41655076   2300.98344
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   57817911. 9.504314E+11   0.00006083   0.00117578   19.32781255   2325.87980
60000.00000
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60000.00000
   58819246. 9.166636E+11   0.00006417   0.00123200   19.19999993   2373.64920
60000.00000
   59406952. 9.023841E+11   0.00006583   0.00126029   19.14365637   2395.52775
60000.00000
   59771790. 8.855080E+11   0.00006750   0.00128545   19.04365504   2413.68476
60000.00000

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60000.00000					
60425142.	8.530608E+11	0.00007083	0.00133513	18.84886444	2446.19380
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60748678.	8.379128E+11	0.00007250	0.00136007	18.75961769	2460.85134
60000.00000					
61070078.	8.234168E+11	0.00007417	0.00138509	18.67532980	2474.43195
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61389328.	8.095296E+11	0.00007583	0.00141017	18.59568965	2486.92636
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61706396.	7.962116E+11	0.00007750	0.00143533	18.52040970	2498.32497
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62333867.	7.711406E+11	0.00008083	0.00148587	18.38190043	2517.79529
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62639351.	7.592649E+11	0.00008250	0.00151118	18.31728065	2525.82325
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62822730.	7.464087E+11	0.00008417	0.00153465	18.23349917	2532.22483
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63004429.	7.340322E+11	0.00008583	0.00155819	18.15370238	2537.65757
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63184440.	7.221079E+11	0.00008750	0.00158180	18.07767355	2542.11339
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63362727.	7.106100E+11	0.00008917	0.00160546	18.00520670	2545.58396
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63748861.	6.891769E+11	0.00009250	0.00165834	17.92802775	2549.73497
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63916787.	6.787623E+11	0.00009417	0.00168161	17.85778391	2548.99081
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64081853.	6.686802E+11	0.00009583	0.00170494	17.79069650	2545.07331
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64245783.	6.589311E+11	0.00009750	0.00172834	17.72660887	2545.69855
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64408575.	6.494982E+11	0.00009917	0.00175182	17.66538370	2547.93915
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64730660.	6.315186E+11	0.00010250	0.00179898	17.55099928	2549.97695
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65046230.	6.146100E+11	0.00010583	0.00184651	17.44732010	2543.57073
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65357696.	5.986965E+11	0.00010917	0.00189431	17.35241926	2547.31493
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65585970.	5.829864E+11	0.00011250	0.00194026	17.24679816	2549.73247
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65742241.	5.675589E+11	0.00011583	0.00198470	17.13413680	2546.86905
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65895526.	5.529695E+11	0.00011917	0.00202938	17.02976453	2542.04033
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66046931.	5.391586E+11	0.00012250	0.00207423	16.93249476	2546.54318

60000.00000
66196388. 5.260640E+11 0.00012583 0.00211926 16.84178674 2549.20491
60000.00000
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66664390. 4.907808E+11 0.00013583 0.00226472 16.67277539 2542.44647
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66799867. 4.799990E+11 0.00013917 0.00230924 16.59331763 2546.30811
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66934144. 4.697133E+11 0.00014250 0.00235390 16.51859987 2548.81203
60000.00000
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67197878. 4.504886E+11 0.00014917 0.00244378 16.38288867 2546.68019
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67455824. 4.328716E+11 0.00015583 0.00253435 16.26319349 2537.47170
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67583605. 4.246090E+11 0.00015917 0.00257980 16.20815885 2542.11377
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67710574. 4.166805E+11 0.00016250 0.00262536 16.15608752 2545.70112
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67836716. 4.090656E+11 0.00016583 0.00267105 16.10681427 2548.21816
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  60000.00000
     68835154.  2.726145E+11    0.00025250    0.00383380   15.18337047    2546.72289
  60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 =   68244.25971
in-kip



--------------------------------------------------------------------------------
             Computed Values of Load Distribution and Deflection
                 for Lateral Loading for Load Case Number  1
--------------------------------------------------------------------------------

Pile-head boundary conditions are Shear and Moment (Pile-head Condition Type 1)
Specified shear force at pile head  =       32000.000 lbs
Specified moment at pile head       =    33756000.000 in-lbs
Specified axial load at pile head   =       32000.000 lbs


Output Verification:

Computed forces and moments are within specified convergence limits.



--------------------------------------------------------------------------------
             Computed Values of Load Distribution and Deflection
                 for Lateral Loading for Load Case Number  2
--------------------------------------------------------------------------------
```

Pile-head boundary conditions are Shear and Moment (Pile-head Condition Type 1)
Specified shear force at pile head =   13000.000 lbs
Specified moment at pile head   =   14088000.000 in-lbs
Specified axial load at pile head   =   32000.000 lbs

Output Verification:

Computed forces and moments are within specified convergence limits.

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

Type 1 = Shear and Moment, y = pile-head displacment in
Type 2 = Shear and Slope, M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness, V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment, S = Pile-head Slope, radians
Type 5 = Deflection and Slope, R = Rot. Stiffness of Pile-head in-lbs/rad

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 32000.	M= 3.38E+07	32000.0000	0.8791112	3.5209E+07	-313127.
1	V= 13000.	M= 1.41E+07	32000.0000	0.2273205	1.4715E+07	-128020.

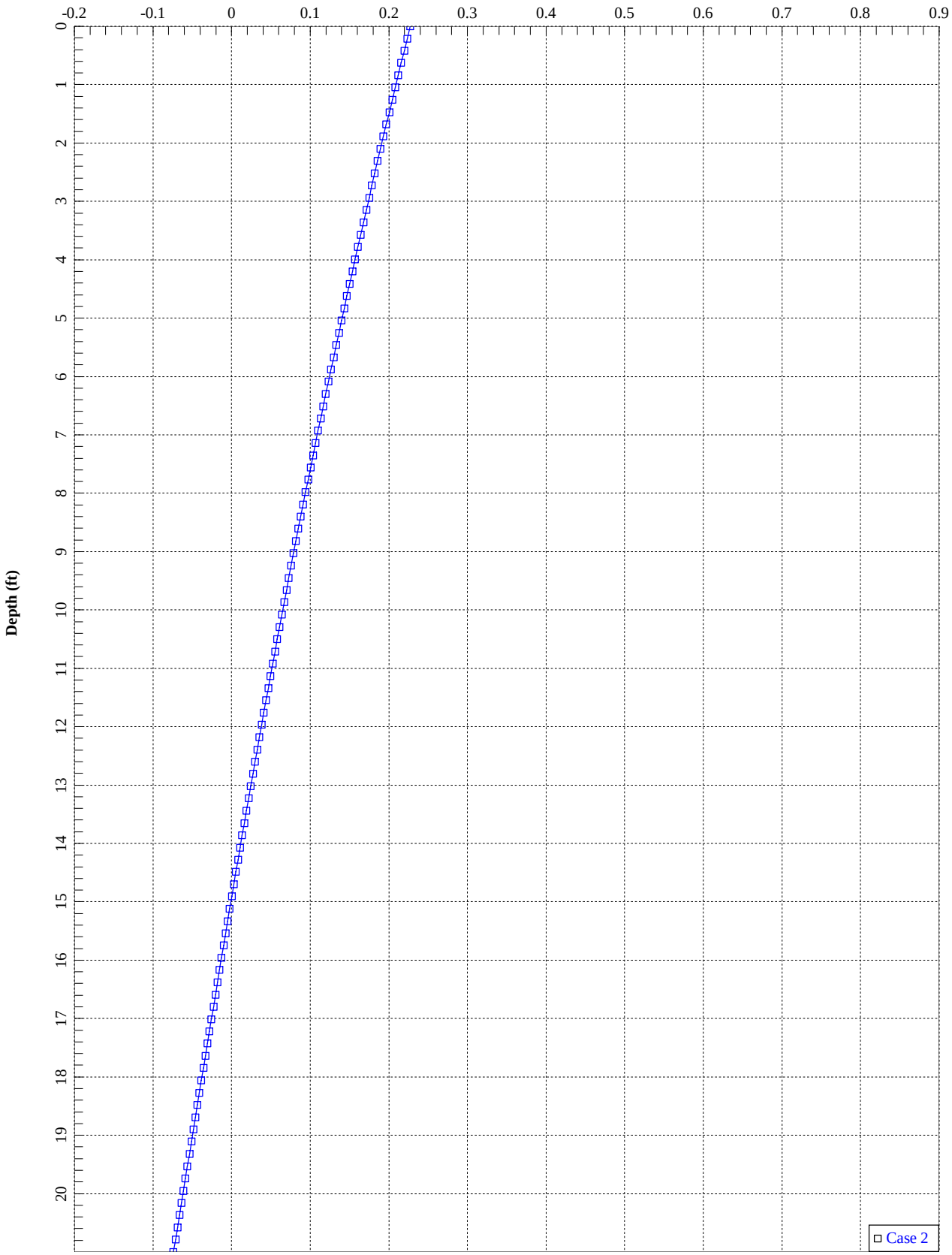
Computed Pile-head Stiffness Matrix Members
K22, K23, K32, K33 for Superstructure

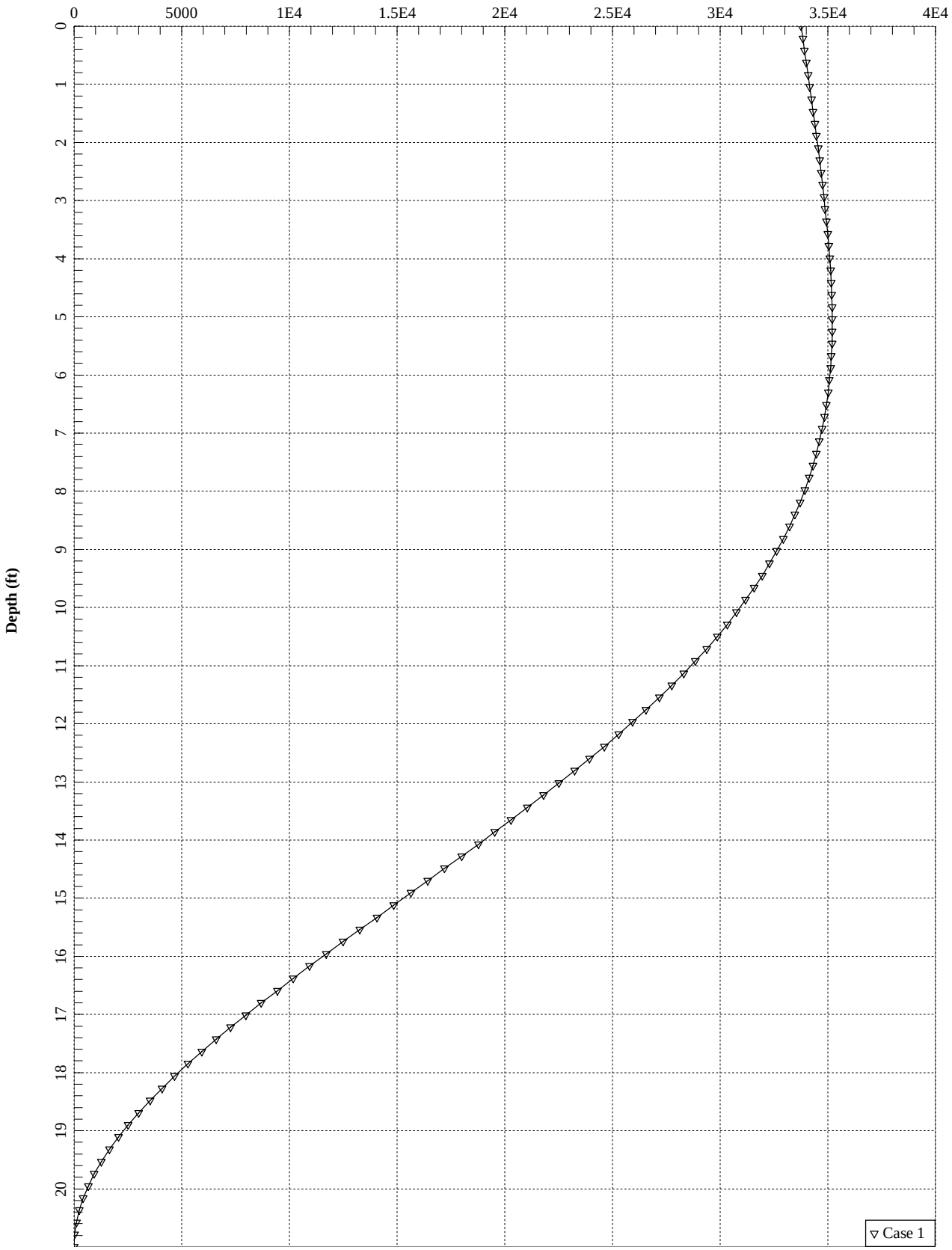
Top y in	Shear React. lbs	Mom. React. in-lbs	K22 lbs/in	K32 in-lbs/in
0.00150179	3200.00005	460967.95009	2130789.	3.069455E+08
0.00452084	9632.95986	1387652.	2130789.	3.069455E+08
0.00716536	15267.88015	2199376.	2130789.	3.069455E+08
0.00904168	19265.91972	2775304.	2130789.	3.069455E+08
0.01049707	22367.04014	3222028.	2130789.	3.069455E+08
0.01168621	24900.84001	3587028.	2130789.	3.069455E+08
0.01269161	27043.13728	3895631.	2130789.	3.069455E+08
0.01356290	28898.87958	4162927.	2130729.	3.069348E+08
0.01433201	30535.76030	4398656.	2130599.	3.069114E+08
0.01502037	32000.00000	4609492.	2130440.	3.068826E+08

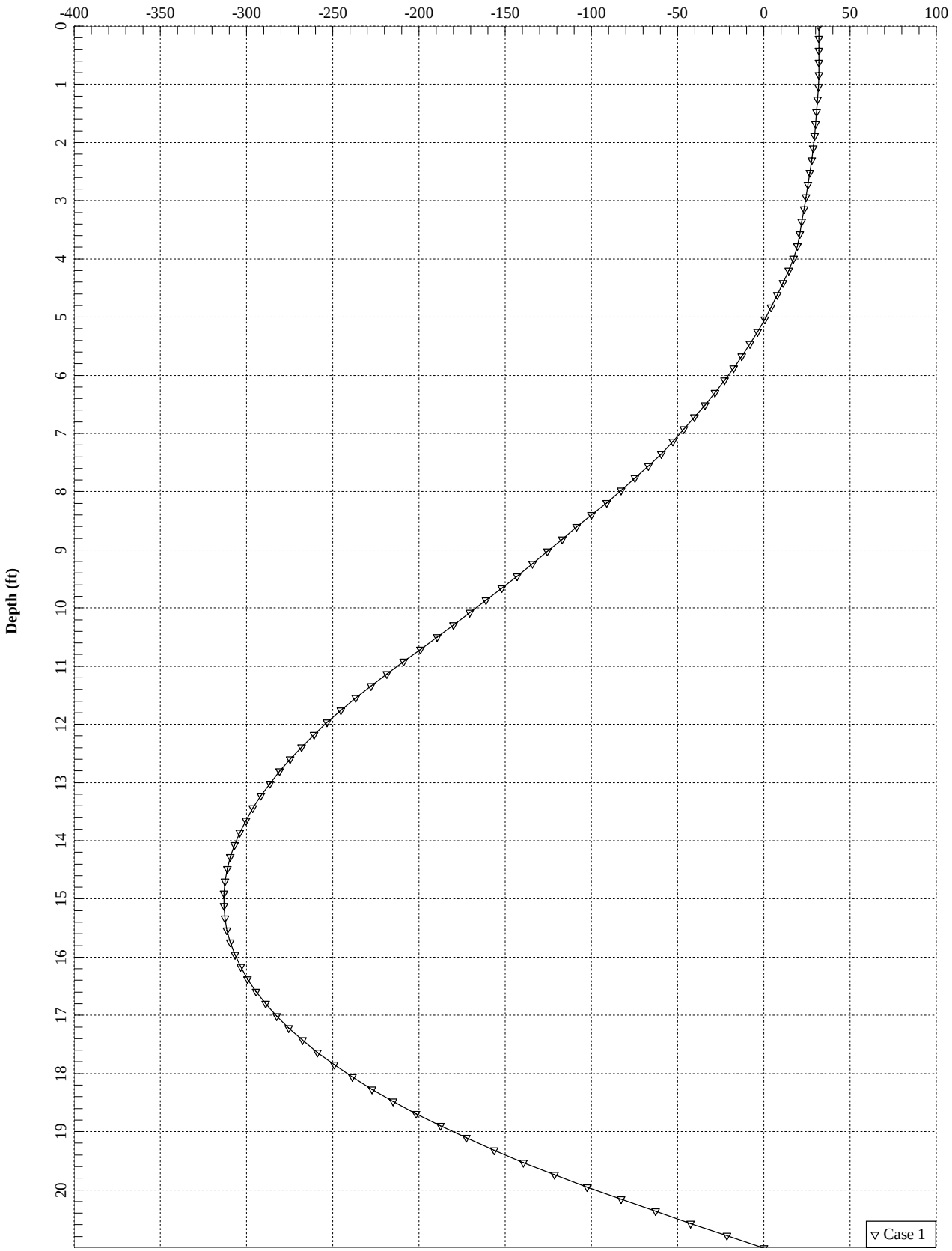
Top Rota. rad	Shear React. lbs	Mom. React. in-lbs	K23 lbs/rad	K33 in-lbs/rad
0.00006179	18966.87454	3375600.	3.069455E+08	5.462814E+10
0.00018677	57108.40391	10161569.	3.057627E+08	5.440581E+10
0.00029946	90545.00570	16105705.	3.023649E+08	5.378320E+10
0.00074819	117132.99259	20323137.	1.565552E+08	2.716308E+10
0.00102668	139712.44540	23594431.	1.360823E+08	2.298138E+10
0.00121992	158188.38515	26267274.	1.296711E+08	2.153195E+10
0.00137459	173866.52076	28527129.	1.264859E+08	2.075316E+10
0.00150809	187661.56904	30484706.	1.244362E+08	2.021406E+10
0.00161512	199390.83152	32211410.	1.234525E+08	1.994364E+10
0.00171577	210233.60068	33756000.	1.225305E+08	1.967401E+10

K22 = abs(Shear Reaction/Top y)
K23 = abs(Shear Reaction/Top Rotation)
K32 = abs(Moment Reaction/Top y)
K33 = abs(Moment Reaction/Top Rotation)

The analysis ended normally.


Lateral Deflection (in)
-0.2
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Case 2


Bending Moment (in-kips)
0
5000
1E4
1.5E4
2E4
2.5E4
3E4
3.5E4
4E4
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Case 1


Shear Force (kips)
-400
-350
-300
-250
-200
-150
-100
-50
0
50
100
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Case 1

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11103A_Anchor_5_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3

Section 1 - Site Information

Site ID: CT11103A
Status: Draft
Version: 5
Project Type: Anchor
Approved: Not Approved
Approved By: Not Approved
Last Modified: 7/1/2020 4:30:47 PM
Last Modified By: Dominic.Kallas2@T-Mobile.com

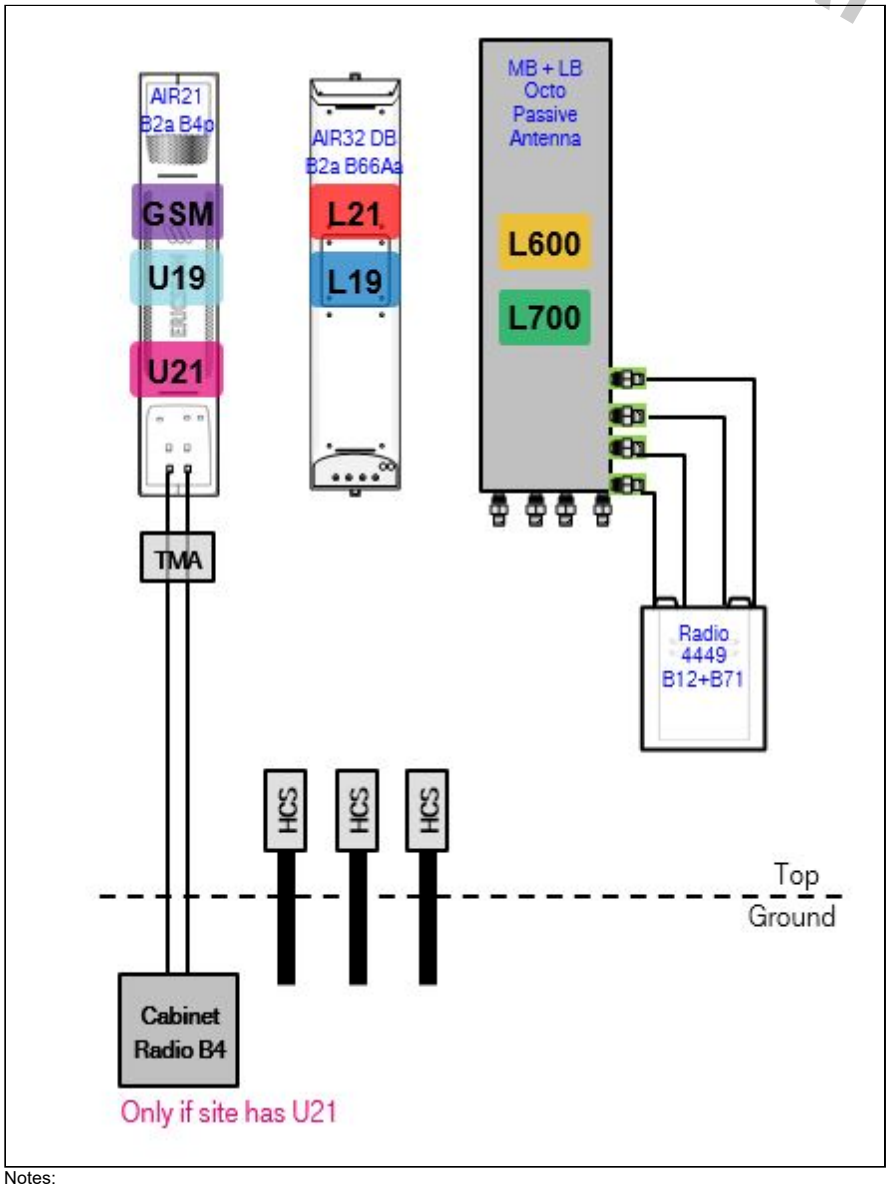
Site Name: Ridgefield/ Downtown1
Site Class: Monopole
Site Type: Structure Non Building
Plan Year: 2020
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Town of Ridgefield

Latitude: 41.28080844
Longitude: -73.49290060
Address: 76 East Ridge Road
City, State: Ridgefield, CT
Region: NORTHEAST

RAN Template: 67D5A997DB Outdoor			AL Template: 67D5997DB_2xAIR+1OP (U21 Market)	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 6	**TMA Count:** 3	**RRU Count:** 6

Section 2 - Existing Template Images

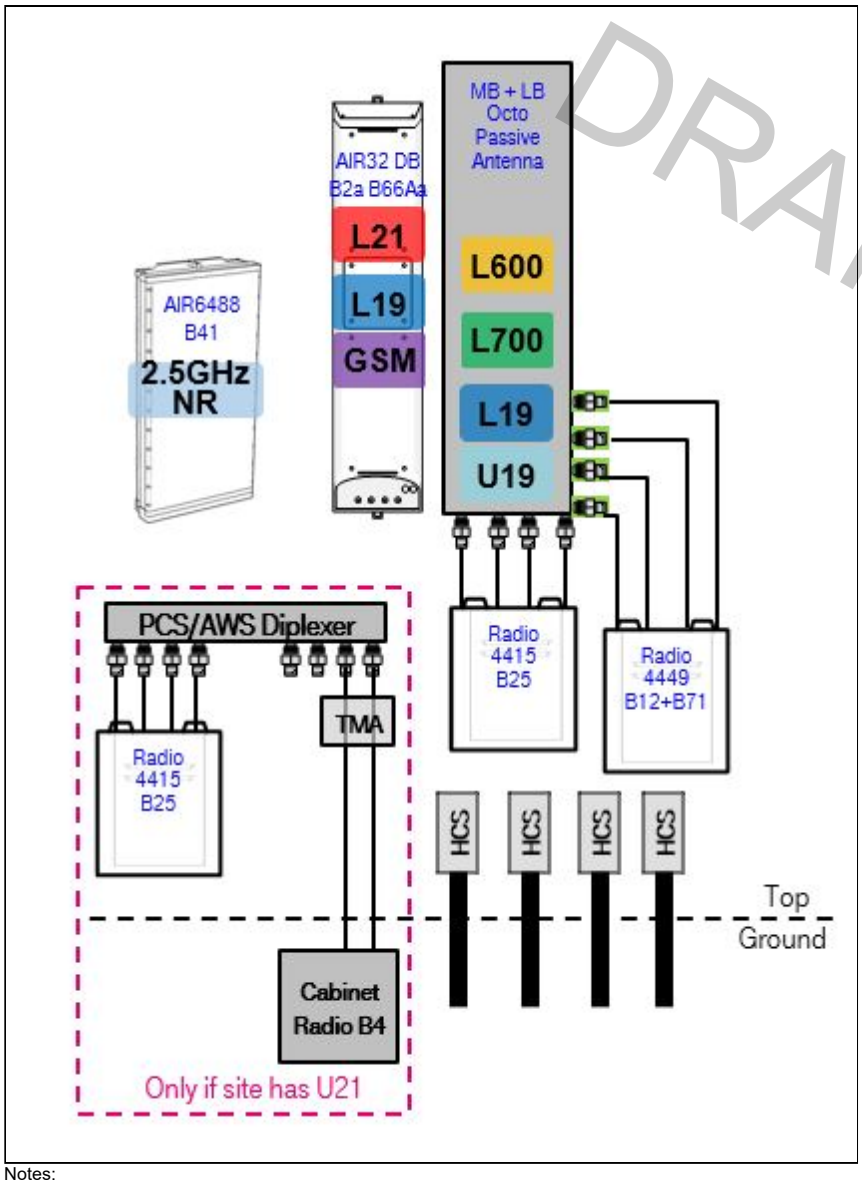
67D92DB_2xAIR+1OP.JPG



Notes:

Section 3 - Proposed Template Images

67D5997DB_2xAIR+1OP.JPG



Notes:

Section 4 - Siteplan Images

----- This section is intentionally blank. -----

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11103A_Anchor_5_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 67D92DB Outdoor

Enclosure	1	2
Enclosure Type	RBS 6131	Ancillary Equipment (Ericsson)
Baseband	DUW30 (U1900 (DECOMMISSIONED)); DUW30 (U2100); DUG20 (G1900); BB 6630 (L700, L600, L2100, L1900); BB 6630 (N600)	
Hybrid Cable System		Ericsson 9x18 HCS 40m; Ericsson 6x12 HCS 6AWG 40m **(x 2)**
Radio	RU22 **(x 6)** (U2100)	

Proposed RAN Equipment

Template: 67D5A997DB Outdoor

Enclosure	1	2	3	4
Enclosure Type	RBS 6131	Ancillary Equipment (Ericsson)	Enclosure 6160	B160
Baseband	DUW30; DUW30 (U2100); DUG20 (G1900); BB 6630 (L700, L600, L2100, L1900); BB 6630 (N600)		BB 6630 (L2500); BB 6648 (N2500)	
Hybrid Cable System		Ericsson 6x12 HCS 6AWG 40m **(x 2)**	Ericsson 6x12 HCS *Select AWG & Length*	
Radio	RU22 **(x 6)** (U2100)			

RAN Scope of Work:

Generator on site.

Remove XMU from existing RBS6131 cabinet, if present.

Replace BB5216 with (1) BB6630 for L2100, L1900 (both Carriers), L700, and L600 in existing RBS6131 cabinet, if not already done.

Add (1) Enclosure 6160.

Add (1) Battery Cabinet B160.

Add (1) iXRe Router to new Enclosure 6160.

Add (1) BB6630 for L2500 to new Enclosure 6160.

Add (1) BB6648 for N2500 to new Enclosure 6160.

Existing: (12) Coaxial Lines; (1) 9x18 & (2) 6x12 HCS

Remove (6) coaxial lines for a new total of (6) coaxial lines.

Remove (1) 9X18 HCS.

Add (1) 6X12 HCS for Anchor A&L equipment. Length of new HCS will match that of existing HCS.

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11103A_Anchor_5_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3

Section 6 - A&L Equipment

Existing Template: 67D92DB_2xAIR+1OP
Proposed Template: 67D5997DB_2xAIR+1OP (U21 Market)

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro										
Antenna	1		2				3	4			
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			
Azimuth	110		110					110			
M. Tilt	0		0					0			
Height	100		100					100			
Ports	P1	P2	P3	P4	P5	P6		P7	P8	P9	P10
Active Tech.	G1900	U2100	L700 L600 N600	L700 L600 N600				L2100	L2100	L1900	L1900
Dark Tech.											
Restricted Tech.											
Decomm. Tech.	U1900										
E. Tilt											
Cables		1 5/8In AVA COAX CABLE FIRE RETARDENT - 125 ft. JUMPER 6' SUREFLEX DIN MALE-DIN MALE	JUMPER 6' SUREFLEX DIN MALE-DIN MALE	JUMPER 6' SUREFLEX DIN MALE-DIN MALE				Fiber Jumper		Fiber Jumper	
TMAs		Generic Twin Style 1B - AWS (AtAntenna)									
Diplexers / Combiners											
Radio			Radio 4449 B71+B85 (At Antenna)								
Sector Equipment											

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11103A_Anchor_5_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3

Sector 1 (Proposed) view from behind											
Coverage Type	A - Outdoor Macro										
Antenna	1		2				3	4			
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)		RFS - APXVAARR24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			
Azimuth	110		110					110			
M. Tilt	0		0					0			
Height	100		100					100			
Ports	P1	P2	P3	P4	P5	P6		P7	P8	P9	P10
Active Tech.	L2500 N2500	L2500 N2500	L700 L600 N600	L700 L600 N600	L1900	U2100 L1900		L2100	L2100	G1900 L1900	L1900
Dark Tech.											
Restricted Tech.											
Decomm. Tech.											
E. Tilt											
Cables			JUMPER 6' SUREFLEX DIN MALE-DIN MALE **(x2)**	JUMPER 6' SUREFLEX DIN MALE-DIN MALE **(x2)**	JUMPER 6' SUREFLEX DIN MALE-DIN MALE **(x2)**	JUMPER 6' SUREFLEX DIN MALE-DIN MALE **(x2)** 1 5/8In AVA COAX CABLE FIRERETARDENT - 125 ft. **(x2)**		Fiber Jumper		Fiber Jumper	
TMAs						Generic Twin Style 1B - AWS (AtAntenna)					
Diplexers / Combiners					Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)	SHARED Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)					
Radio			Radio 4449	SHARED	Radio 4415	SHARED					

			B71 +B85 (Antenna)	Radio 4449 B71 +B85 (Antenna)	B25 (Antenna)	Radio 4415 B25 (Antenna)					
Sector Equipment											

Unconnected Equipment:

Scope of Work:

Remove AIR21 B2A/B4P from Position 1.

Install AIR6449 B41 for L2500 and N2500 in Position 1.

Add (1) PCS/AWS 8:4 diplexer to Position 2 at antenna, and connect its four output ports to the Mid-Band ports of the Octo antenna.

Add (1) Radio 4415 B25 for L1900 2nd Carrier to Position 2 near antenna, and connect its ports to the four PCS input ports of the diplexer.

Move coaxial lines and AWS TMA for U2100 to Position 2, and connect them to two AWS input ports of the diplexer.

Make sure to install metal caps on all empty ports of AWS/PCS diplexer for load balancing.

Move GSM to AIR32 DB in Position 4. GSM will share B2 Radios with L1900 1st Carrier.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11103A_Anchor_5_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3

Sector 2 (Existing) view from behind

Coverage Type	A - Outdoor Macro										
Antenna	1		2				3	4			
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			
Azimuth	230		230					230			
M. Tilt	0		0					0			
Height	100		100					100			
Ports	P1	P2	P3	P4	P5	P6		P7	P8	P9	P10
Active Tech.	G1900	U2100	L700 L600 N600	L700 L600 N600				L2100	L2100	L1900	L1900
Dark Tech.											
Restricted Tech.											
Decomm. Tech.	U1900										
E. Tilt											
Cables		1 5/8In AVA COAX CABLE FIRE RETARDENT - 125 ft. JUMPER 6' SUREFLEX DIN MALE-DIN MALE	JUMPER 6' SUREFLEX DIN MALE-DIN MALE	JUMPER 6' SUREFLEX DIN MALE-DIN MALE				Fiber Jumper		Fiber Jumper	
TMAs		Generic Twin Style 1B - AWS (AtAntenna)									
Diplexers / Combiners											
Radio			Radio 4449 B71+B85 (At Antenna)								
Sector Equipment											

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11103A_Anchor_5_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3

Sector 2 (Proposed) view from behind											
Coverage Type	A - Outdoor Macro										
Antenna	1		2				3	4			
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)		RFS - APXVAARR24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			
Azimuth	230		230					230			
M. Tilt	0		0					0			
Height	100		100					100			
Ports	P1	P2	P3	P4	P5	P6		P7	P8	P9	P10
Active Tech.	L2500 N2500	L2500 N2500	L700 L600 N600	L700 L600 N600	L1900	U2100 L1900		L2100	L2100	G1900 L1900	L1900
Dark Tech.											
Restricted Tech.											
Decomm. Tech.											
E. Tilt											
Cables			JUMPER 6' SUREFLEX DIN MALE-DIN MALE **(x2)**	JUMPER 6' SUREFLEX DIN MALE-DIN MALE **(x2)**	JUMPER 6' SUREFLEX DIN MALE-DIN MALE **(x2)**	JUMPER 6' SUREFLEX DIN MALE-DIN MALE **(x2)** 1 5/8In AVA COAX CABLE FIRERETARDENT - 125 ft. **(x2)**		Fiber Jumper		Fiber Jumper	
TMAs						Generic Twin Style 1B - AWS (AtAntenna)					
Diplexers / Combiners					Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)	SHARED Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)					
Radio			Radio 4449	SHARED	Radio 4415	SHARED					

			B71 +B85 (Antenna)	Radio 4449 B71 +B85 (Antenna)	B25 (Antenna)	Radio 4415 B25 (Antenna)					
Sector Equipment											

Unconnected Equipment:

Scope of Work:

Remove AIR21 B2A/B4P from Position 1.

Install AIR6449 B41 for L2500 and N2500 in Position 1.

Add (1) PCS/AWS 8:4 diplexer to Position 2 at antenna, and connect its four output ports to the Mid-Band ports of the Octo antenna.

Add (1) Radio 4415 B25 for L1900 2nd Carrier to Position 2 near antenna, and connect its ports to the four PCS input ports of the diplexer.

Move coaxial lines and AWS TMA for U2100 to Position 2, and connect them to two AWS input ports of the diplexer.

Make sure to install metal caps on all empty ports of AWS/PCS diplexer for load balancing.

Move GSM to AIR32 DB in Position 4. GSM will share B2 Radios with L1900 1st Carrier.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11103A_Anchor_5_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3

Sector 3 (Existing) view from behind

Coverage Type	A - Outdoor Macro										
Antenna	1		2				3	4			
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			
Azimuth	350		350					350			
M. Tilt	0		0					0			
Height	100		100					100			
Ports	P1	P2	P3	P4	P5	P6		P7	P8	P9	P10
Active Tech.	G1900	U2100	L700 L600 N600	L700 L600 N600				L2100	L2100	L1900	L1900
Dark Tech.											
Restricted Tech.											
Decomm. Tech.	U1900										
E. Tilt											
Cables		1 5/8In AVA COAX CABLE FIRE RETARDENT - 125 ft. JUMPER 6' SUREFLEX DIN MALE-DIN MALE	JUMPER 6' SUREFLEX DIN MALE-DIN MALE	JUMPER 6' SUREFLEX DIN MALE-DIN MALE				Fiber Jumper		Fiber Jumper	
TMAs		Generic Twin Style 1B - AWS (AtAntenna)									
Diplexers / Combiners											
Radio			Radio 4449 B71+B85 (At Antenna)								
Sector Equipment											

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11103A_Anchor_5_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3

Sector 3 (Proposed) view from behind											
Coverage Type	A - Outdoor Macro										
Antenna	1		2				3	4			
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)		RFS - APXVAARR24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			
Azimuth	350		350					350			
M. Tilt	0		0					0			
Height	100		100					100			
Ports	P1	P2	P3	P4	P5	P6		P7	P8	P9	P10
Active Tech.	L2500 N2500	L2500 N2500	L700 L600 N600	L700 L600 N600	L1900	U2100 L1900		L2100	L2100	G1900 L1900	L1900
Dark Tech.											
Restricted Tech.											
Decomm. Tech.											
E. Tilt											
Cables			JUMPER 6' SUREFLEX DIN MALE-DIN MALE **(x2)**	JUMPER 6' SUREFLEX DIN MALE-DIN MALE **(x2)**	JUMPER 6' SUREFLEX DIN MALE-DIN MALE **(x2)**	JUMPER 6' SUREFLEX DIN MALE-DIN MALE **(x2)** 1 5/8In AVA COAX CABLE FIRERETARDENT - 125 ft. **(x2)**		Fiber Jumper		Fiber Jumper	
TMAs						Generic Twin Style 1B - AWS (AtAntenna)					
Diplexers / Combiners					Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)	SHARED Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)					
Radio			Radio 4449	SHARED	Radio 4415	SHARED					

			B71 +B85 (Antenna)	Radio 4449 B71 +B85 (Antenna)	B25 (Antenna)	Radio 4415 B25 (Antenna)					
Sector Equipment											

Unconnected Equipment:

Scope of Work:

Remove AIR21 B2A/B4P from Position 1.

Install AIR6449 B41 for L2500 and N2500 in Position 1.

Add (1) PCS/AWS 8:4 diplexer to Position 2 at antenna, and connect its four output ports to the Mid-Band ports of the Octo antenna.

Add (1) Radio 4415 B25 for L1900 2nd Carrier to Position 2 near antenna, and connect its ports to the four PCS input ports of the diplexer.

Move coaxial lines and AWS TMA for U2100 to Position 2, and connect them to two AWS input ports of the diplexer.

Make sure to install metal caps on all empty ports of AWS/PCS diplexer for load balancing.

Move GSM to AIR32 DB in Position 4. GSM will share B2 Radios with L1900 1st Carrier.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11103A_Anchor_5_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

----- This section is intentionally blank. -----

Proposed Power Systems Equipment

CENTEK engineering

Centered on Solutions℠

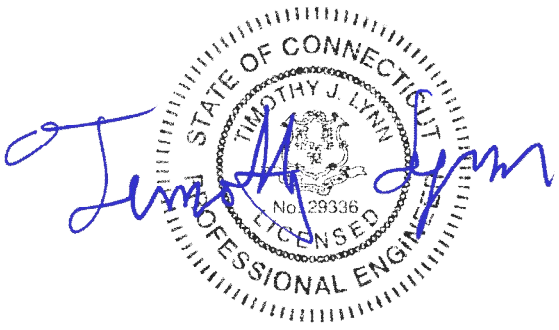
Structural Analysis Report

Antenna Mount Analysis

T-Mobile Site #: CT11103A

76 East Ridge Road
Ridgefield, CT

Centek Project No. 20074.48



Date: July 15, 2020

Max Stress Ratio = 53.2%

Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

July 15, 2020

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11103A
76 East Ridge Road
Ridgefield, CT 06877

Centek Project No. 20074.48

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting of one (1) 13-ft platform w/ handrail to support the equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  Platform: Three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson AIR32 panel antennas, three (3) RFS APXVAARR24-43-NA20 panel antennas, three (3) KRY112 TMAs, three (3) Ericsson 4415 remote radio units and three (3) Ericsson 4449 remote radio units mounted on one (1) platform with a RAD center elevation of 100-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 93 mph for Ridgefield as required in Appendix N of the 2018 Connecticut State Building Code.

A structural analysis of tower and foundation needs to be completed prior to any work.

Based on our review of the installation, it is our opinion that the subject antenna mount has sufficient capacity to support the aforementioned antenna configuration. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Section 2 - Calculations

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: TIA-222-G Loads

Location: Ridgefield, CT

Rev. 0: 7/15/20

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 20074.48

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-G

Wind Speeds

Basic Wind Speed $V := 93$ mph (User Input - 2016 CSBC Appendix N)

Basic Wind Speed with Ice $V_i := 50$ mph (User Input per Annex B of TIA-222-G)

Input

Structure Type = Structure_Type := Pole (User Input)

Structure Category = $SC := II$ (User Input)

Exposure Category = $Exp := B$ (User Input)

Structure Height = $h := 130$ ft (User Input)

Height to Center of Antennas = $z_{ant} := 100$ ft (User Input)

Radial Ice Thickness = $t_i := 0.75$ in (User Input per Annex B of TIA-222-G)

Radial Ice Density = $Id := 56.00$ pcf (User Input)

Topograpic Factor = $K_{zt} := 1.0$ (User Input)

$K_a := 1.0$ (User Input)

Gust Response Factor = $G_H = 1.1$ (User Input)

Output

Wind Direction Probability Factor =

$$K_d := \begin{cases} 0.95 & \text{if Structure\_Type = Pole} \\ 0.85 & \text{if Structure\_Type = Lattice} \end{cases} = 0.95$$

(Per Table 2-2 of TIA-222-G)

Importance Factors =

$$I_{Wind} := \begin{cases} 0.87 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \end{cases} = 1$$

(Per Table 2-3 of TIA-222-G)

$$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.00 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \end{cases} = 1$$

$$K_{iz} := \left(\frac{z_{ant}}{33}\right)^{0.1} = 1.117$$

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.676$$

Velocity Pressure Coefficient Antennas =

$$Kz_{ant} := 2.01\left(\left(\frac{z_{ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 0.988$$

Velocity Pressure w/o Ice Antennas = $qz_{ant} := 0.00256 \cdot K_d \cdot Kz_{ant} \cdot V^2 \cdot I_{Wind} = 20.787$

Velocity Pressure with Ice Antennas = $qz_{ice.ant} := 0.00256 \cdot K_d \cdot Kz_{ant} \cdot V_i^2 \cdot I_{Wind} = 6.008$

CENTEK engineering
Centered on Solutions™ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	TIA-222-G Loads
Location:	Ridgefield, CT
Rev. 0: 7/15/20	Prepared by: T.J.L. Checked by: C.F.C. Job No. 20074.48

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR32		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 56.6$	in	(User Input)
Antenna Width =	$W_{ant} := 12.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 133$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.4$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.1$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 149$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.4$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 100$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.8$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 57$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 5$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 43$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 133$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6352$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 5390$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 175$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 175$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR6449		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 33.1$	in	(User Input)
Antenna Width =	$W_{ant} := 20.5$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.3$	in	(User Input)
Antenna Weight =	$WT_{ant} := 103$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.6$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 129$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 52$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 48$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 2.9$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 23$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 103$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5632$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 4498$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 146$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 146$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPXVAARR24-43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 153$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 463$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 168$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 18.9$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 158$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.3$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 70$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 153$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \times 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 411$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 411$	lbs

Development of Wind & Ice Load on TMA's

TMA Data:

TMA Model = Ericsson KRY112 TMA

TMA Shape = Flat (User Input)

TMA Height = $L_{TMA} := 7.7$ in (User Input)

TMA Width = $W_{TMA} := 7.5$ in (User Input)

TMA Thickness = $T_{TMA} := 3.4$ in (User Input)

TMA Weight = $WT_{TMA} := 11$ lbs (User Input)

Number of TMA's = $N_{TMA} := 1$ (User Input)

TMA Aspect Ratio = $Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1$

TMA Force Coefficient = $Ca_{TMA} = 1.2$

Wind Load (without ice)

Surface Area for One TMA = $SA_{TMAF} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.4$ sf

Total TMA Wind Force = $F_{TMA} := qz_{ant} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAF} = 11$ lbs

Surface Area for One TMA = $SA_{TMAS} := \frac{L_{TMA} \cdot T_{TMA}}{144} = 0.2$ sf

Total TMA Wind Force = $F_{TMA} := qz_{ant} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAS} = 5$ lbs

Wind Load (with ice)

Surface Area for One TMA w/ Ice = $SA_{ICETMAF} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz})}{144} = 0.8$ sf

Total TMA Wind Force w/ Ice = $Fi_{TMA} := qz_{ice.ant} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAF} = 7$ lbs

Surface Area for One TMA w/ Ice = $SA_{ICETMAS} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz})}{144} = 0.5$ sf

Total TMA Wind Force w/ Ice = $Fi_{TMA} := qz_{ice.ant} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAS} = 4$ lbs

Gravity Load (without ice)

Weight of All TMAs = $WT_{TMA} \cdot N_{TMA} = 11$ lbs

Gravity Loads (ice only)

Volume of Each TMA = $V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 196$ cu in

Volume of Ice on Each TMA = $V_{ice} := (L_{TMA} + 2 \cdot t_{iz})(W_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz}) - V_{TMA} = 613$ cu in

Weight of Ice on Each TMA = $W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 20$ lbs

Weight of Ice on All TMAs = $W_{ICETMA} \cdot N_{TMA} = 20$ lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4449 B71B12		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 14.9$	in	(User Input)
RRUS Width =	$W_{RRUS} := 13.2$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 10.4$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 74$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		(User Input)
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz_{ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 37$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz_{ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 30$	lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice.ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 17$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.7$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice.ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 14$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 74$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2045$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2109$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 68$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 68$	lbs

Development of Wind & Ice Load on RRUS

RRUS Data:

RRUS Model = Ericsson 4415 B25

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 14.9$ in (User Input)

RRUS Width = $W_{RRUS} := 13.2$ in (User Input)

RRUS Thickness = $T_{RRUS} := 5.4$ in (User Input)

RRUS Weight = $WT_{RRUS} := 47$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$ (User Input)

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$

RRUS Force Coefficient = $Ca_{RRUS} = 1.2$

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 37$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 0.6$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 15$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 17$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.1$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 9$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 47$ lbs

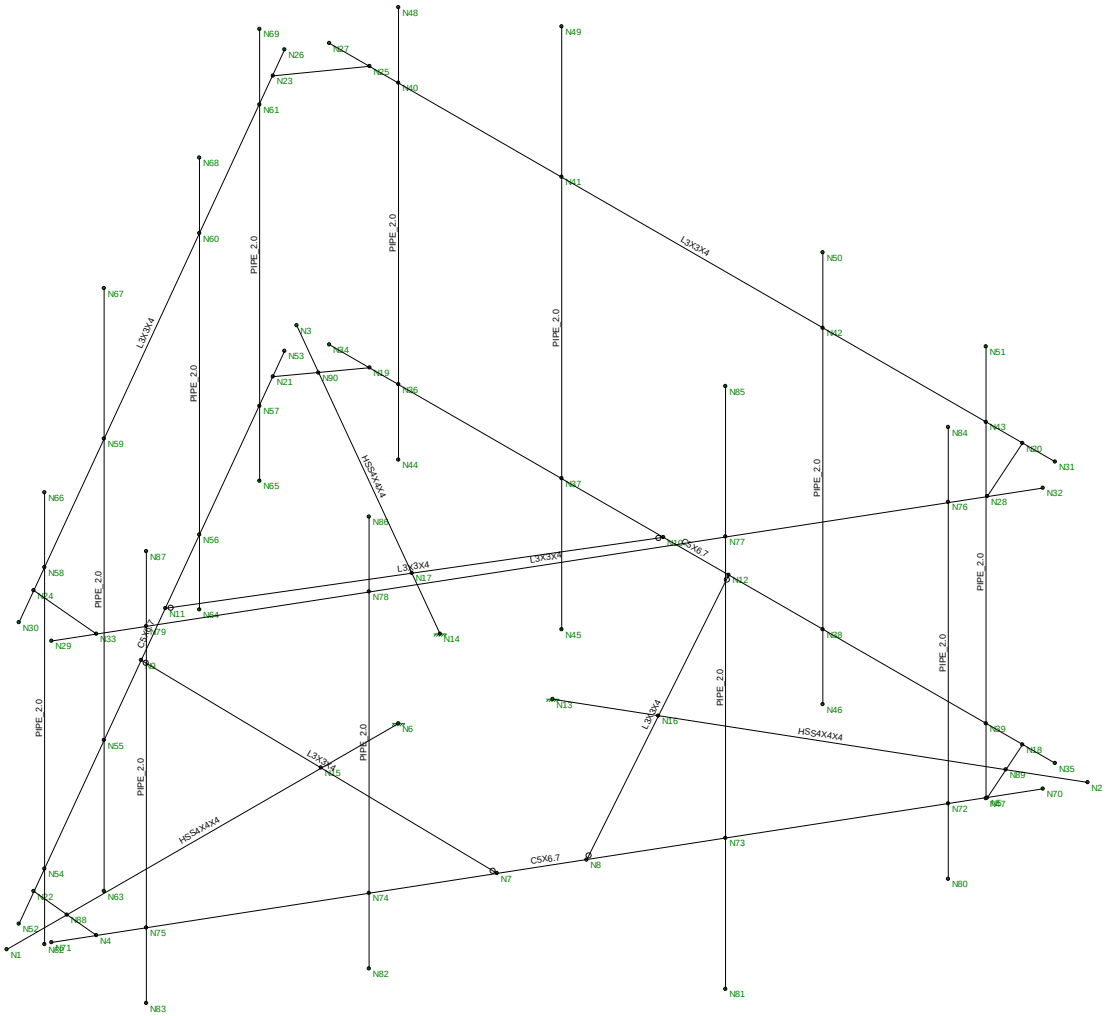
Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 1062$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 1582$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 51$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 51$ lbs



Envelope Only Solution

Centek		
TJL	CT11103A	July 15, 2020 at 9:11 AM
20074.48	Member Framing	Mount.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Outrigger	HSS4X4X4	Beam	Tube	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
2	Horz	C5X6.7	Beam	Pipe	A36 Gr.36	Typical	1.97	.47	7.48	.055
3	Antenna Mast	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Support	L3X3X4	Beam	Tube	A36 Gr.36	Typical	1.44	1.23	1.23	.031
5	Handrail	L3X3X4	Beam	Single Angle	A36 Gr.36	Typical	1.44	1.23	1.23	.031

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Outrigger	6			Lbyy						Lateral
2	M9	Horz	11.124									Lateral
3	M10	Horz	11.124									Lateral
4	M11	Horz	11.124					0				Lateral
5	M17A	Support	5.563									Lateral
6	M18A	Outrigger	6			Lbyy						Lateral
7	M19A	Support	5.563									Lateral
8	M20A	Outrigger	6			Lbyy						Lateral
9	M21A	Support	5.563									Lateral
10	M24	Handrail	11.124									Lateral
11	M21	Handrail	11.124									Lateral
12	M23A	Handrail	11.124									Lateral
13	M19	Antenna Mast	6			Lbyy						Lateral
14	M20	Antenna Mast	8			Lbyy						Lateral
15	M21B	Antenna Mast	6			Lbyy						Lateral
16	M22	Antenna Mast	6			Lbyy						Lateral
17	M23	Antenna Mast	6			Lbyy						Lateral
18	M24B	Antenna Mast	8			Lbyy						Lateral
19	M25	Antenna Mast	6			Lbyy						Lateral
20	M26	Antenna Mast	6			Lbyy						Lateral
21	M27	Antenna Mast	6			Lbyy						Lateral
22	M28	Antenna Mast	8			Lbyy						Lateral
23	M29	Antenna Mast	6			Lbyy						Lateral
24	M30	Antenna Mast	6			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N6	N1			Outrigger	Beam	Tube	A500 Gr....	Typical
2	M9	N70	N71		180	Horz	Beam	Pipe	A36 Gr.36	Typical
3	M10	N34	N35		180	Horz	Beam	Pipe	A36 Gr.36	Typical
4	M11	N52	N53		180	Horz	Beam	Pipe	A36 Gr.36	Typical
5	M17A	N7	N9		90	Support	Beam	Tube	A36 Gr.36	Typical
6	M18A	N13	N2			Outrigger	Beam	Tube	A500 Gr....	Typical
7	M19A	N12	N8		90	Support	Beam	Tube	A36 Gr.36	Typical
8	M20A	N14	N3			Outrigger	Beam	Tube	A500 Gr....	Typical
9	M21A	N11	N10		90	Support	Beam	Tube	A36 Gr.36	Typical
10	M24	N26	N30		180	Handrail	Beam	Single Angle	A36 Gr.36	Typical
11	M21	N29	N32		180	Handrail	Beam	Single Angle	A36 Gr.36	Typical
12	M23A	N31	N27		180	Handrail	Beam	Single Angle	A36 Gr.36	Typical
13	M22A	N23	N25			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
14	M23B	N33	N24			RIGID	None	None	RIGID	Typical
15	M24A	N28	N20			RIGID	None	None	RIGID	Typical
16	M16	N22	N4			RIGID	None	None	RIGID	Typical
17	M17	N21	N19			RIGID	None	None	RIGID	Typical
18	M18	N18	N5			RIGID	None	None	RIGID	Typical
19	M19	N44	N48			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
20	M20	N45	N49			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
21	M21B	N46	N50			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
22	M22	N47	N51			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
23	M23	N62	N66			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
24	M24B	N63	N67			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
25	M25	N64	N68			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
26	M26	N65	N69			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
27	M27	N80	N84			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
28	M28	N81	N85			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
29	M29	N82	N86			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
30	M30	N83	N87			Antenna Mast	Beam	Pipe	A53 Gra...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	7	0	
2	N2	6.062178	0	-3.5	0	
3	N3	-6.062178	0	-3.5	0	
4	N4	.5	0	6.133975	0	
5	N5	5.5	0	-2.526279	0	
6	N6	0	0	1	0	
7	N7	2.75	0	2.23686	0	
8	N8	3.25	0	1.370835	0	
9	N9	-2.812178	0	2.129165	0	
10	N10	-0.437822	0	-3.5	0	
11	N11	-3.312178	0	1.26314	0	
12	N12	0.562178	0	-3.5	0	
13	N13	0.866025	0	-.5	0	
14	N14	-0.866025	0	-.5	0	
15	N15	0	0	2.183615	0	
16	N16	1.891066	0	-1.091807	0	
17	N17	-1.891066	0	-1.091807	0	
18	N18	5.062178	0	-3.5	0	
19	N19	-4.937822	0	-3.5	0	
20	N20	5.062178	4	-3.5	0	
21	N21	-5.562178	0	-2.633975	0	
22	N22	-0.562178	0	6.026279	0	
23	N23	-5.562178	4	-2.633975	0	
24	N24	-0.562178	4	6.026279	0	
25	N25	-4.937822	4	-3.5	0	
26	N26	-5.812178	4	-3.066987	0	
27	N27	-5.562178	4	-3.5	0	
28	N28	5.5	4	-2.526279	0	
29	N29	.25	4	6.566987	0	
30	N30	-.25	4	6.566987	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
31	N31	5.562178	4	-3.5	0	
32	N32	5.812178	4	-3.066987	0	
33	N33	.5	4	6.133975	0	
34	N34	-5.561822	0	-3.5	0	
35	N35	5.562178	0	-3.5	0	
36	N36	-4.5	0	-3.5	0	
37	N37	-2	0	-3.5	0	
38	N38	2	0	-3.5	0	
39	N39	4.5	0	-3.5	0	
40	N40	-4.5	4	-3.5	0	
41	N41	-2	4	-3.5	0	
42	N42	2	4	-3.5	0	
43	N43	4.5	4	-3.5	0	
44	N44	-4.5	-1	-3.5	0	
45	N45	-2	-2	-3.5	0	
46	N46	2	-1	-3.5	0	
47	N47	4.5	-1	-3.5	0	
48	N48	-4.5	5	-3.5	0	
49	N49	-2	6	-3.5	0	
50	N50	2	5	-3.5	0	
51	N51	4.5	5	-3.5	0	
52	N52	-0.250178	0	6.566679	0	
53	N53	-5.812178	0	-3.066987	0	
54	N54	-0.781089	0	5.647114	0	
55	N55	-2.031089	0	3.482051	0	
56	N56	-4.031089	0	0.017949	0	
57	N57	-5.281089	0	-2.147114	0	
58	N58	-0.781089	4	5.647114	0	
59	N59	-2.031089	4	3.482051	0	
60	N60	-4.031089	4	0.017949	0	
61	N61	-5.281089	4	-2.147114	0	
62	N62	-0.781089	-1	5.647114	0	
63	N63	-2.031089	-2	3.482051	0	
64	N64	-4.031089	-1	0.017949	0	
65	N65	-5.281089	-1	-2.147114	0	
66	N66	-0.781089	5	5.647114	0	
67	N67	-2.031089	6	3.482051	0	
68	N68	-4.031089	5	0.017949	0	
69	N69	-5.281089	5	-2.147114	0	
70	N70	5.812	0	-3.066679	0	
71	N71	.25	0	6.566987	0	
72	N72	5.281089	0	-2.147114	0	
73	N73	4.031089	0	0.017949	0	
74	N74	2.031089	0	3.482051	0	
75	N75	0.781089	0	5.647114	0	
76	N76	5.281089	4	-2.147114	0	
77	N77	4.031089	4	0.017949	0	
78	N78	2.031089	4	3.482051	0	
79	N79	0.781089	4	5.647114	0	
80	N80	5.281089	-1	-2.147114	0	
81	N81	4.031089	-2	0.017949	0	
82	N82	2.031089	-1	3.482051	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
83	N83	0.781089	-1	5.647114	0	
84	N84	5.281089	5	-2.147114	0	
85	N85	4.031089	6	0.017949	0	
86	N86	2.031089	5	3.482051	0	
87	N87	0.781089	5	5.647114	0	
88	N88	0	0	6.083279	0	
89	N89	5.268274	0	-3.04164	0	
90	N90	-5.268274	0	-3.04164	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N6	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N13	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N14	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M19	Y	-.052	2.5
2	M19	Y	-.052	5.5
3	M23	Y	-.052	2.5
4	M27	Y	-.052	2.5
5	M23	Y	-.052	5.5
6	M27	Y	-.052	5.5
7	M22	Y	-.067	1.5
8	M22	Y	-.067	5.5
9	M26	Y	-.067	1.5
10	M30	Y	-.067	1.5
11	M26	Y	-.067	5.5
12	M30	Y	-.067	5.5
13	M20	Y	-.077	1
14	M24B	Y	-.077	1
15	M28	Y	-.077	1
16	M20	Y	-.077	7
17	M24B	Y	-.077	7
18	M28	Y	-.077	7
19	M20	Y	-.074	3
20	M24B	Y	-.074	3
21	M28	Y	-.074	3
22	M20	Y	-.047	5.5
23	M24B	Y	-.047	5.5
24	M28	Y	-.047	5.5

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M19	Y	-.073	2.5
2	M19	Y	-.073	5.5
3	M23	Y	-.073	2.5
4	M27	Y	-.073	2.5

Member Point Loads (BLC 3 : Ice Load) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
5	M23	Y	-.073	5.5
6	M27	Y	-.073	5.5
7	M22	Y	-.088	1.5
8	M22	Y	-.088	5.5
9	M26	Y	-.088	1.5
10	M30	Y	-.088	1.5
11	M26	Y	-.088	5.5
12	M30	Y	-.088	5.5
13	M20	Y	-.206	1
14	M24B	Y	-.206	1
15	M28	Y	-.206	1
16	M20	Y	-.206	7
17	M24B	Y	-.206	7
18	M28	Y	-.206	7
19	M20	Y	-.068	3
20	M24B	Y	-.068	3
21	M28	Y	-.068	3
22	M20	Y	-.051	5.5
23	M24B	Y	-.051	5.5
24	M28	Y	-.051	5.5

Member Point Loads (BLC 4 : Wind with Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M19	X	.012	2.5
2	M19	X	.012	5.5
3	M23	X	.024	2.5
4	M27	X	.024	2.5
5	M23	X	.024	5.5
6	M27	X	.024	5.5
7	M22	X	.022	1.5
8	M22	X	.022	5.5
9	M26	X	.029	1.5
10	M30	X	.029	1.5
11	M26	X	.029	5.5
12	M30	X	.029	5.5
13	M20	X	.035	1
14	M20	X	.035	7
15	M24B	X	.079	1
16	M28	X	.079	1
17	M24B	X	.079	7
18	M28	X	.079	7
19	M20	X	.014	3
20	M24B	X	.014	3
21	M28	X	.014	3
22	M20	X	.009	5.5
23	M24B	X	.009	5.5
24	M28	X	.009	5.5

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M19	X	.026	2.5

Member Point Loads (BLC 5 : Wind X) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
2	M19	X	.026	5.5
3	M23	X	.065	2.5
4	M27	X	.065	2.5
5	M23	X	.065	5.5
6	M27	X	.065	5.5
7	M22	X	.05	1.5
8	M22	X	.05	5.5
9	M26	X	.075	1.5
10	M30	X	.075	1.5
11	M26	X	.075	5.5
12	M30	X	.075	5.5
13	M20	X	.084	1
14	M20	X	.084	7
15	M24B	X	.232	1
16	M28	X	.232	1
17	M24B	X	.232	7
18	M28	X	.232	7
19	M20	X	.03	3
20	M24B	X	.03	3
21	M28	X	.03	3
22	M20	X	.015	5.5
23	M24B	X	.015	5.5
24	M28	X	.015	5.5

Member Point Loads (BLC 6 : Wind with Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M19	Z	.024	2.5
2	M19	Z	.024	5.5
3	M23	Z	.012	2.5
4	M27	Z	.012	2.5
5	M23	Z	.012	5.5
6	M27	Z	.012	5.5
7	M22	Z	.029	1.5
8	M22	Z	.029	5.5
9	M26	Z	.022	1.5
10	M30	Z	.022	1.5
11	M26	Z	.022	5.5
12	M30	Z	.022	5.5
13	M20	Z	.079	1
14	M20	Z	.079	7
15	M24B	Z	.035	1
16	M28	Z	.035	1
17	M24B	Z	.035	7
18	M28	Z	.035	7
19	M20	Z	.014	3
20	M24B	Z	.014	3
21	M28	Z	.014	3
22	M20	Z	.009	5.5
23	M24B	Z	.009	5.5
24	M28	Z	.009	5.5

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M19	Z	.065	2.5
2	M19	Z	.065	5.5
3	M23	Z	.026	2.5
4	M27	Z	.026	2.5
5	M23	Z	.026	5.5
6	M27	Z	.026	5.5
7	M22	Z	.075	1.5
8	M22	Z	.075	5.5
9	M26	Z	.05	1.5
10	M30	Z	.05	1.5
11	M26	Z	.05	5.5
12	M30	Z	.05	5.5
13	M20	Z	.232	1
14	M20	Z	.232	7
15	M24B	Z	.084	1
16	M28	Z	.084	1
17	M24B	Z	.084	7
18	M28	Z	.084	7
19	M20	Z	.03	3
20	M24B	Z	.03	3
21	M28	Z	.03	3
22	M20	Z	.015	5.5
23	M24B	Z	.015	5.5
24	M28	Z	.015	5.5

Member Distributed Loads (BLC 4 : Wind with Ice X)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M11	X	.003	.003	0	0
2	M19	X	.003	.003	0	0
3	M20	X	.003	.003	0	0
4	M21B	X	.003	.003	0	0
5	M22	X	.003	.003	0	0
6	M25	X	.003	.003	0	0
7	M29	X	.003	.003	0	0
8	M24	X	.003	.003	0	0
9	M21	X	.003	.003	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M11	X	.009	.009	0	0
2	M19	X	.009	.009	0	0
3	M20	X	.009	.009	0	0
4	M21B	X	.009	.009	0	0
5	M22	X	.009	.009	0	0
6	M25	X	.009	.009	0	0
7	M29	X	.009	.009	0	0
8	M24	X	.009	.009	0	0
9	M21	X	.009	.009	0	0

Member Distributed Loads (BLC 6 : Wind with Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M23A	Z	.003	.003	0	0
2	M21B	Z	.003	.003	0	0
3	M10	Z	.003	.003	0	0
4	M27	Z	.003	.003	0	0
5	M28	Z	.003	.003	0	0
6	M29	Z	.003	.003	0	0
7	M30	Z	.003	.003	0	0
8	M23	Z	.003	.003	0	0
9	M24B	Z	.003	.003	0	0
10	M25	Z	.003	.003	0	0
11	M26	Z	.003	.003	0	0
12	M24	Z	.003	.003	0	0
13	M21	Z	.003	.003	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M23A	Z	.009	.009	0	0
2	M21B	Z	.009	.009	0	0
3	M10	Z	.009	.009	0	0
4	M27	Z	.009	.009	0	0
5	M28	Z	.009	.009	0	0
6	M29	Z	.009	.009	0	0
7	M30	Z	.009	.009	0	0
8	M23	Z	.009	.009	0	0
9	M24B	Z	.009	.009	0	0
10	M25	Z	.009	.009	0	0
11	M26	Z	.009	.009	0	0
12	M24	Z	.009	.009	0	0
13	M21	Z	.009	.009	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	DL		-1						
2	Dead Load	None					24			
3	Ice Load	None					24			
4	Wind with Ice X	None					24	9		
5	Wind X	None					24	9		
6	Wind with Ice Z	None					24	13		
7	Wind Z	None					24	13		

Load Combinations

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.2D + 1.6W (X-direc...	Yes	Y		1	1.2	2	1.2	5	1.6																
2	0.9D + 1.6W (X-direc...	Yes	Y		1	.9	2	.9	5	1.6																
3	1.2D + 1.0Di + 1.0Wi...	Yes	Y		1	1.2	2	1.2	3	1	4	1														
4	1.2D + 1.6W (Z-direc...	Yes	Y		1	1.2	2	1.2	7	1.6																
5	0.9D + 1.6W (Z-direc...	Yes	Y		1	.9	2	.9	7	1.6																
6	1.2D + 1.0Di + 1.0Wi...	Yes	Y		1	1.2	2	1.2	3	1	6	1														

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N6	max	.156	5	2.147	4	.246	2	-1.705	2	.112	5	.675	2
2		min	-.909	2	.745	2	-2.133	4	-6.5	4	-.991	2	-.118	6
3	N13	max	.485	5	2.087	3	.801	1	2.676	1	.145	5	5.463	1
4		min	-2.016	1	.169	5	-.513	5	-.753	5	.038	3	-.038	5
5	N14	max	.025	6	1.711	6	-.128	3	1.878	3	-.075	3	2.005	2
6		min	-1.236	2	-.282	2	-1.29	5	-.706	5	-.734	5	-3.294	6
7	Totals:	max	0	5	5.541	6	0	1						
8		min	-4.137	1	2.237	2	-3.906	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
1	N1	max	.028	2	-.094	2	.001	5	7.721e-03	4	1.371e-04	5	7.167e-04	6
2		min	0	6	-.499	4	0	1	9.828e-04	2	5.295e-06	3	-1.347e-03	2
3	N2	max	0	6	.089	5	0	4	2.38e-03	5	7.35e-04	2	1.091e-03	5
4		min	-.01	2	-.463	1	-.02	2	-2.747e-03	1	4.328e-05	6	-6.662e-03	1
5	N3	max	0	6	.237	2	.019	2	2.018e-03	5	5.082e-04	2	1.317e-03	6
6		min	-.01	2	-.196	6	.001	6	-1.377e-03	3	-3.285e-04	5	-4.518e-03	2
7	N4	max	.027	2	-.092	2	0	5	7.72e-03	4	1.371e-04	5	7.167e-04	6
8		min	0	6	-.417	4	-.001	1	9.818e-04	2	5.295e-06	3	-1.347e-03	2
9	N5	max	.002	5	.054	5	.002	4	2.381e-03	5	7.35e-04	2	1.092e-03	5
10		min	-.002	1	-.386	1	-.016	2	-2.746e-03	1	4.328e-05	6	-6.661e-03	1
11	N6	max	0	6	0	6	0	6	0	6	0	6	0	6
12		min	0	1	0	1	0	1	0	1	0	1	0	1
13	N7	max	.005	2	-.129	5	0	6	6.437e-03	4	1.274e-04	4	-1.66e-03	6
14		min	0	4	-.176	3	-.013	1	1.347e-03	3	-7.395e-05	1	-1.311e-02	1
15	N8	max	.014	2	-.093	5	0	5	6.088e-03	5	-1.052e-04	6	-1.915e-03	6
16		min	0	6	-.188	3	-.008	1	6.458e-04	3	-1.771e-03	2	-1.176e-02	1
17	N9	max	.005	1	.005	2	.012	2	7.026e-03	4	7.857e-04	2	5.023e-03	4
18		min	0	5	-.181	6	0	6	-4.023e-03	2	-4.753e-04	5	-1.083e-02	1
19	N10	max	0	6	.024	5	.004	4	1.246e-02	5	1.492e-03	5	6.837e-04	6
20		min	-.009	2	-.162	3	-.003	2	-4.498e-04	3	-5.297e-04	2	-3.599e-03	2
21	N11	max	.01	1	.03	2	.009	2	7.112e-03	4	2.479e-04	5	6.107e-03	4
22		min	0	6	-.166	6	0	6	-4.073e-03	2	-9.865e-04	2	-1.162e-02	2
23	N12	max	0	6	.027	5	.005	1	1.39e-02	5	-1.039e-04	3	4.416e-04	4
24		min	-.009	2	-.166	3	0	6	-3.724e-04	3	-6.075e-04	2	-3.819e-03	2
25	N13	max	0	6	0	6	0	6	0	6	0	6	0	6
26		min	0	1	0	1	0	1	0	1	0	1	0	1
27	N14	max	0	6	0	6	0	6	0	6	0	6	0	6
28		min	0	1	0	1	0	1	0	1	0	1	0	1
29	N15	max	.005	2	-.01	2	0	4	4.932e-03	4	4.261e-04	2	1.408e-04	6
30		min	0	4	-.04	4	0	2	1.193e-03	2	-1.91e-05	4	-8.058e-04	2
31	N16	max	0	1	.003	5	0	5	8.935e-04	5	9.361e-05	2	3.536e-05	5
32		min	0	6	-.037	1	0	1	-1.869e-03	1	-2.435e-05	4	-4.226e-03	1
33	N17	max	0	3	.013	2	.003	5	8.37e-04	5	2.534e-04	2	2.283e-03	6
34		min	-.002	5	-.022	6	0	3	-1.366e-03	3	4.053e-05	3	-1.799e-03	2
35	N18	max	0	6	.076	5	.003	4	2.381e-03	5	7.35e-04	2	1.092e-03	5
36		min	-.01	2	-.383	1	-.012	2	-2.746e-03	1	4.328e-05	6	-6.661e-03	1
37	N19	max	0	6	.177	2	.013	1	2.019e-03	5	5.082e-04	2	1.316e-03	6
38		min	-.01	2	-.178	6	.002	3	-1.376e-03	3	-3.285e-04	5	-4.519e-03	2

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
39	N20	max	.462	1	.076	5	.551	4	2.162e-03	4	7.391e-03	2	1.027e-03	5
40		min	-.006	5	-.375	1	.012	3	-1.557e-03	2	1.38e-03	3	-4.e-03	1
41	N21	max	0	3	.195	2	.016	2	2.019e-03	5	5.082e-04	2	1.316e-03	6
42		min	-.006	5	-.175	6	.002	6	-1.376e-03	3	-3.285e-04	5	-4.519e-03	2
43	N22	max	.027	2	-.074	2	.002	5	7.72e-03	4	1.371e-04	5	7.167e-04	6
44		min	0	6	-.41	4	0	3	9.818e-04	2	5.295e-06	3	-1.347e-03	2
45	N23	max	.509	1	.194	2	.546	4	1.519e-03	5	4.572e-03	2	-2.282e-04	6
46		min	-.1	4	-.166	6	-.001	3	-5.285e-04	3	-9.035e-03	4	-3.812e-03	2
47	N24	max	.671	1	-.072	2	.485	4	5.148e-03	4	1.162e-03	5	6.674e-04	6
48		min	-.004	6	-.404	4	-.068	1	2.664e-04	2	-9.775e-03	1	-1.024e-03	2
49	N25	max	.461	1	.177	2	.614	4	1.519e-03	5	4.572e-03	2	-2.282e-04	6
50		min	-.007	5	-.172	6	-.009	1	-5.285e-04	3	-9.035e-03	4	-3.812e-03	2
51	N26	max	.485	1	.211	2	.519	4	1.519e-03	5	4.57e-03	2	-2.278e-04	6
52		min	-.054	5	-.167	6	0	3	-5.295e-04	3	-9.034e-03	4	-3.811e-03	2
53	N27	max	.461	1	.206	2	.546	4	1.519e-03	5	4.573e-03	2	-2.258e-04	6
54		min	-.007	5	-.17	6	-.001	3	-5.285e-04	3	-9.029e-03	4	-3.811e-03	2
55	N28	max	.548	1	.056	5	.513	4	2.162e-03	4	7.391e-03	2	1.027e-03	5
56		min	.02	6	-.378	1	-.007	2	-1.557e-03	2	1.38e-03	3	-4.e-03	1
57	N29	max	.608	1	-.084	2	.474	4	5.148e-03	4	1.163e-03	5	6.678e-04	6
58		min	-.004	6	-.436	4	.007	3	2.66e-04	2	-9.774e-03	1	-1.024e-03	2
59	N30	max	.608	1	-.078	2	.48	4	5.148e-03	4	1.161e-03	5	6.666e-04	6
60		min	-.004	6	-.437	4	-.031	1	2.697e-04	2	-9.77e-03	1	-1.026e-03	2
61	N31	max	.462	1	.082	5	.507	4	2.162e-03	4	7.391e-03	2	1.025e-03	5
62		min	-.006	5	-.399	1	-.013	2	-1.557e-03	2	1.38e-03	3	-4.001e-03	1
63	N32	max	.5	1	.074	5	.485	4	2.161e-03	4	7.388e-03	2	1.027e-03	5
64		min	.01	6	-.403	1	-.035	2	-1.556e-03	2	1.38e-03	3	-3.999e-03	1
65	N33	max	.658	1	-.086	2	.47	4	5.148e-03	4	1.162e-03	5	6.674e-04	6
66		min	-.004	6	-.409	4	.015	3	2.664e-04	2	-9.775e-03	1	-1.024e-03	2
67	N34	max	0	6	.21	2	.016	2	2.019e-03	5	5.082e-04	2	1.316e-03	6
68		min	-.01	2	-.188	6	.002	6	-1.376e-03	3	-3.208e-04	5	-4.519e-03	2
69	N35	max	0	6	.083	5	.002	4	2.381e-03	5	7.35e-04	2	1.092e-03	5
70		min	-.01	2	-.423	1	-.016	2	-2.746e-03	1	4.246e-05	6	-6.661e-03	1
71	N36	max	0	6	.153	2	.016	5	1.28e-02	5	8.111e-04	2	9.227e-04	6
72		min	-.01	2	-.173	6	.002	3	-5.296e-04	1	-1.749e-03	4	-4.623e-03	2
73	N37	max	0	6	.03	5	.045	5	1.103e-02	4	9.453e-04	5	5.125e-04	6
74		min	-.009	2	-.161	3	-.007	2	-3.581e-04	1	-1.318e-04	2	-4.065e-03	2
75	N38	max	0	6	.038	5	.012	5	1.677e-02	5	-3.476e-05	6	7.957e-04	5
76		min	-.01	2	-.184	3	.002	3	1.046e-04	3	-2.177e-04	1	-4.726e-03	1
77	N39	max	0	6	.069	5	.007	5	1.19e-02	4	1.134e-03	2	1.074e-03	5
78		min	-.01	1	-.34	1	-.005	1	2.514e-04	3	2.039e-04	6	-6.26e-03	1
79	N40	max	.461	1	.153	2	.662	4	1.338e-02	4	2.279e-03	2	-8.558e-05	6
80		min	-.007	5	-.173	6	-.027	1	-7.485e-04	1	-8.945e-03	4	-5.235e-03	2
81	N41	max	.461	1	.029	5	.895	4	2.441e-02	4	-5.915e-04	3	4.99e-04	6
82		min	-.007	5	-.163	3	-.025	1	-3.709e-04	1	-4.091e-03	5	-5.837e-03	2
83	N42	max	.461	1	.038	5	.818	5	1.671e-02	4	5.587e-03	5	4.39e-04	5
84		min	-.006	5	-.184	3	.008	3	1.336e-04	3	-2.281e-03	1	-5.975e-03	1
85	N43	max	.462	1	.069	5	.602	4	1.275e-02	4	7.434e-03	5	8.743e-04	5
86		min	-.006	5	-.341	1	.019	3	4.615e-04	3	6.1e-04	3	-5.987e-03	1
87	N44	max	.011	6	.153	2	.015	1	1.28e-02	5	8.111e-04	2	9.227e-04	6
88		min	-.065	2	-.173	6	-.138	5	-5.296e-04	1	-1.749e-03	4	-4.599e-03	2
89	N45	max	.012	6	.03	5	.005	3	9.182e-03	4	9.453e-04	5	5.11e-04	6
90		min	-.09	2	-.162	3	-.182	4	-3.578e-04	1	-1.318e-04	2	-3.208e-03	2

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
91	N46	max	.009	5	.038	5	.001	3	1.675e-02	5	-3.476e-05	6	7.957e-04	5
92		min	-.066	1	-.184	3	-.189	5	1.046e-04	3	-2.177e-04	1	-4.702e-03	1
93	N47	max	.012	5	.069	5	-.004	3	1.19e-02	4	1.134e-03	2	1.074e-03	5
94		min	-.085	1	-.34	1	-.135	4	2.514e-04	3	2.039e-04	6	-6.236e-03	1
95	N48	max	.524	1	.153	2	.824	4	1.351e-02	4	2.279e-03	2	-8.561e-05	6
96		min	.003	6	-.173	6	-.036	1	-7.487e-04	1	-8.945e-03	4	-5.311e-03	2
97	N49	max	.617	2	.029	5	1.519	4	2.628e-02	4	-5.915e-04	3	5.005e-04	6
98		min	-.01	6	-.163	3	-.034	1	-3.713e-04	1	-4.091e-03	5	-6.697e-03	2
99	N50	max	.533	1	.038	5	1.019	5	1.673e-02	4	5.587e-03	5	4.39e-04	5
100		min	-.012	5	-.184	3	.01	3	1.336e-04	3	-2.281e-03	1	-5.999e-03	1
101	N51	max	.535	1	.069	5	.757	4	1.29e-02	4	7.434e-03	5	8.744e-04	5
102		min	-.017	5	-.341	1	.024	3	4.617e-04	3	6.1e-04	3	-6.111e-03	1
103	N52	max	.027	2	-.085	2	.002	5	7.72e-03	4	1.371e-04	5	7.165e-04	6
104		min	0	6	-.459	4	0	3	9.819e-04	2	6.685e-06	3	-1.347e-03	2
105	N53	max	0	6	.216	2	.018	2	2.019e-03	5	5.048e-04	2	1.316e-03	6
106		min	-.007	2	-.186	6	.001	6	-1.376e-03	3	-3.285e-04	5	-4.519e-03	2
107	N54	max	.029	2	-.066	2	.003	5	8.014e-03	4	4.648e-04	5	1.596e-03	5
108		min	0	6	-.377	4	0	1	-4.913e-03	2	-1.163e-03	1	-1.162e-02	1
109	N55	max	.038	2	-.027	2	.009	5	7.235e-03	4	1.399e-03	1	3.494e-03	5
110		min	-.008	5	-.223	4	-.006	2	-4.181e-03	2	6.942e-05	6	-1.038e-02	1
111	N56	max	.017	2	.074	2	.009	5	7.845e-03	5	5.992e-04	5	7.56e-03	4
112		min	-.007	5	-.155	6	0	3	-4.434e-03	1	7.487e-05	3	-1.346e-02	2
113	N57	max	0	1	.171	2	.013	1	6.282e-03	5	1.199e-03	2	5.553e-03	4
114		min	-.009	5	-.166	6	.002	6	-1.937e-03	3	-8.113e-04	4	-1.004e-02	2
115	N58	max	.713	1	-.066	2	.49	4	7.233e-03	4	2.897e-03	5	1.58e-03	5
116		min	-.005	6	-.378	4	-.092	1	-5.05e-03	2	-8.406e-03	1	-1.239e-02	1
117	N59	max	.87	1	-.028	2	.558	4	9.568e-03	4	5.441e-03	4	4.835e-03	5
118		min	-.122	4	-.224	4	-.183	1	-8.578e-03	2	-1.115e-03	2	-2.127e-02	1
119	N60	max	.725	2	.074	2	.622	4	8.967e-03	5	7.02e-03	2	6.821e-03	4
120		min	-.233	4	-.156	6	-.1	2	-4.11e-03	1	-1.47e-04	6	-1.356e-02	2
121	N61	max	.541	1	.171	2	.571	4	7.539e-03	5	6.193e-03	2	5.245e-03	4
122		min	-.144	4	-.166	6	-.005	3	-1.872e-03	1	-5.918e-03	4	-1.062e-02	2
123	N62	max	.02	5	-.066	2	.058	2	7.99e-03	4	4.648e-04	5	1.596e-03	5
124		min	-.11	1	-.377	4	-.093	4	-4.913e-03	2	-1.163e-03	1	-1.162e-02	1
125	N63	max	.076	5	-.027	2	.094	2	6.373e-03	4	1.399e-03	1	3.492e-03	5
126		min	-.174	1	-.223	4	-.148	4	-4.178e-03	2	6.942e-05	6	-8.534e-03	1
127	N64	max	.083	4	.074	2	.058	1	7.822e-03	5	5.992e-04	5	7.56e-03	4
128		min	-.144	2	-.155	6	-.085	5	-4.434e-03	1	7.487e-05	3	-1.344e-02	2
129	N65	max	.058	4	.171	2	.037	1	6.258e-03	5	1.199e-03	2	5.553e-03	4
130		min	-.12	2	-.166	6	-.065	5	-1.937e-03	3	-8.113e-04	4	-1.004e-02	2
131	N66	max	.863	1	-.066	2	.578	4	7.309e-03	4	2.897e-03	5	1.58e-03	5
132		min	-.023	4	-.378	4	-.152	1	-5.05e-03	2	-8.406e-03	1	-1.252e-02	1
133	N67	max	1.418	1	-.028	2	.805	4	1.043e-02	4	5.441e-03	4	4.839e-03	5
134		min	-.238	4	-.224	4	-.389	2	-8.585e-03	2	-1.115e-03	2	-2.313e-02	1
135	N68	max	.888	2	.074	2	.73	4	8.991e-03	5	7.02e-03	2	6.821e-03	4
136		min	-.315	4	-.156	6	-.149	1	-4.11e-03	1	-1.47e-04	6	-1.358e-02	2
137	N69	max	.67	1	.171	2	.662	5	7.663e-03	5	6.193e-03	2	5.246e-03	4
138		min	-.207	4	-.166	6	-.017	3	-1.872e-03	1	-5.918e-03	4	-1.077e-02	2
139	N70	max	0	5	.074	5	.001	4	2.38e-03	5	7.35e-04	2	1.092e-03	5
140		min	-.006	1	-.429	1	-.018	2	-2.747e-03	1	4.328e-05	6	-6.661e-03	1
141	N71	max	.027	2	-.093	2	.001	5	7.72e-03	4	1.371e-04	5	7.167e-04	6
142		min	0	6	-.458	4	0	1	9.819e-04	2	5.295e-06	3	-1.347e-03	2

Envelope Joint Displacements (Continued)

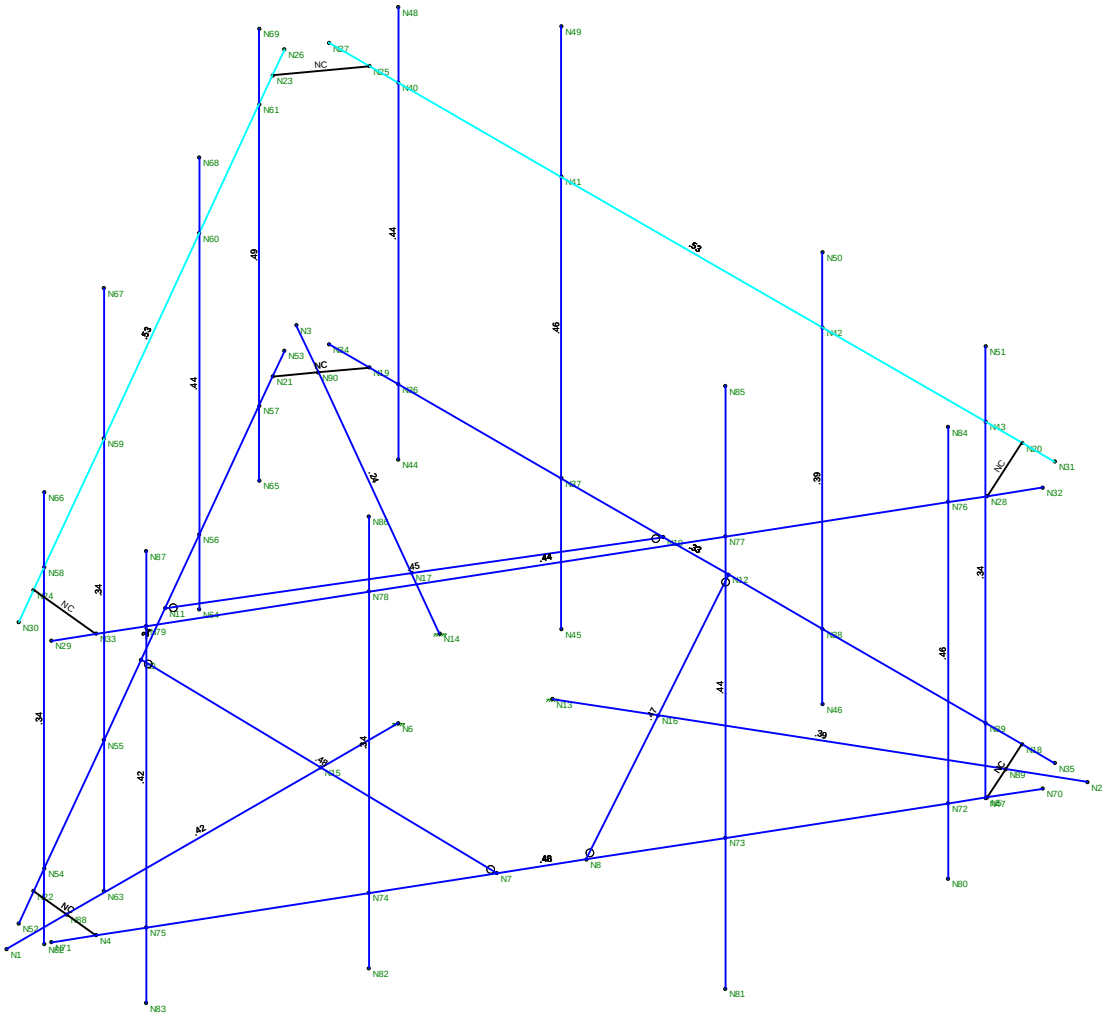
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
143	N72	max	.005	2	.04	5	.003	4	5.872e-03	5	1.945e-03	2	-1.905e-03	6
144		min	.001	6	-.357	1	-.012	2	-7.529e-04	3	1.716e-04	6	-1.183e-02	1
145	N73	max	.042	2	-.043	5	.009	2	6.403e-03	5	1.352e-06	3	-1.735e-03	6
146		min	.003	6	-.23	1	.002	6	5.12e-06	3	-5.646e-04	5	-1.011e-02	1
147	N74	max	.013	2	-.11	2	0	5	7.807e-03	1	6.619e-04	2	-9.718e-04	6
148		min	0	6	-.216	4	-.009	1	2.184e-03	6	-2.794e-04	4	-1.569e-02	1
149	N75	max	.028	2	-.092	2	0	5	8.035e-03	4	3.046e-05	5	5.347e-04	6
150		min	0	6	-.373	4	0	1	2.956e-03	3	-4.524e-04	1	-1.101e-02	2
151	N76	max	.585	1	.04	5	.529	4	6.846e-03	5	8.494e-03	1	-1.105e-03	6
152		min	.025	6	-.358	1	.009	3	2.842e-04	3	1.053e-03	6	-1.12e-02	1
153	N77	max	.817	1	-.043	5	.576	4	9.102e-03	5	7.159e-03	1	-1.988e-03	6
154		min	.048	6	-.23	1	.041	3	1.092e-03	3	-7.281e-04	5	-2.06e-02	1
155	N78	max	.876	1	-.11	2	.517	4	8.061e-03	4	-8.689e-04	3	-8.045e-04	6
156		min	.029	6	-.216	4	.051	3	2.032e-03	3	-4.346e-03	4	-1.619e-02	1
157	N79	max	.71	1	-.092	2	.471	4	7.535e-03	4	-5.173e-04	6	6.588e-05	6
158		min	-.002	6	-.374	4	.022	3	1.736e-03	3	-7.828e-03	1	-1.252e-02	2
159	N80	max	-.022	6	.04	5	.007	3	5.848e-03	5	1.945e-03	2	-1.905e-03	6
160		min	-.137	1	-.357	1	-.067	5	-7.529e-04	3	1.716e-04	6	-1.183e-02	1
161	N81	max	-.039	6	-.043	5	.002	3	5.544e-03	5	1.352e-06	3	-1.73e-03	6
162		min	-.163	1	-.23	1	-.128	5	5.104e-06	3	-5.646e-04	5	-8.26e-03	1
163	N82	max	-.012	6	-.11	2	-.026	6	7.807e-03	1	6.619e-04	2	-9.718e-04	6
164		min	-.175	1	-.216	4	-.102	1	2.179e-03	6	-2.794e-04	4	-1.566e-02	1
165	N83	max	.007	6	-.092	2	-.035	3	8.012e-03	4	3.046e-05	5	5.347e-04	6
166		min	-.104	2	-.373	4	-.096	4	2.956e-03	3	-4.524e-04	1	-1.101e-02	2
167	N84	max	.721	1	.04	5	.612	4	6.922e-03	5	8.494e-03	1	-1.105e-03	6
168		min	.039	6	-.358	1	.013	3	2.843e-04	3	1.053e-03	6	-1.133e-02	1
169	N85	max	1.349	1	-.043	5	.811	4	9.964e-03	5	7.159e-03	1	-1.994e-03	6
170		min	.096	6	-.23	1	.067	3	1.096e-03	3	-7.281e-04	5	-2.246e-02	1
171	N86	max	1.07	1	-.11	2	.614	4	8.085e-03	4	-8.689e-04	3	-8.045e-04	6
172		min	.039	6	-.216	4	.076	3	2.032e-03	3	-4.346e-03	4	-1.622e-02	1
173	N87	max	.862	1	-.092	2	.562	4	7.66e-03	4	-5.173e-04	6	6.591e-05	6
174		min	-.003	6	-.374	4	.043	3	1.737e-03	3	-7.828e-03	1	-1.267e-02	2
175	N88	max	.027	2	-.083	2	.001	5	7.72e-03	4	1.371e-04	5	7.167e-04	6
176		min	0	6	-.414	4	0	1	9.818e-04	2	5.295e-06	3	-1.347e-03	2
177	N89	max	0	5	.066	5	.003	4	2.381e-03	5	7.35e-04	2	1.092e-03	5
178		min	-.006	1	-.384	1	-.013	2	-2.746e-03	1	4.328e-05	6	-6.661e-03	1
179	N90	max	0	6	.186	2	.015	2	2.019e-03	5	5.082e-04	2	1.316e-03	6
180		min	-.007	2	-.177	6	.002	6	-1.376e-03	3	-3.285e-04	5	-4.519e-03	2

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Lo...	LC	She...	Lo...			phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
1	M24	L3X3X4	.532	1....	4	.309	10...	z	1	6.247	46.656	1.688	3.407	2.5...	H2-1
2	M23A	L3X3X4	.528	.579	1	.305	10...	z	4	6.247	46.656	1.688	3.386	2.5...	H2-1
3	M26	PIPE 2.0	.488	1	4	.127	1		4	20.867	32.13	1.872	1.872	1.7...	H1-...
4	M9	C5X6.7	.478	.695	1	.259	10...	z	2	5.959	63.828	1.604	7.519	1.4...	H1-...
5	M17A	L3X3X4	.475	2....	6	.033	2....	z	1	23.505	46.656	1.688	3.426	1.3...	H2-1
6	M19A	L3X3X4	.469	2....	3	.036	2....	z	6	23.505	46.656	1.688	3.421	1.3...	H2-1
7	M20	PIPE 2.0	.457	2	1	.112	6		5	14.916	32.13	1.872	1.872	1.5...	H1-...
8	M27	PIPE 2.0	.456	1	4	.111	1		4	20.867	32.13	1.872	1.872	1.7...	H1-...
9	M21A	L3X3X4	.453	2....	6	.036	2....	z	3	23.505	46.656	1.688	3.482	1.4...	H2-1

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
10	M28	PIPE_2.0	.441	2	4	.143	6		1	14.916	32.13	1.872	1.872	1.4...	H1-...
11	M21	L3X3X4	.439	10...	5	.235	.579	z	1	6.247	46.656	1.688	3.291	2.2...	H2-1
12	M19	PIPE_2.0	.436	1	1	.119	1		5	20.867	32.13	1.872	1.872	1.8...	H1-...
13	M25	PIPE_2.0	.435	1	4	.116	1		1	20.867	32.13	1.872	1.872	1.7...	H1-...
14	M30	PIPE_2.0	.417	1	1	.152	1		1	20.867	32.13	1.872	1.872	1.96	H1-...
15	M1	HSS4X4X4	.416	0	4	.075	0	y	1	120....	139....	16.181	16.181	2.3...	H1-...
16	M21B	PIPE_2.0	.389	1	2	.088	1		5	20.867	32.13	1.872	1.872	1.8...	H1-...
17	M18A	HSS4X4X4	.388	0	1	.083	0	y	1	120....	139....	16.181	16.181	2.3...	H1-...
18	M24B	PIPE_2.0	.345	6	2	.109	2		5	14.916	32.13	1.872	1.872	1.3...	H1-...
19	M22	PIPE_2.0	.343	1	2	.108	1		5	20.867	32.13	1.872	1.872	1.8...	H1-...
20	M11	C5X6.7	.342	.695	1	.377	1....	y	1	5.959	63.828	1.604	9.585	1.8...	H1-...
21	M29	PIPE_2.0	.339	1	1	.089	1		4	20.867	32.13	1.872	1.872	1.8...	H1-...
22	M23	PIPE_2.0	.337	1	2	.140	1		2	20.867	32.13	1.872	1.872	1.9...	H1-...
23	M10	C5X6.7	.334	.695	4	.342	1....	z	4	5.959	63.828	1.604	9.327	1.7...	H1-...
24	M20A	HSS4X4X4	.244	0	6	.063	0	z	5	120....	139....	16.181	16.181	2.4...	H1-...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CT11103A	July 15, 2020 at 9:12 AM
20074.48	Unity Check	Mount.r3d

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11103A

Ridgefield/ Downtown1
76 East Ridge Road
Ridgefield, Connecticut 06877

July 27, 2020

EBI Project Number: 6220003394

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**26.53%**

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

July 27, 2020

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

Emissions Analysis for Site: CT11103A - Ridgefield/ Downtown1

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **76 East Ridge Road** in **Ridgefield, Connecticut** 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 ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency 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 76 East Ridge Road in Ridgefield, Connecticut 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 4 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.

5) 4 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.

6) 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.

7) 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.

8) 2 LTE channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

9) 2 NR channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

10) 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.

11) 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.

12) The antennas used in this modeling are the Ericsson AIR6449 B41 for the 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24_43-UNA20 for the 700 MHz / 600 MHz / 600 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 32 for the 2100 MHz / 1900 MHz / 1900 MHz channel(s) in Sector A, the Ericsson AIR6449 B41 for the 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24_43-UNA20 for the 700 MHz / 600 MHz / 600 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 32 for the 2100 MHz / 1900 MHz / 1900 MHz channel(s) in Sector B, the Ericsson AIR6449 B41 for the 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24_43-UNA20 for the 700 MHz / 600 MHz / 600 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 32 for the 2100 MHz / 1900 MHz / 1900 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.

13) The antenna mounting height centerline of the proposed antennas is 100 feet above ground level (AGL).

14) 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.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR6449 B41	Make / Model:	Ericsson AIR6449 B41	Make / Model:	Ericsson AIR6449 B41
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd
Height (AGL):	100 feet	Height (AGL):	100 feet	Height (AGL):	100 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts
ERP (W):	25,651.93	ERP (W):	25,651.93	ERP (W):	25,651.93
Antenna A1 MPE %:	**9.22%**	Antenna B1 MPE %:	**9.22%**	Antenna C1 MPE %:	**9.22%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAARR24_43-UNA20	Make / Model:	RFS APXVAARR24_43-UNA20	Make / Model:	RFS APXVAARR24_43-UNA20
Frequency Bands:	700 MHz / 600 MHz / 600 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	700 MHz / 600 MHz / 600 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	700 MHz / 600 MHz / 600 MHz / 1900 MHz / 2100 MHz
Gain:	13.35 dBd / 12.95 dBd / 12.95 dBd / 15.65 dBd / 16.35 dBd	Gain:	13.35 dBd / 12.95 dBd / 12.95 dBd / 15.65 dBd / 16.35 dBd	Gain:	13.35 dBd / 12.95 dBd / 12.95 dBd / 15.65 dBd / 16.35 dBd
Height (AGL):	100 feet	Height (AGL):	100 feet	Height (AGL):	100 feet
Channel Count:	9	Channel Count:	9	Channel Count:	9
Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts
ERP (W):	11,055.53	ERP (W):	11,055.53	ERP (W):	11,055.53
Antenna A2 MPE %:	**6.00%**	Antenna B2 MPE %:	**6.00%**	Antenna C2 MPE %:	**6.00%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	2100 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	2100 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	2100 MHz / 1900 MHz / 1900 MHz
Gain:	15.85 dBd / 15.35 dBd / 15.35 dBd	Gain:	15.85 dBd / 15.35 dBd / 15.35 dBd	Gain:	15.85 dBd / 15.35 dBd / 15.35 dBd
Height (AGL):	100 feet	Height (AGL):	100 feet	Height (AGL):	100 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts
ERP (W):	12,841.53	ERP (W):	12,841.53	ERP (W):	12,841.53
Antenna A3 MPE %:	**4.62%**	Antenna B3 MPE %:	**4.62%**	Antenna C3 MPE %:	**4.62%**
ERP (W):	0.00	ERP (W):	0.00	ERP (W):	0.00
Antenna A4 MPE %:	**0.00%**	Antenna B4 MPE %:	**0.00%**	Antenna C4 MPE %:	**0.00%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	19.84%
Verizon	5.5%
Sprint	1.19%
Site Total MPE % :	26.53%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	19.84%
T-Mobile Sector B Total:	19.84%
T-Mobile Sector C Total:	19.84%
Site Total MPE % :	26.53%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 2500 MHz LTE	2	6412.98	100.0	46.11	2500 MHz LTE	1000	4.61%
T-Mobile 2500 MHz NR	2	6412.98	100.0	46.11	2500 MHz NR	1000	4.61%
T-Mobile 700 MHz LTE	2	648.82	100.0	4.67	700 MHz LTE	467	1.00%
T-Mobile 600 MHz LTE	2	591.73	100.0	4.25	600 MHz LTE	400	1.06%
T-Mobile 600 MHz NR	1	1577.94	100.0	5.67	600 MHz NR	400	1.42%
T-Mobile 1900 MHz LTE	2	2203.69	100.0	15.85	1900 MHz LTE	1000	1.58%
T-Mobile 2100 MHz UMTS	2	1294.56	100.0	9.31	2100 MHz UMTS	1000	0.93%
T-Mobile 2100 MHz LTE	2	2307.55	100.0	16.59	2100 MHz LTE	1000	1.66%
T-Mobile 1900 MHz GSM	4	1028.30	100.0	14.79	1900 MHz GSM	1000	1.48%
T-Mobile 1900 MHz LTE	2	2056.61	100.0	14.79	1900 MHz LTE	1000	1.48%
						Total:	**19.84%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	19.84%
Sector B:	19.84%
Sector C:	19.84%
T-Mobile Maximum MPE % (Sector A):	19.84%
Site Total:	26.53%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **26.53%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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