Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

August 27, 2020

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

RE: Notice of Exempt Modification
254 Silas Deane Highway, Wethersfield, CT 06109
Latitude: 41.72060000
Longitude: -72.666100000
T-Mobile Site#: CTHA507A – Anchor

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 105-foot level of the existing 120-foot monopole tower at 254 Silas Deane Highway, Wethersfield, CT. The 120-foot monopole tower and property are owned by the Town of Wethersfield. T-Mobile now intends to remove the six (6) existing antennas and add nine (9) new 600/700/1900/2100/2500 MHz antennas. The new antennas will be installed at the same 105-foot level of the tower. Mount modifications are also required as detailed in the enclosed mount analysis.

Planned Modifications:
Tower:

Remove
(6) AIR 21 2100 MHz Antennas

Remove and Replace:
N/A

Install New:
(3) AIR 6449 B41 2500 MHz Antennas
(3) AIR 32 1900 MHz Antennas
(3) APXVARR24_43-U-NA20 600/700/1900/2100 MHz Antennas
(3) Radio 4449 B71B85
(3) Radio 4415 B25
(3) Radio 4415 B66A
(3) Commscope SDX1926Q-43 Diplexers
(3) 1-5/8" Hybrid

Existing to Remain:

(1) 1-5/8" Hybrid

Ground:
Install New:
6' X 4' Concrete Slab
(1) 6160 Cabinet
(1) B160 Battery Cabinet

This facility was not originally approved by the Connecticut Siting Council. As confirmed in previous filings for this facility, there is no record of an original zoning approval by the Town of Wethersfield for this town-owned tower. Metro PCS, now under T-Mobile, has been approved for tower-sharing at this site. There is no indication that this proposed modification does not comply with any previous approvals for this tower facility.

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 -Michael Rell, Elected Official, and Peter Gillespie, Director of Planning and Economic Development for the Town of Wethersfield.

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: Michael Rell – Mayor of Town of Wethersfield
Peter Gillespie– Director of Planning & Economic Development for Town of Wethersfield

UPS Internet Shipping: View/Print Label

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

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

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

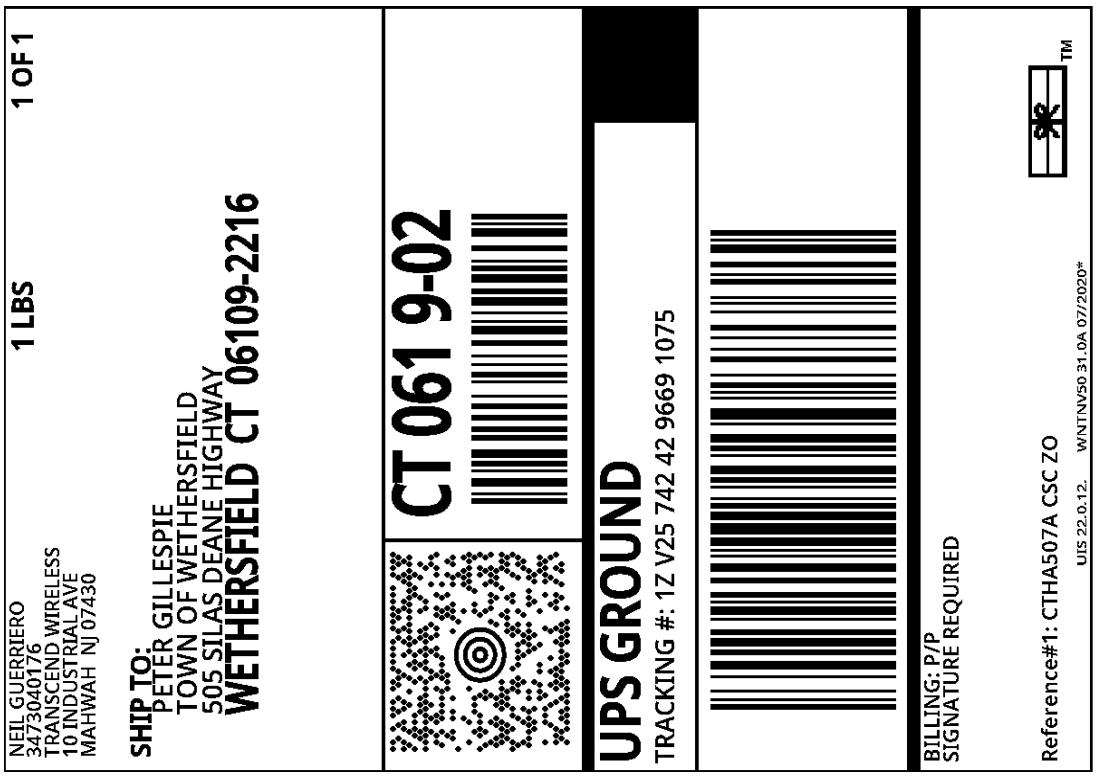
   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To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

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

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

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

FOLD HERE



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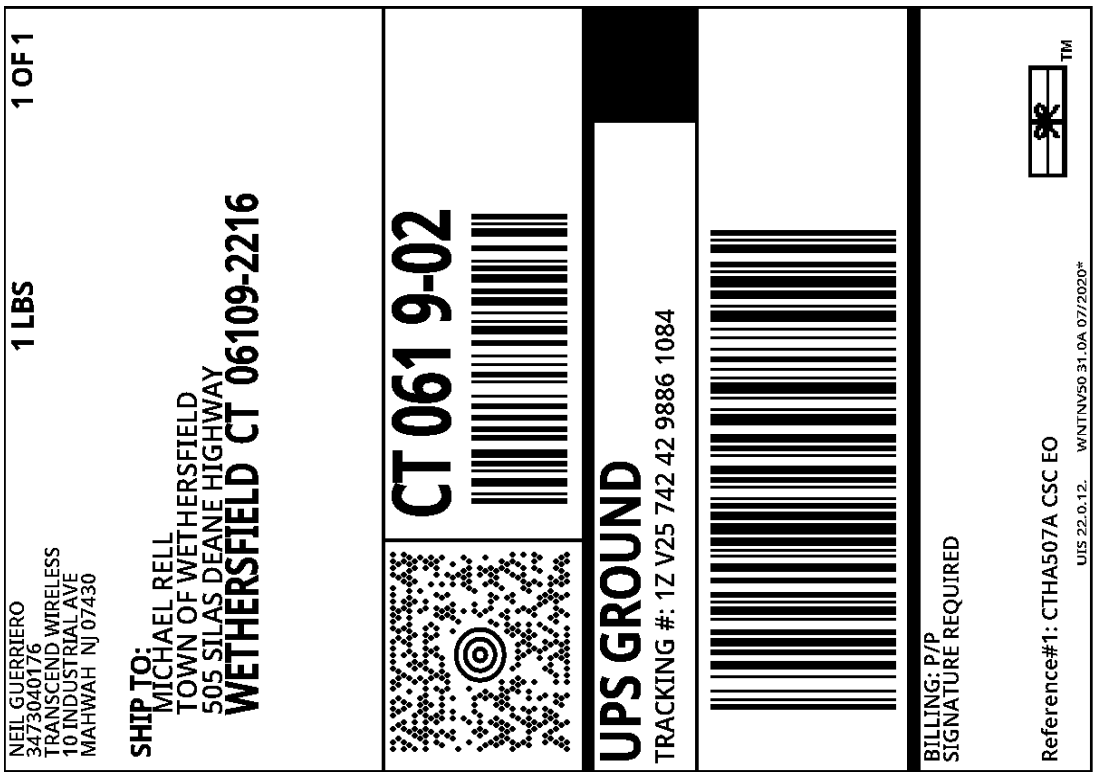
FOLD HERE



Unique ID: 210010 **Wethersfield** **Card No:** 1of 1

Location:	250 SILAS DEANE HWY	Map/Lot:	210 010	Zone:	GB	Date Printed:	08-06-19
911 Address:		Exempt	X	Nbhd:	C35	Last Update:	07-02-19

Owner Of Record	Volume/Page	Date	Sales Type	Valid	Sale Price
WETHERSFIELD TOWN OF POLICE FACILITY	0784 /0051	01-12-00		NO	1,300,000
505 SILAS DEANE HWY WETHERSFIELD , CT 06109					
Additional Owners:					
Prior Owner History					
ROBERT JOSEPH L A & SCOVILLE HOMER	0333 /0023	02-28-83		NO	725,000
	/				
	/				
	/				
	/				

Permit Number	Date	Cost	New Hous	Status	% Comp	Est Completion	Building Permit
M-18-0122	12-21-19	4,000	No	Closed	100	06-21-19	EMERGENCY BURNER REPLACEMENT BOILER #2
E-19-0100	04-26-19	326,280	No	Closed	100	06-26-19	INSTALL & WIRE WPD HQ IP VIDEO SECURITY SYSTEM
P-19-0090	04-15-19	1,500	No	Closed	100	06-26-19	CHANGE PENDANT SPRINKLER HEADS TO UPRIGHT HEADS IN 2ND COMPUTER ROOM
M-19-0062	04-12-19	1,500	No	Closed	100	06-26-19	INSTALL PAN UNDER HVAC UNIT
E-19-0175	04-08-19	10,000	Yes	Closed	100	01-01-01	Install 2 new UPS's , new feeds from MDP-E to mech room to power new UP
M-19-0047	04-03-19	12,575	No	Closed	100	06-26-19	REPL DISPATCH COOLING ONLY ROOFTOP UNIT

Census/Tract	4923
Dev Map	**Dev Lot** 3
Date	05/14/2018
Inspector	EQ
Action	Measure & List

State Item Codes

Code	Quantity	Value	Code	Quantity	Value
21- Comm Land	3.52	892,460			
22-Comm Bldg	1.00	3,815,190			
25-Comm Outbldg	4.00	662,470			

Appraised Value

Total Land Value	1,274,948
Total Building Value	5,450,266
Total Outbuilding Value	946,380
Total Market Value	**7,671,594**

Acres

Land Type	Acres	490	Rate	Adj	Influence	Total Value
Primary Site	1.00	0.00	500,000	1.00	150	1,250,000
Comm Excess	2.52	0.00	10,000	0.99	0	24,948
Total	3.52					1,274,948

Influence Factors

Land Type	Influence	Reason	Comment
Primary Site	150	Intensive Use	

Assessment History (Prior Years as of Oct 1)

	Current	2018	2017	2016	2015
Land	892,460	892,460	512,300	512,300	512,300
Building	3,815,190	3,815,190	3,483,700	3,483,700	4,303,900
Outbuilding	662,470	662,470	820,200	820,200	0
Total	**5,370,120**	**5,370,120**	**4,816,200**	**4,816,200**	**4,816,200**

490 Appraised Totals

Type	Acres	Value	Type	Acres	Value
			Totals		

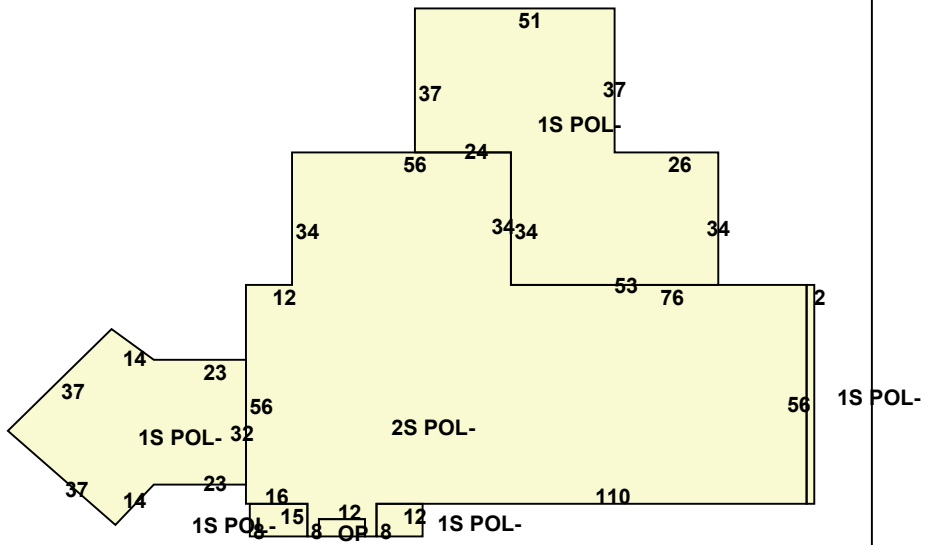
Comments

CELL POLE 4500 MONTH, 8 CAP RATE
4 X 3000 X 12= 144,000 LESS 25% EXP=
GENERATOR BACKUP/6 HOLDING CELLS
2003 CELL TOWER-180'
108,000/.11 CAP= 981,800
POLICE STATION

Unique ID: 210010 **Wethersfield**

Location:	250 SILAS DEANE HWY	Unit	

Use	Class	Quality	Stry	WH	Area	BG	Units
Police Station	Fireproof Steel	C+	2	12	26,000	NO	



Commercial Building Description

Building Use	Jail - Police S
Class	Steel & Conc
Overall Condition	Good
Construction Quality	C+
Stories	2.00
Year Built	2002
Remodel	
Percent Complete	100
GLA	**26,000**

Basement

Basement Area	
Basement Unfinished Area	

HVAC

Heating Type	Forced Hot Air	
Fuel Type	Natural Gas	
Cooling Type	Central	100 %

Interior

Floors	Vinyl Tile
Walls	Drywall
Wall Height	12

Exterior

Exterior Walls	Brick Veneer
Roof Cover	Asphalt

Special Features

Comm Pass Elev	2
Wet Sprinkler	26,080

Total Building Value

Building 1 **Value** **5,450,266**

Valuation Method C

Description	Area/Qty	Value
Base Value	26,000	5,362,500
Central Air	5,362,500	120,656
Commercial Passenger Elev	2	135,000
Wet Sprinklers	26,080	58,680
Value Before Depr.	0	5,676,836
Depr/Adjust Amount	0	227,073
Final Value (After Depr)	0	5,449,763

Grade Factor	0	**Physical Depreciation %**	4
Functional Depreciation %	0	**Economical Depreciation %**	0

Attached Component Computations

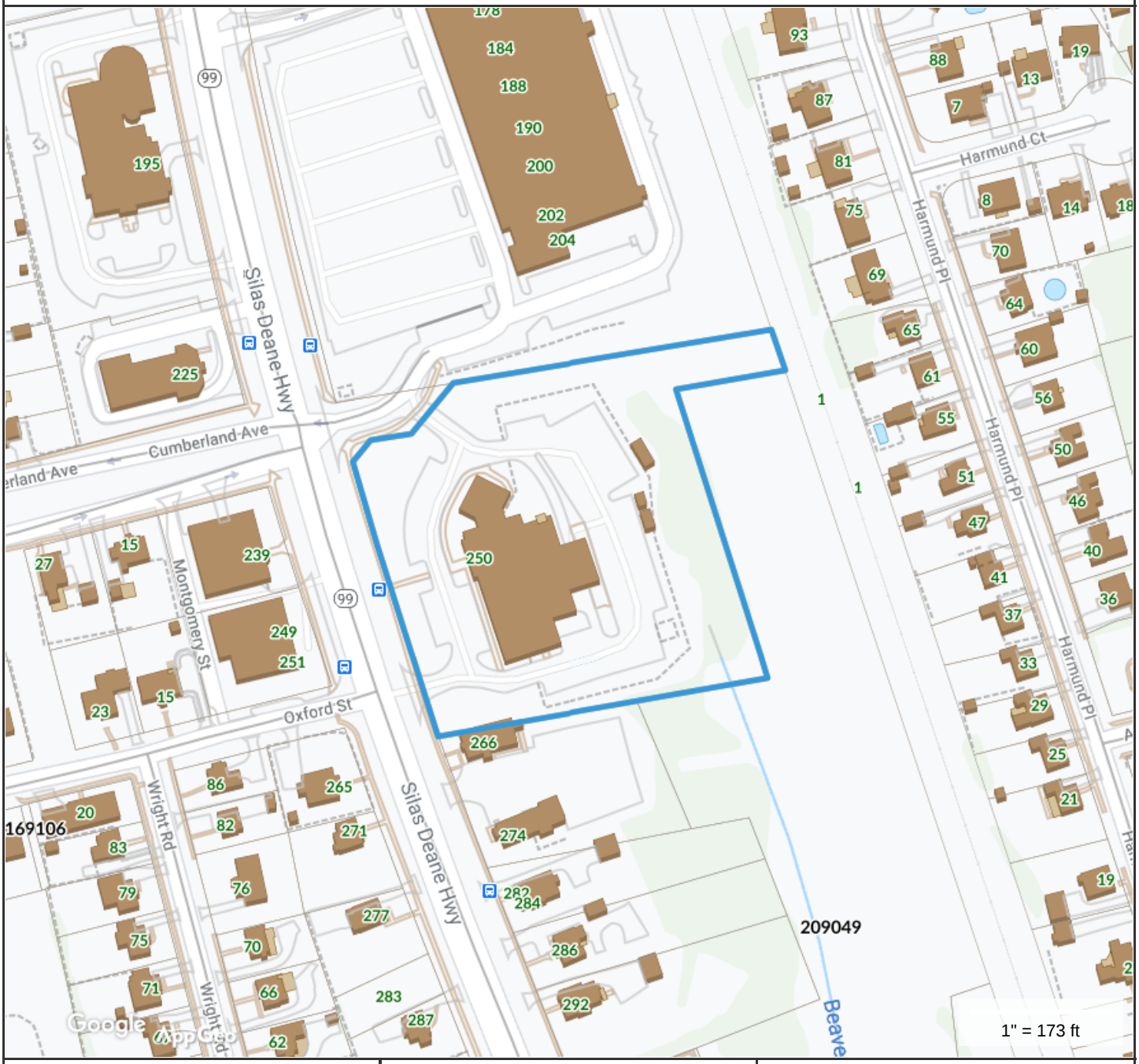
Type	Yr Blt	Condition	Area/Qty	Value
Open Porch	2002	Average	48	503

Detached Component Computations

Type	Year	Condition	Area/Qty	Value
Lights in W/PL	2007	Average/Good	17	186,048
PreCastConCel	2007	Good	348	16,704
Paving	2002	Excellent	43,000	68,628
Cell Tower	2002	Average	1	675,000

Type	Year	Condition	Area/Qty	Value

CTHA507A



Property Information

Property ID	210010
Location	250 SILAS DEANE HWY
Owner	WETHERSFIELD TOWN OF

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

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

TOWN OF WETHERSFIELD MONOPOLE

SITE ID: CTHA507A

254 SILAS DEANE HWY

WETHERSFIELD, CT 06109

T-MOBILE RF CONFIGURATION

67D5997DB_2xAIR+1OP

GENERAL NOTES

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

SITE DIRECTIONS

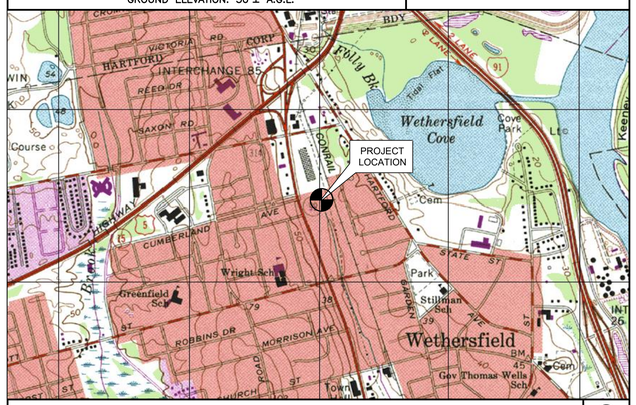
FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

TO: 254 SILAS DEANE HWY
WETHERSFIELD, CT 06109

1.	START OUT GOING NORTH ON GRIFFIN RD TOWARD HARTMAN RD.	0.30 MI.
2.	TURN RIGHT ONTO DAY HILL RD.	0.14 MI.
3.	TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187. CONTINUE TO FOLLOW CT-187.	0.64 MI.
4.	STAY STRAIGHT TO GO ONTO BLUE HILLS AVE/CT-187.	1.24 MI.
5.	TURN LEFT ONTO OLD WINDSOR RD/CT-305. CONTINUE TO FOLLOW CT-305.	2.33 MI.
6.	STAY STRAIGHT TO GO ONTO BLUE HILLS AVE/CT-187.	1.24 MI.
7.	TURN LEFT ONTO OLD WINDSOR RD/CT-305. CONTINUE TO FOLLOW CT-305.	2.33 MI.
8.	MERGE ONTO I-91 S TOWARD HARTFORD.	8.38 MI.
9.	MERGE ONTO US-5 S/CT-15 S VIA EXIT 28 TOWARD WETHERSFIELD/NEWINGTON/BERLIN TPKE.	0.98 MI.
10.	MERGE ONTO SILAS DEANE HWY/CT-99 S VIA EXIT 85 TOWARD ROCKY HILL/WETHERSFIELD.	0.65 MI.
11.	254 SILAS DEANE HWY, WETHERSFIELD, CT 06109-1735, 254 SILAS DEANE HWY IS ON THE LEFT.	

SITE COORDINATES: LATITUDE: 41°-43'-14.23" N
LONGITUDE: 72°-39'-57.88" W
GROUND ELEVATION: 30'± A.G.L.

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH



VICINITY MAP

PROJECT SUMMARY

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

1. ADD (1) ENCLOSURE 6160
2. ADD (1) BATTERY CABINET B160
3. ADD (1) iXRe ROUTER
4. ADD (1) BB6630 FOR L2500
5. ADD (1) BB6648 FOR N2500
6. ADD (1) PSU 4813 POWER BOOSTER
7. REMOVE (6) ERICSSON AIR21 ANTENNAS
8. INSTALL (3) ERICSSON AIR32 ANTENNAS, (3) RFS APXVAARR24 ANTENNAS AND (3) ERICSSON AIR6449 ANTENNAS
9. INSTALL (3) COMMSCOPE DIPLEXERS
10. INSTALL (3) RADIO 4449 B71+B85, (3) RADIO 4415 B25 AND (3) RADIO 4415 B66A
11. INSTALL (3) DUAL SWIVEL MOUNT KITS
12. INSTALL (3) 6x12 HCS
13. INSTALL (1) 6'-0" X 4'-0" CONCRETE SLAB-ON-GRADE

PROJECT SUMMARY (STRUCTURAL)

FOR REQUIRED STRUCTURAL MODIFICATIONS, SEE SHEET(S) S-1 FOR ADDITIONAL DETAILS.

1. INSTALL (1) NEW SITEPRO1 PLATFORM AND HANDRAIL KIT
2. INSTALL (1) NEW CONCRETE SLAB-ON-GRADE

PROJECT INFORMATION

SITE NAME:	TOWN OF WETHERSFIELD MONOPOLE
SITE ID:	CTHA507A
SITE ADDRESS:	254 SILAS DEANE HWY 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 OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
PROJECT COORDINATES:	LATITUDE: 41°-43'-14.23" N LONGITUDE: 72°-39'-57.88" W GROUND ELEVATION: 30'± A.G.L. SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
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C-2	PARTIAL SITE PLAN	1
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S-1	STRUCTURAL DETAILS	1
E-1	TYPICAL ELECTRICAL DETAILS	1

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/21/20	RTS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
1	08/25/20	RTS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

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

TOWN OF WETHERSFIELD MONOPOLE

SITE ID: CTHA507A

254 SILAS DEANE HWY
WETHERSFIELD, CT 06109

DATE: 07/15/20
SCALE: AS NOTED
JOB NO. 20074.57

TITLE SHEET

T-1

Sheet No. 1 of 9

NOTES AND SPECIFICATIONS

DESIGN BASIS:

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

1. DESIGN CRITERIA:

- RISK CATEGORY III (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 97 MPH (Vasd) (EXPOSURE C/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

SITE NOTES

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

GENERAL NOTES

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

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
0	08/21/20	RYS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
	08/25/20	RYS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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WIRELESS COMMUNICATIONS FACILITY

TOWN OF WETHERSFIELD MONOPOLE
SITE ID: CTHA507A
254 SILAS DEANE HWY
WETHERSFIELD, CT 06109

DATE: 07/15/20
SCALE: AS NOTED
JOB NO. 20074.57

GENERAL NOTES AND SPECIFICATIONS

N-1

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

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA @ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) TMA (QTY)	(E/P) DIPLEXER (QTY)	(QTY) PROPOSED COAX (LENGTH)
A1	PROPOSED	ERICCSON (AIR32 KRD901146-1_B66A_B2A)	56.6 x 12.9 x 8.7	105'	0°				(1) 6x12 HYBRID CABLE (±180')
A2	PROPOSED	RFS (APXVAARR24_43-U-NA20)	95.9 x 24 x 8.7	105'	0°	(P) RADIO 4449 B71 (1), (P) RADIO 4415 B66A (1), (P) 4415 B25 (1)		(P) COMMSCOPE - SDX192 6Q-43 (E14F05P86) (1)	
A3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	105'	0°				
B1	PROPOSED	ERICCSON (AIR32 KRD901146-1_B66A_B2A)	56.6 x 12.9 x 8.7	105'	120°				(1) 6x12 HYBRID CABLE (±180')
B2	PROPOSED	RFS (APXVAARR24_43-U-NA20)	95.9 x 24 x 8.7	105'	120°	(P) RADIO 4449 B71 (1), (P) RADIO 4415 B66A (1), (P) 4415 B25 (1)		(P) COMMSCOPE - SDX192 6Q-43 (E14F05P86) (1)	
B3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	105'	120°				
C1	PROPOSED	ERICCSON (AIR32 KRD901146-1_B66A_B2A)	56.6 x 12.9 x 8.7	105'	240°				(1) 6x12 HYBRID CABLE (±180')
C2	PROPOSED	RFS (APXVAARR24_43-U-NA20)	95.9 x 24 x 8.7	105'	240°	(P) RADIO 4449 B71 (1), (P) RADIO 4415 B66A (1), (P) 4415 B25 (1)		(P) COMMSCOPE - SDX192 6Q-43 (E14F05P86) (1)	
C3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	105'	240°				

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

TRUE NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/21/20	RYS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
	08/25/20	RYS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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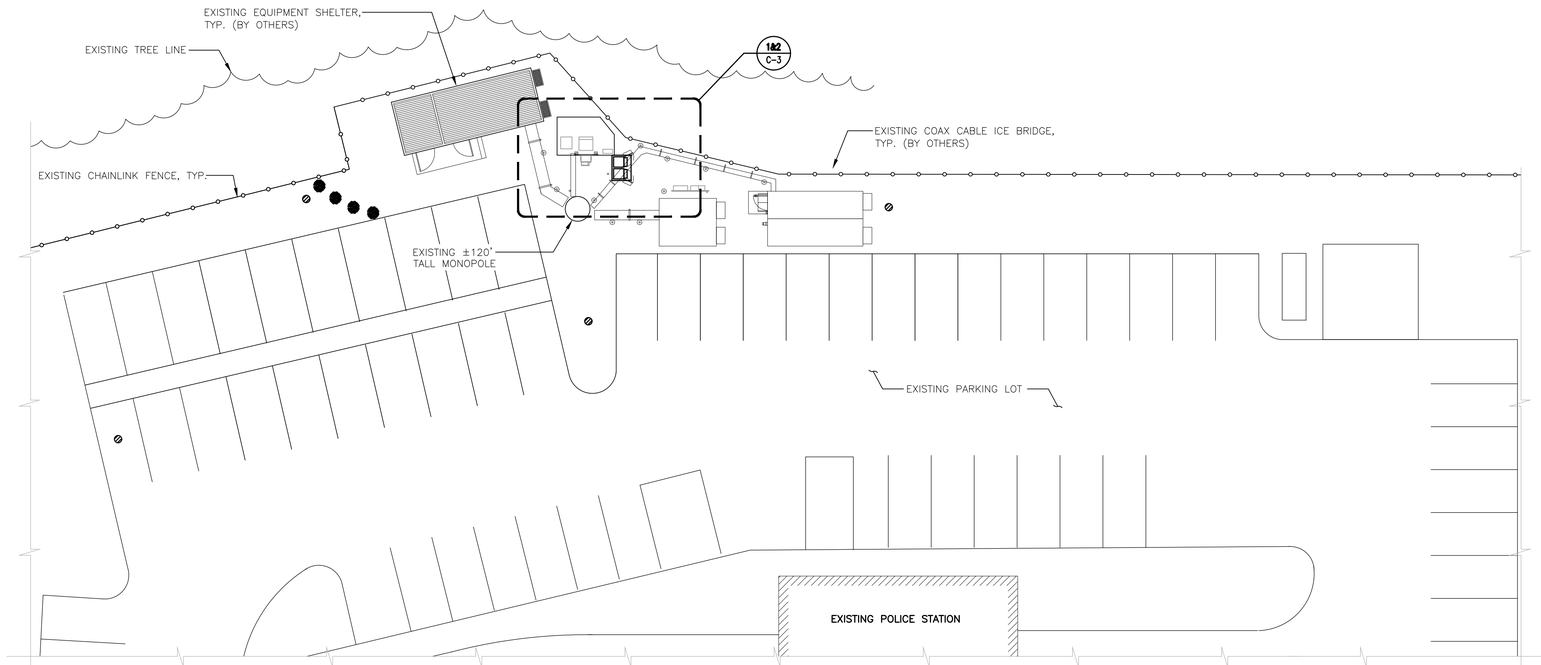
SITE LOCATION PLAN

C-1

Sheet No. 3 of 9



1 / C-2 **PARTIAL SITE PLAN - PROPOSED**
SCALE: 1" = 15'

APPROXIMATE NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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	08/25/20	RYS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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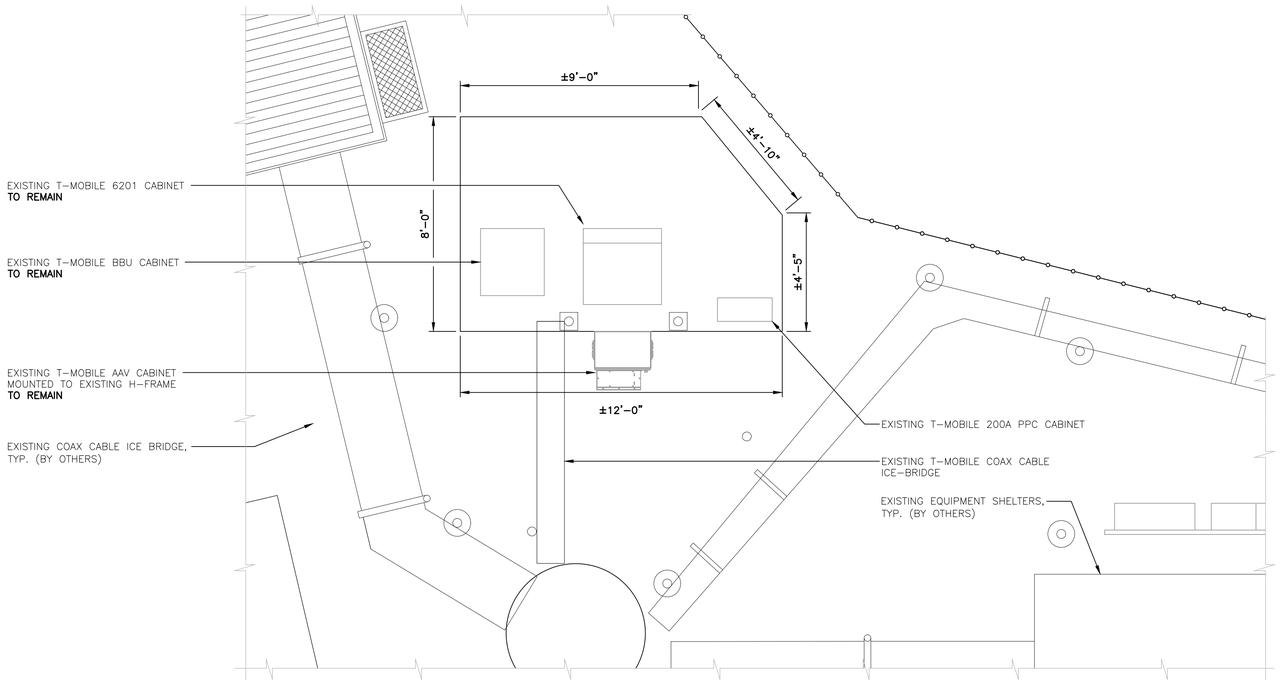
PARTIAL SITE PLAN

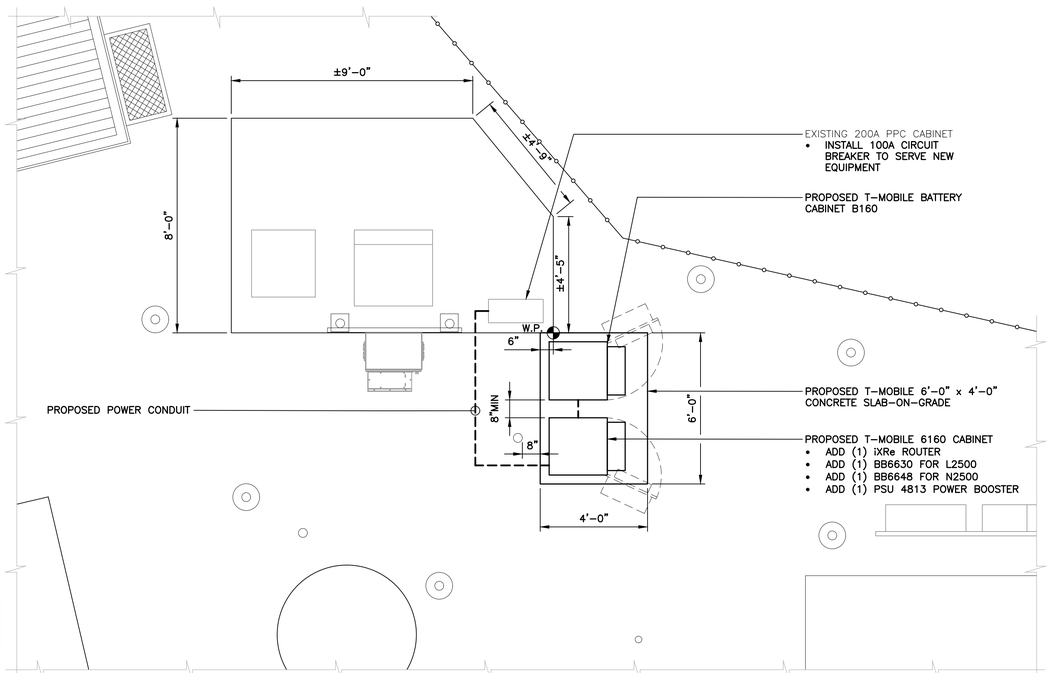
C-2

Sheet No. 4 of 9



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

APPROXIMATE NORTH



NOTES:
COAX CABLE ICE-BRIDGE NOT SHOWN FOR CLARITY

LEGEND
W.P.

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

APPROXIMATE NORTH

STRUCTURAL COMPLIANCE

ANTENNA MOUNTS

A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY DEFICIENT AND WARRANTING MODIFICATION PRIOR TO INSTALLATION OF THE PROPOSED EQUIPMENT. FOR REQUIRED STRUCTURAL MODIFICATIONS, SEE SHEET(S) S-1 FOR ADDITIONAL DETAILS.

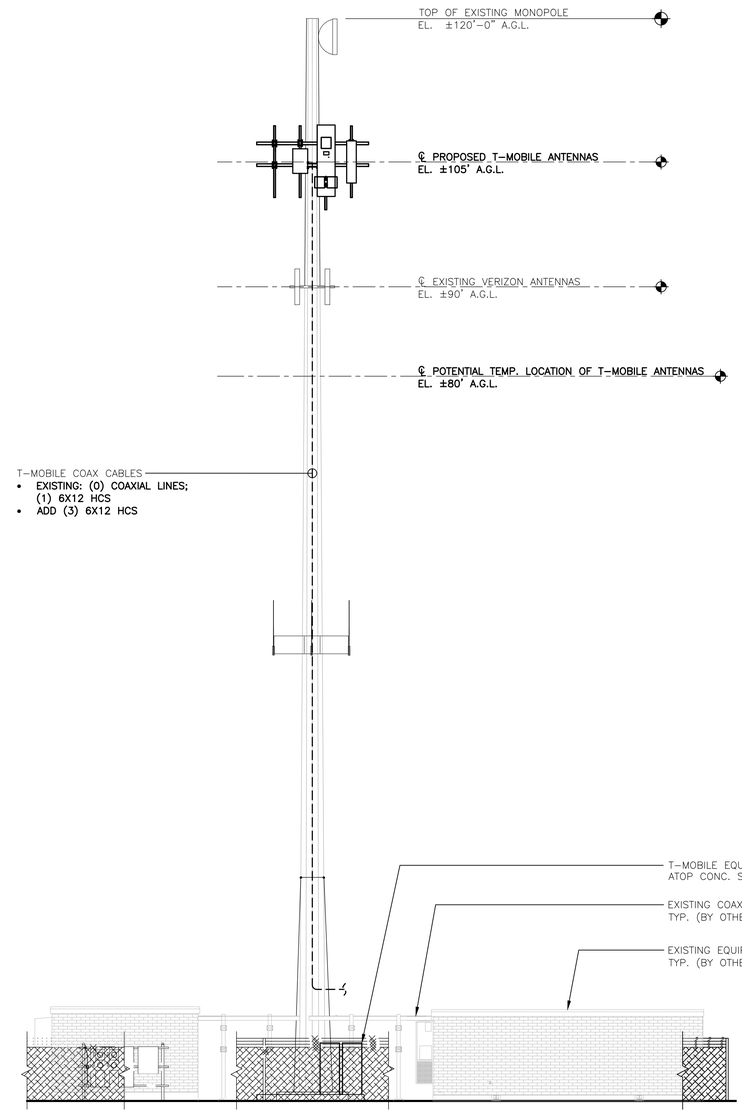
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 20074.57) DATED 07/20/20 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

TOWER AND TOWER FOUNDATION

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

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 20074.57) DATED 07/21/20 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

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



3 C-3 **TOWER ELEVATION - PROPOSED**
SCALE: 1/8" = 1'

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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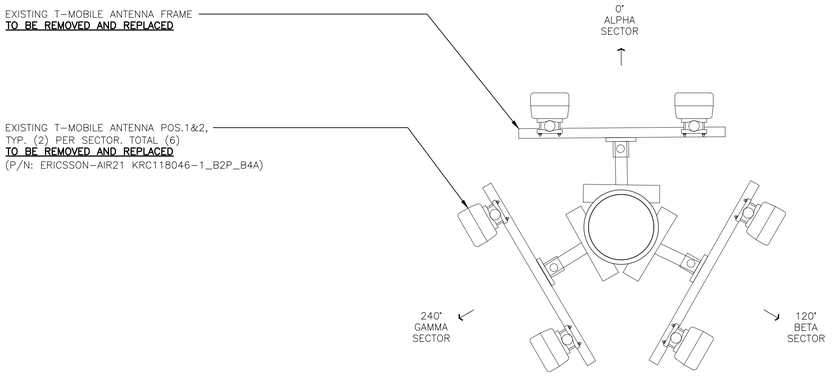
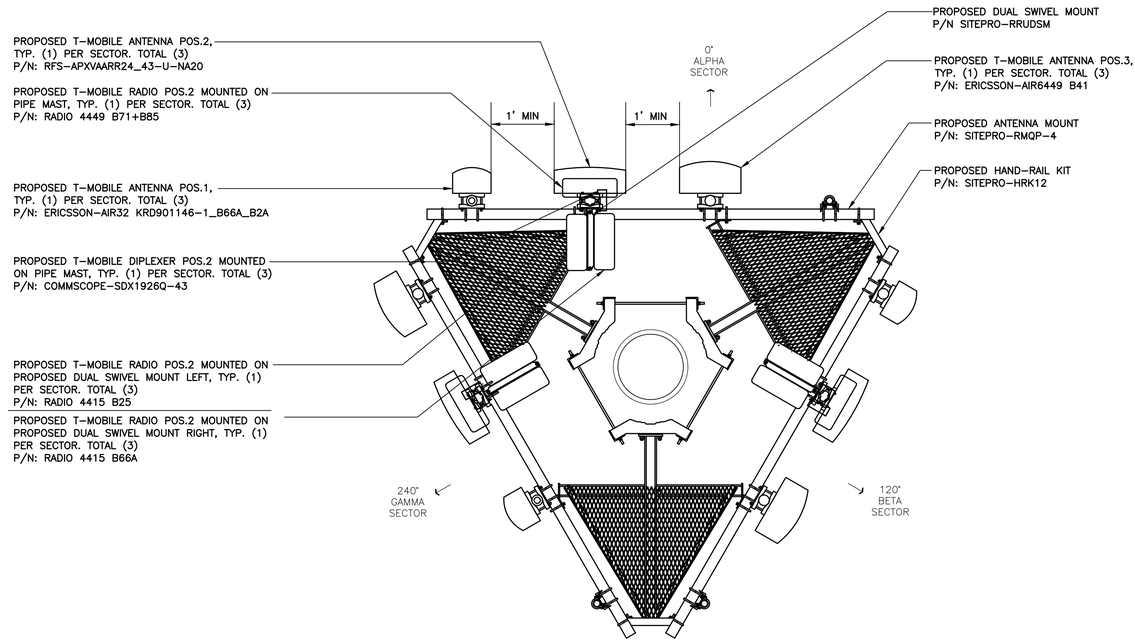
EQUIPMENT PLAN & ELEVATION

C-3

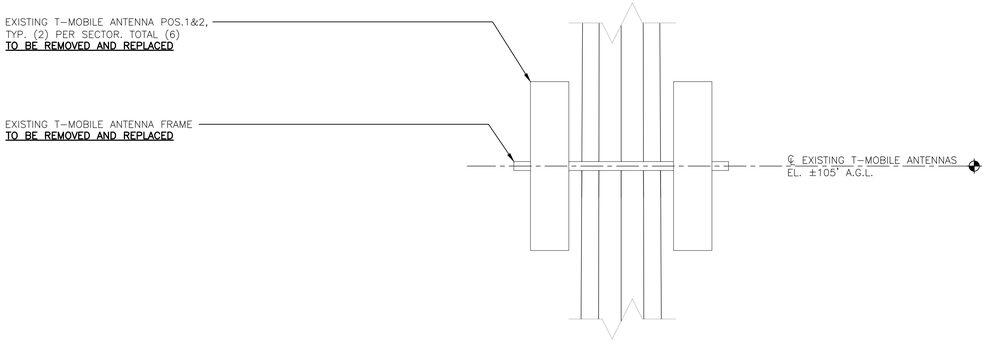
Sheet No. 5 of 9



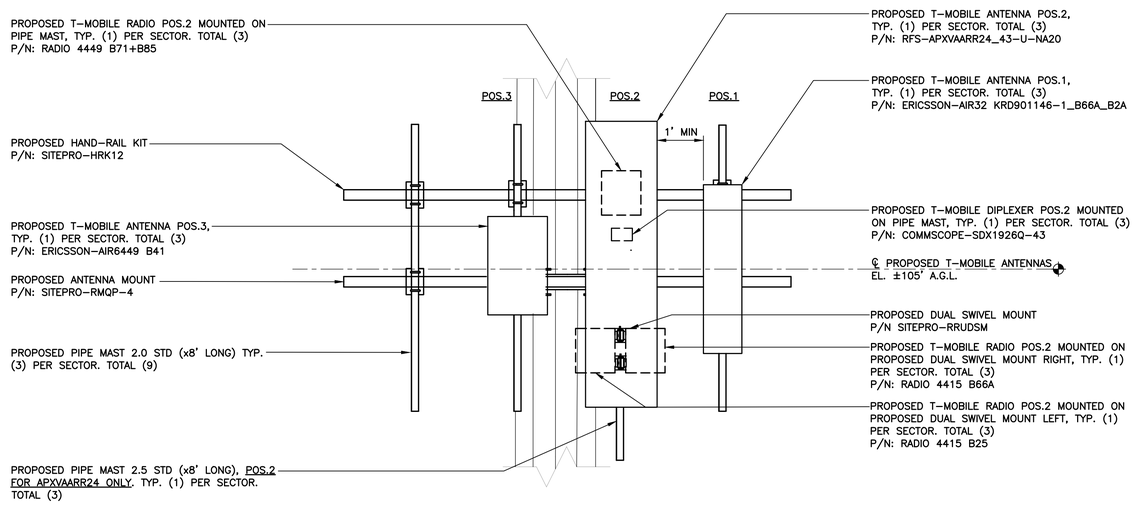
1 C-4 **ANTENNA PLAN - EXISTING**
SCALE: 1/2" = 1'



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



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



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

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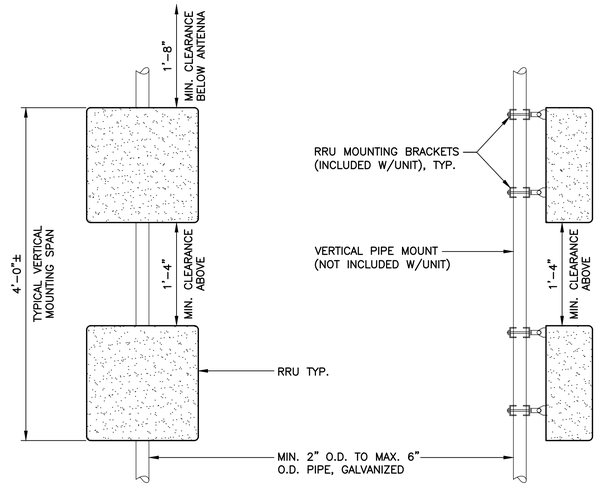
ANTENNA PLANS

C-4

Sheet No. 6 of 9



FRONT ELEVATION SIDE ELEVATION

NOTES:

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

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

SIDE AIR6449 AIR32 APXVAARR24

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXVAARR24_43–U–NA20	95.9"L x 24"W x 8.7"D	±128 LBS.
MAKE: ERICSSON MODEL: AIR32 B66A B2A	56.6"L x 12.9"W x 8.7"D	±132.2 LBS.
MAKE: ERICSSON MODEL: AIR6449 B41	33.1"L x 20.6"W x 8.6"D	±104 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

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

RADIO 4449 B71 RADIO 4415 B25 RADIO 4415 B66A

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4449 B71	14.9"L x 13.18"W x 9.2"D	±74 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4415 B25	14.9"L x 13.2"W x 5.4"D	±46 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4415 B66A	16.9"L x 13.4"W x 5.8"D	±44 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.			

3 / C-5 **PROPOSED RADIO DETAILS**
SCALE: NOT TO SCALE

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

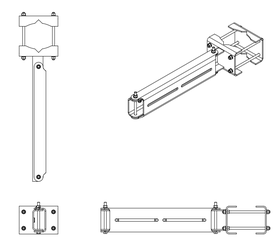
4 / C-5 **ENCLOSURE 6160 (OUTDOOR)**
SCALE: NOT TO SCALE

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

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

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

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



RRU DUAL SWIVEL MOUNT		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SITE PRO 1 PART NO.: RRUDSM	27.75"L x 6.5"W x 4.7"D	39.4 LBS.

7 / C-5 **RRH DUAL SWIVEL MOUNT DETAIL**
SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/21/20	RTS	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
	08/25/20	RTS	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

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

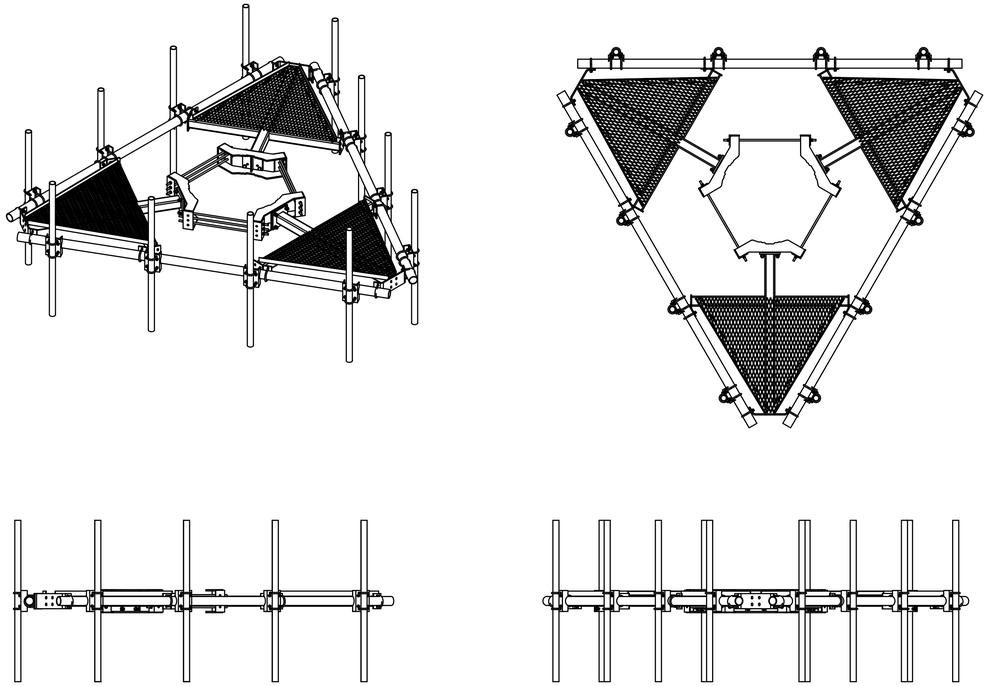
T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
TOWN OF WETHERSFIELD MONOPOLE
SITE ID: CTHA507A
254 SILAS DEANE HWY
WETHERSFIELD, CT 06109

DATE: 07/15/20
SCALE: AS NOTED
JOB NO. 20074.57

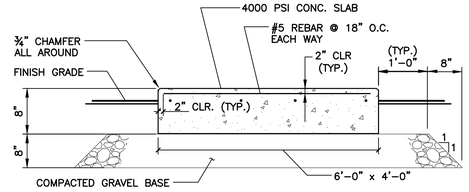
TYPICAL EQUIPMENT DETAILS

C-5

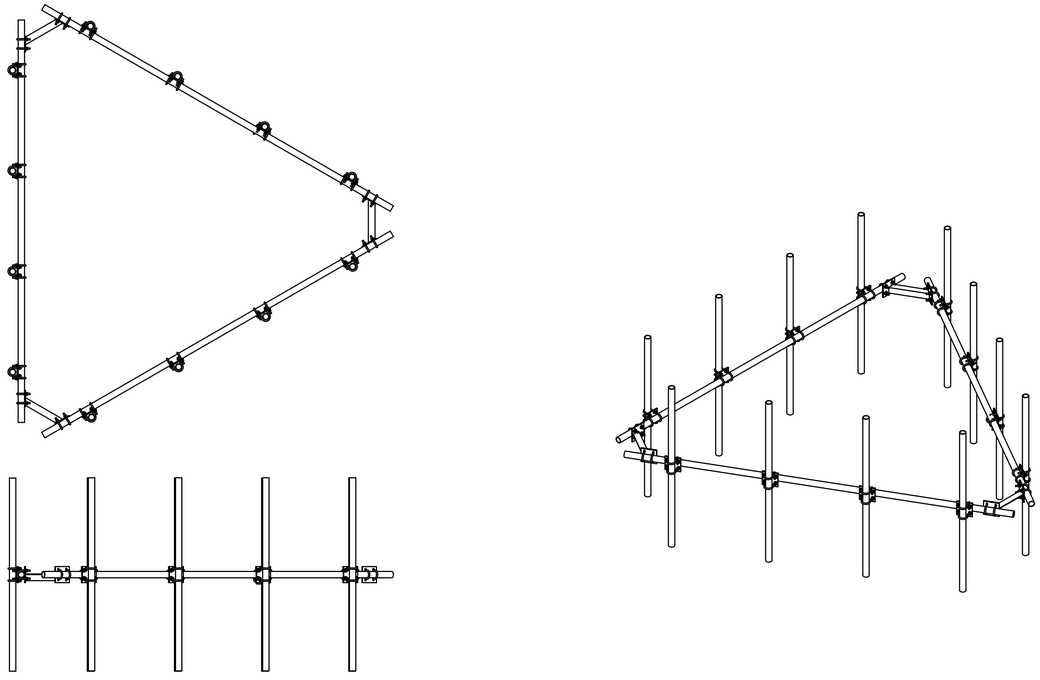
Sheet No. 7 of 9



1 / S-1 **PROPOSED SITEPRO PLATFORM (P/N: RMQP-496)**
SCALE: NOT TO SCALE



3 / S-1 **TYPICAL CONCRETE PAD DETAIL**
NOT TO SCALE



2 / S-1 **PROPOSED SITEPRO HANDRAIL KIT (P/N: HRK12)**
SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/21/20	RYS	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
	08/25/20	RYS	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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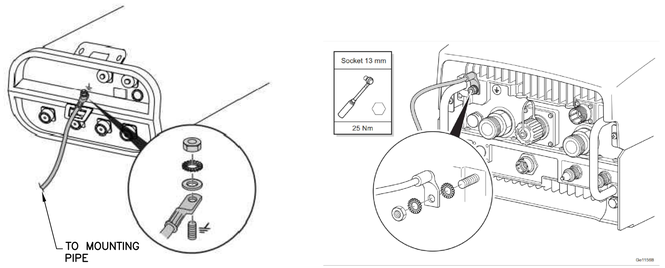
WETHERSFIELD, CT 06109

DATE: 07/15/20
SCALE: AS NOTED
JOB NO. 20074.57

STRUCTURAL DETAILS

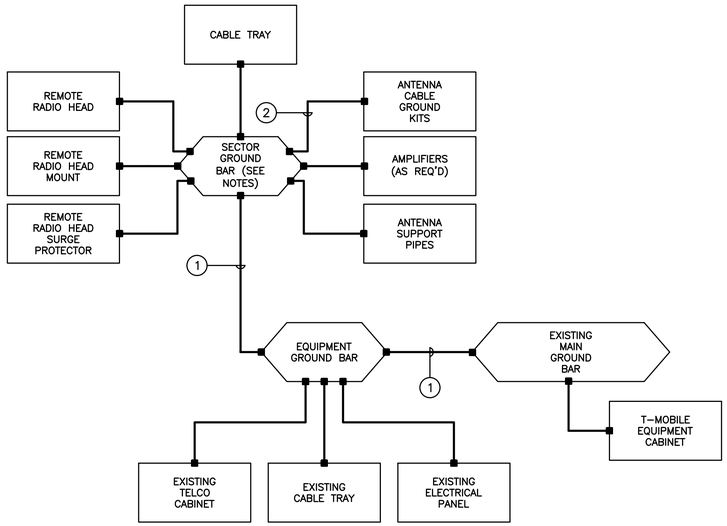
S-1

Sheet No. 8 of 9



1 E-1 TYPICAL ANTENNA/RRU GROUNDING DETAILS

SCALE: NOT TO SCALE



GROUNDING SCHEMATIC NOTES

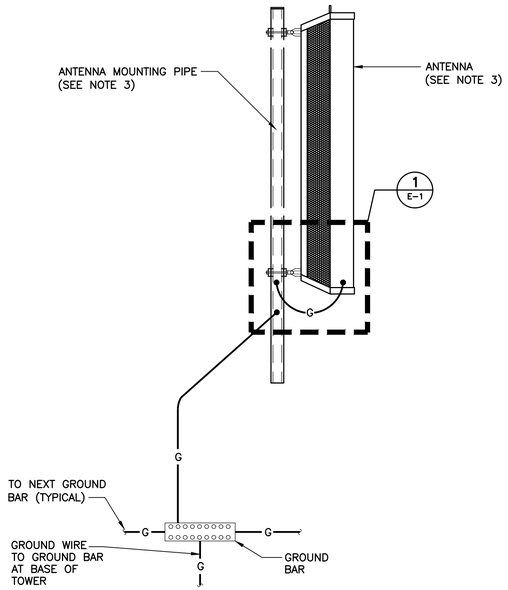
1. #2 AWG
2. #6 AWG

GENERAL NOTES:

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

4 E-1 TYPICAL GROUNDING SCHEMATIC DETAIL

SCALE: NOT TO SCALE

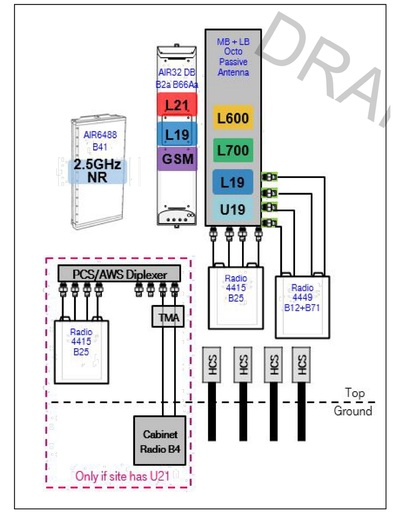


NOTES:

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

2 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE

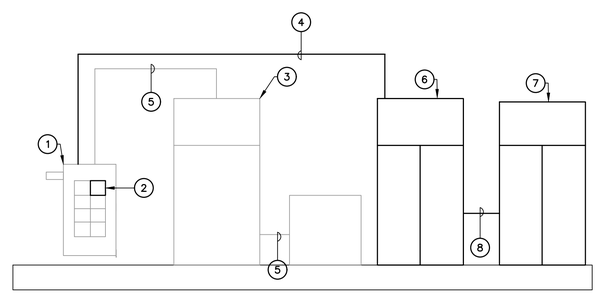


3 E-1 PROPOSED PLUMBING DIAGRAM

SCALE: NOT TO SCALE

RISER DIAGRAM NOTES

1. EXISTING 200A, PPC CABINET TO REMAIN.
2. NEW 100A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.
3. EXISTING CABINETS TO REMAIN.
4. (3) #1 AWG, (1) #8 AWG GROUND, 1–1/4" CONDUIT.
5. EXISTING CONDUITS AND CONDUCTORS TO REMAIN.
6. NEW T–MOBILE EQUIPMENT CABINET
7. NEW T–MOBILE BATTERY CABINET
8. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.



5 E-1 ELECTRICAL POWER RISER DIAGRAM

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/21/20	RTS	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
	08/25/20	RTS	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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SITE ID: CTHA507A

254 SILAS DEANE HWY

WETHERSFIELD, CT 06109

DATE: 07/15/20

SCALE: AS NOTED

JOB NO. 20074.57

TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 9 of 9

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

120-ft Existing Rohn Monopole

Proposed T-Mobile
Antenna Upgrade

T-Mobile Site Ref: CTHA507A

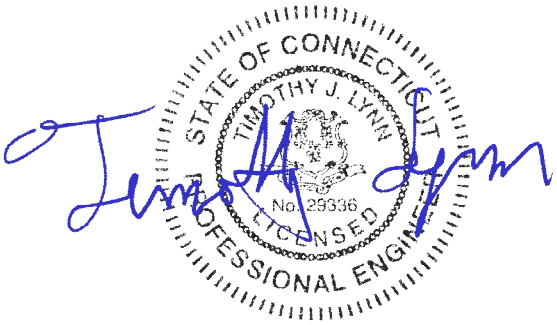
254 Silas Deane Highway
Wethersfield, CT

Centek Project No. 20074.57

~~Date: July 20, 2020~~

Rev 1: July 21, 2020

Max Stress Ratio = 96.5%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

Introduction

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

The host tower is a 120-ft tall, three-section, eighteen sided, tapered monopole originally designed and manufactured by ROHN Eng. File No: 50576RA, dated July 11, 2002. The tower geometry, structure member sizes and foundation system information were obtained from the aforementioned tower design documents. This analysis takes into account monopole reinforcements designed and installed by Structural Components for Verizon Wireless, SC no. 110361, dated March 25, 2011.

Antenna and appurtenance information were obtained from a previous structural report prepared by Dewberry job no; 50110164 dated August 9 2019, visual verification from grade by Centek personnel on July 7, 2020 and a T-Mobile RF data sheet.

The tower consists of three (3) tapered vertical sections consisting of A572-65 pole sections. The vertical tower sections are slip joint connected. The diameter of the pole (flat-flat) is 16.00-in at the top and 36.00-in at the base.

Antenna and Appurtenance Summary

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

- TOWN (Reserved):
  Antennas: Two (2) Andrew DB809-XC Omni-directional whip antennas pipe mounted with an elevation of 117-ft above grade.
  Coax Cables: Two (2) 7/8" ∅ coax cables running on the inside of the existing monopole.
- TOWN (Existing):
  Antennas: One (1) 2-ft ∅ Microwave dish antenna pipe mounted to the monopole with an elevation of 110-ft above grade.
  Coax Cables: Two (2) 1/2" ∅ coax cables running on the inside of the existing monopole.
- TOWN (Reserved):
  Antennas: Two (2) 1-ft ∅ and two (2) 2-ft ∅ Microwave dish antennas pipe mounted to the monopole with an elevation of 110-ft above grade.
  Coax Cables: Six (6) 7/8" ∅ coax cables running on the inside of the existing monopole.
- TOWN (EXISTING):
  Antennas: One (1) Decibel DB404 4-Bay Dipole, two (2) Andrew Decibel DB583, one (1) RFS Celwave PD1142 and one (1) 5-ft x 1" ∅ Omni-directional whip antennas mounted on three (3) side arms with an elevation of 54-ft above existing grade.
  Coax Cables: Five (5) 1/2" ∅ coax cables running on the inside of the existing monopole.

- VERIZON WIRELESS (Existing):
  Antennas: Six (6) Antel BXA-80063-6CF panel antennas, six (6) Andrew SBNHH-1D65B panel antennas, six (6) remote radio heads and one (1) main distribution box mounted on T-Arms with a RAD center elevation of 90-ft above grade.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables and one (1) 1-5/8" ∅ fiber cable running on the inside of the existing tower.
- T-MOBILE (Existing to Remain):
  Coax Cables: One (1) 6x12 fiber cable running on the inside of the existing tower.
- **T-MOBILE (Existing to Remove):**
  Antennas: Six (6) Ericsson AIR21 panel antennas mounted on three (3) 6-ft T-arms with a RAD center elevation of 105-ft above existing grade.
- **T-MOBILE (Proposed):**
  Antennas: Three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson AIR32 panel antennas, three (3) RFS APXVAARR24_43 panel antennas, three (3) Ericsson 4449 remote radio units, six (6) Ericsson 4415 remote radio units and three (3) Commscope SDX1926Q-43 diplexers mounted on one (1) SitePro platform (p/n RMQP-496) w/ handrail (p/n HRK12) with a RAD center elevation of 105-ft above existing grade.
  Coax Cables: Three (3) 6x12 fiber cables running on the exterior of the existing tower.

Primary Assumptions Used in the Analysis

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

Analysis

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

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

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

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 1.00" radial ice on the tower structure and its components.

Basic Wind Speed:	Wethersfield; v = 97 mph (3 second gust)	*[Appendix N of the 2018 CT Building Code]*
Load Cases:	Load Case 1; 97 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2018 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 1.00" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

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

Tower Capacity

- Calculated stresses were found to be within allowable limits. This tower was found to be at **96.5%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L4)	0'-37.17'	96.5%	**PASS**

Foundation and Anchors

The existing foundation consists of a 5-ft 6in ∅ x 19ft-6in long modified reinforced concrete caisson with a 2.0-ft thick x 14-ft-6in square reinforced concrete pad. The base of the monopole tower is connected to the caisson foundation by means of (6) original 2.25"∅, ASTM A615-75 anchor bolts and six (6) additional 2.75"∅, ASTM A615-75 anchor bolts embedded approximately 7-ft into the concrete foundation. The base plate thickness was field measured and noted in a Pre-construction and TIA Inspection report prepared by Structural Components, dated August 25, 2010 as 2.25in thick in lieu of the original ROHN design thickness of 2.00in.

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

Location	Vector	Proposed Reactions
Base	Shear	27 kips
	Compression	22 kips
	Moment	1956 kip-ft

- The foundation was found to be within allowable limits.

Foundation	Design Limit	TIA-222-G Section 9.4 FS[(1)]	Proposed Loading (FS)[(1)]	Result
Reinforced Concrete Pad w/ Caisson	OTM[(2)]	1.0	1.15	**PASS**

Note 1: FS denotes Factor of Safety.
Note 2: OTM denotes Overturning Moment.

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

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Combined Axial and Shear	63.0%	**PASS**
Base Plate	Bending	24.1%	**PASS**

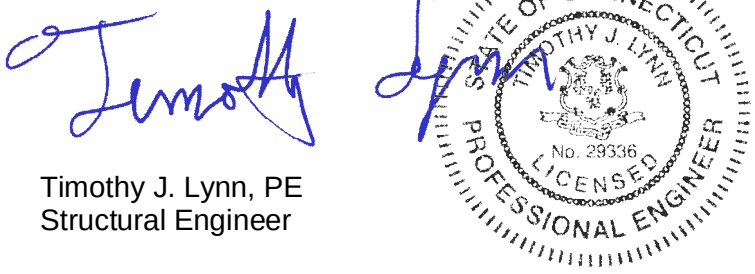
Conclusion

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

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

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

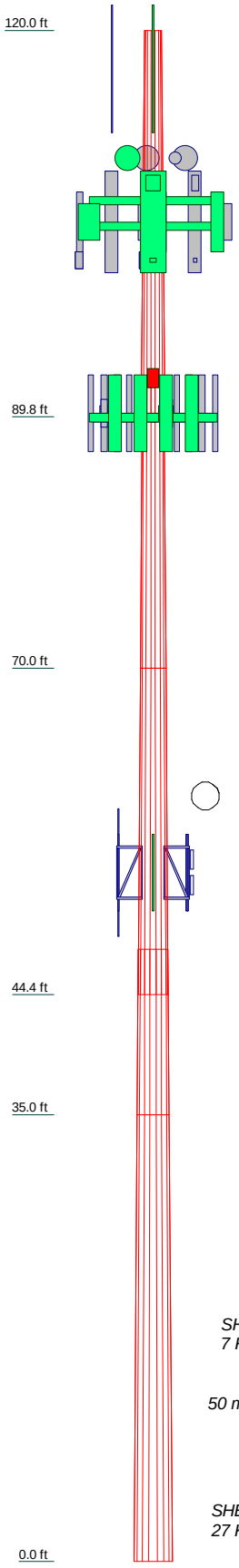
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

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

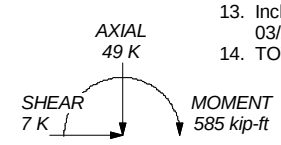
TnxTower Features:

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

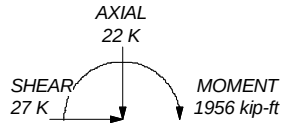
Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	30.250	18	0.188	2.670	16.000	21.287		1.1
2	22.420	18	0.188		20.445	24.252		1.0
3	25.583	18	0.275	3.583	24.252	28.725	A572-65	2.0
4	13.000	18	0.275		27.549	29.880		1.1
5	35.000	18	0.364		29.880	36.000		4.5
								9.7



ALL REACTIONS ARE FACTORED



TORQUE 2 kip-ft
50 mph WIND - 1.000 in ICE



TORQUE 6 kip-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DB809K-XC (Town)	117	DB-T1-6Z-8AB-0Z (Verizon - Existing)	92
DB809K-XC (Town)	117	B2/B66A RRH (Verizon - Existing)	90
6'x2" Pipe Mount (Town)	110	B2/B66A RRH (Verizon - Existing)	90
6'x2" Pipe Mount (Town)	110	B2/B66A RRH (Verizon - Existing)	90
6'x2" Pipe Mount (Town)	110	B5/B15 RRH -BRO4C (Verizon - Existing)	90
2-ft dish (Town)	110		
2-ft dish (Town)	110	B5/B15 RRH -BRO4C (Verizon - Existing)	90
2-ft dish (Town)	110		
1-ft Dish (Town)	110	B5/B15 RRH -BRO4C (Verizon - Existing)	90
1-ft Dish (Town)	110		
SitePro 12' Handrail Kit HRK12 (T-Mobile - Existing)	107	BXA-80063/6CF (Verizon - Existing)	90
		EEI 6-ft T-Arm (Verizon - Existing)	90
AIR32 (T-Mobile - Proposed)	105	EEI 6-ft T-Arm (Verizon - Existing)	90
APXVAARR24-43 (T-Mobile - Proposed)	105	EEI 6-ft T-Arm (Verizon - Existing)	90
		BXA-80063/6CF (Verizon - Existing)	90
AIR6449 (T-Mobile - Proposed)	105	SBNHH-1D65B (Verizon - Existing)	90
AIR32 (T-Mobile - Proposed)	105	BXA-80063/6CF (Verizon - Existing)	90
APXVAARR24-43 (T-Mobile - Proposed)	105	SBNHH-1D65B (Verizon - Existing)	90
		SBNHH-1D65B (Verizon - Existing)	90
AIR6449 (T-Mobile - Proposed)	105	BXA-80063/6CF (Verizon - Existing)	90
AIR32 (T-Mobile - Proposed)	105	SBNHH-1D65B (Verizon - Existing)	90
APXVAARR24-43 (T-Mobile - Proposed)	105	BXA-80063/6CF (Verizon - Existing)	90
		BXA-80063/6CF (Verizon - Existing)	90
AIR6449 (T-Mobile - Proposed)	105	SBNHH-1D65B (Verizon - Existing)	90
4449 B12,B71 (T-Mobile - Proposed)	105	SBNHH-1D65B (Verizon - Existing)	90
4449 B12,B71 (T-Mobile - Proposed)	105	Pirod 4' Side Mount Standoff (1) (Town)	54
4449 B12,B71 (T-Mobile - Proposed)	105	Pirod 4' Side Mount Standoff (1) (Town)	54
(2) 4415 B25 (T-Mobile - Proposed)	105	5' x 1" dia. Omni (Town)	54
(2) 4415 B25 (T-Mobile - Proposed)	105	PD1142-1 (Town)	54
(2) 4415 B25 (T-Mobile - Proposed)	105	DB404 (Town)	54
SDX1926Q-43 (T-Mobile - Proposed)	105	DB583 (Town)	54
SDX1926Q-43 (T-Mobile - Proposed)	105	DB583 (Town)	54
SDX1926Q-43 (T-Mobile - Proposed)	105	Pirod 4' Side Mount Standoff (1) (Town)	54
SitePro RMQP-496 (T-Mobile - Existing)	105		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. Weld together tower sections have flange connections.
8. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
9. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
10. Welds are fabricated with ER-70S-6 electrodes.
11. Pole Sections 3 and 4 - Equivalent Thickness of 0.275" Used to Account for Stiffened Section
12. Pole Section 5 - Equivalent Thickness of 0.3640" Used to Account for Stiffened Section.
13. Includes monpole reinforcement design prepared by Structural Components, LLC., dated 03/25/11.
14. TOWER RATING: 96.5%

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

Job: **20074.57 - CTHA507A**		
Project: **120-ft ROHN Monopole - 250 Silas Deane Hwy., Wethersfield, CT**		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 07/21/20	Scale: NTS
Path:		Dwg No. E-1

Tower Input Data

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

Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
Pole Sections 3 and 4 - Equivalent Thickness of 0.275" Used to Account for Stiffened Section.
Pole Section 5 - Equivalent Thickness of 0.3640" Used to Account for Stiffened Section..
Includes monpole reinforcement design prepared by Structural Components, LLC., dated 03/25/11..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	120.000-89.750	30.250	2.670	18	16.000	21.287	0.188	0.750	A572-65 (65 ksi)
L2	89.750-70.000	22.420	0.000	18	20.445	24.252	0.188	0.750	A572-65 (65 ksi)
L3	70.000-44.417	25.583	3.583	18	24.252	28.725	0.275	1.100	A572-65 (65 ksi)
L4	44.417-35.000	13.000	0.000	18	27.549	29.880	0.275	1.100	A572-65 (65 ksi)
L5	35.000-0.000	35.000		18	29.880	36.000	0.364	1.456	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.218	9.410	297.267	5.613	8.128	36.573	594.926	4.706	2.486	13.259
	21.586	12.557	706.256	7.490	10.814	65.311	1413.441	6.280	3.417	18.221
L2	21.192	12.056	625.065	7.192	10.386	60.182	1250.953	6.029	3.268	17.431
	24.597	14.321	1047.795	8.543	12.320	85.048	2096.968	7.162	3.938	21.005
L3	24.584	20.928	1520.063	8.512	12.320	123.382	3042.126	10.466	3.784	13.761
	29.126	24.833	2539.358	10.100	14.592	174.020	5082.057	12.419	4.572	16.624
L4	28.584	23.806	2237.183	9.682	13.995	159.860	4477.310	11.905	4.365	15.871
	30.299	25.841	2861.358	10.510	15.179	188.507	5726.482	12.923	4.775	17.363
L5	30.285	34.101	3753.343	10.478	15.179	247.271	7511.625	17.054	4.618	12.687
	36.499	41.172	6605.605	12.651	18.288	361.199	13219.902	20.590	5.695	15.647

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 120.000-89.750				1	1	1			
L2 89.750-70.000				1	1	1			
L3 70.000-44.417				1	1	1			
L4 44.417-35.000				1	1	1			
L5 35.000-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
HYBRIFLEX 1-5/8" (Verizon - Existing)	C	No	Surface Ar (CaAa)	90.000 - 4.000	1	1	0.000 0.000	1.980		0.002
HYBRIFLEX 1-5/8" (T-Mobile - Proposed)	C	No	Surface Ar (CaAa)	105.000 - 4.000	3	3	0.000 0.000	1.980		0.002

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF5-50A (7/8 FOAM) (Town - Reserved)	C	No	No	Inside Pole	117.000 - 4.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
LDF4P-50A (1/2 FOAM) (Town)	C	No	No	Inside Pole	110.000 - 4.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
LDF5-50A (7/8 FOAM) (Town - Reserved)	C	No	No	Inside Pole	110.000 - 4.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
LDF7-50A (1-5/8 FOAM) (Verizon - Existing)	C	No	No	Inside Pole	90.000 - 4.000	12	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
LDF4-50A (1/2 FOAM) (Town - Existing)	C	No	No	Inside Pole	55.000 - 4.000	5	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
HYBRIFLEX 1-5/8" (T-Mobile - Existing)	C	No	No	Inside Pole	105.000 - 7.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.002 0.002 0.002
HYBRIFLEX 1-5/8" (Verizon - Existing)	C	No	No	Inside Pole	90.000 - 4.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.002 0.002 0.002
SC - SwitchBlade (SC - Reinf)	A	No	No	CaAa (Out Of Face)	35.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
SC - SwitchBlade (SC - Reinf)	B	No	No	CaAa (Out Of Face)	70.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.350 0.450 0.550	0.000 0.000 0.000

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.000-89.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	9.108	0.000	0.183
L2	89.750-70.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	15.642	0.000	0.478
L3	70.000-44.417	A	0.000	0.000	0.000	0.000	0.000

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	0.000	8.954	0.000
		C	0.000	0.000	20.262	0.000	0.627
L4	44.417-35.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	3.296	0.000
		C	0.000	0.000	7.458	0.000	0.235
L5	35.000-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	12.250	0.000
		C	0.000	0.000	24.552	0.000	0.767

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.000-89.750	A	2.244	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	20.040	0.000	0.478
L2	89.750-70.000	A	2.184	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	38.517	0.000	1.084
L3	70.000-44.417	A	2.112	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	19.759	0.000
		C		0.000	0.000	48.372	0.000	1.350
L4	44.417-35.000	A	2.037	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	7.273	0.000
		C		0.000	0.000	17.806	0.000	0.501
L5	35.000-0.000	A	1.877	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	25.387	0.000
		C		0.000	0.000	55.335	0.000	1.515

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	120.000-89.750	0.000	2.493	0.000	2.132
L2	89.750-70.000	0.000	4.785	0.000	4.356
L3	70.000-44.417	1.471	4.980	1.353	4.893
L4	44.417-35.000	1.557	5.243	1.427	5.133
L5	35.000-0.000	1.730	5.199	1.554	5.003

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	12	HYBRIFLEX 1-5/8"	89.75 - 90.00	1.0000	1.0000
L1	13	HYBRIFLEX 1-5/8"	89.75 - 105.00	1.0000	1.0000
L3	12	HYBRIFLEX 1-5/8"	44.42 - 70.00	1.0000	1.0000
L3	13	HYBRIFLEX 1-5/8"	44.42 - 70.00	1.0000	1.0000
L5	12	HYBRIFLEX 1-5/8"	4.00 - 35.00	1.0000	1.0000
L5	13	HYBRIFLEX 1-5/8"	4.00 - 35.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
EEI 6-ft T-Arm	A	From Face	1.750	0.000	90.000	No Ice	5.000	5.000	0.500
(Verizon - Existing)			0.000			1/2" Ice	8.000	8.000	0.750
			0.000			1" Ice	11.000	11.000	1.000
EEI 6-ft T-Arm	B	From Face	1.750	0.000	90.000	No Ice	5.000	5.000	0.500
(Verizon - Existing)			0.000			1/2" Ice	8.000	8.000	0.750
			0.000			1" Ice	11.000	11.000	1.000
EEI 6-ft T-Arm	C	From Face	1.750	0.000	90.000	No Ice	5.000	5.000	0.500
(Verizon - Existing)			0.000			1/2" Ice	8.000	8.000	0.750
			0.000			1" Ice	11.000	11.000	1.000
BXA-80063/6CF	A	From Face	3.000	0.000	90.000	No Ice	7.582	4.050	0.015
(Verizon - Existing)			-3.000			1/2" Ice	8.029	4.487	0.057
			0.000			1" Ice	8.484	4.931	0.105
SBNHH-1D65B	A	From Face	3.000	0.000	90.000	No Ice	8.079	5.342	0.042
(Verizon - Existing)			-1.000			1/2" Ice	8.535	5.795	0.092
			0.000			1" Ice	8.998	6.255	0.148
SBNHH-1D65B	A	From Face	3.000	0.000	90.000	No Ice	8.079	5.342	0.042
(Verizon - Existing)			1.000			1/2" Ice	8.535	5.795	0.092
			0.000			1" Ice	8.998	6.255	0.148
BXA-80063/6CF	A	From Face	3.000	0.000	90.000	No Ice	7.582	4.050	0.015
(Verizon - Existing)			3.000			1/2" Ice	8.029	4.487	0.057
			0.000			1" Ice	8.484	4.931	0.105
BXA-80063/6CF	B	From Face	3.000	0.000	90.000	No Ice	7.582	4.050	0.015
(Verizon - Existing)			-3.000			1/2" Ice	8.029	4.487	0.057
			0.000			1" Ice	8.484	4.931	0.105
SBNHH-1D65B	B	From Face	3.000	0.000	90.000	No Ice	8.079	5.342	0.042
(Verizon - Existing)			-1.000			1/2" Ice	8.535	5.795	0.092
			0.000			1" Ice	8.998	6.255	0.148
SBNHH-1D65B	B	From Face	3.000	0.000	90.000	No Ice	8.079	5.342	0.042
(Verizon - Existing)			1.000			1/2" Ice	8.535	5.795	0.092
			0.000			1" Ice	8.998	6.255	0.148
BXA-80063/6CF	B	From Face	3.000	0.000	90.000	No Ice	7.582	4.050	0.015
(Verizon - Existing)			3.000			1/2" Ice	8.029	4.487	0.057
			0.000			1" Ice	8.484	4.931	0.105
BXA-80063/6CF	C	From Face	3.000	0.000	90.000	No Ice	7.582	4.050	0.015
(Verizon - Existing)			-3.000			1/2" Ice	8.029	4.487	0.057
			0.000			1" Ice	8.484	4.931	0.105
SBNHH-1D65B	C	From Face	3.000	0.000	90.000	No Ice	8.079	5.342	0.042
(Verizon - Existing)			-1.000			1/2" Ice	8.535	5.795	0.092
			0.000			1" Ice	8.998	6.255	0.148

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
SBNHH-1D65B	C	From Face	3.000	0.000	90.000	No Ice	8.079	5.342	0.042
(Verizon - Existing)			1.000			1/2" Ice	8.535	5.795	0.092
			0.000			1" Ice	8.998	6.255	0.148
BXA-80063/6CF	C	From Face	3.000	0.000	90.000	No Ice	7.582	4.050	0.015
(Verizon - Existing)			3.000			1/2" Ice	8.029	4.487	0.057
			0.000			1" Ice	8.484	4.931	0.105
B2/B66A RRH	A	From Face	3.000	0.000	90.000	No Ice	2.537	1.610	0.060
(Verizon - Existing)			-1.000			1/2" Ice	2.750	1.791	0.080
			0.000			1" Ice	2.970	1.978	0.103
B2/B66A RRH	B	From Face	3.000	0.000	90.000	No Ice	2.537	1.610	0.060
(Verizon - Existing)			-1.000			1/2" Ice	2.750	1.791	0.080
			0.000			1" Ice	2.970	1.978	0.103
B2/B66A RRH	C	From Face	3.000	0.000	90.000	No Ice	2.537	1.610	0.060
(Verizon - Existing)			-1.000			1/2" Ice	2.750	1.791	0.080
			0.000			1" Ice	2.970	1.978	0.103
B5/B15 RRH -BRO4C	A	From Face	3.000	0.000	90.000	No Ice	1.865	1.016	0.070
(Verizon - Existing)			-1.000			1/2" Ice	2.035	1.148	0.086
			0.000			1" Ice	2.212	1.288	0.106
B5/B15 RRH -BRO4C	B	From Face	3.000	0.000	90.000	No Ice	1.865	1.016	0.070
(Verizon - Existing)			-1.000			1/2" Ice	2.035	1.148	0.086
			0.000			1" Ice	2.212	1.288	0.106
B5/B15 RRH -BRO4C	C	From Face	3.000	0.000	90.000	No Ice	1.865	1.016	0.070
(Verizon - Existing)			-1.000			1/2" Ice	2.035	1.148	0.086
			0.000			1" Ice	2.212	1.288	0.106
DB-T1-6Z-8AB-0Z	C	From Face	0.500	0.000	92.000	No Ice	4.800	2.000	0.044
(Verizon - Existing)			0.000			1/2" Ice	5.070	2.193	0.080
			0.000			1" Ice	5.348	2.393	0.120
DB809K-XC	A	From Face	3.000	0.000	117.000	No Ice	3.660	3.660	0.030
(Town)			0.000			1/2" Ice	4.913	4.913	0.056
			0.000			1" Ice	6.183	6.183	0.091
DB809K-XC	C	From Face	3.000	0.000	117.000	No Ice	3.660	3.660	0.030
(Town)			0.000			1/2" Ice	4.913	4.913	0.056
			0.000			1" Ice	6.183	6.183	0.091
6'x2" Pipe Mount	A	None		0.000	110.000	No Ice	1.200	1.200	0.022
(Town)						1/2" Ice	1.802	1.802	0.031
						1" Ice	2.170	2.170	0.045
6'x2" Pipe Mount	B	None		0.000	110.000	No Ice	1.200	1.200	0.022
(Town)						1/2" Ice	1.802	1.802	0.031
						1" Ice	2.170	2.170	0.045
6'x2" Pipe Mount	C	None		0.000	110.000	No Ice	1.200	1.200	0.022
(Town)						1/2" Ice	1.802	1.802	0.031
						1" Ice	2.170	2.170	0.045
AIR32	A	From Face	3.000	0.000	105.000	No Ice	6.510	4.712	0.133
(T-Mobile - Proposed)			-5.000			1/2" Ice	6.887	5.068	0.179
			0.000			1" Ice	7.271	5.431	0.230
APXVAARR24-43	A	From Face	3.000	0.000	105.000	No Ice	20.243	8.889	0.153
(T-Mobile - Proposed)			0.000			1/2" Ice	20.890	9.487	0.266
			0.000			1" Ice	21.544	10.092	0.387
AIR6449	A	From Face	3.000	0.000	105.000	No Ice	5.655	2.416	0.103
(T-Mobile - Proposed)			5.000			1/2" Ice	5.956	2.641	0.141
			0.000			1" Ice	6.265	2.874	0.184
AIR32	B	From Face	3.000	0.000	105.000	No Ice	6.510	4.712	0.133
(T-Mobile - Proposed)			-5.000			1/2" Ice	6.887	5.068	0.179
			0.000			1" Ice	7.271	5.431	0.230
APXVAARR24-43	B	From Face	3.000	0.000	105.000	No Ice	20.243	8.889	0.153
(T-Mobile - Proposed)			0.000			1/2" Ice	20.890	9.487	0.266
			0.000			1" Ice	21.544	10.092	0.387

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft ft ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
AIR6449	B	From Face	3.000	0.000	105.000	No Ice	5.655	2.416	0.103
(T-Mobile - Proposed)			5.000			1/2" Ice	5.956	2.641	0.141
			0.000			1" Ice	6.265	2.874	0.184
AIR32	C	From Face	3.000	0.000	105.000	No Ice	6.510	4.712	0.133
(T-Mobile - Proposed)			-5.000			1/2" Ice	6.887	5.068	0.179
			0.000			1" Ice	7.271	5.431	0.230
APXVAARR24-43	C	From Face	3.000	0.000	105.000	No Ice	20.243	8.889	0.153
(T-Mobile - Proposed)			0.000			1/2" Ice	20.890	9.487	0.266
			0.000			1" Ice	21.544	10.092	0.387
AIR6449	C	From Face	3.000	0.000	105.000	No Ice	5.655	2.416	0.103
(T-Mobile - Proposed)			5.000			1/2" Ice	5.956	2.641	0.141
			0.000			1" Ice	6.265	2.874	0.184
4449 B12,B71	A	From Face	3.000	0.000	105.000	No Ice	1.650	1.156	0.080
(T-Mobile - Proposed)			0.000			1/2" Ice	1.810	1.295	0.096
			3.000			1" Ice	1.978	1.441	0.115
4449 B12,B71	B	From Face	3.000	0.000	105.000	No Ice	1.650	1.156	0.080
(T-Mobile - Proposed)			0.000			1/2" Ice	1.810	1.295	0.096
			3.000			1" Ice	1.978	1.441	0.115
4449 B12,B71	C	From Face	3.000	0.000	105.000	No Ice	1.650	1.156	0.080
(T-Mobile - Proposed)			0.000			1/2" Ice	1.810	1.295	0.096
			3.000			1" Ice	1.978	1.441	0.115
(2) 4415 B25	A	From Face	3.000	0.000	105.000	No Ice	1.843	0.820	0.046
(T-Mobile - Proposed)			0.000			1/2" Ice	2.012	0.943	0.060
			-3.000			1" Ice	2.190	1.075	0.077
(2) 4415 B25	A	From Face	3.000	0.000	105.000	No Ice	1.843	0.820	0.046
(T-Mobile - Proposed)			0.000			1/2" Ice	2.012	0.943	0.060
			-3.000			1" Ice	2.190	1.075	0.077
(2) 4415 B25	A	From Face	3.000	0.000	105.000	No Ice	1.843	0.820	0.046
(T-Mobile - Proposed)			0.000			1/2" Ice	2.012	0.943	0.060
			-3.000			1" Ice	2.190	1.075	0.077
SDX1926Q-43	A	From Face	3.000	0.000	105.000	No Ice	0.241	0.101	0.030
(T-Mobile - Proposed)			0.000			1/2" Ice	0.306	0.144	0.032
			-3.000			1" Ice	0.379	0.195	0.036
SDX1926Q-43	B	From Face	3.000	0.000	105.000	No Ice	0.241	0.101	0.030
(T-Mobile - Proposed)			0.000			1/2" Ice	0.306	0.144	0.032
			-3.000			1" Ice	0.379	0.195	0.036
SDX1926Q-43	C	From Face	3.000	0.000	105.000	No Ice	0.241	0.101	0.030
(T-Mobile - Proposed)			0.000			1/2" Ice	0.306	0.144	0.032
			-3.000			1" Ice	0.379	0.195	0.036
SitePro RMQP-496	C	From Face	1.750	0.000	105.000	No Ice	15.700	15.700	1.700
(T-Mobile - Existing)			0.000			1/2" Ice	20.100	20.100	2.000
			0.000			1" Ice	24.500	24.500	2.300
SitePro 12' Handrail Kit	C	From Face	1.750	0.000	107.000	No Ice	5.000	5.000	0.265
HRK12			0.000			1/2" Ice	8.000	8.000	0.350
(T-Mobile - Existing)			0.000			1" Ice	11.000	11.000	0.435
PD1142-1	A	From Face	2.000	5.000	54.000	No Ice	1.316	1.316	0.010
(Town)			0.000			1/2" Ice	3.210	3.210	0.024
			0.000			1" Ice	5.121	5.121	0.049
DB404	B	From Face	2.000	4.000	54.000	No Ice	1.140	1.140	0.014
(Town)			0.000			1/2" Ice	2.052	2.052	0.018
			0.000			1" Ice	2.964	2.964	0.022
DB583	A	From Face	2.000	-2.500	54.000	No Ice	0.537	0.537	0.006
(Town)			0.000			1/2" Ice	0.711	0.711	0.012
			0.000			1" Ice	0.894	0.894	0.019
DB583	B	From Face	2.000	-2.500	54.000	No Ice	0.537	0.537	0.006
(Town)			0.000			1/2" Ice	0.711	0.711	0.012
			0.000			1" Ice	0.894	0.894	0.019

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pirod 4' Side Mount Standoff	A	From Face	1.000	0.000	54.000	No Ice	2.720	2.720	0.050
(1)			0.000			1/2" Ice	4.910	4.910	0.089
(Town)			0.000			1" Ice	7.100	7.100	0.128
Pirod 4' Side Mount Standoff	B	From Face	1.000	0.000	54.000	No Ice	2.720	2.720	0.050
(1)			0.000			1/2" Ice	4.910	4.910	0.089
(Town)			0.000			1" Ice	7.100	7.100	0.128
Pirod 4' Side Mount Standoff	C	From Face	1.000	0.000	54.000	No Ice	2.720	2.720	0.050
(1)			0.000			1/2" Ice	4.910	4.910	0.089
(Town)			0.000			1" Ice	7.100	7.100	0.128
5' x 1" dia. Omni	C	From Face	2.000	3.500	54.000	No Ice	0.500	0.500	0.010
(Town)			0.000			1/2" Ice	1.017	1.017	0.015
			0.000			1" Ice	1.426	1.426	0.023

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
2-ft dish	A	Paraboloid w/o	From	1.000	Worst		110.000	2.000	No Ice	3.140	0.050
(Town)		Radome	Face	2.000					1/2" Ice	3.410	0.080
				0.000					1" Ice	3.680	0.100
2-ft dish	B	Paraboloid w/o	From	1.000	Worst		110.000	2.000	No Ice	3.140	0.050
(Town)		Radome	Face	2.000					1/2" Ice	3.410	0.080
				0.000					1" Ice	3.680	0.100
2-ft dish	C	Paraboloid w/o	From	1.000	Worst		110.000	2.000	No Ice	3.140	0.050
(Town)		Radome	Face	2.000					1/2" Ice	3.410	0.080
				0.000					1" Ice	3.680	0.100
1-ft Dish	A	Paraboloid w/o	From	1.000	Worst		110.000	1.000	No Ice	0.790	0.010
(Town)		Radome	Face	0.500					1/2" Ice	0.920	0.020
				0.000					1" Ice	1.050	0.030
1-ft Dish	B	Paraboloid w/o	From	1.000	Worst		110.000	1.000	No Ice	0.790	0.010
(Town)		Radome	Face	0.500					1/2" Ice	0.920	0.020
				0.000					1" Ice	1.050	0.030

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	104.273	1.277	0.029	47.649	A	0.000	47.649	47.649	100.00	0.000	0.000
120.000-89.75					B	0.000	47.649		100.00	0.000	0.000
0					C	0.000	47.649		100.00	9.108	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L2	79.631	1.206	0.028	37.681	A	0.000	37.681	37.681	100.00	0.000	0.000
89.750-70.000					B	0.000	37.681		100.00	0.000	0.000
					C	0.000	37.681		100.00	15.642	0.000
L3	56.848	1.124	0.026	57.252	A	0.000	57.252	57.252	100.00	0.000	0.000
70.000-44.417					B	0.000	57.252		100.00	0.000	8.954
					C	0.000	57.252		100.00	20.262	0.000
L4	39.663	1.042	0.024	23.104	A	0.000	23.104	23.104	100.00	0.000	0.000
44.417-35.000					B	0.000	23.104		100.00	0.000	3.296
					C	0.000	23.104		100.00	7.458	0.000
L5	17.461	0.876	0.021	97.393	A	0.000	97.393	97.393	100.00	0.000	0.000
35.000-0.000					B	0.000	97.393		100.00	0.000	12.250
					C	0.000	97.393		100.00	24.552	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	104.273	1.277	0.008	2.244	58.962	A	0.000	58.962	58.962	100.00	0.000	0.000
120.000-89.750						B	0.000	58.962		100.00	0.000	0.000
						C	0.000	58.962		100.00	20.040	0.000
L2	79.631	1.206	0.007	2.184	45.067	A	0.000	45.067	45.067	100.00	0.000	0.000
89.750-70.000						B	0.000	45.067		100.00	0.000	0.000
						C	0.000	45.067		100.00	38.517	0.000
L3	56.848	1.124	0.007	2.112	66.256	A	0.000	66.256	66.256	100.00	0.000	0.000
70.000-44.417						B	0.000	66.256		100.00	0.000	19.759
						C	0.000	66.256		100.00	48.372	0.000
L4	39.663	1.042	0.006	2.037	26.418	A	0.000	26.418	26.418	100.00	0.000	0.000
44.417-35.000						B	0.000	26.418		100.00	0.000	7.273
						C	0.000	26.418		100.00	17.806	0.000
L5 35.000-0.000	17.461	0.876	0.005	1.877	108.341	A	0.000	108.341	108.341	100.00	0.000	0.000
						B	0.000	108.341		100.00	0.000	25.387
						C	0.000	108.341		100.00	55.335	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	104.273	1.277	0.010	47.649	A	0.000	47.649	47.649	100.00	0.000	0.000
120.000-89.75					B	0.000	47.649		100.00	0.000	0.000
0					C	0.000	47.649		100.00	9.108	0.000
L2	79.631	1.206	0.009	37.681	A	0.000	37.681	37.681	100.00	0.000	0.000
89.750-70.000					B	0.000	37.681		100.00	0.000	0.000
					C	0.000	37.681		100.00	15.642	0.000
L3	56.848	1.124	0.009	57.252	A	0.000	57.252	57.252	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
70.000-44.417					B	0.000	57.252		100.00	0.000	8.954
					C	0.000	57.252		100.00	20.262	0.000
L4	39.663	1.042	0.008	23.104	A	0.000	23.104	23.104	100.00	0.000	0.000
44.417-35.000					B	0.000	23.104		100.00	0.000	3.296
					C	0.000	23.104		100.00	7.458	0.000
L5	17.461	0.876	0.007	97.393	A	0.000	97.393	97.393	100.00	0.000	0.000
35.000-0.000					B	0.000	97.393		100.00	0.000	12.250
					C	0.000	97.393		100.00	24.552	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	0.183	1.131	A	1	0.65	0.029	1	1	47.649	0.995	0.033	C
120.000-89.75			B	1	0.65		1	1	47.649			
0			C	1	0.65		1	1	47.649			
L2	0.478	1.006	A	1	0.65	0.028	1	1	37.681	0.744	0.038	C
89.750-70.000			B	1	0.65		1	1	37.681			
			C	1	0.65		1	1	37.681			
L3	0.627	1.992	A	1	0.718	0.026	1	1	57.252	1.416	0.055	B
70.000-44.417			B	1	0.718		1	1	57.252			
			C	1	0.709		1	1	57.252			
L4	0.235	1.098	A	1	0.695	0.024	1	1	23.104	0.507	0.054	B
44.417-35.000			B	1	0.695		1	1	23.104			
			C	1	0.687		1	1	23.104			
L5	0.767	4.482	A	1	0.666	0.021	1	1	97.393	1.746	0.050	B
35.000-0.000			B	1	0.666		1	1	97.393			
			C	1	0.659		1	1	97.393			
Sum Weight:	2.289	9.709						OTM	294.066 kip-ft	5.408		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	0.183	1.131	A	1	0.65	0.029	1	1	47.649	1.172	0.039	B
120.000-89.75			B	1	0.766		1	1	47.649			
0			C	1	0.65		1	1	47.649			
L2	0.478	1.006	A	1	0.65	0.028	1	1	37.681	1.848	0.094	B
89.750-70.000			B	1	1.2		1	1	37.681			
			C	1	0.65		1	1	37.681			
L3	0.627	1.992	A	1	0.709	0.026	1	1	57.252	2.770	0.108	B
70.000-44.417			B	1	1.2		1	1	57.252			
			C	1	0.709		1	1	57.252			
L4	0.235	1.098	A	1	0.687	0.024	1	1	23.104	1.009	0.107	B
44.417-35.000			B	1	1.2		1	1	23.104			
			C	1	0.687		1	1	23.104			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L5	0.767	4.482	A	1	0.659	0.021	1	1	97.393	3.480	0.099	B
35.000-0.000			B	1	1.2		1	1	97.393			
			C	1	0.659		1	1	97.393			
Sum Weight:	2.289	9.709						OTM	527.559 kip-ft	10.278		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.183	1.131	A	1	0.65	0.029	1	1	47.649	0.995	0.033	C
120.000-89.75			B	1	0.65		1	1	47.649			
0			C	1	0.65		1	1	47.649			
L2	0.478	1.006	A	1	0.65	0.028	1	1	37.681	0.744	0.038	C
89.750-70.000			B	1	0.65		1	1	37.681			
			C	1	0.65		1	1	37.681			
L3	0.627	1.992	A	1	0.709	0.026	1	1	57.252	1.416	0.055	C
70.000-44.417			B	1	0.718		1	1	57.252			
			C	1	0.718		1	1	57.252			
L4	0.235	1.098	A	1	0.687	0.024	1	1	23.104	0.507	0.054	C
44.417-35.000			B	1	0.695		1	1	23.104			
			C	1	0.695		1	1	23.104			
L5	0.767	4.482	A	1	0.659	0.021	1	1	97.393	1.746	0.050	C
35.000-0.000			B	1	0.666		1	1	97.393			
			C	1	0.666		1	1	97.393			
Sum Weight:	2.289	9.709						OTM	294.066 kip-ft	5.408		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.183	1.131	A	1	0.65	0.029	1	1	47.649	1.172	0.039	C
120.000-89.75			B	1	0.65		1	1	47.649			
0			C	1	0.766		1	1	47.649			
L2	0.478	1.006	A	1	0.65	0.028	1	1	37.681	1.848	0.094	C
89.750-70.000			B	1	0.65		1	1	37.681			
			C	1	1.2		1	1	37.681			
L3	0.627	1.992	A	1	0.709	0.026	1	1	57.252	2.770	0.108	C
70.000-44.417			B	1	0.709		1	1	57.252			
			C	1	1.2		1	1	57.252			
L4	0.235	1.098	A	1	0.687	0.024	1	1	23.104	1.009	0.107	C
44.417-35.000			B	1	0.687		1	1	23.104			
			C	1	1.2		1	1	23.104			
L5	0.767	4.482	A	1	0.659	0.021	1	1	97.393	3.480	0.099	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
35.000-0.000			B	1	0.659		1	1	97.393			
			C	1	1.2		1	1	97.393			
Sum Weight:	2.289	9.709						OTM	527.559 kip-ft	10.278		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.478	2.881	A	1	1.2	0.008	1	1	58.962	0.604	0.020	C
120.000-89.75			B	1	1.2		1	1	58.962			
0			C	1	1.2		1	1	58.962			
L2	1.084	2.325	A	1	1.2	0.007	1	1	45.067	0.436	0.022	C
89.750-70.000			B	1	1.2		1	1	45.067			
			C	1	1.2		1	1	45.067			
L3	1.350	3.899	A	1	1.2	0.007	1	1	66.256	0.746	0.029	C
70.000-44.417			B	1	1.2		1	1	66.256			
			C	1	1.2		1	1	66.256			
L4	0.501	1.834	A	1	1.2	0.006	1	1	26.418	0.272	0.029	C
44.417-35.000			B	1	1.2		1	1	26.418			
			C	1	1.2		1	1	26.418			
L5	1.515	7.305	A	1	1.2	0.005	1	1	108.341	0.935	0.027	C
35.000-0.000			B	1	1.2		1	1	108.341			
			C	1	1.2		1	1	108.341			
Sum Weight:	4.928	18.243						OTM	167.211 kip-ft	2.993		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.478	2.881	A	1	1.2	0.008	1	1	58.962	0.604	0.020	C
120.000-89.75			B	1	1.2		1	1	58.962			
0			C	1	1.2		1	1	58.962			
L2	1.084	2.325	A	1	1.2	0.007	1	1	45.067	0.706	0.036	B
89.750-70.000			B	1	1.2		1	1	45.067			
			C	1	1.2		1	1	45.067			
L3	1.350	3.899	A	1	1.2	0.007	1	1	66.256	1.061	0.041	B
70.000-44.417			B	1	1.2		1	1	66.256			
			C	1	1.2		1	1	66.256			
L4	0.501	1.834	A	1	1.2	0.006	1	1	26.418	0.379	0.040	B
44.417-35.000			B	1	1.2		1	1	26.418			
			C	1	1.2		1	1	26.418			
L5	1.515	7.305	A	1	1.2	0.005	1	1	108.341	1.223	0.035	B
35.000-0.000			B	1	1.2		1	1	108.341			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
			C	1	1.2		1	1	108.341			
Sum Weight:	4.928	18.243						OTM	215.822 kip-ft	3.972		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	0.478	2.881	A	1	1.2	0.008	1	1	58.962	0.604	0.020	C
120.000-89.75			B	1	1.2		1	1	58.962			
0			C	1	1.2		1	1	58.962			
L2	1.084	2.325	A	1	1.2	0.007	1	1	45.067	0.436	0.022	C
89.750-70.000			B	1	1.2		1	1	45.067			
			C	1	1.2		1	1	45.067			
L3	1.350	3.899	A	1	1.2	0.007	1	1	66.256	0.746	0.029	C
70.000-44.417			B	1	1.2		1	1	66.256			
			C	1	1.2		1	1	66.256			
L4	0.501	1.834	A	1	1.2	0.006	1	1	26.418	0.272	0.029	C
44.417-35.000			B	1	1.2		1	1	26.418			
			C	1	1.2		1	1	26.418			
L5	1.515	7.305	A	1	1.2	0.005	1	1	108.341	0.935	0.027	C
35.000-0.000			B	1	1.2		1	1	108.341			
			C	1	1.2		1	1	108.341			
Sum Weight:	4.928	18.243						OTM	167.211 kip-ft	2.993		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	0.478	2.881	A	1	1.2	0.008	1	1	58.962	0.604	0.020	C
120.000-89.75			B	1	1.2		1	1	58.962			
0			C	1	1.2		1	1	58.962			
L2	1.084	2.325	A	1	1.2	0.007	1	1	45.067	0.706	0.036	C
89.750-70.000			B	1	1.2		1	1	45.067			
			C	1	1.2		1	1	45.067			
L3	1.350	3.899	A	1	1.2	0.007	1	1	66.256	1.061	0.041	C
70.000-44.417			B	1	1.2		1	1	66.256			
			C	1	1.2		1	1	66.256			
L4	0.501	1.834	A	1	1.2	0.006	1	1	26.418	0.379	0.040	C
44.417-35.000			B	1	1.2		1	1	26.418			
			C	1	1.2		1	1	26.418			
L5	1.515	7.305	A	1	1.2	0.005	1	1	108.341	1.223	0.035	C
35.000-0.000			B	1	1.2		1	1	108.341			
			C	1	1.2		1	1	108.341			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
Sum Weight:	4.928	18.243						OTM	215.822 kip-ft	3.972		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.183	1.131	A	1	0.65	0.010	1	1	47.649	0.341	0.011	C
120.000-89.75			B	1	0.65		1	1	47.649			
0			C	1	0.65		1	1	47.649			
L2	0.478	1.006	A	1	0.65	0.009	1	1	37.681	0.255	0.013	C
89.750-70.000			B	1	0.65		1	1	37.681			
			C	1	0.65		1	1	37.681			
L3	0.627	1.992	A	1	0.718	0.009	1	1	57.252	0.485	0.019	B
70.000-44.417			B	1	0.718		1	1	57.252			
			C	1	0.709		1	1	57.252			
L4	0.235	1.098	A	1	0.695	0.008	1	1	23.104	0.174	0.018	B
44.417-35.000			B	1	0.695		1	1	23.104			
			C	1	0.687		1	1	23.104			
L5	0.767	4.482	A	1	0.666	0.007	1	1	97.393	0.598	0.017	B
35.000-0.000			B	1	0.666		1	1	97.393			
			C	1	0.659		1	1	97.393			
Sum Weight:	2.289	9.709						OTM	100.670 kip-ft	1.851		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.183	1.131	A	1	0.65	0.010	1	1	47.649	0.401	0.013	B
120.000-89.75			B	1	0.766		1	1	47.649			
0			C	1	0.65		1	1	47.649			
L2	0.478	1.006	A	1	0.65	0.009	1	1	37.681	0.633	0.032	B
89.750-70.000			B	1	1.2		1	1	37.681			
			C	1	0.65		1	1	37.681			
L3	0.627	1.992	A	1	0.709	0.009	1	1	57.252	0.948	0.037	B
70.000-44.417			B	1	1.2		1	1	57.252			
			C	1	0.709		1	1	57.252			
L4	0.235	1.098	A	1	0.687	0.008	1	1	23.104	0.345	0.037	B
44.417-35.000			B	1	1.2		1	1	23.104			
			C	1	0.687		1	1	23.104			
L5	0.767	4.482	A	1	0.659	0.007	1	1	97.393	1.191	0.034	B
35.000-0.000			B	1	1.2		1	1	97.393			
			C	1	0.659		1	1	97.393			
Sum Weight:	2.289	9.709						OTM	180.603	3.518		

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
									kip-ft			

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.183	1.131	A	1	0.65	0.010	1	1	47.649	0.341	0.011	C
120.000-89.75			B	1	0.65		1	1	47.649			
0			C	1	0.65		1	1	47.649			
L2	0.478	1.006	A	1	0.65	0.009	1	1	37.681	0.255	0.013	C
89.750-70.000			B	1	0.65		1	1	37.681			
			C	1	0.65		1	1	37.681			
L3	0.627	1.992	A	1	0.709	0.009	1	1	57.252	0.485	0.019	C
70.000-44.417			B	1	0.718		1	1	57.252			
			C	1	0.718		1	1	57.252			
L4	0.235	1.098	A	1	0.687	0.008	1	1	23.104	0.174	0.018	C
44.417-35.000			B	1	0.695		1	1	23.104			
			C	1	0.695		1	1	23.104			
L5	0.767	4.482	A	1	0.659	0.007	1	1	97.393	0.598	0.017	C
35.000-0.000			B	1	0.666		1	1	97.393			
			C	1	0.666		1	1	97.393			
Sum Weight:	2.289	9.709						OTM	100.670 kip-ft	1.851		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.183	1.131	A	1	0.65	0.010	1	1	47.649	0.401	0.013	C
120.000-89.75			B	1	0.65		1	1	47.649			
0			C	1	0.766		1	1	47.649			
L2	0.478	1.006	A	1	0.65	0.009	1	1	37.681	0.633	0.032	C
89.750-70.000			B	1	0.65		1	1	37.681			
			C	1	1.2		1	1	37.681			
L3	0.627	1.992	A	1	0.709	0.009	1	1	57.252	0.948	0.037	C
70.000-44.417			B	1	0.709		1	1	57.252			
			C	1	1.2		1	1	57.252			
L4	0.235	1.098	A	1	0.687	0.008	1	1	23.104	0.345	0.037	C
44.417-35.000			B	1	0.687		1	1	23.104			
			C	1	1.2		1	1	23.104			
L5	0.767	4.482	A	1	0.659	0.007	1	1	97.393	1.191	0.034	C
35.000-0.000			B	1	0.659		1	1	97.393			
			C	1	1.2		1	1	97.393			
Sum Weight:	2.289	9.709						OTM	180.603 kip-ft	3.518		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	9.709					
Bracing Weight	0.000					
Total Member Self-Weight	9.709			5.408	0.983	
Total Weight	18.505			5.408	0.983	
Wind 0 deg - No Ice		-0.068	-11.933	-926.286	7.916	-0.126
Wind 30 deg - No Ice		5.912	-10.300	-797.996	-459.637	0.647
Wind 45 deg - No Ice		8.396	-8.390	-648.497	-654.021	0.980
Wind 60 deg - No Ice		10.337	-5.924	-455.070	-804.868	1.246
Wind 90 deg - No Ice		16.845	0.068	12.341	-1167.030	3.731
Wind 120 deg - No Ice		10.405	6.042	477.894	-811.802	1.373
Wind 135 deg - No Ice		8.492	8.486	669.117	-663.827	1.159
Wind 150 deg - No Ice		6.029	10.368	815.745	-471.646	0.866
Wind 180 deg - No Ice		0.068	11.933	937.101	-5.951	0.126
Wind 210 deg - No Ice		-5.912	10.300	808.811	461.602	-0.647
Wind 225 deg - No Ice		-8.396	8.390	659.312	655.986	-0.980
Wind 240 deg - No Ice		-10.337	5.924	465.885	806.833	-1.246
Wind 270 deg - No Ice		-16.845	-0.068	-1.526	1168.995	-3.731
Wind 300 deg - No Ice		-10.405	-6.042	-467.079	813.767	-1.373
Wind 315 deg - No Ice		-8.492	-8.486	-658.302	665.792	-1.159
Wind 330 deg - No Ice		-6.029	-10.368	-804.929	473.612	-0.866
Member Ice	8.534					
Total Weight Ice	44.466			12.270	3.615	
Wind 0 deg - Ice		-0.022	-6.092	-445.936	5.810	-0.137
Wind 30 deg - Ice		3.029	-5.265	-383.450	-223.892	0.363
Wind 45 deg - Ice		4.295	-4.292	-310.178	-319.264	0.584
Wind 60 deg - Ice		5.268	-3.027	-214.932	-392.633	0.765
Wind 90 deg - Ice		7.075	0.022	14.465	-503.810	1.816
Wind 120 deg - Ice		5.290	3.065	243.274	-394.827	0.902
Wind 135 deg - Ice		4.326	4.323	337.823	-322.367	0.777
Wind 150 deg - Ice		3.066	5.286	410.186	-227.693	0.600
Wind 180 deg - Ice		0.022	6.092	470.476	1.421	0.137
Wind 210 deg - Ice		-3.029	5.265	407.991	231.122	-0.363
Wind 225 deg - Ice		-4.295	4.292	334.719	326.495	-0.584
Wind 240 deg - Ice		-5.268	3.027	239.473	399.864	-0.765
Wind 270 deg - Ice		-7.075	-0.022	10.076	511.041	-1.816
Wind 300 deg - Ice		-5.290	-3.065	-218.733	402.058	-0.902
Wind 315 deg - Ice		-4.326	-4.323	-313.282	329.598	-0.777
Wind 330 deg - Ice		-3.066	-5.286	-385.645	234.923	-0.600
Total Weight	18.505			5.408	0.983	
Wind 0 deg - Service		-0.023	-4.085	-314.442	3.356	-0.043
Wind 30 deg - Service		2.024	-3.526	-270.523	-156.705	0.221
Wind 45 deg - Service		2.874	-2.872	-219.344	-223.250	0.335
Wind 60 deg - Service		3.539	-2.028	-153.127	-274.890	0.427
Wind 90 deg - Service		5.767	0.023	6.885	-398.872	1.277
Wind 120 deg - Service		3.562	2.068	166.262	-277.264	0.470
Wind 135 deg - Service		2.907	2.905	231.724	-226.607	0.397
Wind 150 deg - Service		2.064	3.549	281.920	-160.816	0.296
Wind 180 deg - Service		0.023	4.085	323.465	-1.391	0.043
Wind 210 deg - Service		-2.024	3.526	279.547	158.670	-0.221
Wind 225 deg - Service		-2.874	2.872	228.368	225.215	-0.335
Wind 240 deg - Service		-3.539	2.028	162.150	276.855	-0.427
Wind 270 deg - Service		-5.767	-0.023	2.138	400.837	-1.277

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 300 deg - Service		-3.562	-2.068	-157.238	279.229	-0.470
Wind 315 deg - Service		-2.907	-2.905	-222.701	228.572	-0.397
Wind 330 deg - Service		-2.064	-3.549	-272.897	162.781	-0.296

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 89.75	Pole	Max Tension	43	0.000	-0.001	0.001
			Max. Compression	34	-17.255	1.946	-5.420
			Max. Mx	26	-5.136	118.704	-4.299
			Max. My	18	-5.318	-0.026	-117.295
			Max. Vy	26	-8.766	73.736	-2.096
			Max. Vx	2	-8.531	1.308	66.742
			Max. Torque	29			2.139
L2	89.75 - 70	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-29.093	4.191	-12.668
			Max. Mx	26	-9.269	427.572	-2.217
			Max. My	18	-9.696	-2.569	-400.032
			Max. Vy	26	-15.886	427.572	-2.217
			Max. Vx	18	13.693	-2.569	-400.032
			Max. Torque	11			-2.641
L3	70 - 44.417	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-35.041	4.792	-14.247
			Max. Mx	26	-12.403	819.429	-0.050
			Max. My	18	-12.879	-5.075	-723.765
			Max. Vy	26	-20.069	819.429	-0.050
			Max. Vx	18	16.007	-5.075	-723.765
			Max. Torque	11			-3.556
L4	44.417 - 35	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-38.755	4.903	-15.216
			Max. Mx	26	-14.760	1094.533	1.228
			Max. My	18	-15.179	-6.544	-938.777
			Max. Vy	26	-22.191	1094.533	1.228
			Max. Vx	18	17.000	-6.544	-938.777
			Max. Torque	11			-4.229
L5	35 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-48.625	5.015	-17.067
			Max. Mx	26	-22.171	1956.067	4.690
			Max. My	18	-22.186	-10.429	-1571.946
			Max. Vy	26	-26.981	1956.067	4.690
			Max. Vx	18	19.116	-10.429	-1571.946
			Max. Torque	11			-5.799

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	47	48.625	7.075	0.022
	Max. H_x	27	16.654	26.952	0.109
	Max. H_z	2	22.205	0.109	19.093
	Max. M_x	2	1557.919	0.109	19.093
	Max. M_z	10	1953.520	-26.952	-0.109
	Max. Torsion	27	5.771	26.952	0.109
	Min. Vert	15	16.654	-13.587	-13.577
	Min. H_x	11	16.654	-26.952	-0.109
	Min. H_z	18	22.205	-0.109	-19.093
	Min. M_x	18	-1571.946	-0.109	-19.093
	Min. M_z	26	-1956.067	26.952	0.109
	Min. Torsion	11	-5.799	-26.952	-0.109

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	18.505	-0.000	0.000	5.850	1.071	-0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	22.205	-0.109	-19.093	-1557.919	12.995	-0.157
0.9 Dead+1.6 Wind 0 deg - No Ice	16.654	-0.109	-19.093	-1539.423	12.478	-0.167
1.2 Dead+1.6 Wind 30 deg - No Ice	22.205	9.459	-16.480	-1342.437	-772.429	1.009
0.9 Dead+1.6 Wind 30 deg - No Ice	16.654	9.459	-16.480	-1326.756	-762.699	1.015
1.2 Dead+1.6 Wind 45 deg - No Ice	22.205	13.433	-13.424	-1091.295	-1098.971	1.509
0.9 Dead+1.6 Wind 45 deg - No Ice	16.654	13.433	-13.424	-1078.892	-1084.981	1.523
1.2 Dead+1.6 Wind 60 deg - No Ice	22.205	16.539	-9.479	-766.336	-1352.317	1.904
0.9 Dead+1.6 Wind 60 deg - No Ice	16.654	16.539	-9.479	-758.178	-1335.033	1.925
1.2 Dead+1.6 Wind 90 deg - No Ice	22.205	26.952	0.109	18.708	-1953.520	5.763
0.9 Dead+1.6 Wind 90 deg - No Ice	16.654	26.952	0.109	16.658	-1929.957	5.799
1.2 Dead+1.6 Wind 120 deg - No Ice	22.205	16.647	9.667	800.659	-1363.882	2.030
0.9 Dead+1.6 Wind 120 deg - No Ice	16.654	16.647	9.667	788.428	-1346.448	2.062
1.2 Dead+1.6 Wind 135 deg - No Ice	22.205	13.587	13.577	1121.834	-1115.387	1.692
0.9 Dead+1.6 Wind 135 deg - No Ice	16.654	13.587	13.577	1105.422	-1101.178	1.722

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.6 Wind 150 deg - No Ice	22.205	9.647	16.589	1368.094	-792.613	1.241
0.9 Dead+1.6 Wind 150 deg - No Ice	16.654	9.647	16.589	1348.483	-782.605	1.267
1.2 Dead+1.6 Wind 180 deg - No Ice	22.205	0.109	19.093	1571.946	-10.429	0.131
0.9 Dead+1.6 Wind 180 deg - No Ice	16.654	0.109	19.093	1549.691	-10.605	0.142
1.2 Dead+1.6 Wind 210 deg - No Ice	22.205	-9.459	16.480	1356.490	774.953	-1.007
0.9 Dead+1.6 Wind 210 deg - No Ice	16.654	-9.459	16.480	1337.043	764.545	-1.012
1.2 Dead+1.6 Wind 225 deg - No Ice	22.205	-13.433	13.424	1105.373	1101.488	-1.491
0.9 Dead+1.6 Wind 225 deg - No Ice	16.654	-13.433	13.424	1089.196	1086.822	-1.505
1.2 Dead+1.6 Wind 240 deg - No Ice	22.205	-16.539	9.479	780.437	1354.840	-1.876
0.9 Dead+1.6 Wind 240 deg - No Ice	16.654	-16.539	9.479	768.497	1336.878	-1.897
1.2 Dead+1.6 Wind 270 deg - No Ice	22.205	-26.952	-0.109	-4.692	1956.067	-5.735
0.9 Dead+1.6 Wind 270 deg - No Ice	16.654	-26.952	-0.109	-6.402	1931.818	-5.771
1.2 Dead+1.6 Wind 300 deg - No Ice	22.205	-16.647	-9.667	-786.563	1366.487	-2.035
0.9 Dead+1.6 Wind 300 deg - No Ice	16.654	-16.647	-9.667	-778.114	1348.348	-2.066
1.2 Dead+1.6 Wind 315 deg - No Ice	22.205	-13.587	-13.577	-1107.762	1118.000	-1.712
0.9 Dead+1.6 Wind 315 deg - No Ice	16.654	-13.587	-13.577	-1095.124	1103.083	-1.741
1.2 Dead+1.6 Wind 330 deg - No Ice	22.205	-9.647	-16.589	-1354.046	795.220	-1.271
0.9 Dead+1.6 Wind 330 deg - No Ice	16.654	-9.647	-16.589	-1338.201	784.506	-1.295
1.2 Dead+1.0 Ice+1.0 Temp	48.625	-0.000	0.000	17.067	5.015	-0.001
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	48.625	-0.022	-6.092	-508.578	7.577	-0.117
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	48.625	3.029	-5.265	-436.873	-255.958	0.363
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	48.625	4.295	-4.292	-352.808	-365.383	0.574
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	48.625	5.268	-3.027	-243.536	-449.565	0.746
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	48.625	7.075	0.022	19.614	-574.874	1.778
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	48.625	5.290	3.065	282.097	-452.133	0.860
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	48.625	4.326	4.323	390.549	-369.012	0.735
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	48.625	3.066	5.286	473.549	-260.403	0.561
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	48.625	0.022	6.092	542.675	2.441	0.113
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	48.625	-3.029	5.265	470.983	265.974	-0.365
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	48.625	-4.295	4.292	386.919	375.400	-0.575
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	48.625	-5.268	3.027	277.649	459.584	-0.746

Load Combination	*Vertical*	*Shear$_x$*	*Shear$_z$*	*Overturning Moment, M$_x$*	*Overturning Moment, M$_z$*	*Torque*
	K	*K*	*K*	*kip-ft*	*kip-ft*	*kip-ft*
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	48.625	-7.075	-0.022	14.478	584.886	-1.778
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	48.625	-5.290	-3.065	-247.982	462.146	-0.862
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	48.625	-4.326	-4.323	-356.442	379.036	-0.739
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	48.625	-3.066	-5.286	-439.446	270.427	-0.565
Dead+Wind 0 deg - Service	18.505	-0.023	-4.085	-326.860	3.561	-0.037
Dead+Wind 30 deg - Service	18.505	2.024	-3.526	-281.041	-163.419	0.217
Dead+Wind 45 deg - Service	18.505	2.874	-2.872	-227.650	-232.841	0.326
Dead+Wind 60 deg - Service	18.505	3.539	-2.028	-158.567	-286.707	0.413
Dead+Wind 90 deg - Service	18.505	5.767	0.023	8.348	-414.990	1.254
Dead+Wind 120 deg - Service	18.505	3.562	2.068	174.599	-289.193	0.448
Dead+Wind 135 deg - Service	18.505	2.907	2.905	242.890	-236.358	0.377
Dead+Wind 150 deg - Service	18.505	2.064	3.549	295.250	-167.727	0.279
Dead+Wind 180 deg - Service	18.505	0.023	4.085	338.579	-1.416	0.035
Dead+Wind 210 deg - Service	18.505	-2.024	3.526	292.762	165.562	-0.217
Dead+Wind 225 deg - Service	18.505	-2.874	2.872	239.372	234.984	-0.326
Dead+Wind 240 deg - Service	18.505	-3.539	2.028	170.290	288.851	-0.412
Dead+Wind 270 deg - Service	18.505	-5.767	-0.023	3.371	417.135	-1.253
Dead+Wind 300 deg - Service	18.505	-3.562	-2.068	-162.877	291.340	-0.449
Dead+Wind 315 deg - Service	18.505	-2.907	-2.905	-231.168	238.504	-0.378
Dead+Wind 330 deg - Service	18.505	-2.064	-3.549	-283.529	169.873	-0.281

Solution Summary

	Sum of Applied Forces			*Sum of Reactions*			
Load Comb.	*PX*	*PY*	*PZ*	*PX*	*PY*	*PZ*	*% Error*
	K	*K*	*K*	*K*	*K*	*K*	
1	0.000	-18.505	0.000	0.000	18.505	-0.000	0.000%
2	-0.109	-22.205	-19.093	0.109	22.205	19.093	0.000%
3	-0.109	-16.654	-19.093	0.109	16.654	19.093	0.000%
4	9.459	-22.205	-16.480	-9.459	22.205	16.480	0.000%
5	9.459	-16.654	-16.480	-9.459	16.654	16.480	0.000%
6	13.433	-22.205	-13.424	-13.433	22.205	13.424	0.000%
7	13.433	-16.654	-13.424	-13.433	16.654	13.424	0.000%
8	16.539	-22.205	-9.479	-16.539	22.205	9.479	0.000%
9	16.539	-16.654	-9.479	-16.539	16.654	9.479	0.000%
10	26.952	-22.205	0.109	-26.952	22.205	-0.109	0.000%
11	26.952	-16.654	0.109	-26.952	16.654	-0.109	0.000%
12	16.647	-22.205	9.667	-16.647	22.205	-9.667	0.000%
13	16.647	-16.654	9.667	-16.647	16.654	-9.667	0.000%
14	13.587	-22.205	13.577	-13.587	22.205	-13.577	0.000%
15	13.587	-16.654	13.577	-13.587	16.654	-13.577	0.000%
16	9.647	-22.205	16.589	-9.647	22.205	-16.589	0.000%
17	9.647	-16.654	16.589	-9.647	16.654	-16.589	0.000%
18	0.109	-22.205	19.093	-0.109	22.205	-19.093	0.000%
19	0.109	-16.654	19.093	-0.109	16.654	-19.093	0.000%
20	-9.459	-22.205	16.480	9.459	22.205	-16.480	0.000%
21	-9.459	-16.654	16.480	9.459	16.654	-16.480	0.000%
22	-13.433	-22.205	13.424	13.433	22.205	-13.424	0.000%
23	-13.433	-16.654	13.424	13.433	16.654	-13.424	0.000%
24	-16.539	-22.205	9.479	16.539	22.205	-9.479	0.000%
25	-16.539	-16.654	9.479	16.539	16.654	-9.479	0.000%
26	-26.952	-22.205	-0.109	26.952	22.205	0.109	0.000%
27	-26.952	-16.654	-0.109	26.952	16.654	0.109	0.000%
28	-16.647	-22.205	-9.667	16.647	22.205	9.667	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
29	-16.647	-16.654	-9.667	16.647	16.654	9.667	0.000%
30	-13.587	-22.205	-13.577	13.587	22.205	13.577	0.000%
31	-13.587	-16.654	-13.577	13.587	16.654	13.577	0.000%
32	-9.647	-22.205	-16.589	9.647	22.205	16.589	0.000%
33	-9.647	-16.654	-16.589	9.647	16.654	16.589	0.000%
34	0.000	-48.625	0.000	0.000	48.625	-0.000	0.000%
35	-0.022	-48.625	-6.092	0.022	48.625	6.092	0.000%
36	3.029	-48.625	-5.265	-3.029	48.625	5.265	0.000%
37	4.295	-48.625	-4.292	-4.295	48.625	4.292	0.000%
38	5.268	-48.625	-3.027	-5.268	48.625	3.027	0.000%
39	7.075	-48.625	0.022	-7.075	48.625	-0.022	0.000%
40	5.290	-48.625	3.065	-5.290	48.625	-3.065	0.000%
41	4.326	-48.625	4.323	-4.326	48.625	-4.323	0.000%
42	3.066	-48.625	5.286	-3.066	48.625	-5.286	0.000%
43	0.022	-48.625	6.092	-0.022	48.625	-6.092	0.000%
44	-3.029	-48.625	5.265	3.029	48.625	-5.265	0.000%
45	-4.295	-48.625	4.292	4.295	48.625	-4.292	0.000%
46	-5.268	-48.625	3.027	5.268	48.625	-3.027	0.000%
47	-7.075	-48.625	-0.022	7.075	48.625	0.022	0.000%
48	-5.290	-48.625	-3.065	5.290	48.625	3.065	0.000%
49	-4.326	-48.625	-4.323	4.326	48.625	4.323	0.000%
50	-3.066	-48.625	-5.286	3.066	48.625	5.286	0.000%
51	-0.023	-18.505	-4.085	0.023	18.505	4.085	0.000%
52	2.024	-18.505	-3.526	-2.024	18.505	3.526	0.000%
53	2.874	-18.505	-2.872	-2.874	18.505	2.872	0.000%
54	3.539	-18.505	-2.028	-3.539	18.505	2.028	0.000%
55	5.767	-18.505	0.023	-5.767	18.505	-0.023	0.000%
56	3.562	-18.505	2.068	-3.562	18.505	-2.068	0.000%
57	2.907	-18.505	2.905	-2.907	18.505	-2.905	0.000%
58	2.064	-18.505	3.549	-2.064	18.505	-3.549	0.000%
59	0.023	-18.505	4.085	-0.023	18.505	-4.085	0.000%
60	-2.024	-18.505	3.526	2.024	18.505	-3.526	0.000%
61	-2.874	-18.505	2.872	2.874	18.505	-2.872	0.000%
62	-3.539	-18.505	2.028	3.539	18.505	-2.028	0.000%
63	-5.767	-18.505	-0.023	5.767	18.505	0.023	0.000%
64	-3.562	-18.505	-2.068	3.562	18.505	2.068	0.000%
65	-2.907	-18.505	-2.905	2.907	18.505	2.905	0.000%
66	-2.064	-18.505	-3.549	2.064	18.505	3.549	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00051750
3	Yes	5	0.00000001	0.00022511
4	Yes	6	0.00000001	0.00040702
5	Yes	6	0.00000001	0.00011858
6	Yes	6	0.00000001	0.00043383
7	Yes	6	0.00000001	0.00012136
8	Yes	6	0.00000001	0.00038906
9	Yes	6	0.00000001	0.00011223
10	Yes	6	0.00000001	0.00008566
11	Yes	5	0.00000001	0.00058692
12	Yes	6	0.00000001	0.00045200
13	Yes	6	0.00000001	0.00013078

14	Yes	6	0.00000001	0.00044923
15	Yes	6	0.00000001	0.00012312
16	Yes	6	0.00000001	0.00039937
17	Yes	6	0.00000001	0.00011243
18	Yes	5	0.00000001	0.00021901
19	Yes	5	0.00000001	0.00009693
20	Yes	6	0.00000001	0.00041070
21	Yes	6	0.00000001	0.00011777
22	Yes	6	0.00000001	0.00044047
23	Yes	6	0.00000001	0.00012152
24	Yes	6	0.00000001	0.00043040
25	Yes	6	0.00000001	0.00012464
26	Yes	6	0.00000001	0.00006600
27	Yes	5	0.00000001	0.00045482
28	Yes	6	0.00000001	0.00038983
29	Yes	6	0.00000001	0.00011044
30	Yes	6	0.00000001	0.00044471
31	Yes	6	0.00000001	0.00012297
32	Yes	6	0.00000001	0.00044069
33	Yes	6	0.00000001	0.00012828
34	Yes	5	0.00000001	0.00018498
35	Yes	6	0.00000001	0.00048209
36	Yes	6	0.00000001	0.00088907
37	Yes	6	0.00000001	0.00098276
38	Yes	6	0.00000001	0.00083954
39	Yes	6	0.00000001	0.00064538
40	Yes	7	0.00000001	0.00021022
41	Yes	7	0.00000001	0.00021909
42	Yes	7	0.00000001	0.00018559
43	Yes	6	0.00000001	0.00053998
44	Yes	7	0.00000001	0.00020070
45	Yes	7	0.00000001	0.00022689
46	Yes	7	0.00000001	0.00021252
47	Yes	6	0.00000001	0.00065938
48	Yes	6	0.00000001	0.00089407
49	Yes	7	0.00000001	0.00019398
50	Yes	7	0.00000001	0.00018349
51	Yes	4	0.00000001	0.00041274
52	Yes	5	0.00000001	0.00009333
53	Yes	5	0.00000001	0.00010621
54	Yes	5	0.00000001	0.00008077
55	Yes	5	0.00000001	0.00009232
56	Yes	5	0.00000001	0.00013911
57	Yes	5	0.00000001	0.00013444
58	Yes	5	0.00000001	0.00009882
59	Yes	4	0.00000001	0.00038828
60	Yes	5	0.00000001	0.00010910
61	Yes	5	0.00000001	0.00012810
62	Yes	5	0.00000001	0.00012543
63	Yes	5	0.00000001	0.00008878
64	Yes	5	0.00000001	0.00008452
65	Yes	5	0.00000001	0.00011950
66	Yes	5	0.00000001	0.00011978

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 89.75	27.146	63	1.823	0.014

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L2	92.42 - 70	16.761	63	1.717	0.011
L3	70 - 44.417	9.505	63	1.309	0.007
L4	48 - 35	4.420	63	0.885	0.004
L5	35 - 0	2.314	63	0.630	0.003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
117.000	DB809K-XC	63	25.988	1.824	0.014	28239
110.000	2-ft dish	63	23.298	1.821	0.013	14119
107.000	SitePro 12' Handrail Kit HRK12	63	22.154	1.815	0.013	10861
105.000	AIR32	63	21.397	1.809	0.012	9412
92.000	DB-T1-6Z-8AB-0Z	63	16.611	1.711	0.011	4995
90.000	EEI 6-ft T-Arm	63	15.902	1.685	0.010	4610
54.000	PD1142-1	63	5.614	1.000	0.005	3176

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 89.75	126.709	26	8.498	0.065
L2	92.42 - 70	78.419	26	8.027	0.049
L3	70 - 44.417	44.534	26	6.135	0.031
L4	48 - 35	20.723	26	4.149	0.019
L5	35 - 0	10.853	26	2.955	0.013

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
117.000	DB809K-XC	26	121.329	8.504	0.064	7260
110.000	2-ft dish	26	108.829	8.495	0.061	3628
107.000	SitePro 12' Handrail Kit HRK12	26	103.516	8.472	0.059	2790
105.000	AIR32	26	99.995	8.446	0.058	2417
92.000	DB-T1-6Z-8AB-0Z	26	77.720	8.003	0.050	1264
90.000	EEI 6-ft T-Arm	26	74.416	7.880	0.048	1147
54.000	PD1142-1	26	26.319	4.689	0.022	687

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
L1	120 - 118.548	TP21.287x16x0.188	30.250	0.000	0.0	9.561	-0.163	710.364	0.000
	118.548 - 117.097					9.712	-0.109	721.582	0.000
	117.097 - 115.645					9.863	-0.943	732.799	0.001
	115.645 - 114.194					10.014	-0.236	744.016	0.000
	114.194 - 112.742					10.165	-0.293	755.234	0.000
	112.742 - 111.291					10.316	-0.351	766.451	0.000
	111.291 - 109.839					10.467	-0.522	777.669	0.001
	109.839 - 108.387					10.618	-0.581	788.886	0.001
	108.387 - 106.936					10.769	-0.928	800.103	0.001
	106.936 - 105.484					10.920	-0.990	811.321	0.001
	105.484 - 104.033					11.071	-4.716	822.538	0.006
	104.033 - 102.581					11.222	-4.785	832.693	0.006
	102.581 - 101.129					11.373	-4.855	841.029	0.006
	101.129 - 99.6779					11.524	-4.928	849.289	0.006
	99.6779 - 98.2263					11.675	-5.003	857.473	0.006
	98.2263 - 96.7747					11.826	-5.079	865.581	0.006
	96.7747 - 95.3232					11.977	-4.981	873.612	0.006
	95.3232 - 93.8716					12.128	-5.058	881.568	0.006
	93.8716 - 92.42					12.279	-5.136	889.447	0.006
	92.42 - 89.75					12.557	-4.734	903.742	0.005
L2	92.42 - 89.75	TP24.252x20.445x0.188	22.420	0.000	0.0	12.326	-2.813	891.865	0.003
	89.75 - 88.7105					12.431	-7.624	897.285	0.008
	88.7105 - 87.6711					12.536	-7.702	902.668	0.009
	87.6711 - 86.6316					12.641	-7.782	908.015	0.009
	86.6316 - 85.5921					12.746	-7.863	913.324	0.009
	85.5921 - 84.5526					12.851	-7.946	918.597	0.009
	84.5526 - 83.5132					12.956	-8.030	923.833	0.009
	83.5132 - 82.4737					13.061	-8.116	929.032	0.009
	82.4737 - 81.4342					13.166	-8.203	934.194	0.009
	81.4342 -					13.271	-8.292	939.320	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	80.3947								
	80.3947 - 79.3553					13.376	-8.383	944.408	0.009
	79.3553 - 78.3158					13.481	-8.475	949.460	0.009
	78.3158 - 77.2763					13.586	-8.569	954.475	0.009
	77.2763 - 76.2368					13.691	-8.664	959.453	0.009
	76.2368 - 75.1974					13.796	-8.761	964.394	0.009
	75.1974 - 74.1579					13.901	-8.859	969.299	0.009
	74.1579 - 73.1184					14.006	-8.959	974.166	0.009
	73.1184 - 72.0789					14.111	-9.061	978.997	0.009
	72.0789 - 71.0395					14.216	-9.164	983.791	0.009
	71.0395 - 70					14.321	-9.269	988.548	0.009
L3	70 - 68.8421	TP28.725x24.252x0.275	25.583	0.000	0.0	21.105	-9.412	1568.000	0.006
	68.8421 - 67.6842					21.282	-9.552	1581.130	0.006
	67.6842 - 66.5263					21.458	-9.694	1594.260	0.006
	66.5263 - 65.3684					21.635	-9.838	1607.380	0.006
	65.3684 - 64.2105					21.812	-9.984	1620.510	0.006
	64.2105 - 63.0526					21.989	-10.132	1633.640	0.006
	63.0526 - 61.8947					22.165	-10.281	1646.770	0.006
	61.8947 - 60.7368					22.342	-10.432	1659.900	0.006
	60.7368 - 59.5789					22.519	-10.585	1673.030	0.006
	59.5789 - 58.4211					22.695	-10.739	1686.160	0.006
	58.4211 - 57.2632					22.872	-10.895	1699.280	0.006
	57.2632 - 56.1053					23.049	-11.053	1712.410	0.006
	56.1053 - 54.9474					23.226	-11.213	1725.540	0.006
	54.9474 - 53.7895					23.402	-11.563	1738.670	0.007
	53.7895 - 52.6316					23.579	-11.728	1751.800	0.007
	52.6316 - 51.4737					23.756	-11.894	1764.930	0.007
	51.4737 - 50.3158					23.932	-12.062	1778.050	0.007
	50.3158 - 49.1579					24.109	-12.232	1789.480	0.007
	49.1579 - 48					24.286	-12.403	1799.270	0.007
	48 - 44.417					24.833	-6.690	1829.240	0.004
L4	48 - 44.417	TP29.88x27.549x0.275	13.000	0.000	0.0	24.367	-6.533	1803.730	0.004
	44.417 - 43.3707					24.530	-13.400	1812.730	0.007

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	43.3707 - 42.3243					24.694	-13.565	1821.700	0.007
	42.3243 - 41.278					24.858	-13.731	1830.620	0.008
	41.278 - 40.2317					25.022	-13.899	1839.500	0.008
	40.2317 - 39.1853					25.186	-14.069	1848.340	0.008
	39.1853 - 38.139					25.349	-14.239	1857.140	0.008
	38.139 - 37.0927					25.513	-14.412	1865.900	0.008
	37.0927 - 36.0463					25.677	-14.585	1874.610	0.008
	36.0463 - 35					25.841	-14.761	1883.280	0.008
L5	35 - 33.25	TP36x29.88x0.364	35.000	0.000	0.0	34.454	-15.087	2559.790	0.006
	33.25 - 31.5					34.808	-15.424	2586.060	0.006
	31.5 - 29.75					35.161	-15.765	2612.320	0.006
	29.75 - 28					35.515	-16.111	2638.590	0.006
	28 - 26.25					35.869	-16.460	2664.850	0.006
	26.25 - 24.5					36.222	-16.813	2691.120	0.006
	24.5 - 22.75					36.576	-17.170	2717.390	0.006
	22.75 - 21					36.929	-17.532	2743.650	0.006
	21 - 19.25					37.283	-17.897	2769.920	0.006
	19.25 - 17.5					37.636	-18.266	2796.180	0.007
	17.5 - 15.75					37.990	-18.639	2822.450	0.007
	15.75 - 14					38.343	-19.016	2848.710	0.007
	14 - 12.25					38.697	-19.397	2874.980	0.007
	12.25 - 10.5					39.050	-19.782	2901.250	0.007
	10.5 - 8.75					39.404	-20.171	2927.510	0.007
	8.75 - 7					39.757	-20.563	2953.780	0.007
	7 - 5.25					40.111	-20.959	2980.040	0.007
	5.25 - 3.5					40.465	-21.359	3006.310	0.007
	3.5 - 1.75					40.818	-21.763	3032.570	0.007
	1.75 - 0					41.172	-22.171	3058.840	0.007

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	120 - 118.548	TP21.287x16x0.188	0.043	233.802	0.000	0.000	233.802	0.000
	118.548 - 117.097		0.258	241.287	0.001	0.000	241.287	0.000
	117.097 - 115.645		1.326	248.891	0.005	0.000	248.891	0.000
	115.645 - 114.194		2.256	256.613	0.009	0.000	256.613	0.000
	114.194 - 112.742		3.418	264.452	0.013	0.000	264.452	0.000
	112.742 - 111.291		4.717	272.409	0.017	0.000	272.409	0.000
	111.291 - 109.839		6.336	280.484	0.023	0.000	280.484	0.000
	109.839 - 108.387		9.608	288.678	0.033	0.000	288.678	0.000

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
	108.387 - 106.936		13.060	296.989	0.044	0.000	296.989	0.000
	106.936 - 105.484		16.956	305.418	0.056	0.000	305.418	0.000
	105.484 - 104.033		29.156	313.965	0.093	0.000	313.965	0.000
	104.033 - 102.581		39.733	322.219	0.123	0.000	322.219	0.000
	102.581 - 101.129		50.438	329.867	0.153	0.000	329.867	0.000
	101.129 - 99.6779		61.268	337.572	0.181	0.000	337.572	0.000
	99.6779 - 98.2263		72.223	345.332	0.209	0.000	345.332	0.000
	98.2263 - 96.7747		83.303	353.148	0.236	0.000	353.148	0.000
	96.7747 - 95.3232		94.743	361.018	0.262	0.000	361.018	0.000
	95.3232 - 93.8716		106.686	368.941	0.289	0.000	368.941	0.000
	93.8716 - 92.42		118.782	376.915	0.315	0.000	376.915	0.000
	92.42 - 89.75		73.766	391.712	0.188	0.000	391.712	0.000
L2	92.42 - 89.75	TP24.252x20.445x0.188	68.976	379.387	0.182	0.000	379.387	0.000
	89.75 - 88.7105		156.330	384.974	0.406	0.000	384.974	0.000
	88.7105 - 87.6711		170.072	390.586	0.435	0.000	390.586	0.000
	87.6711 - 86.6316		183.967	396.220	0.464	0.000	396.220	0.000
	86.6316 - 85.5921		198.017	401.878	0.493	0.000	401.878	0.000
	85.5921 - 84.5526		212.220	407.558	0.521	0.000	407.558	0.000
	84.5526 - 83.5132		226.578	413.259	0.548	0.000	413.259	0.000
	83.5132 - 82.4737		241.093	418.983	0.575	0.000	418.983	0.000
	82.4737 - 81.4342		255.762	424.728	0.602	0.000	424.728	0.000
	81.4342 - 80.3947		270.589	430.493	0.629	0.000	430.493	0.000
	80.3947 - 79.3553		285.572	436.280	0.655	0.000	436.280	0.000
	79.3553 - 78.3158		300.713	442.086	0.680	0.000	442.086	0.000
	78.3158 - 77.2763		316.012	447.913	0.706	0.000	447.913	0.000
	77.2763 - 76.2368		331.469	453.757	0.730	0.000	453.757	0.000
	76.2368 - 75.1974		347.087	459.622	0.755	0.000	459.622	0.000
	75.1974 - 74.1579		362.863	465.504	0.780	0.000	465.504	0.000
	74.1579 - 73.1184		378.800	471.405	0.804	0.000	471.405	0.000
	73.1184 - 72.0789		394.897	477.323	0.827	0.000	477.323	0.000
	72.0789 - 71.0395		411.157	483.259	0.851	0.000	483.259	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	71.0395 - 70		427.578	489.211	0.874	0.000	489.211	0.000
L3	70 - 68.8421	TP28.725x24.252x0.275	446.066	776.914	0.574	0.000	776.914	0.000
	68.8421 - 67.6842		464.766	790.053	0.588	0.000	790.053	0.000
	67.6842 - 66.5263		483.678	803.301	0.602	0.000	803.301	0.000
	66.5263 - 65.3684		502.805	816.659	0.616	0.000	816.659	0.000
	65.3684 - 64.2105		522.146	830.128	0.629	0.000	830.128	0.000
	64.2105 - 63.0526		541.702	843.708	0.642	0.000	843.708	0.000
	63.0526 - 61.8947		561.477	857.392	0.655	0.000	857.392	0.000
	61.8947 - 60.7368		581.469	871.192	0.667	0.000	871.192	0.000
	60.7368 - 59.5789		601.680	885.100	0.680	0.000	885.100	0.000
	59.5789 - 58.4211		622.112	899.125	0.692	0.000	899.125	0.000
	58.4211 - 57.2632		642.764	913.250	0.704	0.000	913.250	0.000
	57.2632 - 56.1053		663.638	927.492	0.716	0.000	927.492	0.000
	56.1053 - 54.9474		684.737	941.842	0.727	0.000	941.842	0.000
	54.9474 - 53.7895		706.164	956.300	0.738	0.000	956.300	0.000
	53.7895 - 52.6316		728.364	970.875	0.750	0.000	970.875	0.000
	52.6316 - 51.4737		750.789	985.550	0.762	0.000	985.550	0.000
	51.4737 - 50.3158		773.441	1000.342	0.773	0.000	1000.342	0.000
	50.3158 - 49.1579		796.321	1014.283	0.785	0.000	1014.283	0.000
	49.1579 - 48		819.429	1027.375	0.798	0.000	1027.375	0.000
	48 - 44.417		459.358	1068.242	0.430	0.000	1068.242	0.000
L4	48 - 44.417	TP29.88x27.549x0.275	433.151	1033.383	0.419	0.000	1033.383	0.000
	44.417 - 43.3707		914.292	1045.592	0.874	0.000	1045.592	0.000
	43.3707 - 42.3243		936.233	1057.850	0.885	0.000	1057.850	0.000
	42.3243 - 41.278		958.350	1070.150	0.896	0.000	1070.150	0.000
	41.278 - 40.2317		980.625	1082.492	0.906	0.000	1082.492	0.000
	40.2317 - 39.1853		1003.067	1094.883	0.916	0.000	1094.883	0.000
	39.1853 - 38.139		1025.683	1107.317	0.926	0.000	1107.317	0.000
	38.139 - 37.0927		1048.467	1119.792	0.936	0.000	1119.792	0.000
	37.0927 - 36.0463		1071.417	1132.308	0.946	0.000	1132.308	0.000
	36.0463 - 35		1094.533	1144.875	0.956	0.000	1144.875	0.000
L5	35 - 33.25	TP36x29.88x0.364	1133.567	1563.025	0.725	0.000	1563.025	0.000
	33.25 - 31.5		1173.033	1595.458	0.735	0.000	1595.458	0.000
	31.5 - 29.75		1212.950	1628.225	0.745	0.000	1628.225	0.000
	29.75 - 28		1253.292	1661.333	0.754	0.000	1661.333	0.000

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
	28 - 26.25		1294.075	1694.767	0.764	0.000	1694.767	0.000
	26.25 - 24.5		1335.283	1728.533	0.772	0.000	1728.533	0.000
	24.5 - 22.75		1376.925	1762.633	0.781	0.000	1762.633	0.000
	22.75 - 21		1419.000	1797.067	0.790	0.000	1797.067	0.000
	21 - 19.25		1461.483	1831.842	0.798	0.000	1831.842	0.000
	19.25 - 17.5		1504.400	1866.942	0.806	0.000	1866.942	0.000
	17.5 - 15.75		1547.733	1902.375	0.814	0.000	1902.375	0.000
	15.75 - 14		1591.475	1938.142	0.821	0.000	1938.142	0.000
	14 - 12.25		1635.633	1974.242	0.828	0.000	1974.242	0.000
	12.25 - 10.5		1680.200	2010.675	0.836	0.000	2010.675	0.000
	10.5 - 8.75		1725.175	2047.442	0.843	0.000	2047.442	0.000
	8.75 - 7		1770.558	2084.542	0.849	0.000	2084.542	0.000
	7 - 5.25		1816.342	2121.975	0.856	0.000	2121.975	0.000
	5.25 - 3.5		1862.525	2159.742	0.862	0.000	2159.742	0.000
	3.5 - 1.75		1909.100	2197.842	0.869	0.000	2197.842	0.000
	1.75 - 0		1956.075	2236.275	0.875	0.000	2236.275	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V_u	ϕV_n	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u	ϕT_n	Ratio $\frac{T_u}{\phi T_n}$
	ft		K	K		kip-ft	kip-ft	
L1	120 - 118.548	TP21.287x16x0.188	0.035	355.182	0.000	0.000	468.998	0.000
	118.548 - 117.097		0.179	360.791	0.000	0.000	484.000	0.000
	117.097 - 115.645		0.275	366.399	0.001	0.001	499.238	0.000
	115.645 - 114.194		0.754	372.008	0.002	0.358	514.713	0.001
	114.194 - 112.742		0.847	377.617	0.002	0.358	530.425	0.001
	112.742 - 111.291		0.942	383.226	0.002	0.358	546.372	0.001
	111.291 - 109.839		2.206	388.834	0.006	0.358	562.556	0.001
	109.839 - 108.387		2.302	394.443	0.006	0.239	578.976	0.000
	108.387 - 106.936		2.639	400.052	0.007	0.808	595.632	0.001
	106.936 - 105.484		2.738	405.660	0.007	0.808	612.524	0.001
	105.484 - 104.033		7.251	411.269	0.018	1.178	629.653	0.002
	104.033 - 102.581		7.336	416.346	0.018	1.178	646.193	0.002
	102.581 - 101.129		7.421	420.514	0.018	1.178	661.517	0.002
	101.129 - 99.6779		7.506	424.644	0.018	1.178	676.955	0.002
	99.6779 - 98.2263		7.591	428.736	0.018	1.178	692.506	0.002
	98.2263 - 96.7747		7.677	432.790	0.018	1.178	708.167	0.002
	96.7747 - 95.3232		8.193	436.806	0.019	1.711	723.935	0.002
	95.3232 -		8.295	440.784	0.019	1.710	739.808	0.002

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	93.8716							
	93.8716 - 92.42		8.398	444.724	0.019	1.710	755.785	0.002
	92.42 - 89.75		8.767	451.871	0.019	0.942	785.433	0.001
L2	92.42 - 89.75	TP24.252x20.445x0.188	4.246	445.932	0.010	0.878	760.738	0.001
	89.75 - 88.7105		13.158	448.642	0.029	1.858	771.933	0.002
	88.7105 - 87.6711		13.304	451.334	0.029	1.896	783.176	0.002
	87.6711 - 86.6316		13.452	454.007	0.030	1.934	794.465	0.002
	86.6316 - 85.5921		13.600	456.662	0.030	1.972	805.800	0.002
	85.5921 - 84.5526		13.748	459.299	0.030	2.010	817.180	0.002
	84.5526 - 83.5132		13.898	461.917	0.030	2.049	828.604	0.002
	83.5132 - 82.4737		14.047	464.516	0.030	2.088	840.075	0.002
	82.4737 - 81.4342		14.197	467.097	0.030	2.127	851.583	0.002
	81.4342 - 80.3947		14.348	469.660	0.031	2.167	863.133	0.003
	80.3947 - 79.3553		14.499	472.204	0.031	2.207	874.725	0.003
	79.3553 - 78.3158		14.651	474.730	0.031	2.247	886.358	0.003
	78.3158 - 77.2763		14.804	477.238	0.031	2.288	898.033	0.003
	77.2763 - 76.2368		14.957	479.727	0.031	2.328	909.742	0.003
	76.2368 - 75.1974		15.110	482.197	0.031	2.369	921.492	0.003
	75.1974 - 74.1579		15.265	484.649	0.031	2.411	933.275	0.003
	74.1579 - 73.1184		15.419	487.083	0.032	2.452	945.100	0.003
	73.1184 - 72.0789		15.574	489.499	0.032	2.494	956.958	0.003
	72.0789 - 71.0395		15.730	491.896	0.032	2.537	968.850	0.003
	71.0395 - 70		15.887	494.274	0.032	2.579	980.775	0.003
L3	70 - 68.8421	TP28.725x24.252x0.275	16.067	783.999	0.020	2.632	1558.392	0.002
	68.8421 - 67.6842		16.250	790.563	0.021	2.686	1584.725	0.002
	67.6842 - 66.5263		16.435	797.128	0.021	2.741	1611.275	0.002
	66.5263 - 65.3684		16.620	803.692	0.021	2.795	1638.050	0.002
	65.3684 - 64.2105		16.806	810.256	0.021	2.850	1665.042	0.002
	64.2105 - 63.0526		16.993	816.821	0.021	2.906	1692.250	0.002
	63.0526 - 61.8947		17.181	823.385	0.021	2.962	1719.683	0.002
	61.8947 - 60.7368		17.370	829.949	0.021	3.019	1747.342	0.002
	60.7368 - 59.5789		17.560	836.513	0.021	3.076	1775.217	0.002
	59.5789 -		17.751	843.078	0.021	3.133	1803.317	0.002

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	58.4211							
	58.4211 - 57.2632		17.943	849.642	0.021	3.191	1831.633	0.002
	57.2632 - 56.1053		18.135	856.206	0.021	3.249	1860.167	0.002
	56.1053 - 54.9474		18.329	862.770	0.021	3.308	1888.925	0.002
	54.9474 - 53.7895		19.086	869.335	0.022	3.307	1917.900	0.002
	53.7895 - 52.6316		19.281	875.899	0.022	3.250	1947.100	0.002
	52.6316 - 51.4737		19.477	882.463	0.022	3.310	1976.525	0.002
	51.4737 - 50.3158		19.673	889.027	0.022	3.370	2006.158	0.002
	50.3158 - 49.1579		19.871	894.742	0.022	3.431	2034.092	0.002
	49.1579 - 48		20.069	899.635	0.022	3.493	2060.325	0.002
	48 - 44.417		10.845	914.621	0.012	1.946	2142.208	0.001
L4	48 - 44.417	TP29.88x27.549x0.275	9.913	901.864	0.011	1.742	2072.367	0.001
	44.417 - 43.3707		20.908	906.367	0.023	3.739	2096.825	0.002
	43.3707 - 42.3243		21.067	910.849	0.023	3.791	2121.383	0.002
	42.3243 - 41.278		21.226	915.311	0.023	3.843	2146.033	0.002
	41.278 - 40.2317		21.385	919.751	0.023	3.896	2170.767	0.002
	40.2317 - 39.1853		21.545	924.171	0.023	3.949	2195.592	0.002
	39.1853 - 38.139		21.706	928.570	0.023	4.003	2220.500	0.002
	38.139 - 37.0927		21.867	932.948	0.023	4.056	2245.500	0.002
	37.0927 - 36.0463		22.029	937.306	0.024	4.111	2270.592	0.002
	36.0463 - 35		22.191	941.642	0.024	4.165	2295.758	0.002
L5	35 - 33.25	TP36x29.88x0.364	22.449	1279.900	0.018	4.243	3135.608	0.001
	33.25 - 31.5		22.701	1293.030	0.018	4.320	3200.625	0.001
	31.5 - 29.75		22.951	1306.160	0.018	4.398	3266.300	0.001
	29.75 - 28		23.201	1319.290	0.018	4.475	3332.650	0.001
	28 - 26.25		23.448	1332.430	0.018	4.553	3399.658	0.001
	26.25 - 24.5		23.695	1345.560	0.018	4.631	3467.342	0.001
	24.5 - 22.75		23.939	1358.690	0.018	4.709	3535.683	0.001
	22.75 - 21		24.183	1371.830	0.018	4.787	3604.700	0.001
	21 - 19.25		24.424	1384.960	0.018	4.866	3674.383	0.001
	19.25 - 17.5		24.665	1398.090	0.018	4.944	3744.733	0.001
	17.5 - 15.75		24.903	1411.220	0.018	5.022	3815.750	0.001
	15.75 - 14		25.140	1424.360	0.018	5.101	3887.425	0.001
	14 - 12.25		25.376	1437.490	0.018	5.180	3959.775	0.001
	12.25 - 10.5		25.610	1450.620	0.018	5.259	4032.792	0.001
	10.5 - 8.75		25.843	1463.760	0.018	5.338	4106.475	0.001
	8.75 - 7		26.074	1476.890	0.018	5.417	4180.833	0.001
	7 - 5.25		26.303	1490.020	0.018	5.496	4255.850	0.001
	5.25 - 3.5		26.531	1503.150	0.018	5.575	4331.533	0.001
	3.5 - 1.75		26.756	1516.290	0.018	5.655	4407.883	0.001
	1.75 - 0		26.981	1529.420	0.018	5.735	4484.900	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 118.548	0.000	0.000	0.000	0.000	0.000	0.000 ✔	1.000	4.8.2 ✔
	118.548 - 117.097	0.000	0.001	0.000	0.000	0.000	0.001 ✔	1.000	4.8.2 ✔
	117.097 - 115.645	0.001	0.005	0.000	0.001	0.000	0.007 ✔	1.000	4.8.2 ✔
	115.645 - 114.194	0.000	0.009	0.000	0.002	0.001	0.009 ✔	1.000	4.8.2 ✔
	114.194 - 112.742	0.000	0.013	0.000	0.002	0.001	0.013 ✔	1.000	4.8.2 ✔
	112.742 - 111.291	0.000	0.017	0.000	0.002	0.001	0.018 ✔	1.000	4.8.2 ✔
	111.291 - 109.839	0.001	0.023	0.000	0.006	0.001	0.023 ✔	1.000	4.8.2 ✔
	109.839 - 108.387	0.001	0.033	0.000	0.006	0.000	0.034 ✔	1.000	4.8.2 ✔
	108.387 - 106.936	0.001	0.044	0.000	0.007	0.001	0.045 ✔	1.000	4.8.2 ✔
	106.936 - 105.484	0.001	0.056	0.000	0.007	0.001	0.057 ✔	1.000	4.8.2 ✔
	105.484 - 104.033	0.006	0.093	0.000	0.018	0.002	0.099 ✔	1.000	4.8.2 ✔
	104.033 - 102.581	0.006	0.123	0.000	0.018	0.002	0.129 ✔	1.000	4.8.2 ✔
	102.581 - 101.129	0.006	0.153	0.000	0.018	0.002	0.159 ✔	1.000	4.8.2 ✔
	101.129 - 99.6779	0.006	0.181	0.000	0.018	0.002	0.188 ✔	1.000	4.8.2 ✔
	99.6779 - 98.2263	0.006	0.209	0.000	0.018	0.002	0.215 ✔	1.000	4.8.2 ✔
	98.2263 - 96.7747	0.006	0.236	0.000	0.018	0.002	0.242 ✔	1.000	4.8.2 ✔
	96.7747 - 95.3232	0.006	0.262	0.000	0.019	0.002	0.269 ✔	1.000	4.8.2 ✔
	95.3232 - 93.8716	0.006	0.289	0.000	0.019	0.002	0.295 ✔	1.000	4.8.2 ✔
	93.8716 - 92.42	0.006	0.315	0.000	0.019	0.002	0.321 ✔	1.000	4.8.2 ✔
	92.42 - 89.75	0.005	0.188	0.000	0.019	0.001	0.194 ✔	1.000	4.8.2 ✔
L2	92.42 - 89.75	0.003	0.182	0.000	0.010	0.001	0.185 ✔	1.000	4.8.2 ✔
	89.75 - 88.7105	0.008	0.406	0.000	0.029	0.002	0.416 ✔	1.000	4.8.2 ✔
	88.7105 - 87.6711	0.009	0.435	0.000	0.029	0.002	0.445 ✔	1.000	4.8.2 ✔
	87.6711 - 86.6316	0.009	0.464	0.000	0.030	0.002	0.474	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	86.6316 - 85.5921	0.009	0.493	0.000	0.030	0.002	0.502	1.000	4.8.2
	85.5921 - 84.5526	0.009	0.521	0.000	0.030	0.002	0.530	1.000	4.8.2
	84.5526 - 83.5132	0.009	0.548	0.000	0.030	0.002	0.558	1.000	4.8.2
	83.5132 - 82.4737	0.009	0.575	0.000	0.030	0.002	0.585	1.000	4.8.2
	82.4737 - 81.4342	0.009	0.602	0.000	0.030	0.002	0.612	1.000	4.8.2
	81.4342 - 80.3947	0.009	0.629	0.000	0.031	0.003	0.638	1.000	4.8.2
	80.3947 - 79.3553	0.009	0.655	0.000	0.031	0.003	0.665	1.000	4.8.2
	79.3553 - 78.3158	0.009	0.680	0.000	0.031	0.003	0.690	1.000	4.8.2
	78.3158 - 77.2763	0.009	0.706	0.000	0.031	0.003	0.716	1.000	4.8.2
	77.2763 - 76.2368	0.009	0.730	0.000	0.031	0.003	0.741	1.000	4.8.2
	76.2368 - 75.1974	0.009	0.755	0.000	0.031	0.003	0.765	1.000	4.8.2
	75.1974 - 74.1579	0.009	0.780	0.000	0.031	0.003	0.790	1.000	4.8.2
	74.1579 - 73.1184	0.009	0.804	0.000	0.032	0.003	0.814	1.000	4.8.2
	73.1184 - 72.0789	0.009	0.827	0.000	0.032	0.003	0.838	1.000	4.8.2
	72.0789 - 71.0395	0.009	0.851	0.000	0.032	0.003	0.861	1.000	4.8.2
	71.0395 - 70	0.009	0.874	0.000	0.032	0.003	0.885	1.000	4.8.2
L3	70 - 68.8421	0.006	0.574	0.000	0.020	0.002	0.581	1.000	4.8.2
	68.8421 - 67.6842	0.006	0.588	0.000	0.021	0.002	0.595	1.000	4.8.2
	67.6842 - 66.5263	0.006	0.602	0.000	0.021	0.002	0.609	1.000	4.8.2
	66.5263 - 65.3684	0.006	0.616	0.000	0.021	0.002	0.622	1.000	4.8.2
	65.3684 - 64.2105	0.006	0.629	0.000	0.021	0.002	0.636	1.000	4.8.2
	64.2105 - 63.0526	0.006	0.642	0.000	0.021	0.002	0.649	1.000	4.8.2
	63.0526 - 61.8947	0.006	0.655	0.000	0.021	0.002	0.662	1.000	4.8.2
	61.8947 - 60.7368	0.006	0.667	0.000	0.021	0.002	0.674	1.000	4.8.2
	60.7368 - 59.5789	0.006	0.680	0.000	0.021	0.002	0.687	1.000	4.8.2
	59.5789 -	0.006	0.692	0.000	0.021	0.002	0.699	1.000	4.8.2

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	58.4211						✔		
	58.4211 - 57.2632	0.006	0.704	0.000	0.021	0.002	0.711 ✔	1.000	4.8.2 ✔
	57.2632 - 56.1053	0.006	0.716	0.000	0.021	0.002	0.722 ✔	1.000	4.8.2 ✔
	56.1053 - 54.9474	0.006	0.727	0.000	0.021	0.002	0.734 ✔	1.000	4.8.2 ✔
	54.9474 - 53.7895	0.007	0.738	0.000	0.022	0.002	0.746 ✔	1.000	4.8.2 ✔
	53.7895 - 52.6316	0.007	0.750	0.000	0.022	0.002	0.757 ✔	1.000	4.8.2 ✔
	52.6316 - 51.4737	0.007	0.762	0.000	0.022	0.002	0.769 ✔	1.000	4.8.2 ✔
	51.4737 - 50.3158	0.007	0.773	0.000	0.022	0.002	0.781 ✔	1.000	4.8.2 ✔
	50.3158 - 49.1579	0.007	0.785	0.000	0.022	0.002	0.793 ✔	1.000	4.8.2 ✔
	49.1579 - 48	0.007	0.798	0.000	0.022	0.002	0.805 ✔	1.000	4.8.2 ✔
	48 - 44.417	0.004	0.430	0.000	0.012	0.001	0.434 ✔	1.000	4.8.2 ✔
L4	48 - 44.417	0.004	0.419	0.000	0.011	0.001	0.423 ✔	1.000	4.8.2 ✔
	44.417 - 43.3707	0.007	0.874	0.000	0.023	0.002	0.882 ✔	1.000	4.8.2 ✔
	43.3707 - 42.3243	0.007	0.885	0.000	0.023	0.002	0.893 ✔	1.000	4.8.2 ✔
	42.3243 - 41.278	0.008	0.896	0.000	0.023	0.002	0.904 ✔	1.000	4.8.2 ✔
	41.278 - 40.2317	0.008	0.906	0.000	0.023	0.002	0.914 ✔	1.000	4.8.2 ✔
	40.2317 - 39.1853	0.008	0.916	0.000	0.023	0.002	0.924 ✔	1.000	4.8.2 ✔
	39.1853 - 38.139	0.008	0.926	0.000	0.023	0.002	0.935 ✔	1.000	4.8.2 ✔
	38.139 - 37.0927	0.008	0.936	0.000	0.023	0.002	0.945 ✔	1.000	4.8.2 ✔
	37.0927 - 36.0463	0.008	0.946	0.000	0.024	0.002	0.955 ✔	1.000	4.8.2 ✔
	36.0463 - 35	0.008	0.956	0.000	0.024	0.002	0.965 ✔	1.000	4.8.2 ✔
L5	35 - 33.25	0.006	0.725	0.000	0.018	0.001	0.731 ✔	1.000	4.8.2 ✔
	33.25 - 31.5	0.006	0.735	0.000	0.018	0.001	0.742 ✔	1.000	4.8.2 ✔
	31.5 - 29.75	0.006	0.745	0.000	0.018	0.001	0.751 ✔	1.000	4.8.2 ✔
	29.75 - 28	0.006	0.754	0.000	0.018	0.001	0.761 ✔	1.000	4.8.2 ✔
	28 - 26.25	0.006	0.764	0.000	0.018	0.001	0.770 ✔	1.000	4.8.2 ✔
	26.25 - 24.5	0.006	0.772	0.000	0.018	0.001	0.779	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	24.5 - 22.75	0.006	0.781	0.000	0.018	0.001	0.788 ✔	1.000	4.8.2 ✔
	22.75 - 21	0.006	0.790	0.000	0.018	0.001	0.796 ✔	1.000	4.8.2 ✔
	21 - 19.25	0.006	0.798	0.000	0.018	0.001	0.805 ✔	1.000	4.8.2 ✔
	19.25 - 17.5	0.007	0.806	0.000	0.018	0.001	0.813 ✔	1.000	4.8.2 ✔
	17.5 - 15.75	0.007	0.814	0.000	0.018	0.001	0.821 ✔	1.000	4.8.2 ✔
	15.75 - 14	0.007	0.821	0.000	0.018	0.001	0.828 ✔	1.000	4.8.2 ✔
	14 - 12.25	0.007	0.828	0.000	0.018	0.001	0.836 ✔	1.000	4.8.2 ✔
	12.25 - 10.5	0.007	0.836	0.000	0.018	0.001	0.843 ✔	1.000	4.8.2 ✔
	10.5 - 8.75	0.007	0.843	0.000	0.018	0.001	0.850 ✔	1.000	4.8.2 ✔
	8.75 - 7	0.007	0.849	0.000	0.018	0.001	0.857 ✔	1.000	4.8.2 ✔
	7 - 5.25	0.007	0.856	0.000	0.018	0.001	0.863 ✔	1.000	4.8.2 ✔
	5.25 - 3.5	0.007	0.862	0.000	0.018	0.001	0.870 ✔	1.000	4.8.2 ✔
	3.5 - 1.75	0.007	0.869	0.000	0.018	0.001	0.876 ✔	1.000	4.8.2 ✔
	1.75 - 0	0.007	0.875	0.000	0.018	0.001	0.882 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	120 - 89.75	Pole	TP21.287x16x0.188	1	-5.136	889.447	32.1	Pass
L2	89.75 - 70	Pole	TP24.252x20.445x0.188	2	-9.269	988.548	88.5	Pass
L3	70 - 44.417	Pole	TP28.725x24.252x0.275	3	-12.403	1799.270	80.5	Pass
L4	44.417 - 35	Pole	TP29.88x27.549x0.275	4	-14.761	1883.280	96.5	Pass
L5	35 - 0	Pole	TP36x29.88x0.364	5	-22.171	3058.840	88.2	Pass
							Summary	
						Pole (L4)	96.5	Pass
						RATING =	**96.5**	**Pass**

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Subject:	Anchor Bolt and Baseplate Analysis
Location:	120-ft ROHN Monopole Wethersfield, CT
Rev. 1: 7/21/20	Prepared by: T.J.L. Checked by: C.F.C. Job No. 20074.57

Reinforced Anchor Bolt and Base Plate Analysis:

Input Data:

Note:
Base plate and anchor bolt information obtained from original ROHN design documents, ROHN Eng File No. 50576RA, dated 07/11/02. Anchor bolt reinforcement infomration obtained from design documents prepared by Structrual Components fro Verizon Wireless, Structural Components No. 100346/110361, dated 03/25/11.

Tower Reactions:

Overturning Moment =	$OM := 1956 \cdot ft \cdot kips$	(Input From tnxTower)
Shear Force =	$Shear := 27 \cdot kips$	(Input From tnxTower)
Axial Force =	$Axial := 22 \cdot kips$	(Input From tnxTower)

Original ROHN Anchor Bolt Data: AST MA615 Grade 75

Number of Anchor Bolts =	$N := 6$	(User Input)
Diameter of Bolt Circle =	$D_{bc} := 41.50 \cdot in$	(User Input)
Bolt "Column" Distance =	$l := 3.50 \cdot in$	(User Input)
Bolt Ultimate Strength =	$F_u := 100 \cdot ksi$	(User Input)
Bolt Yield Strength =	$F_y := 75 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Anchor Bolts =	$D := 2.25 \cdot in$	(User Input)
Threads per Inch =	$n := 4.5$	(User Input)
Top of Concrete to Bot Leveling Nut =	$l_{ar} := 2 \cdot in$	(User Input)

Existing Structural Components Anchor Bolt Reinf. Data: AST MA615 Grade 75

Number of Anchor Bolts =	$No := 6$	(User Input)
Diameter of Bolt Circle =	$D_{bco} := 50.375 \cdot in$	(User Input)
Bolt "Column" Distance =	$lo := 3.0 \cdot in$	(User Input)
Bolt Ultimate Strength =	$F_{uo} := 100 \cdot ksi$	(User Input)
Bolt Yield Strength =	$F_{yo} := 75 \cdot ksi$	(User Input)
Bolt Modulus =	$Eo := 29000 \cdot ksi$	(User Input)
Diameter of Anchor Bolts =	$Do := 2.75 \cdot in$	(User Input)
Threads per Inch =	$no := 4.0$	(User Input)

Base Plate Data:

Use AST MA572 50

Plate Yield Strength =	$Fy_{bp} := 50 \cdot ksi$	(User Input)	Based on field measurements by Structural Components pre-construction and TIA inspection report, dated 08/25/10. Note original ROHN design documents noted base plate as 2.00in thick.
Base Plate Thickness =	$t_{bp} := 2.25 \cdot in$	(User Input)	
Base Plate Diameter =	$D_{bp} := 47.50 \cdot in$	(User Input)	
Outer Pole Diameter =	$D_{pole} := 36.00 \cdot in$	(User Input)	
	$\eta := 0.5$	per TIA-222-G Section 4.9.9	

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

$d_1 := 10.38in$ (User Input)

$d_2 := 20.75in$ (User Input)

$d_3 := 12.69in$ (User Input)

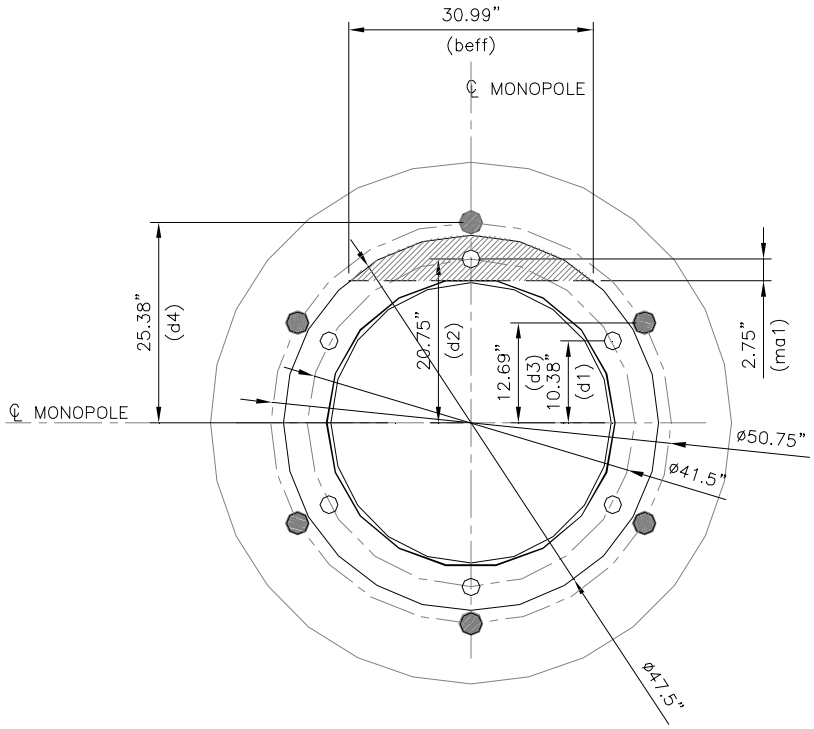
$d_4 := 25.38in$ (User Input)

Critical Distances For Bending in Plate:

$ma_1 := 2.75in$ (User Input)

(User Input)

Effective Width of Baseplate for Bending = $B_{eff} := 30.99in$ (User Input)



MONOPOLE ANCHOR BOLT AND BASE PALTE GEOMETRY w/ ANCHOR BOLT REINFORCEMENT

Anchor Bolt Analysis (Inner Bolts):

Calculated Anchor Bolt Properties:

Total Polar Moment of Inertia = $I_p := \left[\left(d_1\right)^2 \cdot 4 + \left(d_2\right)^2 \cdot 2 + \left(d_3\right)^2 \cdot 4 + \left(d_4\right)^2 \cdot 2\right] = 3224.54 \cdot in^2$

Gross Area of Inner Bolts = $A_{gi} := \frac{\pi}{4} \cdot D^2 = 3.976 \cdot in^2$

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

Net Diameter of Inner Bolt = $D_{ni} := \frac{2 \cdot \sqrt{A_{ni}}}{\sqrt{\pi}} = 2.033 \cdot in$

Radius of Gyration of Inner Bolt = $ri := \frac{D_{ni}}{4} = 0.508 \cdot in$

Section Modulus of Inner Bolt = $S_{xi} := \frac{\pi \cdot D_{ni}^3}{32} = 0.826 \cdot in^3$

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

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := OM \cdot \frac{d_2}{I_p} - \frac{Axial}{N} = 147.4 \cdot kips$

Maximum Compressive Force = $P_u := OM \cdot \frac{d_2}{I_p} + \frac{Axial}{N} = 154.7 \cdot kips$

Maximum Shear Force = $V_u := \frac{Shear}{N} = 4.5 \cdot kips$

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

Bolt % of Capacity = $\frac{\left(P_u + \frac{V_u}{\eta}\right)}{\Phi R_{nt}} \cdot 100 = 63$

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

Condition1 = "OK"

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

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

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

Bolt % of Capacity = $\left[\left(\frac{V_u}{\Phi R_{nv}}\right)^2 + \left(\frac{P_u}{\Phi R_{nt}} + \frac{M_u}{\Phi R_{nm}}\right)^2\right] \cdot 100 = 35.6$

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

Condition2 = "OK"

Anchor Bolt Analysis (Outer Bolts):

Calculated Anchor Bolt Properties:

Gross Area of Inner Bolts = $A_{go} := \frac{\pi}{4} \cdot D^2 = 3.976 \cdot in^2$

Net Area of Inner Bolt = $A_{no} := \frac{\pi}{4} \cdot \left(Do - \frac{0.9743 \cdot in}{n}\right)^2 = 5.041 \cdot in^2$

Net Diameter of Inner Bolt = $D_{no} := \frac{2 \cdot \sqrt{A_{no}}}{\sqrt{\pi}} = 2.533 \cdot in$

Radius of Gyration of Inner Bolt = $ro := \frac{D_{no}}{4} = 0.633 \cdot in$

Section Modulus of Inner Bolt = $S_{xo} := \frac{\pi \cdot D_{no}^3}{32} = 1.596 \cdot in^3$

Plastic Section Modulus = $Z := \frac{D_{no}^3}{6} = 2.71 \cdot in^3$

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := OM \cdot \frac{d_4}{I_p} - \frac{Axial}{N} = 181.1 \cdot kips$

Maximum Compressive Force = $P_u := OM \cdot \frac{d_4}{I_p} + \frac{Axial}{N} = 188.4 \cdot kips$

Maximum Shear Force = $V_u := \frac{Shear}{N} = 4.5 \cdot kips$

Design Tensile Strength = $\Phi R_{nt} := 0.8 \cdot F_u \cdot A_{no} = 403.29 \cdot k$

Bolt % of Capacity = $\frac{\left(P_u + \frac{V_u}{\eta}\right)}{\Phi R_{nt}} \cdot 100 = 49$

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

Condition1 = "OK"

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

Design Flexural Strength = $\Phi R_{nm} := 0.9 \cdot F_y \cdot Z = 182.94 \cdot in \cdot k$

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

Bolt % of Capacity = $\left[\left(\frac{V_u}{\Phi R_{nv}}\right)^2 + \left(\frac{P_u}{\Phi R_{nt}} + \frac{M_u}{\Phi R_{nm}}\right)^2\right] \cdot 100 = 21.9$

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

Condition2 = "OK"

Base Plate Analysis:

Force from Bolts = $C_1 := \frac{OM \cdot d_2}{I_p} + \frac{Axial}{N} = 154.71 \cdot kips$

Applied Bending Stress in Plate = $f_{bp} := \frac{4 \cdot \left(C_1 \cdot ma_1\right)}{B_{eff} t_{bp}^2} = 10.85 \cdot ksi$

Allowable Bending Stress in Plate = $F_{bp} := 0.9 \cdot Fy_{bp} = 45 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} \cdot 100 = 24.1$

Condition5 = $Condition1 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$

Condition1 = "Ok"

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Subject: FOUNDATION ANALYSIS

Location: Wethersfield, CT

Rev. 1: 7/21/20

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 20074.57

Foundation:

Input Data:

Tower Data

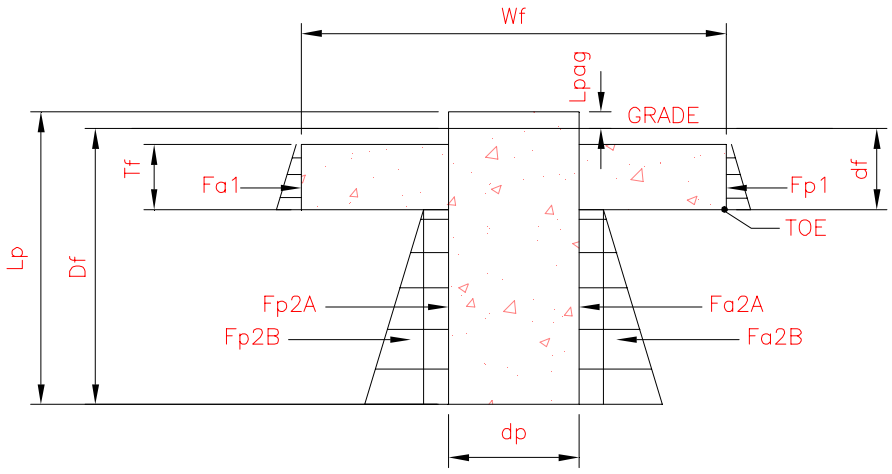
Overturning Moment =	$OM := 1956 \cdot ft \cdot kips$	(User Input)	
Shear Force =	$Shear := 27 \cdot kip$	(User Input)	
Axial Force =	$Axial := 22 \cdot kip$	(User Input)	
Tower Height =	$H_t := 120 \cdot ft$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 19 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 19.5 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0.5 \cdot ft$	(User Input)	
Diameter of Cassion =	$d_p := 5.5 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 2 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 14.5 \cdot ft$	(User Input)	
Water Depth =	$D_{water} := 0 \cdot ft$	(User Input)	
Distance From Grade to Bottom of Pad =	$d_f := 4 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 3000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Anchor Bolt Yield Strength =	$f_{ya} := 75000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil (mat) =	$\Phi_{s1} := 33 \cdot deg$	(User Input)	
Internal Friction Angle of Soil (below mat) =	$\Phi_{s2} := 33 \cdot deg$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil1} := 120 \cdot pcf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil2} := 58 \cdot pcf$	(User Input)	
Ultimate Soil Bearing Capacity =	$q_u := 8000 \cdot psf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)



Calculated Factors:

Coefficient of Lateral Soil Pressure =

$$K_{p1} := \frac{1+\sin(\Phi_{s1})}{1-\sin(\Phi_{s1})} = 3.4 \qquad Ka1 := \frac{(1-\sin(\Phi_{s1}))}{(1+\sin(\Phi_{s1}))} = 0.295$$

$$K_{p2} := \frac{1+\sin(\Phi_{s2})}{1-\sin(\Phi_{s2})} = 3.4 \qquad Ka2 := \frac{(1-\sin(\Phi_{s2}))}{(1+\sin(\Phi_{s2}))} = 0.295$$

Stability of Footing:

Passive Pressure 1 =

$$P_{p1.top} := K_{p1}\cdot\gamma_{soil1}\cdot(d_f - T_f) = 0.814\cdot ksf$$

$$P_{p1.bot} := K_{p1}\cdot\gamma_{soil1}\cdot d_f = 1.628\cdot ksf$$

$$P_{p1.ave} := \frac{P_{p1.top} + P_{p1.bot}}{2} = 1.221\cdot ksf$$

Active Pressure 1 =

$$P_{a1.top} := Ka1\cdot\gamma_{soil1}\cdot(d_f - T_f) = 0.071\cdot ksf$$

$$P_{a1.bot} := Ka1\cdot\gamma_{soil1}\cdot d_f = 0.142\cdot ksf$$

$$P_{a1.ave} := \frac{P_{a1.top} + P_{a1.bot}}{2} = 0.106\cdot ksf$$

Area of Pressure 1 =

$$A_{p1} := T_f\cdot W_f = 29 ft^2$$

Forces 1 =

$$F_{p1} := P_{p1.ave}\cdot A_{p1} = 35.414\cdot kip$$

$$F_{a1} := P_{a1.ave}\cdot A_{p1} = 3.078\cdot kip$$

Ultimate Shear 1 =

$$S_{u1} := (F_{p1} - F_{a1}) = 32.3\cdot kip$$

Passive Pressure 2 = $P_{p2.top} := K_{p2} \cdot \gamma_{soil2} \cdot d_f = 0.787 \cdot ksf$

$P_{p2.bot} := K_{p2} \cdot \gamma_{soil2} \cdot D_f = 3.738 \cdot ksf$

Active Pressure 2 = $P_{a2.top} := Ka2 \cdot \gamma_{soil2} \cdot d_f = 0.068 \cdot ksf$

$P_{a2.bot} := Ka2 \cdot \gamma_{soil2} \cdot D_f = 0.325 \cdot ksf$

Area of Pressure 2 = $A_{p2} := \left(D_f - d_f\right) \cdot d_p = 82.5 ft^2$

Forces 2 = $F_{p2A} := P_{p2.top} \cdot A_{p2} = 64.925 \cdot kips$

$F_{a2A} := P_{a2.top} \cdot A_{p2} = 5.6 \cdot kips$

$F_{p2B} := \frac{1}{2} \cdot \left(P_{p2.bot} - P_{p2.top}\right) \cdot A_{p2} = 121.735 \cdot kips$

$F_{a2B} := \frac{1}{2} \cdot \left(P_{a2.bot} - P_{a2.top}\right) \cdot A_{p2} = 10.6 \cdot kips$

Ultimate Shear 2 = $S_{u2A} := F_{p2A} - F_{a2A} = 59.3 \cdot kip$

$S_{u2B} := F_{p2B} - F_{a2B} = 111.2 \cdot kip$

Weight of Concrete Mat = $WT_{mat} := \left(W_f^2 - \frac{d_p^2 \cdot \pi}{4}\right) \cdot T_f \cdot \gamma_{conc} = 55.95 \cdot kip$

Weight of Concrete Caission = $WT_{caission} := \left(\frac{d_p^2 \cdot \pi}{4} L_p\right) \cdot \gamma_{conc} = 69.49 \cdot kip$

Weight of Soil Above Mat = $WT_s := \left[\left(W_f^2 - \frac{d_p^2 \cdot \pi}{4}\right) \cdot \left(d_f - T_f\right)\right] \cdot \gamma_{soil1} = 44.76 \cdot kip$

Total Weight = $W_{tot} := 0.9WT_{mat} + 0.9WT_{caission} + 0.75WT_s + 0.9Axial = 166.265 \cdot kips$

Overturning Moment = $M_{ot} := OM + Shear \cdot \left(d_f + L_{pag}\right) = 2078 \cdot kip \cdot ft$

Resisting Moment = $M_r := \left(W_{tot}\right) \cdot \frac{W_f}{2} + 0.75S_{u1} \cdot T_f \cdot \frac{1}{3} + 0.75S_{u2A} \cdot \frac{\left(D_f - d_f\right)}{2} + 0.75S_{u2B} \cdot \frac{2 \cdot \left(D_f - d_f\right)}{3} = 2389 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 1.15$

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

$Overturing\_Check := if\left(FS \geq FS_{req}, "Okay", "No Good"\right)$

$Overturing\_Check = "Okay"$

Bearing Pressure Check:

Area of Mat = $A_{mat} := W_f^2 - \frac{d_p^2 \cdot \pi}{4} = 186.492\,ft^2$

Section Modulus of Mat = $S_{mat} := \frac{W_f^3}{6} - \frac{d_p^3 \cdot \pi}{32} = 492\cdot ft^3$

Axial Force @ Base of Mat = $P_{mat} := WT_{mat} + WT_s = 100.706\cdot kips$

Resisting Moment Capacity of Caissson = $M_{cap} := S_{u2A}\cdot\left[\frac{1}{2}\cdot\left(D_f - d_f\right)\right] + S_{u2B}\cdot\left[\frac{2}{3}\cdot\left(D_f - d_f\right)\right] = 1556\cdot kip\cdot ft$

Residual Moment @ Base of Mat = $M_{mat} := \begin{cases} \left[\left(OM - M_{cap}\right) + Shear\cdot\left(d_f + L_{pag}\right)\right] & \text{if } \left(OM - M_{cap}\right) + Shear\cdot\left(d_f + L_{pag}\right) \geq 0 \\ 0 & \text{otherwise} \end{cases} = 521\cdot kip\cdot ft$

Maximum Pressure in Mat = $P_{max} := \frac{P_{mat}}{A_{mat}} + \frac{M_{mat}}{S_{mat}} = 1.6\cdot ksf$

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

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat = $P_{min} := \frac{P_{mat}}{A_{mat}} - \frac{M_{mat}}{S_{mat}} = -0.52\cdot ksf$

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

Min_Pressure_Check = "No Good"

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}}\cdot\frac{1}{3} = 3.648\,ft$

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

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

Eccentricity = $e := \frac{M_{mat}}{P_{mat}} = 5.177\,ft$

Adjusted Soil Pressure = $P_a := \frac{2\cdot P_{mat}}{3\cdot W_f\cdot\left(\frac{W_f}{2} - e\right)} = 2.233\cdot ksf$

$q_{adj} := if\left(P_{min} < 0, P_a, P_{max}\right) = 2.233\cdot ksf$

$Pressure\_Check := if\left(q_{adj} < .75\cdot q_u, \text{"Okay"}, \text{"No Good"}\right)$

Pressure_Check = "Okay"

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

CTHA507A_Anchor_4_draft

Print Name: Standard
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Section 1 - Site Information

Site ID: CTHA507A
Status: Draft
Version: 4
Project Type: Anchor
Approved: Not Approved
Approved By: Not Approved
Last Modified: 7/1/2020 11:18:51 AM
Last Modified By: Hansraj.Rana4@T-Mobile.com

Site Name: Town of Wethersfield Monopole
Site Class: Monopole
Site Type: Structure Non Building
Plan Year: 2020
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: <undefined>

Latitude: 41.72060000
Longitude: -72.66610000
Address: 254 Silas Deane Hwy
City, State: Wethersfield, CT
Region: NORTHEAST

RAN Template: 67D5A997DB Outdoor			AL Template: 67D5997DB_2xAIR+1OP (U21 Market)	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 9

Section 2 - Existing Template Images

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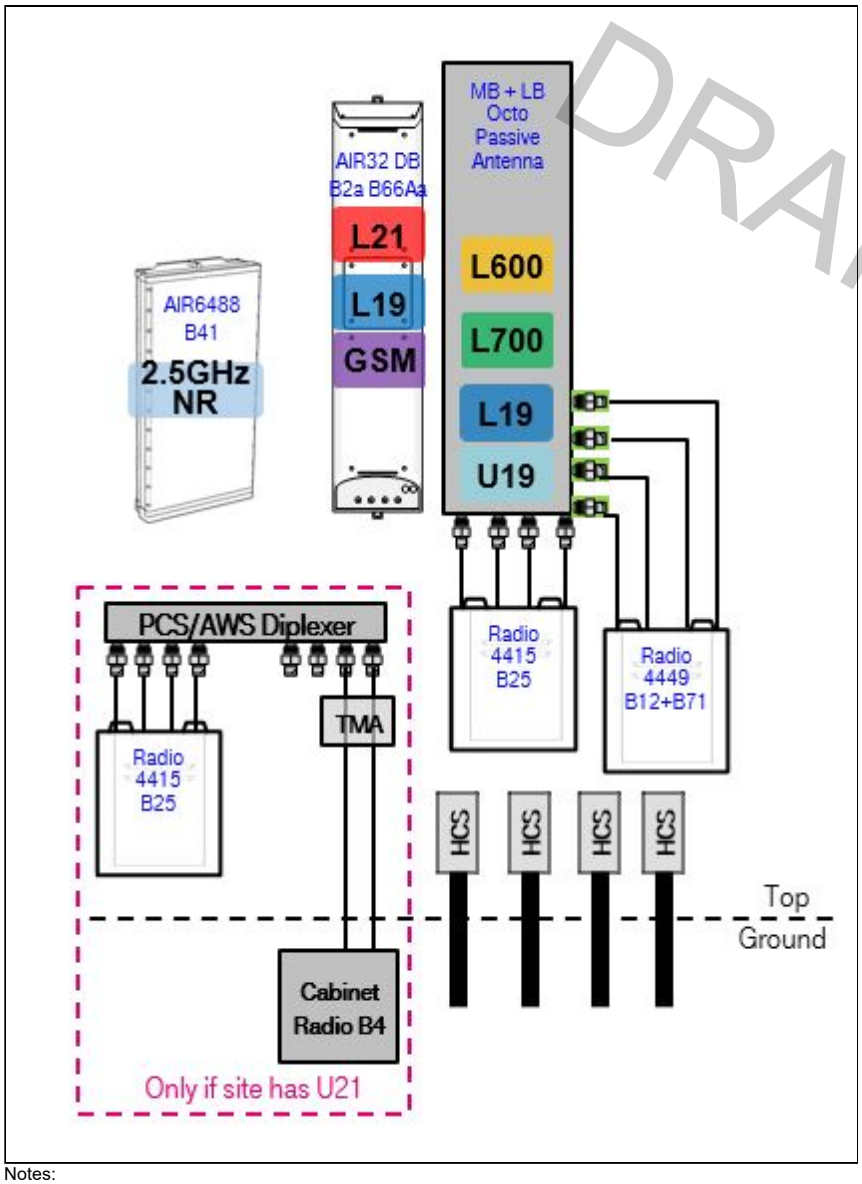
Section 3 - Proposed Template Images

67D5997DB_2xAIR+1OP.JPG



Notes:

Section 4 - Siteplan Images

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

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

CTHA507A_Anchor_4_draft

Print Name: Standard
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 5A U19 Shutdown

Enclosure	1	2
Enclosure Type	Legacy ODE	Ancillary Equipment (Ericsson)
Baseband	DUW30 (U2100); BB 6630 (L2100)	
Hybrid Cable System		Ericsson 9x18 HCS *Select Length*

Proposed RAN Equipment

Template: 67D5A997DB Outdoor

Enclosure	1	2	3
Enclosure Type	Legacy ODE	Enclosure 6160	B160
Baseband	DUW30 (U2100); BB 6630 (L700, L600, N600); BB 6630 (L2100, L1900)	BB 6648 (N2500); BB 6630 (L2500)	
Hybrid Cable System	Ericsson 6x12 HCS *Select Length & AWG* Ericsson 6x12 HCS *Select AWG & Length*	PSU 4813 Ericsson 6x12 HCS *Select Length & AWG*	

RAN Scope of Work:

Add (1) Enclosure 6160.

Add (1) Battery Cabinet B160.

Add (1) iXRe Router to new Enclosure 6160.

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

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

Add (1) PSU 4813 Power Booster

Existing: (0) coax lines & (1) 6x12 HCS (**9x18 not present on site *)

Add (2) 6X12 HCS for AIR32-DB, Radio 4449 and AIR6449 B41. Length of new HCS will match that of existing HCS.

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

CTHA507A_Anchor_4_draft

Print Name: Standard
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Section 6 - A&L Equipment

Existing Template: 5A_2xAIR U19 Shutdown
Proposed Template: 67D5997DB_2xAIR+1OP (U21 Market)

Sector 1 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)		Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	0		0	
M. Tilt	0		0	
Height	105		105	
Ports	**P1**	**P2**	**P3**	**P4**
Active Tech.	U2100		L2100	
Dark Tech.				
Restricted Tech.				
Decomm. Tech.				
E. Tilt	5		2	
Cables	Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.	
TMAs				
Diplexers / Combiners				
Radio				
Sector Equipment				

Unconnected Equipment:

Scope of Work:

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

CTHA507A_Anchor_4_draft

Print Name: Standard
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro									
Antenna	1				2				3	
Antenna Model	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				RFS - APXVAARR24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	0				0				0	
M. Tilt	0				0				0	
Height	105				105				105	
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Active Tech.	L2100	L2100	L1900	L1900	L700 L600 N600	L700 L600 N600	L1900 U2100	L1900 U2100	L2500 N2500	L2500 N2500
Dark Tech.										
Restricted Tech.										
Decomm. Tech.										
E. Tilt										
Cables	Fiber Jumper	Fiber Jumper	Fiber Jumper	Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Fiber Jumper	Fiber Jumper
TMAs										
Diplexers / Combiners							Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)	SHARED Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)		
Radio					Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B25 (At Antenna) Radio 4415 B66A (At Antenna)	SHARED Radio 4415 B25 (At Antenna) SHARED Radio 4415 B66A (At Antenna)		
Sector Equipment										

Unconnected Equipment:

Scope of Work:

Swap P1 AIR21-B4A antenna with (1) AIR32-DB for L2100 & L1900-C1.

Swap P2 AIR21-B4A antenna with (1) Octo Port RFS - APXVAARR24_43-U-NA20 antenna for L600/L700 and L1900-C2 and U2100.

Add (1) AIR6449 B41 antenna at P3 for L2500/N2500.

Add (1) Radio 4449 B71+B85 with Octo antenna (P2) for L600/L700/NR600.

Add (1) 8x4 diplexer Commscope - SDX1926Q-43 with P2 Octo antenna.

Add (1) Radio 4415 B25 for L1900 2nd Carrier to P2 Octo antenna, and connect its ports to the four PCS input ports of the diplexer.

Add (1) Radio 4415 B66A for U21 to P2 Octo antenna, and connect its ports to the four AWS input ports of the diplexer. Move U21 to P2 Octo antenna with Fiber.

U21 will be diplexed with L1900 C2 using 8x4 diplexer Commscope - SDX1926Q-43 on Octo antenna.

Make sure to place metal caps on the unused ports of the diplexer.

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

*No GSM on site.

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

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

CTHA507A_Anchor_4_draft

Print Name: Standard
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 2 (Existing) view from behind

Coverage Type	A - Outdoor Macro			
Antenna	**1**		**2**	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)		Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	120		120	
M. Tilt	0		0	
Height	105		105	
Ports	**P1**	**P2**	**P3**	**P4**
Active Tech.	U2100		L2100	
Dark Tech.				
Restricted Tech.				
Decomm. Tech.				
E. Tilt	2		2	
Cables	Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.	
TMAs				
Diplexers / Combiners				
Radio				
Sector Equipment				

Unconnected Equipment:

Scope of Work:

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

CTHA507A_Anchor_4_draft

Print Name: Standard
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro									
Antenna	1				2				3	
Antenna Model	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				RFS - APXVAARR24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	120				120				120	
M. Tilt	0				0				0	
Height	105				105				105	
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Active Tech.	L2100	L2100	L1900	L1900	L700 L600 N600	L700 L600 N600	L1900 U2100	L1900 U2100	L2500 N2500	L2500 N2500
Dark Tech.										
Restricted Tech.										
Decomm. Tech.										
E. Tilt										
Cables	Fiber Jumper	Fiber Jumper	Fiber Jumper	Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Fiber Jumper	Fiber Jumper
TMAs										
Diplexers / Combiners							Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)	SHARED Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)		
Radio					Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B25 (At Antenna) Radio 4415 B66A (At Antenna)	SHARED Radio 4415 B25 (At Antenna) SHARED Radio 4415 B66A (At Antenna)		
Sector Equipment										

Unconnected Equipment:

Scope of Work:

Swap P1 AIR21-B4A antenna with (1) AIR32-DB for L2100 & L1900-C1.

Swap P2 AIR21-B4A antenna with (1) Octo Port RFS - APXVAARR24_43-U-NA20 antenna for L600/L700 and L1900-C2 and U2100.

Add (1) AIR6449 B41 antenna at P3 for L2500/N2500.

Add (1) Radio 4449 B71+B85 with Octo antenna (P2) for L600/L700/NR600.

Add (1) 8x4 diplexer Commscope - SDX1926Q-43 with P2 Octo antenna.

Add (1) Radio 4415 B25 for L1900 2nd Carrier to P2 Octo antenna, and connect its ports to the four PCS input ports of the diplexer.

Add (1) Radio 4415 B66A for U21 to P2 Octo antenna, and connect its ports to the four AWS input ports of the diplexer. Move U21 to P2 Octo antenna with Fiber.

U21 will be diplexed with L1900 C2 using 8x4 diplexer Commscope - SDX1926Q-43 on Octo antenna.

Make sure to place metal caps on the unused ports of the diplexer.

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

*No GSM on site.

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

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

CTHA507A_Anchor_4_draft

Print Name: Standard
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 3 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	**1**		**2**	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)		Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	240		240	
M. Tilt	0		0	
Height	105		105	
Ports	**P1**	**P2**	**P3**	**P4**
Active Tech.	U2100		L2100	
Dark Tech.				
Restricted Tech.				
Decomm. Tech.				
E. Tilt	2		2	
Cables	Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.	
TMAs				
Diplexers / Combiners				
Radio				
Sector Equipment				

Unconnected Equipment:

Scope of Work:

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

CTHA507A_Anchor_4_draft

Print Name: Standard
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro									
Antenna	1				2				3	
Antenna Model	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				RFS - APXVAARR24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	240				240				240	
M. Tilt	0				0				0	
Height	105				105				105	
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Active Tech.	L2100	L2100	L1900	L1900	L700 L600 N600	L700 L600 N600	L1900 U2100	L1900 U2100	L2500 N2500	L2500 N2500
Dark Tech.										
Restricted Tech.										
Decomm. Tech.										
E. Tilt										
Cables	Fiber Jumper	Fiber Jumper	Fiber Jumper	Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Fiber Jumper	Fiber Jumper
TMAs										
Diplexers / Combiners							Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)	SHARED Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)		
Radio					Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B25 (At Antenna) Radio 4415 B66A (At Antenna)	SHARED Radio 4415 B25 (At Antenna) SHARED Radio 4415 B66A (At Antenna)		
Sector Equipment										

Unconnected Equipment:

Scope of Work:

Swap P1 AIR21-B4A antenna with (1) AIR32-DB for L2100 & L1900-C1.

Swap P2 AIR21-B4A antenna with (1) Octo Port RFS - APXVAARR24_43-U-NA20 antenna for L600/L700 and L1900-C2 and U2100.

Add (1) AIR6449 B41 antenna at P3 for L2500/N2500.

Add (1) Radio 4449 B71+B85 with Octo antenna (P2) for L600/L700/NR600.

Add (1) 8x4 diplexer Commscope - SDX1926Q-43 with P2 Octo antenna.

Add (1) Radio 4415 B25 for L1900 2nd Carrier to P2 Octo antenna, and connect its ports to the four PCS input ports of the diplexer.

Add (1) Radio 4415 B66A for U21 to P2 Octo antenna, and connect its ports to the four AWS input ports of the diplexer. Move U21 to P2 Octo antenna with Fiber.

U21 will be diplexed with L1900 C2 using 8x4 diplexer Commscope - SDX1926Q-43 on Octo antenna.

Make sure to place metal caps on the unused ports of the diplexer.

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

*No GSM on site.

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

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

CTHA507A_Anchor_4_draft

Print Name: Standard
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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

Proposed Power Systems Equipment

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

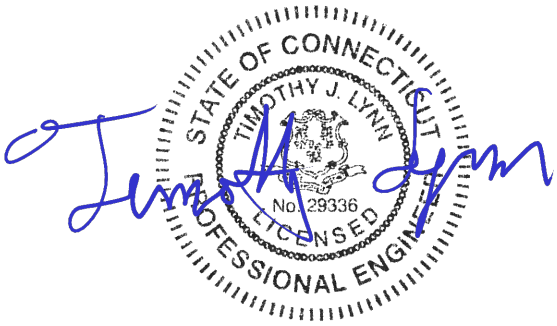
T-Mobile Site #: CTHA507A

254 Silas Deane Highway
Wethersfield, CT

Centek Project No. 20074.57

Date: July 20, 2020

Max Stress Ratio = 51.3%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

July 20, 2020

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

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTHA507A
254 Silas Deane Highway
Wethersfield, CT 06109

Centek Project No. 20074.57

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The existing T-Arms are inadequate to support the proposed antenna configuration. Replacement of the existing mount with one (1) SitePro platform (p/n RMQP-496) w/ handrail (p/n HRK12) is required. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  Platform: Three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson AIR32 panel antennas, three (3) RFS APXVAARR243-NA20 panel antennas, three (3) Ericsson 4449 remote radio units, six (6) Ericsson 4415 remote radio units and three (3) Commscope SDX1926Q-43 diplexers mounted on one (1) platform with a RAD center elevation of 105-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 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 existing T-Arms are inadequate to support the proposed antenna configuration. Replacement of the existing mount with one (1) SitePro platform (p/n RMQP-496) w/ handrail (p/n HRK12) is required. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

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

Section 2 - Calculations

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

Subject: TIA-222-G Loads

Location: Wethersfield, CT

Rev. 0: 7/20/20

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 20074.57

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 = $h := 120$ ft (User Input)

Height to Center of Antennas = $z_{Ant} := 105$ ft (User Input)

Radial Ice Thickness = $t_i := 1.00$ in (User Input per Annex B of TIA-222-G)

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

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

$K_a := 1.0$ (User Input)

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

Output

Wind Direction Probability Factor =

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

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

Importance Factors =

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

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

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

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

$$K_{iz} := \left(\frac{z_{Ant}}{33}\right)^{0.1} = 1.123$$

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.245$$

Velocity Pressure Coefficient Antennas =

$$Kz_{Ant} := 2.01\left(\left(\frac{z_{Ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.279$$

Velocity Pressure w/o Ice Antennas =

$$qz_{Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V^2 \cdot I_{Wind} = 29.26$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V_i^2 \cdot I_{Wind} = 7.774$$

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Subject:	TIA-222-G Loads
Location:	Wethersfield, CT
Rev. 0: 7/20/20	Prepared by: T.J.L. Checked by: C.F.C. Job No. 20074.57

Development of Wind & Ice Load on Antennas

Antenna Data:

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

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 652$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 236$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 19.9$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 215$	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 =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 100$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 2 \times 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 574$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 574$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR32		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 56.6$	in	(User Input)
Antenna Width =	$W_{ant} := 12.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 132$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.4$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.1$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 210$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.4$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 141$	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 =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 81$	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 =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 61$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 132$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6352$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 7662$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 248$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 248$	lbs

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Subject:	TIA-222-G Loads
Location:	Wethersfield, CT
Rev. 0: 7/20/20	Prepared by: T.J.L. Checked by: C.F.C. Job No. 20074.57

Development of Wind & Ice Load on Antennas

Antenna Data:

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

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 182$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 74$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.5$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 67$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3.3$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 34$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5632$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 6384$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 207$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 207$	lbs

Development of Wind & Ice Load on RRUS

RRUS Data:

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

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 53$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 42$	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 =	$Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 24$	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 =	$Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 21$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2045$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 3068$	
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 99$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 99$	lbs

Development of Wind & Ice Load on RRUS

RRUS Data:

RRUS Model =	Ericsson 4415 B25		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 14.9$	in	(User Input)
RRUS Width =	$W_{RRUS} := 13.2$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 5.4$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 47$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		(User Input)
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 53$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 0.6$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 22$	lbs

Wind Load (with ice)

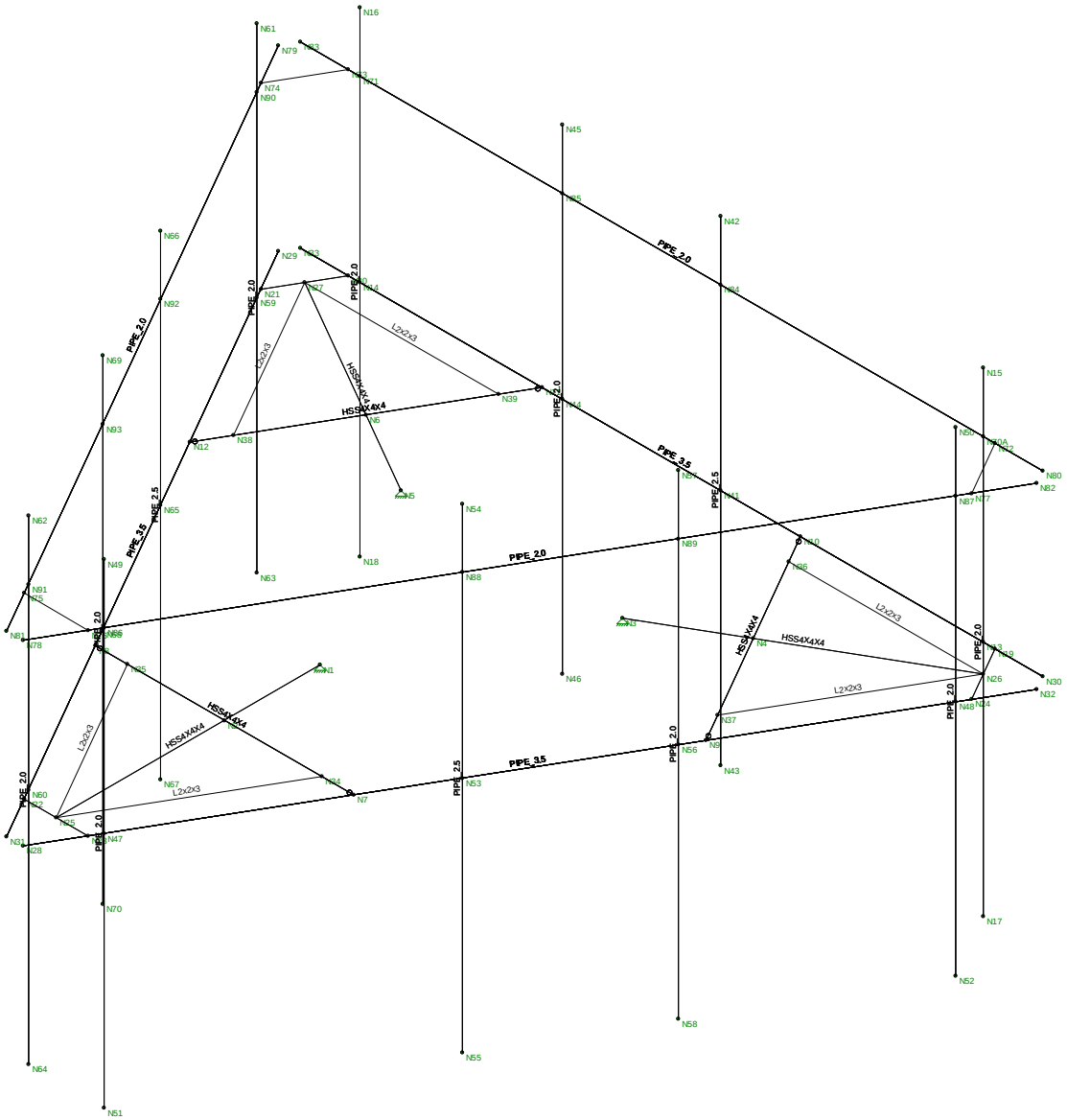
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.4$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 24$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.3$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 14$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 1062$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2331$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 76$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 76$	lbs



Envelope Only Solution

Centek		
TJL	CTHA507A	July 20, 2020 at 1:52 PM
20074.57	Member Framing	Mount.r3d

(Global) Model Settings

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

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

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	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 (\...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Outrigger	HSS4X4X4	Beam	Tube	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
2	Horz	PIPE_3.5	Beam	Pipe	A53 Grade B	Typical	2.5	4.52	4.52	9.04
3	Antenna Mast	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Support	HSS4X4X4	Beam	Tube	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
5	L2x2	L2x2x3	Beam	Tube	A500 Gr.46	Typical	.722	.271	.271	.009
6	Handrail	PIPE_2.0	Beam	Tube	A53 Grade B	Typical	1.02	.627	.627	1.25
7	Antenna Mast 2	PIPE_2.5	Beam	Tube	A53 Grade B	Typical	1.61	1.45	1.45	2.89

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Outrigger	4.446			Lbyy						Lateral
2	M2	Support	4.346			Lbyy						Lateral
3	M3	Outrigger	4.445			Lbyy						Lateral
4	M4	Support	4.346			Lbyy						Lateral
5	M5	Outrigger	4.445			Lbyy						Lateral
6	M6	Support	4.346			Lbyy						Lateral
7	M7	Horz	12.5			Lbyy						Lateral
8	M8	Horz	12.5			Lbyy						Lateral
9	M9	Horz	12.5			Lbyy						Lateral
10	M10	Antenna Mast	8			Lbyy						Lateral
11	M11	Antenna Mast	8			Lbyy						Lateral
12	M15	L2x2	3.271			Lbyy						Lateral
13	M16	L2x2	3.271			Lbyy						Lateral
14	M17	L2x2	3.27			Lbyy						Lateral
15	M18	L2x2	3.271			Lbyy						Lateral
16	M19	L2x2	3.271			Lbyy						Lateral
17	M20	L2x2	3.27			Lbyy						Lateral
18	M21	Antenna Mast 2	8			Lbyy						Lateral
19	M22	Antenna Mast	8			Lbyy						Lateral
20	M23	Antenna Mast	8			Lbyy						Lateral
21	M24	Antenna Mast	8			Lbyy						Lateral
22	M25	Antenna Mast 2	8			Lbyy						Lateral
23	M26	Antenna Mast	8			Lbyy						Lateral
24	M27	Antenna Mast	8			Lbyy						Lateral
25	M28	Antenna Mast	8			Lbyy						Lateral
26	M29	Antenna Mast 2	8			Lbyy						Lateral
27	M30	Antenna Mast	8			Lbyy						Lateral
28	M31	Handrail	12.5			Lbyy						Lateral
29	M32	Handrail	12.5			Lbyy						Lateral
30	M33	Handrail	12.5			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	N25			Outrigger	Beam	Tube	A500 Gr...	Typical
2	M2	N7	N8			Support	Beam	Tube	A500 Gr...	Typical
3	M3	N3	N26			Outrigger	Beam	Tube	A500 Gr...	Typical
4	M4	N9	N10			Support	Beam	Tube	A500 Gr...	Typical
5	M5	N5	N27			Outrigger	Beam	Tube	A500 Gr...	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
6	M6	N11	N12			Support	Beam	Tube	A500 Gr...	Typical
7	M7	N28	N32			Horz	Beam	Pipe	A53 Gra...	Typical
8	M8	N30	N33			Horz	Beam	Pipe	A53 Gra...	Typical
9	M9	N29	N31			Horz	Beam	Pipe	A53 Gra...	Typical
10	M10	N15	N17			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
11	M11	N16	N18			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
12	M12	N21	N20			RIGID	None	None	RIGID	Typical
13	M13	N19	N24			RIGID	None	None	RIGID	Typical
14	M14	N23	N22			RIGID	None	None	RIGID	Typical
15	M15	N25	N34		180	L2x2	Beam	Tube	A500 Gr...	Typical
16	M16	N25	N35		180	L2x2	Beam	Tube	A500 Gr...	Typical
17	M17	N26	N36		180	L2x2	Beam	Tube	A500 Gr...	Typical
18	M18	N26	N37		180	L2x2	Beam	Tube	A500 Gr...	Typical
19	M19	N27	N38		180	L2x2	Beam	Tube	A500 Gr...	Typical
20	M20	N27	N39		180	L2x2	Beam	Tube	A500 Gr...	Typical
21	M21	N43	N42			Antenna Mast 2	Beam	Tube	A53 Gra...	Typical
22	M22	N46	N45			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
23	M23	N49	N51			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
24	M24	N50	N52			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
25	M25	N55	N54			Antenna Mast 2	Beam	Tube	A53 Gra...	Typical
26	M26	N58	N57			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
27	M27	N61	N63			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
28	M28	N62	N64			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
29	M29	N67	N66			Antenna Mast 2	Beam	Tube	A53 Gra...	Typical
30	M30	N70	N69			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
31	M31	N78	N82			Handrail	Beam	Tube	A53 Gra...	Typical
32	M32	N80	N83			Handrail	Beam	Tube	A53 Gra...	Typical
33	M33	N79	N81			Handrail	Beam	Tube	A53 Gra...	Typical
34	M34	N74	N73			RIGID	None	None	RIGID	Typical
35	M35	N72	N77			RIGID	None	None	RIGID	Typical
36	M36	N76	N75			RIGID	None	None	RIGID	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	2.150723	0	
2	N2	0	0	3.763765	0	
3	N3	1.86258	0	-1.075361	0	
4	N4	3.259516	0	-1.881882	0	
5	N5	-1.86258	0	-1.075361	0	
6	N6	-3.259516	0	-1.881882	0	
7	N7	2.173011	0	3.763765	0	
8	N8	-2.173011	0	3.763765	0	
9	N9	4.346021	0	-0.	0	
10	N10	2.173011	0	-3.763765	0	
11	N11	-2.173011	0	-3.763765	0	
12	N12	-4.346021	0	0.	0	
13	N13	5.250196	0	-3.763765	0	
14	N14	-5.249805	0	-3.763765	0	
15	N15	5.250196	4	-3.763765	0	
16	N16	-5.249805	4	-3.763765	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
17	N17	5.250196	-4	-3.763765	0	
18	N18	-5.249805	-4	-3.763765	0	
19	N19	5.44367	0	-3.763765	0	
20	N20	-5.443288	0	-3.763765	0	
21	N21	-5.981351	0	-2.832474	0	
22	N22	-0.537681	0	6.596239	0	
23	N23	0.537681	0	6.596239	0	
24	N24	5.98116	0	-2.832143	0	
25	N25	0	0	6.596239	0	
26	N26	5.712367	0	-3.298037	0	
27	N27	-5.712367	0	-3.298037	0	
28	N28	0.13442	0	7.294707	0	
29	N29	-6.384611	0	-3.530942	0	
30	N30	6.250191	0	-3.763765	0	
31	N31	-0.134611	0	7.294375	0	
32	N32	6.38442	0	-3.530611	0	
33	N33	-6.249809	0	-3.763765	0	
34	N34	1.63533	0	3.763765	0	
35	N35	-1.63533	0	3.763765	0	
36	N36	2.441899	0	-3.298037	0	
37	N37	4.077181	0	-0.465645	0	
38	N38	-4.077181	0	-0.465645	0	
39	N39	-2.441899	0	-3.298037	0	
40	N41	0.833529	0	-3.763765	0	
41	N42	0.833529	4	-3.763765	0	
42	N43	0.833529	-4	-3.763765	0	
43	N44	-1.833137	0	-3.763765	0	
44	N45	-1.833137	4	-3.763765	0	
45	N46	-1.833137	-4	-3.763765	0	
46	N47	0.634418	0	6.428685	0	
47	N48	5.884418	0	-2.664582	0	
48	N49	0.634418	4	6.428685	0	
49	N50	5.884418	4	-2.664582	0	
50	N51	0.634418	-4	6.428685	0	
51	N52	5.884418	-4	-2.664582	0	
52	N53	2.842751	0	2.60374	0	
53	N54	2.842751	4	2.60374	0	
54	N55	2.842751	-4	2.60374	0	
55	N56	4.176084	0	0.294339	0	
56	N57	4.176084	4	0.294339	0	
57	N58	4.176084	-4	0.294339	0	
58	N59	-5.884614	0	-2.664921	0	
59	N60	-0.634613	0	6.428347	0	
60	N61	-5.884614	4	-2.664921	0	
61	N62	-0.634613	4	6.428347	0	
62	N63	-5.884614	-4	-2.664921	0	
63	N64	-0.634613	-4	6.428347	0	
64	N65	-3.67628	0	1.160025	0	
65	N66	-3.67628	4	1.160025	0	
66	N67	-3.67628	-4	1.160025	0	
67	N68	-2.342947	0	3.469426	0	
68	N69	-2.342947	4	3.469426	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
69	N70	-2.342947	-4	3.469426	0	
70	N70A	5.250196	3	-3.763765	0	
71	N71	-5.249805	3	-3.763765	0	
72	N72	5.44367	3	-3.763765	0	
73	N73	-5.443288	3	-3.763765	0	
74	N74	-5.981351	3	-2.832474	0	
75	N75	-0.537681	3	6.596239	0	
76	N76	0.537681	3	6.596239	0	
77	N77	5.98116	3	-2.832143	0	
78	N78	0.13442	3	7.294707	0	
79	N79	-6.384611	3	-3.530942	0	
80	N80	6.250191	3	-3.763765	0	
81	N81	-0.134611	3	7.294375	0	
82	N82	6.38442	3	-3.530611	0	
83	N83	-6.249809	3	-3.763765	0	
84	N84	0.833529	3	-3.763765	0	
85	N85	-1.833137	3	-3.763765	0	
86	N86	0.634418	3	6.428685	0	
87	N87	5.884418	3	-2.664582	0	
88	N88	2.842751	3	2.60374	0	
89	N89	4.176084	3	0.294339	0	
90	N90	-5.884614	3	-2.664921	0	
91	N91	-0.634613	3	6.428347	0	
92	N92	-3.67628	3	1.160025	0	
93	N93	-2.342947	3	3.469426	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			
2	N3	Reaction	Reaction	Reaction			
3	N5	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M11	Y	-.066	.5
2	M24	Y	-.066	.5
3	M28	Y	-.066	.5
4	M11	Y	-.066	5.5
5	M24	Y	-.066	5.5
6	M28	Y	-.066	5.5
7	M10	Y	-.052	.5
8	M23	Y	-.052	.5
9	M27	Y	-.052	.5
10	M10	Y	-.052	3.5
11	M23	Y	-.052	3.5
12	M27	Y	-.052	3.5
13	M21	Y	-.077	.5
14	M25	Y	-.077	.5
15	M29	Y	-.077	.5

Member Point Loads (BLC 2 : Equipment Weight) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
16	M21	Y	-.077	7.5
17	M25	Y	-.077	7.5
18	M29	Y	-.077	7.5
19	M21	Y	-.074	6
20	M25	Y	-.074	6
21	M29	Y	-.074	6
22	M21	Y	-.047	2
23	M25	Y	-.047	2
24	M29	Y	-.047	2
25	M21	Y	-.047	2
26	M25	Y	-.047	2
27	M29	Y	-.047	2

Member Point Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M11	Y	-.124	.5
2	M24	Y	-.124	.5
3	M28	Y	-.124	.5
4	M11	Y	-.124	5.5
5	M24	Y	-.124	5.5
6	M28	Y	-.124	5.5
7	M10	Y	-.104	.5
8	M23	Y	-.104	.5
9	M27	Y	-.104	.5
10	M10	Y	-.104	3.5
11	M23	Y	-.104	3.5
12	M27	Y	-.104	3.5
13	M21	Y	-.287	.5
14	M25	Y	-.287	.5
15	M29	Y	-.287	.5
16	M21	Y	-.287	7.5
17	M25	Y	-.287	7.5
18	M29	Y	-.287	7.5
19	M21	Y	-.099	6
20	M25	Y	-.099	6
21	M29	Y	-.099	6
22	M21	Y	-.076	2
23	M25	Y	-.076	2
24	M29	Y	-.076	2
25	M21	Y	-.076	2
26	M25	Y	-.076	2
27	M29	Y	-.076	2

Member Point Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M11	X	.031	.5
2	M11	X	.031	5.5
3	M24	X	.041	.5
4	M28	X	.041	.5
5	M24	X	.041	5.5
6	M28	X	.041	5.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
7	M10	X	.017	.5
8	M10	X	.017	3.5
9	M23	X	.034	.5
10	M27	X	.034	.5
11	M23	X	.034	3.5
12	M27	X	.034	3.5
13	M21	X	.05	.5
14	M21	X	.05	7.5
15	M25	X	.108	.5
16	M29	X	.108	.5
17	M25	X	.108	7.5
18	M29	X	.108	7.5
19	M21	X	.021	6
20	M21	X	.024	2

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M11	X	.071	.5
2	M11	X	.071	5.5
3	M24	X	.105	.5
4	M28	X	.105	.5
5	M24	X	.105	5.5
6	M28	X	.105	5.5
7	M10	X	.037	.5
8	M10	X	.037	3.5
9	M23	X	.091	.5
10	M27	X	.091	.5
11	M23	X	.091	3.5
12	M27	X	.091	3.5
13	M21	X	.118	.5
14	M21	X	.118	7.5
15	M25	X	.326	.5
16	M29	X	.326	.5
17	M25	X	.326	7.5
18	M29	X	.326	7.5
19	M21	X	.042	6
20	M21	X	.053	2

Member Point Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M11	Z	.041	.5
2	M11	Z	.041	5.5
3	M24	Z	.031	.5
4	M28	Z	.031	.5
5	M24	Z	.031	5.5
6	M28	Z	.031	5.5
7	M10	Z	.034	.5
8	M10	Z	.034	3.5
9	M23	Z	.017	.5
10	M27	Z	.017	.5
11	M23	Z	.017	3.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
12	M27	Z	.017	3.5
13	M21	Z	.108	.5
14	M21	Z	.108	7.5
15	M25	Z	.05	.5
16	M29	Z	.05	.5
17	M25	Z	.05	7.5
18	M29	Z	.05	7.5
19	M25	Z	.021	6
20	M29	Z	.021	6
21	M25	Z	.024	2
22	M29	Z	.024	2

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M11	Z	.105	.5
2	M11	Z	.105	5.5
3	M24	Z	.071	.5
4	M28	Z	.071	.5
5	M24	Z	.071	5.5
6	M28	Z	.071	5.5
7	M10	Z	.091	.5
8	M10	Z	.091	3.5
9	M23	Z	.037	.5
10	M27	Z	.037	.5
11	M23	Z	.037	3.5
12	M27	Z	.037	3.5
13	M21	Z	.326	.5
14	M21	Z	.326	7.5
15	M25	Z	.118	.5
16	M29	Z	.118	.5
17	M25	Z	.118	7.5
18	M29	Z	.118	7.5
19	M25	Z	.042	6
20	M29	Z	.042	6
21	M25	Z	.053	2
22	M29	Z	.053	2

Member Distributed Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M9	X	.003	.003	0	0
2	M11	X	.003	.003	0	0
3	M22	X	.003	.003	0	0
4	M21	X	.003	.003	0	0
5	M10	X	.003	.003	0	0
6	M30	X	.003	.003	0	0
7	M26	X	.003	.003	0	0
8	M33	X	.003	.003	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M9	X	.008	.008	0	0
2	M11	X	.008	.008	0	0
3	M22	X	.008	.008	0	0
4	M21	X	.008	.008	0	0
5	M10	X	.008	.008	0	0
6	M30	X	.008	.008	0	0
7	M26	X	.008	.008	0	0
8	M33	X	.008	.008	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M8	Z	.003	.003	0	0
2	M27	Z	.003	.003	0	0
3	M29	Z	.003	.003	0	0
4	M30	Z	.003	.003	0	0
5	M28	Z	.003	.003	0	0
6	M24	Z	.003	.003	0	0
7	M26	Z	.003	.003	0	0
8	M25	Z	.003	.003	0	0
9	M23	Z	.003	.003	0	0
10	M22	Z	.003	.003	0	0
11	M32	Z	.003	.003	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M8	Z	.008	.008	0	0
2	M27	Z	.008	.008	0	0
3	M29	Z	.008	.008	0	0
4	M30	Z	.008	.008	0	0
5	M28	Z	.008	.008	0	0
6	M24	Z	.008	.008	0	0
7	M26	Z	.008	.008	0	0
8	M25	Z	.008	.008	0	0
9	M23	Z	.008	.008	0	0
10	M22	Z	.008	.008	0	0
11	M32	Z	.008	.008	0	0

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.004	-.004	1.334	4.001
2	M15	Y	-.0004265	-.002	0	1.635
3	M15	Y	-.002	-.003	1.635	3.271
4	M16	Y	-.0004619	-.002	0	1.635
5	M16	Y	-.002	-.003	1.635	3.271
6	M5	Y	-.006	-.002	1.334	4.001
7	M19	Y	-.0004198	-.002	0	1.635
8	M19	Y	-.002	-.003	1.635	3.271
9	M20	Y	-.0004265	-.002	0	1.635
10	M20	Y	-.002	-.003	1.635	3.27
11	M3	Y	-.006	-.002	1.334	4.001

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
12	M17	Y	-.0004619	-.002	0	1.635
13	M17	Y	-.002	-.003	1.635	3.27
14	M18	Y	-.0004199	-.002	0	1.635
15	M18	Y	-.002	-.003	1.635	3.271

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	DL		-1						
2	Equipment Weight	None					27		3	
3	Ice Weight	None					27			
4	Wind w/ Ice X	None					20	8		
5	Wind X	None					20	8		
6	Wind w/ Ice Z	None					22	11		
7	Wind Z	None					22	11		
8	BLC 2 Transient Area Loads	None						15		

Load Combinations

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

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	.017	4	2.63	6	.419	3	0	6	0	6	0	6
2		min	-1.385	2	.88	2	-2.001	5	0	1	0	1	0	1
3	N3	max	.738	4	2.63	3	.927	2	0	6	0	6	0	6
4		min	-1.594	2	.53	5	-1.527	4	0	1	0	1	0	1
5	N5	max	-.534	6	2.361	6	-.411	3	0	6	0	6	0	6
6		min	-2.22	1	.141	2	-1.191	4	0	1	0	1	0	1
7	Totals:	max	0	5	7.353	6	0	3						
8		min	-5.15	1	2.632	2	-4.662	5						

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	1.131e-02	6	2.775e-03	2	-1.328e-04	5
2		min	0	1	0	1	0	1	3.79e-03	2	-2.757e-04	4	-3.225e-03	1
3	N2	max	.046	2	-.068	2	0	5	8.595e-03	6	1.341e-03	2	-1.328e-04	5
4		min	-.005	4	-.204	6	0	3	2.884e-03	2	-2.59e-04	4	-3.225e-03	1
5	N3	max	0	6	0	6	0	6	1.188e-03	5	1.201e-03	2	-2.274e-03	5
6		min	0	1	0	1	0	1	-5.576e-03	3	-1.316e-03	4	-9.849e-03	3
7	N4	max	.01	4	-.024	5	.018	4	1.46e-03	5	1.197e-03	2	-1.802e-03	5
8		min	-.011	2	-.204	3	-.02	2	-4.218e-03	3	-3.284e-04	4	-7.504e-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
9	N5	max	0	6	0	6	0	6	1.124e-03	5	9.414e-04	2	8.611e-03	6
10		min	0	1	0	1	0	1	-4.565e-03	3	6.588e-05	3	-2.02e-03	2
11	N6	max	0	6	.029	2	.017	2	1.395e-03	5	1.204e-03	2	6.495e-03	6
12		min	-.009	2	-.171	6	.001	6	-3.39e-03	3	-1.774e-04	4	-2.138e-03	2
13	N7	max	.046	2	-.165	2	.009	5	5.732e-03	6	3.679e-04	1	-1.236e-03	5
14		min	-.005	4	-.259	6	-.022	1	2.321e-03	2	-4.49e-04	5	-3.431e-03	1
15	N8	max	.046	2	-.001	2	.023	2	5.602e-03	4	4.007e-04	2	2.154e-03	6
16		min	-.005	4	-.246	6	-.004	4	1.388e-03	2	1.742e-05	6	-2.867e-03	2
17	N9	max	.019	2	-.089	5	.018	4	2.371e-03	5	1.155e-03	2	-2.021e-03	5
18		min	.002	6	-.255	3	-.037	2	-6.75e-04	1	-1.142e-04	4	-6.482e-03	1
19	N10	max	.008	4	.022	5	.019	4	8.314e-04	5	5.866e-04	1	-6.709e-04	5
20		min	-.038	2	-.25	3	-.005	2	-4.609e-03	3	8.759e-05	3	-4.791e-03	1
21	N11	max	.008	4	.021	5	.012	5	1.497e-03	5	6.175e-04	2	2.973e-03	6
22		min	-.038	2	-.205	3	0	3	-4.103e-03	3	-5.915e-04	4	-2.411e-03	2
23	N12	max	.023	1	.066	2	.036	2	1.861e-03	5	1.296e-03	1	5.362e-03	6
24		min	-.012	5	-.233	6	0	4	-4.788e-04	3	-2.063e-04	5	-1.863e-03	2
25	N13	max	.009	4	-.019	5	.02	4	2.223e-03	5	1.397e-03	2	-1.462e-03	5
26		min	-.039	1	-.435	3	-.049	2	-2.997e-03	3	3.105e-05	6	-6.173e-03	1
27	N14	max	.007	4	.072	2	.048	2	2.114e-03	5	1.51e-03	1	4.542e-03	6
28		min	-.039	2	-.349	6	-.003	4	-2.335e-03	3	-5.131e-04	4	-2.557e-03	2
29	N15	max	.195	1	-.018	5	.241	5	4.433e-03	5	1.695e-03	5	3.541e-04	5
30		min	.003	6	-.435	3	-.064	1	-7.275e-04	1	-1.384e-06	3	-4.916e-03	1
31	N16	max	.194	2	.072	2	.21	4	4.289e-03	4	2.871e-03	1	7.909e-04	6
32		min	-.013	6	-.349	6	.012	3	2.927e-04	3	-1.416e-03	5	-4.78e-03	2
33	N17	max	-.061	5	-.019	5	.138	3	2.222e-03	5	1.397e-03	2	-1.462e-03	5
34		min	-.286	1	-.435	3	-.087	5	-2.996e-03	3	3.105e-05	6	-4.986e-03	3
35	N18	max	.218	6	.072	2	.117	3	2.414e-04	5	1.51e-03	1	4.503e-03	6
36		min	-.059	2	-.35	6	-.025	5	-2.314e-03	3	-5.131e-04	4	6.103e-05	2
37	N19	max	.009	4	-.022	5	.019	4	2.199e-03	5	1.371e-03	1	-1.544e-03	5
38		min	-.039	2	-.448	3	-.052	2	-3.002e-03	3	4.668e-05	6	-6.235e-03	1
39	N20	max	.007	4	.078	2	.051	2	2.129e-03	5	1.479e-03	1	4.648e-03	6
40		min	-.039	2	-.36	6	-.004	4	-2.309e-03	3	-5.509e-04	5	-2.611e-03	2
41	N21	max	.001	4	.102	2	.061	2	2.129e-03	5	1.479e-03	1	4.648e-03	6
42		min	-.022	2	-.372	6	-.007	4	-2.309e-03	3	-5.509e-04	5	-2.611e-03	2
43	N22	max	.077	2	-.124	2	.005	2	6.172e-03	6	7.884e-04	1	-1.344e-04	5
44		min	-.014	4	-.446	6	0	4	2.004e-03	2	-2.492e-04	5	-4.054e-03	1
45	N23	max	.077	2	-.176	2	.003	5	6.172e-03	6	7.884e-04	1	-1.344e-04	5
46		min	-.014	4	-.45	6	-.005	1	2.004e-03	2	-2.492e-04	5	-4.054e-03	1
47	N24	max	.011	4	-.057	5	.018	4	2.199e-03	5	1.371e-03	1	-1.544e-03	5
48		min	-.023	2	-.449	3	-.061	2	-3.002e-03	3	4.668e-05	6	-6.235e-03	1
49	N25	max	.077	2	-.15	2	.001	5	6.172e-03	6	7.884e-04	1	-1.344e-04	5
50		min	-.014	4	-.448	6	0	3	2.004e-03	2	-2.492e-04	5	-4.054e-03	1
51	N26	max	.01	4	-.039	5	.019	4	2.199e-03	5	1.371e-03	1	-1.544e-03	5
52		min	-.031	2	-.448	3	-.056	2	-3.002e-03	3	4.668e-05	6	-6.235e-03	1
53	N27	max	.004	4	.09	2	.056	2	2.129e-03	5	1.479e-03	1	4.648e-03	6
54		min	-.03	2	-.366	6	-.006	4	-2.309e-03	3	-5.509e-04	5	-2.611e-03	2
55	N28	max	.084	2	-.173	2	.002	5	6.173e-03	6	7.884e-04	1	-1.339e-04	5
56		min	-.016	4	-.5	6	-.001	1	2.005e-03	2	-2.492e-04	5	-4.053e-03	1
57	N29	max	.006	4	.109	2	.068	2	2.128e-03	5	1.477e-03	1	4.649e-03	6
58		min	-.035	2	-.408	6	-.01	4	-2.31e-03	3	-5.509e-04	5	-2.611e-03	2
59	N30	max	.009	4	-.037	5	.018	4	2.199e-03	5	1.371e-03	1	-1.545e-03	5
60		min	-.039	2	-.5	3	-.065	2	-3.002e-03	3	4.632e-05	6	-6.236e-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
61	N31	max	.084	2	-.16	2	.001	2	6.173e-03	6	7.897e-04	1	-1.349e-04	5
62		min	-.016	4	-.499	6	0	3	2.005e-03	2	-2.492e-04	5	-4.055e-03	1
63	N32	max	.009	4	-.046	5	.018	4	2.198e-03	5	1.371e-03	1	-1.544e-03	5
64		min	-.035	2	-.5	3	-.067	2	-3.003e-03	3	4.668e-05	6	-6.235e-03	1
65	N33	max	.007	4	.104	2	.065	2	2.129e-03	5	1.479e-03	1	4.65e-03	6
66		min	-.039	2	-.405	6	-.009	4	-2.309e-03	3	-5.494e-04	5	-2.61e-03	2
67	N34	max	.046	2	-.139	2	.006	5	6.463e-03	6	7.061e-04	1	-1.585e-03	5
68		min	-.005	4	-.24	6	-.018	1	2.471e-03	2	-3.328e-04	5	-4.11e-03	1
69	N35	max	.046	2	-.016	2	.018	2	6.36e-03	6	7.192e-04	1	2.249e-03	6
70		min	-.005	4	-.231	6	-.003	4	1.772e-03	2	-1.504e-04	4	-2.369e-03	2
71	N36	max	.01	4	.012	5	.018	4	1.209e-03	5	1.202e-03	1	-1.079e-03	5
72		min	-.031	2	-.234	3	-.009	2	-5.299e-03	3	6.347e-05	6	-5.096e-03	1
73	N37	max	.011	2	-.072	5	.018	4	1.933e-03	5	1.374e-03	1	-1.845e-03	5
74		min	.002	6	-.237	3	-.033	2	-9.56e-04	3	3.202e-05	6	-7.075e-03	1
75	N38	max	.014	1	.057	2	.031	2	1.786e-03	5	1.496e-03	1	6.03e-03	6
76		min	-.009	5	-.213	6	0	6	-6.19e-04	3	-4.824e-04	5	-2.08e-03	2
77	N39	max	.004	4	.011	5	.01	5	1.285e-03	5	1.301e-03	1	3.566e-03	6
78		min	-.031	2	-.189	3	0	3	-4.303e-03	3	-5.725e-04	5	-2.127e-03	2
79	N41	max	.008	4	.027	5	.027	4	5.157e-04	5	2.594e-04	5	-1.248e-04	5
80		min	-.038	2	-.212	3	-.001	2	-4.005e-03	3	-3.601e-05	3	-2.791e-03	1
81	N42	max	.196	2	.027	5	.387	5	1.01e-02	5	-7.205e-05	2	-2.122e-04	5
82		min	.005	6	-.212	3	-.111	3	-1.668e-03	3	-6.062e-04	3	-5.003e-03	1
83	N43	max	.052	2	.027	5	.492	4	-1.841e-03	2	2.594e-04	5	3.56e-03	2
84		min	-.038	6	-.212	3	.087	2	-1.36e-02	4	-3.601e-05	3	-8.291e-04	6
85	N44	max	.008	4	.023	5	.014	4	1.533e-03	5	4.117e-04	2	2.067e-03	6
86		min	-.038	2	-.198	3	-.001	2	-4.007e-03	3	-6.702e-04	4	-2.511e-03	2
87	N45	max	.171	2	.023	5	.313	5	7.65e-03	5	1.571e-03	3	1.586e-03	6
88		min	-.022	6	-.198	3	-.084	3	-9.52e-04	3	-1.685e-03	5	-2.862e-03	2
89	N46	max	.101	6	.023	5	.191	3	1.816e-04	5	4.117e-04	2	2.066e-03	6
90		min	-.11	2	-.198	3	-.01	5	-4.004e-03	3	-6.702e-04	4	-1.159e-03	2
91	N47	max	.076	2	-.177	2	.003	5	6.087e-03	6	8.541e-04	2	-1.523e-04	5
92		min	-.013	4	-.438	6	-.006	1	2.028e-03	2	-2.362e-04	4	-4.067e-03	1
93	N48	max	.011	4	-.059	5	.019	4	2.157e-03	5	1.353e-03	1	-1.585e-03	5
94		min	-.021	2	-.437	3	-.059	2	-2.91e-03	3	3.984e-05	6	-6.2e-03	1
95	N49	max	.348	1	-.178	2	.207	4	4.496e-03	4	-3.432e-04	6	-4.043e-05	6
96		min	-.009	5	-.438	6	.012	3	6.676e-04	3	-5.711e-04	4	-4.903e-03	2
97	N50	max	.226	1	-.06	5	.219	5	3.683e-03	5	2.038e-03	1	-6.852e-06	5
98		min	.008	6	-.437	3	-.08	1	-1.02e-03	3	7.382e-04	3	-5.478e-03	1
99	N51	max	-.02	6	-.177	2	-.103	2	5.766e-03	6	8.541e-04	2	-1.522e-04	5
100		min	-.12	1	-.438	6	-.28	6	2.027e-03	2	-2.362e-04	4	-4.064e-03	1
101	N52	max	-.065	5	-.059	5	.131	3	-4.598e-04	5	1.353e-03	1	-1.581e-03	5
102		min	-.24	3	-.437	3	.014	2	-2.884e-03	3	3.984e-05	6	-4.878e-03	3
103	N53	max	.044	2	-.143	5	.013	5	3.481e-03	4	2.493e-04	2	-1.632e-03	5
104		min	0	6	-.227	3	-.023	1	1.488e-03	2	-4.775e-04	4	-3.488e-03	3
105	N54	max	.46	1	-.143	5	.26	4	5.393e-03	4	6.47e-04	2	-1.398e-03	6
106		min	.075	5	-.227	3	.065	2	1.833e-03	3	-8.893e-04	4	-1.005e-02	1
107	N55	max	.365	2	-.143	5	.081	5	2.82e-03	3	2.493e-04	2	1.06e-02	2
108		min	-.146	6	-.227	3	-.139	3	-3.095e-03	5	-4.775e-04	4	-3.041e-03	6
109	N56	max	.023	2	-.093	5	.018	4	2.571e-03	5	1.142e-03	2	-1.933e-03	5
110		min	.002	6	-.243	3	-.035	2	-1.758e-04	1	-1.19e-04	4	-6.036e-03	1
111	N57	max	.366	1	-.093	5	.234	4	3.281e-03	5	3.221e-03	1	-1.993e-03	6
112		min	.087	5	-.243	3	.012	2	-5.546e-04	3	2.978e-04	5	-7.622e-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
113	N58	max	-.084	5	-.093	5	-.012	3	1.219e-03	5	1.142e-03	2	-1.932e-03	5
114		min	-.25	3	-.243	3	-.057	5	-1.757e-04	1	-1.19e-04	4	-5.212e-03	3
115	N59	max	0	6	.1	2	.059	2	2.132e-03	5	1.461e-03	2	4.604e-03	6
116		min	-.019	2	-.364	6	-.007	4	-2.217e-03	3	-5.395e-04	4	-2.677e-03	2
117	N60	max	.076	2	-.115	2	.006	2	6.088e-03	6	8.487e-04	1	-1.069e-04	5
118		min	-.013	4	-.433	6	0	4	1.894e-03	2	-2.761e-04	4	-3.992e-03	1
119	N61	max	.241	2	.1	2	.189	5	3.437e-03	5	3.014e-03	2	4.162e-04	6
120		min	-.014	4	-.364	6	.012	3	-1.787e-04	3	-1.426e-03	4	-5.449e-03	2
121	N62	max	.352	1	-.115	2	.205	4	4.747e-03	4	3.939e-04	6	-1.61e-04	5
122		min	-.01	5	-.433	6	.005	2	1.36e-04	2	-2.031e-04	2	-5.296e-03	1
123	N63	max	.221	6	.1	2	.114	3	7.797e-04	5	1.461e-03	2	4.601e-03	6
124		min	-.148	2	-.364	6	-.06	5	-2.216e-03	3	-5.395e-04	4	-2.676e-03	2
125	N64	max	-.014	6	-.115	2	-.085	2	5.378e-03	6	8.487e-04	1	-1.066e-04	5
126		min	-.037	1	-.433	6	-.265	6	1.889e-03	2	-2.761e-04	4	-2.113e-03	1
127	N65	max	.039	1	.052	2	.026	2	2.365e-03	4	7.996e-04	2	3.88e-03	6
128		min	-.013	5	-.212	6	0	6	7.325e-05	2	9.782e-06	6	-1.444e-03	2
129	N66	max	.409	2	.052	2	.236	4	4.704e-03	4	7.276e-04	2	1.995e-03	6
130		min	-.106	6	-.212	6	-.028	2	-2.324e-03	2	-5.444e-04	6	-9.636e-03	2
131	N67	max	.459	1	.052	2	.113	5	1.079e-03	3	7.996e-04	2	1.267e-02	1
132		min	.063	5	-.212	6	-.049	3	-4.026e-03	5	9.782e-06	6	1.577e-03	5
133	N68	max	.045	2	.009	2	.023	2	4.99e-03	4	2.108e-04	2	2.522e-03	6
134		min	-.006	4	-.233	6	-.004	4	1.051e-03	2	-1.739e-06	3	-2.78e-03	2
135	N69	max	.382	2	.008	2	.223	4	4.508e-03	4	1.653e-03	6	1.125e-03	5
136		min	-.066	6	-.234	6	-.02	2	-1.942e-03	2	-2.478e-04	2	-7.91e-03	1
137	N70	max	.12	6	.009	2	-.027	2	4.354e-03	6	2.108e-04	2	2.52e-03	6
138		min	-.039	2	-.233	6	-.214	6	1.05e-03	2	-1.739e-06	3	-1.427e-03	2
139	N70A	max	.137	2	-.018	5	.188	5	4.252e-03	5	1.695e-03	5	3.541e-04	5
140		min	-.001	6	-.435	3	-.055	1	-7.274e-04	1	-1.384e-06	3	-4.82e-03	1
141	N71	max	.136	2	.072	2	.159	4	4.08e-03	4	2.871e-03	1	7.904e-04	6
142		min	-.004	6	-.349	6	.009	3	2.926e-04	3	-1.416e-03	5	-4.618e-03	2
143	N72	max	.137	2	-.017	5	.184	5	3.45e-03	5	1.777e-03	1	4.183e-04	5
144		min	-.001	6	-.439	3	-.059	1	-1.077e-03	1	3.649e-04	3	-4.923e-03	1
145	N73	max	.136	2	.083	2	.155	4	3.291e-03	5	3.01e-03	1	5.452e-04	6
146		min	-.004	6	-.351	6	.011	3	1.033e-04	3	-1.438e-03	5	-4.783e-03	2
147	N74	max	.17	2	.107	2	.146	4	3.291e-03	5	3.01e-03	1	5.452e-04	6
148		min	-.01	4	-.363	6	.015	3	1.033e-04	3	-1.438e-03	5	-4.783e-03	2
149	N75	max	.288	1	-.12	2	.149	4	4.497e-03	4	2.003e-05	6	-1.314e-04	5
150		min	-.012	5	-.437	6	.002	3	5.12e-04	2	-3.482e-04	2	-4.195e-03	1
151	N76	max	.288	1	-.174	2	.153	5	4.497e-03	4	2.003e-05	6	-1.314e-04	5
152		min	-.012	5	-.441	6	.003	3	5.12e-04	2	-3.482e-04	2	-4.195e-03	1
153	N77	max	.157	2	-.053	5	.173	5	3.45e-03	5	1.777e-03	1	4.183e-04	5
154		min	.004	6	-.44	3	-.07	1	-1.077e-03	1	3.649e-04	3	-4.923e-03	1
155	N78	max	.285	1	-.158	2	.151	5	4.5e-03	4	2.003e-05	6	-1.301e-04	5
156		min	-.015	5	-.454	6	.003	3	5.143e-04	2	-3.482e-04	2	-4.193e-03	1
157	N79	max	.145	2	.135	2	.139	4	3.289e-03	5	3.e-03	1	5.47e-04	6
158		min	-.004	6	-.359	6	.018	3	1.001e-04	3	-1.438e-03	5	-4.782e-03	2
159	N80	max	.137	2	-.013	5	.168	5	3.45e-03	5	1.777e-03	1	4.156e-04	5
160		min	-.001	6	-.454	1	-.076	1	-1.077e-03	1	3.649e-04	3	-4.926e-03	1
161	N81	max	.286	1	-.145	2	.15	5	4.5e-03	4	2.003e-05	6	-1.328e-04	5
162		min	-.015	5	-.453	6	.003	3	5.143e-04	2	-3.386e-04	2	-4.197e-03	1
163	N82	max	.142	2	-.022	5	.166	5	3.448e-03	5	1.777e-03	1	4.17e-04	5
164		min	0	6	-.459	1	-.079	1	-1.08e-03	1	3.649e-04	3	-4.925e-03	1

Envelope Joint Displacements (Continued)

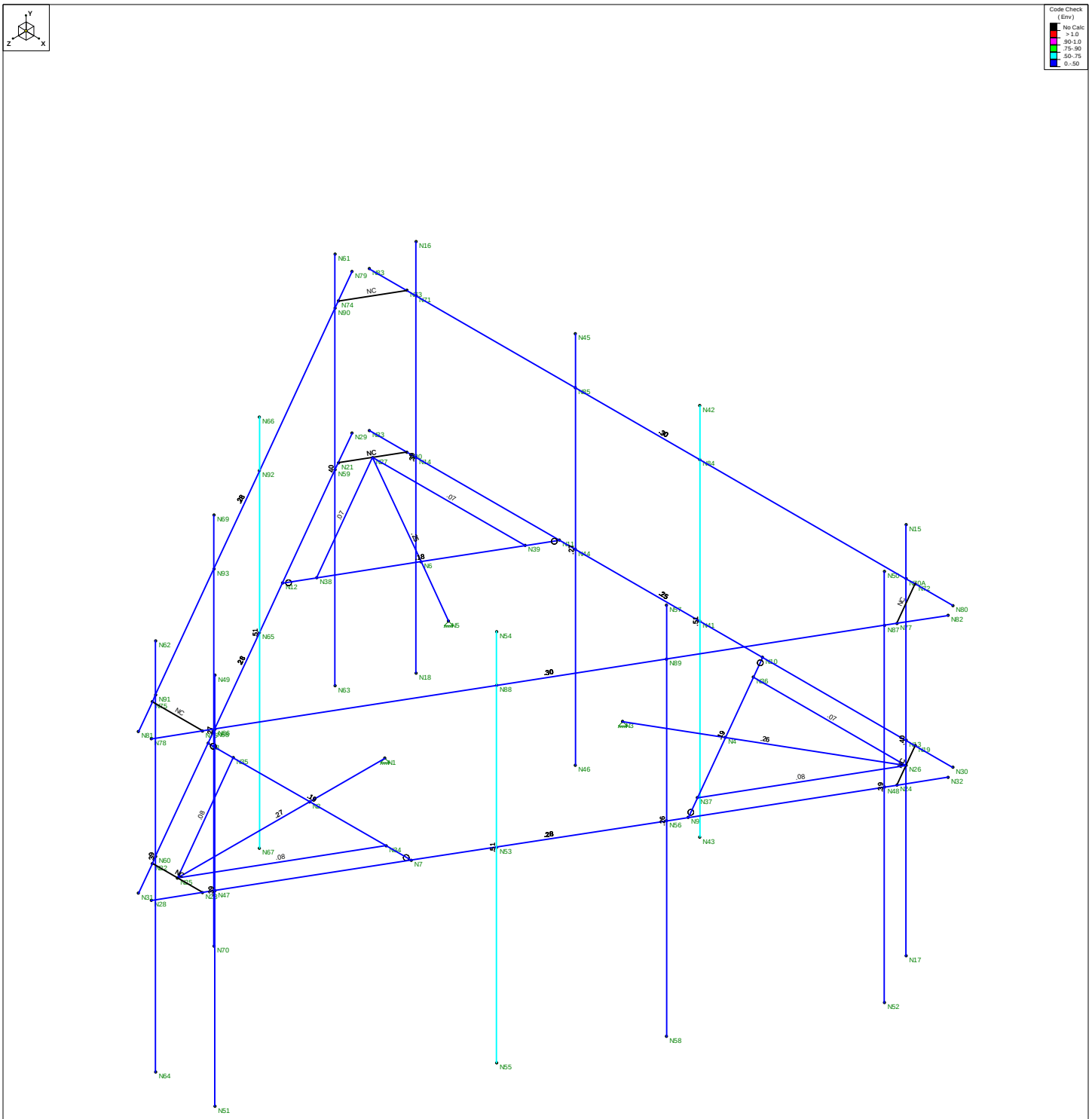
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
165	N83	max	.136	2	.129	2	.142	4	3.291e-03	5	3.01e-03	1	5.488e-04	6
166		min	-.004	6	-.356	6	.017	3	1.033e-04	3	-1.427e-03	5	-4.781e-03	2
167	N84	max	.137	2	.027	5	.266	5	9.823e-03	5	-7.205e-05	2	-2.122e-04	5
168		min	-.002	6	-.212	3	-.091	3	-1.668e-03	3	-6.062e-04	3	-4.892e-03	1
169	N85	max	.136	2	.023	5	.221	5	7.629e-03	5	1.571e-03	3	1.586e-03	6
170		min	-.003	6	-.198	3	-.073	3	-9.52e-04	3	-1.685e-03	5	-2.841e-03	2
171	N86	max	.289	1	-.178	2	.153	5	4.401e-03	4	-3.432e-04	6	-4.041e-05	6
172		min	-.011	5	-.438	6	.004	3	6.674e-04	3	-5.711e-04	4	-4.723e-03	2
173	N87	max	.161	2	-.06	5	.175	5	3.521e-03	5	2.038e-03	1	-6.851e-06	5
174		min	.005	6	-.437	3	-.068	1	-1.02e-03	3	7.382e-04	3	-5.269e-03	1
175	N88	max	.339	1	-.143	5	.195	4	5.283e-03	4	6.47e-04	2	-1.398e-03	6
176		min	.055	5	-.227	3	.032	2	1.833e-03	3	-8.893e-04	4	-9.772e-03	1
177	N89	max	.274	1	-.093	5	.196	4	3.26e-03	5	3.221e-03	1	-1.993e-03	6
178		min	.059	5	-.243	3	-.005	2	-5.546e-04	3	2.978e-04	5	-7.6e-03	1
179	N90	max	.176	2	.1	2	.148	4	3.342e-03	5	3.014e-03	2	4.161e-04	6
180		min	-.013	4	-.364	6	.014	3	-1.786e-04	3	-1.426e-03	4	-5.268e-03	2
181	N91	max	.289	1	-.114	2	.148	4	4.585e-03	4	3.939e-04	6	-1.609e-04	5
182		min	-.011	5	-.433	6	.003	3	1.36e-04	2	-2.031e-04	2	-5.087e-03	1
183	N92	max	.293	2	.052	2	.179	4	4.594e-03	4	7.276e-04	2	1.994e-03	6
184		min	-.082	6	-.212	6	0	2	-2.323e-03	2	-5.444e-04	6	-9.356e-03	2
185	N93	max	.287	2	.008	2	.169	4	4.486e-03	4	1.653e-03	6	1.125e-03	5
186		min	-.063	6	-.234	6	.003	2	-1.942e-03	2	-2.478e-04	2	-7.889e-03	1

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
1	M1	HSS4X4X4	.266	1....	3	.069	0	y	6	128....	139....	16.181	16.181	1.87	H1-...
2	M2	HSS4X4X4	.194	2....	6	.140	3....	y	6	128....	139....	16.181	16.181	1.3...	H1-...
3	M3	HSS4X4X4	.258	1....	3	.069	0	y	3	128....	139....	16.181	16.181	1.88	H1-...
4	M4	HSS4X4X4	.195	2....	3	.139	.498	y	3	128....	139....	16.181	16.181	1.3...	H1-...
5	M5	HSS4X4X4	.247	1....	6	.062	0	y	6	128....	139....	16.181	16.181	1.8...	H1-...
6	M6	HSS4X4X4	.183	2....	6	.129	.498	y	6	128....	139....	16.181	16.181	1.33	H1-...
7	M7	PIPE_3.5	.281	8....	3	.088	4....		6	41.651	78.75	7.954	7.954	2.4...	H1-...
8	M8	PIPE_3.5	.253	8....	6	.089	4....		3	41.651	78.75	7.954	7.954	2.4...	H1-...
9	M9	PIPE_3.5	.279	8....	6	.082	8....		6	41.651	78.75	7.954	7.954	2.44	H1-...
10	M10	PIPE_2.0	.396	4	6	.069	3.5		4	14.916	32.13	1.872	1.872	1.89	H1-...
11	M11	PIPE_2.0	.395	4	3	.053	4		3	14.916	32.13	1.872	1.872	1.8...	H1-...
12	M15	L2x2x3	.076	3....	6	.008	3....	y	6	15.071	29.891	.713	1.584	2.2...	H2-1
13	M16	L2x2x3	.079	3....	6	.008	3....	y	6	15.071	29.891	.713	1.584	2.2...	H2-1
14	M17	L2x2x3	.073	3.27	3	.008	3.27	y	3	15.072	29.891	.713	1.584	2.2...	H2-1
15	M18	L2x2x3	.081	3....	3	.008	3....	y	3	15.072	29.891	.713	1.584	2.2...	H2-1
16	M19	L2x2x3	.065	3....	6	.007	3....	y	6	15.072	29.891	.713	1.584	2.3...	H2-1
17	M20	L2x2x3	.072	3.27	6	.008	3.27	y	6	15.072	29.891	.713	1.584	2.2...	H2-1
18	M21	PIPE_2.5	.513	4	4	.047	7		4	30.038	50.715	3.596	3.596	1.7...	H1-...
19	M22	PIPE_2.0	.269	4	4	.060	4		3	14.916	32.13	1.872	1.872	1.69	H1-...
20	M23	PIPE_2.0	.392	4	3	.067	3.5		1	14.916	32.13	1.872	1.872	1.64	H1-...
21	M24	PIPE_2.0	.392	4	6	.054	4		4	14.916	32.13	1.872	1.872	1.9...	H1-...
22	M25	PIPE_2.5	.513	4	1	.044	7		2	30.038	50.715	3.596	3.596	1.5...	H1-...
23	M26	PIPE_2.0	.261	4	6	.059	4		6	14.916	32.13	1.872	1.872	1.9...	H1-...
24	M27	PIPE_2.0	.404	4	3	.068	3.5		1	14.916	32.13	1.872	1.872	1.9	H1-...
25	M28	PIPE_2.0	.389	4	3	.047	1		6	14.916	32.13	1.872	1.872	1.74	H1-...

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...		phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
26	M29	PIPE_2.5	.509	4	1	.039	4	1	30.038	50.715	3.596	3.596	1.4...	H1-...
27	M30	PIPE_2.0	.270	4	1	.053	7	6	14.916	32.13	1.872	1.872	1.7...	H1-...
28	M31	PIPE_2.0	.302	11...	6	.259	.911	2	6.295	32.13	1.872	1.872	3.2...	H1-...
29	M32	PIPE_2.0	.300	11...	3	.296	.911	4	6.295	32.13	1.872	1.872	3.2...	H1-...
30	M33	PIPE_2.0	.284	11...	6	.350	11...	1	6.295	32.13	1.872	1.872	3.5...	H1-...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CTHA507A	July 20, 2020 at 1:52 PM
20074.57	Unity Check	Mount.r3d

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CTHA507A

Town of Wethersfield Monopole
254 Silas Deane Highway
Wethersfield, Connecticut 06109

August 7, 2020

EBI Project Number: 6220003721

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**18.29%**

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

August 7, 2020

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

Emissions Analysis for Site: CTHA507A - Town of Wethersfield Monopole

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **254 Silas Deane Highway** 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 254 Silas Deane Highway 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) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

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

4) 4 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 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.

6) 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.

7) 2 LTE channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

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

9) 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.

10) 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.

11) The antennas used in this modeling are the Ericsson AIR 32 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 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.

12) The antenna mounting height centerline of the proposed antennas is 105 feet above ground level (AGL).

13) 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.

14) 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 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz
Gain:	15.35 dBd / 15.35 dBd	Gain:	15.35 dBd / 15.35 dBd	Gain:	15.35 dBd / 15.35 dBd
Height (AGL):	105 feet	Height (AGL):	105 feet	Height (AGL):	105 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):	8,226.43	ERP (W):	8,226.43	ERP (W):	8,226.43
Antenna A1 MPE %:	**2.68%**	Antenna B1 MPE %:	**2.68%**	Antenna C1 MPE %:	**2.68%**
Antenna #:	2	Antenna #:	2	Antenna #:	2
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 / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd
Height (AGL):	105 feet	Height (AGL):	105 feet	Height (AGL):	105 feet
Channel Count:	9	Channel Count:	9	Channel Count:	9
Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts
ERP (W):	11,055.53	ERP (W):	11,055.53	ERP (W):	11,055.53
Antenna A2 MPE %:	**5.44%**	Antenna B2 MPE %:	**5.44%**	Antenna C2 MPE %:	**5.44%**
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd
Height (AGL):	105 feet	Height (AGL):	105 feet	Height (AGL):	105 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts
ERP (W):	25,651.93	ERP (W):	25,651.93	ERP (W):	25,651.93
Antenna A3 MPE %:	**8.36%**	Antenna B3 MPE %:	**8.36%**	Antenna C3 MPE %:	**8.36%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	16.49%
Verizon	0.63%
Metro PCS	0.04%
Town	0.51%
Nextel	0.62%
Site Total MPE % :	18.29%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	16.49%
T-Mobile Sector B Total:	16.49%
T-Mobile Sector C Total:	16.49%
Site Total MPE % :	18.29%

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 1900 MHz LTE	2	2056.61	105.0	13.41	1900 MHz LTE	1000	1.34%
T-Mobile 1900 MHz LTE	2	2056.61	105.0	13.41	1900 MHz LTE	1000	1.34%
T-Mobile 600 MHz LTE	2	591.73	105.0	3.86	600 MHz LTE	400	0.96%
T-Mobile 600 MHz NR	1	1577.94	105.0	5.15	600 MHz NR	400	1.29%
T-Mobile 700 MHz LTE	2	648.82	105.0	4.23	700 MHz LTE	467	0.91%
T-Mobile 1900 MHz LTE	2	2203.69	105.0	14.37	1900 MHz LTE	1000	1.44%
T-Mobile 2100 MHz UMTS	2	1294.56	105.0	8.44	2100 MHz UMTS	1000	0.84%
T-Mobile 2500 MHz LTE	2	6412.98	105.0	41.82	2500 MHz LTE	1000	4.18%
T-Mobile 2500 MHz NR	2	6412.98	105.0	41.82	2500 MHz NR	1000	4.18%
						Total:	**16.49%**

• 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:	16.49%
Sector B:	16.49%
Sector C:	16.49%
T-Mobile Maximum MPE % (Sector A):	16.49%
Site Total:	18.29%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **18.29%** 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.