Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

June 26, 2019

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

RE: Notice of Exempt Modification
75 Wells Road, Wethersfield, CT 06109
Latitude: 41.7058800000
Longitude: -72.66333000000
T-Mobile Site#: CTHA506A – L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 95-foot level of the existing 101-foot monopole at 75 Wells Road, Wethersfield, CT. The 101-foot monopole is owned and operated by Everest Infrastructure Partners. The property is owned by Frontier Communications. T-Mobile now intends to remove three (3) of its existing antennas and add six (6) new 600/700/1900/2100 MHz antennas. The new antennas will be installed at the same 95-foot level of the tower.

Planned Modifications:
Tower:

Remove
N/A

Remove and Replace:
(3) AIR 21 B4A/B12P (Remove) – (3) AIR 32 KRD901146-1 B66A B2A Antenna (Replace) 1900/2100 MHz
(3) RRUS11B12 (Remove) - Radio 4449 B71+B12 (Replace)

Install New:
(3) APXVAARR24_43-U-NA20 Antenna 600/700 MHz
(3) 1-3/8” Hybrid Cables
Handrail Kit on Antenna Mounts

Existing to Remain:
(3) AIR 21 KRC1180121_B2P/B4A Antenna 2100 MHz
(2) 1-3/8” Hybrid Cable

Ground:
Install New: Equipment inside existing 6131 cabinet

This facility has been approved by the Council in Petition No. 1012 dated 12/1/2011. This modification complies with this approval. Please see the enclosed.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mayor-Amy Bello, Elected Official, and Peter Gillespie, Director of Planning & Economic Development for the Town of Wethersfield, as well as the tower owner and property owner.

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

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

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

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

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

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

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

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

Sincerely,

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

Attachments
cc: Amy Bello – Town of Wethersfield Mayor
Peter Gillespie– Town of Wethersfield Director of Planning & Economic Development
Everest Infrastructure Partners – Tower Owner
Frontier Communications- Property Owner

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, June 26, 2019 9:05 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTHA506A CSC ZO

You have a package coming.

Scheduled Delivery Date: Thursday, 06/27/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424292677964
Ship To:	Peter Gillespie Town of Wethersfield 505 Silas Deane Highway WETHERSFIELD, CT 061092216 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/27/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTHA506A CSC ZO

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, June 26, 2019 9:08 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTHA506A CSC EO

You have a package coming.

Scheduled Delivery Date: Thursday, 06/27/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424293867971
Ship To:	Amy Bello Town of Wethersfield Mayor's Office 505 Silas Deane Highway WETHERSFIELD, CT 061092216 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/27/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTHA506A CSC EO

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Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, June 26, 2019 9:11 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTHA506A CSC PO

You have a package coming.

Scheduled Delivery Date: Thursday, 06/27/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424291061988
Ship To:	Frontier Communications 401 Merritt 7 NORWALK, CT 068511000 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/27/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTHA506A CSC PO

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Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Wednesday, June 26, 2019 9:15 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTHA506A CSC TO

You have a package coming.

Scheduled Delivery Date: Friday, 06/28/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424290859995
Ship To:	Everest Infrastructure Partners 1435 Bedford Avenue Suite 108 PITTSBURGH, PA 152193675 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	06/28/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTHA506A CSC TO

Download the UPS mobile app

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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 2018.

Wethersfield
CONNECTICUT

Information on the Property Records for the Municipality of Wethersfield was last updated on 5/22/2019.

Parcel Information

Location:	75 WELLS RD	Property Use:	Industrial	Primary Use:	Utility Building
Unique ID:	205069	Map Block Lot:	205 069	Acres:	0.90
490 Acres:	0.00	Zone:	SRD/A	Volume / Page:	0121/0472
Developers Map / Lot:	3A	Census:	4922		

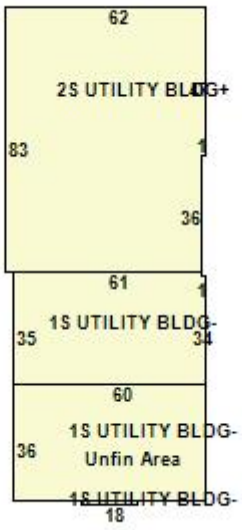
Value Information

	Appraised Value	Assessed Value
Land	371,250	259,870
Buildings	435,101	304,570
Detached Outbuildings	686,169	480,320
Total	1,492,520	1,044,760

Owner's Information

Owner's Data
SOUTHERN N E TELEPHONE CO C/O FRONTIER COMMUNICATIONS 401 MERRITT 7 TAX DEPT

Building 1



Category:	Industrial	Use:	Utility Building	GLA:	14,497
Stories:	2.00	Construction:	Masonry	Year Built:	1939

Heating:	Hot Water	Fuel:	Oil	Cooling Percent:	100
Siding:	Brick/Pre-Finish Metal	Roof Material:	Tar and Gravel	Beds/Units:	0

Special Features

Attached Components

Type:	Year Built:	Area:
Unfinished Area	1939	2,160

Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
PreCastConCel	2003	200.00	0.00	200
Paving	1999	0.00	0.00	2,400
Cell Tower	2000	0.00	0.00	1

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
SOUTHERN N E TELEPHONE CO	0121	0472	11/30/1946		No	$0

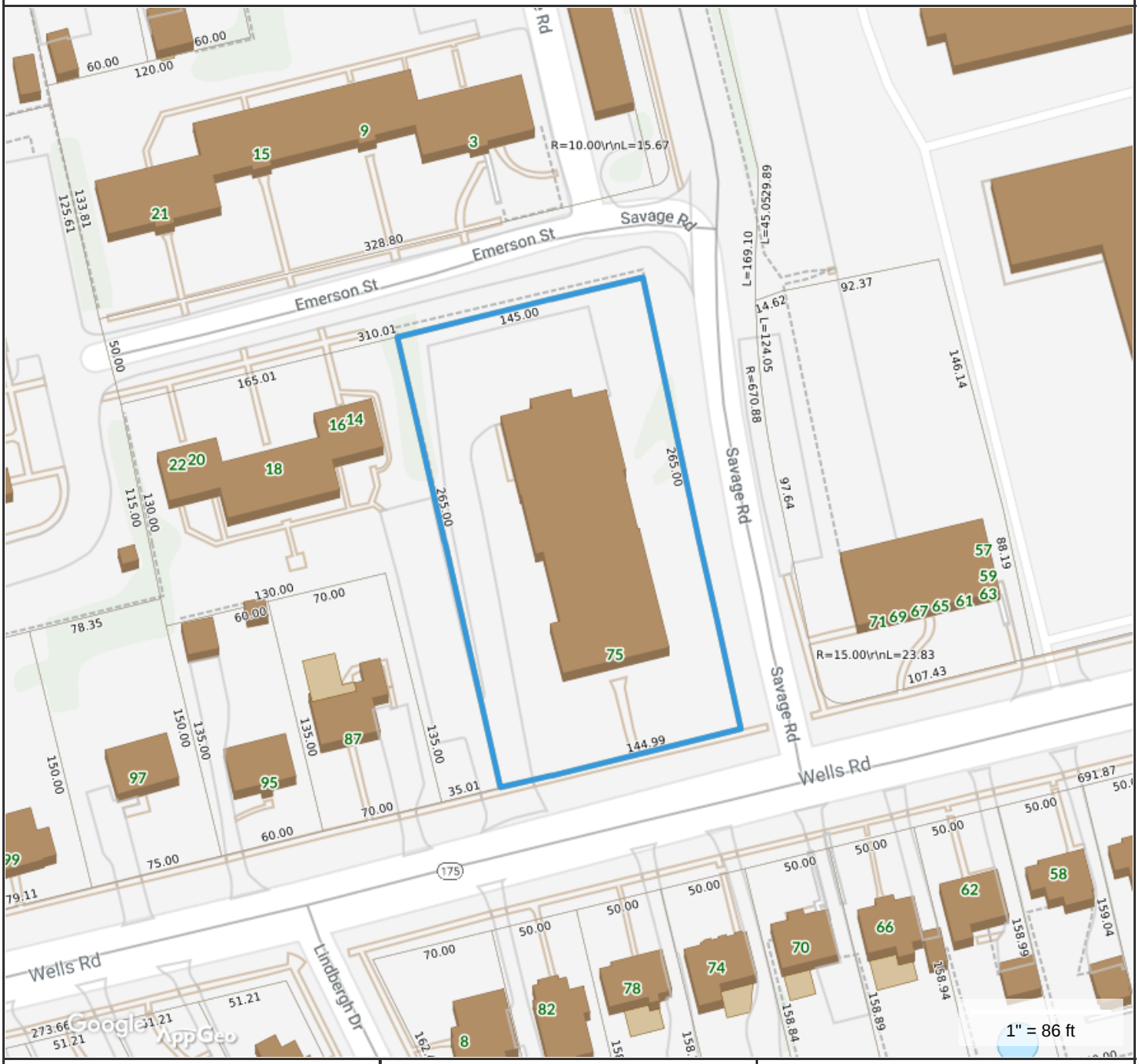
Building Permits

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
B-17-502	Miscellaneous	10/11/2018		Closed	CELL TOWER WORK (AT&T)

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
B-16-545	Comm Renovations	11/08/2016		Permit Issued	REMOVE 3 ANTENNA AND REPL WITH 3 NEWER MODELS. ADD 2 NEW RRUS PER SECTOR FOR 6 TOTAL. ADD 1 DC6 S
B-16-552	Comm Renovations	11/04/2016		Permit Issued	REPL EXISTING 6201 CABINET W/ NEW 6131 CABINET. ADD 6 NEW COAX LINES & 1 NEW HYBRID. REPL 3 EXIST
E-15-251	Electrical	07/20/2015		Permit Issued	INSTALL NEW 200 AMP METER & NEW ELECTRICAL FOR T-MOBILE CABINET W/ PIPING & FIBER
E-15-284	Electrical	07/20/2015		Permit Issued	INSTALL SURFACE MOUNT FEED IN RIGID PIPE FROM METER TO NEW PPC CABINET
B-15-26	Comm Renovations	03/05/2015		Permit Issued	16x10 CONCRETE PAD, ANTENNA T ANN MOUNTING TO EXISTING TOWER. 16 NEW ANTENNAS, 8' HIGH ICE BRIDGE,
E-13-8	Electrical	01/14/2013		Permit Issued	INSTALL NEW 200 AMP PANEL ON EXISTING METER CAN
M-10-24	HVAC	07/28/2010		Permit Issued	Replace existing a/c split sys. & ductwork
B-10-119	Other	07/08/2010		Permit Issued	Instsall reinforcement to existing 101.5' monopole tower.
MP-0199	HVAC	12/23/2009		Permit Issued	Install 3 split a/c systems & ducts on roof
EP-0227	Electrical	09/10/2009		Permit Issued	Wiring for new ac and controls
MP-0075	HVAC	06/03/2009		Permit Issued	Replace air cond. unit
BP06840	Comm Renovations	12/28/2006		Permit Issued	Change Cellular antennas
BP03629	Comm Renovations	10/10/2003		Permit Issued	Foundation for generator
EP03344	Electrical	10/03/2003		Permit Issued	Install generator
MP03041	HVAC	04/29/2003		Permit Issued	Install 2 A/C units
EP03086	Electrical	04/11/2003		Permit Issued	Wire A/C-2nd fl

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
EP03066	Electrical	03/17/2003		Permit Issued	Wire A/C per plan
BP0356	Comm Renovations	02/12/2003		Permit Issued	Revamp 1st fl
MP02202	HVAC	12/31/2002		Permit Issued	A/C-computer rm
BP02824	Comm Renovations	12/05/2002		Permit Issued	Partial demolition-CMU unit
BP02626	Comm Renovations	09/23/2002		Permit Issued	6X10.4 concrete pad & antennas
MP01030	HVAC	02/12/2001		Permit Issued	Trane A/C
EP000415	Electrical	11/15/2000		Permit Issued	1200 amp service
EP000416	Electrical	11/15/2000		Permit Issued	Repl tank level system
EP000246	Electrical	06/29/2000		Permit Issued	Telecom Install
MP990137	HVAC	09/09/1999		Permit Issued	INSTALL AIR HANDLER & COOLING UNIT
EP990184	Electrical	06/25/1999		Permit Issued	
BP990306	Comm Renovations	06/21/1999		Permit Issued	
8737	Comm Renovations	10/26/1998		Permit Issued	

CTHA506A



Property Information

Property ID	205069
Location	75 WELLS RD
Owner	SOUTHERN N E TELEPHONE CO

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Wethersfield, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 11/14/17
Data updated daily

Petition No. 1012
MetroPCS
75 Wells Road, Wethersfield, Connecticut
Staff Report
December 1, 2011

On October 26, 2011, the Connecticut Siting Council (Council) received a petition (Petition) from MetroPCS for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the proposed modifications to an existing telecommunications facility at 75 Wells Road in Wethersfield. Specifically, MetroPCS seeks to co-locate on an existing 104-foot tall monopole owned by New Cingular Wireless PCS LLC (AT&T). The existing tower, located adjacent to the east side of an existing building, currently supports AT&T. T-Mobile and Verizon have existing leases for tower space but have not located on the tower to date.

MetroPCS seeks to install six panel antennas on t-arms at the 75-foot level of the tower. The tower and foundation would require modifications to support the new equipment.

MetroPCS would install three equipment cabinets adjacent to the existing fenced compound area. The ground equipment would require MetroPCS to expand the existing compound and lease area to the south. The new fenced area would extend 17 feet to the south, then angle 12 feet to the west, terminating at the existing building. The new fence would match the existing. Three new plantings would be installed along the east side of the new fenced area to screen views from Wells Road and Savage Road. Staff recommends one additional evergreen planting along the south side of the compound extension to provide further screening.

There are no wetlands at the site. One evergreen shrub would be removed. The addition of new plantings along the fence line of the compound expansion area would mitigate views of the compound from the south and east. Evergreens along the east side and north side of the existing compound would remain. The maximum worst-case power density including AT&T's existing and T-Mobile's and Verizon's proposed equipment, would be 53 percent of the applicable limit.

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

WETHERSFIELD MONOPOLE

CTHA506A

75 WELLS ROAD

WETHERSFIELD, CT 06109

T-MOBILE RF CONFIGURATION

67D92DB_2xAIR+1OP

PROJECT SUMMARY

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

A. REMOVE (3) EXISTING ANTENNAS, TYP. (1) PER SECTOR
B. INSTALL (3) LB/MB 0CTO 8' ANTENNAS, TYP. (1) PER SECTOR
C. INSTALL (3) AIR32 B66A/B2A ANTENNAS, TYP. (1) PER SECTOR
D. REMOVE (3) RRUS11 B12, TYP. (1) PER SECTOR
E. INSTALL (3) RADIO 4449, TYP. (1) PER SECTOR
F. REMOVE (1) DUS41 AND (1) XMU
G. INSTALL (2) BB6630
H. INSTALL (3) NEW 6X12 HYBRIDS
I. INSTALL (1) 125 AMP CABINET BREAKER
J. INSTALL HANDRAIL KIT ON MOUNT.

PROJECT INFORMATION

SITE NAME:	WETHERSFIELD MONOPOLE
SITE ID:	CTHA506A
SITE ADDRESS:	75 WELLS ROAD WETHERSFIELD, CT 06109
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:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-42'-21.07" N LONGITUDE: 72°-39'-48.26" W GROUND ELEVATION: ±74' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
N-1	DESIGN BASIS AND SITE NOTES	1
C-1	SITE LOCATION PLAN	1
C-2	COMPOUND PLAN AND ELEVATION	1
C-3	ANTENNA MOUNTING CONFIGURATION	1
E-1	TYPICAL ELECTRICAL DETAILS	1
E-2	TYPICAL ELECTRICAL DETAILS	1

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, 2017 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 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 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 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 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 "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 OWNERS 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

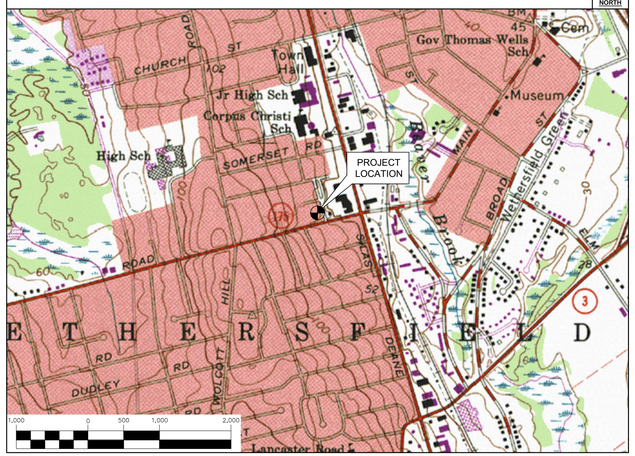
FROM: 35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002

TO: 75 WELLS ROAD, WETHERSFIELD, CT 06109

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	0.30 MI.
2.	TAKE THE 2ND RIGHT ONTO DAY HILL RD.	0.14 MI.
3.	TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187	1.89 MI.
4.	TURN LEFT ONTO CT-305/OLD WINDSOR RD.	2.33 MI.
5.	MERGE ONTO I-91 S TOWARD HARTFORD	8.33 MI.
6.	MERGE ONT US-5 S/CT-15 S via EXIT 28 TOWARD WETHERSFIELD/NEWINGTON/BERLIN TPKE	0.97 MI.
7.	MERGE ON SILAS DEANE HWY/CT-99 S via EXIT 85 TOWARD ROCKY HILL/WETHERSFIELD	1.71 MI.
8.	TURN RIGHT ONTO WELLS RD/CT-175	0.11 MI.
9.	75 WELLS RD, WETHERSFIELD, CT 06109-3050, 75 WELLS RD IS ON THE RIGHT	

VICINITY MAP

SCALE: 1" = 1000'



PROFESSIONAL ENGINEER SEAL	
REV.	0 / 1
DATE	05/28/19 / 06/11/19
DRAWN BY	RTS / RTS
CHK'D BY	CAG / CAG
DESCRIPTION	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION / CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

T-Mobile · Transcend Wireless

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

T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY

WETHERSFIELD MONOPOLE
SITE ID: CTHA506A
75 WELLS ROAD
WETHERSFIELD, CT 06109

DATE: 04/24/19
SCALE: AS NOTED
JOB NO. 19027.22

TITLE SHEET

T-1

Sheet No. 1 of 7

DESIGN BASIS:

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

1. DESIGN CRITERIA:

- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 97 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10) PER 2015 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. 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.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. 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. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. 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.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325-N
   G. U-BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	06/11/19	RTS	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
0	05/28/19	RTS	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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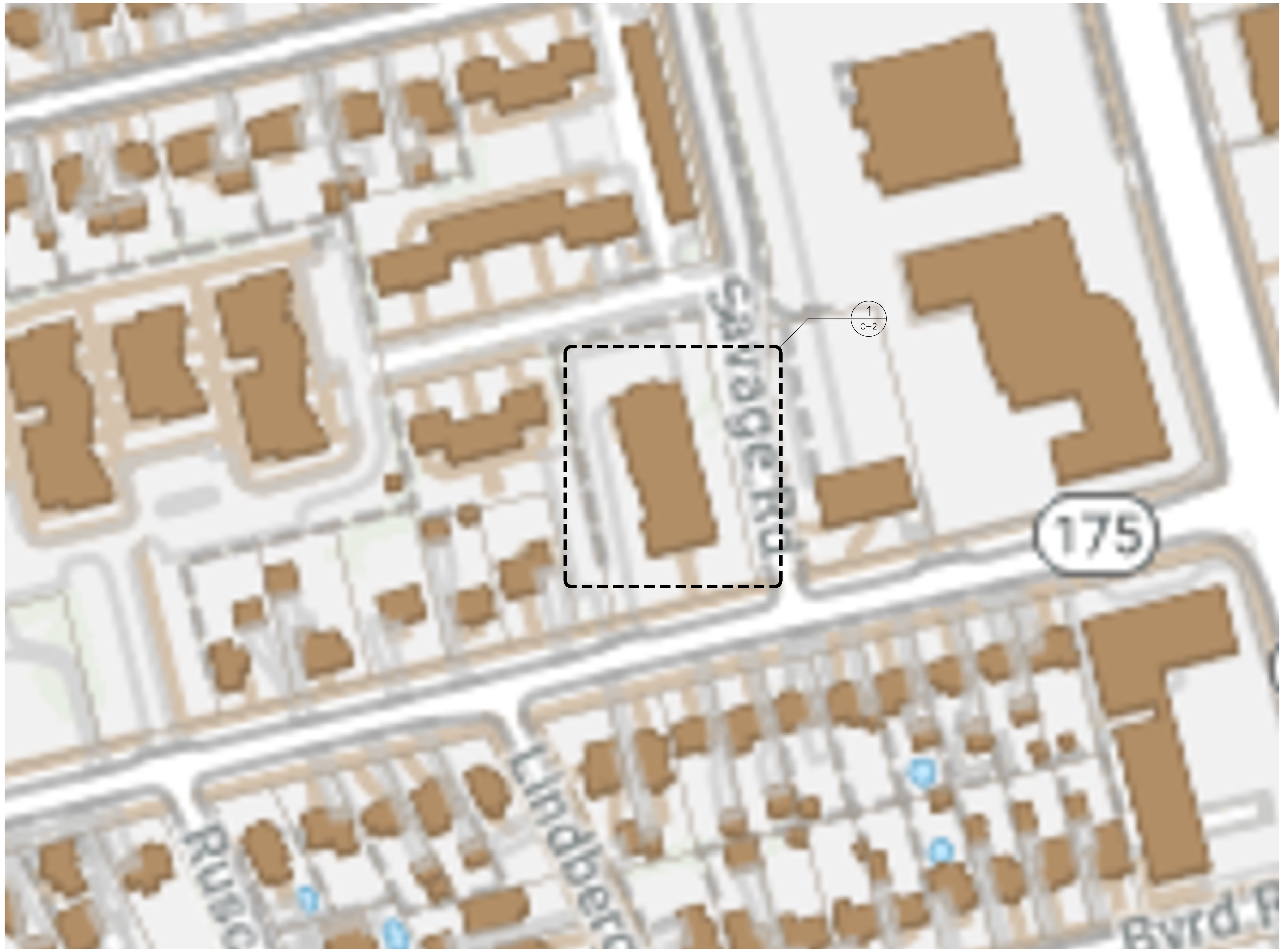
WIRELESS COMMUNICATIONS FACILITY

WETHERSFIELD MONOPOLE
SITE ID: CTHA506A
75 WELLS ROAD
WETHERSFIELD, CT 06109

DATE: 04/24/19
SCALE: AS NOTED
JOB NO. 19027.22

DESIGN BASIS AND SITE NOTES

N-1



1
C-1
SITE LOCATION PLAN
SCALE: 1" = 20'

APPROX. NORTH

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

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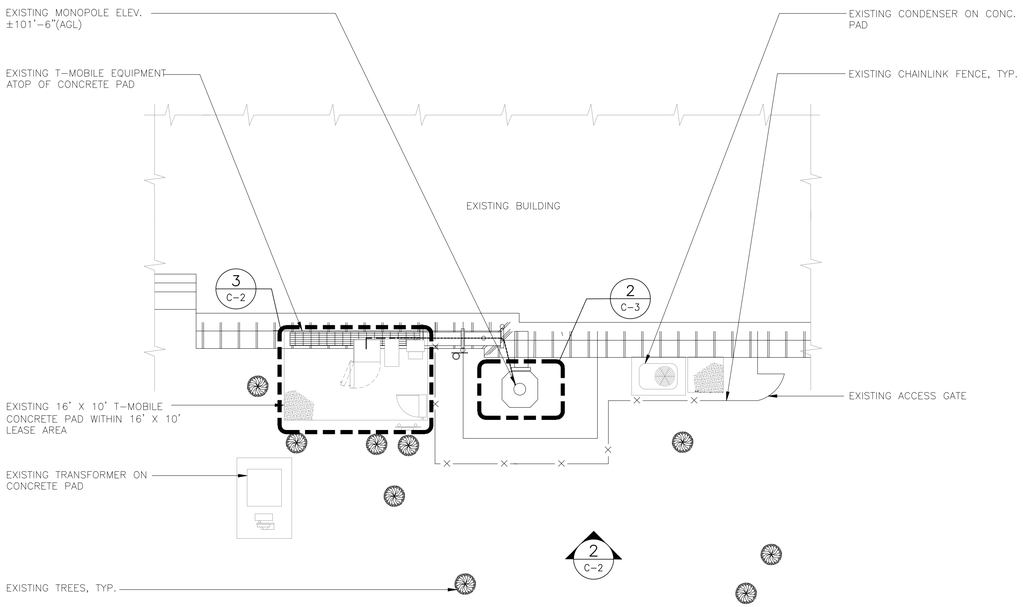
SITE LOCATION PLAN

C-1

Sheet No. 3 of 7

T-MOBILE RAN TEMPLATE:
67D92DB OUTDOOR

T-MOBILE RF CONFIGURATION:
67D92DB_2xAIR+10P

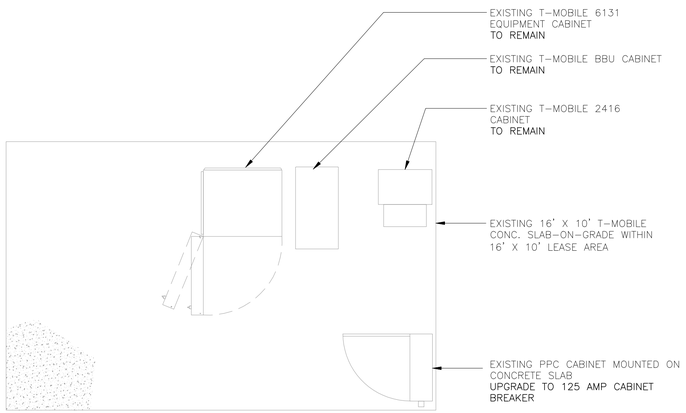


1 C-2 **SITE PLAN**
SCALE: 1" = 8'

TRUE NORTH

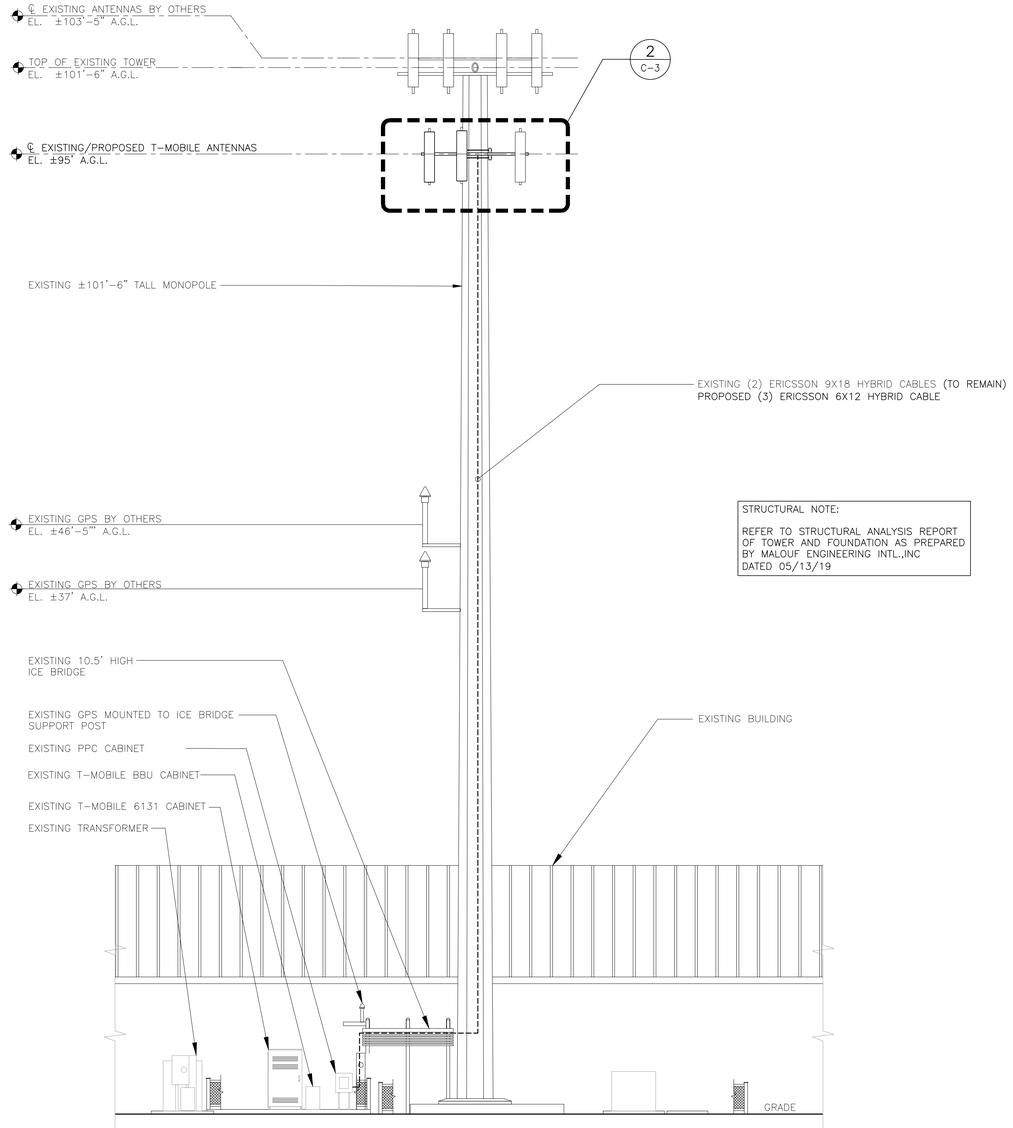
GRAPHIC SCALE
8 0 4 8 16 32
(IN FEET)
1 inch = 8 ft.

NOTE:
REFERENCE SHEET T-1 FOR T-MOBILE EQUIPMENT SCOPE OF WORK



3 C-2 **EQUIPMENT PLAN**
SCALE: 3/8" = 1'

TRUE NORTH



STRUCTURAL NOTE:

REFER TO STRUCTURAL ANALYSIS REPORT OF TOWER AND FOUNDATION AS PREPARED BY MALOUF ENGINEERING INTL.,INC DATED 05/13/19

2 C-2 **EAST TOWER ELEVATION - PROPOSED**
SCALE: 1" = 6'

TRUE NORTH

GRAPHIC SCALE
6 0 3 6 12 24
(IN FEET)
1 inch = 6 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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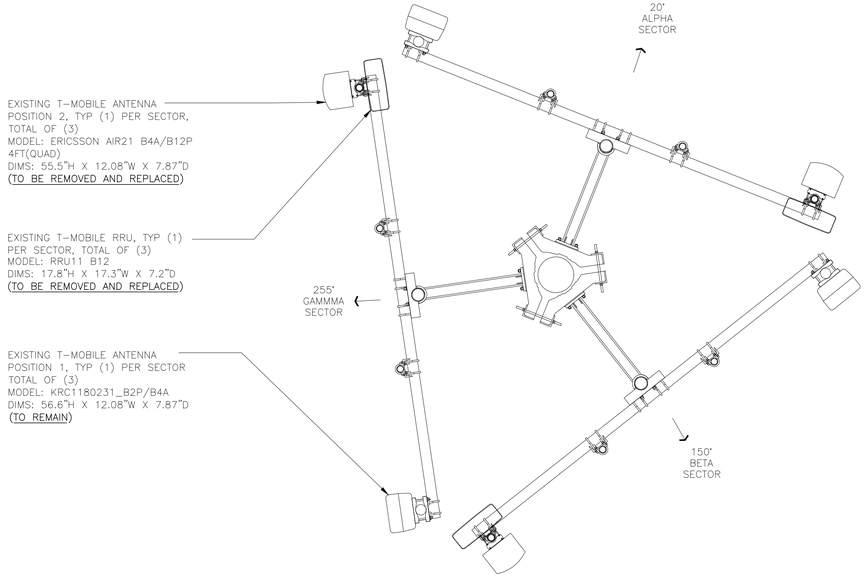
COMPOUND PLAN, AND ELEVATION

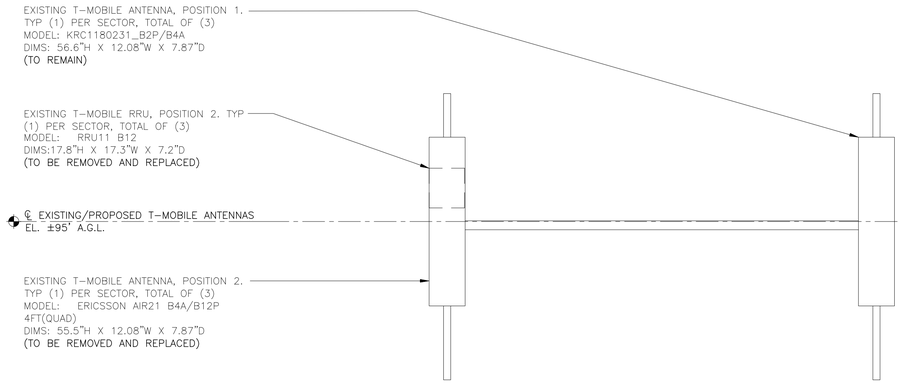
C-2

Sheet No. 4 of 7

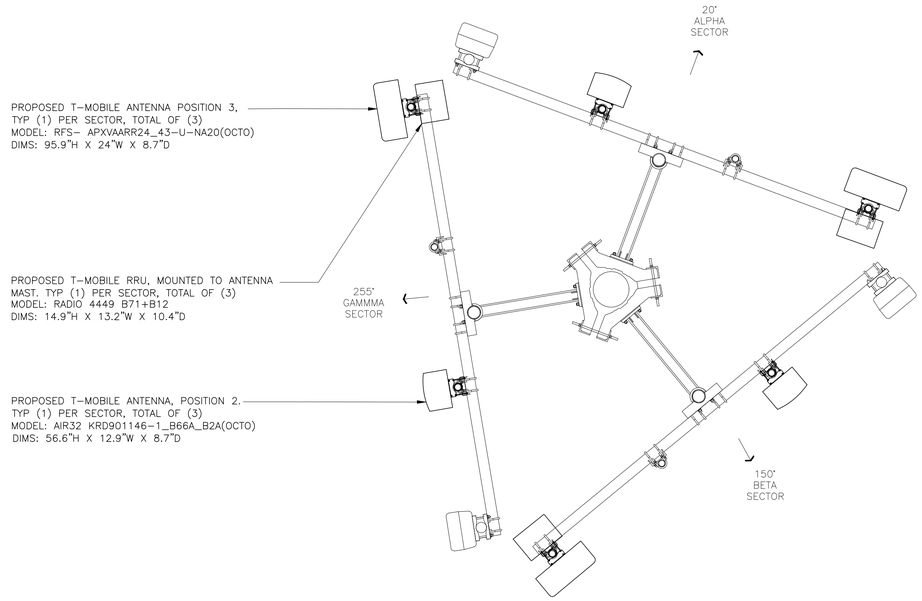


1 / C-3 **EXISTING ANTENNA MOUNTING CONFIGURATION**
SCALE: 1/2" = 1'

TRUE NORTH

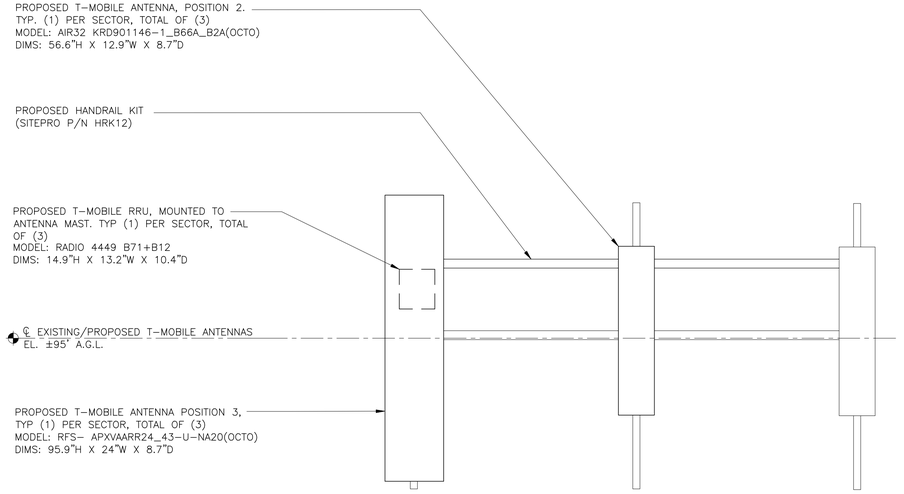


1A / C-3 **EXISTING ANTENNA ELEVATION**
SCALE: 3/4" = 1'



2 / C-3 **PROPOSED ANTENNA MOUNTING CONFIGURATION**
SCALE: 1/2" = 1'

TRUE NORTH



2A / C-3 **PROPOSED ANTENNA ELEVATION**
SCALE: 1/2" = 1'

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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SCALE: AS NOTED
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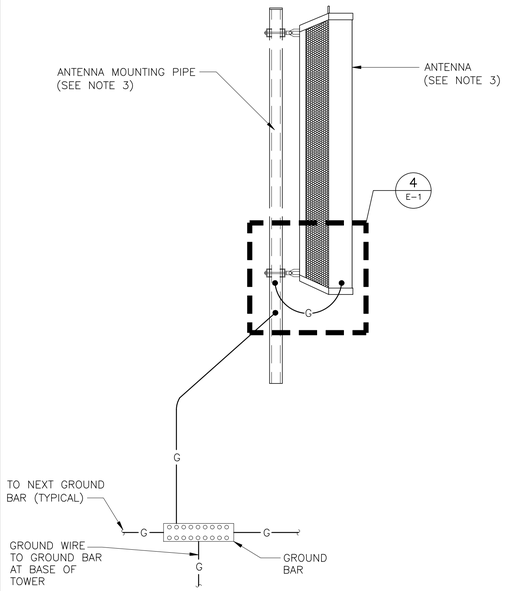
ANTENNA MOUNTING CONFIGURATION

C-3

Sheet No. 5 of 7

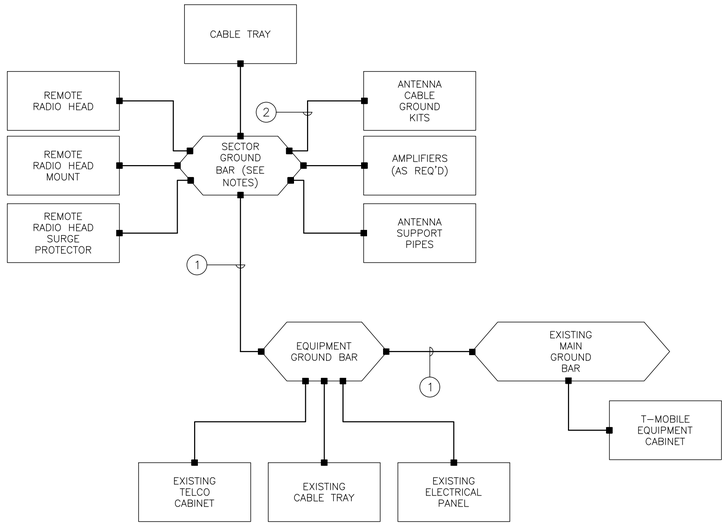


NOTES:

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.

1 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE



GROUNDING SCHEMATIC NOTES

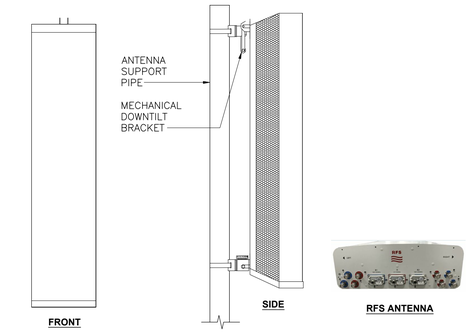
1. #2 AWG
2. #6 AWG

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.

2 E-1 TYPICAL GROUNDING SCHEMATIC DETAIL

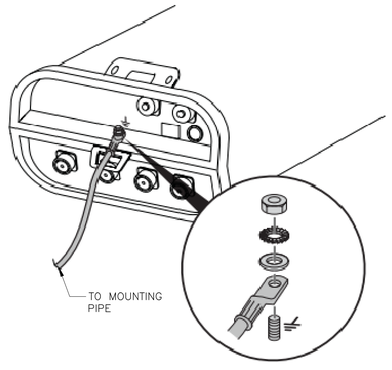
SCALE: NOT TO SCALE



ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXVAARR24_43-U-NA20	95.9"H x 24"W x 8.7"D	153 LBS.

3 E-1 PROPOSED ANTENNA DETAIL

SCALE: NOT TO SCALE



4 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE

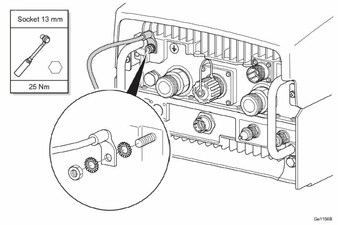
ISOMETRIC VIEW

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4449 B71B12	14.9"L x 13.2"W x 10.4"D	74 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

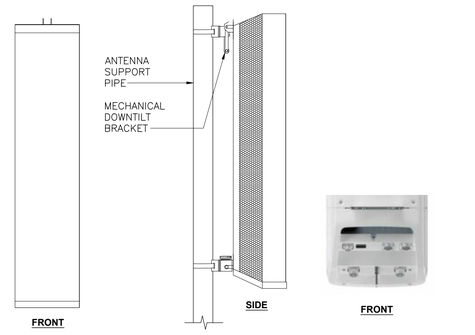
5 E-1 PROPOSED RRU DETAIL

SCALE: NOT TO SCALE



6 E-1 TYPICAL RRU GROUNDING DETAIL

SCALE: NOT TO SCALE



ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR32 KRD901146-1_B66A_B2A	56.6"H x 12.9"W x 8.7"D	132.2 LBS.

7 E-1 PROPOSED ANTENNA DETAIL

SCALE: NOT TO SCALE

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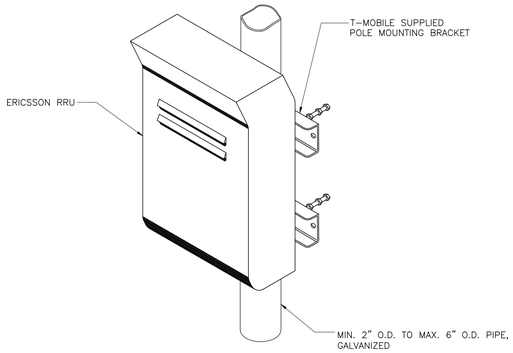
TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 6 of 7



ISOMETRIC VIEW

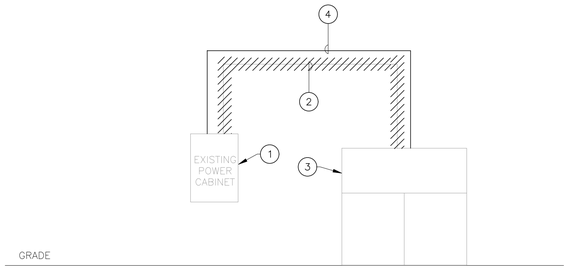
NOTES:

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.

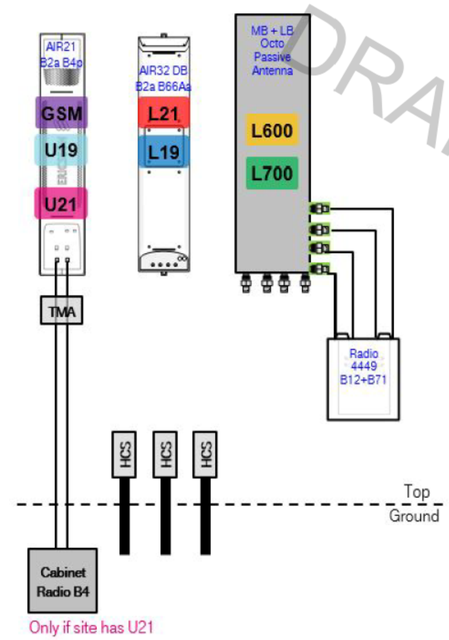
1 / E-2 **TYPICAL RRUS MOUNTING DETAILS**
SCALE: NOT TO SCALE

RISER DIAGRAM NOTES

1. EXISTING POWER CABINET TO REMAIN
2. EXISTING CONDUITS, CONDUCTORS AND ASSOCIATED CIRCUIT BREAKER TO BE REMOVED.
3. EXISTING RADIO CABINET TO REMAIN
4. (3) #1 AWG, (1) #6 AWG GROUND, 1-1/2" CONDUIT CONNECTED TO NEW 125A/2P CIRCUIT BREAKER.



2 / E-2 **ELECTRICAL POWER RISER DIAGRAM**
NOT TO SCALE



3 / E-2 **PROPOSED PLUMBING DIAGRAM**
SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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TYPICAL ELECTRICAL DETAILS

E-2

Sheet No. 7 of 7

Rigorous Structural Analysis Report

T-Mobile - Wethersfield Site #CTHA506A

Owner: Everest Infrastructure - Wethersfield CO Site

Wethersfield, Connecticut

May 13, 2019

MEI PROJECT ID: CT04861M-19V1

MALOUF ENGINEERING INTL., INC.

STRUCTURAL CONSULTANTS

17950 PRESTON ROAD, SUITE 720 ▪ DALLAS, TEXAS 75252 ▪ TEL. 972 -783-2578 FAX 972-783-2583

www.maloufengineering.com

MALOUF ENGINEERING INTL., INC.

STRUCTURAL CONSULTANTS

May 13, 2019

Mr. Kyle Richers
Transcend Wireless
Mahwah, NJ 04730

RIGOROUS STRUCTURAL ANALYSIS

Structure/Make/Model:	101 ft **Monopole**		Not Known / 18-Sided	
Client/Site Name/#:	**Transcend Wireless | T-Mobile**		**Wethersfield #CTHA506A**	
Owner/Site Name/#:	Everest Infrastructure		Wethersfield CO	
MEI Project ID:	**CT04861M-19V1**			
Location:	75 Wells Rd Wethersfield, Connecticut 06109		Hartford County FCC #1200438	
	LAT	41-42-21.2 N	LON	72-39-48.0 W

EXECUTIVE SUMMARY:

Malouf Engineering Int'l (MEI), as requested, has performed a rigorous structural analysis of the above-mentioned structure to assess the impact of the changed condition as noted in Table 1.

Based on the stress analysis performed, the existing structure **is in conformance** with the Int'l Building Code (IBC) / ANSI/TIA-**222-G** Standard for the loading considered under the criteria listed and referenced in the report sections – tower rated at 99.5% - Base Plate.

The installation of the proposed changed condition as noted in Table 1 is structurally acceptable. Please refer to Appendix 1 for Schematic Lines Layout.

MEI appreciates the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or other projects, please contact us.

Respectfully submitted,

MALOUF ENGINEERING INT'L, INC.

Analysis performed by:

Luan Nguyen, PE
Sr. Project Engineer

Reviewed & Approved by:

E. Mark Malouf, PE
Connecticut #17715
972-783-2578 ext. 106
mmalouf@maloufengineering.com

5/13/2019

TABLE OF CONTENTS

1. INTRODUCTION & SCOPE 4

2. SOURCE OF DATA 4

Background Information: 4

3. ANALYSIS CRITERIA 5

Appurtenances Configuration 5

4. ANALYSIS PROCEDURE 6

Analysis Program 6

Assumptions 6

5. ANALYSIS RESULTS 7

6. FINDINGS & RECOMMENDATIONS 8

7. REPORT DISCLAIMER 9

APPENDIX 1 - ANALYSIS PRINTOUT & GRAPHICS 10

APPENDIX 2 – SOURCE / CHANGED CONDITION 11

1. INTRODUCTION & SCOPE

A rigorous structural analysis was performed by Malouf Engineering Int'l (MEI), as requested and authorized by Mr. Kyle Richers, Transcend Wireless, on behalf of T-Mobile, to determine the acceptance of the proposed changed conditions in conformance with the IBC / ANSI/TIA-222-G Standard, "*Structural Standard for Antenna Supporting Structures and Antennas*".

The scope of this independent analysis is to determine the overall stability and the adequacy of structural members, foundations, and member connections, as available and stated. This analysis considers the structure to have been properly installed and maintained with no structural defects. Installation procedures and related loading are not within the scope of this analysis and should be performed and evaluated by a competent person of the erection contractor.

The different report sections detail the applicable information used in this evaluation, relating to the tower data, the appurtenances configuration and the wind and ice loading considered.

2. SOURCE OF DATA

The following information has been used in this evaluation as source data that accurately represent the existing structure and the related appurtenances:

	Source	Information	Reference
STRUCTURE			
Tower	MEI Records	Previous Structural Analysis	ID CT04861M-19V0 Dated 03/26/2019
Foundation	MEI Records	Previous Structural Analysis	ID CT04861M-19V0 Dated 03/26/2019
Material Grade	Not available from supplied documents-Assumed based on typical towers of this type-refer to Appendix		
CURRENT APPURTENANCES			
	MEI Records	Previous Structural Analysis	ID CT04861M-19V0 Dated 03/26/2019
CHANGED CONDITION			
	Transcend Wireless Mr. Kyle Richers	T-Mobile Collocation Application	Dated 04/30/2019

Background Information:

Based on available information, the following is known regarding this structure:

DESIGNER / FABRICATOR	Not Known / 18-Sided
ORIGINAL DESIGN CRITERIA	TIA/EIA 222-Unknown
PRIOR STRUCTURAL MODIFICATIONS	As per GPD Group base plate and anchor rod modifications Job #2009264.50 dated 06/12/2009; pole shaft modifications by others as per B+T mapping report dated 07/17/2014 – considered properly installed.

3. ANALYSIS CRITERIA

The structural analysis performed used the following criteria:

CODE / STANDARD	2018 CT Building Code / 2015 Int'l Building Code / ANSI/TIA-222-G-4 Standard	
LOADING CASES	*Full Wind*:	129 Mph ultimate gust [equiv. 100 Mph (3-sec gust)] w/No Radial Ice**
	Iced Case:	40 Mph + 1.25" Radial Ice
	Service:	60 Mph
	Seismic:	S_s = 0.181 / S_1 = 0.064 / Site Class: D – Stiff Soil
STRUCTURE CRITERIA	*Risk Category (Structural Class)*: 2	
	Exposure Category: '**B**' – *Topographic Category:* 1	

Appurtenances Configuration

The following appurtenances configuration is denoted by the *summation of Tables 1 & 2*:

Table 1: Tenant with Changed Condition Appurtenances Configuration

Elev (ft)	Tenant	Ants Qty	Appurtenance Model / Description	Mount Description	Lines Qty	Line size & Location
95	T-Mobile	3	AIR32 KRD901146-1 B66A B2A Panel Antennas	[Existing Mount] **w/ New Handrail Kit**	4	1-5/8 Hybrid-Fiber cables – (I)
		3	APXVAARR24_43-U-NA20 Panel Antennas			
		3	Radio 4449 B71/B12 Boxes			
Appurtenances to Remain						
95	T-Mobile	3	AIR21 KRC118023 B2P B4A Panel Antennas	(3) 12.5 ft. L.P. T-Arm Mounts (SitePro1 RMV12-3XX)	6 1	7/8" 1-5/8 Hybrid-Cable – (I)
Appurtenances to be Removed						
95	T-Mobile	3	AIR21 B4A B12P Panel Antennas			
		3	RRUS-11 B12 Boxes			

Table 2: Remaining Tenants Current and Reserved/Future Appurtenances

Elev (ft)	Tenant	Ants Qty	Appurtenance Model / Description	Mount Description	Lines Qty	Line size & Location
101		1	5' Lightning Rod		1	1/2" – (I)
		1	Beacon/Strobe			
103.5	AT&T [New]	3	HPA-65R-BUU-H6 Panel Antennas	(3) SitePro1 RRU Dual Swivel Mounts #RRUDSM (2/sector)		[Existing Lines]
		3	RRUS-32 B66 Boxes			
103.5	AT&T	3	QS66512-3 Panel Antennas	Top Platform w/ Rails (& Ladder)	12 2 4 1	1-5/8" 5/8" Fiber 3/4" DC Power ATCB-B01-xxx Homerun Cable-(I/E)
		3	7770.00 Panels Panel Antennas			
		3	RRUS-11 Boxes			
		3	RRUS-32 Boxes			
		3	RRUS-32 B2 Boxes			
		2	Raycap DC6 (Squid) Suppressors			
		6	LGP21401 TMA'S			
		6	TPX-070821 Triplexers			
46.5		1	GPS Antenna	18" ±. Standoff Arm Mount	1	3/8"-(E)
37		1	GPS Antenna	18" ± Standoff Arm Mount	1	3/8"-(E)

Notes:

1. **As per 2015 IBC for ultimate 3-sec gust wind speed converted to nominal 3-sec gust wind speed as per Sect. 1609.3.1 as required to be used in ANSI/TIA-222-G Standard per exception 5 of Sect. 1609.1.1.
2. All elevations are measured from tower base.
3. Please note appurtenances not listed above are to be removed/not present as per data supplied.
4. (I) = Internal; (E) = External; (FZ) = Within Face Zone; (OFZ) = Outside Face Zone - as per TIA-222-G.
5. The above appurtenances represent MEI's understanding of the appurtenances configuration. If different than above, the analysis is invalid. Please contact MEI if any discrepancies are found.

4. ANALYSIS PROCEDURE

The subject structure is analyzed for feasibility of the installation of the proposed changed condition previously noted. The data records furnished were reviewed and a computer stress analysis was performed in accordance with the TIA-222 Standard provisions and with the agreed scope of work terms and the results of this analysis are reported.

Analysis Program

The computer program used to model the structure is a rigorous Finite Element Analysis program, tnxTower (ver. 8.05), a commercially available program by Tower Numerics Inc. The latticed structures members are modeled using beam/truss and cable members and the pole members using tubular beam elements. The structural parameters and geometry of the members are included in the model. The dead and temperature loads and the wind loads are internally calculated by the program for the different wind directions and then applied as external loads on the structure. Any applicable exemptions, as per Section 15.6 of the TIA-222-G Standard for existing structures originally designed in accordance with a previous revision of the TIA-222 Standard, have been taken.

Assumptions

This engineering study is based on the theoretical capacity of the members and is not a condition assessment of the structure. This analysis is based on information supplied, and therefore, its results are based on and as accurate as that supplied data. MEI has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural stress analysis:

- This existing tower is assumed, for the purpose of this analysis, to have been properly maintained and to be in good condition with no structural defects and with no deterioration to its member capacities ('as-new' condition).
- The tower member sizes and configuration are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated.
- The appurtenances configuration is as supplied and/or as stated in the report. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
- Some assumptions are made regarding antennas and mounts sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type & industry practice.
- Mounts/Platforms are considered adequate to support the loading. No actual analysis of the platform/mount itself is performed, with the analysis being limited to analyzing the structure.
- The soil parameters are as per data supplied or as assumed and stated in the calculations. Refer to the Appendix. If no data is available, the foundation system is assumed to support the structure with its new reactions.
- All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
- All prior structural modifications, if any, are assumed to be as per data supplied/available, and to have been properly installed and to be fully effective.

If any of the above assumptions are not valid or have been made in error, this analysis results may be invalided, MEI should be contacted to review any contradictory information to determine its effect.

5. ANALYSIS RESULTS

The results of the structural stress analysis based on data available and with the previous listed criteria, indicated the following:

Note: The Wind loading controls over the Seismic loading as per TIA Section 2.7.

Table 3: Stress Analysis Results

Component Type	Maximum Stress Ratio	Controlling Elev. (ft) / Component	Pass/Fail	Comment
POLE	95.0%	88 - 61.25	**Pass**	
BASE PLATE	99.5%	Bending	**Pass**	
ANCHOR RODS	60.7%	Tension	**Pass**	
FOUNDATION	95.0%	**Moment**	**Pass**	

Table 4: Serviceability Requirements

	Maximum Value	TIA Requirement (10dB)	Pass/Fail	Comment
TWIST/SWAY	2.0805 Deg.	4 Deg. from Vert. or Horiz. Axis	**Pass**	
HORIZONTAL DISPLACEMENT	22.233 In./ 1.79% of Ht.	3.0% of Height	**Pass**	

Notes:

1. The Maximum Stress Ratio is the percentage that the maximum load in the member is relative to the allowable load as determined by Code requirements.
2. Refer to the Appendix 1 for more details on the member loads.
3. A maximum stress ratio between 100% and 105% may be considered as *Acceptable* according to industry standard practice.

6. FINDINGS & RECOMMENDATIONS

- Based on the rigorous stress analysis results, the subject structure is **rated at 99.5%** of its support capacity (controlling component: Base Plate) with the proposed changed condition considered. Please refer to Table 3 and to Appendix 1 for more details of the analysis results.
- Based on the stress analysis performed, the existing structure **is in conformance** with the IBC / ANSI/TIA **222-G** Standard for the loading considered under the criteria listed and referenced in the report sections.
- ***The installation of the proposed changed condition as noted in Table 1 is structurally acceptable***. Please refer to Appendix 1 for Schematic Lines Layout.
- This structure is at its support capacity for the appurtenances and loading criteria considered. Therefore, no changes to the configuration considered should be made without performing a new proper evaluation.

Rigging and temporary supports required for the erection/modification shall be determined, documented, furnished and installed by the erector/contractor accounting for the loads imposed on the structure due to the proposed construction method.

7. REPORT DISCLAIMER

The engineering services rendered by **M**alouf **E**ngineering **I**nternational*,* Inc. *('MEI') in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size and capacity of its members. MEI does not analyze the fabrication, including welding and connection capacities, except as included in this Report.*

The analysis performed, and the conclusions contained herein are based on the assumption that the tower has been properly installed and maintained, including, but not limited to the following:

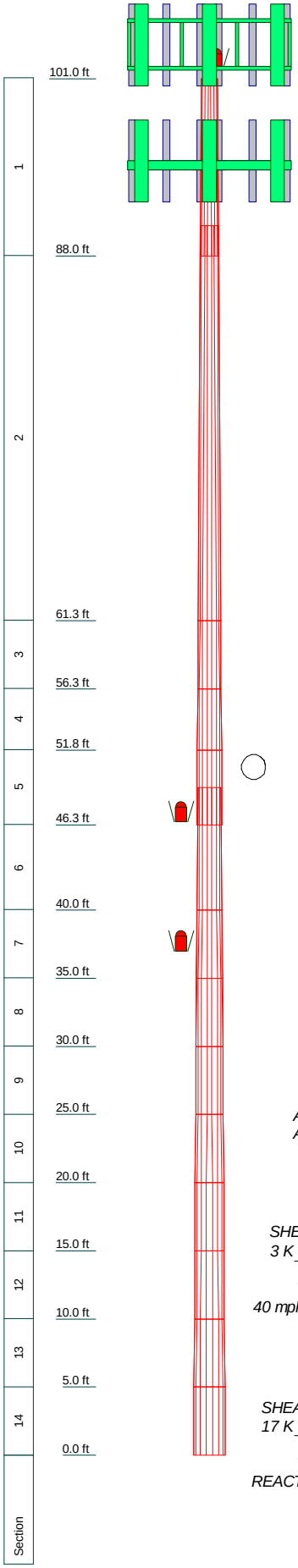
1. Proper alignment and plumbness.
2. Correct guy tensions, as applicable.
3. Correct bolt tightness or slip jacking of sleeved connections.
4. No significant deterioration or damage to any structural component.

Furthermore, the information and conclusions contained in this Report were determined by application of the current "state-of-the-art" engineering and analysis procedures and formulae. MALOUF ENGINEERING INTERNATIONAL, INC. assumes no obligation to revise any of the information or conclusions contained in this Report in the event that such engineering and analysis procedures and formulae are hereafter modified or revised. In addition, under no circumstances will MALOUF ENGINEERING INTERNATIONAL, INC. have any obligation or responsibility whatsoever for or on account of consequential or incidental damages sustained by any person, firm or organization as a result of any information or conclusions contained in the Report, and the maximum liability of MALOUF ENGINEERING INTERNATIONAL, INC., if any, pursuant to this Report shall be limited to the total funds actually received by MALOUF ENGINEERING INTERNATIONAL, INC. for preparation of this Report.

Customer has requested MALOUF ENGINEERING INTERNATIONAL, INC. to prepare and submit to Customer an engineering analysis with respect to the Subject Tower and has further requested MALOUF ENGINEERING INTERNATIONAL, INC. to make appropriate recommendations regarding suggested structural modifications and changes to the Subject Tower. In making such request of MALOUF ENGINEERING INTERNATIONAL, INC., Customer has informed MALOUF ENGINEERING INTERNATIONAL, INC. that Customer will make a determination as to whether or not to implement any of the changes or modifications which may be suggested by MALOUF ENGINEERING INTERNATIONAL, INC. and that Customer will have any such changes or modifications made by riggers, erectors and other subcontractors of Customer's choice. MALOUF ENGINEERING INTERNATIONAL, INC. shall have the right to rely upon the accuracy of the information supplied by the customer and shall not be held responsible for the Customer's misrepresentation or omission of relevant fact whether intentional or otherwise.

Customer hereby agrees and acknowledges that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability whatsoever to Customer or to others for any work or services performed by any persons other than MALOUF ENGINEERING INTERNATIONAL, INC. in connection with the implementation of services including but not limited to any services rendered for Customer or for others by riggers, erectors or other subcontractors. Customer acknowledges and agrees that any riggers, erectors or subcontractors retained or employed by Customer shall be solely responsible to Customer and to others for the quality of work performed by them and that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability or responsibility whatsoever as a result of any negligence or breach of contract by any such rigger, erector or subcontractor and that Customer and rigger, erector, or subcontractor will provide MALOUF ENGINEERING INTERNATIONAL, INC. with a Certificate of Insurance naming MALOUF ENGINEERING INTERNATIONAL, INC. as additional insured.

APPENDIX 1 - ANALYSIS PRINTOUT & GRAPHICS



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION
QS66512-3 w/ Pipe Mount (ATI / E)	103.5
QS66512-3 w/ Pipe Mount (ATI / E)	103.5
QS66512-3 w/ Pipe Mount (ATI / E)	103.5
7770.00 Panels w/ Pipe Mount (ATI / E)	103.5
7770.00 Panels w/ Pipe Mount (ATI / E)	103.5
7770.00 Panels w/ Pipe Mount (ATI / E)	103.5
HPA-65R-BUU-H6 w/ Pipe Mounts (ATI / New)	103.5
HPA-65R-BUU-H6 w/ Pipe Mounts (ATI / New)	103.5
HPA-65R-BUU-H6 w/ Pipe Mounts (ATI / New)	103.5
RRUS-11 (ATT) (ATI / E)	103.5
RRUS-11 (ATT) (ATI / E)	103.5
RRUS-11 (ATT) (ATI / E)	103.5
RRUS-32 B2 (ATI / E)	103.5
RRUS-32 B2 (ATI / E)	103.5
RRUS-32 B2 (ATI / E)	103.5
RRUS-32 (ATI / E)	103.5
RRUS-32 (ATI / E)	103.5
RRUS-32 (ATI / E)	103.5
(2) LGP21401 TMA'S (ATI / E)	103.5
(2) LGP21401 TMA'S (ATI / E)	103.5
(2) LGP21401 TMA'S (ATI / E)	103.5
(2) TPX-070821 Triplexer (ATI / E)	103.5
(2) TPX-070821 Triplexer (ATI / E)	103.5
(2) TPX-070821 Triplexer (ATI / E)	103.5
Raycap DC6 (Squid) Suppressor (ATI / E)	103.5
Raycap DC6 (Squid) Suppressor (ATI / E)	103.5
RRUS-32 B66 (ATI / New)	103.5
RRUS-32 B66 (ATI / New)	103.5
RRUS-32 B66 (ATI / New)	103.5
SitePro1 RRU Dual Swivel Mount (ATI / New)	103.5
SitePro1 RRU Dual Swivel Mount (ATI / New)	103.5
SitePro1 RRU Dual Swivel Mount (ATI / New)	103.5

TYPE	ELEVATION
Top Platform w/ Rails (Ladder) (ATI / E)	103.5
Beacon/Strobe (E)	101
5' Lightning Rod (E)	101
AIR21 KRC118023 B2P B4A w/ Pipe Mount (T-Mobile / E)	95
AIR21 KRC118023 B2P B4A w/ Pipe Mount (T-Mobile / E)	95
AIR21 KRC118023 B2P B4A w/ Pipe Mount (T-Mobile / E)	95
AIR32 KRD901146-1 B66A B2A Panel Antenna w/ Pipe Mount (T-Mobile / P)	95
AIR32 KRD901146-1 B66A B2A Panel Antenna w/ Pipe Mount (T-Mobile / P)	95
AIR32 KRD901146-1 B66A B2A Panel Antenna w/ Pipe Mount (T-Mobile / P)	95
APXVAARR24_43-U-NA20 w/ Pipe Mount (T-Mobile / P)	95
APXVAARR24_43-U-NA20 w/ Pipe Mount (T-Mobile / P)	95
APXVAARR24_43-U-NA20 w/ Pipe Mount (T-Mobile / P)	95
RADIO 4449 - B71 + B12 (T-Mobile / P)	95
RADIO 4449 - B71 + B12 (T-Mobile / P)	95
RADIO 4449 - B71 + B12 (T-Mobile / P)	95
12.5 ft. L.P. T-Arm Mount (SitePro1 RMV12-3XX) w/ New Handrail Kit (T-Mobile / E)	95
12.5 ft. L.P. T-Arm Mount (SitePro1 RMV12-3XX) w/ New Handrail Kit (T-Mobile / E)	95
12.5 ft. L.P. T-Arm Mount (SitePro1 RMV12-3XX) w/ New Handrail Kit (T-Mobile / E)	95
GPS (E)	46.5
18" Approx. Standoff Arm (E)	46.5
GPS (E)	37
18" Approx. Standoff Arm (E)	37

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 100 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.25 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 99.5%

ALL REACTIONS ARE FACTORED

AXIAL 59 K

SHEAR 3 K

MOMENT 350 kip-ft

TORQUE 0 kip-ft

40 mph WIND - 1.2500 in ICE

AXIAL 23 K

SHEAR 17 K

MOMENT 1326 kip-ft

TORQUE 0 kip-ft

REACTIONS - 100 mph WIND

MALOUF ENGINEERING INTL., INC. STRUCTURAL CONSULTANTS

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Malouf Engineering Int'l, Inc.

17950 Preston Road, Suite #720

Dallas, TX 75252

Phone: (972) 783-2578

FAX: (972) 783-2583

Job: ***101 ft MP | Wethersfield Site #CTHA506A***			
Project: ***CT04861M-19V1***			
Client: Transcend Wireless / T-Mobile	Drawn by: LNguyen	App'd:	
Code: TIA-222-G	Date: 05/13/19	Scale: NTS	
Path: D:\MEIProjects\19 DATA\MNP\CT04861M-19V1\CT04861M-19V1.eri		Dwg No. E-1	

No.	QTY.	DESCRIPTION	ELEV.	TENANT
1	1	1/2	101'	E (Lighting)
2	12	1 5/8	101'	AT&T / E
3	2	5/8" Fiber Cable	101'	AT&T / E
4	2	3/4" DC Power Cable	101'	AT&T / E
5	2	3/4" DC Power Cable	101'	AT&T / E
6	1	ATCB-B01-xxx Homerun Cable (Ext.)	62'-101'	AT&T / E
7	1	ATCB-B01-xxx Homerun Cable (Int.)	62'	AT&T / E
8	1	1 5/8 (Hybrid-Fiber)	95'	T-Mobile / E
9	4	1 5/8 (Hybrid-Fiber)	95'	T-Mobile / P
10	6	7/8	95'	T-Mobile / E
11	1	3/8	46'	E
12	1	3/8	37'	E

LEGEND:

E = EXISTING — #X

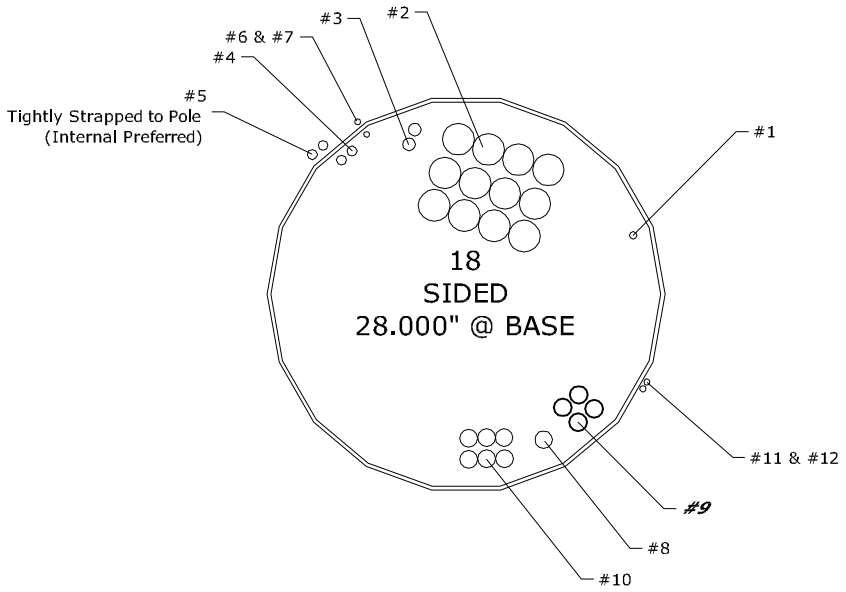
P = PROPOSED — *#X*

F = FUTURE — #X

R = REMOVE — #X

TO RELOCATE

CONTACT MEI IF LINE LAYOUT IS DIFFERENT FROM WHAT IS SHOWN BELOW.



101 PLAN: SCHEMATIC Tx-LINE LAYOUT

SCALE: NOT TO SCALE

NOTES:

1. Tx LINE LAYOUT IS SCHEMATIC ONLY, BASED UPON MEI RECORDS. NO RECENT SITE PHOTOS PROVIDED.
2. NEW BRACKET SUPPORT SPECIFICATION BY OTHERS.

MAY 13, 2019

MALOUF ENGINEERING INTERNATIONAL, INC.
STRUCTURAL CONSULTANTS
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DALLAS, TEXAS 75252-5635
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T-Mobile

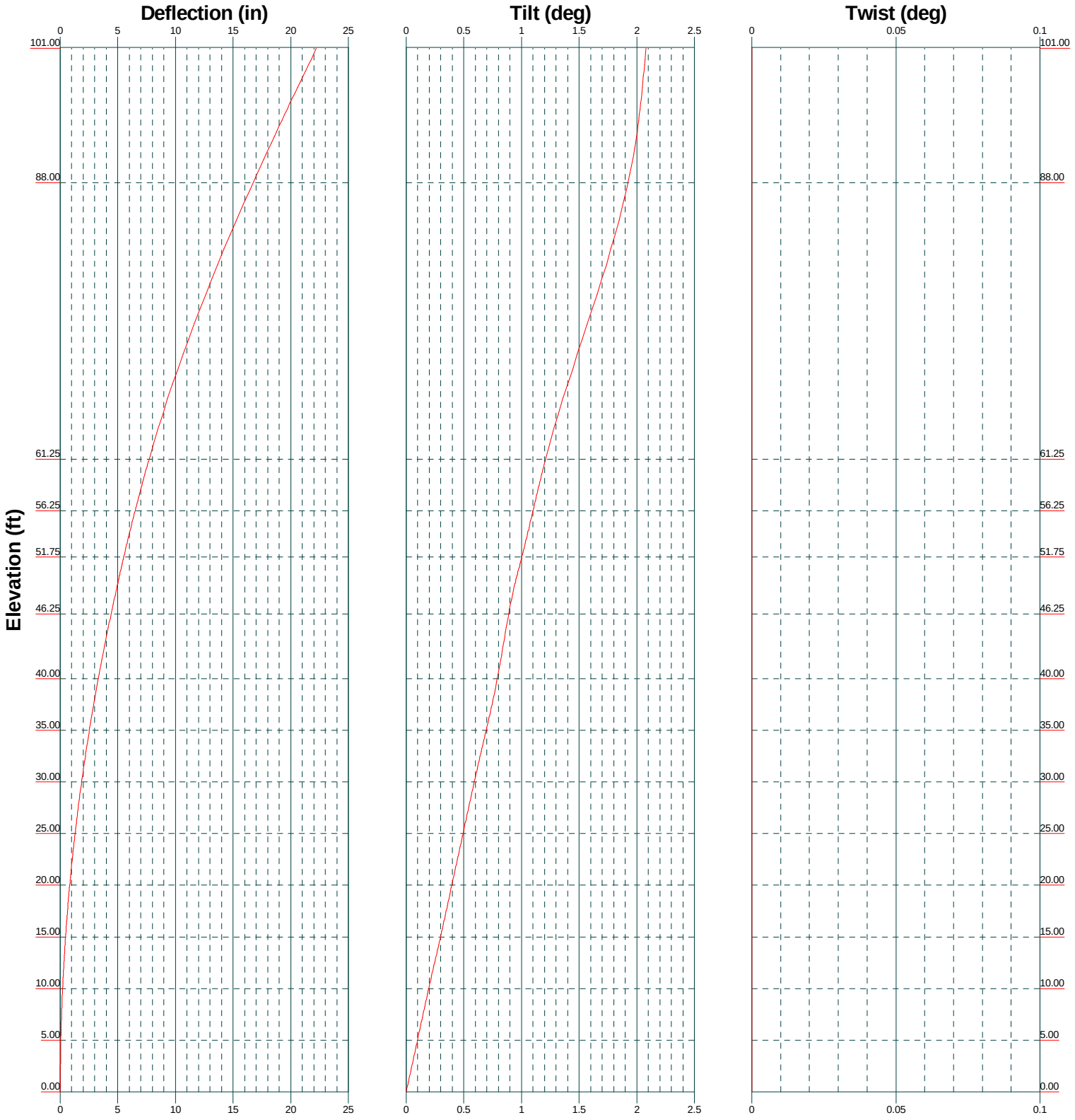
101 ft MP | Wethersfield Site #CTHA506A

MONOPOLE TxLINE LAYOUT

MEI PROJECT ID	SHEET NUMBER	REV.
CT04861M-19V1	**L01**	0

TIA-222-G - Service - 60 mph

Maximum Values



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FAX: (972) 783-2583

Job: ***101 ft MP | Wethersfield Site #CTHA506A***			
Project: ***CT04861M-19V1***			
Client: Transcend Wireless / T-Mobile	Drawn by: LNguyen	App'd:	
Code: TIA-222-G	Date: 05/13/19	Scale: NTS	
Path: D:\MEIProjects\19 DATA\MNP\CT04861M-19V1\CT04861M-19V1.eri		Dwg No. E-5	

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 Hartford County, Connecticut.
Basic wind speed of 100 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.2500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 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.

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Placement ft	Total Number
3/4" DC Power Cable (AT&T / E)	101.00 - 0.00	2
ATCB-B01-xxx Homerun Cable (AT&T / E)	101.00 - 62.00	1
3/8 (Shielded) (E)	46.50 - 0.00	1
3/8 (Shielded) (E)	37.00 - 0.00	1

Feed Line/Linear Appurtenances - Entered As Area

Description	Placement ft	Total Number
Safety Line 3/8 (E)	101.00 - 0.00	1
Step Bolts (E)	101.00 - 0.00	1
1/2 (E (Lighting))	101.00 - 0.00	1
1 5/8 (AT&T / E)	101.00 - 0.00	12
5/8" Fiber Cable (AT&T / E)	101.00 - 0.00	2
3/4" DC Power Cable (AT&T / E)	101.00 - 0.00	2
ATCB-B01-xxx Homerun Cable (AT&T / E)	62.00 - 0.00	1
1 5/8 (Hybrid-Fiber) (T-Mobile / E)	95.00 - 0.00	1
1 5/8 (Hybrid-Fiber) (T-Mobile / P)	95.00 - 0.00	4
7/8 (T-Mobile / E)	95.00 - 0.00	6
MP303 (Mods)	62.00 - 47.00	1
MP303 (Mods)	62.00 - 47.00	1
MP304 (Mods)	45.50 - 0.00	1
MP304 (Mods)	45.50 - 0.00	1

Discrete Tower Loads

Description	Placement	Weight
	ft	K
5' Lightning Rod	101.00	0.00
(E)		0.01
		0.01
		0.03
Beacon/Strobe	101.00	0.06
(E)		0.09
		0.12
		0.20
QS66512-3 w/ Pipe Mount	103.50	0.16
(AT&T / E)		0.23
		0.32
		0.52
QS66512-3 w/ Pipe Mount	103.50	0.16
(AT&T / E)		0.23
		0.32
		0.52
QS66512-3 w/ Pipe Mount	103.50	0.16
(AT&T / E)		0.23
		0.32
		0.52
7770.00 Panels w/ Pipe	103.50	0.04
Mount		0.09
(AT&T / E)		0.15
		0.29
7770.00 Panels w/ Pipe	103.50	0.04
Mount		0.09
(AT&T / E)		0.15
		0.29
7770.00 Panels w/ Pipe	103.50	0.04
Mount		0.09
(AT&T / E)		0.15
		0.29
HPA-65R-BUU-H6 w/ Pipe	103.50	0.09
Mounts		0.17
(AT&T / New)		0.26
		0.48
HPA-65R-BUU-H6 w/ Pipe	103.50	0.09
Mounts		0.17
(AT&T / New)		0.26
		0.48
HPA-65R-BUU-H6 w/ Pipe	103.50	0.09
Mounts		0.17
(AT&T / New)		0.26
		0.48
RRUS-11 (AT&T)	103.50	0.06
(AT&T / E)		0.08
		0.11
		0.18
RRUS-11 (AT&T)	103.50	0.06
(AT&T / E)		0.08
		0.11
		0.18
RRUS-11 (AT&T)	103.50	0.06
(AT&T / E)		0.08
		0.11
		0.18

Description	Placement	Weight
	ft	K
RRUS-32 B2	103.50	0.05
(AT&T / E)		0.07
		0.10
		0.16
RRUS-32 B2	103.50	0.05
(AT&T / E)		0.07
		0.10
		0.16
RRUS-32 B2	103.50	0.05
(AT&T / E)		0.07
		0.10
		0.16
RRUS-32	103.50	0.08
(AT&T / E)		0.10
		0.14
		0.21
RRUS-32	103.50	0.08
(AT&T / E)		0.10
		0.14
		0.21
RRUS-32	103.50	0.08
(AT&T / E)		0.10
		0.14
		0.21
(2) LGP21401 TMA'S	103.50	0.02
(AT&T / E)		0.03
		0.04
		0.06
(2) LGP21401 TMA'S	103.50	0.02
(AT&T / E)		0.03
		0.04
		0.06
(2) LGP21401 TMA'S	103.50	0.02
(AT&T / E)		0.03
		0.04
		0.06
(2) TPX-070821 Triplexer	103.50	0.01
(AT&T / E)		0.01
		0.02
		0.03
(2) TPX-070821 Triplexer	103.50	0.01
(AT&T / E)		0.01
		0.02
		0.03
(2) TPX-070821 Triplexer	103.50	0.01
(AT&T / E)		0.01
		0.02
		0.03
Raycap DC6 (Squid)	103.50	0.02
Suppressor		0.04
(AT&T / E)		0.05
		0.10
Raycap DC6 (Squid)	103.50	0.02
Suppressor		0.04
(AT&T / E)		0.05
		0.10

Description	Placement	Weight
	ft	K
RRUS-32 B66 (AT&T / New)	103.50	0.06 0.08 0.11 0.16
RRUS-32 B66 (AT&T / New)	103.50	0.06 0.08 0.11 0.16
RRUS-32 B66 (AT&T / New)	103.50	0.06 0.08 0.11 0.16
SitePro1 RRU Dual Swivel Mount (AT&T / New)	103.50	0.04 0.07 0.10 0.16
SitePro1 RRU Dual Swivel Mount (AT&T / New)	103.50	0.04 0.07 0.10 0.16
SitePro1 RRU Dual Swivel Mount (AT&T / New)	103.50	0.04 0.07 0.10 0.16
Top Platform w/ Rails (& Ladder) (AT&T / E)	103.50	2.00 3.15 4.30 6.60
AIR21 KRC118023 B2P B4A w/ Pipe Mount (T-Mobile / E)	95.00	0.13 0.18 0.25 0.40
AIR21 KRC118023 B2P B4A w/ Pipe Mount (T-Mobile / E)	95.00	0.13 0.18 0.25 0.40
AIR21 KRC118023 B2P B4A w/ Pipe Mount (T-Mobile / E)	95.00	0.13 0.18 0.25 0.40
AIR32 KRD901146-1 B66A B2A Panel Antenna w/ Pipe Mount (T-Mobile / P)	95.00	0.17 0.23 0.30 0.46
AIR32 KRD901146-1 B66A B2A Panel Antenna w/ Pipe Mount (T-Mobile / P)	95.00	0.17 0.23 0.30 0.46
AIR32 KRD901146-1 B66A B2A Panel Antenna w/ Pipe Mount (T-Mobile / P)	95.00	0.17 0.23 0.30 0.46
APXVAARR24_43-U-NA20 w/ Pipe Mount (T-Mobile / P)	95.00	0.18 0.32 0.46 0.78
APXVAARR24_43-U-NA20 w/ Pipe Mount (T-Mobile / P)	95.00	0.18 0.32 0.46 0.78
APXVAARR24_43-U-NA20 w/ Pipe Mount (T-Mobile / P)	95.00	0.18 0.32 0.46 0.78
RADIO 4449 - B71 + B12 (T-Mobile / P)	95.00	0.07 0.09 0.11 0.15
RADIO 4449 - B71 + B12 (T-Mobile / P)	95.00	0.07 0.09 0.11 0.15
RADIO 4449 - B71 + B12 (T-Mobile / P)	95.00	0.07 0.09 0.11 0.15
12.5 ft. L.P. T-Arm Mount (SitePro1 RMV12-3XX) w/ New Handrail Kit (T-Mobile / E)	95.00	0.40 0.60 0.80 1.20
12.5 ft. L.P. T-Arm Mount (SitePro1 RMV12-3XX) w/ New Handrail Kit (T-Mobile / E)	95.00	0.40 0.60 0.80 1.20
12.5 ft. L.P. T-Arm Mount (SitePro1 RMV12-3XX) w/ New Handrail Kit (T-Mobile / E)	95.00	0.40 0.60 0.80 1.20
GPS (E)	46.50	0.00 0.01 0.01 0.01
18" Approx. Standoff Arm (E)	46.50	0.03 0.04 0.06 0.09
GPS (E)	37.00	0.00 0.00 0.01 0.01
18" Approx. Standoff Arm (E)	37.00	0.03 0.05 0.07 0.11

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	59.03	-0.00	-0.00
	Max. H_x	21	16.94	16.58	-0.02
	Max. H_z	3	16.94	-0.02	16.73
	Max. M_x	2	1313.41	-0.02	16.73
	Max. M_z	8	1308.13	-16.58	0.02
	Max. Torsion	6	0.25	-14.48	8.38
	Min. Vert	3	16.94	-0.02	16.73
	Min. H_x	9	16.94	-16.58	0.02
	Min. H_z	15	16.94	0.02	-16.73
	Min. M_x	14	-1313.06	0.02	-16.73
	Min. M_z	20	-1308.28	16.58	-0.02
	Min. Torsion	18	-0.25	14.48	-8.38

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 88	22.233	40	2.0805	0.0011
L2	90.25 - 61.25	17.648	40	1.9659	0.0007
L3	61.25 - 56.25	7.712	40	1.2108	0.0004
L4	56.25 - 51.75	6.501	40	1.1027	0.0003
L5	51.75 - 46.25	5.509	40	1.0025	0.0003
L6	49 - 40	4.949	40	0.9399	0.0003
L7	40 - 35	3.304	40	0.7885	0.0003
L8	35 - 30	2.530	40	0.6909	0.0002
L9	30 - 25	1.858	40	0.5925	0.0002
L10	25 - 20	1.289	40	0.4937	0.0001
L11	20 - 15	0.824	40	0.3946	0.0001
L12	15 - 10	0.463	40	0.2955	0.0001
L13	10 - 5	0.205	40	0.1966	0.0001
L14	5 - 0	0.051	40	0.0981	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
103.50	QS66512-3 w/ Pipe Mount	40	22.233	2.0805	0.0011	6815
101.00	5' Lightning Rod	40	22.233	2.0805	0.0011	6815
95.00	AIR21 KRC118023 B2P B4A w/ Pipe Mount	40	19.646	2.0281	0.0009	5680
46.50	GPS	40	4.463	0.8926	0.0003	3460
37.00	GPS	40	2.827	0.7313	0.0002	2899

Base Plate Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension K	Actual Allowable Ratio Concrete Stress ksi	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Critical Ratio
in		in						
3.7000	8	1.7500	131.36 216.48 0.61	3.064 4.080 0.75	44.763 45.000 0.99		Plate	0.99 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	101 - 88	Pole	TP16.36x14.64x0.1875	1	-7.15	701.90	45.3	Pass
L2	88 - 61.25	Pole	TP19.7689x15.6873x0.25	2	-10.32	1150.70	95.0	Pass
L3	61.25 - 56.25	Pole	TP20.4726x19.7689x0.250*	3	-11.07	1717.72	71.0	Pass
L4	56.25 - 51.75	Pole	TP21.1059x20.4726x0.250*	4	-11.75	1754.20	75.0	Pass
L5	51.75 - 46.25	Pole	TP21.88x21.1059x0.250*	5	-12.17	1764.42	77.9	Pass
L6	46.25 - 40	Pole	TP22.28x20.725x0.3125*	6	-14.13	2370.46	68.2	Pass
L7	40 - 35	Pole	TP22.995x22.28x0.3125*	7	-15.14	2419.54	71.0	Pass
L8	35 - 30	Pole	TP23.71x22.995x0.3125*	8	-16.13	2466.74	73.8	Pass
L9	30 - 25	Pole	TP24.425x23.71x0.3125*	9	-17.15	2517.17	76.2	Pass
L10	25 - 20	Pole	TP25.14x24.425x0.3125*	10	-18.19	2566.02	78.6	Pass
L11	20 - 15	Pole	TP25.855x25.14x0.3125*	11	-19.25	2613.31	80.8	Pass
L12	15 - 10	Pole	TP26.57x25.855x0.3125*	12	-20.33	2664.61	82.7	Pass
L13	10 - 5	Pole	TP27.285x26.57x0.3125*	13	-21.44	2714.66	84.5	Pass
L14	5 - 0	Pole	TP28x27.285x0.3125*	14	-22.57	2763.46	86.3	Pass
							Summary	
						Pole (L2)	95.0	Pass
						Base Plate	99.5	Pass
						RATING =	**99.5**	**Pass**

***Modified w/ MP304 & MP303 Channels**

APPENDIX 2 – SOURCE / CHANGED CONDITION

Everest Infrastructure
Colocation Application

Tower Equipment

List **ALL** equipment components installed on the tower or ground space area, including mounting apparatus, ice bridges, etc.

Tower Equipment				Equipment Status (mark with "x")			Equipment Dimensions				Azimuths	Equip. Centerline		Lines		
Component Type (Ant. type, RRU, mount, etc.)	Manufacturer	Model	# Units	Exist	New	To be Removed	Height (inches)	Width (inches)	Depth (inches)	Weight (lbs)	Degrees (a/b/c)	AGL (ft)	Leg (e.g. NE)	Type	# Units	Size
Antenna	Ericsson	AIR 21 KRC118023 B2P_B4A	3	X			56.0	12.0	8.0	91.0	20/150/255	95'		Coax	6	7/8"
Antenna	Ericsson	AIR 21 B4A/B12P	3			X	57.0	14.8	9.5	124.0	20/150/255	95'				
Antenna	Ericsson	AIR 32 KRD901146-1_B66A_B2A	3		X		56.5	12.9	8.7	132.2	20/150/255	95'		Hybrid	5	1-5/8"
Antenna	RFS	APXVAARR24_43-U-NA20	3		X		95.9	24.0	8.7	128.0	20/150/255	95'				
RRU	Ericsson	Radio 4449 B71B12	3		X		14.9	13.2	9.3	74.0	20/150/255	95'				
RRU	Ericsson	RRUS11B12	3			X	19.7	17.0	7.2	50.7	20/150/255	95'				

Ground Equipment Equipment

List all equipment components installed in the compound or interior space not owned by the Tenant. Incude battery information even if in owned shelter

Ground Equipment				Equipment Status (mark with "x")			Equipment Dimensions				Equipment Details
Component	Manufacturer	Model	Quantity	Existing	New	To be Removed	Height (inches)	Width (inches)	Depth (inches)	Weight (lbs)	(e.g. generator KWs, battery type, operating requirements, etc.)

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

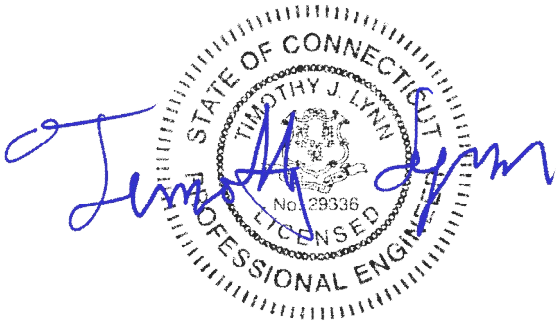
T-Mobile Site #: CTHA506A

75 Wells Road
Wethersfield, CT

Centek Project No. 19027.22

Date: May 03, 2019

Max Stress Ratio =90.8%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

SECTION 1 – REPORT

- ANTENNA AND APPURTENANCE SUMMARY
- STRUCTURE LOADING
- CONCLUSION

SECTION 2 – CALCULATIONS

- WIND LOAD ON APPURTENANCES
- RISA3D OUTPUT REPORT

SECTION 3 – REFERENCE MATERIALS (NOT INCLUDED WITHIN REPORT)

- RF DATA SHEET, DATED 04/13/2019

CENTEK engineering

Centered on Solutions℠

May 03, 2019

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

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTHA506A
75 Wells Road
Wethersfield, CT 06109

Centek Project No. 19027.22

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 three (3) 12-ft T-frames with proposed handrails (SitePro P/N: HRK12-U). 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:
  T-Arms: Three (3) Ericsson AIR21 KRC118023-1_B2P_B4A panel antennas, three (3) Ericsson AIR32KRD901146-1_B66A_B2A panel antennas ,three (3) RFS APXVAARR24_43-U-NA20 panel antennas and (3) Ericsson 4449 B71_B12 remote radio units mounted on three (3) T-Arms with a RAD center elevation of 95 ft +/- AGL. (Proposed handrail SitePro P/N: HRK12-U to be installed)

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 97 mph for Wethersfield 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

Prepared by:

Fernando J. Palacios
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: Loads on Equipment

Location: Wethersfield, CT

Rev. 0: 05/03/19

Prepared by: F.J.P Checked by: C.A.G.
Job No. 19027.22

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

Wind Speeds

Basic Wind Speed	$V := 97$	mph	(User Input - 2018 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 =	$Exp := C$		(User Input)
Structure Height =	$h := 103.5$	ft	(User Input)
Height to Center of Antennas =	$z := 95$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1$	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)

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

Importance Factors =

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

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

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

$$K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.112$$

Velocity Pressure Coefficient Antennas =

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.223$$

$$Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.252$$

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot K_d \cdot Kz \cdot V^2 \cdot I_{Wind} = 28.65$ psf

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot K_d \cdot Kz \cdot V_i^2 \cdot I_{Wind} = 7.612$ psf

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAARR24_43-U-NA20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 19.7$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 133.4$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.9$		
Antenna Force Coefficient =	$Ca_{ant} = 1.31$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 13.1$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 540$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 238$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 16.8$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 184$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 9.2$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 100$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 2 \cdot 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 500$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 500$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR 32 KRD901146-1_B66A_B2A		
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 Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 205$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.4$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 138$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 7.4$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 79$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 5.6$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 60$	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 =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 7568$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 245$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 245$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model = Ericsson - AIR21 KRC118023-1_B2P_B4A

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 55.9$ in (User Input)

Antenna Width = $W_{ant} := 12.1$ in (User Input)

Antenna Thickness = $T_{ant} := 7.9$ in (User Input)

Antenna Weight = $WT_{ant} := 91.5$ lbs (User Input)

Number of Antennas = $N_{ant} := 1$ (User Input)

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.6$

Antenna Force Coefficient = $Ca_{ant} = 1.29$

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 Front = $F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 192$ lbs

Surface Area for One Antenna = $SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.1$ sf

Total Antenna Wind Force Side = $F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 125$ lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.9$ sf

Total Antenna Wind Force w/ Ice Front = $Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 75$ lbs

Surface Area for One Antenna w/ Ice = $SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 5.2$ sf

Total Antenna Wind Force w/ Ice Side = $Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 56$ lbs

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 92$ lbs

Gravity Loads (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5343$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 6984$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 226$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 226$ 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 =	$N_{RRUS} := 1$		
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 =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 52$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 41$	lbs

Wind Load (with ice)

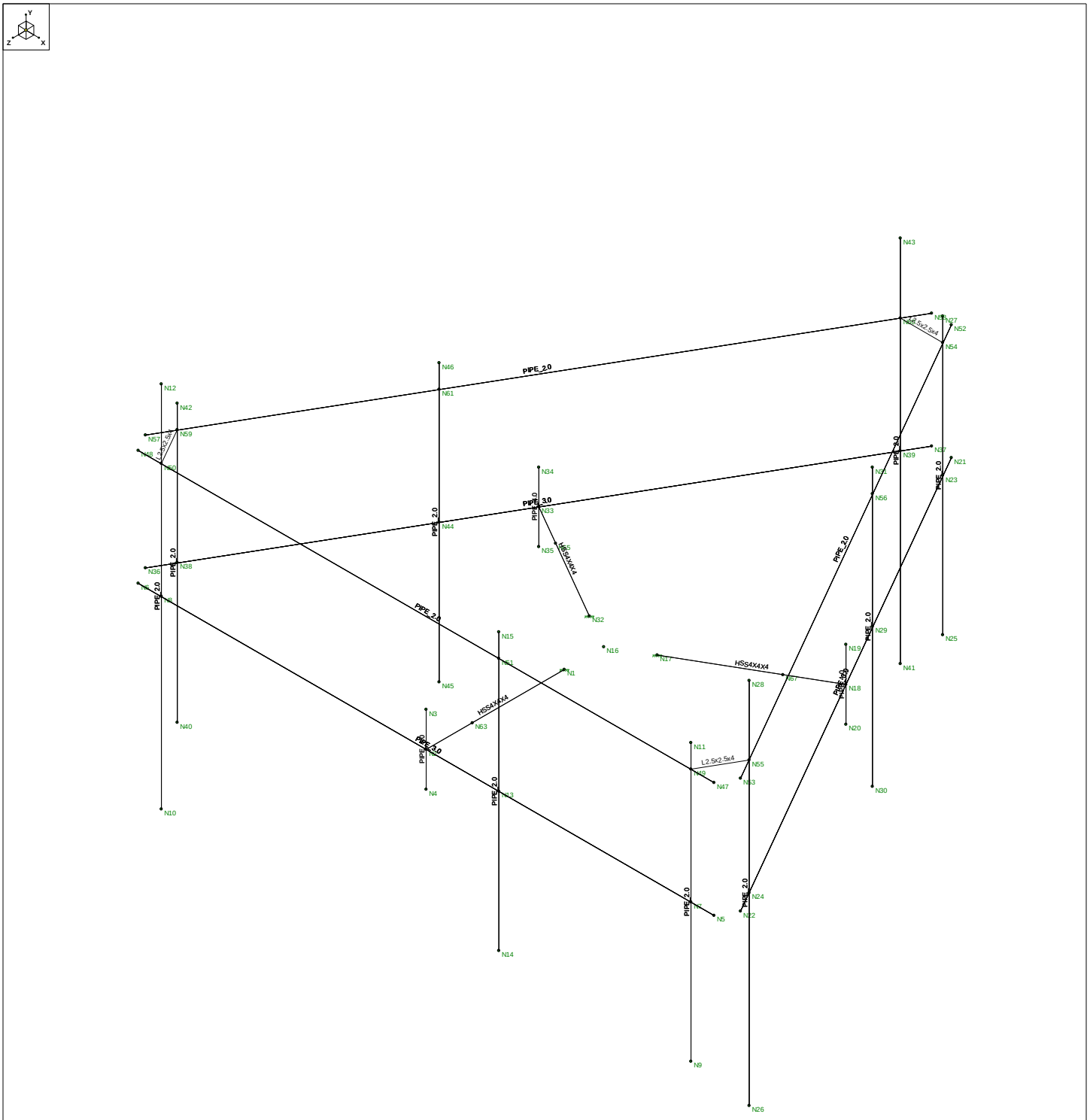
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.4$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 24$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 20$	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 =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 3023$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 98$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 98$	lbs



Envelope Only Solution

Centek		
FJP	CTHA506A - Mount	May 3, 2019 at 12:28 PM
19027.22	Member Framing	CTHA506A_AMA.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	1
Cd X	1
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 (\1...	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 ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	(E)Outrigger	HSS4X4X4	Beam	Tube	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
2	(E) Horz	PIPE_3.0	Beam	Pipe	A53 Grade B	Typical	2.07	2.85	2.85	5.69
3	(E) Antenna Mast	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	(E) Vert	PIPE_4.0	Column	Pipe	A53 Grade B	Typical	2.96	6.82	6.82	13.6
5	(P) Antenna Mast	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
6	(P) Handrails	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
7	(P) Handrail Co...	L2.5x2.5x4	Column	Pipe	A36 Gr.36	Typical	1.19	.692	.692	.026

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	(E)Outrigger	3			Lbyy						Lateral
2	M2	(E) Vert	1.5			Lbyy						Lateral
3	M3	(E) Horz	12.5	Segment	6	Lbyy	6	6				Lateral
4	M4	(E) Antenna...	8			Lbyy						Lateral
5	M5	(E) Antenna...	6			Lbyy						Lateral
6	M6	(E) Antenna...	6			Lbyy						Lateral
7	M7	(E)Outrigger	3			Lbyy						Lateral
8	M8	(E) Vert	1.5			Lbyy						Lateral
9	M9	(E) Horz	12.5	Segment	6	Lbyy	6	6				Lateral
10	M10	(E) Antenna...	8			Lbyy						Lateral
11	M11	(E) Antenna...	6			Lbyy						Lateral
12	M12	(E) Antenna...	6			Lbyy						Lateral
13	M13	(E)Outrigger	3			Lbyy						Lateral
14	M14	(E) Vert	1.5			Lbyy						Lateral
15	M15	(E) Horz	12.5	Segment	6	Lbyy	6	6				Lateral
16	M16	(E) Antenna...	8			Lbyy						Lateral
17	M17	(E) Antenna...	6			Lbyy						Lateral
18	M18	(E) Antenna...	6			Lbyy						Lateral
19	M19	(P) Handrails	12.5	Segment		Lbyy						Lateral
20	M20	(P) Handrails	12.5	Segment		Lbyy						Lateral
21	M21	(P) Handrails	12.5	Segment		Lbyy						Lateral
22	M22	(P) Handrail...	.926	Segment		Lbyy						Lateral
23	M23	(P) Handrail...	.926	Segment		Lbyy						Lateral
24	M24	(P) Handrail...	.926	Segment		Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N2			(E)Outrigger	Beam	Tube	A500 Gr...	Typical
2	M2	N3	N4			(E) Vert	Column	Pipe	A53 Gra...	Typical
3	M3	N6	N5			(E) Horz	Beam	Pipe	A53 Gra...	Typical
4	M4	N12	N10			(E) Antenna Mast	Column	Pipe	A53 Gra...	Typical
5	M5	N11	N9			(E) Antenna Mast	Column	Pipe	A53 Gra...	Typical
6	M6	N15	N14			(E) Antenna Mast	Column	Pipe	A53 Gra...	Typical
7	M7	N17	N18			(E)Outrigger	Beam	Tube	A500 Gr...	Typical
8	M8	N19	N20			(E) Vert	Column	Pipe	A53 Gra...	Typical
9	M9	N22	N21			(E) Horz	Beam	Pipe	A53 Gra...	Typical
10	M10	N28	N26			(E) Antenna Mast	Column	Pipe	A53 Gra...	Typical
11	M11	N27	N25			(E) Antenna Mast	Column	Pipe	A53 Gra...	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
12	M12	N31	N30			(E) Antenna Mast	Column	Pipe	A53 Gra...	Typical
13	M13	N32	N33			(E)Outrigger	Beam	Tube	A500 Gr....	Typical
14	M14	N34	N35			(E) Vert	Column	Pipe	A53 Gra...	Typical
15	M15	N37	N36			(E) Horz	Beam	Pipe	A53 Gra...	Typical
16	M16	N43	N41			(E) Antenna Mast	Column	Pipe	A53 Gra...	Typical
17	M17	N42	N40			(E) Antenna Mast	Column	Pipe	A53 Gra...	Typical
18	M18	N46	N45			(E) Antenna Mast	Column	Pipe	A53 Gra...	Typical
19	M19	N48	N47			(P) Handrails	Column	Pipe	A53 Gra...	Typical
20	M20	N57	N58			(P) Handrails	Column	Pipe	A53 Gra...	Typical
21	M21	N53	N52			(P) Handrails	Column	Pipe	A53 Gra...	Typical
22	M22	N50	N59		180	(P) Handrail Connector	Column	Pipe	A36 Gr.36	Typical
23	M23	N49	N55		90	(P) Handrail Connector	Column	Pipe	A36 Gr.36	Typical
24	M24	N60	N54		180	(P) Handrail Connector	Column	Pipe	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	0.854167	0	
2	N2	0	0	3.854167	0	
3	N3	0	.75	3.854167	0	
4	N4	0	-.75	3.854167	0	
5	N5	6.25	0	3.854167	0	
6	N6	-6.25	0	3.854167	0	
7	N7	5.75	0	3.854167	0	
8	N8	-5.75	0	3.854167	0	
9	N9	5.75	-3	3.854167	0	
10	N10	-5.75	-4	3.854167	0	
11	N11	5.75	3	3.854167	0	
12	N12	-5.75	4	3.854167	0	
13	N13	1.583333	0	3.854167	0	
14	N14	1.583333	-3	3.854167	0	
15	N15	1.583333	3	3.854167	0	
16	N16	0	0	0	0	
17	N17	0.73973	0	-0.427083	0	
18	N18	3.337806	0	-1.927083	0	
19	N19	3.337806	.75	-1.927083	0	
20	N20	3.337806	-.75	-1.927083	0	
21	N21	0.212806	0	-7.339742	0	
22	N22	6.462806	0	3.485575	0	
23	N23	0.462806	0	-6.906729	0	
24	N24	6.212806	0	3.052563	0	
25	N25	0.462806	-3	-6.906729	0	
26	N26	6.212806	-4	3.052563	0	
27	N27	0.462806	3	-6.906729	0	
28	N28	6.212806	4	3.052563	0	
29	N29	2.54614	0	-3.29829	0	
30	N30	2.54614	-3	-3.29829	0	
31	N31	2.54614	3	-3.29829	0	
32	N32	-0.73973	0	-0.427083	0	
33	N33	-3.337806	0	-1.927083	0	
34	N34	-3.337806	.75	-1.927083	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
35	N35	-3.337806	-.75	-1.927083	0	
36	N36	-6.462806	0	3.485575	0	
37	N37	-0.212806	0	-7.339742	0	
38	N38	-6.212806	0	3.052563	0	
39	N39	-0.462806	0	-6.906729	0	
40	N40	-6.212806	-3	3.052563	0	
41	N41	-0.462806	-4	-6.906729	0	
42	N42	-6.212806	3	3.052563	0	
43	N43	-0.462806	4	-6.906729	0	
44	N44	-4.129473	0	-0.555876	0	
45	N45	-4.129473	-3	-0.555876	0	
46	N46	-4.129473	3	-0.555876	0	
47	N47	6.25	2.5	3.854167	0	
48	N48	-6.25	2.5	3.854167	0	
49	N49	5.75	2.5	3.854167	0	
50	N50	-5.75	2.5	3.854167	0	
51	N51	1.583333	2.5	3.854167	0	
52	N52	0.212806	2.5	-7.339742	0	
53	N53	6.462806	2.5	3.485575	0	
54	N54	0.462806	2.5	-6.906729	0	
55	N55	6.212806	2.5	3.052563	0	
56	N56	2.54614	2.5	-3.29829	0	
57	N57	-6.462806	2.5	3.485575	0	
58	N58	-0.212806	2.5	-7.339742	0	
59	N59	-6.212806	2.5	3.052563	0	
60	N60	-0.462806	2.5	-6.906729	0	
61	N61	-4.129473	2.5	-0.555876	0	
62	N63	0	0	2.854167	0	
63	N65	-2.471781	0	-1.427083	0	
64	N67	2.471781	0	-1.427083	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	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N17	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N32	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N63						
5	N65						
6	N67						

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Y	-.067	.5
2	M10	Y	-.067	.5
3	M16	Y	-.067	.5
4	M4	Y	-.067	7.5
5	M10	Y	-.067	7.5
6	M16	Y	-.067	7.5
7	M6	Y	-.067	.5

Member Point Loads (BLC 2 : Dead Load) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
8	M12	Y	-.067	.5
9	M18	Y	-.067	.5
10	M6	Y	-.067	5.5
11	M12	Y	-.067	5.5
12	M18	Y	-.067	5.5
13	M5	Y	-.046	.5
14	M11	Y	-.046	.5
15	M17	Y	-.046	.5
16	M5	Y	-.046	5.5
17	M11	Y	-.046	5.5
18	M17	Y	-.046	5.5
19	M4	Y	-.074	3
20	M10	Y	-.074	3
21	M16	Y	-.074	3

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Y	-.25	.5
2	M10	Y	-.25	.5
3	M16	Y	-.25	.5
4	M4	Y	-.25	7.5
5	M10	Y	-.25	7.5
6	M16	Y	-.25	7.5
7	M6	Y	-.123	.5
8	M12	Y	-.123	.5
9	M18	Y	-.123	.5
10	M6	Y	-.123	5.5
11	M12	Y	-.123	5.5
12	M18	Y	-.123	5.5
13	M5	Y	-.113	.5
14	M11	Y	-.113	.5
15	M17	Y	-.113	.5
16	M5	Y	-.113	5.5
17	M11	Y	-.113	5.5
18	M17	Y	-.113	5.5
19	M4	Y	-.098	3
20	M10	Y	-.098	3
21	M16	Y	-.098	3

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	X	.05	.5
2	M4	X	.05	7.5
3	M10	X	.092	.5
4	M16	X	.092	.5
5	M10	X	.092	7.5
6	M16	X	.092	7.5
7	M6	X	.03	.5
8	M6	X	.03	5.5
9	M12	X	.04	.5
10	M18	X	.04	.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
11	M12	X	.04	5.5
12	M18	X	.04	5.5
13	M5	X	.028	.5
14	M5	X	.028	5.5
15	M11	X	.038	.5
16	M17	X	.038	.5
17	M11	X	.038	5.5
18	M17	X	.038	5.5
19	M4	X	.02	3

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	X	.119	.5
2	M4	X	.119	7.5
3	M10	X	.27	.5
4	M16	X	.27	.5
5	M10	X	.27	7.5
6	M16	X	.27	7.5
7	M6	X	.069	.5
8	M6	X	.069	5.5
9	M12	X	.103	.5
10	M18	X	.103	.5
11	M12	X	.103	5.5
12	M18	X	.103	5.5
13	M5	X	.063	.5
14	M5	X	.063	5.5
15	M11	X	.096	.5
16	M17	X	.096	.5
17	M11	X	.096	5.5
18	M17	X	.096	5.5
19	M4	X	.041	3

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Z	.092	.5
2	M4	Z	.092	7.5
3	M10	Z	.05	.5
4	M16	Z	.05	.5
5	M10	Z	.05	7.5
6	M16	Z	.05	7.5
7	M6	Z	.04	.5
8	M6	Z	.04	5.5
9	M12	Z	.03	.5
10	M18	Z	.03	.5
11	M12	Z	.03	5.5
12	M18	Z	.03	5.5
13	M5	Z	.038	.5
14	M5	Z	.038	5.5
15	M11	Z	.028	.5
16	M17	Z	.028	.5
17	M11	Z	.028	5.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
18	M17	Z	.028	5.5
19	M10	Z	.02	3
20	M16	Z	.02	3

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Z	.27	.5
2	M4	Z	.27	7.5
3	M10	Z	.119	.5
4	M16	Z	.119	.5
5	M10	Z	.119	7.5
6	M16	Z	.119	7.5
7	M6	Z	.103	.5
8	M6	Z	.103	5.5
9	M12	Z	.069	.5
10	M18	Z	.069	.5
11	M12	Z	.069	5.5
12	M18	Z	.069	5.5
13	M5	Z	.096	.5
14	M5	Z	.096	5.5
15	M11	Z	.063	.5
16	M17	Z	.063	.5
17	M11	Z	.063	5.5
18	M17	Z	.063	5.5
19	M10	Z	.041	3
20	M16	Z	.041	3

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M20	X	.002	.002	0	0
2	M21	X	.002	.002	0	0
3	M22	X	.002	.002	0	0
4	M23	X	.002	.002	0	0
5	M15	X	.002	.002	0	0
6	M9	X	.002	.002	0	0
7	M2	X	.003	.003	0	0
8	M8	X	.003	.003	0	0
9	M14	X	.003	.003	0	0
10	M1	X	.003	.003	0	0
11	M7	X	.003	.003	0	0
12	M13	X	.003	.003	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M20	X	.006	.006	0	0
2	M21	X	.006	.006	0	0
3	M22	X	.006	.006	0	0
4	M23	X	.006	.006	0	0
5	M15	X	.008	.008	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
6	M9	X	.008	.008	0	0
7	M2	X	.011	.011	0	0
8	M8	X	.011	.011	0	0
9	M14	X	.011	.011	0	0
10	M1	X	.01	.01	0	0
11	M7	X	.01	.01	0	0
12	M13	X	.01	.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M19	Z	.002	.002	0	0
2	M20	Z	.002	.002	0	0
3	M21	Z	.002	.002	0	0
4	M22	Z	.002	.002	0	0
5	M23	Z	.002	.002	0	0
6	M24	Z	.002	.002	0	0
7	M15	Z	.002	.002	0	0
8	M9	Z	.002	.002	0	0
9	M3	Z	.002	.002	0	0
10	M2	Z	.003	.003	0	0
11	M8	Z	.003	.003	0	0
12	M14	Z	.003	.003	0	0
13	M7	Z	.003	.003	0	0
14	M13	Z	.003	.003	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M19	Z	.006	.006	0	0
2	M24	Z	.006	.006	0	0
3	M20	Z	.006	.006	0	0
4	M21	Z	.006	.006	0	0
5	M22	Z	.006	.006	0	0
6	M23	Z	.006	.006	0	0
7	M15	Z	.008	.008	0	0
8	M9	Z	.008	.008	0	0
9	M3	Z	.008	.008	0	0
10	M2	Z	.011	.011	0	0
11	M8	Z	.011	.011	0	0
12	M14	Z	.011	.011	0	0
13	M7	Z	.01	.01	0	0
14	M13	Z	.01	.01	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	Self Weight	None		-1						
2	Dead Load	None					21			
3	Ice Load	None					21			
4	Wind with Ice X	None					19	12		
5	Wind X	None					19	12		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
6	Wind with Ice Z	None					20	14		
7	Wind Z	None					20	14		

Load Combinations

	Description	Solve	PDel...	S...	B...	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-dire...	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-dire...	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	N1	max	.043	6	1.961	6	.15	3	-1.415	5	-.121	6	.492	1
2		min	-1.481	2	.556	2	-1.188	5	-5.118	3	-3.403	1	-.129	5
3	N17	max	.031	6	1.958	3	-.225	3	2.639	6	3.071	5	4.423	6
4		min	-1.572	2	.508	5	-1.473	4	.43	2	.576	3	1.463	5
5	N32	max	.298	5	1.853	6	.463	2	2.504	3	3.163	2	-1.395	5
6		min	-1.642	1	.388	2	-1.653	4	.196	5	-3.902	4	-4.595	3
7	Totals:	max	0	6	5.687	6	0	3						
8		min	-4.679	1	1.858	2	-4.298	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	0	6	0	6	0	6	0	6	0	6	0	6
2		min	0	1	0	1	0	1	0	1	0	1	0	1
3	N2	max	.086	1	-.023	5	0	5	5.53e-03	3	2.893e-03	1	3.908e-04	5
4		min	.007	6	-.143	3	0	3	9.834e-05	5	4.427e-04	6	-1.489e-03	1
5	N3	max	.1	1	-.023	5	.05	3	5.53e-03	3	2.893e-03	1	3.908e-04	5
6		min	.01	6	-.143	3	.001	5	9.944e-05	5	4.427e-04	6	-1.49e-03	1
7	N4	max	.073	1	-.023	5	0	5	5.53e-03	3	2.893e-03	1	3.908e-04	5
8		min	.004	6	-.143	3	-.05	3	9.724e-05	5	4.427e-04	6	-1.487e-03	1
9	N5	max	.087	1	-.181	5	.298	5	3.394e-03	1	2.045e-03	3	-2.104e-03	5
10		min	.006	6	-.602	3	-.133	3	-3.378e-03	5	-5.357e-03	5	-6.169e-03	3
11	N6	max	.087	1	-.057	2	.689	5	3.874e-03	3	1.169e-02	5	6.18e-03	6
12		min	.008	6	-.636	6	-.009	3	-1.46e-02	5	-5.886e-04	1	1.722e-04	2
13	N7	max	.087	1	-.169	5	.266	5	3.394e-03	1	2.045e-03	3	-2.104e-03	5
14		min	.006	6	-.565	3	-.12	3	-3.378e-03	5	-5.356e-03	5	-6.168e-03	3
15	N8	max	.087	1	-.056	2	.618	5	3.874e-03	3	1.169e-02	5	6.18e-03	6
16		min	.008	6	-.598	6	-.006	3	-1.46e-02	5	-5.886e-04	1	1.719e-04	2
17	N9	max	-.01	2	-.169	5	.512	5	3.389e-03	1	2.045e-03	3	-1.832e-03	2
18		min	-.192	6	-.566	3	-.227	3	-8.122e-03	5	-5.356e-03	5	-5.509e-03	6
19	N10	max	.514	1	-.056	2	2.21	5	3.821e-03	3	1.169e-02	5	1.222e-02	1
20		min	.199	5	-.599	6	-.19	3	-4.069e-02	5	-5.886e-04	1	3.673e-03	5
21	N11	max	.312	1	-.169	5	.182	5	4.586e-03	2	2.128e-03	3	-1.517e-03	5
22		min	.048	5	-.566	3	-.078	3	-1.765e-03	4	-1.539e-03	5	-6.15e-03	1

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
23	N12	max	.42	1	-.056	2	.328	4	3.136e-03	6	3.295e-03	4	-8.073e-04	5
24		min	.053	5	-.599	6	-.099	2	-2.997e-03	2	5.224e-04	2	-8.342e-03	1
25	N13	max	.086	1	-.043	5	.025	5	4.314e-03	3	1.738e-03	1	-1.853e-03	5
26		min	.007	6	-.215	3	-.044	1	-5.882e-04	5	-2.944e-03	5	-5.574e-03	3
27	N14	max	.032	2	-.043	5	.18	5	4.294e-03	3	1.738e-03	1	-5.65e-04	2
28		min	-.176	6	-.216	3	-.181	3	-5.68e-03	5	-2.944e-03	5	-5.068e-03	6
29	N15	max	.301	1	-.043	5	.139	4	3.449e-03	4	1.79e-03	3	-2.921e-05	5
30		min	.039	5	-.216	3	.019	2	1.633e-03	3	-6.203e-04	5	-4.498e-03	1
31	N16	max	0	6	0	6	0	6	0	6	0	6	0	6
32		min	0	1	0	1	0	1	0	1	0	1	0	1
33	N17	max	0	6	0	6	0	6	0	6	0	6	0	6
34		min	0	1	0	1	0	1	0	1	0	1	0	1
35	N18	max	.038	5	-.029	2	.066	5	8.041e-04	2	-2.432e-04	3	-9.541e-04	2
36		min	.006	3	-.145	6	.01	3	-3.009e-03	6	-2.44e-03	5	-4.765e-03	6
37	N19	max	.06	4	-.029	2	.07	2	8.041e-04	2	-2.432e-04	3	-9.552e-04	2
38		min	.045	2	-.145	6	-.014	3	-3.008e-03	6	-2.44e-03	5	-4.765e-03	6
39	N20	max	.028	2	-.029	2	.071	4	8.041e-04	2	-2.432e-04	3	-9.53e-04	2
40		min	-.035	6	-.145	6	.035	3	-3.009e-03	6	-2.44e-03	5	-4.765e-03	6
41	N21	max	.408	2	.039	5	.153	4	2.476e-03	2	4.026e-03	4	3.191e-03	1
42		min	-.119	6	-.531	3	-.151	2	-5.261e-03	6	-6.364e-03	2	-6.962e-04	5
43	N22	max	.413	2	-.204	5	.197	4	8.425e-03	1	8.482e-03	2	7.966e-03	2
44		min	-.189	4	-.638	3	-.155	2	-1.553e-03	5	-3.626e-03	4	-7.841e-03	6
45	N23	max	.375	2	.029	5	.141	4	2.476e-03	2	4.025e-03	4	3.191e-03	1
46		min	-.104	6	-.501	3	-.132	2	-5.261e-03	6	-6.364e-03	2	-6.963e-04	5
47	N24	max	.369	2	-.193	5	.186	4	8.425e-03	1	8.481e-03	2	7.967e-03	2
48		min	-.17	4	-.601	3	-.129	2	-1.553e-03	5	-3.625e-03	4	-7.841e-03	6
49	N25	max	.614	2	.029	5	.29	6	2.473e-03	2	4.025e-03	4	7.932e-03	1
50		min	-.117	4	-.502	3	-.221	2	-6.104e-03	6	-6.364e-03	2	-6.955e-04	5
51	N26	max	1.643	2	-.193	5	.653	5	8.393e-03	1	8.481e-03	2	3.408e-02	2
52		min	-.512	4	-.602	3	-.532	1	-1.307e-02	5	-3.625e-03	4	-7.734e-03	6
53	N27	max	.305	2	.029	5	.295	5	4.317e-03	5	3.188e-03	4	3.267e-03	3
54		min	-.136	6	-.501	3	-.015	3	-1.821e-03	3	-2.033e-03	2	9.898e-04	5
55	N28	max	.349	1	-.193	5	.237	5	4.256e-03	2	9.985e-04	3	-2.62e-03	3
56		min	.115	6	-.602	3	-.137	3	-3.178e-03	6	-1.03e-03	5	-6.705e-03	4
57	N29	max	.104	2	-.022	2	.062	4	4.211e-04	5	1.386e-03	6	4.776e-04	2
58		min	-.002	6	-.202	6	.009	3	-5.976e-03	6	-5.161e-03	2	-1.34e-03	4
59	N30	max	.255	2	-.022	2	.258	6	3.731e-04	2	1.386e-03	6	5.569e-03	2
60		min	-.049	6	-.203	6	.011	2	-6.872e-03	6	-5.161e-03	2	-1.337e-03	4
61	N31	max	.239	1	-.022	2	.209	5	3.643e-03	5	2.222e-03	6	4.397e-04	5
62		min	.034	6	-.203	6	-.068	3	-1.409e-03	3	-2.035e-03	2	-3.525e-03	1
63	N32	max	0	6	0	6	0	6	0	6	0	6	0	6
64		min	0	1	0	1	0	1	0	1	0	1	0	1
65	N33	max	.044	2	-.039	5	.09	4	5.624e-04	5	3.726e-03	4	5.316e-03	3
66		min	-.052	4	-.149	3	-.075	2	-2.619e-03	3	-3.223e-03	2	2.218e-03	5
67	N34	max	.018	2	-.039	5	.095	5	5.635e-04	5	3.726e-03	4	5.316e-03	3
68		min	-.076	4	-.149	3	-.092	1	-2.619e-03	3	-3.223e-03	2	2.218e-03	5
69	N35	max	.074	1	-.039	5	.087	4	5.613e-04	5	3.726e-03	4	5.316e-03	3
70		min	-.031	5	-.149	3	-.059	2	-2.619e-03	3	-3.223e-03	2	2.218e-03	5
71	N36	max	.278	1	-.048	2	.264	4	3.739e-03	6	5.805e-03	1	5.884e-03	4
72		min	.148	6	-.599	6	.054	2	-2.218e-03	2	2.939e-03	6	2.469e-03	2
73	N37	max	.654	1	.017	5	.278	1	-2.518e-04	5	-1.169e-03	6	1.485e-02	1
74		min	.023	5	-.58	3	.048	6	-8.287e-03	3	-1.118e-02	1	1.527e-03	6

Envelope Joint Displacements (Continued)

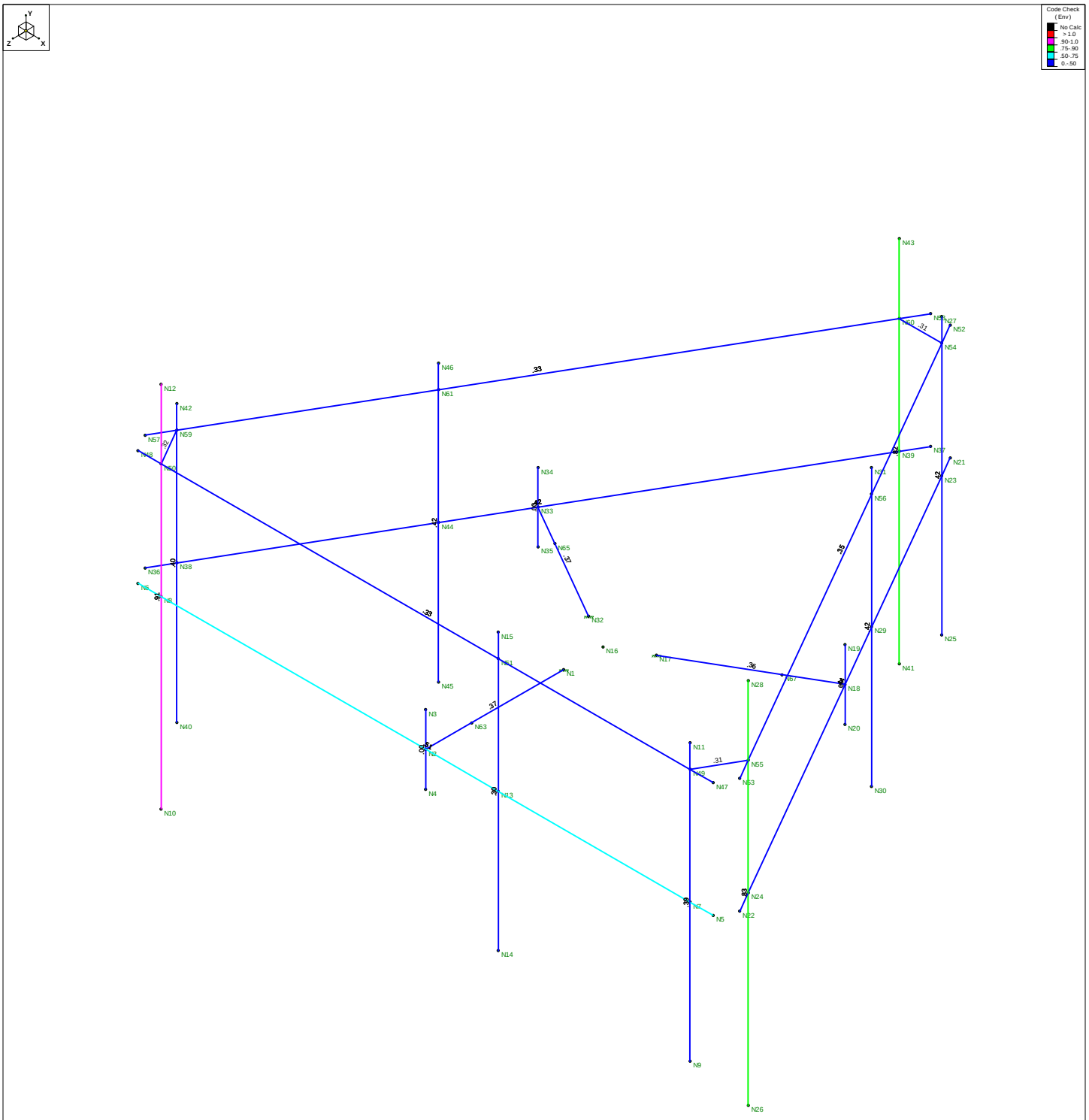
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
75	N38	max	.248	1	-.052	2	.251	4	3.738e-03	6	5.804e-03	1	5.883e-03	4
76		min	.132	6	-.562	6	.037	2	-2.219e-03	2	2.939e-03	6	2.468e-03	2
77	N39	max	.596	1	.011	5	.244	1	-2.515e-04	5	-1.169e-03	6	1.485e-02	1
78		min	.008	5	-.549	3	.045	6	-8.287e-03	3	-1.118e-02	1	1.527e-03	6
79	N40	max	.478	1	-.052	2	.236	5	2.86e-03	6	5.804e-03	1	7.705e-03	1
80		min	.34	6	-.562	6	-.035	3	-2.216e-03	2	2.939e-03	6	5.382e-03	5
81	N41	max	2.199	1	.011	5	.629	1	-7.322e-03	2	-1.169e-03	6	4.091e-02	1
82		min	.094	6	-.55	3	.46	3	-1.245e-02	4	-1.118e-02	1	1.507e-03	6
83	N42	max	.266	1	-.052	2	.38	4	4.233e-03	6	2.996e-03	1	6.537e-03	4
84		min	-.017	5	-.562	6	-.045	2	-1.373e-03	2	1.541e-03	5	-1.622e-03	2
85	N43	max	.279	2	.011	5	.435	4	8.121e-03	4	8.834e-04	4	4.611e-03	6
86		min	-.202	6	-.55	3	-.119	2	-6.584e-03	2	-3.374e-03	2	1.869e-03	2
87	N44	max	.041	1	-.069	2	.131	4	2.64e-03	4	4.596e-03	4	6.542e-03	6
88		min	.015	6	-.215	6	-.077	2	-1.473e-03	2	1.712e-03	3	2.225e-03	2
89	N45	max	.278	3	-.069	2	.131	5	1.818e-03	3	4.596e-03	4	7.948e-03	1
90		min	.143	5	-.216	6	-.07	3	-1.471e-03	2	1.712e-03	3	3.464e-03	5
91	N46	max	.135	2	-.069	2	.323	4	4.28e-03	4	2.22e-03	4	2.153e-03	6
92		min	-.105	6	-.216	6	-.115	2	1.431e-04	2	1.284e-03	2	-2.951e-03	2
93	N47	max	.275	1	-.178	5	.201	5	4.586e-03	2	2.128e-03	3	-1.518e-03	5
94		min	.038	5	-.595	3	-.091	3	-1.765e-03	4	-1.541e-03	5	-6.151e-03	1
95	N48	max	.273	1	-.013	2	.37	4	2.675e-03	6	3.297e-03	4	-8.064e-04	5
96		min	.038	5	-.584	6	-.042	2	-3.248e-03	5	5.224e-04	2	-7.395e-03	1
97	N49	max	.275	1	-.169	5	.192	5	4.586e-03	2	2.128e-03	3	-1.517e-03	5
98		min	.038	5	-.566	3	-.078	3	-1.765e-03	4	-1.539e-03	5	-6.15e-03	1
99	N50	max	.273	1	-.056	2	.35	4	2.675e-03	6	3.295e-03	4	-8.07e-04	5
100		min	.038	5	-.599	6	-.045	2	-3.248e-03	5	5.224e-04	2	-7.396e-03	1
101	N51	max	.274	1	-.043	5	.118	4	3.449e-03	4	1.79e-03	3	-2.921e-05	5
102		min	.039	5	-.216	3	.009	2	1.633e-03	3	-6.203e-04	5	-4.498e-03	1
103	N52	max	.331	2	.048	5	.278	5	4.316e-03	5	3.189e-03	4	3.267e-03	3
104		min	-.134	6	-.521	3	.001	3	-1.822e-03	3	-2.035e-03	2	9.901e-04	5
105	N53	max	.285	1	-.22	5	.201	5	4.255e-03	2	9.988e-04	3	-1.996e-03	2
106		min	.043	5	-.593	3	-.089	3	-3.418e-03	6	-1.031e-03	5	-6.702e-03	4
107	N54	max	.32	2	.029	5	.269	5	4.317e-03	5	3.188e-03	4	3.267e-03	3
108		min	-.119	6	-.501	3	-.004	3	-1.821e-03	3	-2.033e-03	2	9.898e-04	5
109	N55	max	.28	1	-.193	5	.198	5	4.255e-03	2	9.985e-04	3	-1.995e-03	2
110		min	.048	5	-.602	3	-.086	3	-3.419e-03	6	-1.03e-03	5	-6.702e-03	4
111	N56	max	.217	1	-.022	2	.187	5	3.643e-03	5	2.222e-03	6	4.397e-04	5
112		min	.032	6	-.203	6	-.06	3	-1.409e-03	3	-2.035e-03	2	-3.525e-03	1
113	N57	max	.273	1	-.04	2	.366	4	4.233e-03	6	2.998e-03	1	6.537e-03	4
114		min	.029	5	-.592	6	-.029	2	-1.373e-03	2	1.542e-03	5	-1.622e-03	2
115	N58	max	.338	2	.055	5	.289	4	7.174e-03	4	8.824e-04	4	4.96e-03	3
116		min	-.123	6	-.54	3	.006	3	-6.582e-03	2	-3.376e-03	2	2.15e-03	5
117	N59	max	.257	1	-.052	2	.361	4	4.233e-03	6	2.996e-03	1	6.537e-03	4
118		min	.021	5	-.562	6	-.037	2	-1.373e-03	2	1.541e-03	5	-1.622e-03	2
119	N60	max	.32	2	.011	5	.292	4	7.175e-03	4	8.834e-04	4	4.961e-03	3
120		min	-.119	6	-.549	3	0	2	-6.582e-03	2	-3.374e-03	2	2.151e-03	5
121	N61	max	.118	2	-.069	2	.297	4	4.28e-03	4	2.22e-03	4	2.153e-03	6
122		min	-.093	6	-.216	6	-.116	2	1.431e-04	2	1.284e-03	2	-2.951e-03	2
123	N63	max	.048	1	-.017	5	0	5	5.166e-03	3	3.083e-03	1	2.605e-04	5
124		min	.003	6	-.076	3	0	3	7.89e-04	5	2.608e-04	6	-9.923e-04	1
125	N65	max	.024	2	-.02	5	.049	4	2.135e-04	5	3.72e-03	4	4.803e-03	3
126		min	-.028	4	-.079	3	-.04	2	-2.473e-03	3	-3.107e-03	2	1.759e-03	5

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
127	N67	max	.021	5	-.019	2	.037	5	1.797e-04	2	-4.13e-04	3	-1.253e-03	2
128		min	.004	3	-.077	6	.006	3	-2.743e-03	6	-2.707e-03	5	-4.453e-03	6

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	...	Eqn
1	M4	PIPE_2.0	.908	4	4	.242	1.5		5	14.916	32.13	1.872	1.872	...	H1-...
2	M10	PIPE_2.0	.831	4	1	.221	1.5		2	14.916	32.13	1.872	1.872	...	H1-...
3	M16	PIPE_2.0	.817	4	2	.228	1.5		1	14.916	32.13	1.872	1.872	...	H1-...
4	M3	PIPE_3.0	.513	6.25	4	.271	6.25		4	53.776	65.205	5.749	5.749	1	H3-6
5	M9	PIPE_3.0	.439	6.25	1	.217	6.25		1	53.776	65.205	5.749	5.749	1	H1-...
6	M15	PIPE_3.0	.424	6.25	6	.237	6.25		1	53.776	65.205	5.749	5.749	1	H1-...
7	M18	PIPE_2.0	.423	3	1	.099	.5		5	20.867	32.13	1.872	1.872	...	H1-...
8	M11	PIPE_2.0	.421	3	3	.150	.5		1	20.867	32.13	1.872	1.872	...	H1-...
9	M12	PIPE_2.0	.419	3	1	.124	.5		1	20.867	32.13	1.872	1.872	...	H1-...
10	M17	PIPE_2.0	.398	3	3	.092	.5		1	20.867	32.13	1.872	1.872	...	H1-...
11	M5	PIPE_2.0	.388	3	6	.118	.5		4	20.867	32.13	1.872	1.872	...	H1-...
12	M13	HSS4X4X4	.373	0	6	.081	0	z	4	134....	139....	16.181	16.181	...	H1-...
13	M1	HSS4X4X4	.371	0	3	.075	0	z	1	134....	139....	16.181	16.181	...	H1-...
14	M7	HSS4X4X4	.364	0	6	.061	0	z	2	134....	139....	16.181	16.181	...	H1-...
15	M21	PIPE_2.0	.346	7.9...	3	.117	7.9...		1	6.295	32.13	1.872	1.872	...	H1-...
16	M19	PIPE_2.0	.335	7.9...	6	.090	7.9...		4	6.295	32.13	1.872	1.872	...	H1-...
17	M20	PIPE_2.0	.331	4.5...	3	.083	4.6...		1	6.295	32.13	1.872	1.872	...	H1-...
18	M22	L2.5x2.5x4	.321	0	5	.149	.926	z	4	37.493	38.556	1.114	2.537	...	H2-1
19	M23	L2.5x2.5x4	.310	.926	2	.089	.926	y	5	37.493	38.556	1.114	2.537	...	H2-1
20	M24	L2.5x2.5x4	.308	0	1	.161	0	z	2	37.493	38.556	1.114	2.537	...	H2-1
21	M6	PIPE_2.0	.295	3	5	.086	.5		4	20.867	32.13	1.872	1.872	...	H1-...
22	M2	PIPE_4.0	.001	.75	1	.000	.75		1	92.571	93.24	10.631	10.631	...	H1-...
23	M8	PIPE_4.0	.001	.75	1	.000	.75		1	92.571	93.24	10.631	10.631	...	H1-...
24	M14	PIPE_4.0	.001	.75	4	.000	.75		5	92.571	93.24	10.631	10.631	1	H1-...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
FJP	CTHA506A - Mount	May 3, 2019 at 12:27 PM
19027.22	Unity Check	CTHA506A_AMA.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: CTHA506A

AT&T Wethersfield Monopole
75 Wells Road
Wethersfield, Connecticut 06109

May 29, 2019

EBI Project Number: 6219001818

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**15.79%**

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

May 29, 2019

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

Emissions Analysis for Site: CTHA506A - AT&T Wethersfield Monopole

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **75 Wells Road** in **Wethersfield, 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 75 Wells Road in Wethersfield, 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) 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.

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

4) 2 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.

5) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 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.

7) 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.

8) The antennas used in this modeling are the Ericsson AIR 21 for the 2100 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector A, the Ericsson AIR 21 for the 2100 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector B, the Ericsson AIR 21 for the 2100 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 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.

9) The antenna mounting height centerline of the proposed antennas is 95 feet above ground level (AGL).

10) 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.

11) 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 AIR 21	Make / Model:	Ericsson AIR 21	Make / Model:	Ericsson AIR 21
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.35 dBd	Gain:	15.35 dBd	Gain:	15.35 dBd
Height (AGL):	95 feet	Height (AGL):	95 feet	Height (AGL):	95 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	60 Watts	Total TX Power (W):	60 Watts	Total TX Power (W):	60 Watts
ERP (W):	2,056.61	ERP (W):	2,056.61	ERP (W):	2,056.61
Antenna A1 MPE %:	**0.82%**	Antenna B1 MPE %:	**0.82%**	Antenna C1 MPE %:	**0.82%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.85 dBd
Height (AGL):	95 feet	Height (AGL):	95 feet	Height (AGL):	95 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	8,728.31	ERP (W):	8,728.31	ERP (W):	8,728.31
Antenna A2 MPE %:	**3.48%**	Antenna B2 MPE %:	**3.48%**	Antenna C2 MPE %:	**3.48%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz
Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd
Height (AGL):	95 feet	Height (AGL):	95 feet	Height (AGL):	95 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	2,481.08	ERP (W):	2,481.08	ERP (W):	2,481.08
Antenna A3 MPE %:	**2.29%**	Antenna B3 MPE %:	**2.29%**	Antenna C3 MPE %:	**2.29%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	6.58%
AT&T	9.21%
Site Total MPE % :	15.79%

T-Mobile Sector A Total:	6.58%
T-Mobile Sector B Total:	6.58%
T-Mobile Sector C Total:	6.58%
Site Total:	15.79%

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 2100 MHz UMTS	2	1028.30	95.0	8.19	2100 MHz UMTS	1000	0.82%
T-Mobile 1900 MHz LTE	2	2056.61	95.0	16.39	1900 MHz LTE	1000	1.64%
T-Mobile 2100 MHz LTE	2	2307.55	95.0	18.38	2100 MHz LTE	1000	1.84%
T-Mobile 600 MHz LTE	2	591.73	95.0	4.71	600 MHz LTE	400	1.18%
T-Mobile 700 MHz LTE	2	648.82	95.0	5.17	700 MHz LTE	467	1.11%
						Total:	**6.58%**

• 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:	6.58%
Sector B:	6.58%
Sector C:	6.58%
T-Mobile Maximum MPE % (Sector A):	6.58%
Site Total:	15.79%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **15.79%** 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.