1 INDUSTRIAL AVE,
S TE 3
M HWAH NJ 07430

P NE: 201.684.0055
F : 201.684.0066

Transcend Wireless

June 17, 2022

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

RE: Notice of Exempt Modification
2 Westwoods Drive, Farmington, CT 06032
Latitude: 41.4238
Longitude: -72.5253
T-Mobile Site#: CTHA112A - Anchor

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 116' level and three (3) antennas at the 126' level of the 150' flagpole tower located at 2 Westwoods Drive in Farmington, CT. The tower is owned by Phoenix Tower International. The property is owned by the Town of Farmington Southwest Fire Department. T-Mobile now intends to replace six (6) of its existing antennas with six (6) N600/L600/L700 antennas. The new antennas would be installed at the same 116' and 126' level of the tower. The new antennas support 5G services.

**Planned Modifications:**
**Tower:**
Install New:
(3) Commscope FVV-65B-R3 Antennas
(3) Commscope VV-65A-R1 Antennas
(3) Radio 4460 B2 B25
(3) Radio 8863 B41
(3) Commscope Smart BIAST-ATSBT
(12) ⅞" Coax Cables

To Be Removed:
(3) APX16DWV Antennas
(3) APXVAA24 Antennas
(3) Radio 4415 B66A
(3) Radio 4415 B25

All TMAs and Diplexers

To Remain:
(3) Radio 4449 B71 B85A
(18) ⅞" Coax Cables

Ground Work:
**Install** (1) 6160 Cabinet and (1) B160 Battery Cabinet.

This flagpole tower was originally approved by the Connecticut Siting Council in Docket No. 480 dated May 10, 2018. There will be no expansion of height or ground space that will break any conditions provided in the docket.

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 Town Manager Kathleen Blonski, Elected Official, and Shannon Rutherford, Town Planner, as well as the property and tower owner.

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

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

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

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

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

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

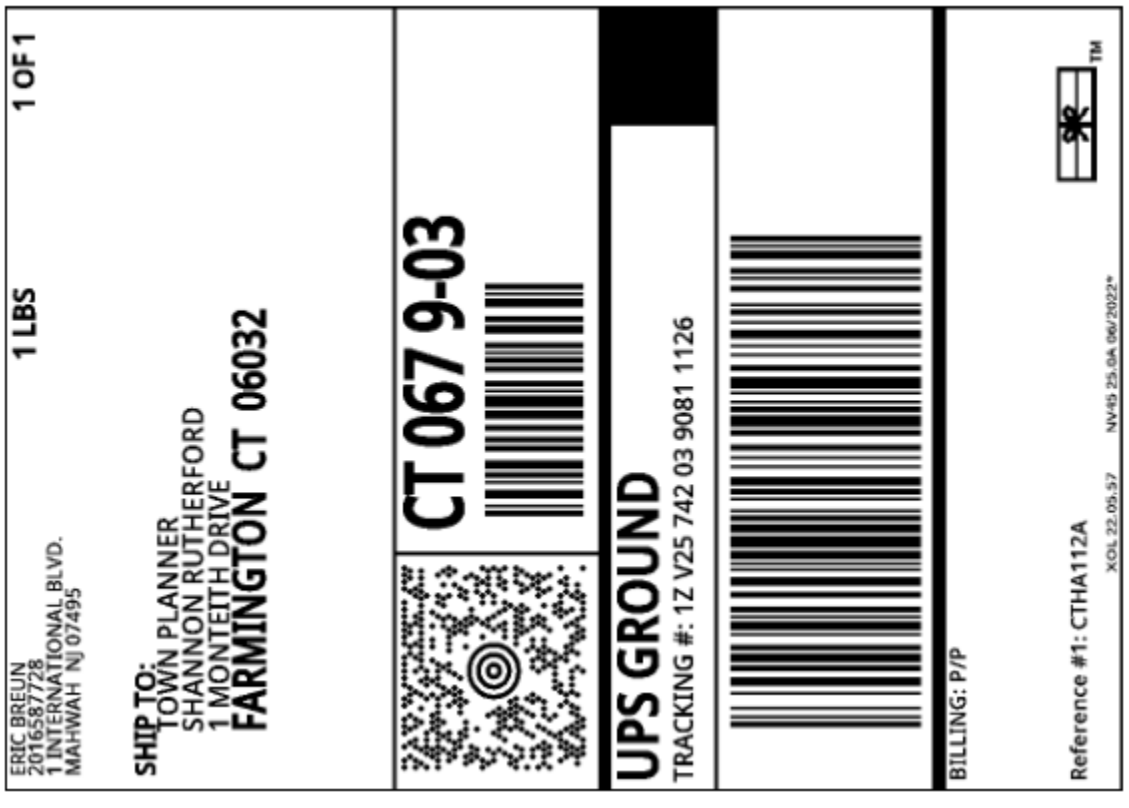
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

**Eric Breun**
Transcend Wireless
Cell: 201-658-7728
Email: ebreun@transcendwireless.com

Attachments
cc: Kathleen Blonski - Town Manager of Farmington
Shannon Rutherford - Town Planner
Phoenix Towers - Tower Owner
Farmington Fire Department Southwest Fire House - Property Owner



ERIC BREUN
2016587728
1 INTERNATIONAL BLVD.
MAHWAH NJ 07495

1 LBS

1 OF 1

**SHIP TO:**
PHOENIX TOWER INTERNATIONAL
SUITE 100
999 YAMATO ROAD
**BOCA RATON FL 33431**

FL 332 6-06

**UPS GROUND**

TRACKING #: 1Z V25 742 03 9026 5137

BILLING: P/P

Reference #1: CTHA112A

XOL 22.05.57 NV45 25.0A 06/2022*

ERIC BREUN
2016587728
1 INTERNATIONAL BLVD.
MAHWAH NJ 07495

1 LBS

1 OF 1

**SHIP TO:**
SOUTHWEST FIRE HOUSE
FARMINGTON FIRE DEPARTMENT
2 WESTWOODS DRIVE
**FARMINGTON CT 06032**

CT 067 9-03

**UPS GROUND**

TRACKING #: 1Z V25 742 03 9549 8618

BILLING: P/P

Reference #1: CTHA112A

XOL 22.05.57 NV45 25.0A 06/2022*

**Hello, your package has been delivered.**

**Delivery Date:** Wednesday, 06/15/2022

**Delivery Time:** 11:01 AM

**Signed by:** NANCY

## TRANSCEND WIRELESS

| | |
|---|---|
| **Tracking Number:** | 1ZV257420390811126 |
| **Ship To:** | SHANNON RUTHERFORD<br>1 MONTEITH DRIVE<br>FARMINGTON, CT 06032<br>US |
| **Number of Packages:** | 1 |
| **UPS Service:** | UPS Ground |
| **Package Weight:** | 1.0 LBS |
| **Reference Number:** | CTHA112A |

**Hello, your package has been delivered.**

**Delivery Date:** Wednesday, 06/15/2022

**Delivery Time:** 11:01 AM

**Signed by:** NANCY

## TRANSCEND WIRELESS

| | |
|---|---|
| **Tracking Number:** | 1ZV257420398268601 |
| **Ship To:** | KATHLEEN BLONSKI<br>1 MONTEITH DRIVE<br>FARMINGTON, CT 06032<br>US |
| **Number of Packages:** | 1 |
| **UPS Service:** | UPS Ground |
| **Package Weight:** | 1.0 LBS |
| **Reference Number:** | CTHA112A |

**Hello, your package has been delivered.**

**Delivery Date:** Wednesday, 06/15/2022

**Delivery Time:** 12:39 PM

**Experience UPS My Choice® Premium Today**

Be in total control of how, when and where your packages are delivered.

Upgrade to Premium Now

Set Delivery Instructions | Manage Preferences | V

**TRANSCEND WIRELESS**

| | |
|---|---|
| **Tracking Number:** | 1ZV257420395498618 |
| **Ship To:** | FARMINGTON FIRE DEPARTMENT<br>2 WESTWOODS DRIVE<br>FARMINGTON, CT 06032<br>US |
| **Number of Packages:** | 1 |
| **UPS Service:** | UPS Ground |
| **Package Weight:** | 1.0 LBS |
| **Reference Number:** | CTHA112A |

Your shipment

**1ZV257420390265137**

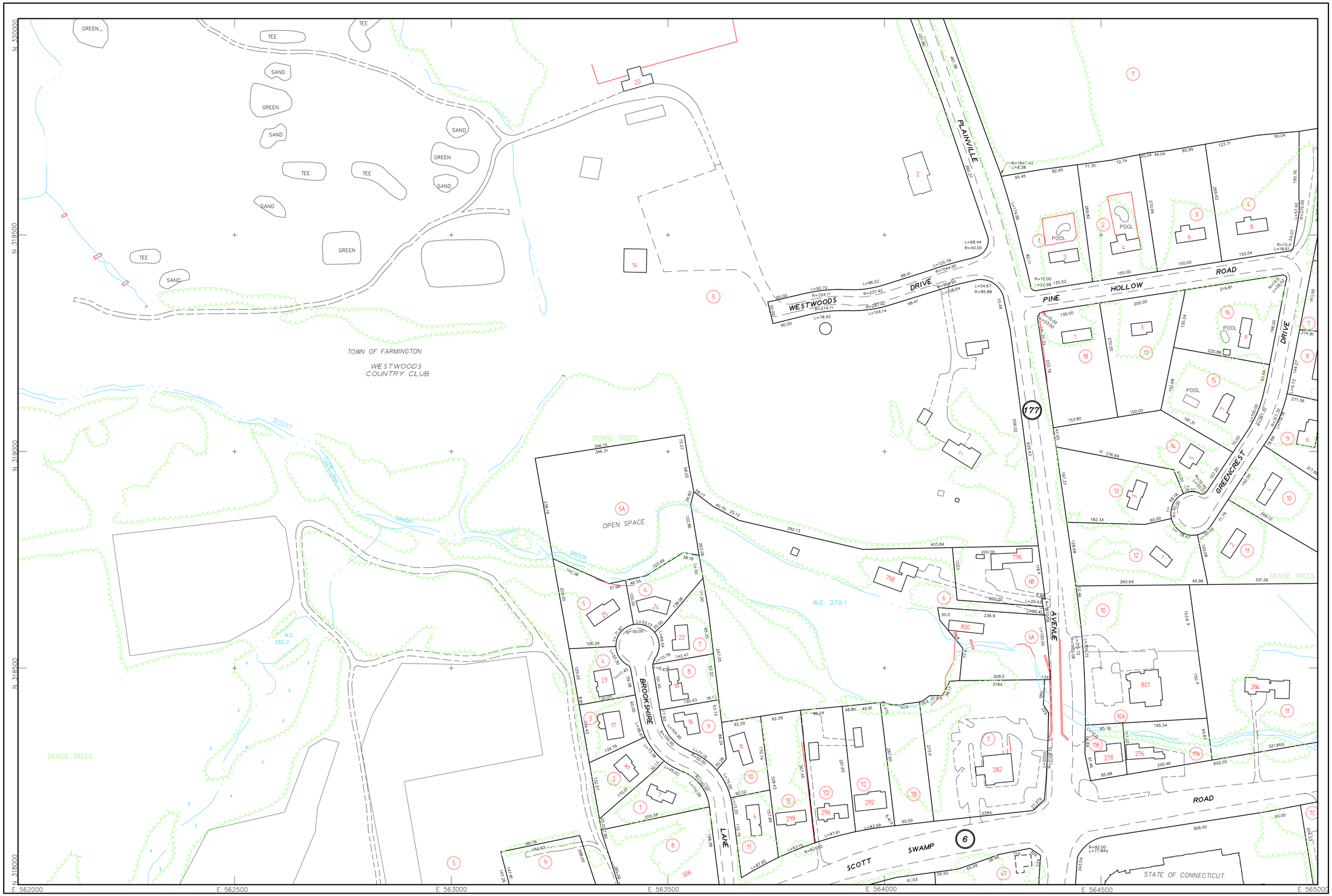
Estimated delivery

# Friday, June 17 by 7:00 P.M.

- Label Created
- **On the Way**
- Out for Delivery
- Delivery

**Ship To**

BOCA RATON, FL US




THESE ASSESSOR MAPS ARE NOT LAND RECORD MAPS AND SHOULD NOT BE USED FOR DEED DESCRIPTION OR REFERENCE. REPORT ANY INACCURACIES TO THE OFFICE OF THE TOWN ENGINEER. ALL AVENUES, STREETS, ROADS AND LANES ARE SHOWN WHETHER ACCEPTED, PROPOSED OR DEDICATED BY DEED.

THE 500 FOOT GRID IS BASED ON THE CONNECTICUT STATE PLANE COORDINATE SYSTEM (N.A. DATUM OF 1927)

NATIONAL GEODETIC DATUM OF 1929

MAPPING CONFORMS TO NATIONAL MAP ACCURACY STANDARDS

DIGITAL PHOTOGRAMMATIC MAPPING BY: QUINN ASSOCIATES, HORSHAM, PA. DATE OF PHOTOGRAPHY MARCH 19,1990. CONTOUR INTERVALS ARE 2 FEET.

## LEGEND

- 8 – ASSESSOR NUMBER
- × 385.6 SPOT ELEV.
- LEDGE
- TRAFFIC SIGNAL
- IRON PIN
- MON
- VALVE
- BENCHMARK
- CATCH BASIN
- HAND HOLE
- FP FLAG POLE
- MANHOLE
- HYDRANT
- POST
- FLOW ARROW
- WELL
- R.R. SWITCH
- LIGHT POLE
- POLE
- SWAMP
- SHRUB
- CTREE
- DTREE
- CULVERT
- LIGHT PEDESTAL
- R.R. CATENARY SUPPORT
- EDGE OF PAVEMENT
- DRIVEWAY
- SIDEWALK
- GUARD RAIL
- FENCE
- RETAINING WALL
- RAILROAD
- WATERCOURSE
- TREE LINE
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- DEPRESSION CONTOUR
- 300 CONTOUR LABEL
- WETLAND

KEY MAP

# TOWN OF FARMINGTON

ASSESSOR'S OFFICE

*1 MONTEITH DRIVE, FARMINGTON, CONNECTICUT 06032*
*PHONE: (860) 675-2370 FAX: (860) 675-2376*

100 0 100 200 300 400
SCALE 1"=100'

*MAP PREPARED AND MAINTAINED BY:*
*DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION*

# ASSESSOR'S MAP

OF THE
*TOWN OF FARMINGTON*
*HARTFORD COUNTY, CONNECTICUT*

SHEET NO:

125 OF 162

DATE PRINTED: FEBRUARY 2020

# Town of Farmington, CT

## Property Listing Report

| Map Block Lot | 125 5 | Building # | 1 | Unique Identifier | 21450002 |
|---|---|---|---|---|---|

## Property Information

| | |
|---|---|
| Property Location | 2 WESTWOODS DR |
| Mailing Address | FARMINGTON CT 06032 |
| Land Use | Fire Station - Staffed |
| Zoning Code | R40 |
| Neighborhood | 99 |

| | |
|---|---|
| Owner | FARMINGTON TOWN OF |
| Co-Owner | SOUTHWEST FIRE HOUSE |
| Book / Page | 0274/1075 |
| Land Class | Commercial |
| Census Tract | 4602 |
| Acreage | 0 |

## Valuation Summary

(Assessed value = 70% of Appraised Value)

| Item | Appraised | Assessed |
|---|---|---|
| Buildings | 1406878 | 984810 |
| Outbuildings | 0 | 0 |
| Land | 0 | 0 |
| Total | 1406878 | 984810 |

## Utility Information

| | |
|---|---|
| Electric | No |
| Gas | No |
| Sewer | No |
| Public Water | No |
| Well | No |


## Primary Construction Details

| | |
|---|---|
| Year Built | 2000 |
| Building Desc. | Commercial |
| Building Style | |
| Stories | 1 |
| Exterior Walls | Horizontal Board |
| Exterior Walls 2 | |
| Interior Walls | Drywall |
| Interior Walls 2 | |
| Interior Floors 1 | Concrete |
| Interior Floors 2 | Hardwood |

| | |
|---|---|
| Heating Fuel | Natural Gas |
| Heating Type | FHA |
| AC Type | Central |
| Bedrooms | 0 |
| Full Bathrooms | 0 |
| Half Bathrooms | 0 |
| Extra Fixtures | 0 |
| Total Rooms | 0 |
| Bath Style | NA |
| Kitchen Style | |
| Occupancy | 0 |

| | |
|---|---|
| Building Use | Fire Station - Staffed |
| Building Condition | Good |
| Frame Type | B |
| Fireplaces | 0 |
| Bsmt Gar | 0 |
| Fin Bsmt Area | |
| Fin Bsmt Quality | |
| Building Grade | 0 |
| Roof Style | Gable |
| Roof Cover | Arch Shingles |

Report Created On 6/6/2022

# Town of Farmington, CT

**Property Listing Report** | Map Block Lot **125 5** | Building # **1** | Unique Identifier **21450002**

## Detached Outbuildings

| Type | Description | Area (sq ft) | Condition | Year Built |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |

## Attached Extra Features

| Type | Description | Area (sq ft) | Condition | Year Built |
|---|---|---|---|---|
| Canopy | Comm Canopy | 91 | Good | 2000 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## Sales History

| Owner of Record | Book/ Page | Sale Date | Sale Price |
|---|---|---|---|
| FARMINGTON TOWN OF | 0274_1075 | 4/9/1980 | 0 |

Report Created On **6/6/2022**

| | | |
|---|---|---|
| **DOCKET NO. 480** – SectorSite LLC and T-Mobile Northeast, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a telecommunications facility on town-owned property behind the Southwest Fire Station located at 2 Westwoods Drive, Farmington, Connecticut. | } | Connecticut |
| | } | Siting |
| | } | Council |
| | | May 10, 2018 |

**Decision and Order**

Pursuant to Connecticut General Statutes §16-50p, and the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, maintenance, and operation of a telecommunications facility, including effects on the natural environment, ecological balance, public health and safety, scenic, historic, and recreational values, agriculture, forests and parks, air and water purity, and fish, aquaculture and wildlife are not disproportionate, either alone or cumulatively with other effects, when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to SectorSite LLC, hereinafter referred to as the Certificate Holder, for a telecommunications facility at 2 Westwoods Drive, Farmington, Connecticut.

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

1. The tower shall be constructed as a flagpole at a height of 130 feet above ground level to provide the proposed wireless services, sufficient to accommodate the antennas of T-Mobile Northeast, LLC and other entities, both public and private. The height of the tower may be extended after the date of this Decision and Order pursuant to regulations of the Federal Communications Commission.

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Farmington for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
    a) final site plan(s) for development of the facility that employ the governing standard in the State of Connecticut for tower design in accordance with the currently adopted International Building Code and include specifications for the tower, tower foundation, antennas and equipment compound including, but not limited to, fencing, radio equipment, access road, utility installation and emergency backup power source;
    b) construction plans for site clearing, grading, landscaping, water drainage and stormwater control, and erosion and sedimentation controls consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended;
    c) deployment of standard Department of Energy and Environmental Protection measures to reduce the potential for impacts to box turtles and spotted turtles during construction; and
    d) hours of construction.

3. Prior to the commencement of operation, the Certificate Holder shall provide the Council worst-case modeling of the electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of the electromagnetic radio frequency power density be submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

6. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed with at least one fully operational wireless telecommunications carrier providing wireless service within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The Certificate Holder shall provide written notice to the Executive Director of any schedule changes as soon as is practicable.

7. Any request for extension of the time period referred to in Condition 6 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of Farmington.

8. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council within 90 days from the one year period of cessation of service. The Certificate Holder may submit a written request to the Council for an extension of the 90 day period not later than 60 days prior to the expiration of the 90 day period.

9. Any nonfunctioning antenna, and associated antenna mounting equipment, on this facility shall be removed within 60 days of the date the antenna ceased to function.

10. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction, and the commencement of site operation.

11. The Certificate Holder shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v.

12. This Certificate may be transferred in accordance with Conn. Gen. Stat. §16-50k(b), provided both the Certificate Holder/transferor and the transferee are current with payments to the Council for their respective annual assessments and invoices under Conn. Gen. Stat. §16-50v. In addition, both the Certificate Holder/transferor and the transferee shall provide the Council a written agreement as to the entity responsible for any quarterly assessment charges under Conn. Gen. Stat. §16-50v(b)(2) that may be associated with this facility.

13. The Certificate Holder shall maintain the facility and associated equipment, including but not limited to, the tower, tower foundation, antennas, equipment compound, radio equipment, access road, utility line and landscaping in a reasonable physical and operational condition that is consistent with this Decision and Order and a Development and Management Plan to be approved by the Council.

14. If the Certificate Holder is a wholly-owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the Certificate Holder within 30 days of the sale and/or transfer.

15. This Certificate may be surrendered by the Certificate Holder upon written notification and approval by the Council.

We hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed in the Service List, dated December 28, 2017, and notice of issuance published in the Valley Press.

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

# T-Mobile

# SITE NAME: CTHA112/FARMINGTONSWFD_RL

# SITE ID: CTHA112A

# 2 WESTWOODS DR
# FARMINGTON, CT 06032

| T-MOBILE A/L TEMPLATE (PROVIDED BY RFDS) |
|---|
| 67G5C998G_10+1QUADDIPLEXER |

| T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS) |
|---|
| 67G5C998G 6160 |

## GENERAL NOTES

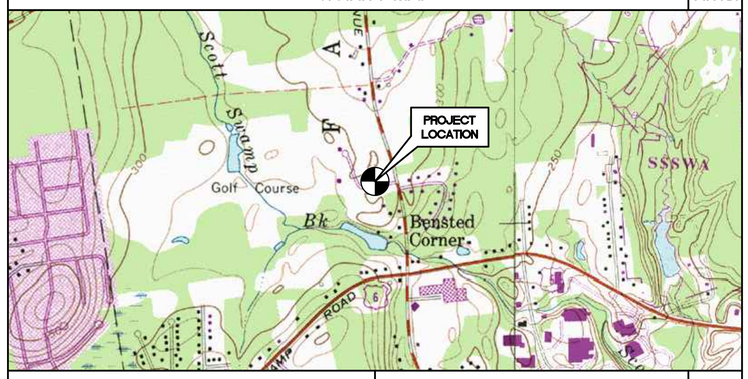
1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. 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.
4. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE, WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
5. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
6. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS, AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
14. 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.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. 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 AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK
22. 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.
23. 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.
24. 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.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. 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.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

## SITE LOCATION MAP

N.T.S.


## VICINITY MAP

N.T.S.




COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH.

SITE COORDINATES: LATITUDE: 41°-42'-38" N
LONGITUDE: 72°-52'-53" W
GROUND ELEVATION: ±93' AMSL

NORTH

## PROJECT SUMMARY

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

1. REMOVE EXISTING RFS: APX16DWV-16DWV-S-E-A20 ANTENNA, TYP. (1) PER SECTOR, TOTAL OF (3)
2. REMOVE EXISTING RFS: APXVAA24_43-U-A20 ANTENNA, TYP. (1) PER SECTOR, TOTAL OF (3)
3. REMOVE EXISTING RADIO 4415 B66A, TYP. (1) PER SECTOR. TOTAL OF (3)
4. REMOVE ALL TMA AND DIPLEXER
5. REMOVE EXISTING RADIO 4415 B25, TYP. (1) PER SECTOR. TOTAL OF (3)
6. EXISTING 125A CIRCUIT BREAKER TO BE REMOVED AND REPLACED WITH NEW 100A CIRCUIT BREAKER TO SERVE EXISTING EQUIPMENT
7. INSTALL (4) 7/8" COAX CABLES PER SECTOR, TO BE A TOTAL OF (30)
8. INSTALL COMMSCOPE: FVV-65B-R3 ANTENNA, TYP. (1) PER SECTOR, TOTAL OF (3)
9. INSTALL COMMSCOPE: VV-65A-R1, TYP. (1) PER SECTOR, TOTAL OF (3)
10. INSTALL COMMSCOPE: SMART BIAST, TYP. (1) PER SECTOR, TOTAL OF (3)
11. INSTALL (1) RADIO 8863 B41, TYP. (1). TOTAL OF (3)
12. INSTALL (1) RADIO 4460 B25+B66, TYP. (1). TOTAL OF (3)
13. INSTALL 6160 POWER ENCLOSURE
14. INSTALL B160 BATTERY CABINET
15. INSTALL NEW 100A CIRCUIT BREAKER TO SERVE NEW EQUIPMENT

## PROJECT INFORMATION

| | |
|---|---|
| SITE NAME: | CTHA112/FARMINGTONSWFD_RL |
| SITE ID: | CTHA112A |
| SITE ADDRESS: | 2 WESTWOODS DR<br>FARMINGTON, CT 06032 |
| APPLICANT: | T-MOBILE NORTHEAST, LLC<br>35 GRIFFIN ROAD SOUTH<br>BLOOMFIELD, CT. 06002 |
| CONTACT PERSON: | DAN REID (PROJECT MANAGER)<br>TRANSCEND WIRELESS, LLC<br>(203) 592-8291 |
| ENGINEER OF RECORD: | CENTEK ENGINEERING, INC.<br>63-2 NORTH BRANFORD ROAD<br>BRANFORD, CT. 06405<br><br>CARLO F. CENTORE, PE<br>(203) 488-0580 EXT. 122 |
| SITE COORDINATES: | LATITUDE: 41°-42'-38" N<br>LONGITUDE: 72°-52'-53" W<br>GROUND ELEVATION: ±93' AMSL<br><br>SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH. |

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T-MOBILE NORTHEAST LLC

SITE NAME: CTHA112/FARMINGTONSWFD_RL
SITE ID: CTHA112A
2 WESTWOODS DR
FARMINGTON, CT 06032

DATE: 03/11/22
SCALE: AS NOTED
JOB NO. 22022.14

TITLE SHEET

T-1

SHEET NO. 1 OF 8

# NOTES AND SPECIFICATIONS:

## DESIGN BASIS:

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

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED: 97 MPH (Vult)
  (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

## SITE NOTES

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

## GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. 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.
4. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE, WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
5. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
6. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS, AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
14. 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.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. 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 AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK
22. 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.
23. 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.
24. 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.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. 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.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

## 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.

## ANTENNA/APPURTENANCE SCHEDULE

| SECTOR | EXISTING/PROPOSED | ANTENNA | SIZE (INCHES) (L x W x D) | ANTENNA ℄ HEIGHT | AZIMUTH | (E/P) RRU (QTY) | (E/P) TMA (QTY) | (QTY) PROPOSED HYBRID/COAX |
|---|---|---|---|---|---|---|---|---|
| A1 | PROPOSED | COMMSCOPE (FVV-65B-R3) | 71.9 x 11.8 x 7.1 | 126' | 30° | (E) RADIO 4449 B71+B85 (1), (P) RADIO 4460 B25+B66 (1) | (P) COMMSCOPE - SMART BIAST-ATSBT-TOP-MF-4G | (4) 7/8" COAX CABLE |
| A2 | PROPOSED | COMMSCOPE (VV-65A-R1) | 54.7 x 12.1 x 4.6 | 116' | 30° | (P) RADIO 8863 B41 (1) | | |
| | | | | | | | | |
| B1 | PROPOSED | COMMSCOPE (FVV-65B-R3) | 71.9 x 11.8 x 7.1 | 126' | 150° | (E) RADIO 4449 B71+B85 (1), (P) RADIO 4460 B25+B66 (1) | (P) COMMSCOPE - SMART BIAST-ATSBT-TOP-MF-4G | (4) 7/8" COAX CABLE |
| B2 | PROPOSED | COMMSCOPE (VV-65A-R1) | 54.7 x 12.1 x 4.6 | 116' | 150° | (P) RADIO 8863 B41 (1) | | |
| | | | | | | | | |
| C1 | PROPOSED | COMMSCOPE (FVV-65B-R3) | 71.9 x 11.8 x 7.1 | 126' | 270° | (E) RADIO 4449 B71+B85 (1), (P) RADIO 4460 B25+B66 (1) | (P) COMMSCOPE - SMART BIAST-ATSBT-TOP-MF-4G | (4) 7/8" COAX CABLE |
| C2 | PROPOSED | COMMSCOPE (VV-65A-R1) | 54.7 x 12.1 x 4.6 | 116' | 270° | (P) RADIO 8863 B41 (1) | | |

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

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T-MOBILE NORTHEAST LLC

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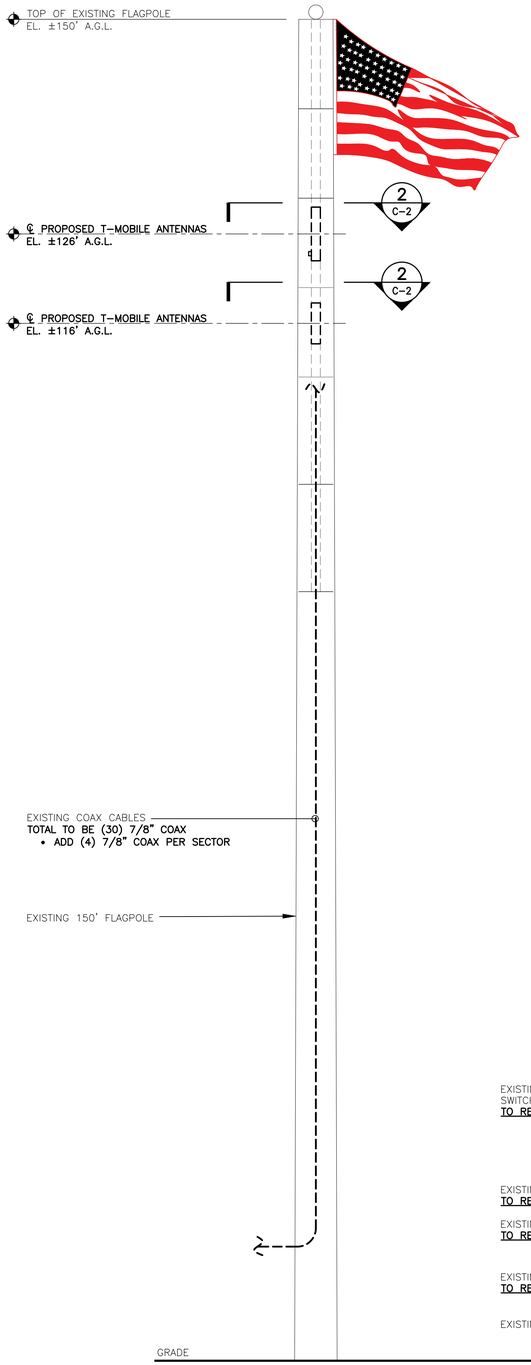
DATE: 03/11/22
SCALE: AS NOTED
JOB NO. 22022.14

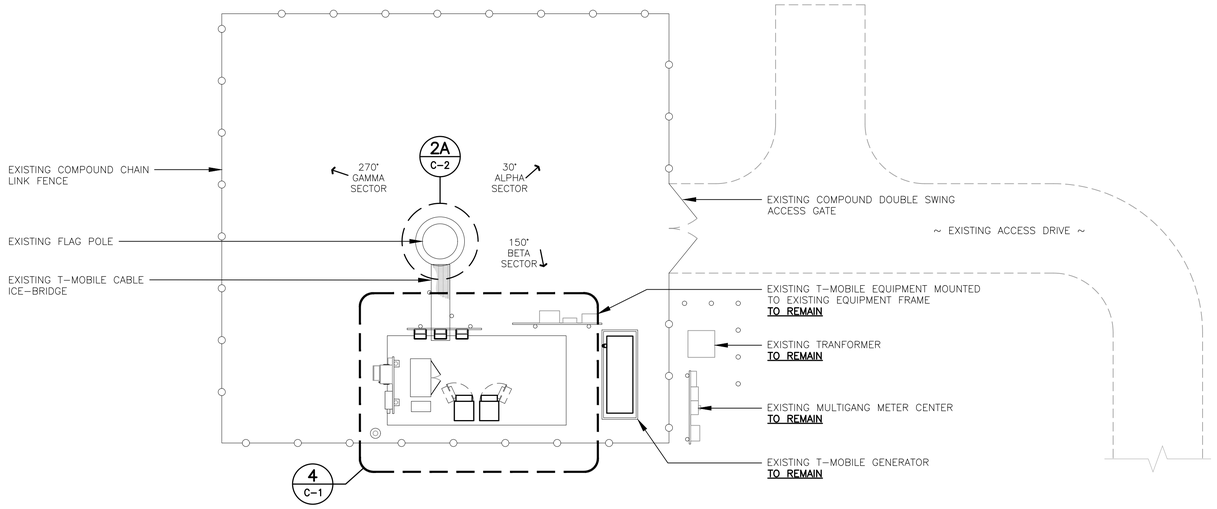
NOTES AND SPECIFICATIONS, ANT. SCHEDULE

N-1

SHEET NO. 2 OF 8

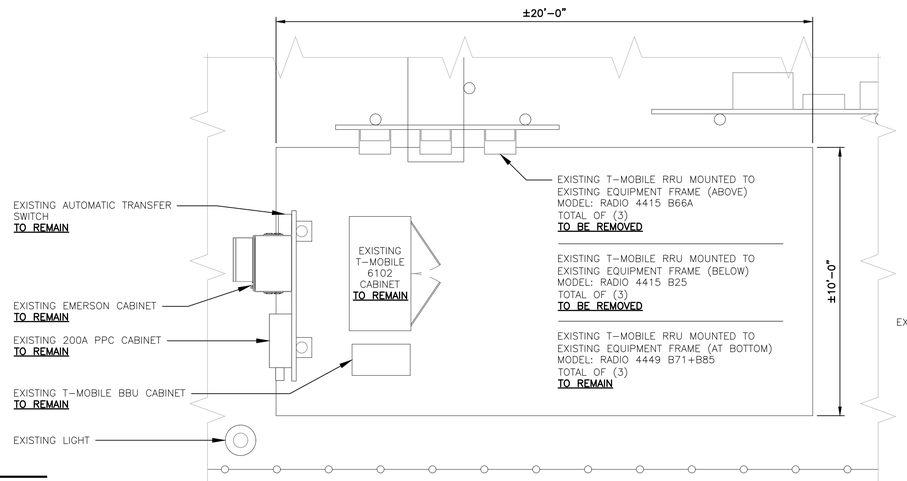



1 C-1 **FLAGPOLE ELEVATION - PROPOSED**
SCALE: 1" = 8'

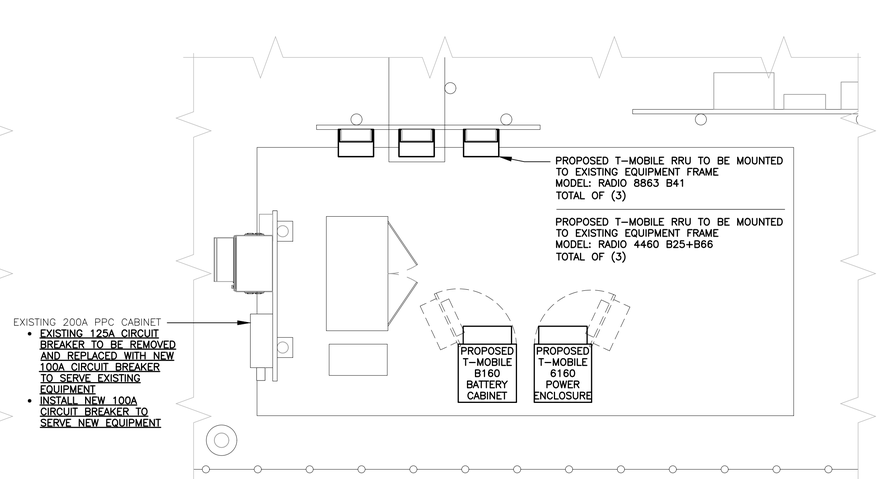



2 C-1 **COMPOUND PLAN - PROPOSED**
SCALE: 1" = 8'
TRUE NORTH

NOTE: ANTENNAS NOT SHOWN FOR CLARITY




3 C-1 **EQUIPMENT PLAN - EXISTING**
SCALE: 3/8" = 1'
TRUE NORTH




4 C-1 **EQUIPMENT PLAN - PROPOSED**
SCALE: 3/8" = 1'
TRUE NORTH

**STRUCTURAL COMPLIANCE**

FLAG POLE

A STRUCTURAL ANALYSIS IS TO BE COMPLETED "BY OTHERS" OF THE FLAG POLE. NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT "BY OTHERS".

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.

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T-MOBILE NORTHEAST LLC

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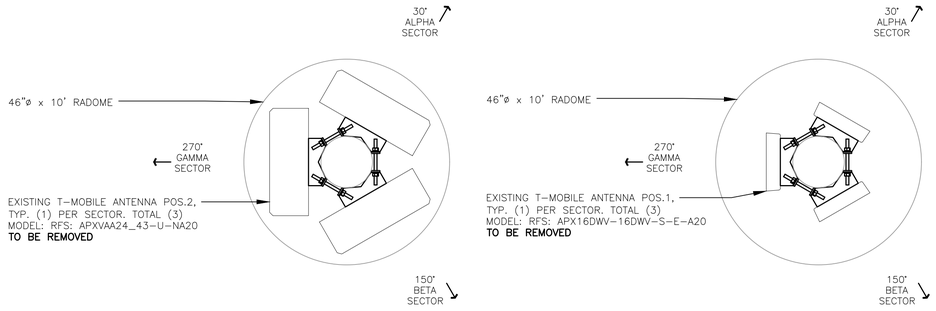
| | |
|---|---|
| DATE: | 03/11/22 |
| SCALE: | AS NOTED |
| JOB NO. | 22022.14 |

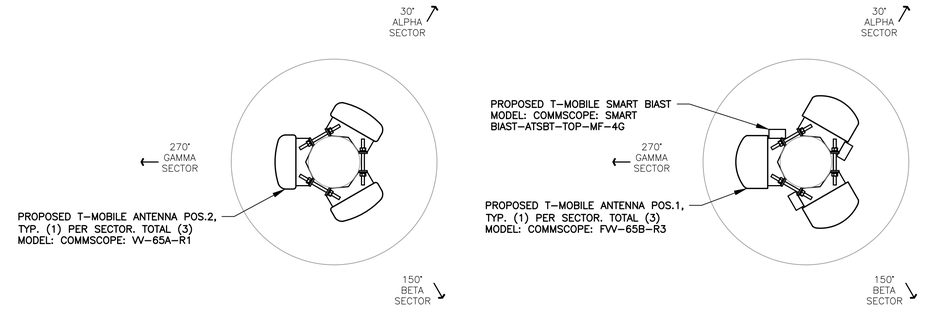
COMPOUND PLAN, EQUIPMENT PLANS, AND ELEVATION

C-1

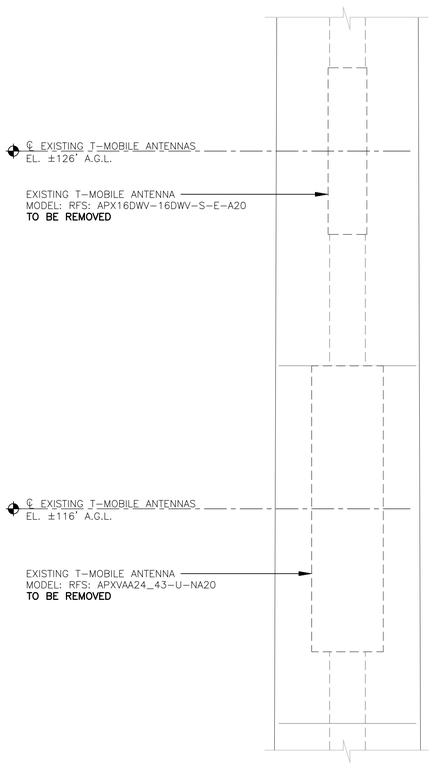
SHEET NO. 3 OF 8



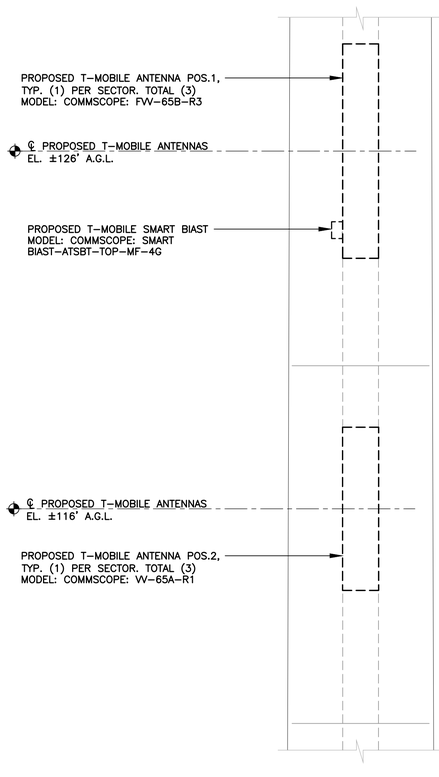

1 / C-2 **ANTENNA PLAN - EXISTING**
SCALE: 3/4" = 1'
TRUE NORTH




2 / C-2 **ANTENNA PLAN - PROPOSED**
SCALE: 3/4" = 1'
TRUE NORTH




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




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

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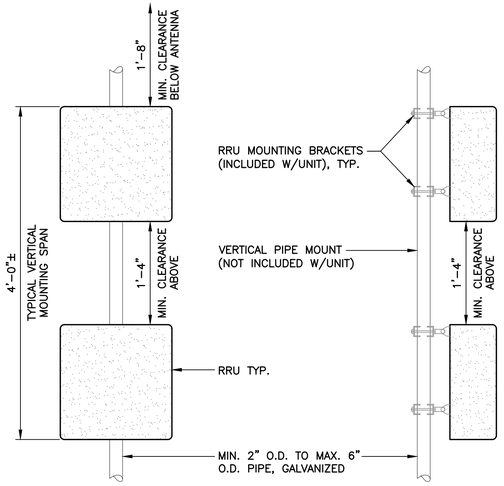
ANTENNA PLANS AND ELEVATIONS

C-2

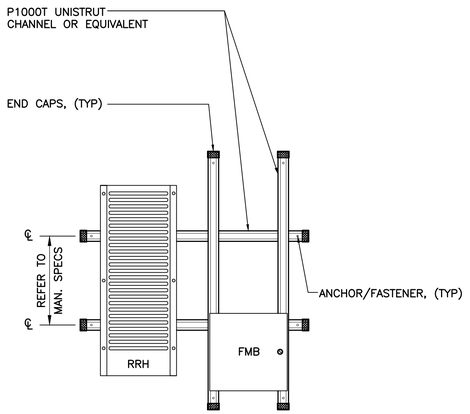
SHEET NO. 4 OF 8




FRONT ELEVATION SIDE ELEVATION

NOTES: (PIPE MOUNTING)

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.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.




FRONT ELEVATION

NOTES: (UNISTRUT MOUNTING)

1. INSTALL A MINIMUM OF (2) ANCHORS PER UNISTRUT (± 16"o/c MIN).
2. MOUNT RRU TO UNISTRUT WITH 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET.
3. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

## 1 C–3 TYPICAL RRU MOUNTING DETAILS

SCALE: NOT TO SCALE

FVV-65B-R3

VV-65A-R1

| ALPHA/BETA/GAMMA ANTENNA | | |
|---|---|---|
| EQUIPMENT | DIMENSIONS | WEIGHT |
| MAKE: COMMSCOPE<br>MODEL: FVV–65B–R3 | 71.9"L x 11.8"W x 7.1"D | ±43 LBS. |
| MAKE: COMMSCOPE<br>MODEL: VV–65A–R1 | 54.7"L x 12.08"W x 4.6"D | ±23 LBS. |
| NOTES:<br>1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING. | | |

## 2 C–3 PROPOSED ANTENNA DETAIL

SCALE: NOT TO SCALE

RADIO 4460 B25+B66

RADIO 8863

| RRU (REMOTE RADIO UNIT) | | | |
|---|---|---|---|
| EQUIPMENT | DIMENSIONS | WEIGHT | CLEARANCES |
| MAKE: ERICSSON<br>MODEL: RADIO 4460 B25+B66 | 19.6"L x 15.7"W x 12.1"D | ±109 LBS. | BEHIND ANT.: 8" MIN.<br>BELOW ANT.: 20" MIN.<br>BELOW RRU: 16" MIN. |
| MAKE: ERICSSON<br>MODEL: RADIO 8863 | 18.5"L x 14.5"W x 5.5"D | ±51 LBS. | BEHIND ANT.: 8" MIN.<br>BELOW ANT.: 20" MIN.<br>BELOW RRU: 16" MIN. |
| NOTES:<br>1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING. | | | |

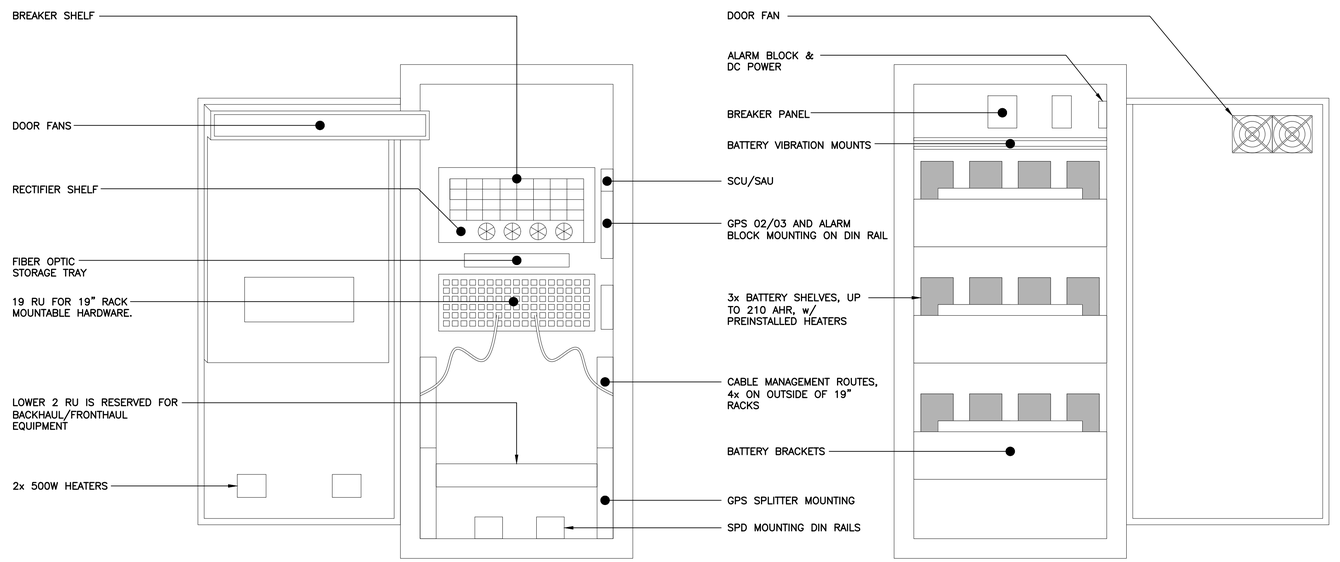
## 3 C–3 PROPOSED RRU DETAIL

SCALE: NOT TO SCALE


| ANDREW SMART BIAS-TEE | | |
|---|---|---|
| EQUIPMENT | DIMENSIONS | WEIGHT |
| MAKE: COMMSCOPE<br>MODEL: ATSBT–TOP–MF–4G | 5.63"L x 3.7"W x 2"D | ±1.7 LBS. |
| NOTES:<br>1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING. | | |

## 4 C–3 PROPOSED BIAS-TEE DETAIL

SCALE: NOT TO SCALE




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

## 5 C–3 ENCLOSURE 6160 CABINET DETAIL

SCALE: NOT TO SCALE

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

## 6 C–3 BATTERY B160 CABINET DETAIL

SCALE: NOT TO SCALE

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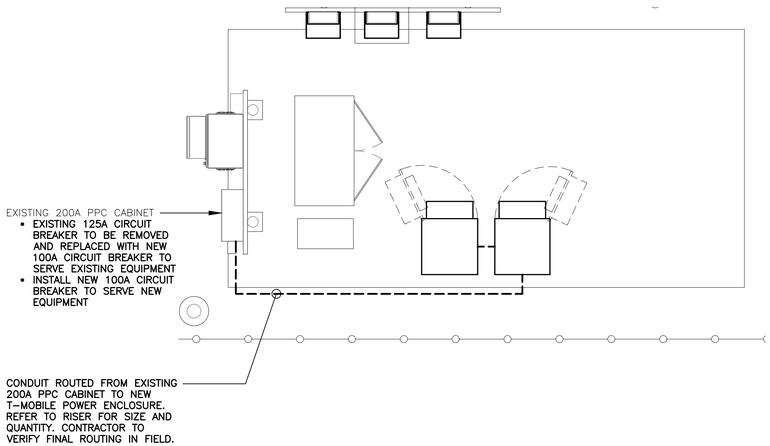
TYPICAL EQUIPMENT DETAILS

C-3

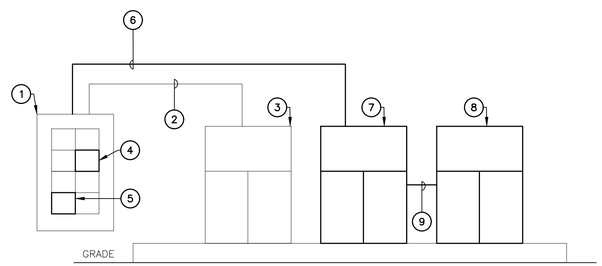
SHEET NO. 5 OF 8




1 / E-1 **ELECTRICAL CONDUIT ROUTING PLAN**
SCALE: 1/4" = 1'

## RISER DIAGRAM NOTES

1. EXISTING 200A, 120/240V, SINGLE PHASE PPC CABINET TO REMAIN.
2. EXISTING CONDUITS AND CONDUCTORS TO REMAIN.
3. EXISTING EQUIPMENT CABINET TO REMAIN.
4. EXISTING 125A/2P CIRCUIT BREAKER SERVING EXISTING EQUIPMENT CABINET TO BE REMOVED AND REPLACED WITH NEW 100A/2P CIRCUIT BREAKER. COORDINATE CABINET DOWNGRADE WITH CONSTRUCTION MANAGER.
5. NEW 100A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.
6. (3) #1 AWG, (1) #8 AWG GROUND, 1-1/2" CONDUIT.
7. NEW RADIO EQUIPMENT CABINET.
8. NEW BATTERY CABINET.
9. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.




2 / E-1 **ELECTRICAL POWER RISER DIAGRAM**
SCALE: NOT TO SCALE

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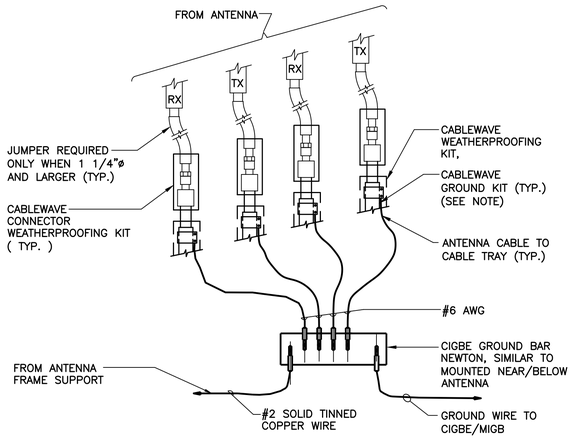
ELECTRICAL DIAGRAM AND CONDUIT ROUTING

E-1

SHEET NO. 6 OF 8

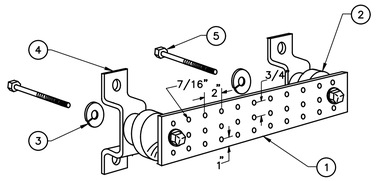



**NOTES:**

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

## 1 E-2 CONNECTION OF GROUND WIRES TO GROUND BAR

SCALE: NOT TO SCALE

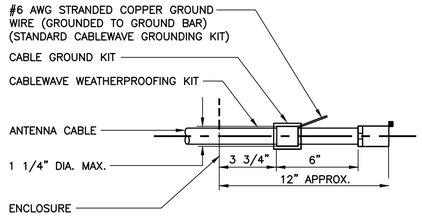



## NOTES

1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

## 2 E-2 GROUND BAR DETAIL

SCALE: NOT TO SCALE

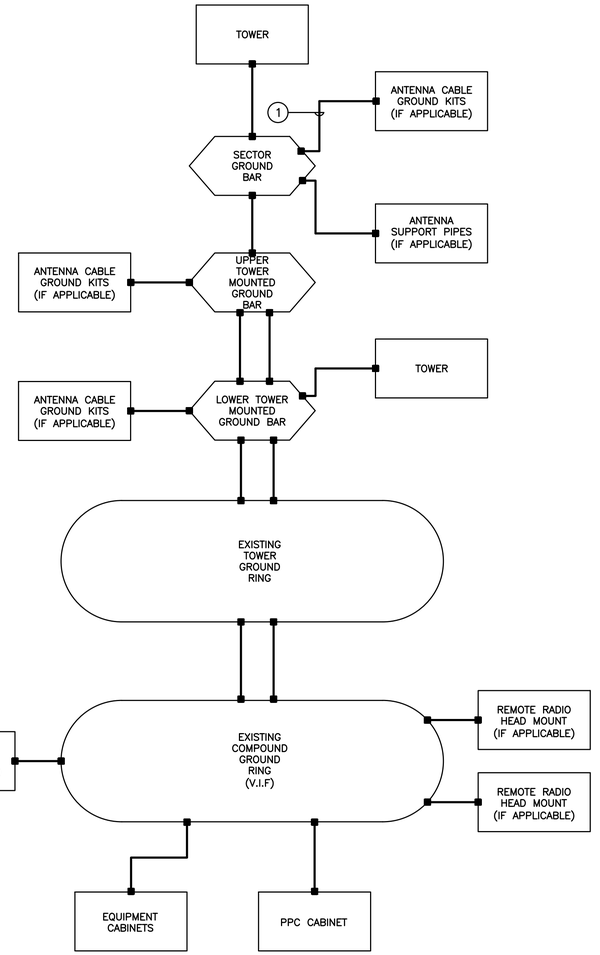


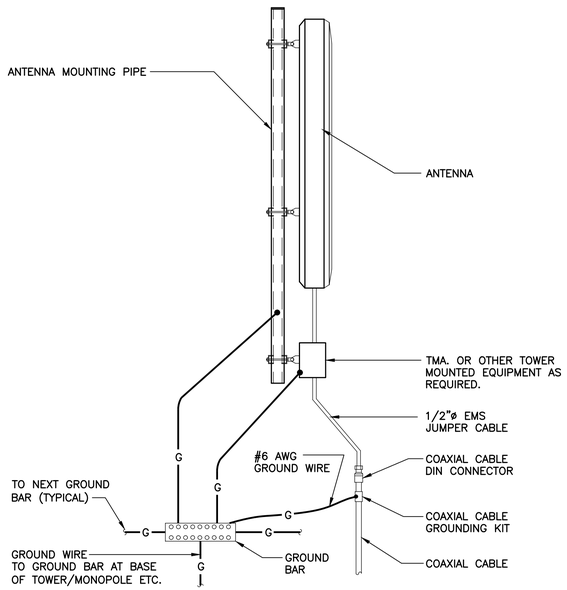

**NOTES:**

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

## 3 E-2 ANTENNA CABLE GROUNDING DETAIL

SCALE: NOT TO SCALE



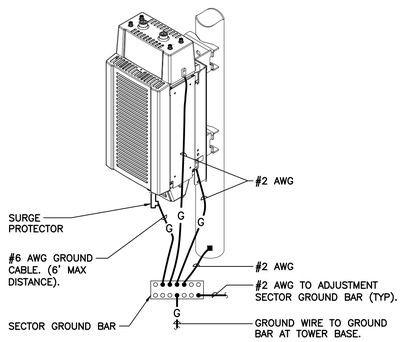




## 4 E-2 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE

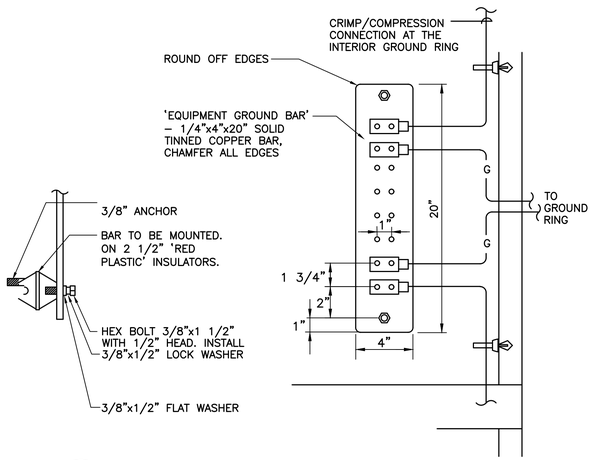
EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:

1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.




## 5 E-2 RRH POLE MOUNT GROUNDING

SCALE: NOT TO SCALE




## 6 E-2 EQUIPMENT GROUND BAR DETAIL

SCALE: NOT TO SCALE

## GROUNDING SCHEMATIC NOTES

#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. BOND CABLE TRAY SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
7. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
8. ALL ROOF MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
9. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

## 7 E-2 ELECTRICAL SCHEMATIC DIAGRAM

SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E-2

SHEET NO. 7 OF 8

# ELECTRICAL SPECIFICATIONS

## SECTION 16010

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR THE SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

F. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

G. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

H. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

I. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

J. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

K. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

L. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

M. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.

2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

N. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

## SECTION 16111

1.01. CONDUITS

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.

B. THE INTERIOR OF RACEWAYS/ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION, INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

C. CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.

D. PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS

E. ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

### CONDUIT SCHEDULE SECTION 16111

| CONDUIT TYPE | NEC REFERENCE | APPLICATION | MIN. BURIAL DEPTH (PER NEC TABLE 300.5) [2,3] |
|---|---|---|---|
| EMT | ARTICLE 358 | INTERIOR CIRCUITING, EQUIPMENT ROOMS, SHELTERS | N/A |
| RMC, RIGID GALV. STEEL | ARTICLE 344, 300.5, 300.50 | ALL INTERIOR/ EXTERIOR CIRCUITING, ALL UNDERGROUND INSTALLATIONS. | 6 INCHES |
| PVC, SCHEDULE 40 | ARTICLE 352, 300.5, 300.50 | INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE. [1] | 18 INCHES |
| PVC, SCHEDULE 80 | ARTICLE 352, 300.5, 300.50 | INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE SUBJECT TO PHYSICAL DAMAGE. [1] | 18 INCHES |
| LIQUID TIGHT FLEX. METAL | ARTICLE 350 | SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS. | N/A |
| FLEX. METAL | ARTICLE 348 | SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS. | N/A |

[1] PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

[2] UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, DRIVEWAYS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".

[3] WHERE SOLID ROCK PREVENTS COMPLIANCE WITH MINIMUM COVER DEPTHS, WIRING SHALL BE INSTALLED IN PERMITTED RACEWAY FOR DIRECT BURIAL. THE RACEWAY SHALL BE COVERED BY A MINIMUM OF 2" OF CONCRETE EXTENDING DOWN TO ROCK.

## SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

| | 120/208/240V | 277/480V |
|---|---|---|
| LINE | COLOR | COLOR |
| A | BLACK | BROWN |
| B | RED | ORANGE |
| C | BLUE | YELLOW |
| N | CONTINUOUS WHITE | GREY |
| G | CONTINUOUS GREEN | GREEN WITH YELLOW STRIPE |

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

## SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

## SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH - INTERMATIC #FF15M (INTERIOR LIGHTS)

2. DUPLEX RECEPTACLE - P&S #2095 (GFCI) SPECIFICATION GRADE

3. SINGLE POLE SWITCH - P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE

4. DUPLEX RECEPTACLE - P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES - ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

## SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

## SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

## SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

## SECTION 16450

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.

2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.

2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.

3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 10 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS

2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).

3. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

## SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

## SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

## SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.

2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.

3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

## SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE CONNECTED TO THE PANELBOARDS SO THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

| REV. | DATE | DRAWN BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| 0 | 06/08/22 | JLD | TJR | CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION |

PROFESSIONAL ENGINEER SEAL

T-Mobile

Transcend Wireless


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


T-MOBILE NORTHEAST LLC

SITE NAME: CTHA112/FARMINGTONSWFD_RL
SITE ID: CTHA112A
2 WESTWOODS DR
FARMINGTON, CT 06032

DATE: 03/11/22
SCALE: AS NOTED
JOB NO. 22022.14

ELECTRICAL SPECIFICATIONS

E-3

SHEET NO. 8 OF 8

Date: **May 19, 2022**

Mikel Hamrick
Phoenix Tower International
999 Yamato Road, Suite 100
Boca Raton, FL 33431
(304) 546-4404

Tower Engineering Professionals, Inc.
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
structures@tepgroup.net

**Subject: Structural Analysis Report**

| | | |
|---|---|---|
| **Carrier Designation:** | ***T-Mobile* Reconfiguration** | |
| | **Carrier Site Number & Name:** | CTHA112A |
| | **Carrier Project Number/Name:** | Anchor Project |
| ***Phoenix Tower Designation:*** | **PTI Site Number:** | US-CT-1061 |
| | **PTI Site Name:** | Farmington |
| ***Engineering Firm Designation:*** | **TEP Project Number:** | 313160.700943 |
| ***Site Data:*** | **2 Westwoods Drive, Farmington, Hartford County, CT 06032**<br>**Latitude *41° 42' 37.34",* Longitude *-72° 52' 54.69"***<br>**130 Foot - Flagpole Tower** | |

Dear Mikel Hamrick,

*Tower Engineering Professionals, Inc.* is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

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

LC1: Existing + Proposed + Future Loading **Sufficient Capacity – 65.4%**
Note: See Table 1 for the existing, proposed, and future loading

| Structure Capacity | Foundation Capacity |
|---|---|
| 44.1% | 65.4% |

The analysis has been performed in accordance with the ANSI/TIA-222-H-2017 Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures (per client request) and the 2018 Connecticut State Building Code.

All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Table 1 and the attached drawings for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals, Inc.,* appreciate the opportunity of providing our continuing professional services to you and *Phoenix Tower International*. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Magdalena Wielgus, E.I.

Respectfully submitted by:

STATE OF CONNECTICUT
AARON THOMAS RUCKER
32608
LICENSED
PROFESSIONAL ENGINEER

Aaron T. Rucker, P.E.

05/19/2022

## TABLE OF CONTENTS

## 1) INTRODUCTION

This tower is a 130-ft flagpole tower designed by TransAmerican in September of 2018. The tower was originally designed for a basic wind speed of 94 mph with 1.0-inch radial ice thickness per TIA-222-G-2 for the appurtenances listed in Table 3. All other information provided to TEP was assumed to be accurate and complete.

## 2) ANALYSIS CRITERIA

| | |
|---|---|
| **TIA-222 Revision:** | TIA-222-H |
| **Risk Category:** | II |
| **Wind Speed:** | 121 mph |
| **Exposure Category:** | C |
| **Topographic Category:** | 1 (Kzt = 1.0) |
| **Ice Thickness:** | 2.0 in |
| **Wind Speed with Ice:** | 50 mph |
| **Seismic Design Category:** | B |
| **Seismic Ss:** | 0.183 |
| **Seismic S1:** | 0.064 |
| **Service Wind Speed:** | 60 mph |

**Table 1 - Existing, Proposed, and Future Antenna and Cable Information**

| Existing/ Proposed | Elevation | Qty | Antenna Model | Mount Type | Qty Coax | Coax Size (in) | Coax Location | Owner/ Tenant |
|---|---|---|---|---|---|---|---|---|
| ***Future*** | ***126*** | ***-*** | ***T-Mobile Future Loading[1]*** | ***-*** | ***-*** | ***-*** | ***-*** | ***T-Mobile*** |
| ***Proposed*** | ***126*** | ***3*** | ***Commscope FVV-65B-R3*** | Pipe Mounts | ***6*** | ***7/8*** | ***Inside*** | ***T-Mobile*** |
| | | ***3*** | ***Ericsson Radio 4460*** | | | | | |
| | | ***3*** | ***Ericsson Radio 4449*** | | | | | |
| | | ***3*** | ***Commscope ATSBT-TOP-MF-4G*** | | | | | |
| Existing | 126 | - | - | | 24 | 7/8 | Inside | T-Mobile |
| *To Be Removed* | *125* | *3* | *Unknown Antennas* | - | - | - | - | *T-Mobile* |
| ***Proposed*** | ***116*** | ***3*** | ***Commscope VV-65A-R1*** | ***Pipe Mounts*** | ***-*** | ***-*** | ***-*** | ***T-Mobile*** |
| | | ***3*** | ***Ericsson Radio 8863*** | | | | | |

Notes:
1) T-Mobile Future Loading consists of 0.00 $in^2$ of wind area and (0) feed lines at the 126-ft level.

**Table 2 - Detailed Future Loading Information**

| Existing/ Proposed | Elevation (ft) | Wind Area ($in^2$) (includes Ca factors) | Weight (lb) | Qty Coax | Coax Size | % Capacity | Owner/ Tenant |
|---|---|---|---|---|---|---|---|
| ***Proposed*** | ***Varies*** | ***-*** | ***1,169.54*** | ***6*** | ***7/8*** | ***65.4*** | ***T-Mobile*** |
| Existing | 126 | - | 480.0 | 24 | 7/8 | 65.4 | T-Mobile |
| *To Be Removed* | *126* | - | *480.0* | - | - | - | *T-Mobile* |
| Total | Varies | - | 1,169.54 | 30 | 7/8 | 65.4 | T-Mobile |

**Table 3 - Design Antenna and Cable Information**

| Mounting Level (ft) | Center Line Elevation (ft) | Number of Antennas | Antenna Model | Mount Type | Qty Coax | Coax Size (in) | Coax Location |
|---|---|---|---|---|---|---|---|
| UNKNOWN | | | | | | | |

## 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

| Document | Remarks | Source |
|---|---|---|
| Previous Structural Analysis | Morrison Hershfield, dated January 8, 2021<br>Project No. PTI-358R2 / 2101309 | PTI |
| Correspondence | Correspondence with Phoenix Tower International regarding the existing, proposed, and future loading. | PTI |

### 3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

### 3.2) Assumptions

1) The tower and foundation were built and maintained in accordance with the manufacturer's specification.
2) The configuration of existing antennas, transmission cables, mounts and other appurtenances are as specified in the tower mapping report by TEP.
3) Unless specified by the client or tower mapping, the location of the existing and proposed coax is assumed by TEP and listed in Table 1.
4) All tower components are in sufficient condition to carry their full design capacity.
5) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
6) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.
7) TEP assumed that the tower geometry, foundation geometry and geotechnical values found in the previous structural analysis by Morrison Hershfield, dated January 8, 2021, were correct.

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

## 4) ANALYSIS RESULTS

**Table 5 - Section Capacity (Summary)**

| Section No. | Elevation (ft) | Component Type | Size | Critical Element | P (lb) | ØP_allow (lb) | % Capacity | Pass / Fail |
|---|---|---|---|---|---|---|---|---|
| L1 | 130 - 120 | Pole | TP15x15x0.3125 | 1 | -2398.0300 | 894849.8594 | 3.5 | Pass |
| L2 | 120 - 110 | Pole | TP15x15x0.3125 | 2 | -4146.4800 | 894849.8594 | 10.0 | Pass |
| L3 | 110 - 98 | Pole | TP15x15x0.3125 | 3 | -5532.5200 | 894849.8594 | 21.6 | Pass |
| L4 | 98 - 86 | Pole | TP15x15x0.3125 | 4 | -6971.7002 | 894849.8594 | 37.4 | Pass |
| L5 | 86 - 42 | Pole | TP52.02x46x0.3125 | 5 | -14580.2002 | 3089897.8597 | 11.7 | Pass |
| L6 | 42 - 1 | Pole | TP57x50.4031x0.3125 | 6 | -27085.3008 | 3436618.3439 | 24.2 | Pass |
| | | | | | | | Summary | |
| | | | | | | Pole (L4) | 37.4 | Pass |
| | | | | | | **RATING =** | **37.4** | **Pass** |

**Table 6 - Component Stresses vs. Capacity**

| Notes | Component | Elevation (ft) | % Capacity | Pass / Fail |
|---|---|---|---|---|
| 1,2 | Anchor Rods | - | 44.1 | Pass |
| 1,2 | Base Plate | - | 33.8 | Pass |
| 1,2 | Base Foundation - Soil Interaction | - | 65.4 | Pass |
| 1,2 | Base Foundation - Structural | - | 28.7 | Pass |

Notes:
1) See additional documentation in "Appendix B - Additional Calculations" for calculations supporting the % capacity listed.
2) Rating per TIA-222-H Section 15.5

| **Structure Rating (max from all components) =** | **65.4%** |
|---|---|

**Table 7 - Dish Twist/Sway Results for 60 mph Service Wind Speed**

| Elevation (ft) | Dish Model | Beam Deflection | | |
|---|---|---|---|---|
| | | Deflection (in) | Tilt (deg) | Twist (deg) |
| - | - | - | - | - |

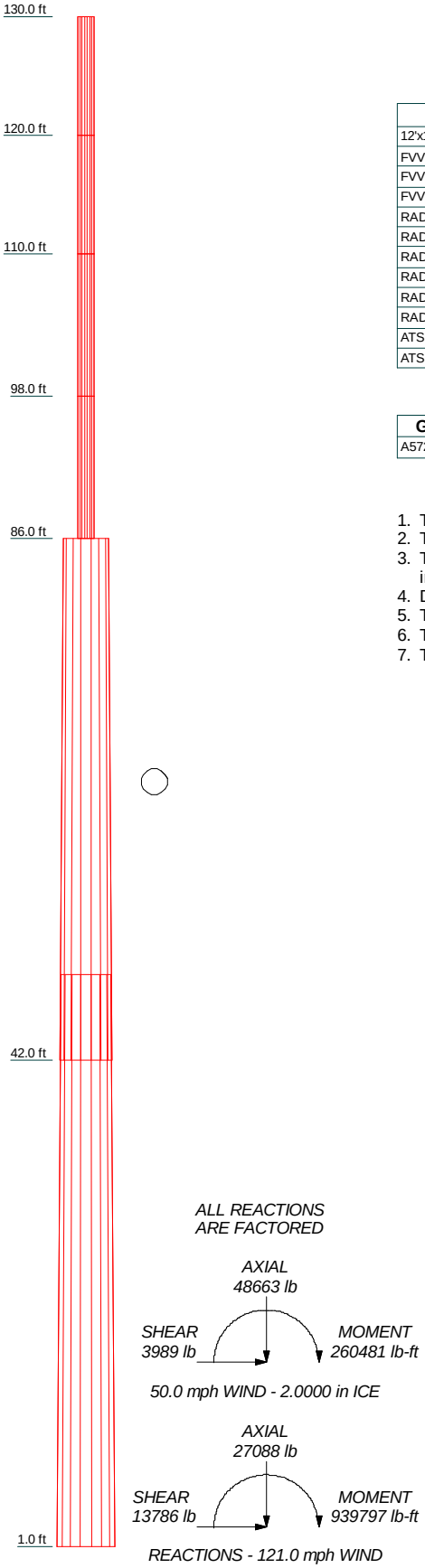
### 4.1) Recommendations

1) If the load differs from that described in Table 1 of this report, or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The tower and its foundation have sufficient capacity to carry the existing, proposed, and future loads. No modifications are required at this time.

## APPENDIX A

## TNXTOWER OUTPUT

| Section | Length (ft) | Number of Sides | Thickness (in) | Socket Length (ft) | Top Dia (in) | Bot Dia (in) | Grade | Weight (lb) |
|---|---|---|---|---|---|---|---|---|
| 1 | 10.0000 | 18 | 0.3125 | | 15.0000 | 15.0000 | | 495.7 |
| 2 | 10.0000 | 18 | 0.3125 | | 15.0000 | 15.0000 | | 495.7 |
| 3 | 12.0000 | 18 | 0.3125 | | 15.0000 | 15.0000 | | 594.9 |
| 4 | 12.0000 | 18 | 0.3125 | | 15.0000 | 15.0000 | | 594.9 |
| 5 | 44.0000 | 18 | 0.3125 | 7.2500 | 46.0000 | 52.0200 | A572-65 | 7231.9 |
| 6 | 48.2500 | 18 | 0.3125 | | 50.4031 | 57.0000 | | 8694.4 |
| | | | | | | | | 18107.5 |




## DESIGNED APPURTENANCE LOADING

| TYPE | ELEVATION | TYPE | ELEVATION |
|---|---|---|---|
| 12'x18' Flag | 130 | ATSBT-TOP-MF-4G | 126 |
| FVV-65B-R3 w/ Mount Pipe | 126 | Radome Cylinder (46"Ø x10') | 125 |
| FVV-65B-R3 w/ Mount Pipe | 126 | VV-65A-R1_TMO w/ Mount Pipe | 116 |
| FVV-65B-R3 w/ Mount Pipe | 126 | VV-65A-R1_TMO w/ Mount Pipe | 116 |
| RADIO 4460 B2/B25 B66_TMO | 126 | VV-65A-R1_TMO w/ Mount Pipe | 116 |
| RADIO 4460 B2/B25 B66_TMO | 126 | RADIO 8863 | 116 |
| RADIO 4460 B2/B25 B66_TMO | 126 | RADIO 8863 | 116 |
| RADIO 4449 | 126 | RADIO 8863 | 116 |
| RADIO 4449 | 126 | Radome Cylinder (46"Ø x10') | 115 |
| RADIO 4449 | 126 | Radome Cylinder (46"Ø x12') | 104 |
| ATSBT-TOP-MF-4G | 126 | Radome Cylinder (46"Ø x12') | 92 |
| ATSBT-TOP-MF-4G | 126 | | |

## 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-H Standard.
2. Tower designed for a 121.0 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50.0 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60.0 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.0000 ft
7. TOWER RATING: 37.4%


Tower Engineering Professionals, Inc.

**Tower Engineering Professionals, Inc.**
326 Tryon Rd.
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350


| | | | |
|---|---|---|---|
| Job: **Farmington (US-CT-1061)** | | | |
| Project: **TEP No. 313160.700943** | | | |
| Client: Phoenix Tower International | Drawn by: MMW | App'd: | |
| Code: TIA-222-H | Date: 05/19/22 | Scale: NTS | |
| Path: C:\Users\mwielgus.TOWER\Desktop\Previous Projects\PTI\TMO\Farmington\tnx\Farmington.eri | | Dwg No. E-1 | |

## Tower Input Data

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

Tower base elevation above sea level: 299.1800 ft.
Basic wind speed of 121.0 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.0000 ft.
Nominal ice thickness of 2.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56.0000 pcf.
A wind speed of 50.0 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60.0 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Maximum demand-capacity ratio is: 1.05.
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-H Bracing Resist. Exemption |
| Include Bolts In Member Capacity | Autocalc Torque Arm Areas | Use TIA-222-H 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<br>ft | Section Length<br>ft | Splice Length<br>ft | Number of Sides | Top Diameter<br>in | Bottom Diameter<br>in | Wall Thickness<br>in | Bend Radius<br>in | Pole Grade |
|---|---|---|---|---|---|---|---|---|---|
| L1 | 130.0000-120.0000 | 10.0000 | 0.0000 | 18 | 15.0000 | 15.0000 | 0.3125 | 1.2500 | A572-65 (65 ksi) |
| L2 | 120.0000-110.0000 | 10.0000 | 0.0000 | 18 | 15.0000 | 15.0000 | 0.3125 | 1.2500 | A572-65 (65 ksi) |
| L3 | 110.0000-98.0000 | 12.0000 | 0.0000 | 18 | 15.0000 | 15.0000 | 0.3125 | 1.2500 | A572-65 (65 ksi) |
| L4 | 98.0000-86.0000 | 12.0000 | 0.0000 | 18 | 15.0000 | 15.0000 | 0.3125 | 1.2500 | A572-65 (65 ksi) |
| L5 | 86.0000-42.0000 | 44.0000 | 7.2500 | 18 | 46.0000 | 52.0200 | 0.3125 | 1.2500 | A572-65 (65 ksi) |
| L6 | 42.0000-1.0000 | 48.2500 | | 18 | 50.4031 | 57.0000 | 0.3125 | 1.2500 | A572-65 (65 ksi) |

## Tapered Pole Properties

| Section | Tip Dia.<br>in | Area<br>$in^2$ | I<br>$in^4$ | r<br>in | C<br>in | I/C<br>$in^3$ | J<br>$in^4$ | It/Q<br>$in^2$ | w<br>in | w/t |
|---|---|---|---|---|---|---|---|---|---|---|
| L1 | 15.1832 | 14.5682 | 397.0434 | 5.2141 | 7.6200 | 52.1054 | 794.6093 | 7.2855 | 2.0900 | 6.688 |
| | 15.1832 | 14.5682 | 397.0434 | 5.2141 | 7.6200 | 52.1054 | 794.6093 | 7.2855 | 2.0900 | 6.688 |
| L2 | 15.1832 | 14.5682 | 397.0434 | 5.2141 | 7.6200 | 52.1054 | 794.6093 | 7.2855 | 2.0900 | 6.688 |
| | 15.1832 | 14.5682 | 397.0434 | 5.2141 | 7.6200 | 52.1054 | 794.6093 | 7.2855 | 2.0900 | 6.688 |
| L3 | 15.1832 | 14.5682 | 397.0434 | 5.2141 | 7.6200 | 52.1054 | 794.6093 | 7.2855 | 2.0900 | 6.688 |
| | 15.1832 | 14.5682 | 397.0434 | 5.2141 | 7.6200 | 52.1054 | 794.6093 | 7.2855 | 2.0900 | 6.688 |
| L4 | 15.1832 | 14.5682 | 397.0434 | 5.2141 | 7.6200 | 52.1054 | 794.6093 | 7.2855 | 2.0900 | 6.688 |
| | 15.1832 | 14.5682 | 397.0434 | 5.2141 | 7.6200 | 52.1054 | 794.6093 | 7.2855 | 2.0900 | 6.688 |
| L5 | 46.6614 | 45.3163 | 11950.5138 | 16.2191 | 23.3680 | 511.4051 | 23916.7524 | 22.6625 | 7.5460 | 24.147 |
| | 52.7743 | 51.2874 | 17324.2729 | 18.3562 | 26.4262 | 655.5728 | 34671.3415 | 25.6486 | 8.6055 | 27.538 |
| L6 | 52.1390 | 49.6836 | 15749.3667 | 17.7822 | 25.6048 | 615.0949 | 31519.4569 | 24.8465 | 8.3209 | 26.627 |
| | 57.8311 | 56.2269 | 22827.3926 | 20.1241 | 28.9560 | 788.3476 | 45684.8220 | 28.1188 | 9.4820 | 30.342 |

| Tower Elevation<br>ft | Gusset Area<br>(per face)<br>$ft^2$ | Gusset Thickness<br>in | Gusset Grade | Adjust. Factor $A_f$ | Adjust. Factor $A_r$ | Weight Mult. | Double Angle Stitch Bolt Spacing Diagonals<br>in | Double Angle Stitch Bolt Spacing Horizontals<br>in | Double Angle Stitch Bolt Spacing Redundants<br>in |
|---|---|---|---|---|---|---|---|---|---|
| L1 130.0000-120.0000 | | | | 1 | 0 | 1 | | | |
| L2 120.0000-110.0000 | | | | 1 | 0 | 1 | | | |
| L3 110.0000-98.0000 | | | | 1 | 0 | 1 | | | |
| L4 98.0000-86.0000 | | | | 1 | 0 | 1 | | | |
| L5 86.0000-42.0000 | | | | 1 | 1 | 1 | | | |
| L6 42.0000-1.0000 | | | | 1 | 1 | 1 | | | |

## Feed Line/Linear Appurtenances - Entered As Round Or Flat

| Description | Sector | Exclude From Torque Calculation | Component Type | Placement ft | Total Number | Number Per Row | Start/End Position | Width or Diameter in | Perimeter in | Weight plf |
|---|---|---|---|---|---|---|---|---|---|---|
| Safety Line 3/8 | C | No | Surface Ar (CaAa) | 1.0000 - 130.0000 | 1 | 1 | 0.000<br>0.000 | 0.3750 | | 0.2200 |
| ***** | | | | | | | | | | |

## Feed Line/Linear Appurtenances - Entered As Area

| Description | Face or Leg | Allow Shield | Exclude From Torque Calculation | Component Type | Placement ft | Total Number | | $C_AA_A$ $ft^2/ft$ | Weight plf |
|---|---|---|---|---|---|---|---|---|---|
| ***** | | | | | | | | | |
| LDF5-50A (7/8 FOAM) | B | No | No | Inside Pole | 8.0000 - 126.0000 | 30 | No Ice<br>1/2" Ice<br>1" Ice<br>2" Ice | 0.0000<br>0.0000<br>0.0000<br>0.0000 | 0.3300<br>0.3300<br>0.3300<br>0.3300 |
| ***** | | | | | | | | | |

## Feed Line/Linear Appurtenances Section Areas

| Tower Section | Tower Elevation ft | Face | $A_R$ $ft^2$ | $A_F$ $ft^2$ | $C_AA_A$ In Face $ft^2$ | $C_AA_A$ Out Face $ft^2$ | Weight lb |
|---|---|---|---|---|---|---|---|
| L1 | 130.0000-120.000 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 |
| | 0 | B | 0.000 | 0.000 | 0.000 | 0.000 | 59.4000 |
| | | C | 0.000 | 0.000 | 0.375 | 0.000 | 2.2000 |
| L2 | 120.0000-110.000 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 |
| | 0 | B | 0.000 | 0.000 | 0.000 | 0.000 | 99.0000 |
| | | C | 0.000 | 0.000 | 0.375 | 0.000 | 2.2000 |
| L3 | 110.0000-98.0000 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 118.8000 |
| | | C | 0.000 | 0.000 | 0.450 | 0.000 | 2.6400 |
| L4 | 98.0000-86.0000 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 118.8000 |
| | | C | 0.000 | 0.000 | 0.450 | 0.000 | 2.6400 |
| L5 | 86.0000-42.0000 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 435.6000 |
| | | C | 0.000 | 0.000 | 1.650 | 0.000 | 9.6800 |
| L6 | 42.0000-1.0000 | A | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 336.6000 |
| | | C | 0.000 | 0.000 | 1.538 | 0.000 | 9.0200 |

## Feed Line/Linear Appurtenances Section Areas - With Ice



| Tower Section | Tower Elevation ft | Face or Leg | Ice Thickness in | $A_R$ $ft^2$ | $A_F$ $ft^2$ | $C_AA_A$ In Face $ft^2$ | $C_AA_A$ Out Face $ft^2$ | Weight lb |
|---|---|---|---|---|---|---|---|---|
| L1 | 130.0000-120.000 | A | 1.942 | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 |
| | 0 | B | | 0.000 | 0.000 | 0.000 | 0.000 | 59.4000 |
| | | C | | 0.000 | 0.000 | 4.259 | 0.000 | 57.1823 |
| L2 | 120.0000-110.000 | A | 1.926 | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 |
| | 0 | B | | 0.000 | 0.000 | 0.000 | 0.000 | 99.0000 |
| | | C | | 0.000 | 0.000 | 4.227 | 0.000 | 56.3463 |
| L3 | 110.0000-98.0000 | A | 1.907 | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 118.8000 |
| | | C | | 0.000 | 0.000 | 5.026 | 0.000 | 66.4269 |
| L4 | 98.0000-86.0000 | A | 1.884 | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 118.8000 |
| | | C | | 0.000 | 0.000 | 4.971 | 0.000 | 65.0080 |
| L5 | 86.0000-42.0000 | A | 1.816 | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 435.6000 |
| | | C | | 0.000 | 0.000 | 17.633 | 0.000 | 223.6281 |
| L6 | 42.0000-1.0000 | A | 1.632 | 0.000 | 0.000 | 0.000 | 0.000 | 0.0000 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 336.6000 |
| | | C | | 0.000 | 0.000 | 16.431 | 0.000 | 208.3807 |

## Feed Line Center of Pressure

| Section | Elevation ft | $CP_X$ in | $CP_Z$ in | $CP_X$ Ice in | $CP_Z$ Ice in |
|---|---|---|---|---|---|
| L1 | 130.0000-120.0000 | 0.0000 | 7.6875 | 0.0000 | 7.6875 |
| L2 | 120.0000-110.0000 | 0.0000 | 7.6875 | 0.0000 | 7.6875 |
| L3 | 110.0000-98.0000 | 0.0000 | 7.6875 | 0.0000 | 7.6875 |
| L4 | 98.0000-86.0000 | 0.0000 | 7.6875 | 0.0000 | 7.6875 |
| L5 | 86.0000-42.0000 | 0.0000 | 0.3497 | 0.0000 | 1.8702 |
| L6 | 42.0000-1.0000 | 0.0000 | 0.3499 | 0.0000 | 1.9050 |

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

## Shielding Factor Ka

| Tower Section | Feed Line Record No. | Description | Feed Line Segment Elev. | $K_a$ No Ice | $K_a$ Ice |
|---|---|---|---|---|---|
| L1 | 1 | Safety Line 3/8 | 120.00 - 130.00 | 1.0000 | 1.0000 |
| L2 | 1 | Safety Line 3/8 | 110.00 - 120.00 | 1.0000 | 1.0000 |
| L3 | 1 | Safety Line 3/8 | 98.00 - 110.00 | 1.0000 | 1.0000 |
| L4 | 1 | Safety Line 3/8 | 86.00 - 98.00 | 1.0000 | 1.0000 |
| L5 | 1 | Safety Line 3/8 | 42.00 - 86.00 | 1.0000 | 1.0000 |
| L6 | 1 | Safety Line 3/8 | 1.00 - 42.00 | 1.0000 | 1.0000 |

## Discrete Tower Loads

| Description | Face or Leg | Offset Type | Offsets: Horz Lateral ft | Vert ft | ft | Azimuth Adjustment ° | Placement ft | | $C_AA_A$ Front $ft^2$ | $C_AA_A$ Side $ft^2$ | Weight lb |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12'x18' Flag | C | None | | | | 0.0000 | 130.0000 | No Ice | 12.0200 | 12.0200 | 100.0000 |
| | | | | | | | | 1/2" Ice | 12.0200 | 12.0200 | 200.0000 |
| | | | | | | | | 1" Ice | 12.0200 | 12.0200 | 300.0000 |
| | | | | | | | | 2" Ice | 12.0200 | 12.0200 | 500.0000 |
| ***** | | | | | | | | | | | |
| Radome Cylinder (46"Ø x10') | C | None | | | | 0.0000 | 125.0000 | No Ice | 19.2600 | 19.2600 | 550.0000 |
| | | | | | | | | 1/2" Ice | 27.7100 | 27.7100 | 890.0000 |
| | | | | | | | | 1" Ice | 28.5000 | 28.5000 | 1240.0000 |
| | | | | | | | | 2" Ice | 30.0800 | 30.0800 | 1940.0000 |
| **** | | | | | | | | | | | |
| Radome Cylinder (46"Ø x10') | C | None | | | | 0.0000 | 115.0000 | No Ice | 19.2600 | 19.2600 | 550.0000 |
| | | | | | | | | 1/2" Ice | 27.7100 | 27.7100 | 890.0000 |
| | | | | | | | | 1" Ice | 28.5000 | 28.5000 | 1240.0000 |
| | | | | | | | | 2" Ice | 30.0800 | 30.0800 | 1940.0000 |
| ***** | | | | | | | | | | | |
| Radome Cylinder (46"Ø x12') | C | None | | | | 0.0000 | 104.0000 | No Ice | 23.6400 | 26.6400 | 450.0000 |
| | | | | | | | | 1/2" Ice | 33.7400 | 33.7400 | 850.0000 |
| | | | | | | | | 1" Ice | 34.6500 | 34.6500 | 1260.0000 |
| | | | | | | | | 2" Ice | 36.4700 | 34.6500 | 2080.0000 |
| ****** | | | | | | | | | | | |
| Radome Cylinder (46"Ø x12') | C | None | | | | 0.0000 | 92.0000 | No Ice | 23.6400 | 26.6400 | 450.0000 |
| | | | | | | | | 1/2" Ice | 33.7400 | 33.7400 | 850.0000 |
| | | | | | | | | 1" Ice | 34.6500 | 34.6500 | 1260.0000 |
| | | | | | | | | 2" Ice | 36.4700 | 34.6500 | 2080.0000 |
| ****** | | | | | | | | | | | |
| ***** | | | | | | | | | | | |
| FVV-65B-R3 w/ Mount Pipe | A | From Leg | 0.5000 | 0.0000 | 0.0000 | 30.0000 | 126.0000 | No Ice | 0.0000 | 0.0000 | 83.1600 |
| | | | | | | | | 1/2" Ice | 0.0000 | 0.0000 | 145.4700 |
| | | | | | | | | 1" Ice | 0.0000 | 0.0000 | 218.5300 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 398.3100 |
| FVV-65B-R3 w/ Mount Pipe | B | From Leg | 0.5000 | 0.0000 | 0.0000 | 30.0000 | 126.0000 | No Ice | 0.0000 | 0.0000 | 83.1600 |
| | | | | | | | | 1/2" Ice | 0.0000 | 0.0000 | 145.4700 |
| | | | | | | | | 1" Ice | 0.0000 | 0.0000 | 218.5300 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 398.3100 |
| FVV-65B-R3 w/ Mount Pipe | C | From Leg | 0.5000 | 0.0000 | 0.0000 | 30.0000 | 126.0000 | No Ice | 0.0000 | 0.0000 | 83.1600 |
| | | | | | | | | 1/2" Ice | 0.0000 | 0.0000 | 145.4700 |
| | | | | | | | | 1" Ice | 0.0000 | 0.0000 | 218.5300 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 398.3100 |
| RADIO 4460 B2/B25 B66_TMO | A | From Leg | 0.5000 | 0.0000 | 0.0000 | 30.0000 | 126.0000 | No Ice | 0.0000 | 0.0000 | 109.0000 |
| | | | | | | | | 1/2" Ice | 0.0000 | 0.0000 | 131.1566 |
| | | | | | | | | 1" Ice | 0.0000 | 0.0000 | 156.3595 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 216.6820 |
| RADIO 4460 B2/B25 B66_TMO | B | From Leg | 0.5000 | 0.0000 | 0.0000 | 30.0000 | 126.0000 | No Ice | 0.0000 | 0.0000 | 109.0000 |
| | | | | | | | | 1/2" Ice | 0.0000 | 0.0000 | 131.1566 |
| | | | | | | | | 1" Ice | 0.0000 | 0.0000 | 156.3595 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 216.6820 |
| RADIO 4460 B2/B25 B66_TMO | C | From Leg | 0.5000 | 0.0000 | 0.0000 | 30.0000 | 126.0000 | No Ice | 0.0000 | 0.0000 | 109.0000 |
| | | | | | | | | 1/2" Ice | 0.0000 | 0.0000 | 131.1566 |
| | | | | | | | | 1" Ice | 0.0000 | 0.0000 | 156.3595 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 216.6820 |
| RADIO 4449 | A | From Leg | 0.5000 | 0.0000 | 0.0000 | 30.0000 | 126.0000 | No Ice | 0.0000 | 0.0000 | 85.0000 |



| Description | Face or Leg | Offset Type | Offsets: Horz Lateral ft | Vert ft | ft | Azimuth Adjustment ° | Placement ft | | $C_AA_A$ Front $ft^2$ | $C_AA_A$ Side $ft^2$ | Weight lb |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.0000 | | | | | 1/2" Ice | 0.0000 | 0.0000 | 114.2963 |
| | | | 0.0000 | | | | | 1" Ice | 0.0000 | 0.0000 | 147.2222 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 224.7407 |
| RADIO 4449 | B | From Leg | 0.5000 | | | 30.0000 | 126.0000 | No Ice | 0.0000 | 0.0000 | 85.0000 |
| | | | 0.0000 | | | | | 1/2" Ice | 0.0000 | 0.0000 | 114.2963 |
| | | | 0.0000 | | | | | 1" Ice | 0.0000 | 0.0000 | 147.2222 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 224.7407 |
| RADIO 4449 | C | From Leg | 0.5000 | | | 30.0000 | 126.0000 | No Ice | 0.0000 | 0.0000 | 85.0000 |
| | | | 0.0000 | | | | | 1/2" Ice | 0.0000 | 0.0000 | 114.2963 |
| | | | 0.0000 | | | | | 1" Ice | 0.0000 | 0.0000 | 147.2222 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 224.7407 |
| ATSBT-TOP-MF-4G | A | From Leg | 0.5000 | | | 30.0000 | 126.0000 | No Ice | 0.0000 | 0.0000 | 1.8000 |
| | | | 0.0000 | | | | | 1/2" Ice | 0.0000 | 0.0000 | 3.4794 |
| | | | 0.0000 | | | | | 1" Ice | 0.0000 | 0.0000 | 6.0876 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 14.8681 |
| ATSBT-TOP-MF-4G | B | From Leg | 0.5000 | | | 30.0000 | 126.0000 | No Ice | 0.0000 | 0.0000 | 1.8000 |
| | | | 0.0000 | | | | | 1/2" Ice | 0.0000 | 0.0000 | 3.4794 |
| | | | 0.0000 | | | | | 1" Ice | 0.0000 | 0.0000 | 6.0876 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 14.8681 |
| ATSBT-TOP-MF-4G | C | From Leg | 0.5000 | | | 30.0000 | 126.0000 | No Ice | 0.0000 | 0.0000 | 1.8000 |
| | | | 0.0000 | | | | | 1/2" Ice | 0.0000 | 0.0000 | 3.4794 |
| | | | 0.0000 | | | | | 1" Ice | 0.0000 | 0.0000 | 6.0876 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 14.8681 |
| ****** | | | | | | | | | | | |
| VV-65A-R1_TMO w/ Mount Pipe | A | From Leg | 0.5000 | | | 30.0000 | 116.0000 | No Ice | 0.0000 | 0.0000 | 53.5879 |
| | | | 0.0000 | | | | | 1/2" Ice | 0.0000 | 0.0000 | 101.8826 |
| | | | 0.0000 | | | | | 1" Ice | 0.0000 | 0.0000 | 156.5819 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 288.3046 |
| VV-65A-R1_TMO w/ Mount Pipe | B | From Leg | 0.5000 | | | 30.0000 | 116.0000 | No Ice | 0.0000 | 0.0000 | 53.5879 |
| | | | 0.0000 | | | | | 1/2" Ice | 0.0000 | 0.0000 | 101.8826 |
| | | | 0.0000 | | | | | 1" Ice | 0.0000 | 0.0000 | 156.5819 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 288.3046 |
| VV-65A-R1_TMO w/ Mount Pipe | C | From Leg | 0.5000 | | | 30.0000 | 116.0000 | No Ice | 0.0000 | 0.0000 | 53.5879 |
| | | | 0.0000 | | | | | 1/2" Ice | 0.0000 | 0.0000 | 101.8826 |
| | | | 0.0000 | | | | | 1" Ice | 0.0000 | 0.0000 | 156.5819 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 288.3046 |
| RADIO 8863 | A | From Leg | 0.5000 | | | 30.0000 | 116.0000 | No Ice | 0.0000 | 0.0000 | 57.3000 |
| | | | 0.0000 | | | | | 1/2" Ice | 0.0000 | 0.0000 | 72.0340 |
| | | | 0.0000 | | | | | 1" Ice | 0.0000 | 0.0000 | 89.3347 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 132.4139 |
| RADIO 8863 | B | From Leg | 0.5000 | | | 30.0000 | 116.0000 | No Ice | 0.0000 | 0.0000 | 57.3000 |
| | | | 0.0000 | | | | | 1/2" Ice | 0.0000 | 0.0000 | 72.0340 |
| | | | 0.0000 | | | | | 1" Ice | 0.0000 | 0.0000 | 89.3347 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 132.4139 |
| RADIO 8863 | C | From Leg | 0.5000 | | | 30.0000 | 116.0000 | No Ice | 0.0000 | 0.0000 | 57.3000 |
| | | | 0.0000 | | | | | 1/2" Ice | 0.0000 | 0.0000 | 72.0340 |
| | | | 0.0000 | | | | | 1" Ice | 0.0000 | 0.0000 | 89.3347 |
| | | | | | | | | 2" Ice | 0.0000 | 0.0000 | 132.4139 |
| ****** | | | | | | | | | | | |

## Load Combinations

| Comb. No. | Description |
|---|---|
| 1 | Dead Only |
| 2 | 1.2 Dead+1.0 Wind 0 deg - No Ice |
| 3 | 0.9 Dead+1.0 Wind 0 deg - No Ice |
| 4 | 1.2 Dead+1.0 Wind 30 deg - No Ice |
| 5 | 0.9 Dead+1.0 Wind 30 deg - No Ice |
| 6 | 1.2 Dead+1.0 Wind 60 deg - No Ice |
| 7 | 0.9 Dead+1.0 Wind 60 deg - No Ice |
| 8 | 1.2 Dead+1.0 Wind 90 deg - No Ice |
| 9 | 0.9 Dead+1.0 Wind 90 deg - No Ice |
| 10 | 1.2 Dead+1.0 Wind 120 deg - No Ice |
| 11 | 0.9 Dead+1.0 Wind 120 deg - No Ice |
| 12 | 1.2 Dead+1.0 Wind 150 deg - No Ice |
| 13 | 0.9 Dead+1.0 Wind 150 deg - No Ice |
| 14 | 1.2 Dead+1.0 Wind 180 deg - No Ice |
| 15 | 0.9 Dead+1.0 Wind 180 deg - No Ice |
| 16 | 1.2 Dead+1.0 Wind 210 deg - No Ice |
| 17 | 0.9 Dead+1.0 Wind 210 deg - No Ice |
| 18 | 1.2 Dead+1.0 Wind 240 deg - No Ice |
| 19 | 0.9 Dead+1.0 Wind 240 deg - No Ice |
| 20 | 1.2 Dead+1.0 Wind 270 deg - No Ice |
| 21 | 0.9 Dead+1.0 Wind 270 deg - No Ice |
| 22 | 1.2 Dead+1.0 Wind 300 deg - No Ice |
| 23 | 0.9 Dead+1.0 Wind 300 deg - No Ice |
| 24 | 1.2 Dead+1.0 Wind 330 deg - No Ice |
| 25 | 0.9 Dead+1.0 Wind 330 deg - No Ice |
| 26 | 1.2 Dead+1.0 Ice+1.0 Temp |
| 27 | 1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp |
| 28 | 1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp |
| 29 | 1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp |
| 30 | 1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp |
| 31 | 1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp |
| 32 | 1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp |
| 33 | 1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp |
| 34 | 1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp |
| 35 | 1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp |
| 36 | 1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp |
| 37 | 1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp |
| 38 | 1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp |
| 39 | Dead+Wind 0 deg - Service |
| 40 | Dead+Wind 30 deg - Service |
| 41 | Dead+Wind 60 deg - Service |
| 42 | Dead+Wind 90 deg - Service |
| 43 | Dead+Wind 120 deg - Service |
| 44 | Dead+Wind 150 deg - Service |
| 45 | Dead+Wind 180 deg - Service |
| 46 | Dead+Wind 210 deg - Service |
| 47 | Dead+Wind 240 deg - Service |
| 48 | Dead+Wind 270 deg - Service |
| 49 | Dead+Wind 300 deg - Service |
| 50 | Dead+Wind 330 deg - Service |

## Maximum Tower Deflections - Service Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|---|---|---|---|---|---|
| L1 | 130 - 120 | 4.9859 | 45 | 0.4670 | 0.0000 |
| L2 | 120 - 110 | 4.0121 | 45 | 0.4599 | 0.0000 |



| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|---|---|---|---|---|---|
| L3 | 110 - 98 | 3.0781 | 45 | 0.4263 | 0.0000 |
| L4 | 98 - 86 | 2.1139 | 45 | 0.3282 | 0.0000 |
| L5 | 86 - 42 | 1.5047 | 45 | 0.1390 | 0.0000 |
| L6 | 49.25 - 1 | 0.5700 | 45 | 0.0986 | 0.0000 |

## Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|---|---|---|---|---|---|---|
| 130.0000 | 12'x18' Flag | 45 | 4.9859 | 0.4670 | 0.0000 | 60920 |
| 126.0000 | FVV-65B-R3 w/ Mount Pipe | 45 | 4.5942 | 0.4660 | 0.0000 | 60920 |
| 125.0000 | Radome Cylinder (46"Ø x10') | 45 | 4.4966 | 0.4655 | 0.0000 | 60920 |
| 116.0000 | VV-65A-R1_TMO w/ Mount Pipe | 45 | 3.6314 | 0.4500 | 0.0000 | 21396 |
| 115.0000 | Radome Cylinder (46"Ø x10') | 45 | 3.5375 | 0.4468 | 0.0000 | 19915 |
| 104.0000 | Radome Cylinder (46"Ø x12') | 45 | 2.5596 | 0.3901 | 0.0000 | 5943 |
| 92.0000 | Radome Cylinder (46"Ø x12') | 45 | 1.7706 | 0.2338 | 0.0000 | 5588 |

## Maximum Tower Deflections - Design Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|---|---|---|---|---|---|
| L1 | 130 - 120 | 21.6292 | 14 | 2.0285 | 0.0000 |
| L2 | 120 - 110 | 17.3998 | 14 | 1.9978 | 0.0000 |
| L3 | 110 - 98 | 13.3433 | 14 | 1.8514 | 0.0000 |
| L4 | 98 - 86 | 9.1573 | 14 | 1.4247 | 0.0000 |
| L5 | 86 - 42 | 6.5147 | 14 | 0.6021 | 0.0000 |
| L6 | 49.25 - 1 | 2.4673 | 14 | 0.4267 | 0.0000 |

## Critical Deflections and Radius of Curvature - Design Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|---|---|---|---|---|---|---|
| 130.0000 | 12'x18' Flag | 14 | 21.6292 | 2.0285 | 0.0000 | 14056 |
| 126.0000 | FVV-65B-R3 w/ Mount Pipe | 14 | 19.9278 | 2.0244 | 0.0000 | 14056 |
| 125.0000 | Radome Cylinder (46"Ø x10') | 14 | 19.5038 | 2.0222 | 0.0000 | 14056 |
| 116.0000 | VV-65A-R1_TMO w/ Mount Pipe | 14 | 15.7465 | 1.9549 | 0.0000 | 4929 |
| 115.0000 | Radome Cylinder (46"Ø x10') | 14 | 15.3388 | 1.9408 | 0.0000 | 4586 |
| 104.0000 | Radome Cylinder (46"Ø x12') | 14 | 11.0922 | 1.6941 | 0.0000 | 1368 |
| 92.0000 | Radome Cylinder (46"Ø x12') | 14 | 7.6679 | 1.0142 | 0.0000 | 1286 |

## *Compression Checks*

## Pole Design Data

| Section No. | Elevation ft | Size | L ft | $L_u$ ft | Kl/r | A $in^2$ | $P_u$ lb | $\phi P_n$ lb | Ratio $\frac{P_u}{\phi P_n}$ |
|---|---|---|---|---|---|---|---|---|---|
| L1 | 130 - 120 (1) | TP15x15x0.3125 | 10.0000 | 0.0000 | 0.0 | 14.5682 | -2398.0300 | 852238.0000 | 0.003 |
| L2 | 120 - 110 (2) | TP15x15x0.3125 | 10.0000 | 0.0000 | 0.0 | 14.5682 | -4146.4800 | 852238.0000 | 0.005 |
| L3 | 110 - 98 (3) | TP15x15x0.3125 | 12.0000 | 0.0000 | 0.0 | 14.5682 | -5532.5200 | 852238.0000 | 0.006 |
| L4 | 98 - 86 (4) | TP15x15x0.3125 | 12.0000 | 0.0000 | 0.0 | 14.5682 | -6971.7002 | 852238.0000 | 0.008 |
| L5 | 86 - 42 (5) | TP52.02x46x0.3125 | 44.0000 | 0.0000 | 0.0 | 50.3035 | -14580.2002 | 2942760.0000 | 0.005 |
| L6 | 42 - 1 (6) | TP57x50.4031x0.3125 | 48.2500 | 0.0000 | 0.0 | 56.2269 | -27085.3008 | 3272970.0000 | 0.008 |

## Pole Bending Design Data

| Section No. | Elevation ft | Size | $M_{ux}$ lb-ft | $\phi M_{nx}$ lb-ft | Ratio $\frac{M_{ux}}{\phi M_{nx}}$ | $M_{uy}$ lb-ft | $\phi M_{ny}$ lb-ft | Ratio $\frac{M_{uy}}{\phi M_{ny}}$ |
|---|---|---|---|---|---|---|---|---|
| L1 | 130 - 120 (1) | TP15x15x0.3125 | 11102.5833 | 322597.5000 | 0.034 | 0.0000 | 322597.5000 | 0.000 |
| L2 | 120 - 110 (2) | TP15x15x0.3125 | 32173.4167 | 322597.5000 | 0.100 | 0.0000 | 322597.5000 | 0.000 |
| L3 | 110 - 98 (3) | TP15x15x0.3125 | 70850.3333 | 322597.5000 | 0.220 | 0.0000 | 322597.5000 | 0.000 |
| L4 | 98 - 86 (4) | TP15x15x0.3125 | 124021.6667 | 322597.5000 | 0.384 | 0.0000 | 322597.5000 | 0.000 |
| L5 | 86 - 42 (5) | TP52.02x46x0.3125 | 382901.6667 | 3245966.6667 | 0.118 | 0.0000 | 3245966.6667 | 0.000 |
| L6 | 42 - 1 (6) | TP57x50.4031x0.3125 | 939800.0000 | 3824150.0000 | 0.246 | 0.0000 | 3824150.0000 | 0.000 |

## Pole Shear Design Data

| Section No. | Elevation ft | Size | Actual $V_u$ lb | $\phi V_n$ lb | Ratio $\frac{V_u}{\phi V_n}$ | Actual $T_u$ lb-ft | $\phi T_n$ lb-ft | Ratio $\frac{T_u}{\phi T_n}$ |
|---|---|---|---|---|---|---|---|---|
| L1 | 130 - 120 (1) | TP15x15x0.3125 | 1616.9500 | 255671.0000 | 0.006 | 0.0000 | 328859.1667 | 0.000 |
| L2 | 120 - 110 (2) | TP15x15x0.3125 | 2592.4099 | 255671.0000 | 0.010 | 0.0000 | 328859.1667 | 0.000 |
| L3 | 110 - 98 (3) | TP15x15x0.3125 | 3848.8401 | 255671.0000 | 0.015 | 0.0000 | 328859.1667 | 0.000 |
| L4 | 98 - 86 (4) | TP15x15x0.3125 | 5006.0400 | 255671.0000 | 0.020 | 0.0000 | 328859.1667 | 0.000 |
| L5 | 86 - 42 (5) | TP52.02x46x0.3125 | 9085.0596 | 882827.0000 | 0.010 | 0.0000 | 3921000.0000 | 0.000 |
| L6 | 42 - 1 (6) | TP57x50.4031x0.3125 | 13791.7998 | 986782.0000 | 0.014 | 0.0000 | 4898791.6667 | 0.000 |

## Pole Interaction Design Data

| Section No. | Elevation ft | Ratio $\frac{P_u}{\phi P_n}$ | Ratio $\frac{M_{ux}}{\phi M_{nx}}$ | Ratio $\frac{M_{uy}}{\phi M_{ny}}$ | Ratio $\frac{V_u}{\phi V_n}$ | Ratio $\frac{T_u}{\phi T_n}$ | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|---|---|---|---|---|---|---|---|---|---|



| Section No. | Elevation ft | Ratio $\frac{P_u}{\phi P_n}$ | Ratio $\frac{M_{ux}}{\phi M_{nx}}$ | Ratio $\frac{M_{uy}}{\phi M_{ny}}$ | Ratio $\frac{V_u}{\phi V_n}$ | Ratio $\frac{T_u}{\phi T_n}$ | Comb. Stress Ratio | Allow. Stress Ratio | Criteria |
|---|---|---|---|---|---|---|---|---|---|
| L1 | 130 - 120 (1) | 0.003 | 0.034 | 0.000 | 0.006 | 0.000 | 0.037 | 1.050 | 4.8.2 |
| L2 | 120 - 110 (2) | 0.005 | 0.100 | 0.000 | 0.010 | 0.000 | 0.105 | 1.050 | 4.8.2 |
| L3 | 110 - 98 (3) | 0.006 | 0.220 | 0.000 | 0.015 | 0.000 | 0.226 | 1.050 | 4.8.2 |
| L4 | 98 - 86 (4) | 0.008 | 0.384 | 0.000 | 0.020 | 0.000 | 0.393 | 1.050 | 4.8.2 |
| L5 | 86 - 42 (5) | 0.005 | 0.118 | 0.000 | 0.010 | 0.000 | 0.123 | 1.050 | 4.8.2 |
| L6 | 42 - 1 (6) | 0.008 | 0.246 | 0.000 | 0.014 | 0.000 | 0.254 | 1.050 | 4.8.2 |

## Section Capacity Table

| Section No. | Elevation ft | Component Type | Size | Critical Element | P lb | $\phi P_{allow}$ lb | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|---|
| L1 | 130 - 120 | Pole | TP15x15x0.3125 | 1 | -2398.0300 | 894849.8594 | 3.5 | Pass |
| L2 | 120 - 110 | Pole | TP15x15x0.3125 | 2 | -4146.4800 | 894849.8594 | 10.0 | Pass |
| L3 | 110 - 98 | Pole | TP15x15x0.3125 | 3 | -5532.5200 | 894849.8594 | 21.6 | Pass |
| L4 | 98 - 86 | Pole | TP15x15x0.3125 | 4 | -6971.7002 | 894849.8594 | 37.4 | Pass |
| L5 | 86 - 42 | Pole | TP52.02x46x0.3125 | 5 | -14580.2002 | 3089897.8597 | 11.7 | Pass |
| L6 | 42 - 1 | Pole | TP57x50.4031x0.3125 | 6 | -27085.3008 | 3436618.3439 | 24.2 | Pass |
| | | | | | | Summary | | |
| | | | | | | Pole (L4) | 37.4 | Pass |
| | | | | | | **RATING =** | **37.4** | **Pass** |

# APPENDIX B

# ADDITIONAL CALCULATIONS

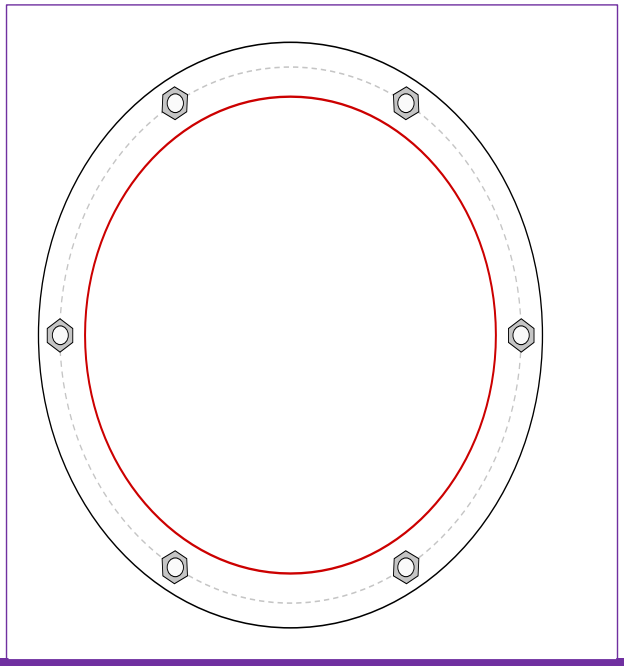
# Monopole Base Plate Connection

| Site Info | |
|---|---|
| Site # | US-CT-1061 |
| Site Name | Farmington |
| TEP # | 313160.700943 |

| Analysis Considerations | |
|---|---|
| TIA-222 Revision | H |
| Grout Considered: | No |
| $l_{ar}$ (in) | 0 |

| Applied Loads | |
|---|---|
| Moment (kip-ft) | 939.80 |
| Axial Force (kips) | 27.09 |
| Shear Force (kips) | 13.79 |

**TIA-222-H Section 15.5 Applied*



## Connection Properties

**Anchor Rod Data**

(6) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 64" BC

**Base Plate Data**

70" OD x 1.75" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

**Stiffener Data**

N/A

**Pole Data**

57" x 0.3125" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

## Analysis Results

**Anchor Rod Summary** *(units of kips, kip-in)*

| | | |
|---|---|---|
| Pu_t = 112.9 | ϕPn_t = 243.75 | **Stress Rating** |
| Vu = 2.3 | ϕVn = 149.1 | **44.1%** |
| Mu = n/a | ϕMn = n/a | **Pass** |

**Base Plate Summary**

| | | |
|---|---|---|
| Max Stress (ksi): | 19.15 | (Flexural) |
| Allowable Stress (ksi): | 54 | |
| Stress Rating: | **33.8%** | **Pass** |

# Pier and Pad Foundation

| | |
|---|---|
| **Site #:** | US-CT-1061 |
| **Site Name:** | Farmington |
| **TEP #:** | 313160.700943 |

| | |
|---|---|
| TIA-222 Revision: | H |
| Tower Type: | Monopole |

| | |
|---|---|
| Top & Bot. Pad Rein. Different?: | ☐ |
| Block Foundation?: | ☐ |
| Rectangular Pad?: | ☐ |

| Superstructure Analysis Reactions | | |
|---|---|---|
| Compression, $P_{comp}$: | 27.088 | kips |
| Base Shear, Vu_comp: | 13.786 | kips |
| | | |
| | | |
| Moment, $M_u$: | 939.797 | ft-kips |
| Tower Height, **H**: | 130 | ft |
| | | |
| BP Dist. Above Fdn, $bp_{dist}$: | | in |

| Pier Properties | | |
|---|---|---|
| Pier Shape: | Square | |
| Pier Diameter, **dpier**: | 7 | ft |
| Ext. Above Grade, **E**: | 0.5 | ft |
| Pier Rebar Size, **Sc**: | 9 | |
| Pier Rebar Quantity, **mc**: | 36 | |
| Pier Tie/Spiral Size, **St**: | 5 | |
| Pier Tie/Spiral Quantity, **mt**: | 8 | |
| Pier Reinforcement Type: | Tie | |
| Pier Clear Cover, $cc_{pier}$: | 3 | in |

| Pad Properties | | |
|---|---|---|
| Depth, **D**: | 6 | ft |
| Pad Width, $W_1$: | 17 | ft |
| Pad Thickness, **T**: | 2 | ft |
| Pad Rebar Size (Bottom dir. 2), $Sp_2$: | 9 | |
| Pad Rebar Quantity (Bottom dir. 2), $mp_2$: | 16 | |
| Pad Clear Cover, $cc_{pad}$: | 3 | in |

| Material Properties | | |
|---|---|---|
| Rebar Grade, **Fy**: | 60 | ksi |
| Concrete Compressive Strength, **F'c**: | 4 | ksi |
| Dry Concrete Density, $\delta$**c**: | 150 | pcf |

| Soil Properties | | |
|---|---|---|
| Total Soil Unit Weight, $\gamma$: | 100 | pcf |
| Ultimate Gross Bearing, Qult: | 6.000 | ksf |
| Cohesion, **Cu**: | 1.000 | ksf |
| Friction Angle, $\varphi$: | | degrees |
| SPT Blow Count, $N_{blows}$: | 8 | |
| Base Friction, $\mu$: | 0.5 | |
| Neglected Depth, **N**: | 3.50 | ft |
| Foundation Bearing on Rock? | No | |
| Groundwater Depth, **gw**: | N/A | ft |

<--Toggle between Gross and Net

| Foundation Analysis Checks | Capacity | Demand | Rating* | Check |
|---|---|---|---|---|
| | | | | |
| *Lateral (Sliding) (kips)* | 150.43 | 13.79 | **8.7%** | **Pass** |
| *Bearing Pressure (ksf)* | 4.50 | 1.93 | **42.9%** | **Pass** |
| *Overturning (kip*ft)* | 1574.23 | 1029.41 | **65.4%** | **Pass** |
| *Pier Flexure (Comp.) (kip*ft)* | 5778.08 | 1001.83 | **16.5%** | **Pass** |
| | | | | |
| *Pier Compression (kip)* | 31187.52 | 66.78 | **0.2%** | **Pass** |
| *Pad Flexure (kip*ft)* | 1340.35 | 276.61 | **19.7%** | **Pass** |
| *Pad Shear - 1-way (kips)* | 373.67 | 74.70 | **19.0%** | **Pass** |
| *Pad Shear - 2-way (Comp) (ksi)* | 0.190 | 0.025 | **12.4%** | **Pass** |
| *Flexural 2-way (Comp) (kip*ft)* | 1993.52 | 601.10 | **28.7%** | **Pass** |

**Rating per TIA-222-H Section 15.5*

| | |
|---|---|
| Structural Rating*: | **28.7%** |
| Soil Rating*: | **65.4%** |

| RAN Template: | A&L Template: |
|---|---|
| 67G5C998G 6160 | 67G5C998G_1O+1QuadDiplexer |

# CTHA112A_Anchor_2

**Print Name:** Preliminary (RFDS_For_Scoping)
**PORs:** Anchor_Phase 3

## Section 1 - Site Information

**Site ID:** CTHA112A
**Status:** Final
**Version:** 2
**Project Type:** Anchor
**Approved:** 3/8/2022 1:37:21 PM
**Approved By:** Pratik.Patil30@T-Mobile.com
**Last Modified:** 3/8/2022 1:37:21 PM
**Last Modified By:** Pratik.Patil30@T-Mobile.com

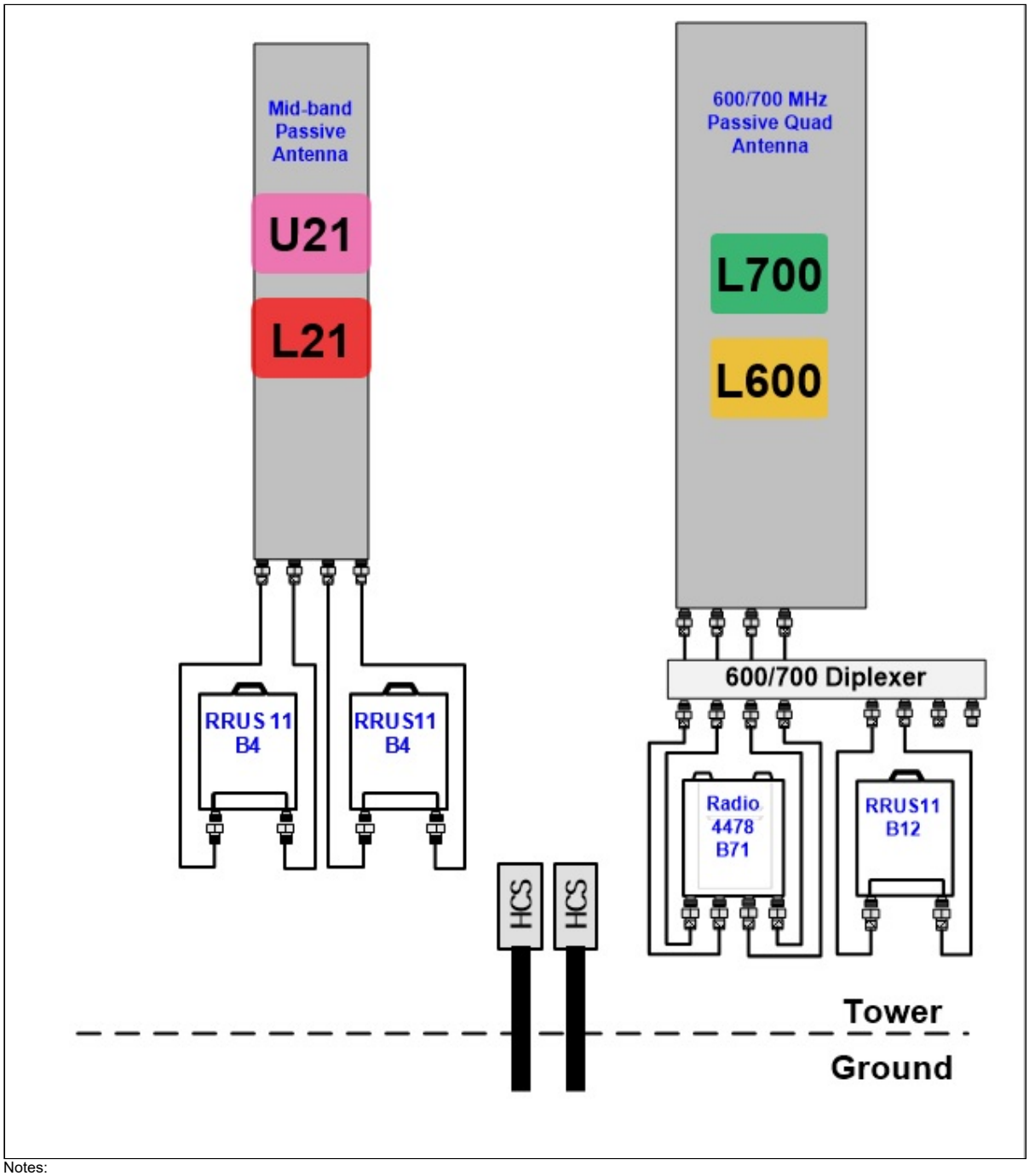
**Site Name:** CTHA112/FarmingtonSWFD_RL
**Site Class:** Flag Pole
**Site Type:** Structure Non Building
**Plan Year:** 2022
**Market:** CONNECTICUT CT
**Vendor:** Ericsson
**Landlord:** Sector Site LLC

**Latitude:** 41.71038889
**Longitude:** -72.88191667
**Address:** 2 Westwoods Drive
**City, State:** Farmington, CT
**Region:** NORTHEAST

| RAN Template: 67G5C998G 6160 | | | AL Template: 67G5C998G_1O+1QuadDiplexer | |
|---|---|---|---|---|
| **Sector Count:** 3 | **Antenna Count:** 6 | **Coax Line Count:** 30 | **TMA Count:** 3 | **RRU Count:** 9 |

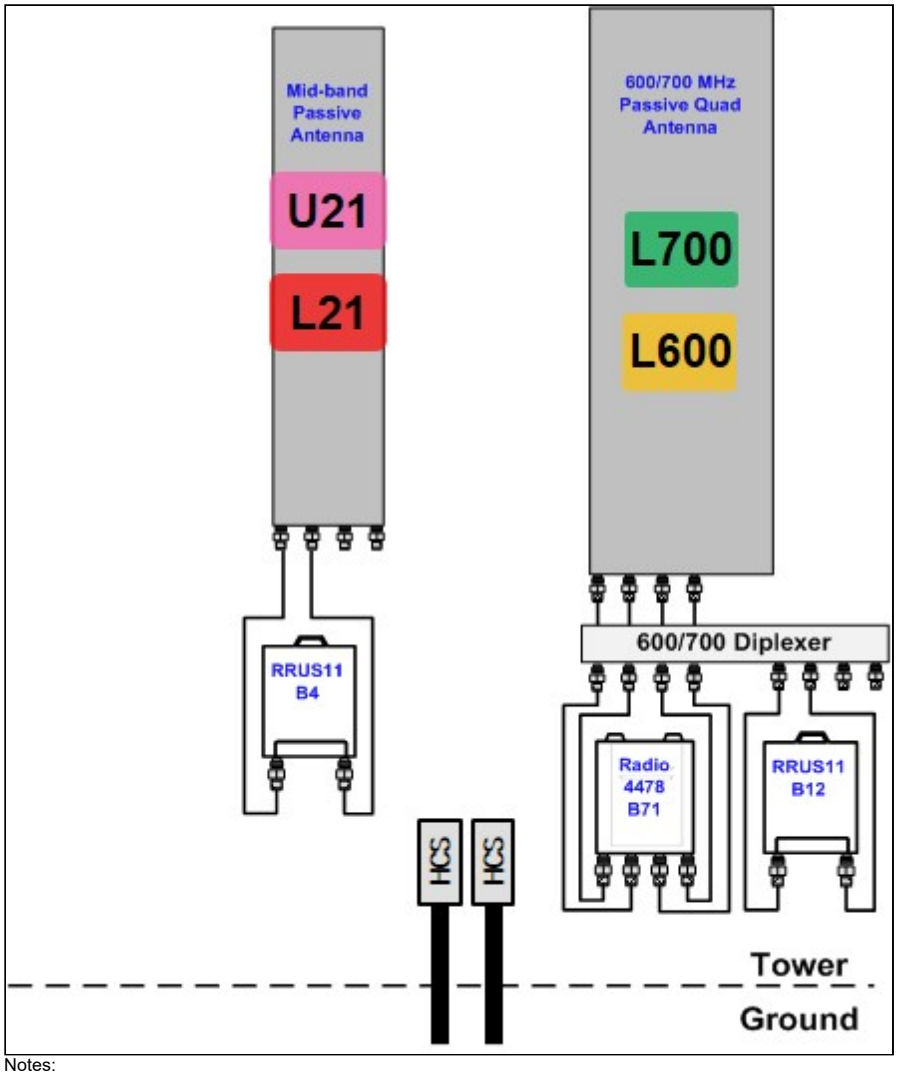
## Section 2 - Existing Template Images

6707B_V2_2QP antenna.jpg



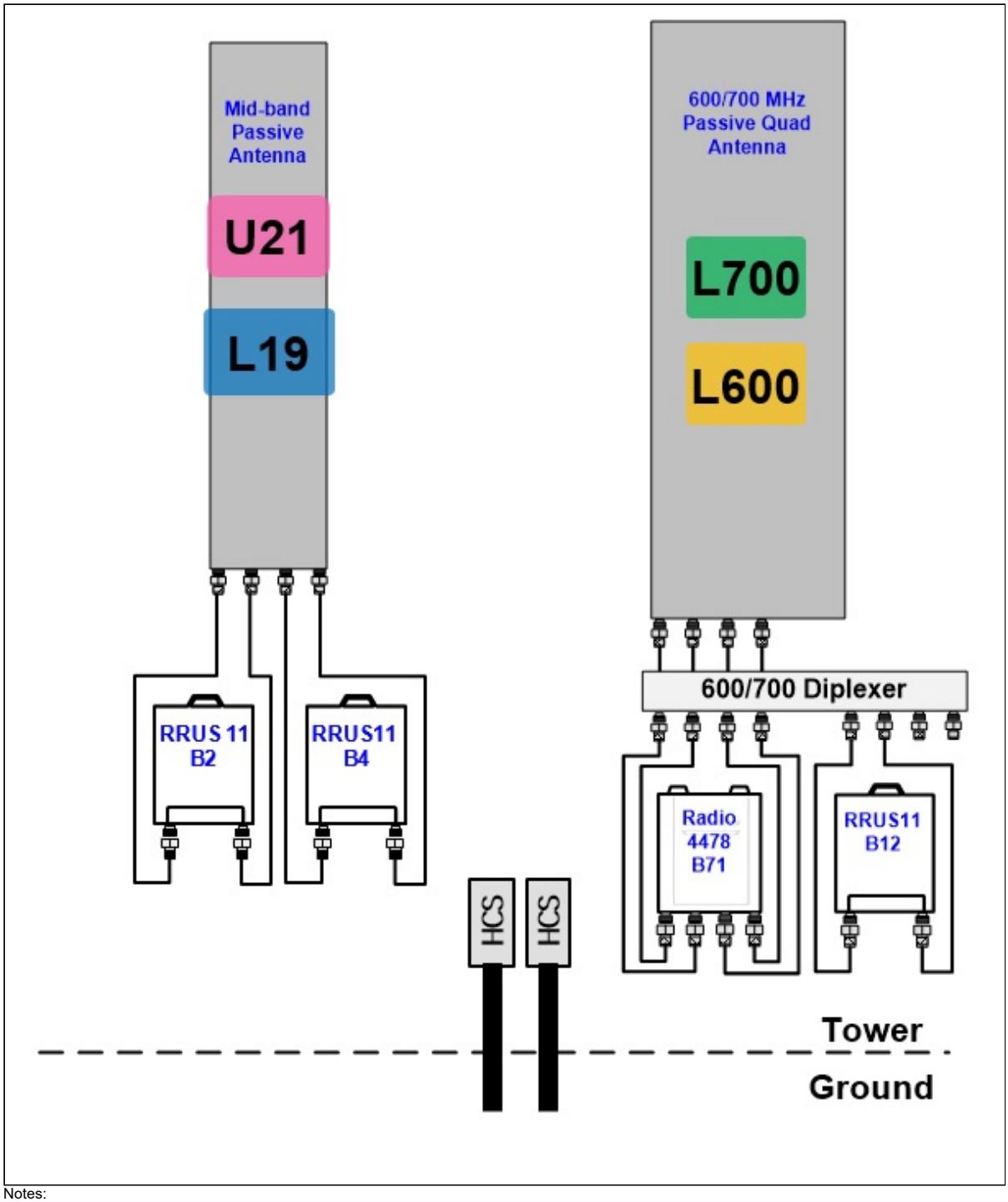

Notes:

6707B.jpg




Notes:

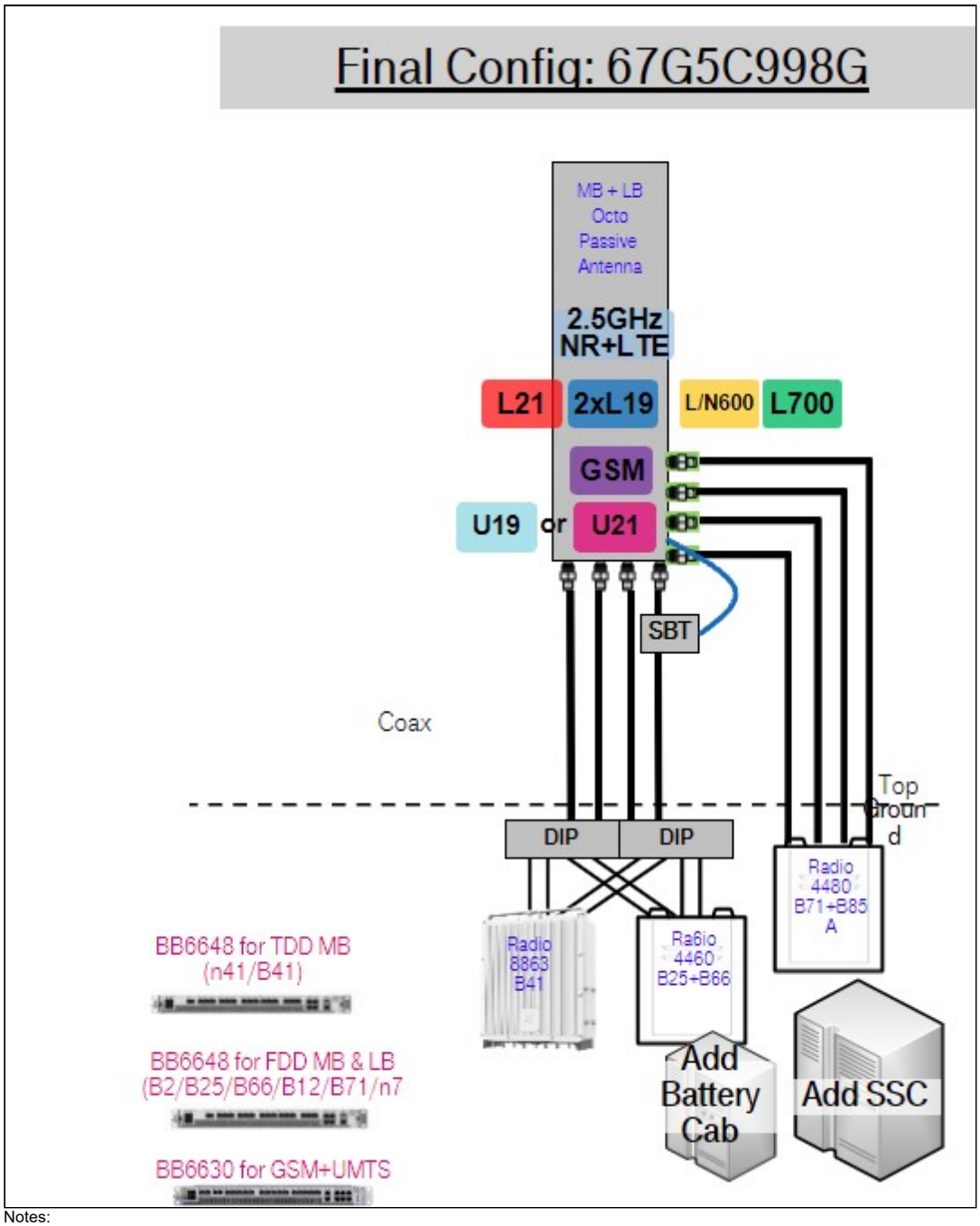
6707C_V2_2QP antenna.jpg


Mid-band
Passive
Antenna
U21
L19
600/700 MHz
Passive Quad
Antenna
L700
L600
600/700 Diplexer
RRUS 11
B2
RRUS11
B4
Radio
4478
B71
RRUS11
B12
HCS
HCS
Tower
Ground

Notes:

## Section 3 - Proposed Template Images

67G5C998G_1OP+SBT+1QuadDiplexer.jpg




Notes:

## Section 4 - Siteplan Images

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

| RAN Template: | A&L Template: |
|---|---|
| 67G5C998G 6160 | 67G5C998G_1O+1QuadDiplexer |

CTHA112A_Anchor_2

**Print Name:** Preliminary (RFDS_For_Scoping)
**PORs:** Anchor_Phase 3

## Section 5 - RAN Equipment

### Existing RAN Equipment

**Template:** 67D97C-U21

| Enclosure | 1 | 2 |
|---|---|---|
| Enclosure Type | RBS 6102 MU AC | Ancillary Equipment (Ericsson) |
| Baseband | DUW30 (U2100); DUG20 (G1900); BB 6630 (L1900, L2100); BB 6630 (L700, L600, N600) | |
| Hybrid Cable System | | Ericsson 6x12 HCS *Select Length & AWG* **(x 2 )** |

### Proposed RAN Equipment

**Template:** 67G5C998G 6160

| Enclosure | 1 | 2 | 3 |
|---|---|---|---|
| Enclosure Type | Enclosure 6160 AC V1 | B160 | RBS 6102 MU AC |
| Baseband | RP 6651 (L2500); RP 6651 (N2500) | | BB 6630 (L600, N600, L700); DUW30 (U2100); BB 6630 (L2100, L1900); DUG20 (G1900) |
| Hybrid Cable System | PSU 4813 vR4A (Kit) | | |
| Transport System | CSR IXRe V2 (Gen2) | | |

**RAN Scope of Work:**

Add (1) Enclosure 6160.

Add (1) iXRe Router to new Enclosure 6160.

Add (1) RP 6651 for N2500 to new Enclosure 6160.

Add (1) RP 6651 for L2500 to new Enclosure 6160.

Add (1) PSU4813 Voltage Booster to new Enclosure 6160.

Add (1) Battery Cabinet B160.

There will be (10) 7/8" coax per sector for a total of (30) 7/8" coax.

| RAN Template: | A&L Template: |
|---|---|
| 67G5C998G 6160 | 67G5C998G_1O+1QuadDiplexer |

CTHA112A_Anchor_2

**Print Name:** Preliminary (RFDS_For_Scoping)
**PORs:** Anchor_Phase 3

## Section 6 - A&L Equipment

**Existing Template:** 67D97C-U21_1QP_1OP
**Proposed Template:** 67G5C998G_1O+1QuadDiplexer

### Sector 1 (Existing) view from behind

| | | | | |
|---|---|---|---|---|
| **Coverage Type** | A - Outdoor Macro | | | |
| **Antenna** | **1** | | **2** | |
| **Antenna Model** | RFS - APX16DWV-16DWV-S-E-A20 (Quad) | | RFS - APXVAA24_43-U-A20 (Quad) | |
| **Azimuth** | 30 | | 30 | |
| **M. Tilt** | 0 | | 0 | |
| **Height** | 126 | | 116 | |
| **Ports** | **P1** | **P2** | **P3** | **P4** |
| **Active Tech.** | | L1900 G1900 U2100 L2100 | L700 L600 N600 | L700 L600 N600 |
| **Dark Tech.** | | | | |
| **Restricted Tech.** | | | | |
| **Decomm. Tech.** | | | | |
| **E. Tilt** | 2 | 2 | 2 | 2 |
| **Cables** | | 7/8" Coax - 140 ft. **(x2)** | 7/8" Coax - 140 ft. **(x2)** | 7/8" Coax - 140 ft. **(x2)** |
| **TMAs** | | RFS Style 2X - ATMA3P-1A20 (AtCabinet) | | |
| **Diplexers / Combiners** | | RFS - FDA4P5020S7-1C (AtCabinet) **(x2)** | | |
| **Radio** | | Radio 4415 B66A (At Cabinet)<br>Radio 4415 B25 (At Cabinet) | Radio 4449 B71+B85 (At Cabinet) | |
| **Sector Equipment** | | | | |

**Unconnected Equipment:**

**Scope of Work:**

| RAN Template: | A&L Template: |
|---|---|
| 67G5C998G 6160 | 67G5C998G_1O+1QuadDiplexer |

# CTHA112A_Anchor_2

**Print Name:** Preliminary (RFDS_For_Scoping)
**PORs:** Anchor_Phase 3

## Sector 1 (Proposed) view from behind

| | | | | | |
|---|---|---|---|---|---|
| **Coverage Type** | A - Outdoor Macro | | | | |
| **Antenna** | 1 | | | 2 | |
| **Antenna Model** | Commscope - FVV-65B-R3 (Hex) | | | Commscope_VV-65A-R1 (Quad) | |
| **Azimuth** | 30 | | | 30 | |
| **M. Tilt** | 0 | | | 0 | |
| **Height** | 126 | | | 116 | |
| **Ports** | **P1** | **P2** | **P3** | **P4** | **P5** |
| **Active Tech.** | L600 N600 L700 | L2100 G1900 L1900 U2100 | L2100 G1900 L1900 U2100 | N2500 L2500 | N2500 L2500 |
| **Dark Tech.** | | | | | |
| **Restricted Tech.** | | | | | |
| **Decomm. Tech.** | | | | | |
| **E. Tilt** | 2 | 2 | 2 | 2 | 2 |
| **Cables** | Coax Jumper **(x2)** 7/8" Coax **(x2)** | Coax Jumper **(x2)** 7/8" Coax **(x2)** | Coax Jumper **(x2)** 7/8" Coax **(x2)** | 7/8" Coax **(x2)** | 7/8" Coax **(x2)** |
| **TMAs** | | Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna) | SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna) | | |
| **Diplexers / Combiners** | | | | | |
| **Radio** | Radio 4449 B71+B85 (At Cabinet) | Radio 4460 B25+B66 (At Cabinet) | SHARED Radio 4460 B25+B66 (At Cabinet) | Radio 8863 B41 (At Cabinet) | SHARED Radio 8863 B41 (At Cabinet) |
| **Sector Equipment** | | | | | |

**Unconnected Equipment:**

**Scope of Work:**

There will be two antennae per sector.

Remove all TMAs.

Remove all diplexers.

Add (4) 7/8" coax

Replace APX16DWV antenna in position 1 with Hex, (1) FVV-65B-R3.

Connect the existing Radio 4449 to LB ports of the Hex antenna,

Remove Radio 4415 B66A and Radio 4415 B25 from position 1 at cabinet.

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both carriers), U2100 and GSM to Position 1 at cabinet and connect it to the Mid-band ports of the hex antenna,

Add (1) Smart BiasT

Replace antenna in Position 2 with (1) VV-65A-R1.

Add (1) Radio 8863 for L2500 and N2500 at cabinet.

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

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

| RAN Template: | A&L Template: |
|---|---|
| 67G5C998G 6160 | 67G5C998G_1O+1QuadDiplexer |

# CTHA112A_Anchor_2

**Print Name:** Preliminary (RFDS_For_Scoping)
**PORs:** Anchor_Phase 3

## Sector 2 (Existing) view from behind

| | | | | |
|---|---|---|---|---|
| **Coverage Type** | A - Outdoor Macro | | | |
| **Antenna** | **1** | | **2** | |
| **Antenna Model** | RFS - APX16DWV-16DWV-S-E-A20 (Quad) | | RFS - APXVAA24_43-U-A20 (Quad) | |
| **Azimuth** | 150 | | 150 | |
| **M. Tilt** | 0 | | 0 | |
| **Height** | 126 | | 116 | |
| **Ports** | **P1** | **P2** | **P3** | **P4** |
| **Active Tech.** | | L1900 G1900 U2100 L2100 | L700 L600 N600 | L700 L600 N600 |
| **Dark Tech.** | | | | |
| **Restricted Tech.** | | | | |
| **Decomm. Tech.** | | | | |
| **E. Tilt** | 2 | 2 | 2 | 2 |
| **Cables** | | 7/8" Coax - 140 ft. **(x2)** | 7/8" Coax - 140 ft. **(x2)** | 7/8" Coax - 140 ft. **(x2)** |
| **TMAs** | | RFS Style 2X - ATMA3P-1A20 (AtCabinet) | | |
| **Diplexers / Combiners** | | RFS - FDA4P5020S7-1C (AtCabinet) **(x2)** | | |
| **Radio** | | Radio 4415 B66A (At Cabinet)<br>Radio 4415 B25 (At Cabinet) | Radio 4449 B71+B85 (At Cabinet) | |
| **Sector Equipment** | | | | |

**Unconnected Equipment:**

**Scope of Work:**

| RAN Template: | A&L Template: |
|---|---|
| 67G5C998G 6160 | 67G5C998G_1O+1QuadDiplexer |

# CTHA112A_Anchor_2

**Print Name:** Preliminary (RFDS_For_Scoping)
**PORs:** Anchor_Phase 3

## Sector 2 (Proposed) view from behind

| | | | | | |
|---|---|---|---|---|---|
| **Coverage Type** | A - Outdoor Macro | | | | |
| **Antenna** | 1 | | | 2 | |
| **Antenna Model** | Commscope - FVV-65B-R3 (Hex) | | | Commscope_VV-65A-R1 (Quad) | |
| **Azimuth** | 150 | | | 150 | |
| **M. Tilt** | 0 | | | 0 | |
| **Height** | 126 | | | 116 | |
| **Ports** | P1 | P2 | P3 | P4 | P5 |
| **Active Tech.** | L700 N600 L600 | G1900 U2100 L2100 L1900 | G1900 U2100 L2100 L1900 | L2500 N2500 | L2500 N2500 |
| **Dark Tech.** | | | | | |
| **Restricted Tech.** | | | | | |
| **Decomm. Tech.** | | | | | |
| **E. Tilt** | 2 | 2 | 2 | 2 | 2 |
| **Cables** | Coax Jumper **(x2)** 7/8" Coax **(x2)** | Coax Jumper **(x2)** 7/8" Coax **(x2)** | Coax Jumper **(x2)** 7/8" Coax **(x2)** | 7/8" Coax **(x2)** | 7/8" Coax **(x2)** |
| **TMAs** | | Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna) | SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna) | | |
| **Diplexers / Combiners** | | | | | |
| **Radio** | Radio 4449 B71+B85 (At Cabinet) | Radio 4460 B25+B66 (At Cabinet) | SHARED Radio 4460 B25+B66 (At Cabinet) | Radio 8863 B41 (At Cabinet) | SHARED Radio 8863 B41 (At Cabinet) |
| **Sector Equipment** | | | | | |

**Unconnected Equipment:**

**Scope of Work:**

There will be two antennae per sector.

Remove all TMAs.

Remove all diplexers.

Add (4) 7/8" coax

Replace APX16DWV antenna in position 1 with Hex, (1) FVV-65B-R3.

Connect the existing Radio 4449 to LB ports of the Hex antenna,

Remove Radio 4415 B66A and Radio 4415 B25 from position 1 at cabinet.

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both carriers), U2100 and GSM to Position 1 at cabinet and connect it to the Mid-band ports of the hex antenna,

Add (1) Smart BiasT

Replace antenna in Position 2 with (1) VV-65A-R1.

Add (1) Radio 8863 for L2500 and N2500 at cabinet.

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

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

| RAN Template: | A&L Template: |
|---|---|
| 67G5C998G 6160 | 67G5C998G_1O+1QuadDiplexer |

# CTHA112A_Anchor_2

**Print Name:** Preliminary (RFDS_For_Scoping)
**PORs:** Anchor_Phase 3

## Sector 3 (Existing) view from behind

| | | | | |
|---|---|---|---|---|
| **Coverage Type** | A - Outdoor Macro | | | |
| **Antenna** | **1** | | **2** | |
| **Antenna Model** | RFS - APX16DWV-16DWV-S-E-A20 (Quad) | | RFS - APXVAA24_43-U-A20 (Quad) | |
| **Azimuth** | 270 | | 270 | |
| **M. Tilt** | 0 | | 0 | |
| **Height** | 126 | | 116 | |
| **Ports** | **P1** | **P2** | **P3** | **P4** |
| **Active Tech.** | | L1900 G1900 U2100 L2100 | L700 L600 N600 | L700 L600 N600 |
| **Dark Tech.** | | | | |
| **Restricted Tech.** | | | | |
| **Decomm. Tech.** | | | | |
| **E. Tilt** | 2 | 2 | 2 | 2 |
| **Cables** | | 7/8" Coax - 140 ft. **(x2)** | 7/8" Coax - 140 ft. **(x2)** | 7/8" Coax - 140 ft. **(x2)** |
| **TMAs** | | RFS Style 2X - ATMA3P-1A20 (AtCabinet) | | |
| **Diplexers / Combiners** | | RFS - FDA4P5020S7-1C (AtCabinet) **(x2)** | | |
| **Radio** | | Radio 4415 B66A (At Cabinet)<br>Radio 4415 B25 (At Cabinet) | Radio 4449 B71+B85 (At Cabinet) | |
| **Sector Equipment** | | | | |

**Unconnected Equipment:**

**Scope of Work:**

| RAN Template: | A&L Template: |
|---|---|
| 67G5C998G 6160 | 67G5C998G_1O+1QuadDiplexer |

# CTHA112A_Anchor_2

**Print Name:** Preliminary (RFDS_For_Scoping)
**PORs:** Anchor_Phase 3

## Sector 3 (Proposed) view from behind

| | | | | | |
|---|---|---|---|---|---|
| **Coverage Type** | A - Outdoor Macro | | | | |
| **Antenna** | 1 | | | 2 | |
| **Antenna Model** | Commscope - FVV-65B-R3 (Hex) | | | Commscope_VV-65A-R1 (Quad) | |
| **Azimuth** | 270 | | | 270 | |
| **M. Tilt** | 0 | | | 0 | |
| **Height** | 126 | | | 116 | |
| **Ports** | **P1** | **P2** | **P3** | **P4** | **P5** |
| **Active Tech.** | L700 N600 L600 | G1900 U2100 L2100 L1900 | G1900 U2100 L2100 L1900 | L2500 N2500 | L2500 N2500 |
| **Dark Tech.** | | | | | |
| **Restricted Tech.** | | | | | |
| **Decomm. Tech.** | | | | | |
| **E. Tilt** | 2 | 2 | 2 | 2 | 2 |
| **Cables** | Coax Jumper **(x2)** 7/8" Coax **(x2)** | Coax Jumper **(x2)** 7/8" Coax **(x2)** | Coax Jumper **(x2)** 7/8" Coax **(x2)** | 7/8" Coax **(x2)** | 7/8" Coax **(x2)** |
| **TMAs** | | Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna) | SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna) | | |
| **Diplexers / Combiners** | | | | | |
| **Radio** | Radio 4449 B71+B85 (At Cabinet) | Radio 4460 B25+B66 (At Cabinet) | SHARED Radio 4460 B25+B66 (At Cabinet) | Radio 8863 B41 (At Cabinet) | SHARED Radio 8863 B41 (At Cabinet) |
| **Sector Equipment** | | | | | |

**Unconnected Equipment:**

**Scope of Work:**

There will be two antennae per sector.

Remove all TMAs.

Remove all diplexers.

Add (4) 7/8" coax

Replace APX16DWV antenna in position 1 with Hex, (1) FVV-65B-R3.

Connect the existing Radio 4449 to LB ports of the Hex antenna,

Remove Radio 4415 B66A and Radio 4415 B25 from position 1 at cabinet.

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both carriers), U2100 and GSM to Position 1 at cabinet and connect it to the Mid-band ports of the hex antenna,

Add (1) Smart BiasT

Replace antenna in Position 2 with (1) VV-65A-R1.

Add (1) Radio 8863 for L2500 and N2500 at cabinet.

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

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

| RAN Template: | A&L Template: |
|---|---|
| 67G5C998G 6160 | 67G5C998G_1O+1QuadDiplexer |

CTHA112A_Anchor_2

**Print Name:** Preliminary (RFDS_For_Scoping)
**PORs:** Anchor_Phase 3

## Section 7 - Power Systems Equipment

| Existing Power Systems Equipment |
|---|
| ----- This section is intentionally blank. ----- |

| | Proposed Power Systems Equipment |
|---|---|
| Enclosure | 1 |
| Enclosure Type | Enclosure 6160 AC V1 |

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: CTHA112A

CTHA112/FarmingtonSWFD_RL
2 Westwoods Drive
Farmington, Connecticut 06032

**June 9, 2022**

**EBI Project Number: 6222003754**

| **Site Compliance Summary** | |
|---|---|
| Compliance Status: | **COMPLIANT** |
| Site total MPE% of FCC general population allowable limit: | **7.63%** |

June 9, 2022

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

Emissions Analysis for Site: CTHA112A - CTHA112/FarmingtonSWFD_RL

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **2 Westwoods Drive** in **Farmington, 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 2 Westwoods Drive in Farmington, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

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

4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

7) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

8) 2 LTE channels (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

9) 2 NR channels (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

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

11) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

12) The antennas used in this modeling are the Commscope FVV-65B-R3 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz channel(s), the Commscope VV-65A-R1 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the Commscope FVV-65B-R3 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz channel(s), the Commscope VV-65A-R1 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the Commscope FVV-65B-R3 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz channel(s), the Commscope VV-65A-R1 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.

13) The antenna mounting height centerlines of the proposed antennas are 116 and 126 feet above ground level (AGL).

14) Emissions from additional carriers were not included because emissions data for the site location are not available.

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

# T-Mobile Site Inventory and Power Data

| Sector: | A | Sector: | B | Sector: | C |
|---|---|---|---|---|---|
| Antenna #: | 1 | Antenna #: | 1 | Antenna #: | 1 |
| Make / Model: | Commscope FVV-65B-R3 | Make / Model: | Commscope FVV-65B-R3 | Make / Model: | Commscope FVV-65B-R3 |
| Frequency Bands: | 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz | Frequency Bands: | 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz | Frequency Bands: | 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz |
| Gain: | 11.48 dBd / 11.48 dBd / 11.9 dBd / 15.17 dBd / 15.17 dBd / 16.12 dBd / 16.12 dBd | Gain: | 11.48 dBd / 11.48 dBd / 11.9 dBd / 15.17 dBd / 15.17 dBd / 16.12 dBd / 16.12 dBd | Gain: | 11.48 dBd / 11.48 dBd / 11.9 dBd / 15.17 dBd / 15.17 dBd / 16.12 dBd / 16.12 dBd |
| Height (AGL): | 126 feet | Height (AGL): | 126 feet | Height (AGL): | 126 feet |
| Channel Count: | 15 | Channel Count: | 15 | Channel Count: | 15 |
| Total TX Power (W): | 620.00 Watts | Total TX Power (W): | 620.00 Watts | Total TX Power (W): | 620.00 Watts |
| ERP (W): | 18,156.89 | ERP (W): | 18,156.89 | ERP (W): | 18,156.89 |
| Antenna A1 MPE %: | **5.54%** | Antenna B1 MPE %: | **5.54%** | Antenna C1 MPE %: | **5.54%** |
| Antenna #: | **2** | Antenna #: | **2** | Antenna #: | **2** |
| Make / Model: | Commscope VV-65A-R1 | Make / Model: | Commscope VV-65A-R1 | Make / Model: | Commscope VV-65A-R1 |
| Frequency Bands: | 2500 MHz / 2500 MHz | Frequency Bands: | 2500 MHz / 2500 MHz | Frequency Bands: | 2500 MHz / 2500 MHz |
| Gain: | 16.45 dBd / 16.45 dBd | Gain: | 16.45 dBd / 16.45 dBd | Gain: | 16.45 dBd / 16.45 dBd |
| Height (AGL): | 116 feet | Height (AGL): | 116 feet | Height (AGL): | 116 feet |
| Channel Count: | 4 | Channel Count: | 4 | Channel Count: | 4 |
| Total TX Power (W): | 160.00 Watts | Total TX Power (W): | 160.00 Watts | Total TX Power (W): | 160.00 Watts |
| ERP (W): | 7,065.13 | ERP (W): | 7,065.13 | ERP (W): | 7,065.13 |
| Antenna A2 MPE %: | **2.10%** | Antenna B2 MPE %: | **2.10%** | Antenna C2 MPE %: | **2.10%** |

| Site Composite MPE % | |
|---|---|
| **Carrier** | **MPE %** |
| T-Mobile (Max at Sector A): | 7.63% |
| no additional carriers | N/A |
| **Site Total MPE % :** | 7.63% |

| T-Mobile MPE % Per Sector | |
|---|---|
| T-Mobile Sector A Total: | 7.63% |
| T-Mobile Sector B Total: | 7.63% |
| T-Mobile Sector C Total: | 7.63% |
| | |
| Site Total MPE % : | 7.63% |

## 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 600 MHz LTE | 2 | 421.81 | 126.0 | 2.11 | 600 MHz LTE | 400 | 0.53% |
| T-Mobile 600 MHz NR | 1 | 1124.84 | 126.0 | 2.81 | 600 MHz NR | 400 | 0.70% |
| T-Mobile 700 MHz LTE | 2 | 464.64 | 126.0 | 2.32 | 700 MHz LTE | 467 | 0.50% |
| T-Mobile 1900 MHz GSM | 4 | 986.55 | 126.0 | 9.85 | 1900 MHz GSM | 1000 | 0.99% |
| T-Mobile 1900 MHz LTE | 2 | 1973.11 | 126.0 | 9.85 | 1900 MHz LTE | 1000 | 0.99% |
| T-Mobile 2100 MHz UMTS | 2 | 1227.78 | 126.0 | 6.13 | 2100 MHz UMTS | 1000 | 0.61% |
| T-Mobile 2100 MHz LTE | 2 | 2455.56 | 126.0 | 12.26 | 2100 MHz LTE | 1000 | 1.23% |
| T-Mobile 2500 MHz LTE | 2 | 1766.28 | 116.0 | 10.50 | 2500 MHz LTE | 1000 | 1.05% |
| T-Mobile 2500 MHz NR | 2 | 1766.28 | 116.0 | 10.50 | 2500 MHz NR | 1000 | 1.05% |
| | | | | | | **Total:** | **7.63%** |

• 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: | 7.63% |
| Sector B: | 7.63% |
| Sector C: | 7.63% |
| T-Mobile Maximum MPE % (Sector A): | 7.63% |
| | |
| Site Total: | 7.63% |
| | |
| Site Compliance Status: | **COMPLIANT** |

The anticipated composite MPE value for this site assuming all carriers present is **7.63%** 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.