Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

April 16, 2021

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

RE: Notice of Exempt Modification
50 Maple Street, Branford, CT 06405
Latitude: 41.2742440000
Longitude: -72.8136560000
T-Mobile Site#: CT11328F – L600

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 96-foot level of the existing 100-foot smokestack at 50 Maple Street, CT. The 100-foot smokestack and property are owned by Marine Systems Incorporated. T-Mobile now intends to replace three (3) existing antennas with (3) new 600/700 MHz antennas. The new antennas will support 5G services and will be installed at the same 96-foot level of the tower.

**Planned Modifications:**
**Tower:**
Remove
(6) 1-5/8" coax

Remove and Replace:
(3) Andrew LNX-6515DS for (3) RFS APXVAALL24_43-U-NA20 600/700 MHz antennas
(3) RRUS11B12 for (3) Radio 4449

Install New:
(3) 1-5/8" Hybrid

Existing to Remain:
(6) AIR 21
(3) TMA
(3) 1-5/8" Hybrid
(6) 1-5/8" coax

The original approval of this facility was by the Town of Branford Planning and Zoning Commission. The Commission approved the facility on January 7, 2010. A copy of this approval is enclosed. T-Mobile was subsequently approved for tower-sharing by the Connecticut Siting Council on March 3, 2017.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to First Selectman -James Cosgrove, Elected Official, and Harry Smith, Town Planner, as well as the owner.

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

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

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

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

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

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

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

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

Sincerely,

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

Attachments
cc: James Cosgrove – First Selectman – Town of Branford
Harry Smith– Town Planner – Town of Branford
Marine Systems Inc – Owner

# View/Print Label

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

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

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

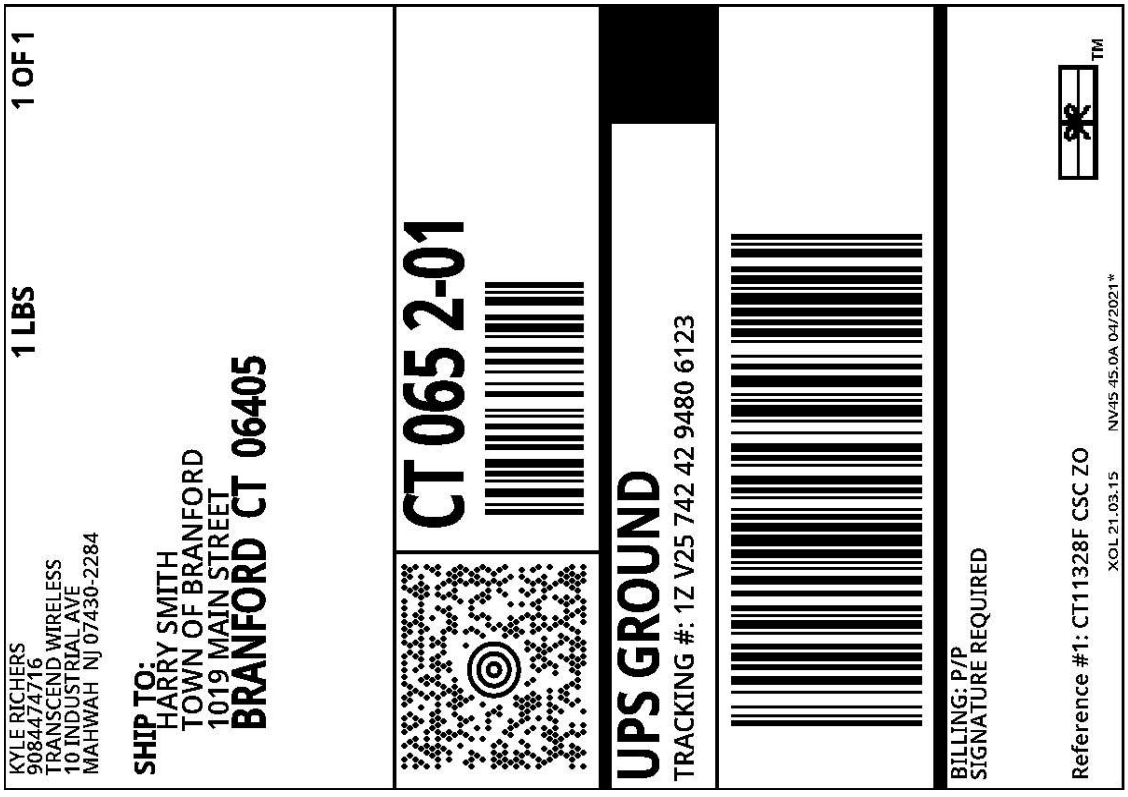
   **Customers without a scheduled Pickup**
   - Schedule a Pickup on ups.com to have a UPS driver pickup all of your packages.
   - Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find the location nearest you, please visit the 'Locations' Quick link at ups.com.

UPS Access Point™
MICHAELS STORE # 7773
75 INTERSTATE SHOP CTR
RAMSEY NJ 07446-1130

UPS Access Point™
THE UPS STORE
115 FRANKLIN TPKE
MAHWAH NJ 07430-1325

UPS Access Point™
THE UPS STORE
120 E MAIN ST
RAMSEY NJ 07446-1925

FOLD HERE



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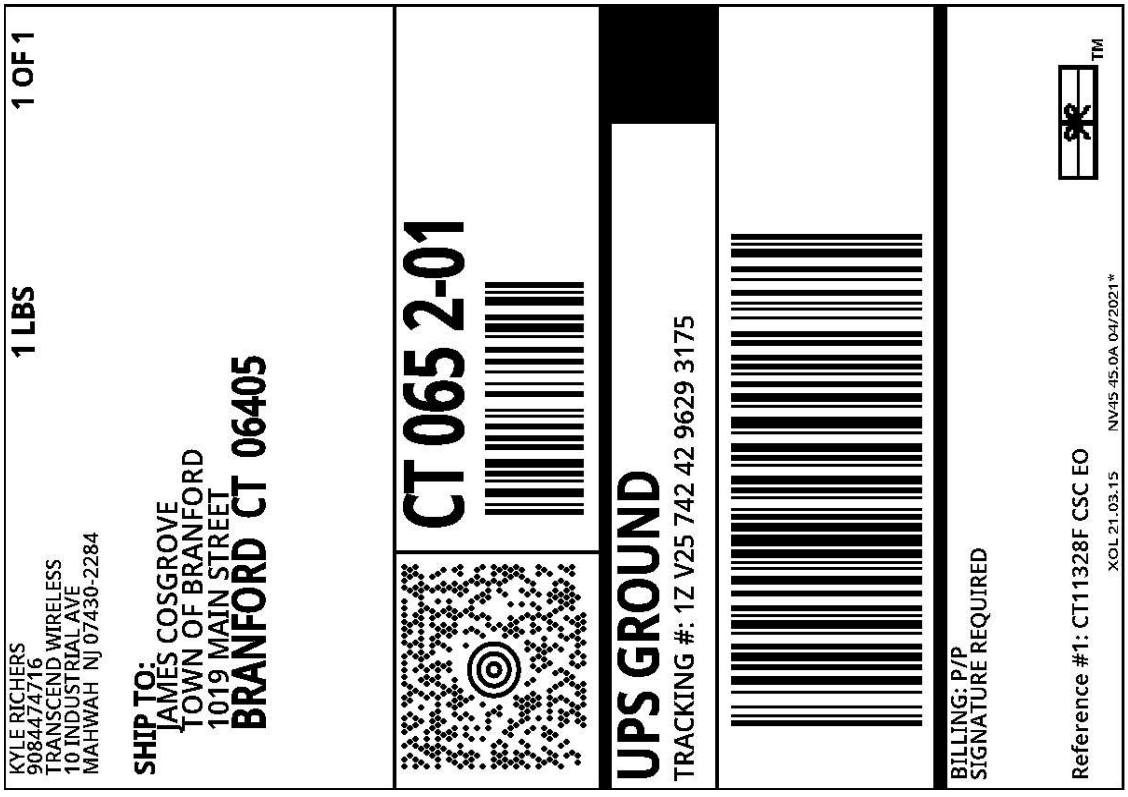

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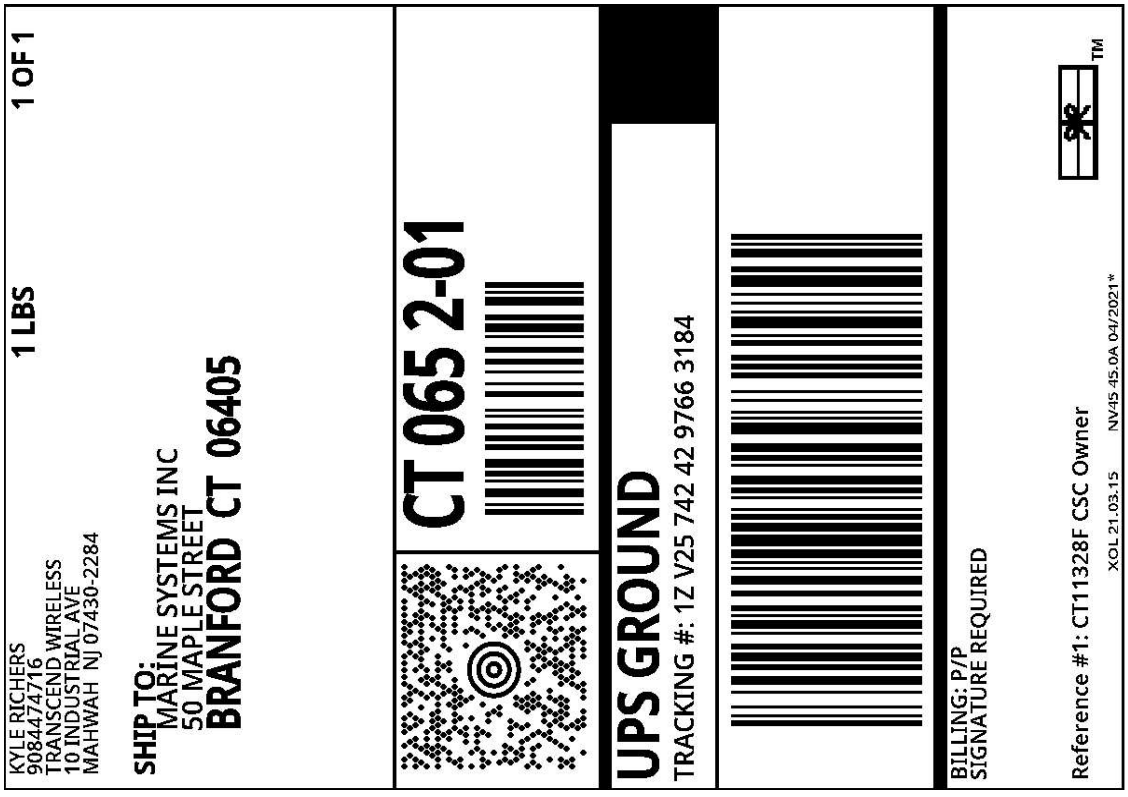


# 50 MAPLE ST

| | | | |
|---|---|---|---|
| **Location** | 50 MAPLE ST | **Mblu** | D08/000 012/ 00003/ / |
| **Acct#** | 000592 | **Owner** | MARINE SYSTEMS INCORPORATED |
| **Assessment** | $964,500 | **Appraisal** | $1,378,100 |
| **PID** | 801 | **Building Count** | 2 |

## Current Value

| Appraisal | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2019 | $412,300 | $965,800 | $1,378,100 |

| Assessment | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2019 | $288,400 | $676,100 | $964,500 |

## Owner of Record

| | | | |
|---|---|---|---|
| **Owner** | MARINE SYSTEMS INCORPORATED | **Sale Price** | $0 |
| **Co-Owner** | | **Certificate** | |
| **Address** | PO BOX 447<br>BRANFORD, CT 06405 | **Book & Page** | 0555/1008 |
| | | **Sale Date** | 09/07/1993 |

## Ownership History

| Ownership History | | | | |
|---|---|---|---|---|
| **Owner** | **Sale Price** | **Certificate** | **Book & Page** | **Sale Date** |
| MARINE SYSTEMS INCORPORATED | $0 | | 0555/1008 | 09/07/1993 |

## Building Information

### Building 1 : Section 1

| | |
|---|---|
| **Year Built:** | 1900 |
| **Living Area:** | 82,765 |
| **Replacement Cost:** | $3,139,276 |
| **Building Percent Good:** | 3 |
| **Replacement Cost Less Depreciation:** | $94,200 |

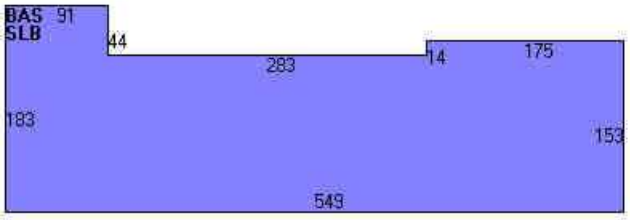
| Building Attributes |
|---|

| Field | Description |
|---|---|
| STYLE | Warehouse |
| MODEL | Ind/Comm |
| Grade | C |
| Stories: | 1 |
| Occupancy | 3 |
| Exterior Wall 1 | Brick |
| Exterior Wall 2 | Concr/Cinder |
| Roof Structure | Flat |
| Roof Cover | T&G/Rubber |
| Interior Wall 1 | Minim/Masonry |
| Interior Wall 2 | |
| Interior Floor 1 | Concr-Finished |
| Interior Floor 2 | |
| Heating Fuel | None/Coal/Wd |
| Heating Type | None |
| AC Type | None |
| Bldg Use | BOATYARD MDL96 |
| Total Rooms | |
| Total Bedrms | 00 |
| Total Baths | 0 |
| 1st Floor Use: | 384I |
| Heat/AC | NONE |
| Frame Type | MASONRY |
| Baths/Plumbing | LIGHT |
| Ceiling/Wall | NONE |
| Rooms/Prtns | AVERAGE |
| Wall Height | 22 |
| % Comn Wall | |

### Building Photo


(http://images.vgsi.com/photos/BranfordCTPhotos/\00\01\54/82.jpg)

### Building Layout




(http://images.vgsi.com/photos/BranfordCTPhotos//Sketches/801_801.jpg)

| Building Sub-Areas (sq ft) | | | Legend |
|---|---|---|---|
| Code | Description | Gross Area | Living Area |
| BAS | First Floor | 82,765 | 82,765 |
| SLB | Slab | 82,765 | 0 |
| | | 165,530 | 82,765 |

## Building 2 : Section 1

**Year Built:** 1920
**Living Area:** 2,304
**Replacement Cost:** $277,502
**Building Percent Good:** 30
**Replacement Cost Less Depreciation:** $83,300

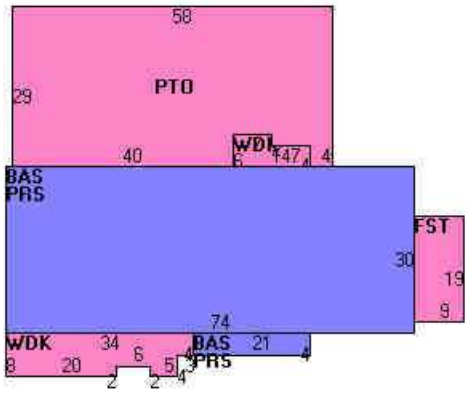
| Building Attributes : Bldg 2 of 2 | |
|---|---|
| Field | Description |
| STYLE | Restaurant |
| MODEL | Comm/Ind |
| Grade | C |

| | |
|---|---|
| Stories: | 1 |
| Occupancy | 1 |
| Exterior Wall 1 | Wood Shingle |
| Exterior Wall 2 | |
| Roof Structure | Gable/Hip |
| Roof Cover | Asphalt |
| Interior Wall 1 | Drywall |
| Interior Wall 2 | |
| Interior Floor 1 | Hardwood |
| Interior Floor 2 | Ceram Clay Til |
| Heating Fuel | Gas |
| Heating Type | Forced Air-Duc |
| AC Type | Central |
| Bldg Use | REST/CLUBS MDL94 |
| Total Rooms | |
| Total Bedrms | 00 |
| Total Baths | 0 |
| 1st Floor Use: | 3840 |
| Heat/AC | HEAT/AC SPLIT |
| Frame Type | WOOD FRAME |
| Baths/Plumbing | AVERAGE |
| Ceiling/Wall | CEIL & WALLS |
| Rooms/Prtns | AVERAGE |
| Wall Height | 8 |
| % Comn Wall | |

### Building Photo


(http://images.vgsi.com/photos/BranfordCTPhotos//\00\02\16/71.jpg)

### Building Layout




(http://images.vgsi.com/photos/BranfordCTPhotos//Sketches/801_14082.jp

| Building Sub-Areas (sq ft) | | | Legend |
|---|---|---|---|
| Code | Description | Gross Area | Living Area |
| BAS | First Floor | 2,304 | 2,304 |
| FST | Utility, Finished | 171 | 0 |
| PRS | Pier Fndtn | 2,304 | 0 |
| PTO | Patio | 1,612 | 0 |
| WDK | Deck, Wood | 318 | 0 |
| | | 6,709 | 2,304 |

### Extra Features

| Extra Features | | | | Legend |
|---|---|---|---|---|
| Code | Description | Size | Value | Bldg # |
| MEZ1 | MEZZANINE-UNF | 784 S.F. | $200 | 1 |
| GIR3 | GIRDERS 19"-24 | 80 L.F. | $200 | 1 |
| HT2 | ELECTRIC | 1248 S.F. | $200 | 1 |

| | | | | |
|---|---|---|---|---|
| HT3 | FORCED AIR | 840 S.F. | $200 | 1 |
| A/C | AIR CONDITION | 0 S.F. | $0 | 1 |

## Land

### Land Use

| | |
|---|---|
| **Use Code** | 3150 |
| **Description** | BOATYARD MDL96 |
| **Zone** | IG-1 |
| **Neighborhood** | 350 |
| **Alt Land Appr** | No |
| **Category** | |

### Land Line Valuation

| | |
|---|---|
| **Size (Acres)** | 4.59 |
| **Frontage** | |
| **Depth** | |
| **Assessed Value** | $676,100 |
| **Appraised Value** | $965,800 |

## Outbuildings

| Outbuildings | | | | | | Legend |
|---|---|---|---|---|---|---|
| **Code** | **Description** | **Sub Code** | **Sub Description** | **Size** | **Value** | **Bldg #** |
| PAV1 | PAVING-ASPHALT | | | 36978 S.F. | $18,300 | 1 |
| SHD5 | SHED COM WOOD | | | 168 S.F. | $1,400 | 2 |
| PAV2 | PAVING-CONC | | | 3204 S.F. | $3,200 | 1 |
| LT1 | LIGHTS-IN W/PL | | | 1 UNITS | $200 | 1 |
| LT1 | LIGHTS-IN W/PL | | | 1 UNITS | $200 | 1 |
| LT2 | W/DOUBLE LIGHT | | | 2 UNITS | $700 | 1 |
| FN3 | FENCE-6' CHAIN | | | 510 L.F. | $1,500 | 1 |
| WDK | WOOD DECK | | | 230 S.F. | $700 | 1 |
| DCK3 | FLOATING | | | 4507 S.F. | $114,900 | 1 |
| DCK3 | FLOATING | | | 2804 S.F. | $71,500 | 1 |
| STK1 | CHIMNEY STK BR | | | 100 UNITS | $20,000 | 1 |
| SHD5 | SHED COM WOOD | | | 160 S.F. | $1,400 | 1 |

## Valuation History

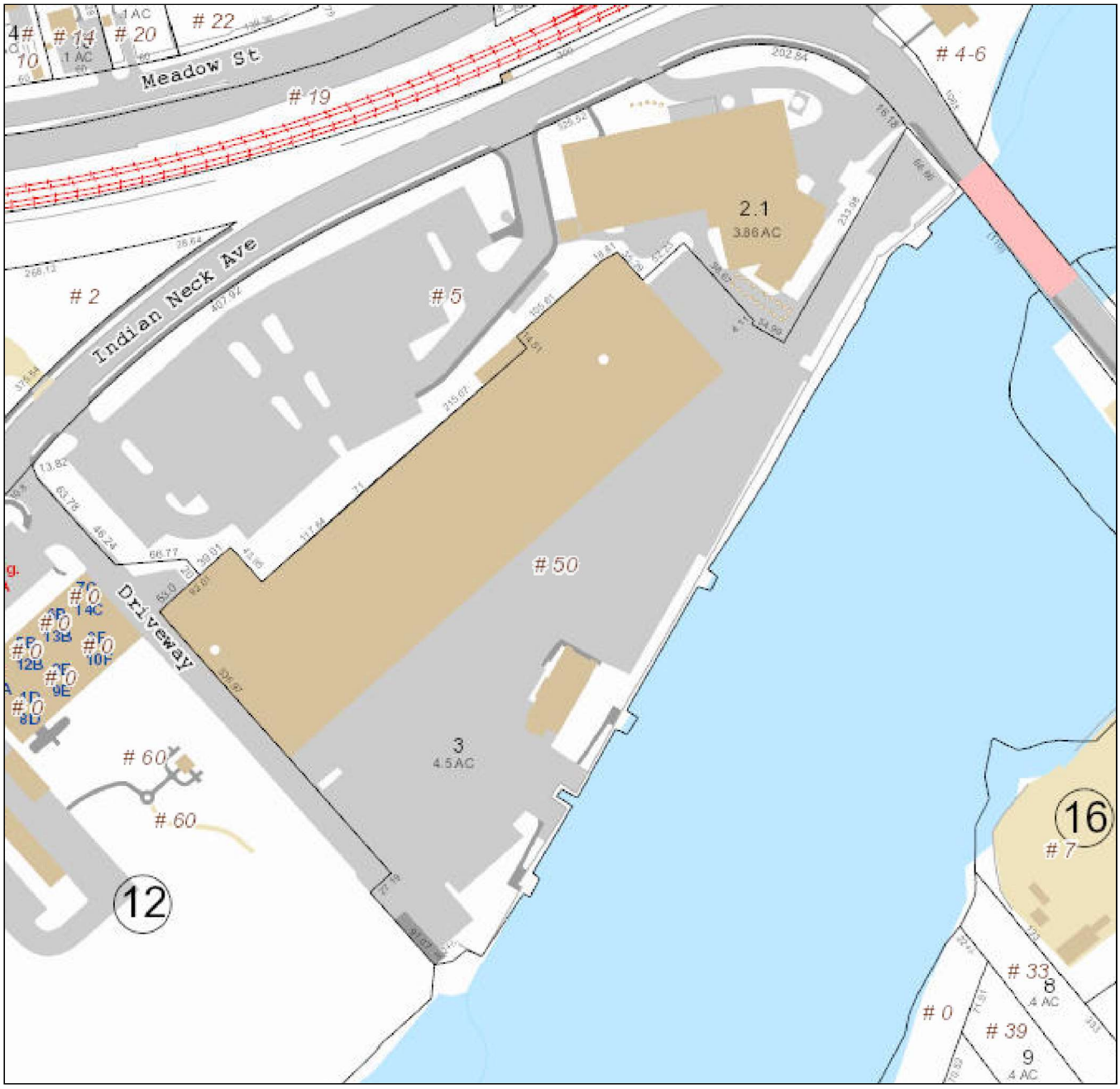
| Appraisal | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2020 | $412,300 | $965,800 | $1,378,100 |
| 2019 | $412,300 | $965,800 | $1,378,100 |
| 2018 | $401,900 | $937,400 | $1,339,300 |

| Assessment | | | |
|---|---|---|---|
| **Valuation Year** | **Improvements** | **Land** | **Total** |
| 2020 | $288,400 | $676,100 | $964,500 |
| 2019 | $288,400 | $676,100 | $964,500 |
| 2018 | $281,300 | $656,200 | $937,500 |

# Town of Branford

Geographic Information System (GIS)

Date Printed: 4/16/2021




**MAP DISCLAIMER - NOTICE OF LIABILITY**

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Branford and its mapping contractors assume no legal responsibility for the information contained herein.

0 150 Feet

N W E S

PLANNING AND ZONING COMMISSION
TOWN OF BRANFORD TOWN HALL DRIVE P.O. BOX 150
Branford, Connecticut 06405
Telephone: (203) 488-1255 Fax: (203) 315-2188

# NOTICE OF DECISION

January 11, 2010

Clearwire by Maxton Technology
Attention: Thomas F. Flynn III
1296 Blue Hills Avenue
Bloomfield, Connecticut 06002

SUBJECT: Site Plan

APPLICATION: #09-12.4 ADDRESS: 50 Maple Street

APPLICANT: Clearwire Wireless LLC d/b/a Clearwire

OWNER OF RECORD: Marine Systems, Inc.

Dear. Sir:

At a meeting of the Branford Planning & Zoning Commission held on Thursday, January 7, 2010 the Commission voted to:

X Approve your above subject application.

Very truly yours,

Shirley Rasmussen

Shirley Rasmussen
Town Planner

NOTE: Site Plan shall become null and void in the event the applicant fails to obtain a building permit within one (1) year of date of approval.
(Per Section 31.7 of the Branford Zoning Regulations)

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# MARINE SYS. SMOKE STACK
# SITE ID: CT11328F
# 50 MAPLE ST
# BRANFORD, CT 06405

| T-MOBILE A+L TEMPLATE (PROVIDED BY RFDS) |
|---|
| 67D92C_2xAIR+1OP |

| T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS) |
|---|
| 67D92C HYBRID |

## GENERAL NOTES

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

## SITE DIRECTIONS

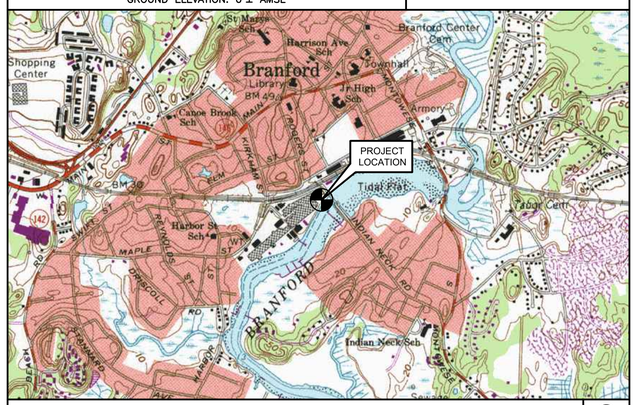
**FROM:** 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

**TO:** 50 MAPLE STREET
BRANFORD, CT 06405

| | | |
|---|---|---|
| 1. | HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD. | 0.30 MI. |
| 2. | TAKE THE 2ND RIGHT ONTO DAY HILL RD. | 3.64 MI. |
| 3. | MERGE ONTO I-91 S TOWARD HARTFORD | 14.42 MI. |
| 4. | TAKE CT-99 EXIT, EXIT 24 TOWARD WETHERSFIELD/ROCKY HILL | 0.28 MI. |
| 5. | TURN LEFT ONTO SILAS DEANE HWY/CT-99 | 0.00 MI. |
| 6. | MERGE ONTO I-91 S via THE RAMP ON THE LEFT TOWARD NEW HAVEN | 31.32 MI. |
| 7. | MERGE ONTO I-95 N via THE EXIT ON THE LEFT TOWARD NEW LONDON | 4.55 MI. |
| 8. | TAKE THE US-1 EXIT, EXIT 53, TOWARD SHORT BEACH/CT-142/CT-146 | 0.43 MI. |
| 9. | MERGE ONTO BRANFORD CONN. | 0.62 MI. |
| 10. | TAKE THE 1ST RIGHT ONTO W MAIN ST/US-1 S | 0.10 MI. |
| 11. | TAKE THE 1ST LEFT ONTO SHORT BEACH RD/CT-142 | 0.22 MI. |
| 12. | TURN LEFT ONTO MAPLE ST | 0.72 MI. |
| 13. | TURN RIGHT ONTO INDIAN NECK AVE. | 0.17 MI. |
| 14. | 50 MAPLE ST BRANFORD, CT 06405-3511, 50 MAPLE ST | |

SITE COORDINATES: LATITUDE: 41°-10'-5.42" N
LONGITUDE: 73°-8'-11.18" W
GROUND ELEVATION: 0'± AMSL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH




VICINITY MAP — NORTH

## PROJECT SUMMARY

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

1. REMOVE (1) ANDREW-LNX 6515DS-A1M ANTENNA PER SECTOR. TOTAL (3)
2. INSTALL (1) RFS APXVAALLR24_43-U-NA20 PER SECTOR. TOTAL (3)
3. REMOVE (1) RRUS11 B12 PER SECTOR. TOTAL (3)
4. INSTALL (1) RADIO 4449 B71+B85 PER SECTOR. TOTAL (3)

## PROJECT INFORMATION

| | |
|---|---|
| SITE NAME: | MARINE SYS. SMOKE STACK |
| SITE ID: | CT11328F |
| SITE ADDRESS: | 50 MAPLE STREET<br>BRANFORD, CT 06405 |
| 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 RD.<br>BRANFORD, CT 06405<br><br>CARLO F. CENTORE, PE<br>(203) 488-0580 EXT. 122 |
| PROJECT COORDINATES: | LATITUDE: 41°-16'-27.57" N<br>LONGITUDE: 72°-48'-49.06" W<br>GROUND ELEVATION: 13'± AMSL<br><br>SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH. |

## SHEET INDEX

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

| REV. | DATE | DRAWN BY | CHK'D BY | DESCRIPTION |
|---|---|---|---|---|
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MARINE SYS SMOKE STACK
SITE ID: CT11328F
50 MAPLE ST
BRANFORD, CT 06405

DATE: 02/18/23
SCALE: AS NOTED
JOB NO. 21022.07

TITLE SHEET

T-1

Sheet No. 1 of 8

## NOTES AND SPECIFICATIONS

### DESIGN BASIS:

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

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- ULTIMATE DESIGN SPEED (OTHER STRUCTURE): 130 MPH (Vasd) (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

### SITE NOTES

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

### GENERAL NOTES

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

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MARINE SYS SMOKE STACK

SITE ID: CT11328F

50 MAPLE ST

BRANFORD, CT 06405

| | |
|---|---|
| DATE: | 02/18/23 |
| SCALE: | AS NOTED |
| JOB NO. | 21022.07 |

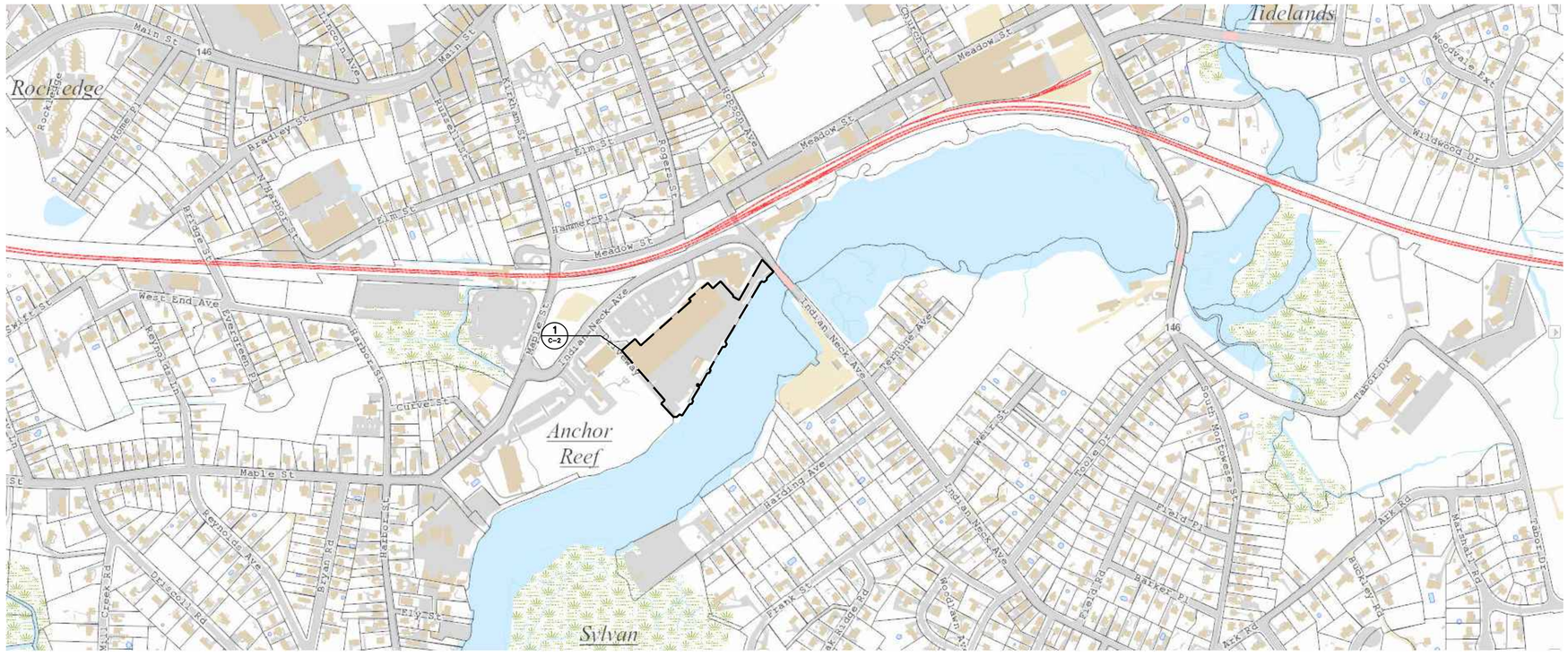
GENERAL NOTES AND SPECIFICATIONS

N-1

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

# ANTENNA SCHEDULE

| SECTOR | EXISTING/PROPOSED | ANTENNA | SIZE (INCHES) (L x W x D) | ANTENNA ℄ HEIGHT | AZIMUTH | (E/P) RRU (QTY) | (E/P) TMA (QTY) | (QTY) PROPOSED COAX |
|---|---|---|---|---|---|---|---|---|
| A1 | EXISTING | ERICSSON (AIR21 KRC118023-1_B2P_B4A) | 56.3 x 12.1 x 7.9 | 96' | 60° | | | (1) 6x24 HYBRID CABLE |
| A2 | PROPOSED | RFS-APXVAALL24_43-U-NA20 | 95.9 x 24 x 8.5 | 96' | 60° | (P) RADIO 4449 B71+B85 (1) | | |
| A3 | EXISTING | ERICSSON (AIR21 KRC118023-1_B2A_B4P) | 56.3 x 12.1 x 7.9 | 96' | 60° | | (E) GENERIC TWIN STYLE 1B (1) | |
| | | | | | | | | |
| B1 | EXISTING | ERICSSON (AIR21 KRC118023-1_B2P_B4A) | 56.3 x 12.1 x 7.9 | 96' | 180° | | | (1) 6x24 HYBRID CABLE |
| B2 | PROPOSED | RFS-APXVAALL24_43-U-NA20 | 95.9 x 24 x 8.5 | 96' | 180° | (P) RADIO 4449 B71+B85 (1) | | |
| B3 | EXISTING | ERICSSON (AIR21 KRC118023-1_B2A_B4P) | 56.3 x 12.1 x 7.9 | 96' | 180° | | (E) GENERIC TWIN STYLE 1B (1) | |
| | | | | | | | | |
| C1 | EXISTING | ERICSSON (AIR21 KRC118023-1_B2P_B4A) | 56.3 x 12.1 x 7.9 | 96' | 300° | | | (1) 6x24 HYBRID CABLE |
| C2 | PROPOSED | RFS-APXVAALL24_43-U-NA20 | 95.9 x 24 x 8.5 | 96' | 300° | (P) RADIO 4449 B71+B85 (1) | | |
| C3 | EXISTING | ERICSSON (AIR21 KRC118023-1_B2A_B4P) | 56.3 x 12.1 x 7.9 | 96' | 300° | | (E) GENERIC TWIN STYLE 1B (1) | |




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

TRUE NORTH

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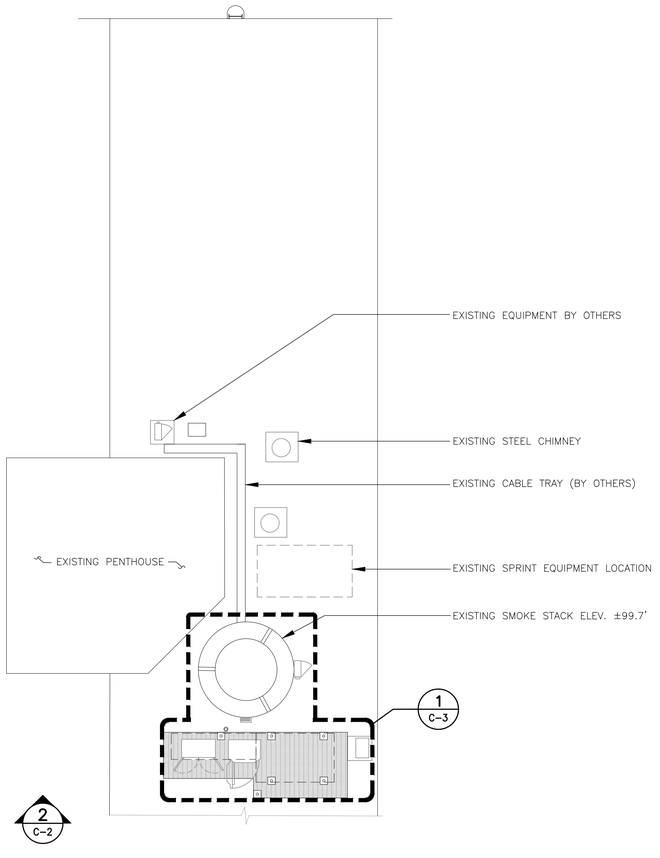
SCALE: AS NOTED
JOB NO. 21022.07

SITE LOCATION PLAN

C-1

Sheet No. 3 of 8

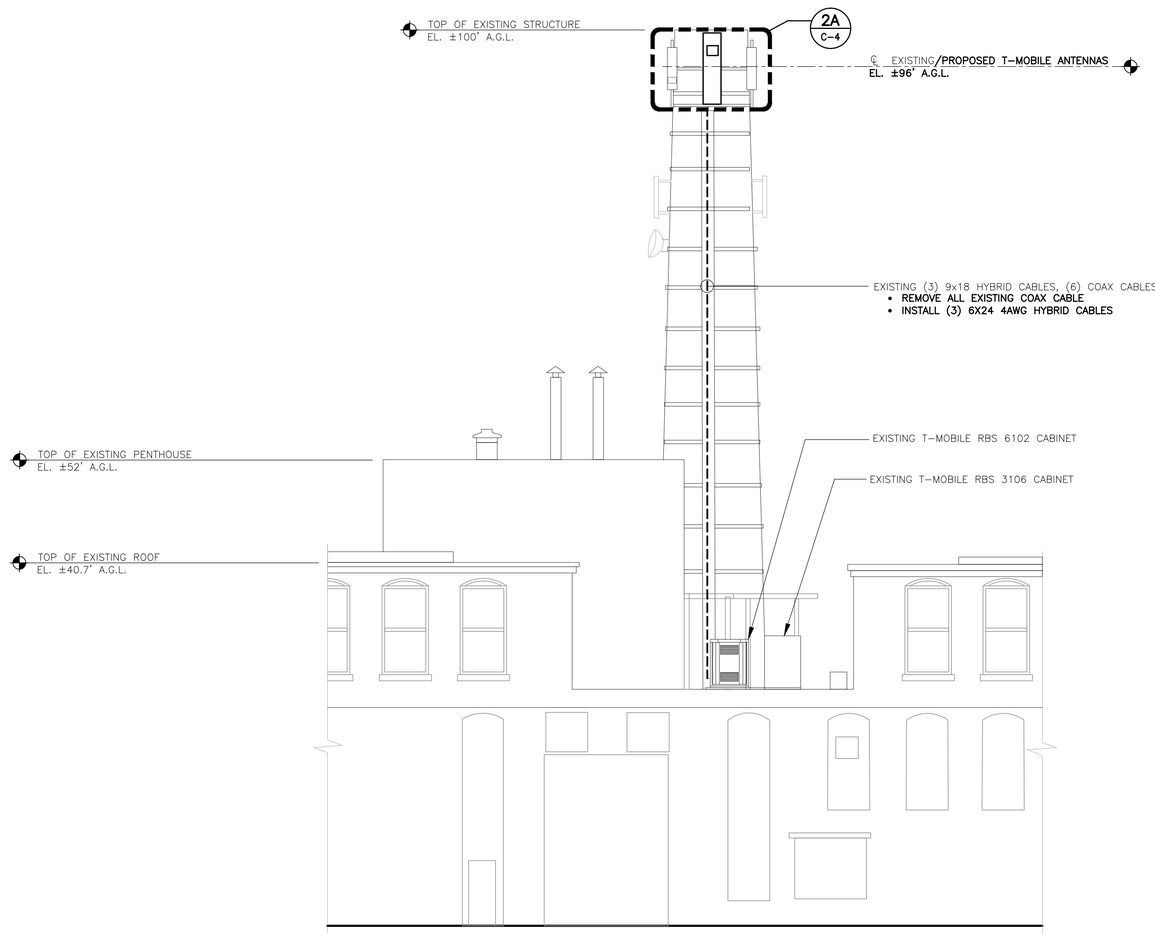
| STRUCTURAL COMPLIANCE |
|---|
| ANTENNA MOUNTS<br><br>A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING..<br><br>REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21022.07) DATED 03/03/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.<br><br>MASONRY SMOKESTACK<br><br>A STRUCTURAL ANALYSIS OF THE MASONRY SMOKESTACK WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.<br><br>REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21022.07) DATED 03/03/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS. |
| NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED. |




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

TRUE NORTH

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




2 C-2 **NORTH ELEVATION**
SCALE: 1" = 8'

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

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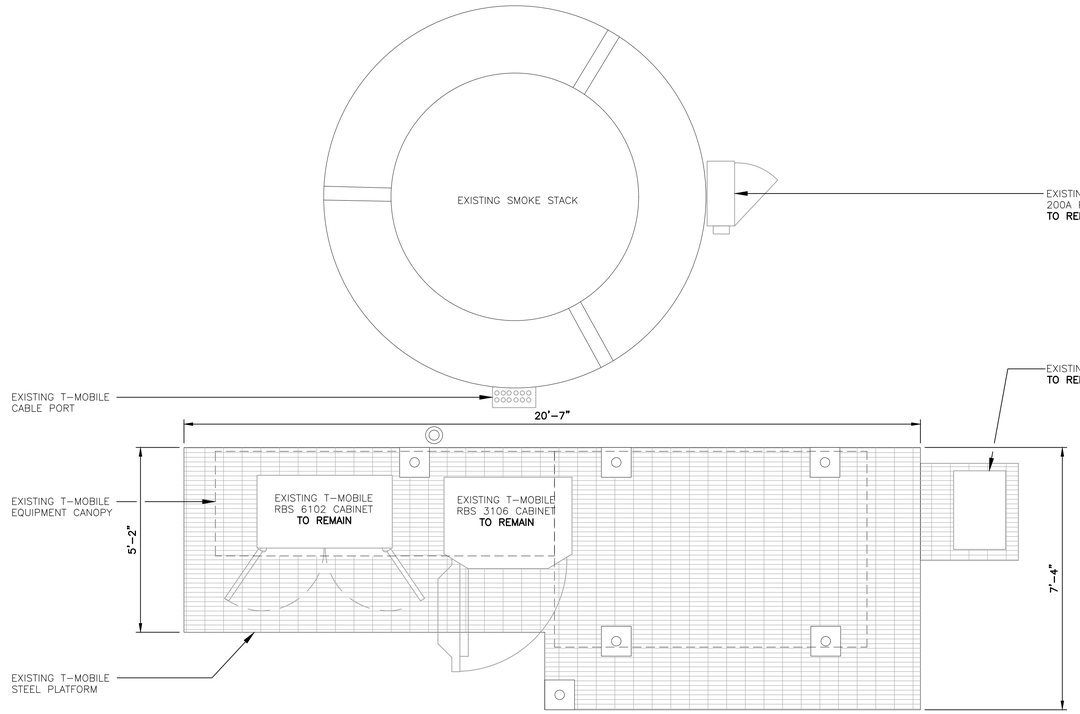
| | |
|---|---|
| DATE: | 02/18/23 |
| SCALE: | AS NOTED |
| JOB NO. | 21022.07 |

COMPOUND PLAN AND ELEVATION

C-2

Sheet No. 4 of 8




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

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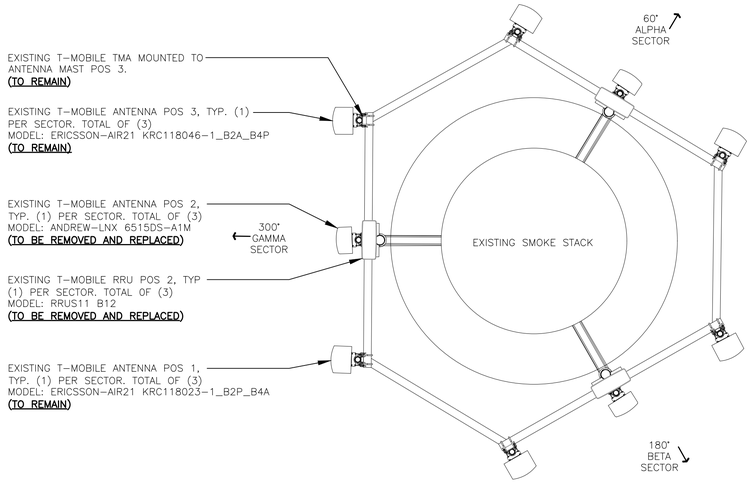
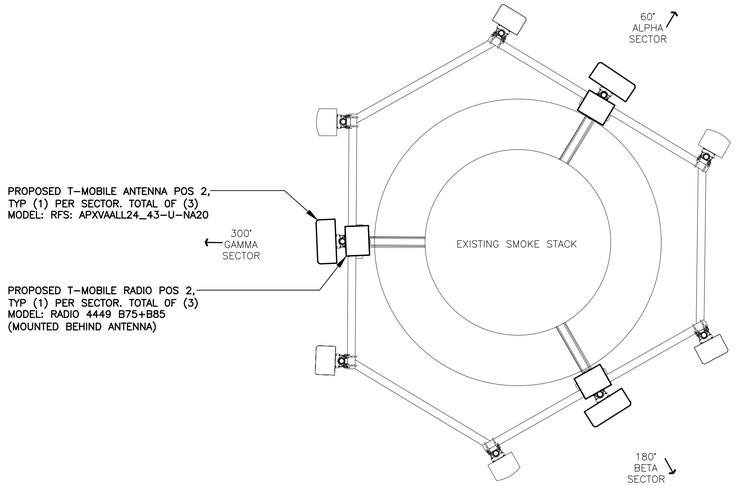
EQUIPMENT PLAN

C-3

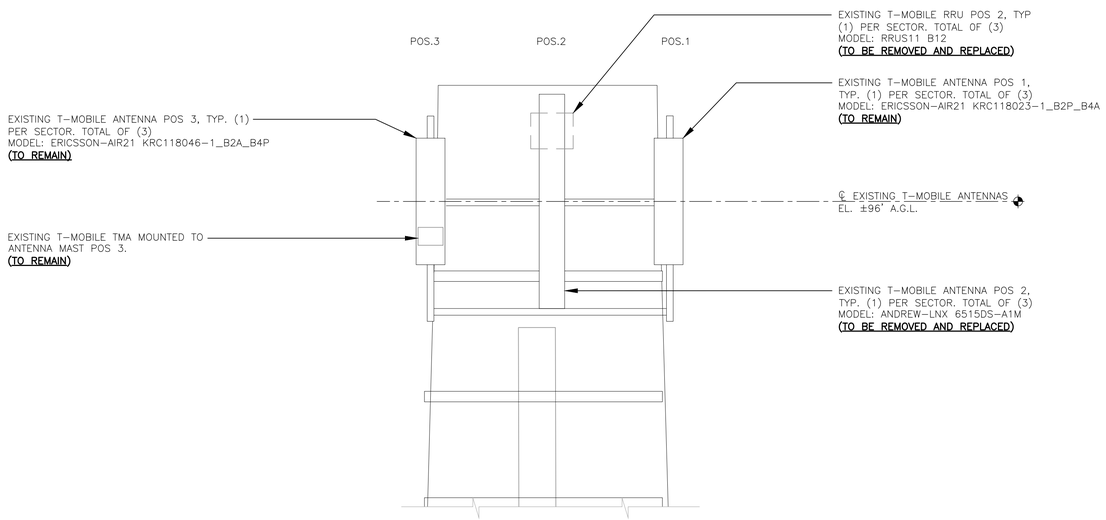
Sheet No. 5 of 8




1 C-4 **ANTENNA PLAN - EXISTING**
SCALE: 3/8" = 1'

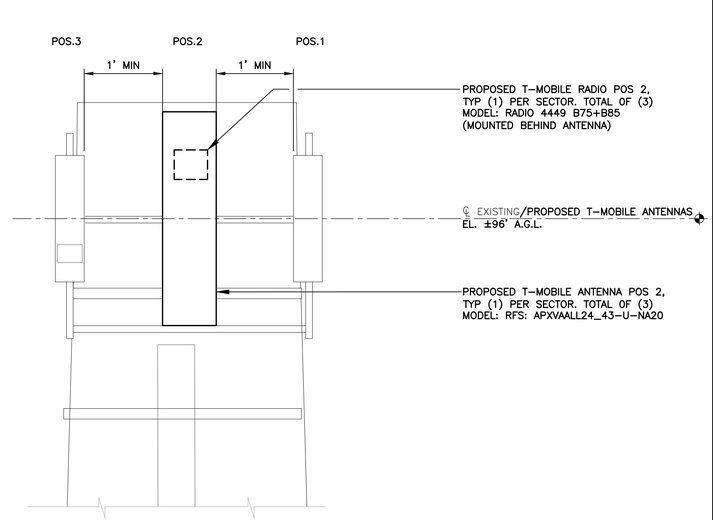



2 C-4 **ANTENNA PLAN - PROPOSED**
SCALE: 3/8" = 1'




TYPICAL EACH SECTOR

1A C-4 **ANTENNA ELEVATION - EXISTING**
SCALE: 3/8" = 1'




TYPICAL EACH SECTOR

2A C-4 **ANTENNA ELEVATION - PROPOSED**
SCALE: 3/8" = 1'

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| | |
|---|---|
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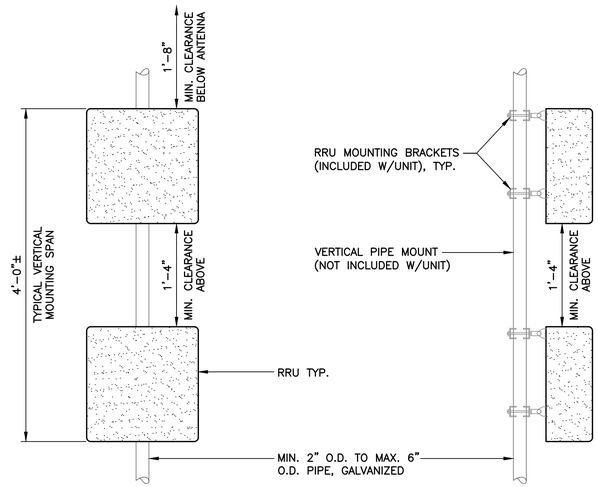
ANTENNA PLANS AND ELEVATIONS

C-4

Sheet No. 6 of 8




FRONT ELEVATION SIDE ELEVATION

NOTES:

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

1 C–5 **TYPICAL RRU MOUNTING DETAIL**
SCALE: NOT TO SCALE

APXVAALL24_43-U-NA20

| ALPHA/BETA/GAMMA ANTENNA | | |
|---|---|---|
| EQUIPMENT | DIMENSIONS | WEIGHT |
| MAKE: RFS<br>MODEL: APXVAALL24_43–U–NA20 | 95.9"L x 24.0"W x 8.5"D | ±127 LBS. |
| NOTES:<br>1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING. | | |

2 C–5 **PROPOSED ANTENNA DETAIL**
SCALE: NOT TO SCALE

RADIO 4449 B71+B85

| RRU (REMOTE RADIO UNIT) | | | |
|---|---|---|---|
| EQUIPMENT | DIMENSIONS | WEIGHT | CLEARANCES |
| MAKE: ERICSSON<br>MODEL: RADIO 4449 B71+B85 | 14.9"L x 13.2"W x 5.4"D | ±74 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–5 **PROPOSED RRU DETAIL**
SCALE: NOT TO SCALE

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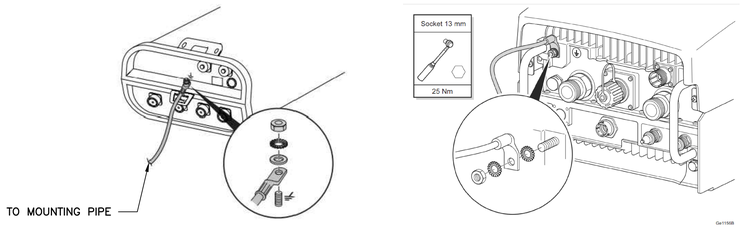
TYPICAL EQUIPMENT DETAILS

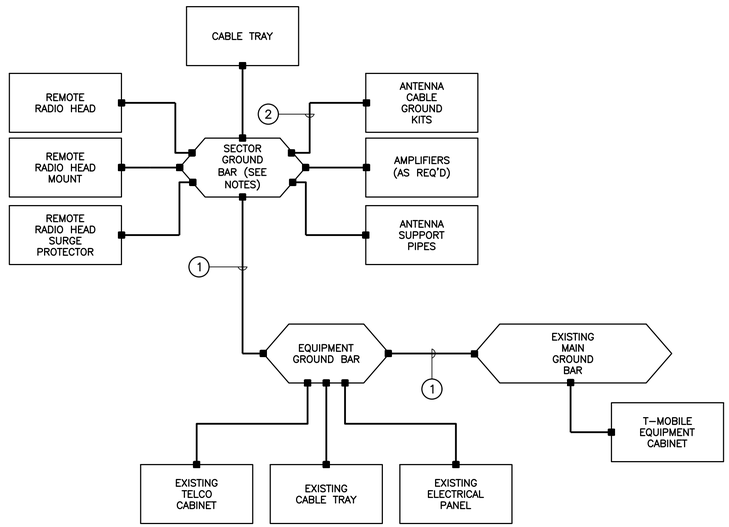
C-5

Sheet No. 7 of 8




## 1 E-1 TYPICAL ANTENNA/RRU GROUNDING DETAILS

SCALE: NOT TO SCALE




### GROUNDING SCHEMATIC NOTES

(1) #2 AWG

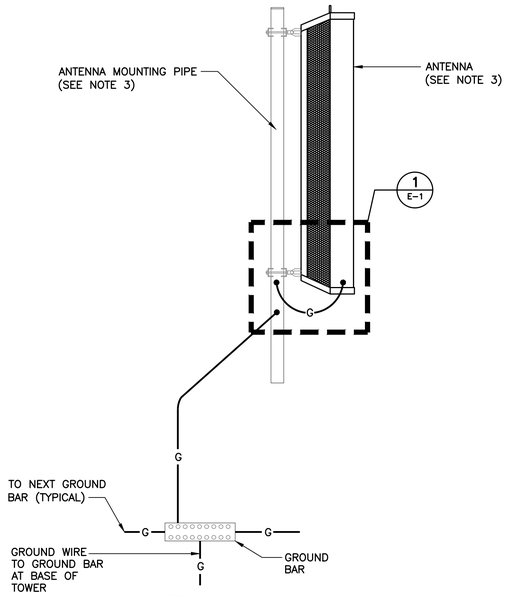
(2) #6 AWG

GENERAL NOTES:

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

## 4 E-1 TYPICAL GROUNDING SCHEMATIC DETAIL

SCALE: NOT TO SCALE

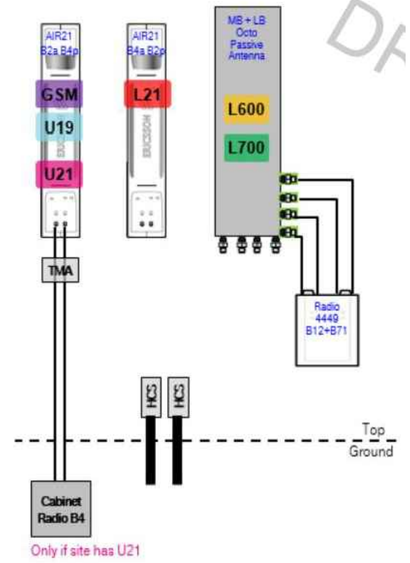



NOTES:

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

## 2 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE




## 3 E-1 PLUMBING DIAGRAM (PROVIDED BY RFDS)

SCALE: NOT TO SCALE

| REV. | DATE | DRAWN BY | CHK'D BY | DESCRIPTION |
|---|---|---|---|---|
| 0 | 04/16/21 | JLW | TJR | CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION |

PROFESSIONAL ENGINEER SEAL

T-Mobile

Transcend Wireless

CENTEK engineering
Centered on Solutions℠
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T-MOBILE NORTHEAST LLC

WIRELESS COMMUNICATIONS FACILITY

MARINE SYS SMOKE STACK

SITE ID: CT11328F

50 MAPLE ST

BRANFORD, CT 06405

| | |
|---|---|
| DATE: | 02/18/23 |
| SCALE: | AS NOTED |
| JOB NO. | 21022.07 |

TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 8 of 8

CENTEK engineering

Centered on Solutions℠

# Structural Analysis Report

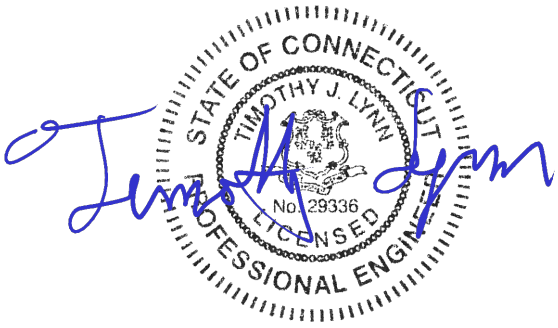
±100-ft Existing Masonry Smokestack

T-Mobile Site Ref: CT11328F

50 Maple Street
Branford, CT 06405

Centek Project No. 21022.07

Date: March 3, 2021




**Prepared for:**
*T-Mobile USA*
*35 Griffin Road*
*Bloomfield, CT 06002*

# ***Table of Contents***

## *Introduction*

The purpose of this report is to summarize the results of the structural analysis of the equipment installation proposed by T-Mobile on the existing host masonry smokestack located in Branford, CT.

The host structure is a ±100-ft tall masonry smokestack. The smokestack geometry and structural information was obtained from a field investigation and inspection report prepared by International Chimney Corporation dated August 8, 2016.

## *Equipment Installation Summary*

- T-Mobile (Existing to Remain):
  Antennas: Six (6) Ericsson AIR21 and three (3) TMAs mounted on custom sector mounts with RAD center elevations of ±96-ft AGL.
  Cables: Six (6) 1-5/8" ∅ coax cables and three (3) 9x18 fiber cables inside cable tray on exterior of smokestack.
- T-Mobile (Existing to Remove):
  Antennas: Three (3) Andrew LNX-6515DS-A1M panel antennas and three (3) Ericsson RRUS-11 B12 remote radio units mounted on custom sector mounts with RAD center elevations of ±96-ft AGL.
  Cables: Six (6) 1-5/8" ∅ coax cables inside cable tray on exterior of smokestack.
- **T-Mobile (Final):**
  **Antennas: Three (3) RFS APXVAALL24_43-U-NA20 panel antennas and three (3) Ericsson 4449 remote radio units mounted on custom sector mounts with RAD center elevations of ±96-ft AGL.**
  **Cables: Three (3) 6x24 fiber cables inside cable tray on exterior of smokestack.**

## *Design Loading*

Loading was determined per the requirements of the 2015 International Building Code as amended by the 2018 CT Building Code and ASCE 7-10 "Minimum Design Loads for Buildings and Other Structures".

| | | |
|---|---|---|
| Wind Speed: | Vult = 130 mph | *[Appendix N of the 2018 CT Building Code]* |
| Exposure Category: | C | |
| Risk Category | II | *[ASCE 7-10, Table 1.5-1]* |

## *Results*

Smokestack:

| Component | Stress Ratio (percentage of capacity) | Result |
|---|---|---|
| Compression | 24.0% | **PASS** |
| Tension of Mortar | 39.0% | **PASS** |

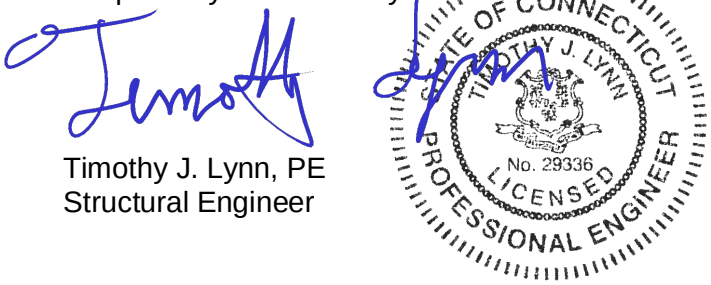
## *Conclusion and Recommendations*

This analysis shows that the subject smokestack **is adequate** to support the proposed T-Mobile equipment installation.

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:




Timothy J. Lynn, PE
Structural Engineer

## *Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures*

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

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

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

Subject: Wind Load on Equipment per ASCE 7-10

Location: Branford, CT

Rev. 0: 3/3/21

Prepared by: T.J.L; Checked by: C.F.C
Job No. 21022.07

**Design Wind Load on Other Structures:** (Based on IBC 2015, CSBC 2018 and ASCE 7-10)

| | | | |
|---|---|---|---|
| Wind Speed = | $V := 130$ mph | (User Input) | (CSBC Appendix-N) |
| Risk Category = | $BC := II$ | (User Input) | (IBC Table 1604.5) |
| Exposure Category = | $Exp := C$ | (User Input) | |
| Structure Type = | $Structuretype :=$ Round_Chimney | (User Input) | |
| Structure Height = | $Height := 100$ ft | (User Input) | |
| Horizontal Dimension of Structure = | $Width := 9.5$ ft | (User Input) | |

Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer = (Table 26.9-1)

$$zg := \begin{cases} 1200 & \text{if } Exp = B \\ 900 & \text{if } Exp = C \\ 700 & \text{if } Exp = D \end{cases} = 900$$

3-Sec Gust Speed Power Law Exponent = (Table 26.9-1)

$$\alpha := \begin{cases} 7 & \text{if } Exp = B \\ 9.5 & \text{if } Exp = C \\ 11.5 & \text{if } Exp = D \end{cases} = 9.5$$

Integral Length Scale Factor = (Table 26.9-1)

$$l := \begin{cases} 320 & \text{if } Exp = B \\ 500 & \text{if } Exp = C \\ 650 & \text{if } Exp = D \end{cases} = 500$$

Integral Length Scale Power Law Exponent = (Table 26.9-1)

$$E := \begin{cases} \frac{1}{3} & \text{if } Exp = B \\ \frac{1}{5} & \text{if } Exp = C \\ \frac{1}{8} & \text{if } Exp = D \end{cases} = 0.2$$

Turbulence Intensity Factor = (Table 26.9-1)

$$c := \begin{cases} 0.3 & \text{if } Exp = B \\ 0.2 & \text{if } Exp = C \\ 0.15 & \text{if } Exp = D \end{cases} = 0.2$$

Exposure Constant = (Table 26.9-1)

$$Z_{min} := \begin{cases} 30 & \text{if } Exp = B \\ 15 & \text{if } Exp = C \\ 7 & \text{if } Exp = D \end{cases} = 15$$

| | | |
|---|---|---|
| Topographic Factor = | $K_{zt} := 1$ | (Eq. 26.8-2) |
| Wind Directionality Factor = | $K_d = 0.95$ | (Table 26.6-1) |
| Peak Factor for Background Response = | $g_Q := 3.4$ | (Sec 26.9.4) |
| Peak Factor for Wind Response = | $g_v := 3.4$ | (Sec 26.9.4) |

CENTEK engineering
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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: Wind Load on Equipment per ASCE 7-10

Location: Branford, CT

Rev. 0: 3/3/21

Prepared by: T.J.L; Checked by: C.F.C
Job No. 21022.07

Equivalent Height of Structure =

$$z := \begin{cases} Z_{min} & \text{if } Z_{min} > 0.6 \cdot Height \\ 0.6 \cdot Height & \text{otherwise} \end{cases} = 60$$

(Sec 26.9.4)

Intensity of Turbulence =

$$I_z := c \cdot \left(\frac{33}{z}\right)^{\left(\frac{1}{6}\right)} = 0.181$$

(Eq. 26.9-7)

Integral Length Scale of Turbulence =

$$L_z := l \cdot \left(\frac{z}{33}\right)^{E} = 563.505$$

(Eq. 26.9-9)

Background Response Factor =

$$Q := \sqrt{\frac{1}{1 + 0.63\left(\frac{Width + Height}{L_z}\right)^{0.63}}} = 0.904$$

(Eq. 26.9-8)

Gust Response Factor =

$$G := 0.925 \cdot \left[\frac{\left(1 + 1.7 \cdot g_Q \cdot I_z \cdot Q\right)}{1 + 1.7 \cdot g_v \cdot I_z}\right] = 0.879$$

(Eq. 26.9-6)

Velocity Pressure =

$$q_z := 0.00256 \cdot K_{zt} \cdot K_d \cdot V^2 = 41.1$$

(Eq. 29.3-1)

Force Coefficient =

$$C_f = 0.82$$

(Fig 29.5-1 - 29.5-3)

Ultimate Wind Pressure =

$$F := q_z \cdot G \cdot C_f = 29.6 \text{ psf}$$

Height Above Grade =

$$Z := 85 \text{ ft}$$

(User Input)

Exposure Coefficient =

$$K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases} = 1.22$$

(Table 29.3-1)

$$K_z = 1.223$$

Height Above Grade =

$$Z := 55 \text{ ft}$$

(User Input)

Exposure Coefficient =

$$K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases} = 1.12$$

(Table 29.3-1)

$$K_z = 1.116$$

Height Above Grade = $Z := 35$ ft (User Input)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \quad = 1.01 \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases}$ (Table 29.3-1)

$K_z = 1.015$

Height Above Grade = $Z := 27$ ft (User Input)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \quad = 0.96 \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases}$ (Table 29.3-1)

$K_z = 0.961$

Height Above Grade = $Z := 20$ ft (User Input)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \quad = 0.9 \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases}$ (Table 29.3-1)

$K_z = 0.902$

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Branford, CT 06405 F: (203) 488-8587

| | | | | | |
|---|---|---|---|---|---|
| Job : | CT11328F | Project No. | 21022.07 | Sheet | 1 of 2 |
| Address: | 50 Maple Street Branford, CT 06405 | Computed by | TJL | Date | 3/3/21 |
| Description: | Smokestack Evaluation | Checked by | LAA | Date | |

| | Wind Force (lb) | Weight (lb) | Height Above Base (ft) | Height (in) |
|---|---|---|---|---|
| T-Mobile | 2500 | 1500 | 96 | 1152 |
| Sprint | 1883 | 936 | 88 | 1056 |

| Section | Top Dia (in) | Bot Dia (in) | Wall Thk (in) | Sect Height (in) | Area At Base (in^2) | Tot. Vol (ft^3) | Unit Weight (pcf) | Weight of Section (lb) | Total Weight (lb) | Axial Stress fa (psi) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 114 | 135.67 | 8 | 356.4 | 3207.0704 | 604.97204 | 127 | 76831.4485 | 79267.4485 | 24.7 |
| 2 | 135.67 | 161.4 | 8.5 | 360 | 4080.901 | 778.2026 | 125 | 97275.3249 | 176542.7734 | 43.3 |
| 3 | 161.4 | 169.92 | 9.5 | 120 | 4785.3286 | 323.30268 | 125 | 40412.83516 | 216955.6086 | 45.3 |
| 4 | 169.92 | 175.68 | 10.5 | 80 | 5445.9846 | 247.58964 | 125 | 30948.70445 | 247904.313 | 45.5 |
| 5 | 175.68 | 177.96 | 13 | 76 | 6733.6672 | 293.93989 | 125 | 36742.48571 | 284646.7987 | 42.3 |

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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

| | | | | | |
|---|---|---|---|---|---|
| Job : | CT11328F | Project No. | 21022.07 | Sheet | 2 of 2 |
| Address: | 50 Maple Street Branford, CT 06405 | Computed by | TJL | Date | 3/3/21 |
| Description: | Smokestack Evaluation | Checked by | LAA | Date | |

| Ultimate Wind Pressure (psf) | ASD Wind Pressure (psf) | KZ | Wind Area (sf) | Wind Force (lb) | Moment @ Base | Section Modulus @ Base | Bending Stress fb (psi) | Allowable Fa (psi) | Allowable Fb (psi) | fa/Fa+fb/Fb | | ft | Ft | ft/Ft | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 18 | 1.23 | 309.0 | 6840.5 | 3299840.856 | 96703.96897 | 34.1 | 375 | 500 | 0.13 | OK | 9.4 | 40 | 0.24 | OK |
| 30 | 18 | 1.12 | 371.3 | 7486.2 | 8687817.964 | 148233.9248 | 58.6 | 375 | 500 | 0.23 | OK | 15.3 | 40 | 0.38 | OK |
| 30 | 18 | 1.02 | 138.1 | 2534.6 | 11085056.05 | 181821.2694 | 61.0 | 375 | 500 | 0.24 | OK | 15.6 | 40 | 0.39 | OK |
| 30 | 18 | 0.096 | 96.0 | 165.9 | 12791234.22 | 212305.0695 | 60.2 | 375 | 500 | 0.24 | OK | 14.7 | 40 | 0.37 | OK |
| 0 | 0 | 0 | 93.3 | 0.0 | 14418407.22 | 259009.3359 | 55.7 | 375 | 500 | 0.22 | OK | 13.4 | 40 | 0.33 | OK |

CENTEK engineering

Centered on Solutions℠

# Structural Analysis Report

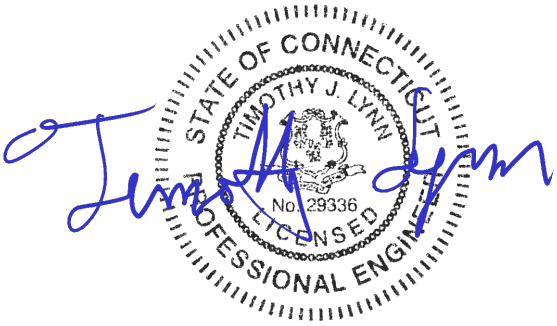
Antenna Mount Analysis

T-Mobile Site #: CT11328F

50 Maple Street
Branford, CT

Centek Project No. 21022.07

Date: March 3, 2021




**Prepared for:**

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

# ***Table of Contents***

CENTEK engineering

Centered on Solutions℠

March 3, 2021

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

*Re: Structural Letter ~ Antenna Mount*
*T-Mobile – Site Ref: CT11328F*
*50 Maple Street*
*Branford, CT 06405*

*Centek Project No. 21022.07*

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting three (3) sector mounts with stiff arms to support the proposed/existing equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) and ASCE 7-10.

The loads considered in this analysis consist of the following:

- T-Mobile:
  Sector Frames: Three (3) RFS APXVAALL24_43 panel antennas, six (6) Ericsson AIR21 panel antennas, three (3) TMAs and three (3) Ericsson 4449 remote radio units mounted on three (3) sector frames with a RAD center elevation of 96-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering an ultimate design wind speed of 130 mph for Branford as required in Appendix N of the 2018 Connecticut State Building Code.

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

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

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

# ***Section 2 - Calculations***

CENTEK engineering
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63-2 North Branford Road P: (203) 488-0580
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Subject: Wind Load on Equipment per ASCE 7-10

Location: Branford, CT

Rev. 0: 3/3/21

Prepared by: T.J.L; Checked by: C.F.C.
Job No. 21022.07

**Design Wind Load on Other Structures:** (Based on IBC 2015, CSBC 2018 and ASCE 7-10)

| | | | |
|---|---|---|---|
| Wind Speed = | $V := 130$ mph | (User Input) | (CSBC Appendix-N) |
| Risk Category = | $BC := II$ | (User Input) | (IBC Table 1604.5) |
| Exposure Category = | $Exp := C$ | (User Input) | |
| Height Above Grade = | $Z := 96$ ft | (User Input) | |
| Structure Type = | $Structuretype := Square\_Chimney$ | (User Input) | |
| Structure Height = | $Height := 8$ ft | (User Input) | |
| Horizontal Dimension of Structure = | $Width := 2$ ft | (User Input) | |

Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer =

$$zg := \begin{cases} 1200 & \text{if } Exp = B = 900 \\ 900 & \text{if } Exp = C \\ 700 & \text{if } Exp = D \end{cases}$$ (Table 26.9-1)

3-Sec Gust Speed Power Law Exponent =

$$\alpha := \begin{cases} 7 & \text{if } Exp = B = 9.5 \\ 9.5 & \text{if } Exp = C \\ 11.5 & \text{if } Exp = D \end{cases}$$ (Table 26.9-1)

Integral Length Scale Factor =

$$l := \begin{cases} 320 & \text{if } Exp = B = 500 \\ 500 & \text{if } Exp = C \\ 650 & \text{if } Exp = D \end{cases}$$ (Table 26.9-1)

Integral Length Scale Power Law Exponent =

$$E := \begin{cases} \frac{1}{3} & \text{if } Exp = B = 0.2 \\ \frac{1}{5} & \text{if } Exp = C \\ \frac{1}{8} & \text{if } Exp = D \end{cases}$$ (Table 26.9-1)

Turbulence Intensity Factor =

$$c := \begin{cases} 0.3 & \text{if } Exp = B = 0.2 \\ 0.2 & \text{if } Exp = C \\ 0.15 & \text{if } Exp = D \end{cases}$$ (Table 26.9-1)

Exposure Constant =

$$Z_{min} := \begin{cases} 30 & \text{if } Exp = B = 15 \\ 15 & \text{if } Exp = C \\ 7 & \text{if } Exp = D \end{cases}$$ (Table 26.9-1)

Exposure Coefficient =

$$K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg = 1.25 \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases}$$ (Table 29.3-1)

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Branford, CT 06405 F: (203) 488-8587

| | |
|---|---|
| Subject: | Wind Load on Equipment per ASCE 7-10 |
| Location: | Branford, CT |
| Rev. 0: 3/3/21 | Prepared by: T.J.L; Checked by: C.F.C.<br>Job No. 21022.07 |

| | | |
|---|---|---|
| Topographic Factor = | $K_{zt} := 1$ | (Eq. 26.8-2) |
| Wind Directionality Factor = | $K_d = 0.9$ | (Table 26.6-1) |
| Velocity Pressure = | $q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 = 48.86$ | (Eq. 29.3-1) |
| Peak Factor for Background Response = | $g_Q := 3.4$ | (Sec 26.9.4) |
| Peak Factor for Wind Response = | $g_v := 3.4$ | (Sec 26.9.4) |
| Equivalent Height of Structure = | $z := \begin{cases} Z_{min} & \text{if } Z_{min} > 0.6 \cdot Height \\ 0.6 \cdot Height & \text{otherwise} \end{cases} = 15$ | (Sec 26.9.4) |
| Intensity of Turbulence = | $I_z := c \cdot \left(\frac{33}{z}\right)^{\left(\frac{1}{6}\right)} = 0.228$ | (Eq. 26.9-7) |
| Integral Length Scale of Turbulence = | $L_Z := l \cdot \left(\frac{z}{33}\right)^{E} = 427.057$ | (Eq. 26.9-9) |
| Background Response Factor = | $Q := \sqrt{\frac{1}{1 + 0.63\left(\frac{Width + Height}{L_Z}\right)^{0.63}}} = 0.972$ | (Eq. 26.9-8) |
| Gust Response Factor = | $G := 0.925 \cdot \left[\frac{\left(1 + 1.7 \cdot g_Q \cdot I_z \cdot Q\right)}{1 + 1.7 \cdot g_v \cdot I_z}\right] = 0.91$ | (Eq. 26.9-6) |
| Force Coefficient = | $C_f = 1.35$ | (Fig 29.5-1 - 29.5-3) |
| Wind Force = | $F := q_z \cdot G \cdot C_f = 60$ | psf |

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Subject: Wind Load on Equipment per ASCE 7-10

Location: Branford, CT

Rev. 0: 3/3/21

Prepared by: T.J.L; Checked by: C.F.C.
Job No. 21022.07

## Development of Wind & Ice Load on Antennas

### Antenna Data:

| | | | |
|---|---|---|---|
| Antenna Model = | Ericsson AIR21 | | |
| Antenna Shape = | Flat | | (User Input) |
| Antenna Height = | $L_{ant} := 56$ | in | (User Input) |
| Antenna Width = | $W_{ant} := 12.1$ | in | (User Input) |
| Antenna Thickness = | $T_{ant} := 7.9$ | in | (User Input) |
| Antenna Weight = | $WT_{ant} := 90$ | lbs | (User Input) |
| Number of Antennas = | $N_{ant} := 1$ | | (User Input) |

### Wind Load (Front)

| | | |
|---|---|---|
| Surface Area for One Antenna = | $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$ | sf |
| Antenna Projected Surface Area = | $A_{ant} := SA_{ant} \cdot N_{ant} = 4.7$ | sf |
| Total Antenna Wind Force = | $F_{ant} := F \cdot A_{ant} = 282$ | lbs |

### Wind Load (Side)

| | | |
|---|---|---|
| Surface Area for One Antenna = | $SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.1$ | sf |
| Antenna Projected Surface Area = | $A_{ant} := SA_{ant} \cdot N_{ant} = 3.1$ | sf |
| Total Antenna Wind Force = | $F_{ant} := F \cdot A_{ant} = 184$ | lbs |

### Gravity Load (without ice)

| | | |
|---|---|---|
| Weight of All Antennas = | $WT_{ant} \cdot N_{ant} = 90$ | lbs |

## Development of Wind & Ice Load on Antennas

### Antenna Data:

| | | | |
|---|---|---|---|
| Antenna Model = | RFSAPXVAALL24-43 | | |
| Antenna Shape = | Flat | | (User Input) |
| Antenna Height = | $L_{ant} := 95.9$ | in | (User Input) |
| Antenna Width = | $W_{ant} := 24$ | in | (User Input) |
| Antenna Thickness = | $T_{ant} := 8.5$ | in | (User Input) |
| Antenna Weight = | $WT_{ant} := 150$ | lbs | (User Input) |
| Number of Antennas = | $N_{ant} := 1$ | | (User Input) |

### Wind Load (Front)

| | | |
|---|---|---|
| Surface Area for One Antenna = | $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$ | sf |
| Antenna Projected Surface Area = | $A_{ant} := SA_{ant} \cdot N_{ant} = 16$ | sf |
| Total Antenna Wind Force = | $F_{ant} := F \cdot A_{ant} = 959$ | lbs |

### Wind Load (Side)

| | | |
|---|---|---|
| Surface Area for One Antenna = | $SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.7$ | sf |
| Antenna Projected Surface Area = | $A_{ant} := SA_{ant} \cdot N_{ant} = 5.7$ | sf |
| Total Antenna Wind Force = | $F_{ant} := F \cdot A_{ant} = 340$ | lbs |

### Gravity Load (without ice)

| | | |
|---|---|---|
| Weight of All Antennas = | $WT_{ant} \cdot N_{ant} = 150$ | lbs |

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| | |
|---|---|
| Subject: | Wind Load on Equipment per ASCE 7-10 |
| Location: | Branford, CT |
| Rev. 0: 3/3/21 | Prepared by: T.J.L; Checked by: C.F.C.<br>Job No. 21022.07 |

## Development of Wind & Ice Load on RRHs

**RRUS Data:**

| | | | |
|---|---|---|---|
| RRUS Model = | Ericsson 4449 | | |
| RRUS Shape = | Flat | | (User Input) |
| RRUS Height = | $L_{RRH} := 14.9$ | in | (User Input) |
| RRUS Width = | $W_{RRH} := 13.2$ | in | (User Input) |
| RRUS Thickness = | $T_{RRH} := 10.4$ | in | (User Input) |
| RRUS Weight = | $WT_{RRH} := 74$ | lbs | (User Input) |
| Number of RRUS's = | $N_{RRH} := 1$ | | (User Input) |

**Wind Load (Front)**

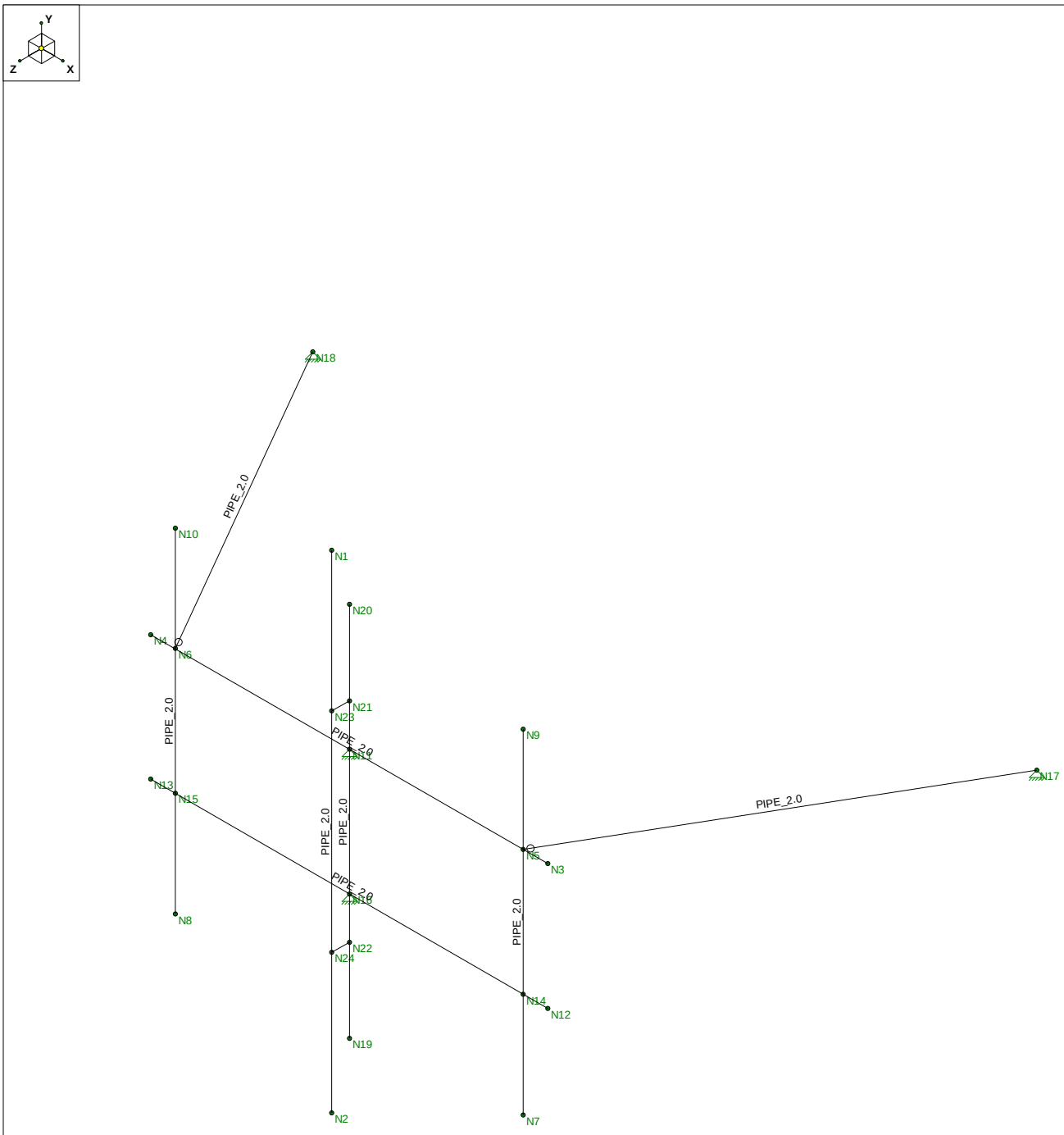
| | | |
|---|---|---|
| Surface Area for One RRH = | $SA_{RRH} := \frac{L_{RRH} \cdot W_{RRH}}{144} = 1.4$ | sf |
| RRH Projected Surface Area = | $A_{RRH} := SA_{RRH} \cdot N_{RRH} = 1.4$ | sf |
| Total RRH Wind Force = | $F_{RRH} := F \cdot A_{RRH} = 82$ | lbs |

**Wind Load (Side)**

| | | |
|---|---|---|
| Surface Area for One RRH = | $SA_{RRH} := \frac{L_{RRH} \cdot T_{RRH}}{144} = 1.1$ | sf |
| RRH Projected Surface Area = | $A_{RRH} := SA_{RRH} \cdot N_{RRH} = 1.1$ | sf |
| Total RRH Wind Force = | $F_{RRH} := F \cdot A_{RRH} = 65$ | lbs |

**Gravity Load (without ice)**

| | | |
|---|---|---|
| Weight of All RRHs = | $WT_{RRH} \cdot N_{RRH} = 74$ | lbs |




Envelope Only Solution

| | | |
|---|---|---|
| Centek | | |
| TJL | CT11328F - Mount | Mar 3, 2021 at 9:36 AM |
| 21022.07 | Member Framing | CT11328F_AMA.r3d |

## (Global) Model Settings

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

| | |
|---|---|
| Hot Rolled Steel Code | AISC 14th(360-10): ASD |
| Adjust Stiffness? | Yes(Iterative) |
| RISAConnection Code | AISC 14th(360-10): ASD |
| Cold Formed Steel Code | AISI S100-12: ASD |
| Wood Code | AWC NDS-15: ASD |
| Wood Temperature | < 100F |
| Concrete Code | ACI 318-14 |
| Masonry Code | ACI 530-13: ASD |
| Aluminum Code | AA ADM1-15: ASD - Building |
| Stainless Steel Code | AISC 14th(360-10): ASD |
| Adjust Stiffness? | Yes(Iterative) |

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

## (Global) Model Settings, Continued

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

## Hot Rolled Steel Properties

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

## Hot Rolled Steel Section Sets

| | Label | Shape | Type | Design List | Material | Design Rul... | A [in2] | Iyy [in4] | Izz [in4] | J [in4] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Pipe 2.0 | PIPE_2.0 | Beam | Pipe | A53 Grade B | Typical | 1.02 | .627 | .627 | 1.25 |
| 2 | Antenna Mast | PIPE_2.0 | Column | Pipe | A53 Grade B | Typical | 1.02 | .627 | .627 | 1.25 |
| 3 | Horizontal | PIPE_2.0 | Beam | Pipe | A53 Grade B | Typical | 1.02 | .627 | .627 | 1.25 |

## Hot Rolled Steel Design Parameters

| | Label | Shape | Length[ft] | Lbyy[ft] | Lbzz[ft] | Lcomp top[... | Lcomp bot[... | L-torq... | Kyy | Kzz | Cb | Functi... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | Antenna Mast | 11.667 | | | Lbyy | | Segm... | | | | Lateral |
| 2 | M2 | Horizontal | 9.5 | | | Lbyy | | 6 | | | | Lateral |
| 3 | M3 | Antenna Mast | 8 | | | Lbyy | | | | | | Lateral |
| 4 | M4 | Antenna Mast | 8 | | | Lbyy | | | | | | Lateral |
| 5 | M5 | Horizontal | 9.5 | | | Lbyy | | 6 | | | | Lateral |
| 6 | M6 | Pipe 2.0 | 8.998 | | | Lbyy | | | | | | Lateral |
| 7 | M7 | Pipe 2.0 | 8.998 | | | Lbyy | | | | | | Lateral |
| 8 | M8 | Antenna Mast | 9 | | | Lbyy | | | | | | Lateral |

## Member Primary Data

| | Label | I Joint | J Joint | K Joint | Rotate(... | Section/Shape | Type | Design List | Material | Design R... |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | N1 | N2 | | | Antenna Mast | Column | Pipe | A53 Grade B | Typical |
| 2 | M2 | N4 | N3 | | | Horizontal | Beam | Pipe | A53 Grade B | Typical |
| 3 | M3 | N8 | N10 | | | Antenna Mast | Column | Pipe | A53 Grade B | Typical |
| 4 | M4 | N7 | N9 | | | Antenna Mast | Column | Pipe | A53 Grade B | Typical |
| 5 | M5 | N13 | N12 | | | Horizontal | Beam | Pipe | A53 Grade B | Typical |
| 6 | M6 | N6 | N18 | | | Pipe 2.0 | Beam | Pipe | A53 Grade B | Typical |
| 7 | M7 | N5 | N17 | | | Pipe 2.0 | Beam | Pipe | A53 Grade B | Typical |
| 8 | M8 | N19 | N20 | | | Antenna Mast | Column | Pipe | A53 Grade B | Typical |
| 9 | M9 | N21 | N23 | | | RIGID | None | None | RIGID | Typical |
| 10 | M10 | N22 | N24 | | | RIGID | None | None | RIGID | Typical |

## Joint Coordinates and Temperatures

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Dia... |
|---|---|---|---|---|---|---|
| 1 | N1 | 0 | 5.833333 | 3.416667 | 0 | |
| 2 | N2 | 0 | -5.833333 | 3.416667 | 0 | |
| 3 | N3 | 4.75 | 1.5 | 3 | 0 | |
| 4 | N4 | -4.75 | 1.5 | 3 | 0 | |
| 5 | N5 | 4.166667 | 1.5 | 3 | 0 | |
| 6 | N6 | -4.166667 | 1.5 | 3 | 0 | |
| 7 | N7 | 4.166667 | -4 | 3 | 0 | |
| 8 | N8 | -4.166667 | -4 | 3 | 0 | |
| 9 | N9 | 4.166667 | 4 | 3 | 0 | |
| 10 | N10 | -4.166667 | 4 | 3 | 0 | |
| 11 | N11 | 0 | 1.5 | 3 | 0 | |
| 12 | N12 | 4.75 | -1.5 | 3 | 0 | |
| 13 | N13 | -4.75 | -1.5 | 3 | 0 | |
| 14 | N14 | 4.166667 | -1.5 | 3 | 0 | |
| 15 | N15 | -4.166667 | -1.5 | 3 | 0 | |
| 16 | N16 | 0 | -1.5 | 3 | 0 | |

## Joint Coordinates and Temperatures (Continued)

| | Label | X [ft] | Y [ft] | Z [ft] | Temp [F] | Detach From Dia... |
|---|---|---|---|---|---|---|
| 17 | N17 | 8.666667 | 1.5 | -4.791667 | 0 | |
| 18 | N18 | -8.666667 | 1.5 | -4.791667 | 0 | |
| 19 | N19 | 0. | -4.5 | 3 | 0 | |
| 20 | N20 | 0. | 4.5 | 3 | 0 | |
| 21 | N21 | 0 | 2.5 | 3 | 0 | |
| 22 | N22 | 0 | -2.5 | 3 | 0 | |
| 23 | N23 | 0 | 2.5 | 3.416667 | 0 | |
| 24 | N24 | 0 | -2.5 | 3.416667 | 0 | |

## Joint Boundary Conditions

| | Joint Label | X [k/in] | Y [k/in] | Z [k/in] | X Rot.[k-ft/rad] | Y Rot.[k-ft/rad] | Z Rot.[k-ft/rad] |
|---|---|---|---|---|---|---|---|
| 1 | N11 | Reaction | Reaction | Reaction | | | |
| 2 | N16 | Reaction | Reaction | Reaction | | | |
| 3 | N18 | Reaction | Reaction | Reaction | | | |
| 4 | N17 | Reaction | Reaction | Reaction | | | |
| 5 | N21 | | | | | | |
| 6 | N22 | | | | | | |
| 7 | N23 | | | | | | |
| 8 | N24 | | | | | | |

## Member Point Loads (BLC 2 : Weight of Equipment)

| | Member Label | Direction | Magnitude[k,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | M4 | Y | -.045 | 7.5 |
| 2 | M4 | Y | -.045 | 3.5 |
| 3 | M3 | Y | -.045 | 7.5 |
| 4 | M3 | Y | -.045 | 3.5 |
| 5 | M3 | Y | -.075 | 1 |
| 6 | M1 | Y | -.075 | .5 |
| 7 | M1 | Y | -.075 | 7.5 |
| 8 | M1 | Y | -.074 | 5 |

## Member Point Loads (BLC 3 : Wind Load X)

| | Member Label | Direction | Magnitude[k,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | M4 | X | .092 | 7.5 |
| 2 | M4 | X | .092 | 3.5 |
| 3 | M3 | X | .092 | 7.5 |
| 4 | M3 | X | .092 | 3.5 |
| 5 | M3 | X | .011 | 1 |
| 6 | M1 | X | .17 | .5 |
| 7 | M1 | X | .17 | 7.5 |
| 8 | M1 | X | .065 | 4 |

## Member Point Loads (BLC 4 : Wind Load Z)

| | Member Label | Direction | Magnitude[k,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 1 | M4 | Z | .141 | 7.5 |
| 2 | M4 | Z | .141 | 3.5 |
| 3 | M3 | Z | .141 | 7.5 |
| 4 | M3 | Z | .141 | 3.5 |

## Member Point Loads (BLC 4 : Wind Load Z) (Continued)

| | Member Label | Direction | Magnitude[k,k-ft] | Location[ft,%] |
|---|---|---|---|---|
| 5 | M3 | Z | .017 | 1 |
| 6 | M1 | Z | .48 | .5 |
| 7 | M1 | Z | .48 | 7.5 |
| 8 | M1 | Z | .082 | 4 |

## Member Distributed Loads (BLC 3 : Wind Load X)

| | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/f.. | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M6 | X | .007 | .007 | 0 | 0 |
| 2 | M7 | X | .007 | .007 | 0 | 0 |
| 3 | M1 | X | .007 | .007 | 0 | 0 |
| 4 | M3 | X | .007 | .007 | 0 | 0 |
| 5 | M4 | X | .007 | .007 | 0 | 0 |
| 6 | M8 | X | .007 | .007 | 0 | 0 |

## Member Distributed Loads (BLC 4 : Wind Load Z)

| | Member Label | Direction | Start Magnitude[k/ft,F,ksf] | End Magnitude[k/f.. | Start Location[ft,%] | End Location[ft,%] |
|---|---|---|---|---|---|---|
| 1 | M2 | Z | .007 | .007 | 0 | 0 |
| 2 | M5 | Z | .007 | .007 | 0 | 0 |
| 3 | M3 | Z | .007 | .007 | 0 | 3.308 |
| 4 | M4 | Z | .007 | .007 | 0 | 3.308 |
| 5 | M1 | Z | .007 | .007 | 8 | 11.667 |

## Basic Load Cases

| | BLC Description | Category | X Gra... | Y Gra... | Z Gra... | Joint | Point | Distrib.. | Area(... | Surfa... |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Self Weight | DL | | -1 | | | | | | |
| 2 | Weight of Equipment | DL | | | | | 8 | | | |
| 3 | Wind Load X | WLX | | | | | 8 | 6 | | |
| 4 | Wind Load Z | WLZ | | | | | 8 | 5 | | |

## Load Combinations

| | Description | Solve | P... | S... | B... | Fa... | BLC | Fact... | BLC | Fa... | BLC | Fa... | BLC | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... | B... | Fa... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | IBC 16-8 | Yes | Y | | DL | 1 | | | | | | | | | | | | | | | | | | |
| 2 | IBC 16-9 | Yes | Y | | DL | 1 | LL | 1 | LLS | 1 | | | | | | | | | | | | | | |
| 3 | IBC 16-12 (a) (a) | Yes | Y | | DL | 1 | WLX | .6 | | | | | | | | | | | | | | | | |
| 4 | IBC 16-12 (a) (b) | Yes | Y | | DL | 1 | WLZ | .6 | | | | | | | | | | | | | | | | |
| 5 | IBC 16-12 (a) (c) | Yes | Y | | DL | 1 | WLX | -.6 | | | | | | | | | | | | | | | | |
| 6 | IBC 16-12 (a) (d) | Yes | Y | | DL | 1 | WLZ | -.6 | | | | | | | | | | | | | | | | |
| 7 | IBC 16-13 (a) (a) | Yes | Y | | DL | 1 | WLX | .45 | LL | .75 | LLS | .75 | | | | | | | | | | | | |
| 8 | IBC 16-13 (a) (b) | Yes | Y | | DL | 1 | WLZ | .45 | LL | .75 | LLS | .75 | | | | | | | | | | | | |
| 9 | IBC 16-13 (a) (c) | Yes | Y | | DL | 1 | WLX | -.45 | LL | .75 | LLS | .75 | | | | | | | | | | | | |
| 10 | IBC 16-13 (a) (d) | Yes | Y | | DL | 1 | WLZ | -.45 | LL | .75 | LLS | .75 | | | | | | | | | | | | |
| 11 | IBC 16-15 (a) | Yes | Y | | DL | .6 | WLX | .6 | | | | | | | | | | | | | | | | |
| 12 | IBC 16-15 (b) | Yes | Y | | DL | .6 | WLZ | .6 | | | | | | | | | | | | | | | | |
| 13 | IBC 16-15 (c) | Yes | Y | | DL | .6 | WLX | -.6 | | | | | | | | | | | | | | | | |
| 14 | IBC 16-15 (d) | Yes | Y | | DL | .6 | WLZ | -.6 | | | | | | | | | | | | | | | | |

## Envelope Joint Reactions

| | Joint | | X [k] | LC | Y [k] | LC | Z [k] | LC | MX [k-ft] | LC | MY [k-ft] | LC | MZ [k-ft] | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | N11 | max | .689 | 5 | 1.614 | 6 | .632 | 14 | 0 | 14 | 0 | 14 | 0 | 14 |
| 2 | | min | -.523 | 11 | -1.038 | 12 | -.689 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 3 | N16 | max | -.002 | 13 | 1.601 | 4 | .084 | 6 | 0 | 14 | 0 | 14 | 0 | 14 |
| 4 | | min | -.164 | 3 | -1.049 | 14 | -.027 | 12 | 0 | 1 | 0 | 1 | 0 | 1 |
| 5 | N18 | max | .117 | 14 | .016 | 4 | .202 | 14 | 0 | 14 | 0 | 14 | 0 | 14 |
| 6 | | min | -.117 | 4 | .009 | 14 | -.203 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 7 | N17 | max | .111 | 4 | .016 | 4 | .192 | 14 | 0 | 14 | 0 | 14 | 0 | 14 |
| 8 | | min | -.111 | 14 | .009 | 14 | -.193 | 4 | 0 | 1 | 0 | 1 | 0 | 1 |
| 9 | Totals: | max | .7 | 13 | .735 | 10 | 1.097 | 14 | | | | | | |
| 10 | | min | -.7 | 3 | .441 | 11 | -1.097 | 4 | | | | | | |

## Envelope Joint Displacements

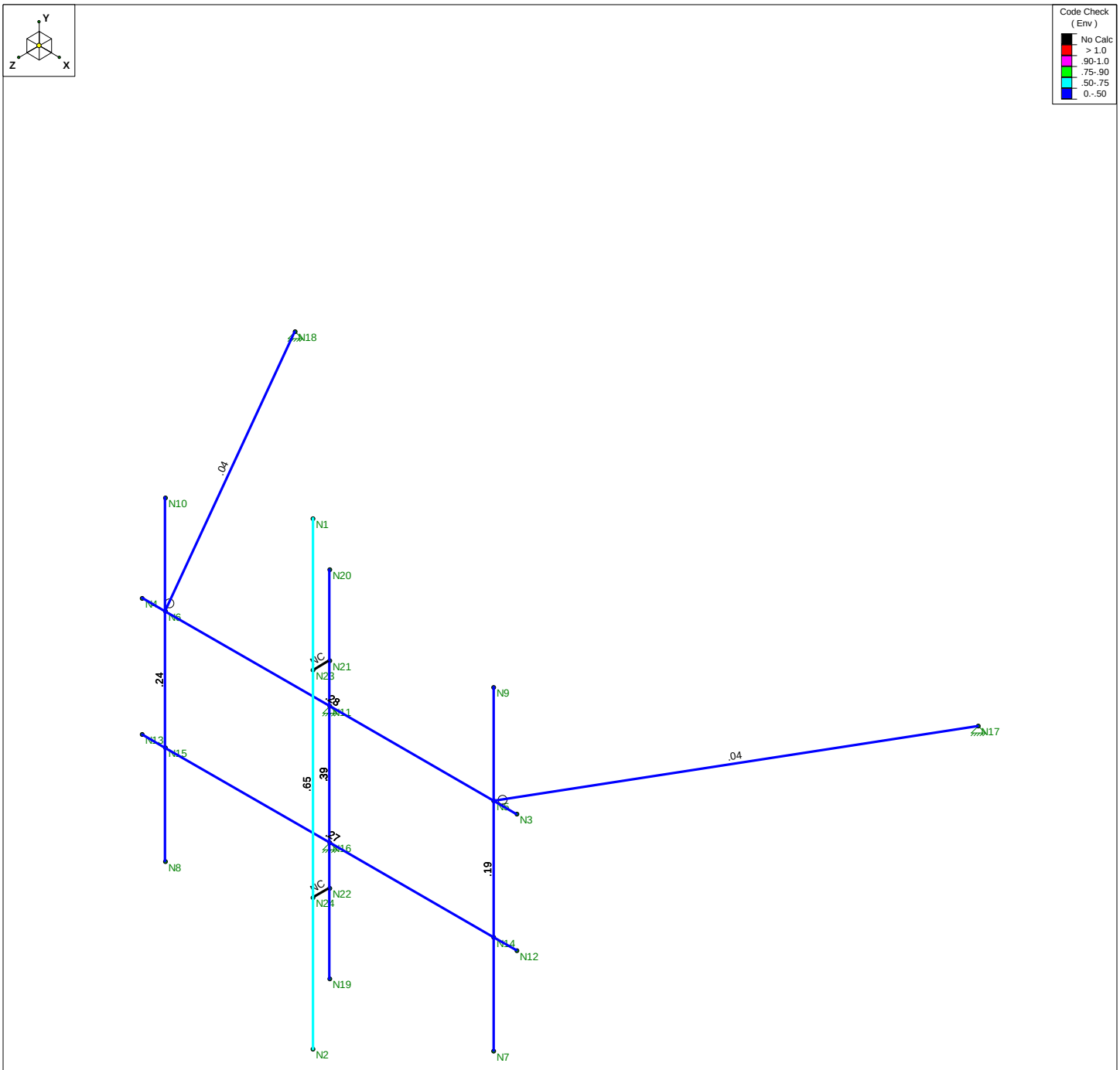
| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [rad] | LC | Y Rotatio... | LC | Z Rotatio... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | N1 | max | .286 | 11 | .018 | 14 | .553 | 4 | 1.586e-02 | 4 | 1.348e-03 | 11 | 7.868e-03 | 5 |
| 2 | | min | -.307 | 5 | -.021 | 4 | -.522 | 14 | -1.521e-02 | 14 | -1.378e-03 | 5 | -7.491e-03 | 11 |
| 3 | N2 | max | .052 | 3 | .015 | 14 | .121 | 14 | 3.212e-03 | 4 | 9.449e-04 | 3 | 1.033e-03 | 3 |
| 4 | | min | -.032 | 13 | -.018 | 4 | -.151 | 4 | -2.596e-03 | 14 | -9.045e-04 | 13 | -6.733e-04 | 13 |
| 5 | N3 | max | 0 | 3 | -.016 | 13 | .002 | 4 | 1.31e-03 | 4 | 2.148e-04 | 5 | 1.694e-05 | 13 |
| 6 | | min | 0 | 13 | -.093 | 3 | -.002 | 14 | -1.194e-03 | 14 | -1.942e-04 | 11 | -1.084e-03 | 3 |
| 7 | N4 | max | 0 | 11 | -.051 | 11 | .003 | 4 | 7.106e-04 | 4 | 1.982e-04 | 13 | 1.52e-03 | 5 |
| 8 | | min | 0 | 5 | -.15 | 5 | -.003 | 14 | -6.168e-04 | 14 | -2.081e-04 | 3 | 2.342e-04 | 11 |
| 9 | N5 | max | 0 | 3 | -.016 | 13 | .001 | 4 | 1.31e-03 | 4 | 2.148e-04 | 5 | 1.762e-05 | 13 |
| 10 | | min | 0 | 13 | -.086 | 3 | -.001 | 14 | -1.194e-03 | 14 | -1.942e-04 | 11 | -1.083e-03 | 3 |
| 11 | N6 | max | 0 | 11 | -.049 | 11 | .002 | 4 | 7.106e-04 | 4 | 1.982e-04 | 13 | 1.518e-03 | 5 |
| 12 | | min | 0 | 5 | -.139 | 5 | -.001 | 14 | -6.168e-04 | 14 | -2.081e-04 | 3 | 2.335e-04 | 11 |
| 13 | N7 | max | -.007 | 13 | -.016 | 13 | .035 | 12 | 9.315e-04 | 6 | 4.006e-04 | 6 | -2.405e-04 | 13 |
| 14 | | min | -.026 | 3 | -.085 | 3 | -.042 | 6 | -8.15e-04 | 12 | -3.242e-04 | 12 | -8.234e-04 | 3 |
| 15 | N8 | max | .035 | 5 | -.049 | 11 | .087 | 12 | 1.778e-03 | 6 | 7.529e-04 | 12 | 1.123e-03 | 5 |
| 16 | | min | .018 | 11 | -.139 | 5 | -.092 | 6 | -1.684e-03 | 12 | -8.197e-04 | 6 | 6.239e-04 | 11 |
| 17 | N9 | max | .06 | 3 | -.016 | 13 | .078 | 4 | 2.988e-03 | 4 | 2.148e-04 | 5 | 1.22e-03 | 13 |
| 18 | | min | -.027 | 13 | -.086 | 3 | -.074 | 14 | -2.871e-03 | 14 | -1.942e-04 | 11 | -2.287e-03 | 3 |
| 19 | N10 | max | .02 | 11 | -.049 | 11 | .06 | 4 | 2.388e-03 | 4 | 1.982e-04 | 13 | 2.723e-03 | 5 |
| 20 | | min | -.073 | 5 | -.139 | 5 | -.057 | 14 | -2.293e-03 | 14 | -2.081e-04 | 3 | -9.682e-04 | 11 |
| 21 | N11 | max | 0 | 14 | 0 | 14 | 0 | 14 | 2.563e-03 | 4 | 5.155e-04 | 11 | 1.6e-03 | 5 |
| 22 | | min | 0 | 1 | 0 | 1 | 0 | 1 | -2.351e-03 | 14 | -5.234e-04 | 5 | -1.074e-03 | 11 |
| 23 | N12 | max | 0 | 11 | -.017 | 13 | .014 | 12 | 8.234e-04 | 6 | 4.02e-04 | 6 | -1.33e-04 | 13 |
| 24 | | min | 0 | 5 | -.092 | 3 | -.018 | 6 | -7.068e-04 | 12 | -3.255e-04 | 12 | -9.33e-04 | 3 |
| 25 | N13 | max | 0 | 3 | -.052 | 11 | .043 | 12 | 1.561e-03 | 6 | 7.542e-04 | 12 | 1.308e-03 | 5 |
| 26 | | min | 0 | 13 | -.148 | 5 | -.046 | 6 | -1.465e-03 | 12 | -8.211e-04 | 6 | 4.442e-04 | 11 |
| 27 | N14 | max | 0 | 11 | -.016 | 13 | .012 | 12 | 8.234e-04 | 6 | 4.006e-04 | 6 | -1.323e-04 | 13 |
| 28 | | min | 0 | 5 | -.085 | 3 | -.015 | 6 | -7.068e-04 | 12 | -3.242e-04 | 12 | -9.319e-04 | 3 |
| 29 | N15 | max | 0 | 3 | -.049 | 11 | .037 | 12 | 1.561e-03 | 6 | 7.529e-04 | 12 | 1.307e-03 | 5 |
| 30 | | min | 0 | 13 | -.139 | 5 | -.04 | 6 | -1.465e-03 | 12 | -8.197e-04 | 6 | 4.435e-04 | 11 |
| 31 | N16 | max | 0 | 14 | 0 | 14 | 0 | 14 | 2.097e-04 | 4 | 5.154e-04 | 3 | 5.094e-04 | 3 |
| 32 | | min | 0 | 1 | 0 | 1 | 0 | 1 | 1.662e-05 | 14 | -4.967e-04 | 13 | 1.676e-05 | 13 |
| 33 | N17 | max | 0 | 14 | 0 | 14 | 0 | 14 | 2.137e-03 | 3 | 1.098e-03 | 3 | 8.231e-04 | 6 |
| 34 | | min | 0 | 1 | 0 | 1 | 0 | 1 | 6.162e-04 | 13 | -1.095e-03 | 13 | -3.661e-04 | 12 |
| 35 | N18 | max | 0 | 14 | 0 | 14 | 0 | 14 | 2.752e-03 | 5 | 1.094e-03 | 11 | 1.888e-04 | 13 |
| 36 | | min | 0 | 1 | 0 | 1 | 0 | 1 | 9.894e-04 | 11 | -1.099e-03 | 5 | -5.343e-04 | 3 |

## Envelope Joint Displacements (Continued)

| | Joint | | X [in] | LC | Y [in] | LC | Z [in] | LC | X Rotation [rad] | LC | Y Rotatio... | LC | Z Rotatio... | LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37 | N19 | max | .028 | 3 | 0 | 14 | .083 | 14 | 3.47e-03 | 4 | 9.449e-04 | 3 | 8.325e-04 | 3 |
| 38 | | min | -.014 | 13 | 0 | 4 | -.104 | 4 | -2.853e-03 | 14 | -9.045e-04 | 13 | -4.722e-04 | 13 |
| 39 | N20 | max | .105 | 11 | 0 | 12 | .152 | 4 | 4.371e-03 | 4 | 1.348e-03 | 11 | 3.589e-03 | 5 |
| 40 | | min | -.119 | 5 | 0 | 6 | -.132 | 14 | -3.741e-03 | 14 | -1.378e-03 | 5 | -3.223e-03 | 11 |
| 41 | N21 | max | .028 | 11 | 0 | 12 | .047 | 4 | 4.371e-03 | 4 | 1.348e-03 | 11 | 3.533e-03 | 5 |
| 42 | | min | -.034 | 5 | 0 | 6 | -.042 | 14 | -3.74e-03 | 14 | -1.378e-03 | 5 | -3.167e-03 | 11 |
| 43 | N22 | max | .009 | 3 | 0 | 14 | .015 | 14 | 3.471e-03 | 4 | 9.449e-04 | 3 | 7.772e-04 | 3 |
| 44 | | min | -.003 | 13 | 0 | 4 | -.02 | 4 | -2.853e-03 | 14 | -9.045e-04 | 13 | -4.168e-04 | 13 |
| 45 | N23 | max | .035 | 11 | .018 | 14 | .047 | 4 | 4.371e-03 | 4 | 1.348e-03 | 11 | 3.533e-03 | 5 |
| 46 | | min | -.04 | 5 | -.021 | 4 | -.042 | 14 | -3.74e-03 | 14 | -1.378e-03 | 5 | -3.167e-03 | 11 |
| 47 | N24 | max | .014 | 3 | .015 | 14 | .015 | 14 | 3.471e-03 | 4 | 9.449e-04 | 3 | 7.772e-04 | 3 |
| 48 | | min | -.008 | 13 | -.018 | 4 | -.02 | 4 | -2.853e-03 | 14 | -9.045e-04 | 13 | -4.168e-04 | 13 |

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

| | Member | Shape | Code Check | Lo... | LC | She... | Lo... | Dir | ... | Pnc/... | Pnt/o... | Mny... | Mnz... | Cb | Eqn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | M1 | PIPE_2.0 | .655 | 3.... | 4 | .045 | .608 | | 4 | 4.808 | 21.377 | 1.245 | 1.245 | 4.9.. | H1-... |
| 2 | M8 | PIPE_2.0 | .388 | 6 | 14 | .111 | 6 | | 5 | 8.08 | 21.377 | 1.245 | 1.245 | 3.3.. | H1-... |
| 3 | M2 | PIPE_2.0 | .281 | 4.75 | 3 | .058 | 4.75 | | 4 | 7.252 | 21.377 | 1.245 | 1.245 | 1.8.. | H1-... |
| 4 | M5 | PIPE_2.0 | .273 | 4.75 | 5 | .054 | 4.75 | | 4 | 7.252 | 21.377 | 1.245 | 1.245 | 1.8.. | H1-... |
| 5 | M3 | PIPE_2.0 | .244 | 5.5 | 4 | .046 | 3.5 | | 6 | 9.924 | 21.377 | 1.245 | 1.245 | 4.9.. | H1-... |
| 6 | M4 | PIPE_2.0 | .193 | 5.5 | 4 | .030 | 5.5 | | 3 | 9.924 | 21.377 | 1.245 | 1.245 | 4.9.. | H1-... |
| 7 | M6 | PIPE_2.0 | .043 | 4.... | 6 | .004 | 8.... | | 5 | 8.084 | 21.377 | 1.245 | 1.245 | 1.1.. | H1-... |
| 8 | M7 | PIPE_2.0 | .042 | 4.... | 6 | .004 | 8.... | | 5 | 8.084 | 21.377 | 1.245 | 1.245 | 1.1.. | H1-... |




Member Code Checks Displayed (Enveloped)
Envelope Only Solution

| | | |
|---|---|---|
| Centek | | |
| TJL | CT11328F - Mount | Mar 3, 2021 at 9:36 AM |
| 21022.07 | Unity Check | CT11328F_AMA.r3d |

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11328F

Marine Sys. Smoke Stack
50 Maple Street
Branford, Connecticut 06405

**April 13, 2021**

**EBI Project Number: 6221001755**

| **Site Compliance Summary** | |
|---|---|
| Compliance Status: | **COMPLIANT** |
| Site total MPE% of FCC general population allowable limit: | **17.13%** |

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

April 13, 2021

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

Emissions Analysis for Site: CT11328F - Marine Sys. Smoke Stack

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **50 Maple Street** in **Branford, 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 50 Maple Street in Branford, 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 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

9) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna 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.

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

11) The antenna mounting height centerline of the proposed antennas is 96 feet above ground level (AGL).

12) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

# T-Mobile Site Inventory and Power Data

| Sector: | A | Sector: | B | Sector: | C |
|---|---|---|---|---|---|
| Antenna #: | 1 | Antenna #: | 1 | Antenna #: | 1 |
| Make / Model: | Ericsson AIR 21 | Make / Model: | Ericsson AIR 21 | Make / Model: | Ericsson AIR 21 |
| Frequency Bands: | 2100 MHz | Frequency Bands: | 2100 MHz | Frequency Bands: | 2100 MHz |
| Gain: | 15.35 dBd | Gain: | 15.35 dBd | Gain: | 15.35 dBd |
| Height (AGL): | 96 feet | Height (AGL): | 96 feet | Height (AGL): | 96 feet |
| Channel Count: | 2 | Channel Count: | 2 | Channel Count: | 2 |
| Total TX Power (W): | 120 Watts | Total TX Power (W): | 120 Watts | Total TX Power (W): | 120 Watts |
| ERP (W): | 4,113.21 | ERP (W): | 4,113.21 | ERP (W): | 4,113.21 |
| Antenna A1 MPE %: | **1.83%** | Antenna B1 MPE %: | **1.83%** | Antenna C1 MPE %: | **1.83%** |
| Antenna #: | **2** | Antenna #: | **2** | Antenna #: | **2** |
| Make / Model: | RFS APXVAARR24_43-U-NA20 | Make / Model: | RFS APXVAARR24_43-U-NA20 | Make / Model: | RFS APXVAARR24_43-U-NA20 |
| Frequency Bands: | 600 MHz / 600 MHz / 700 MHz | Frequency Bands: | 600 MHz / 600 MHz / 700 MHz | Frequency Bands: | 600 MHz / 600 MHz / 700 MHz |
| Gain: | 12.95 dBd / 12.95 dBd / 13.35 dBd | Gain: | 12.95 dBd / 12.95 dBd / 13.35 dBd | Gain: | 12.95 dBd / 12.95 dBd / 13.35 dBd |
| Height (AGL): | 96 feet | Height (AGL): | 96 feet | Height (AGL): | 96 feet |
| Channel Count: | 5 | Channel Count: | 5 | Channel Count: | 5 |
| Total TX Power (W): | 200 Watts | Total TX Power (W): | 200 Watts | Total TX Power (W): | 200 Watts |
| ERP (W): | 4,059.02 | ERP (W): | 4,059.02 | ERP (W): | 4,059.02 |
| Antenna A2 MPE %: | **4.30%** | Antenna B2 MPE %: | **4.30%** | Antenna C2 MPE %: | **4.30%** |
| Antenna #: | **3** | Antenna #: | **3** | Antenna #: | **3** |
| Make / Model: | Ericsson AIR 21 | Make / Model: | Ericsson AIR 21 | Make / Model: | Ericsson AIR 21 |
| Frequency Bands: | 1900 MHz / 1900 MHz / 2100 MHz | Frequency Bands: | 1900 MHz / 1900 MHz / 2100 MHz | Frequency Bands: | 1900 MHz / 1900 MHz / 2100 MHz |
| Gain: | 15.35 dBd / 15.35 dBd / 15.35 dBd | Gain: | 15.35 dBd / 15.35 dBd / 15.35 dBd | Gain: | 15.35 dBd / 15.35 dBd / 15.35 dBd |
| Height (AGL): | 96 feet | Height (AGL): | 96 feet | Height (AGL): | 96 feet |
| Channel Count: | 8 | Channel Count: | 8 | Channel Count: | 8 |
| Total TX Power (W): | 240 Watts | Total TX Power (W): | 240 Watts | Total TX Power (W): | 240 Watts |
| ERP (W): | 8,226.43 | ERP (W): | 8,226.43 | ERP (W): | 8,226.43 |
| Antenna A3 MPE %: | **3.65%** | Antenna B3 MPE %: | **3.65%** | Antenna C3 MPE %: | **3.65%** |

| Site Composite MPE % | |
|---|---|
| **Carrier** | **MPE %** |
| T-Mobile (Max at Sector A): | 9.77% |
| Sprint | 7.36% |
| **Site Total MPE % :** | 17.13% |

| T-Mobile MPE % Per Sector | |
|---|---|
| T-Mobile Sector A Total: | 9.77% |
| T-Mobile Sector B Total: | 9.77% |
| T-Mobile Sector C Total: | 9.77% |
| | |
| Site Total MPE % : | 17.13% |

## T-Mobile Maximum MPE Power Values (Sector A)

| T-Mobile Frequency Band / Technology (Sector A) | # Channels | Watts ERP (Per Channel) | Height (feet) | Total Power Density (μW/cm²) | Frequency (MHz) | Allowable MPE (μW/cm²) | Calculated % MPE |
|---|---|---|---|---|---|---|---|
| T-Mobile 2100 MHz LTE | 2 | 2056.61 | 96.0 | 18.26 | 2100 MHz LTE | 1000 | 1.83% |
| T-Mobile 600 MHz LTE | 2 | 591.73 | 96.0 | 5.25 | 600 MHz LTE | 400 | 1.31% |
| T-Mobile 600 MHz NR | 1 | 1577.94 | 96.0 | 7.00 | 600 MHz NR | 400 | 1.75% |
| T-Mobile 700 MHz LTE | 2 | 648.82 | 96.0 | 5.76 | 700 MHz LTE | 467 | 1.23% |
| T-Mobile 1900 MHz GSM | 4 | 1028.30 | 96.0 | 18.26 | 1900 MHz GSM | 1000 | 1.83% |
| T-Mobile 1900 MHz UMTS | 2 | 1028.30 | 96.0 | 9.13 | 1900 MHz UMTS | 1000 | 0.91% |
| T-Mobile 2100 MHz UMTS | 2 | 1028.30 | 96.0 | 9.13 | 2100 MHz UMTS | 1000 | 0.91% |
| | | | | | | **Total:** | **9.77%** |

• 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: | 9.77% |
| Sector B: | 9.77% |
| Sector C: | 9.77% |
| T-Mobile Maximum MPE % (Sector A): | 9.77% |
| | |
| Site Total: | 17.13% |
| | |
| Site Compliance Status: | **COMPLIANT** |

The anticipated composite MPE value for this site assuming all carriers present is **17.13%** 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.