

1 INDUSTRIAL AVE,

SITE 3

MORRISWAH NJ 07430

PHONE: 201.684.0055

FAX: 201.684.0066



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December 17, 2021

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

RE: Notice of Exempt Modification  
150 E. Aurora Street, Waterbury, CT 06708  
Latitude: 41.5750000  
Longitude: -73.0583000  
T-Mobile Site#: CTNH334A - Anchor

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 95' level and six (6) antennas at the 105' level of the 110' stomestack. The Smokestack is managed by American Tower and the property is owned by 50 East Aurora Storage & Light MFG LLC. T-Mobile now intends to replace six (6) of its existing antennas with three (3) L2500/N2500 antennas. The new antennas would be installed at the 105' level of the tower. The new antennas support 5G services.

**Planned Modifications:**

**Tower:**

Install New:

- (3) AIR6449 Antennas
- (3) Radio 4460 B25 / B66
- (2) 6x24 Hybrid Cables

To Be Removed:

- (3) AIR21 Antennas
- (3) AIR32 Antennas
- (1) 9x18 Hybrid Cable

Existing to Remain:

- (3) RFS APXAARR24 Antennas
- (3) Radio 449 B71 B85

This tower was approved by the City of Waterbury. This was approved on June 27, 2006. The approval is enclosed.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-SOj-73, a copy of this letter is being sent to Mayor Neil O'Leary, Elected Official, and Robert Nerney, Town Planner of Waterbury, as well as the property and tower owner.

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

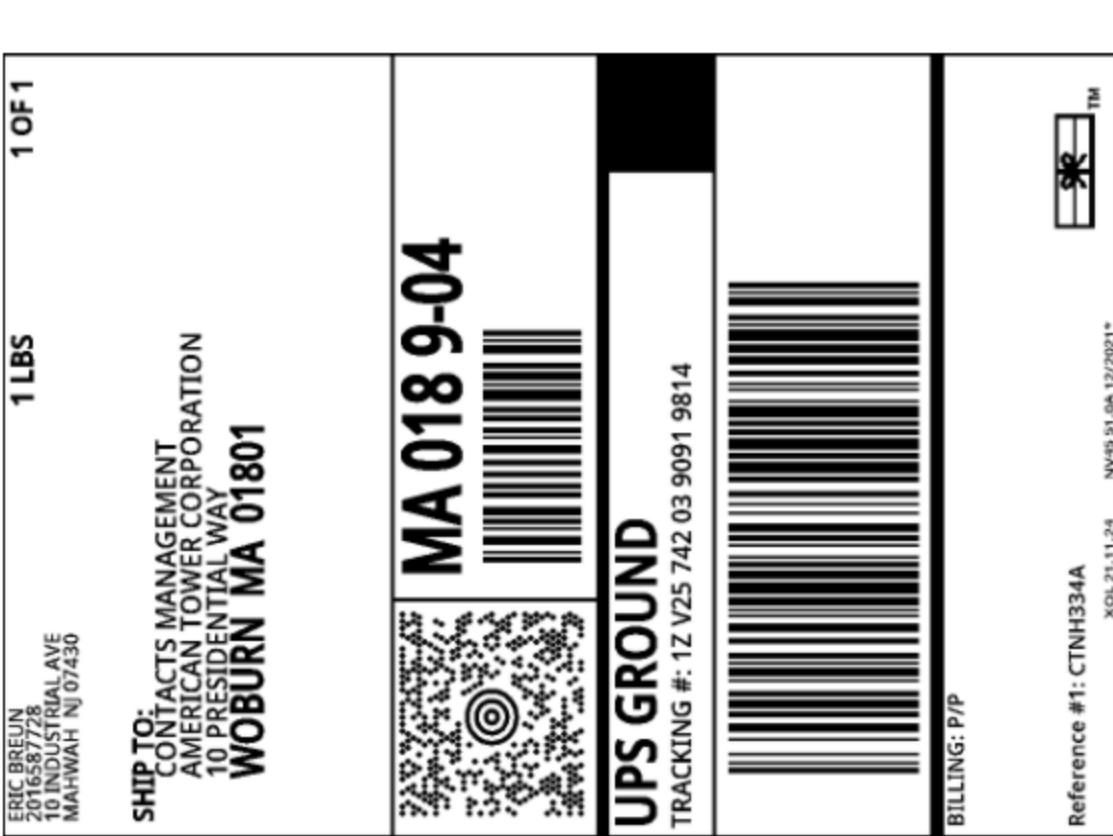
1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

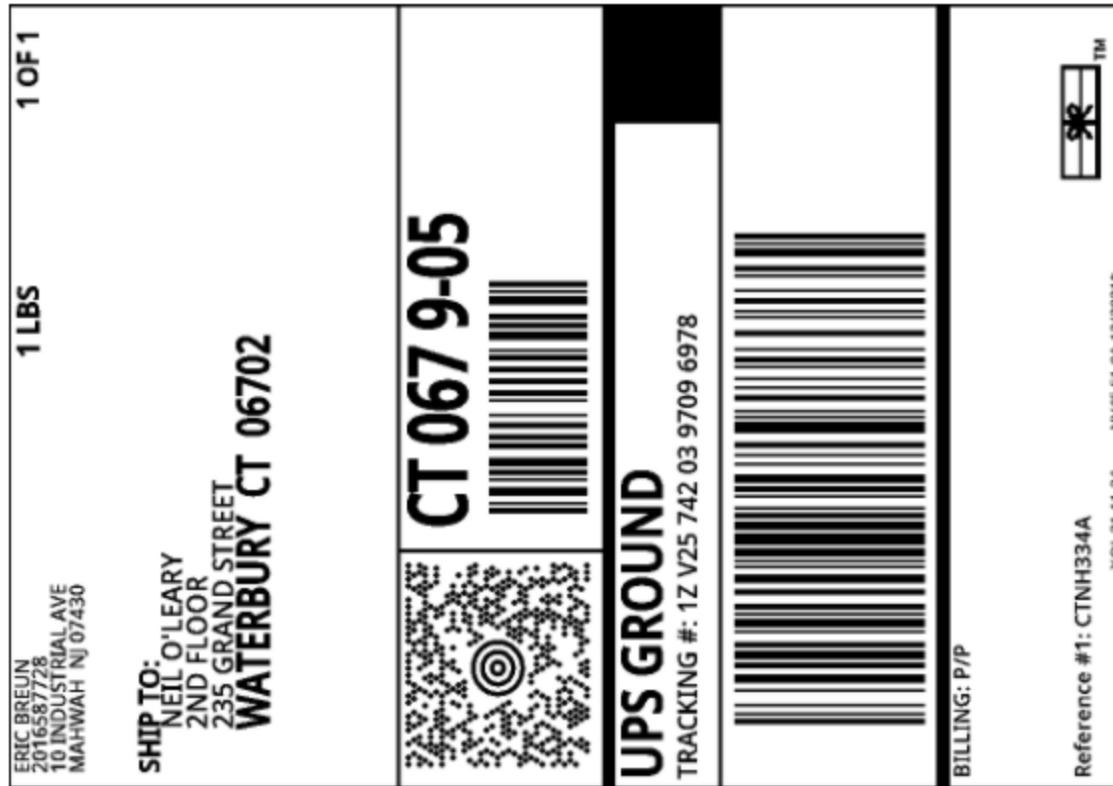
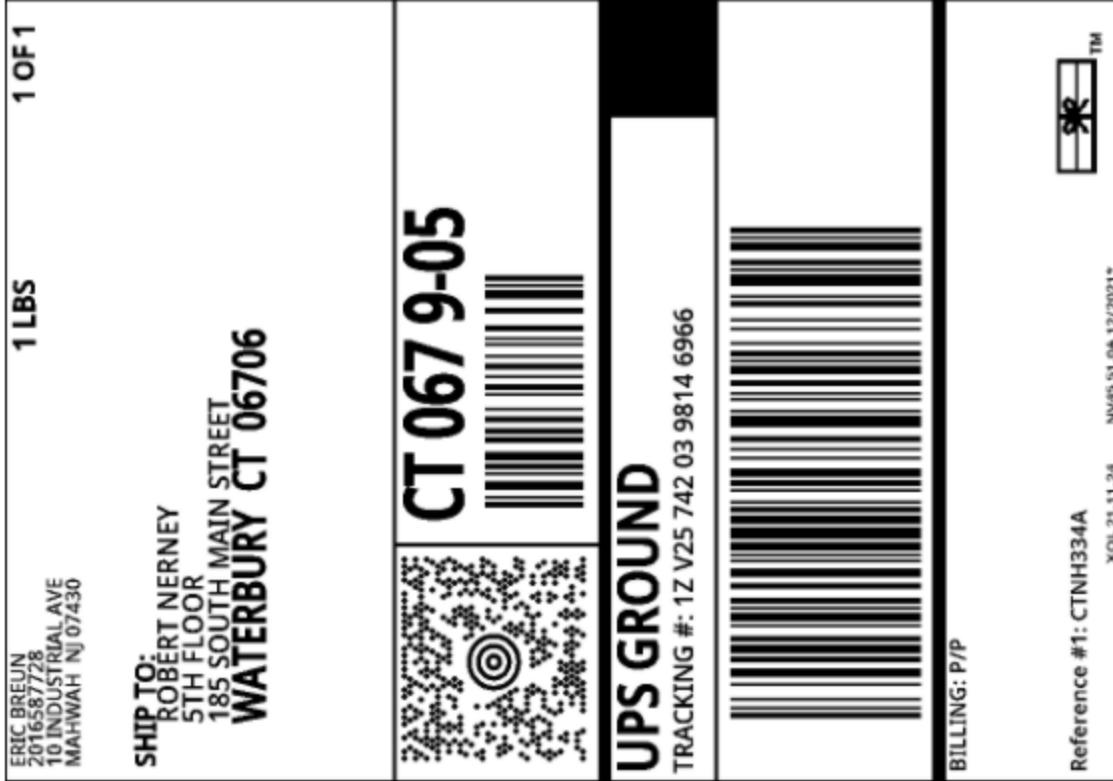
For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

**Eric Breun**  
Transcend Wireless  
Cell: 201-658-7728  
Email: [ebreun@transcendwireless.com](mailto:ebreun@transcendwireless.com)

Attachments  
cc: Neil O'Leary - Mayor of Waterbury  
Robert Nerney - Town Planner  
50 East Aurora Storage & Light MFG LLC - Property Owner  
American Tower - Smokestack Manager





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

**Delivery Date:** Wednesday, 12/15/2021

**Delivery Time:** 10:29 AM

**Left At:** MAIL ROOM

**Signed by:** JAY

## TRANSCEND WIRELESS

**Tracking Number:** [1ZV257420397096978](#)

NEIL O'LEARY  
235 GRAND STREET  
2ND FLOOR  
WATERBURY, CT 06702  
US

**Number of Packages:** 1

**UPS Service:** UPS Ground

**Package Weight:** 1.0 LBS

**Reference Number:** CTNH334A

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

**Delivery Date:** Wednesday, 12/15/2021

**Delivery Time:** 10:32 AM

**Left At:** RECEIVER

**Signed by:** MULLEN

## TRANSCEND WIRELESS

**Tracking Number:** [1ZV257420398146966](#)

ROBERT NERNEY  
185 SOUTH MAIN STREET  
5TH FLOOR  
WATERBURY, CT 06706  
US

**Number of Packages:** 1

**UPS Service:** UPS Ground

**Package Weight:** 1.0 LBS

**Reference Number:** CTNH334A

Hello, your package has been delivered.

**Delivery Date:** Wednesday, 12/15/2021

**Delivery Time:** 11:31 AM

**Left At:** FRONT DESK

**Signed by:** ANCRI

## TRANSCEND WIRELESS

**Tracking Number:** [1ZV257420390919814](#)

AMERICAN TOWER CORPORATION  
10 PRESIDENTIAL WAY  
WOBURN, MA 01801  
US

**Number of Packages:** 1

**UPS Service:** UPS Ground

**Package Weight:** 1.0 LBS

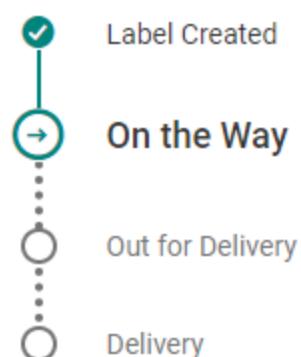
**Reference Number:** CTNH334A

Your shipment

1ZV257421299216951

Estimated delivery

**Friday, December 17 by 9:00 P.M.**



**Ship To**

SPRING, TX US

Location: 150 EAST AURORA ST Owner: 150 EAST AURORA STORAGE AND LIGHT  
MFG LL

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#### Property Information:

Map Block Lot:	0143-0783-0021	Acres:	2.55
Primary Use:	Light Industrial	Zone:	IG
Neighborhood:	80000-Industrial General	Vol/Page:	5612
Mailing Address:	150 EAST AURORA STORAGE AND LIGHT MFG LL 25350 BUDDE RD SPRING TX 77380		

#### Property Values:

	Appraised Value	Assessed Value (70%)
Building	679372	475560
Land	235620	164930
OutBuilding	17882	12520
Total	932874	653010

#### Building Information:

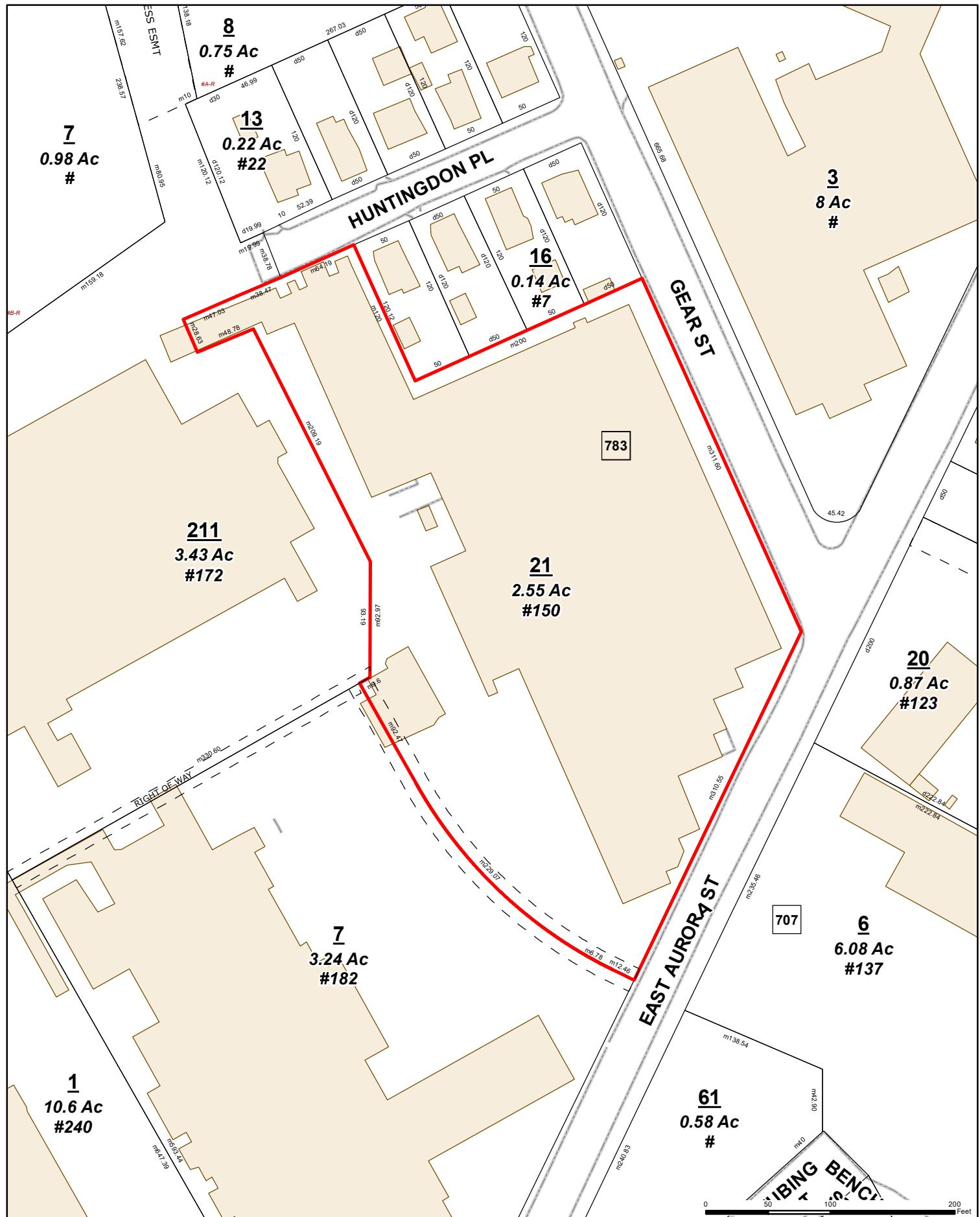
Bldg Style:		Living Area:	87293sq.ft
Construction:	Average	Year Built:	1942
Exterior Wall:	Brick Solid	Stories:	1
Roof Cover:		Heating:	Forced Air
Condition:	Average	Heat Fuel:	Gas
Rooms:	0	Bedrooms:	0
Full Baths:	0	Half Baths:	0

**Building Information:**

Bldg Style:		Living Area:	2562sq.ft
Construction:	Average	Year Built:	1976
Exterior Wall:	Wood Siding	Stories:	1
Roof Cover:		Heating:	Hot Water
Condition:	Average	Heat Fuel:	Gas
Rooms:	0	Bedrooms:	0
Full Baths:	0	Half Baths:	0

**Outbuilding Information:**

Type	Area (sq.ft)	Year Built	Condition
Loading Dock Dock	600sq.ft	1976	Average
Metal Shed	242sq.ft	1942	Average
Asphalt Paving	14000sq.ft	1942	Average
Chain Link Fencing	1440sq.ft	1942	Average
Loading Dock Steel Dock	100sq.ft	1942	Average



**City of Waterbury**  
Public Works Department

MBL: 0143-0783-0021

ADDRESS: 150 EAST AURORA ST

This map is for informational purposes only and has not been prepared for, or suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to verify the usability of the information. The City of Waterbury makes no warranties, express or implied, as to the use of the information obtained herein.





## DEPARTMENT OF PLANNING

CITY OF WATERBURY

235 GRAND STREET

WATERBURY, CONNECTICUT 06702

Tel. (203) 574-6818 Fax (203) 346-3949

no wetlands

James A. Sequin, AICP  
City Planner

## APPLICATION FOR A CERTIFICATE OF ZONING COMPLIANCE

(SHADED AREAS FOR STAFF USE)

ADDRESS: 150 E AURORA ST

TAX ID:

DATE: 1-7-08

### APPLICANT:

Name: T-Mobile / OMN. ft  
Address: 100 Filley ST  
City, State, Zip: Bloomfield CT 06010  
Phone: 516-807-1983- Nick  
Fax: \_\_\_\_\_  
Email: \_\_\_\_\_

### PROPERTY OWNER:

Name: 150 E AURORA ST Storage  
Address: 25350 Budde Rd  
City, State, Zip: Spring TX 77380  
Phone: \_\_\_\_\_  
Fax: \_\_\_\_\_  
Email: \_\_\_\_\_

AS BUILT PLAN ATTACHED?  YES  NO

A-2 SURVEY REQUIRED?  YES  NO

SITE VISIT REQUIRED?  YES  NO

ZONING DISTRICT: \_\_\_\_\_

Fee: \$ \_\_\_\_\_

### CHANGE OF USE:

EXISTING USE: \_\_\_\_\_

PROPOSED USE: \_\_\_\_\_

### TYPE OF IMPROVEMENT

- NEW PRINCIPAL STRUCTURE
- ADDITION
- DECK
- POOL
- GARAGE
- FENCE
- SHED
- SIGN
- OTHER

\$75  
called 119

### EARTH EXCAVATION

CUT

FILL

REGRADING

Cubic Yards


Cellcrete 110'

**COSTROTTA CONSTRUCTION  
MANAGEMENT INC.**

**DEVELOPMENT STANDARDS:**

LOT SIZE (Sq. Ft.)  
FRONTAGE ON PAVED CITY STREET (Feet)  
BUILDING COVERAGE (Sq. Ft.)  
SIDE YARD (Feet)  
SIDE YARD (Feet)  
FRONT YARD (Feet)  
REAR YARD (Feet)  
NUMBER OF ONSITE PARKING SPACES

Provided


office (516) 223-5404  
fax (516) 223-5406  
cell (516) 807-1983

99 Maple Place  
Freeport, NY 11520

**COMMISSION ACTIONS:**

VARIANCE

Not Needed  Approved  Pending

Type:

SPECIAL PERMIT

Not Needed  Approved  Pending

Type:

SPECIAL EXCEPTION

Not Needed  Approved  Pending

Type:

**IMPORTANT INFORMATION**

An application for a Certificate of Zoning compliance must be accompanied by a plot plan containing all the information necessary to enable the Zoning Administrator to decide whether the proposed building, alteration, addition, or use complies with all the provisions of these regulations.

The Zoning Administrator may rely on the information submitted above in making a determination of compliance. It is the responsibility of the applicant to assure the accuracy of all information submitted.

**NOTICE OF RIGHT TO ADVERTISE (CGS 8-3 (f))**

No building permit or certificate of occupancy shall be issued for a building, use or structure subject to the zoning regulations of a municipality without certification in writing by the official charged with the enforcement of such regulations that such building, use or structure is in conformity with such regulations or is a valid nonconforming use under such regulations. Such official shall inform the applicant for any such certification that such applicant may provide notice of such certification by either (1) publication in a newspaper having substantial circulation in such municipality stating that the certification has been issued, or (2) any other method provided for by local ordinance. Any such notice shall contain (A) a description of the building, use or structure, (B) the location of the building, use or structure, (C) the identity of the applicant, and (D) a statement that an aggrieved person may appeal to the zoning board of appeals in accordance within thirty days of the publication of the notice.

I certify that the information submitted herein is accurate to the best of my knowledge and that I have been informed of my right to advertise, at my own expense, notice of any certification received.

Signature: 

Date: 1-7-08

Office Use Only

**CERTIFICATION:**

Date Rec'd

Date Completed

Approved

Denied

Reason for denial:

Signature:

Date:

Land Use Officer

08



The City of Waterbury  
DEPARTMENT OF INSPECTION  
235 Grand Street, Waterbury, CT 06702  
(203) 574-6832

PERMIT NUMBER

7285D

## Building Permit

Date: 6-27-06

Applicant:

Company Name: Omnipoint Communications

Address: 100 Filley St

City/State/Zip: Bloomfield CT 06002

Location of Work:

Address: 150 East Aurora St

Location of Owner:

Owner's Name: 150 East Aurora Storage

Address: 25350 Budde Rd

City/State/Zip: Spring TX 77380

Leave is hereby granted to M.

Omnipoint Communications

to erect a T-Mobile Antenna

as follows: Length \_\_\_\_\_ ft.; Width \_\_\_\_\_ ft.; No. of Stories \_\_\_\_\_; No. of Rooms \_\_\_\_\_

Building to be used as Commercial

Construction Classification \_\_\_\_\_ Use Group \_\_\_\_\_

Designed Live Load: 1<sup>st</sup> \_\_\_\_\_ 2<sup>nd</sup> \_\_\_\_\_ 3<sup>rd</sup> \_\_\_\_\_ Roof \_\_\_\_\_

Remarks: \_\_\_\_\_

The conditions on which this permit is granted are, that the said building shall be erected in accordance with the laws of the State of Connecticut, and the ordinances of the City of Waterbury. If any of the statements of said applicant be not true, or if any change is made in said plans or specifications without the consent of the Building Inspector or his duly appointed agents, this permit shall be revocable.

Limited to six months from date. This permit may be sooner revoked for any violation of any ordinance, statute or order of constituted authority. This permit is subject to the condition that should there be any change in the ordinance or statutes or institution of proceedings to establish any building line or other improvements, before said building is completed, then no further work shall be done on said building thereafter conflicting with such new statute, order, ordinance, or institution of proceedings.

*Edil Mareline*

Building Official

ESTIMATED COST: \$ 150,000.00

Permit Fee: \$ 3,005.00

State Ed Fee: \$ 24.00

CO: \$ 25.00

CA: \$ \_\_\_\_\_

Penalty Fee: \$ \_\_\_\_\_

TOTAL AMOUNT: \$ 3,054.00





# T-Mobile

## NH334/E AURORA SMOKESTACK

### SITE ID: CTNH334A

### 150 E AURORA ST

### WATERBURY, CT 06708

T-MOBILE A&L TEMPLATE (PROVIDED BY RFDS)

67D5998E\_1xAIR+1OP

RAN TEMPLATE (PROVIDED BY RFDS)

67D5998E HYBRID

#### GENERAL NOTES

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
- 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.
- ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSING' 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 MISSING ITEMS.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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

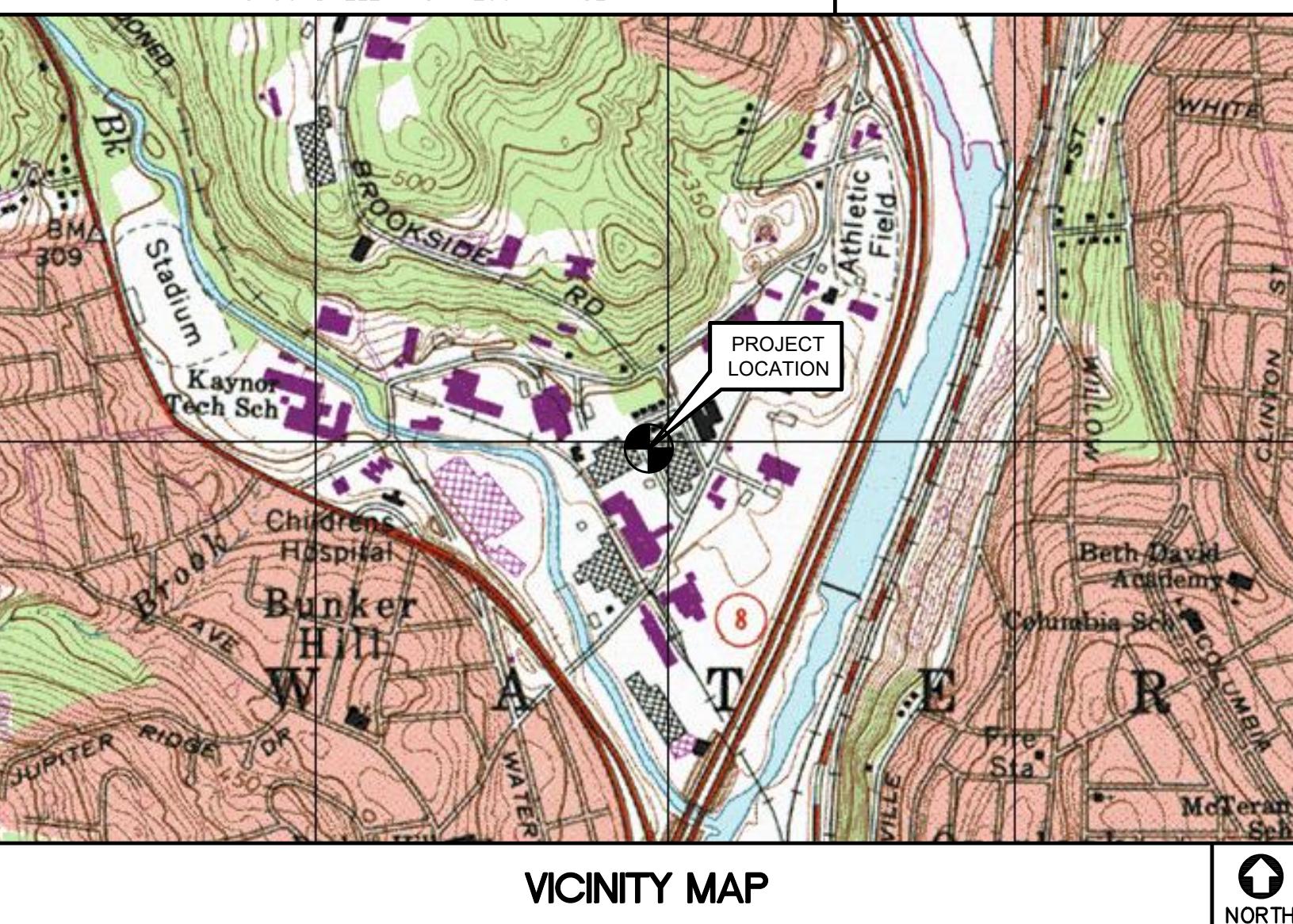
TO: 150 E AURORA ST

WATERBURY, CT 06708

- HEAD NORTHEAST ON GRIFFIN ROAD S TOWARD NEWBERRY RD. 0.6 MI.
- TURN RIGHT ONTO DAY HILL RD. 3.6 MI.
- USE THE RIGHT LANE TO MERGE ONTO I-91 S VIA THE RAMP TO HARTFORD. 0.4 MI.
- MERGE ONTO I-91 S. 6.9 MI.
- MERGE ONTO I-84. 0.5 MI.
- TAKE EXIT 32A-32B FOR I-84 W TOWARD. 30.0 MI.
- MERGE ONTO I-84. 1.1 MI.
- TAKE EXIT 20 TO MERGE ONTO CT-8 N TOWARD TORRINGTON. 0.4 MI.
- USE THE 2ND FROM THE LEFT LANE TO TAKE EXIT 35 FOR CT-73 TOWARD OAKVILLE/WATERTOWN. 0.1 MI.
- TURN RIGHT ONTO E AURORA ST. 0.1 MI.

SITE COORDINATES: LATITUDE: 41° 34' 30.00" N  
LONGITUDE: 73° 03' 29.60" W  
GROUND ELEVATION: 290' ± AMSL

COORDINATES AND GROUND ELEVATION  
ARE REFERENCED FROM GOOGLE EARTH



#### PROJECT SUMMARY

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

- REMOVE (3) AIR21 ANTENNAS, (1) PER SECTOR
- REMOVE (3) AIR32 ANTENNAS, (1) PER SECTOR
- REMOVE (1) 9x18 HYBRID CABLE
- REMOVE EXISTING EQUIPMENT AND BATTERY RACKS.
- INSTALL (3) AIR6449 ANTENNAS TO POS. 1, (1) PER SECTOR
- INSTALL (3) RADIO 4460 B25+B66 FOR POS 2, (1) PER SECTOR
- INSTALL (1) ERICSSON 19" RACK
- INSTALL (1) 6230 BATTERY RACK AND POWER CABINET
- INSTALL (3) DUAL SWIVEL MOUNTS, TYP (1) PER SECTOR
- INSTALL (2) 6x24 HYBRID CABLES

#### PROJECT INFORMATION

SITE NAME: NH334/E AURORA SMOKESTACK

SITE ID: CTNH334A

SITE ADDRESS: 150 E AURORA ST

WATERBURY, CT 06708

APPLICANT: T-MOBILE NORTHEAST, LLC

35 GRIFFIN ROAD SOUTH

BLOOMFIELD, CT 06002

CONTACT PERSON: DAN REID (PROJECT MANAGER)

TRANSCEND WIRELESS, LLC

(203) 592-8291

ENGINEER OF RECORD: CENTEK ENGINEERING, INC.

63-2 NORTH BRANFORD RD.

BRANFORD, CT 06405

CARLO F. CENTORE, PE

(203) 488-0580 EXT. 122

PROJECT COORDINATES: LATITUDE: 41° 34' 30.00" N

LONGITUDE: 73° 03' 29.60" W

GROUND ELEVATION: 290' ± AMSL

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	PARTIAL COMPOUND PLAN AND ELEVATION	0
C-3	EQUIPMENT PLANS	0
C-4	ANTENNA PLANS AND ELEVATIONS	0
C-5	TYPICAL EQUIPMENT DETAILS	0
E-1	ELECTRICAL RISER AND CONDUIT ROUTING	0
E-2	TYPICAL ELECTRICAL DETAILS	0
E-3	ELECTRICAL SPECIFICATIONS	0

T-MOBILE NORTHEAST LLC  
SITE ID: CTNH334A  
150 E AURORA STREET  
WATERBURY, CT 06708

DATE: 09/24/21  
SCALE: AS NOTED  
JOB NO.: 21022.33

TITLE  
SHEET

T-1

Sheet No. 1 of 10

PROFESSIONAL ENGINEER SEAL	
REVIEWED	0
DATE	12/06/21
DRAWN BY	JLW
CHKD BY	TUR
DESCRIPTION	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

## 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: 125 MPH (V<sub>asd</sub>) (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.
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4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSING" 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 MISSING ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
20. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

### STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
  - STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
  - STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
  - STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
  - STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
  - PIPE---ASTM A53 (FY = 35 KSI)
  - CONNECTION BOLTS---ASTM A325-N
  - U-BOLTS---ASTM A36
  - ANCHOR RODS---ASTM F 1554
  - WELDING ELECTRODE---ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

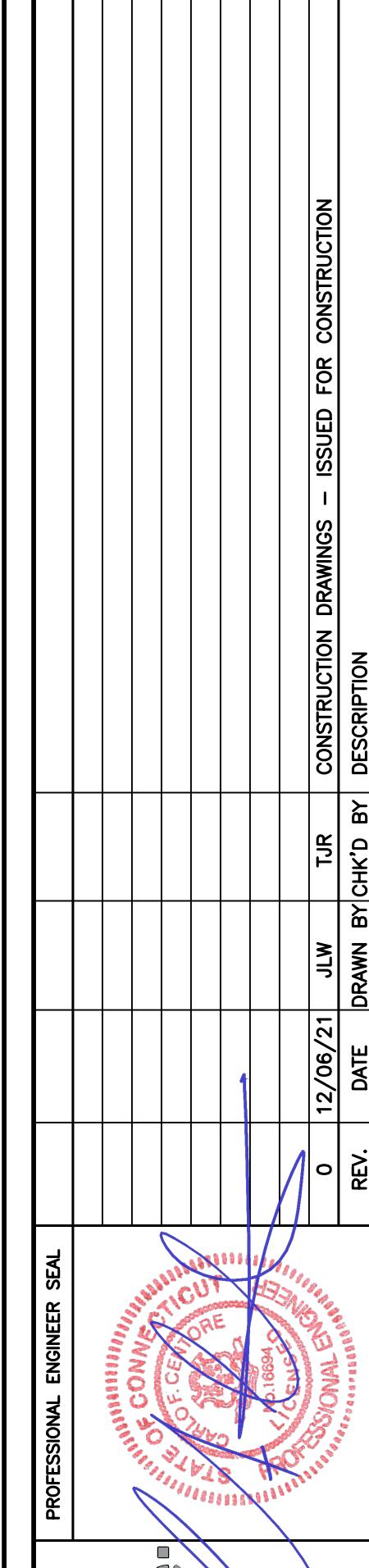
**NH334/E AURORA SMOKESTACK**  
**SITE ID: CTNH334A**  
**150 E AURORA STREET**  
**WATERBURY, CT 06708**

DATE: 09/24/21  
 SCALE: AS NOTED  
 JOB NO. 21022.33

GENERAL NOTES  
 AND  
 SPECIFICATIONS

**N-1**

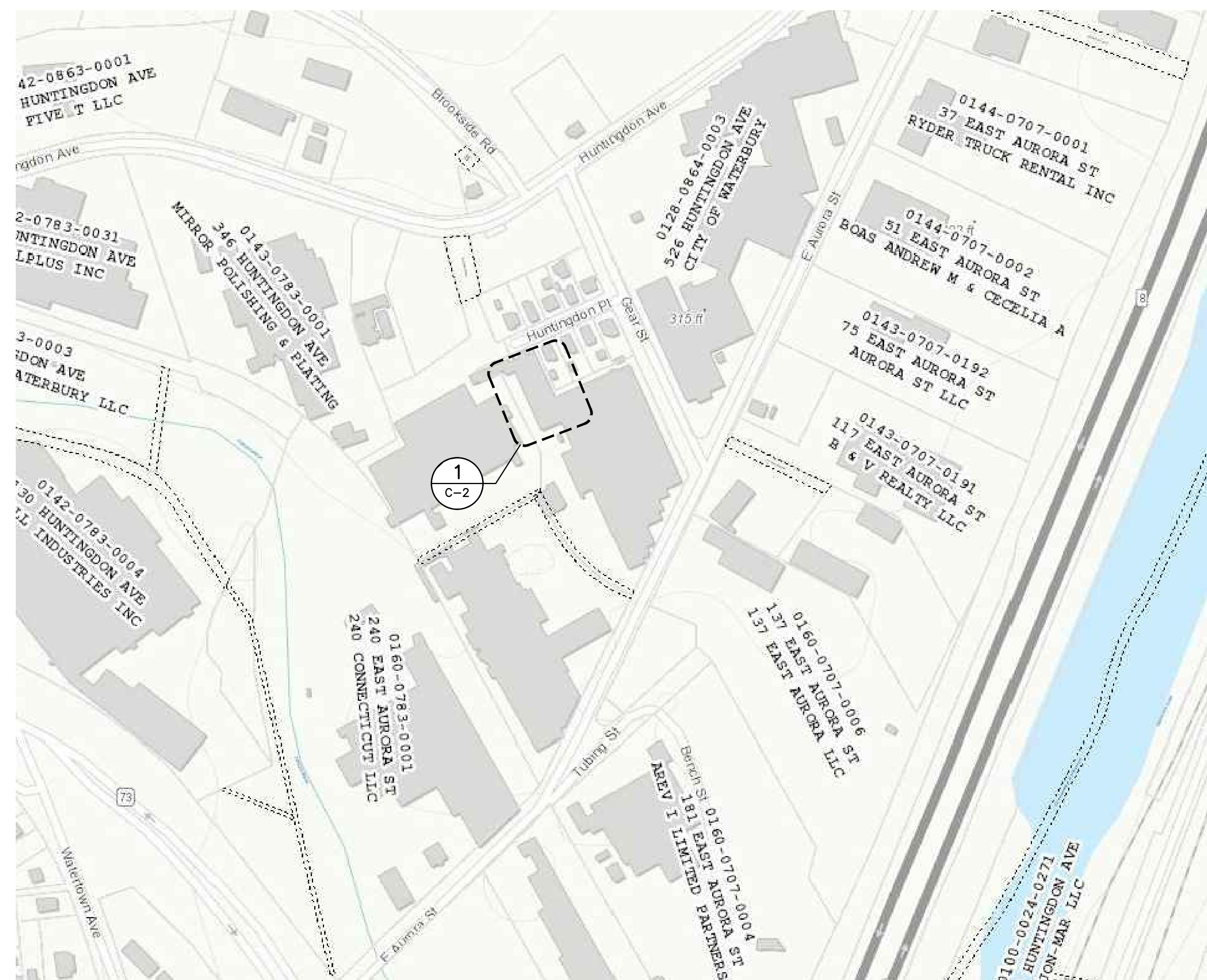
Sheet No. 2 of 10

PROFESSIONAL ENGINEER SEAL		Mobile	Mobile
		Transferred Work	
REV.	0	DATE	12/06/21
DRAWN BY	JLW	TUR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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

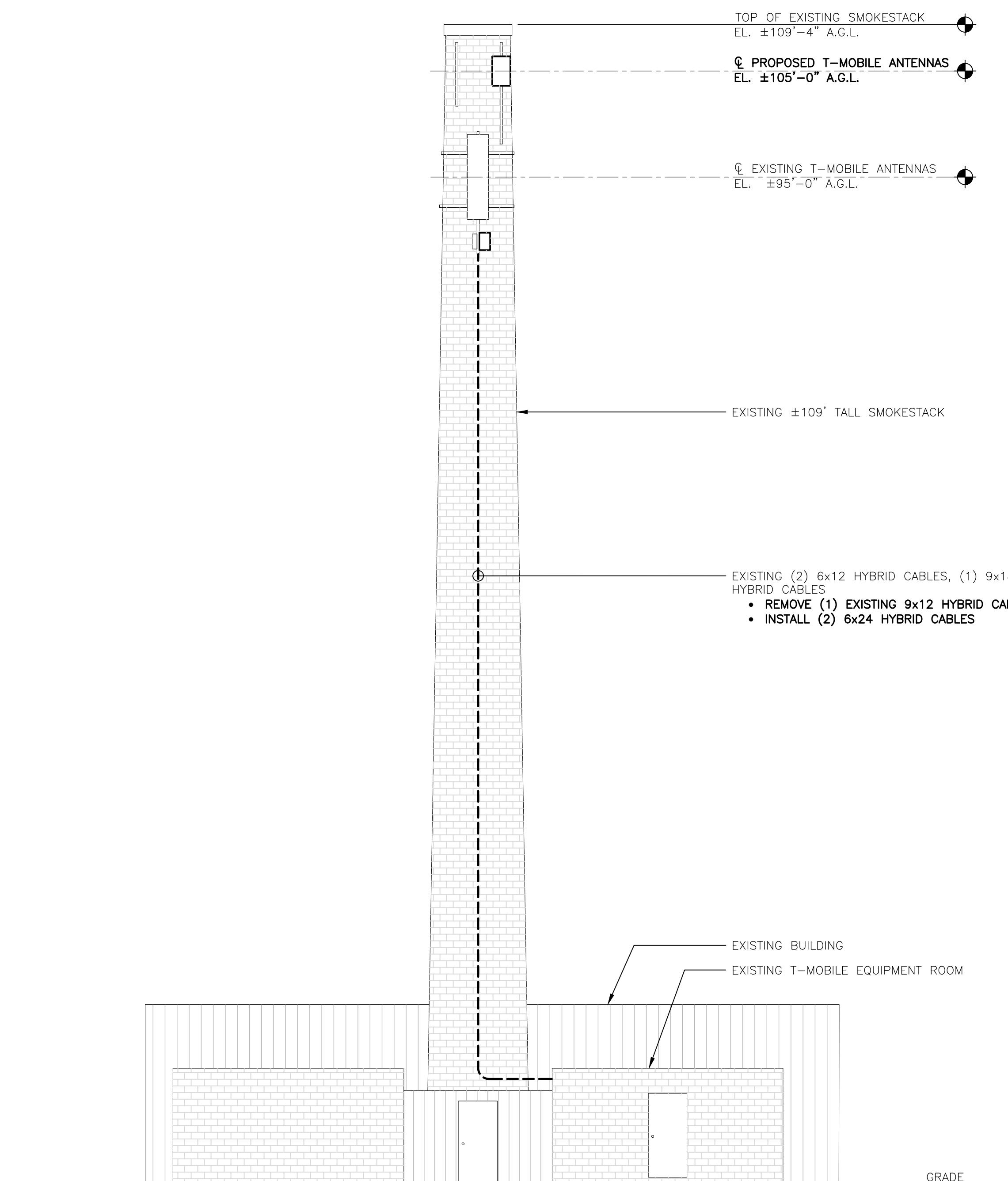
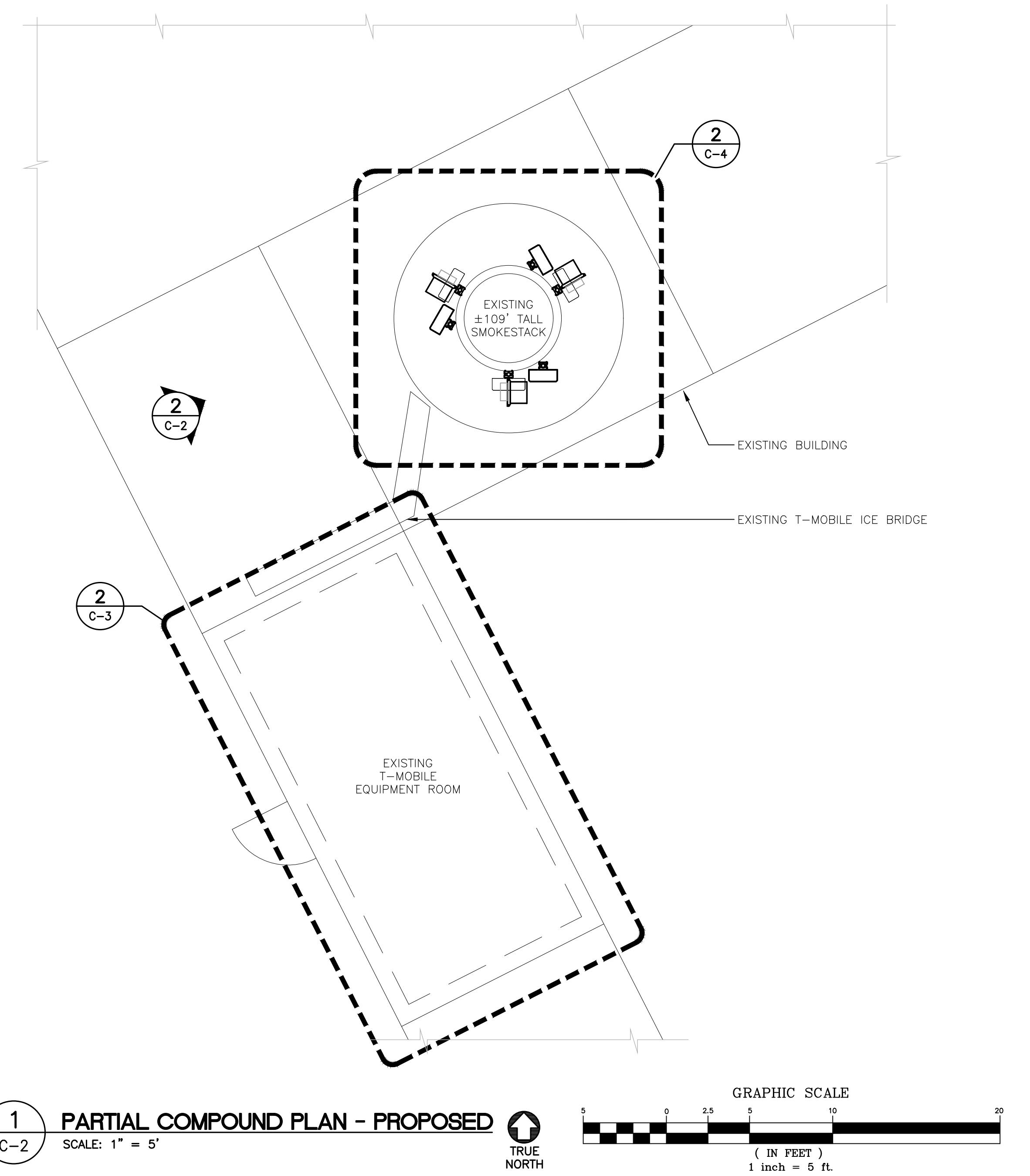
### ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA $\pm$ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) TMA (QTY)	(QTY) PROPOSED COAX (LENGTH)
A1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	105'	60°			(2) 6x24 HYBRID CABLE ( $\pm 180'$ )
A2	EXISTING	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	95'	60°	(E) RADIO 4449 B71+B85 (1), (P) RADIO 4460 B25+B66 (1)		
B1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	105'	180°			
B2	EXISTING	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	95'	180°	(E) RADIO 4449 B71+B85 (1), (P) RADIO 4460 B25+B66 (1)		
C1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	105'	300°			
C2	EXISTING	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	95'	300°	(E) RADIO 4449 B71+B85 (1), (P) RADIO 4460 B25+B66 (1)		



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

T-MOBILE NORTHEAST LLC		CENTEK engineering Centered on Solutions™ (203) 484-5380 (203) 484-5381 Fax Brantford, CT 06405 www.CentekEng.com		T-Mobile Transcend Wireless	
NH334/E AURORA SMOKESTACK SITE ID: CTNH334A 150 E AURORA STREET WATERBURY, CT 06708		PROFESSIONAL ENGINEER SEAL 		CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION	
DATE:	09/24/21	SCALE:	AS NOTED	REV.:	0
JOB NO.:	21022.33	DRAWN BY:	JLW	TUR:	
SITE LOCATION PLAN		0144-0707-0001 0144-0707-0002 0144-0707-0003 0144-0707-0004 0144-0707-0005 0144-0707-0006 0144-0707-0007 0144-0707-0008 0144-0707-0009 0144-0707-0010 0144-0707-0011 0144-0707-0012 0144-0707-0013 0144-0707-0014 0144-0707-0015 0144-0707-0016 0144-0707-0017 0144-0707-0018 0144-0707-0019 0144-0707-0020 0144-0707-0021 0144-0707-0022 0144-0707-0023 0144-0707-0024 0144-0707-0025 0144-0707-0026 0144-0707-0027 0144-0707-0028 0144-0707-0029 0144-0707-0030 0144-0707-0031 0144-0707-0032 0144-0707-0033 0144-0707-0034 0144-0707-0035 0144-0707-0036 0144-0707-0037 0144-0707-0038 0144-0707-0039 0144-0707-0040 0144-0707-0041 0144-0707-0042 0144-0707-0043 0144-0707-0044 0144-0707-0045 0144-0707-0046 0144-0707-0047 0144-0707-0048 0144-0707-0049 0144-0707-0050 0144-0707-0051 0144-0707-0052 0144-0707-0053 0144-0707-0054 0144-0707-0055 0144-0707-0056 0144-0707-0057 0144-0707-0058 0144-0707-0059 0144-0707-0060 0144-0707-0061 0144-0707-0062 0144-0707-0063 0144-0707-0064 0144-0707-0065 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STRUCTURAL COMPLIANCE

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YSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE FICIENT TO ACCOMMODATE THE PROPOSED LOADING..

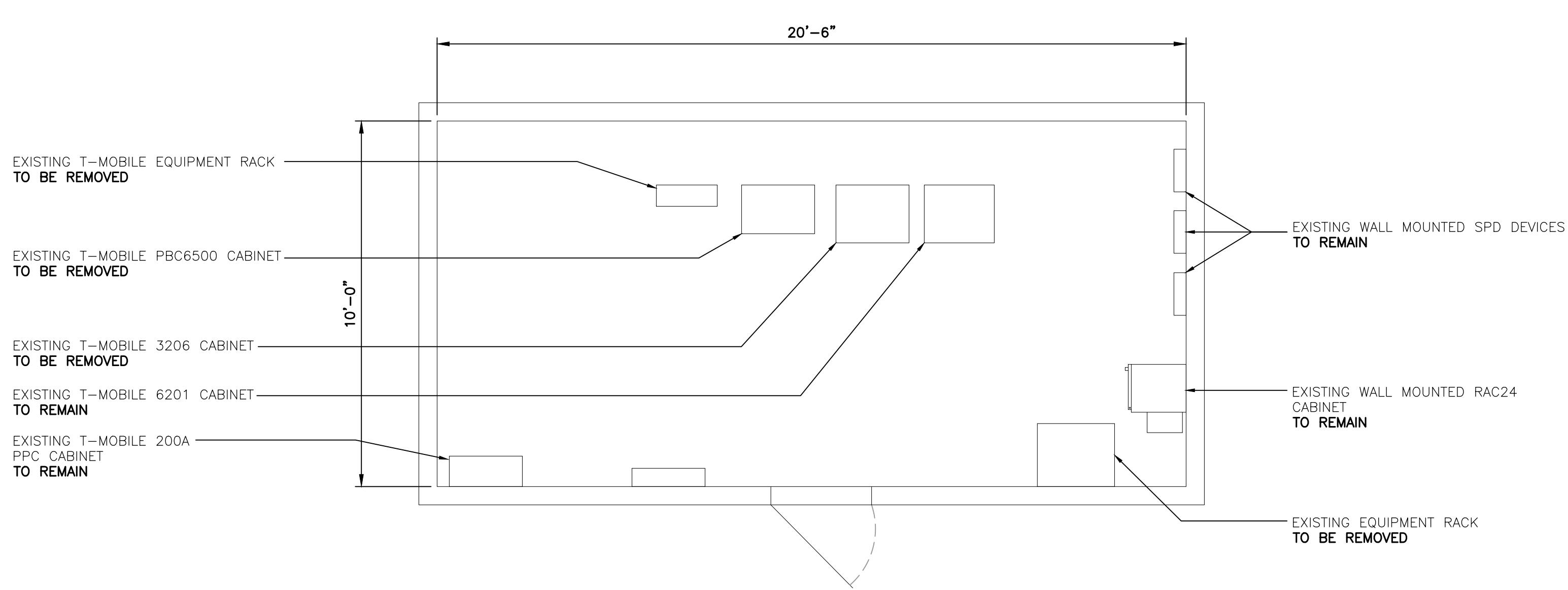
ENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ECT # 21022.33) DATED 11/23/21 FOR ADDITIONAL EQUIREMENTS.

LUATION OF THE HOST STRUCTURE WAS PERFORMED O EQUIPMENT INSTALLATION AND WAS FOUND TO BE FICIENT TO ACCOMMODATE THE PROPOSED LOADING.

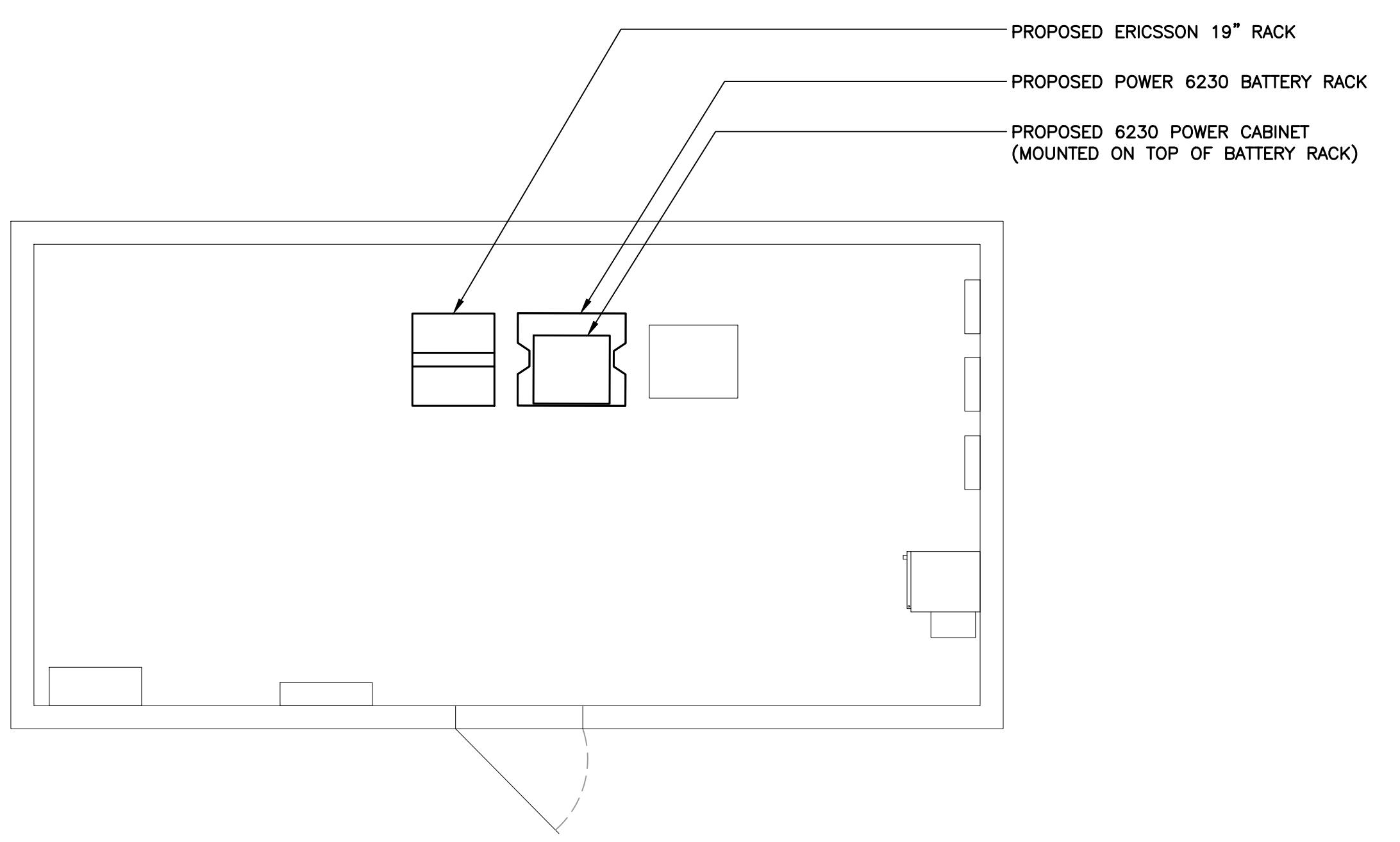
STRUCTURAL LETTER PREPARED BY CENTEK ENGINEERING 33) DATED 11/23/21 FOR ADDITIONAL INFORMATION

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NT SHALL BE INSTALLED ON THE HOSTING STRUCTURE PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR IRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS COMPLETED.

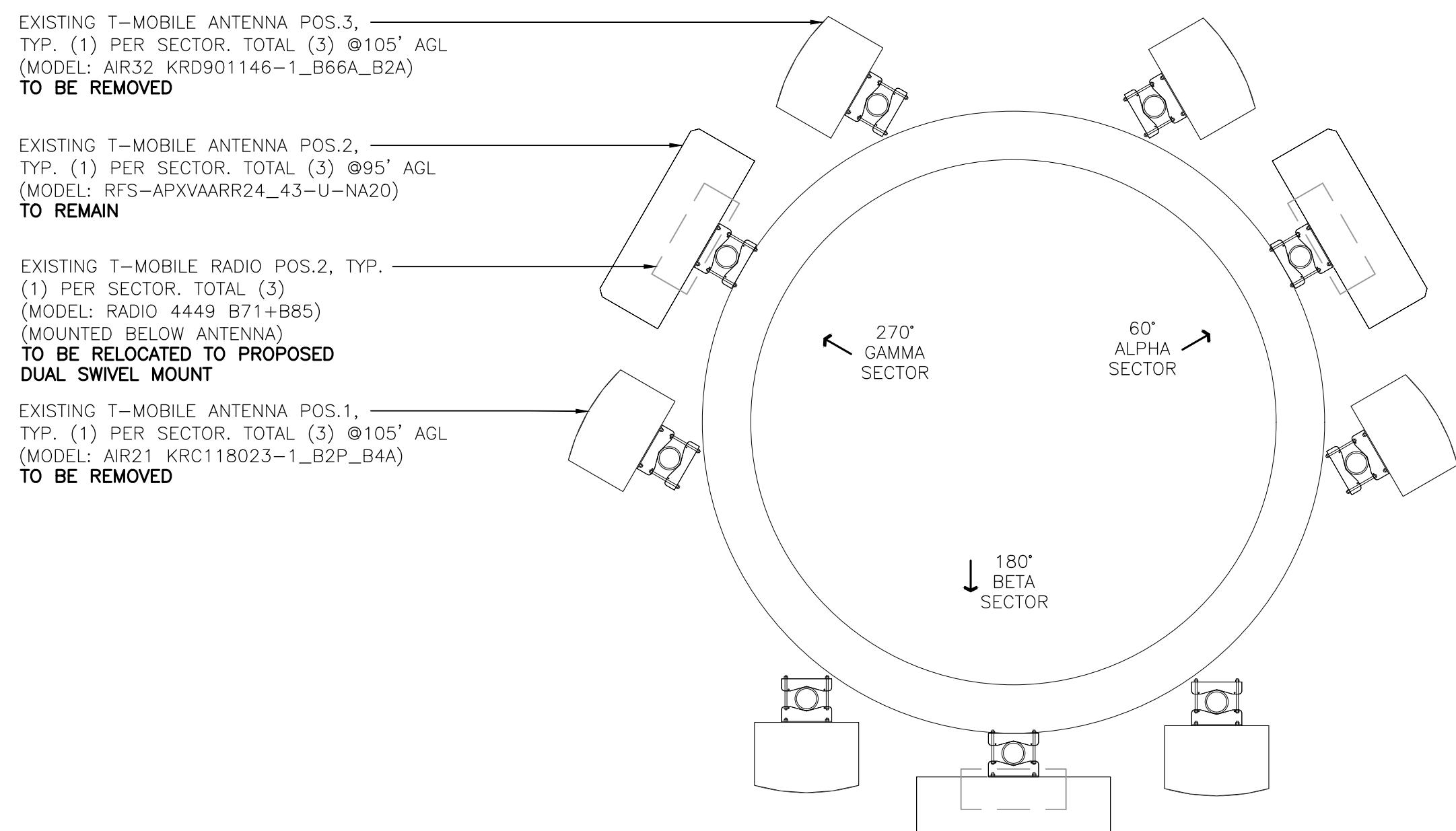


**1** **EQUIPMENT PLAN - EXISTING**  
C-3      SCALE:  $3/8"$  = 1'

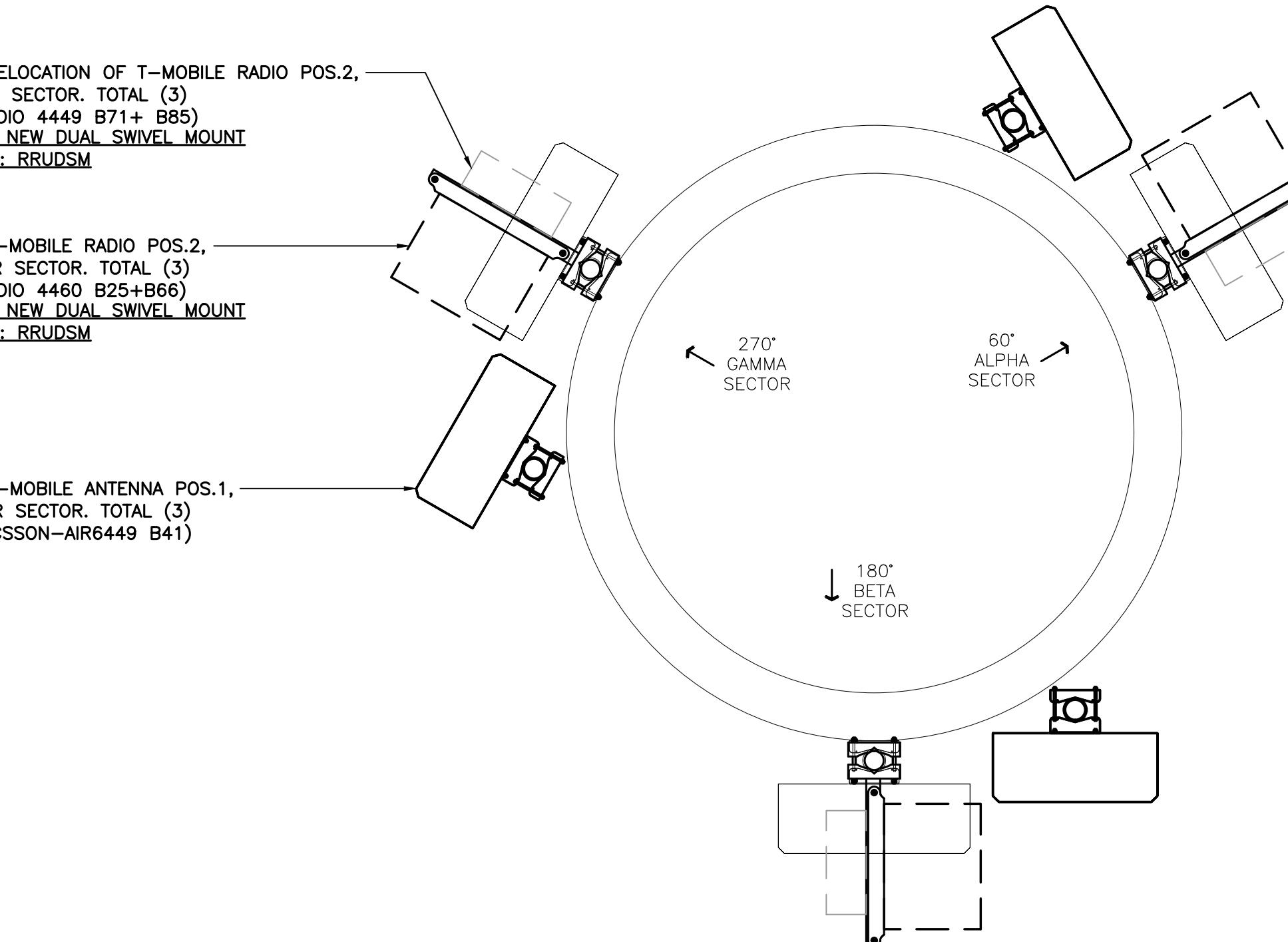


**2** **EQUIPMENT PLAN - PROPOSED**

1-MOBILE NORTHEAST LLC		NHH334/E AURORA SMOKESTACK SITE ID: CTNH334A 150 E AURORA STREET WATERBURY, CT 06708		<p>Centered on Solutions™</p> <p>(203) 488-0580 (203) 488-8587 Fax 63-2 North Branford Road Branford, CT 06405</p> <p><a href="http://www.CentekEng.com">www.CentekEng.com</a></p>	
DATE:	09/24/21	SCALE:	AS NOTED	REV.:	0
JOB NO.:	21022.33			DATE:	12/06/21
				JLR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
				DRAWN BY	CHK'D BY
				DESCRIPTION	
<p><b>EQUIPMENT PLANS</b></p> <p><b>C-3</b></p> <p>sheet No. 5 of 10</p>					



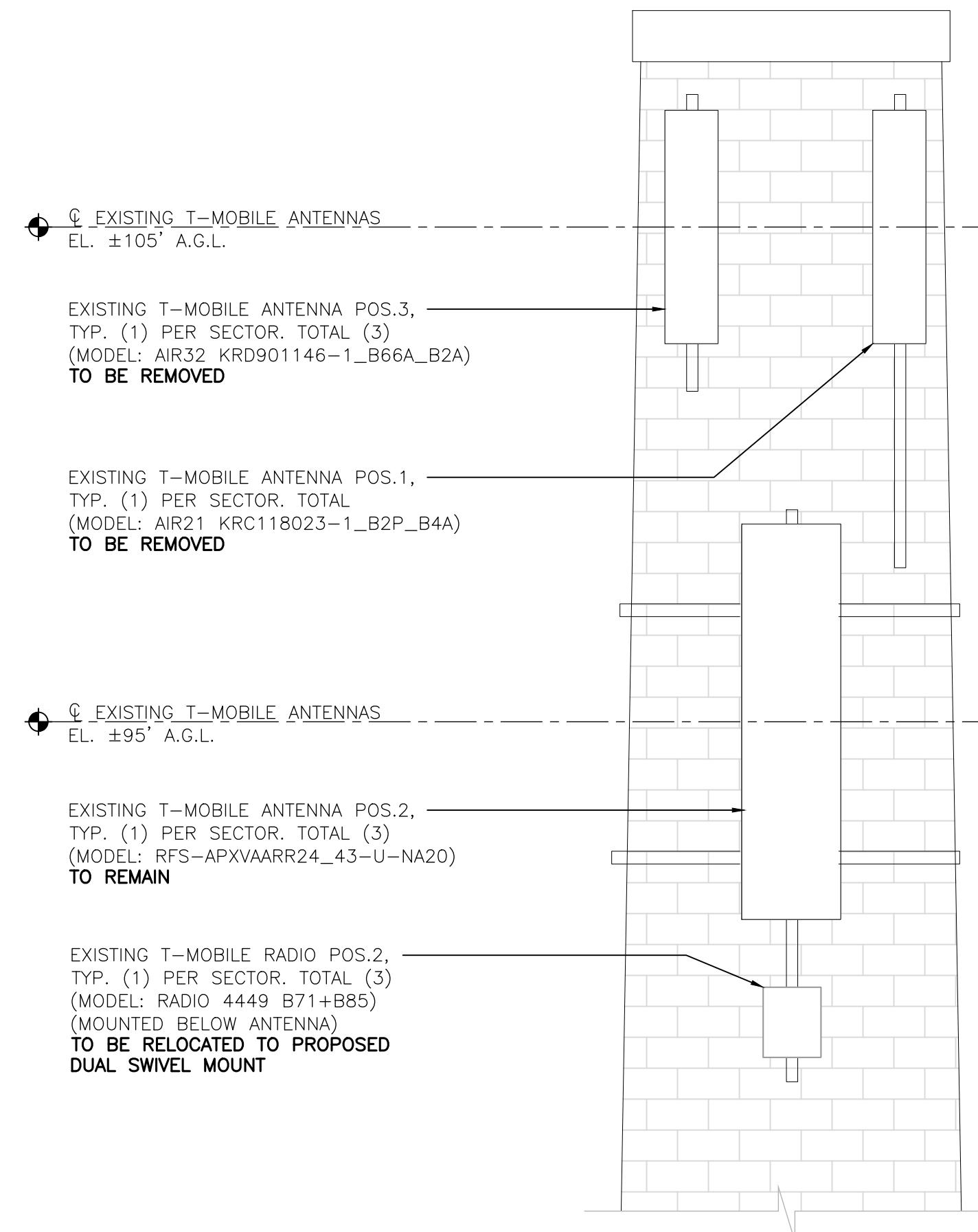
1  
C-4      **ANTENNA PLAN - EXISTING**  
SCALE: 1/2" = 1'  
TRUE  
NORTH



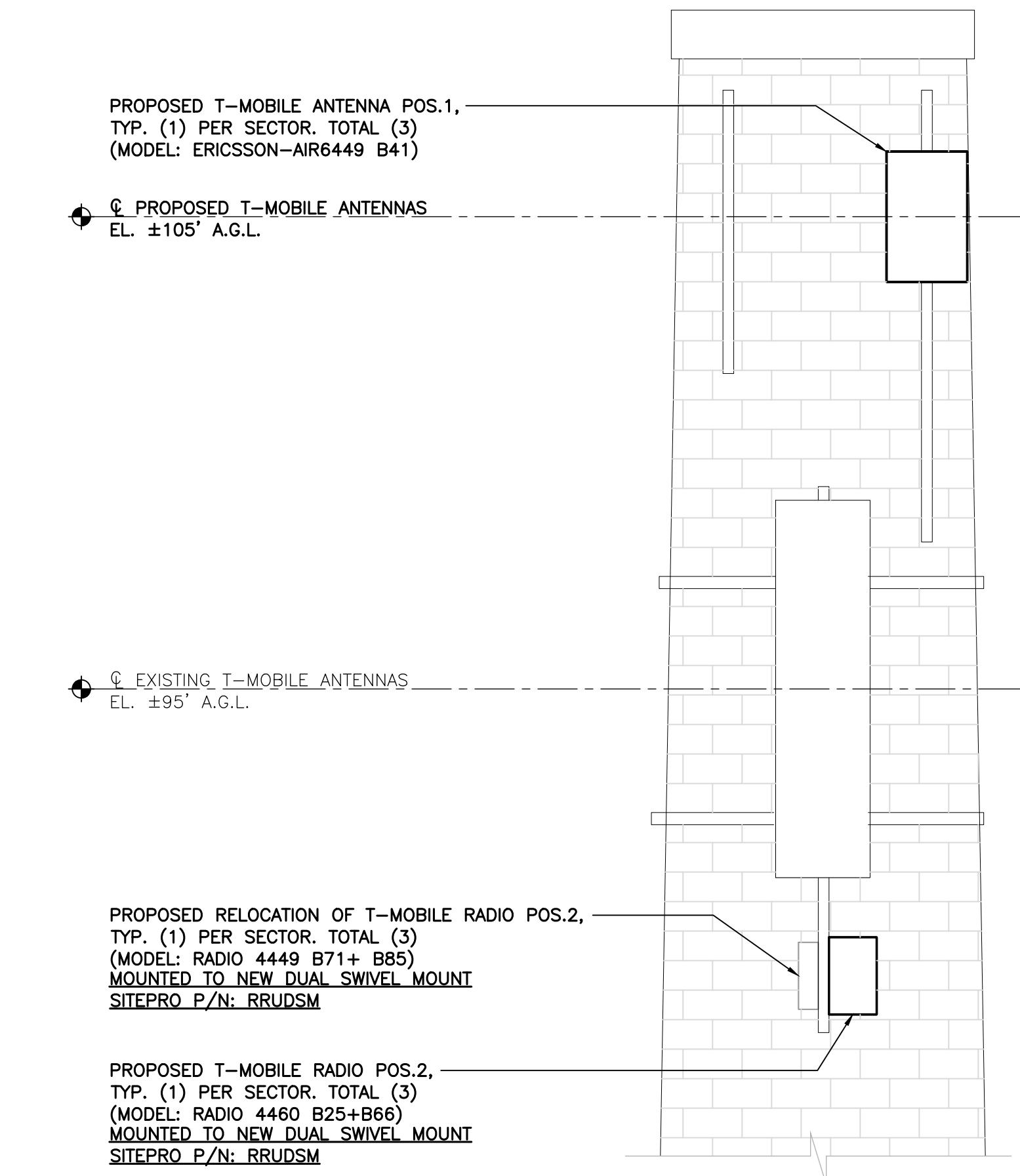
**2** **ANTENNA PLAN - PROPOSED**

C-4 SCALE: 1/2" = 1'

**TRUE NORTH**



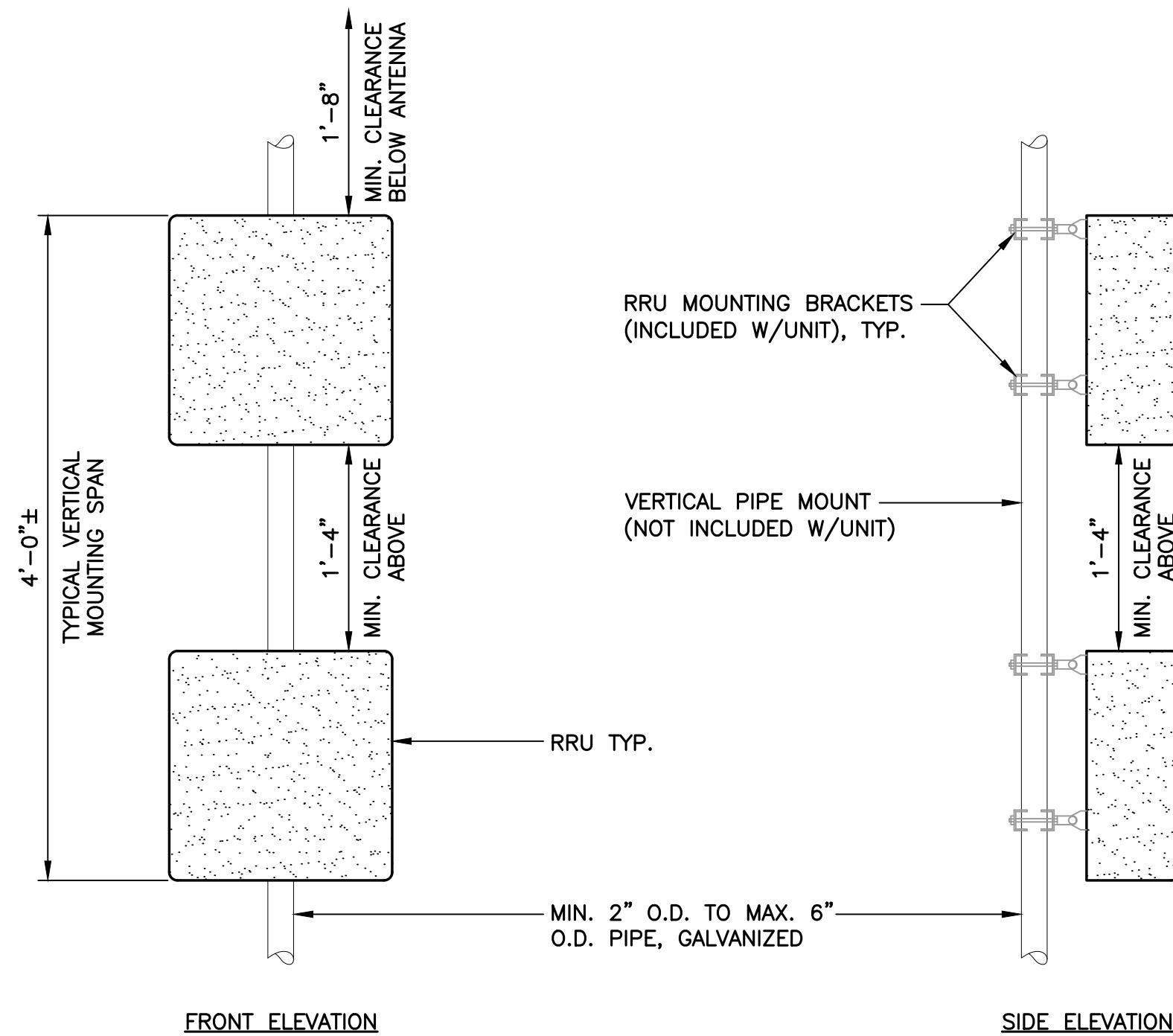
**1A ANTENNA ELEVATION - EXISTING**



**2A ANTENNA ELEVATION - PROPOSED**

T-MOBILE NORTHEAST LLC		ANTENNA PLANS AND ELEVATIONS	
<b>NH334/E AURORA SMOKESTACK</b> <b>SITE ID: CTNH334A</b> <b>150 E AURORA STREET</b> <b>WATERBURY, CT 06708</b>		<b>DATE:</b> 09/24/21 <b>SCALE:</b> AS NOTED <b>JOB NO.</b> 21022.33	
<b>CENTEK</b> engineering Centered on Solutions <sup>SM</sup> 		(203) 488-0580 (203) 488-8587 Fax 63-2 North Branford Road Branford, CT 06405 <a href="http://www.CentekEng.com">www.CentekEng.com</a>	
		<b>PROFESSIONAL ENGINEER SEAL</b> 	
<b>CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION</b>		<b>REV.</b> 0 <b>DATE</b> 12/06/21 <b>JLW</b> <b>TJR</b> <b>DRAWN BY</b> CHKD BY <b>DESCRIPTION</b>	
<b>C-4</b>			

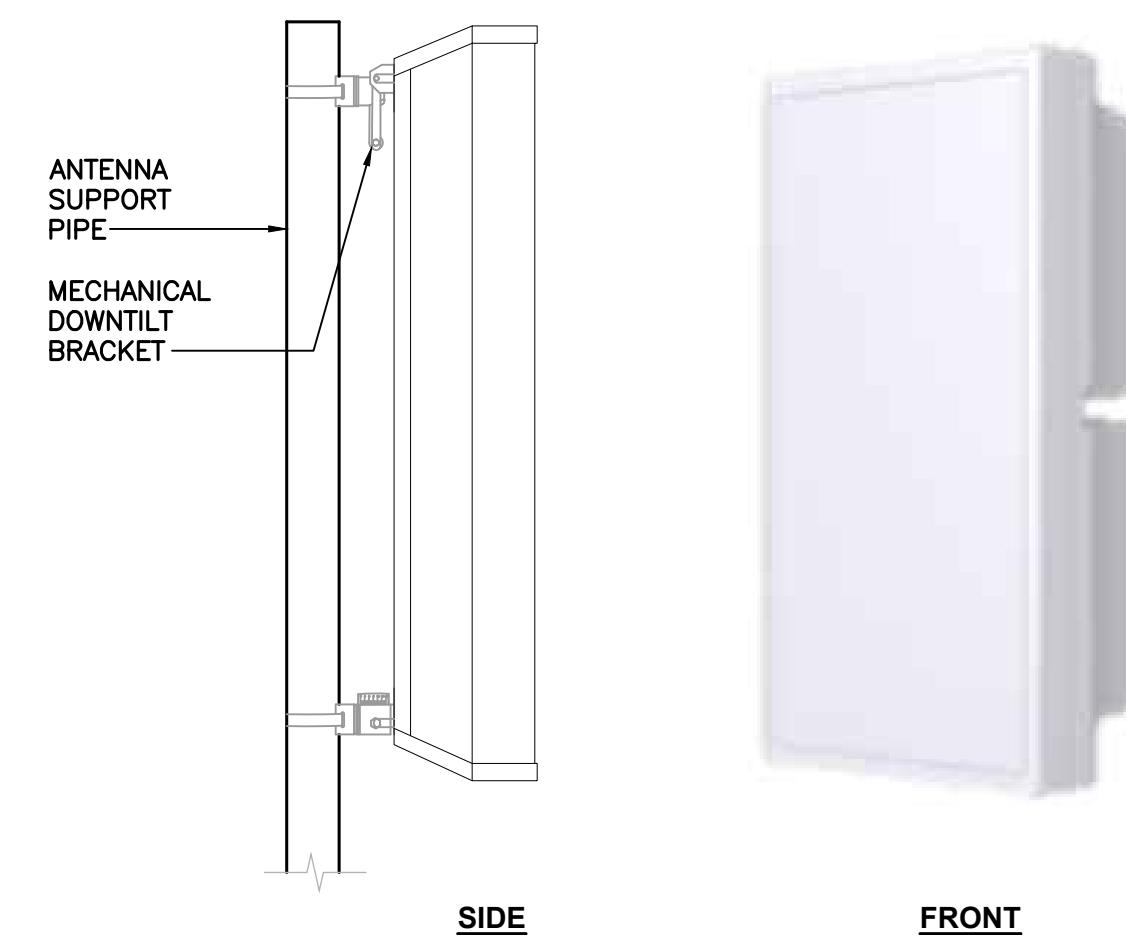
et No. 6 of 10



**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

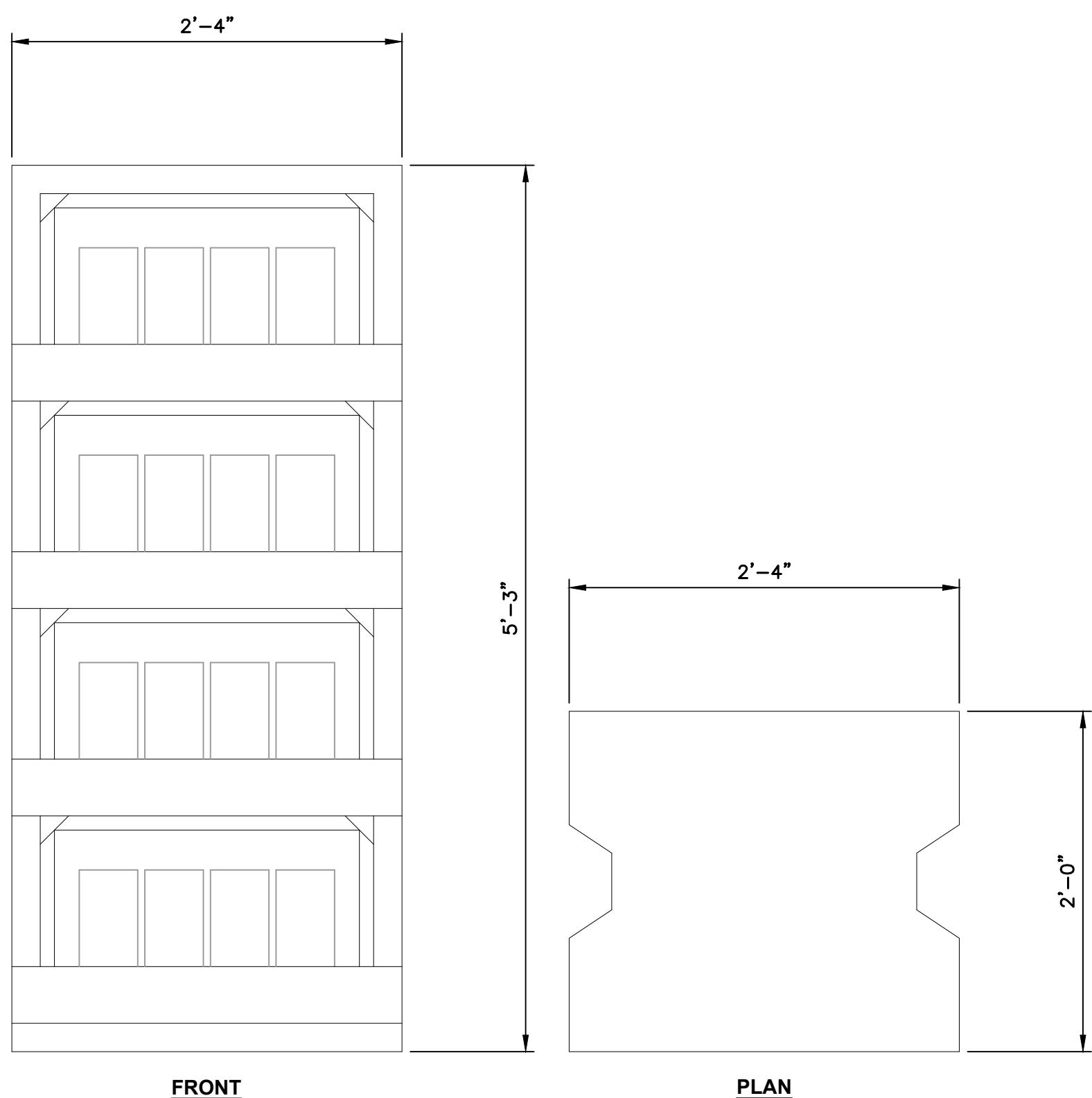


ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR6449 B41	33.1" L x 20.6" W x 8.6" D	±104 LBS.

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

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4460 B25+B66	19.6" L x 15.7" W x 12.1" D	±109 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.

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



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



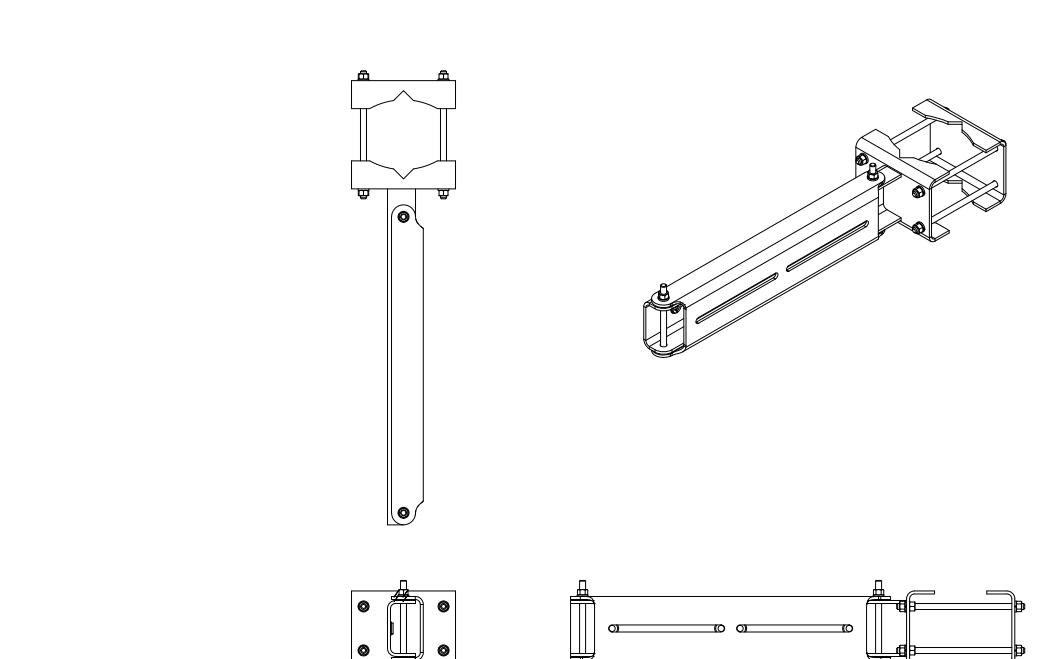
3 C-5 PROPOSED RRU DETAIL  
SCALE: NOT TO SCALE

6230 BATTERY RACK		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: POWER 6230 BATTERY RACK	63.0"H x 28.0"W x 24.0"D	±2400 LBS.

4 C-5 POWER 6230 BATTERY RACK  
SCALE: NOT TO SCALE

POWER ENCLOSURE		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: POWER 6230	14.0"H x 19.0"W x 16.0"D	53 LBS

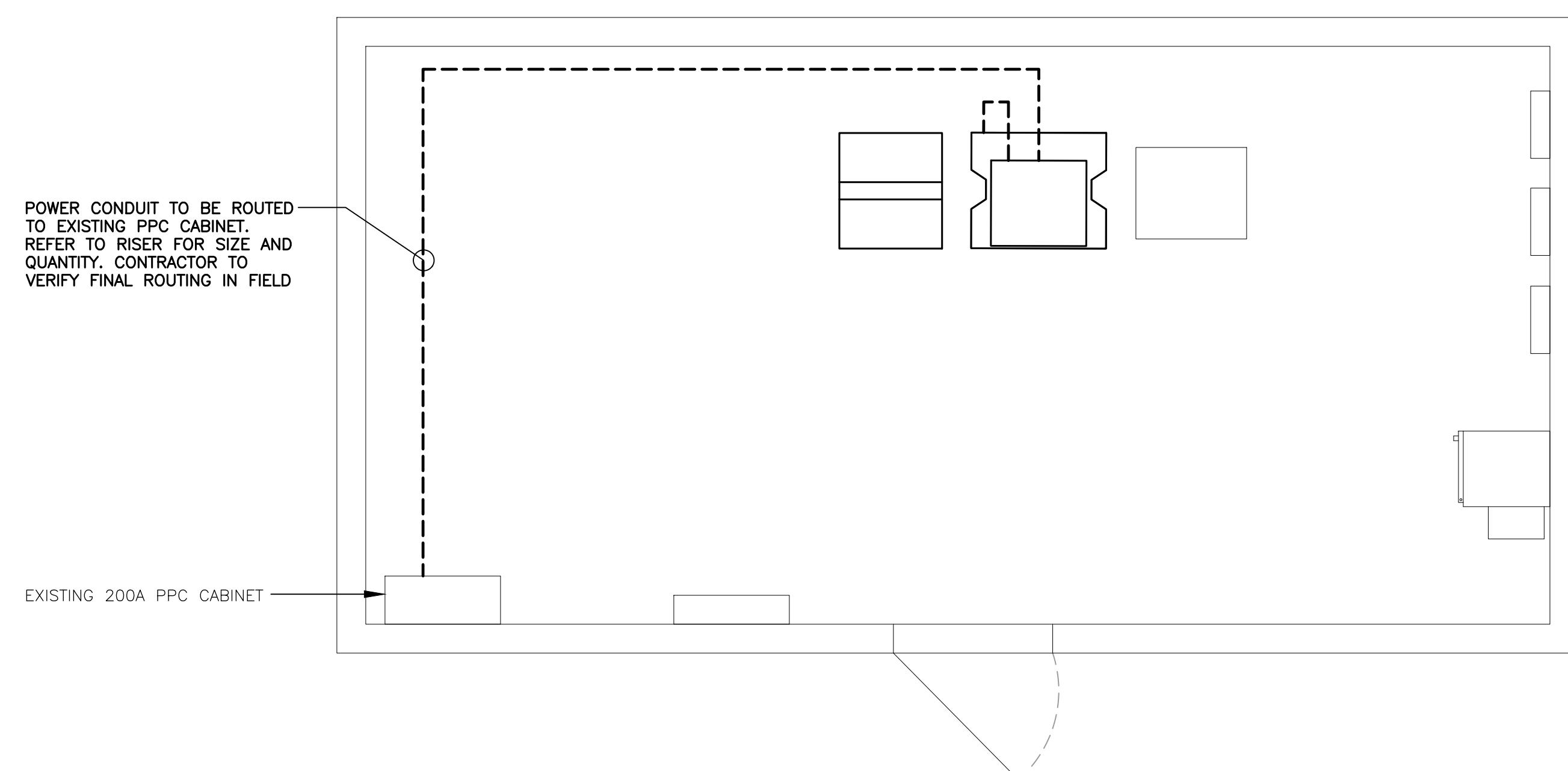
5 C-5 6230 POWER CABINET DETAIL  
SCALE: NOT TO SCALE



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

6 C-5 RRU DUAL SWIVEL MOUNT DETAIL  
SCALE: NOT TO SCALE

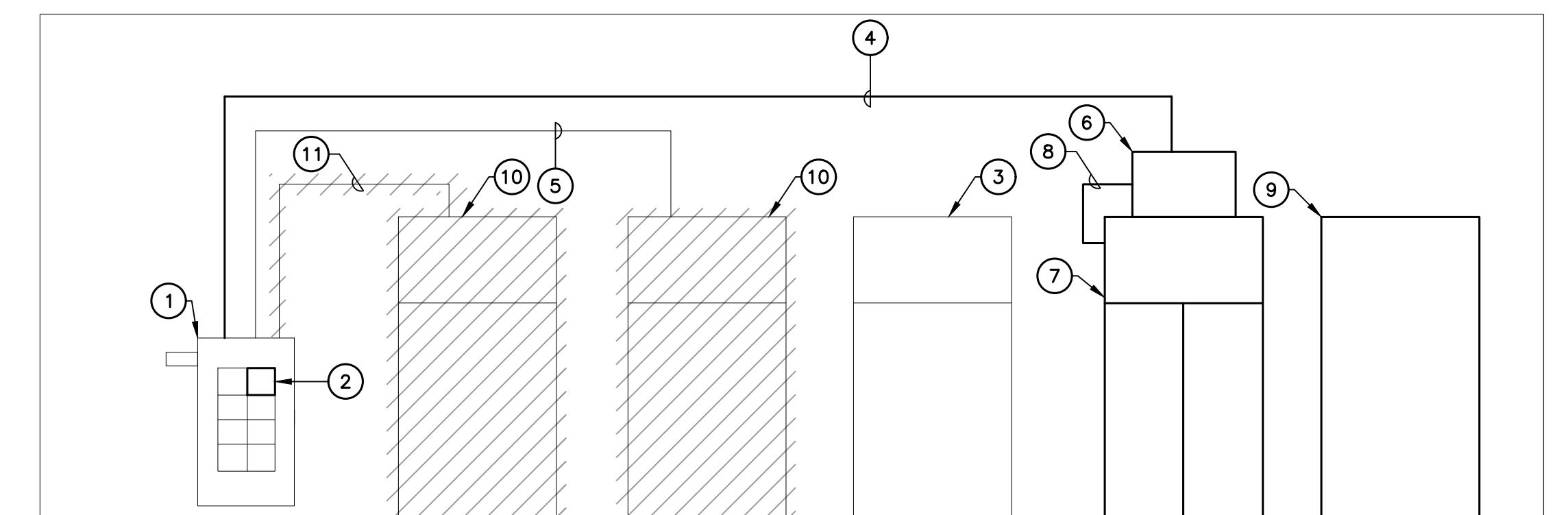
T-MOBILE NORTHEAST LLC		CENTEK engineering Centered on Solutions™		T-Mobile Transcend Wireless	
(203) 484-5380	(203) 484-5382	Fax	63-2 North Branford Road	Branford, CT 06405	www.CentekEng.com
<b>NH334/E AURORA SMOKESTACK</b>					
<b>SITE ID: CTNH334A</b>					
150 E AURORA STREET WATERBURY, CT 06708					
DATE: 09/24/21					
SCALE: AS NOTED					
JOB NO. 21022.33					
TYPICAL EQUIPMENT DETAILS					
<b>C-5</b>					
Sheet No. 7 of 10					



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

RISER DIAGRAM NOTES

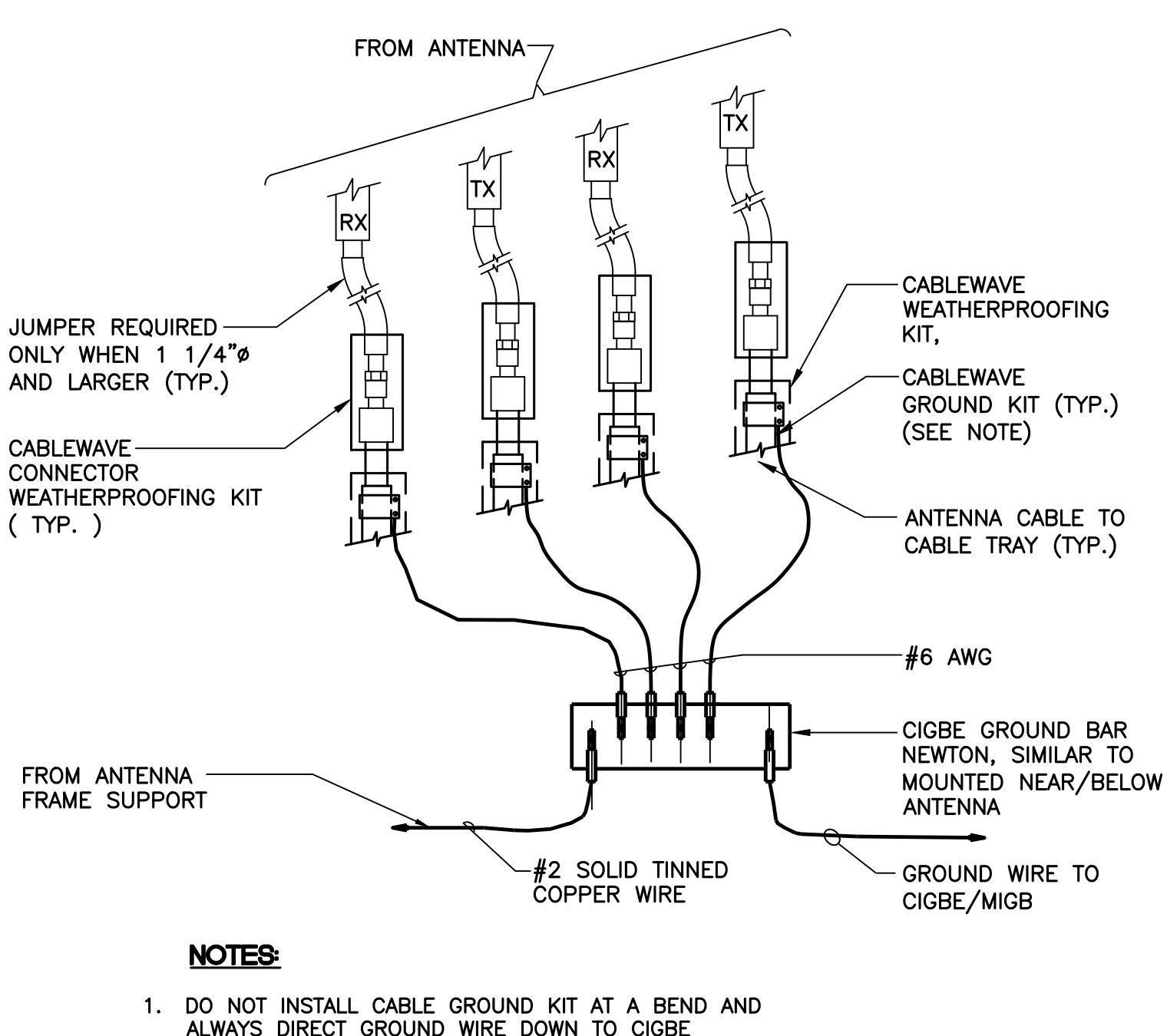
- ① EXISTING 200A, PPC CABINET TO REMAIN.
- ② NEW 100A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.
- ③ EXISTING CABINETS TO REMAIN.
- ④ (3) #1 AWG, (1) #8 AWG GROUND, 1-1/4" CONDUIT.
- ⑤ EXISTING CONDUITS AND CONDUCTORS TO REMAIN.
- ⑥ NEW T-MOBILE 6230 CABINET
- ⑦ NEW T-MOBILE 6230 BATTERY RACK
- ⑧ DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.
- ⑨ NEW T-MOBILE FIF RACK
- ⑩ EXISTING CABINETS TO BE REMOVED
- ⑪ EXISTING CONDUITS, CONDUCTORS AND ASSOCIATED CIRCUIT BREAKERS TO BE REMOVED



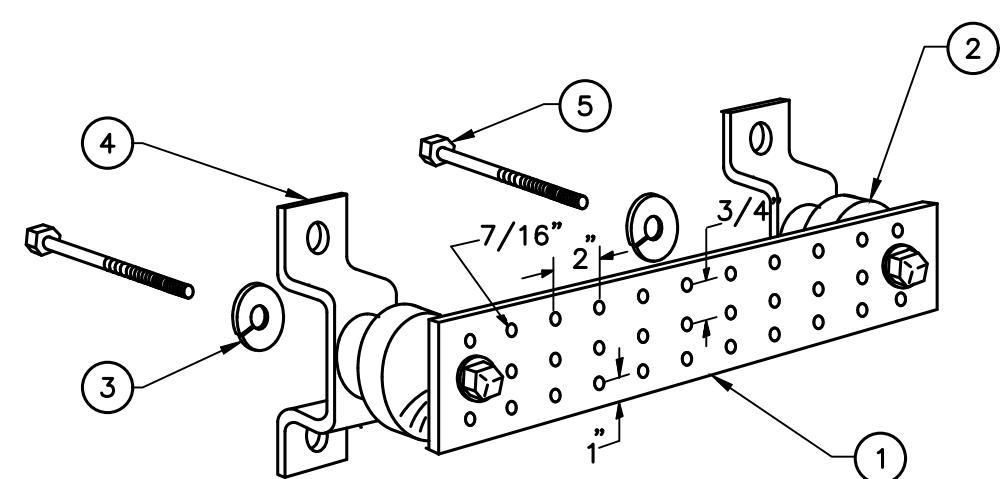
2 ELECTRICAL POWER RISER DIAGRAM  
E-1 SCALE: NOT TO SCALE

T-MOBILE NORTHEAST LLC		CENTEK engineering		T-Mobile	
Centered on Solutions™		(203) 484-5380		(203) 484-5380 Fox	
63-2 North Bedford Road		Brantford, CT 06405		www.CentekEng.com	
SITE ID: CTNH334A		Transferred W/2022		0 12/09/21 JLW	
150 E AURORA STREET				CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION	
WATERBURY, CT 06708				DRAWN BY CHKD BY DATE	
				REVISIONS	

DATE: 09/24/21  
SCALE: AS NOTED  
JOB NO. 21022.33  
ELECTRICAL RISER AND CONDUIT ROUTING  
E-1  
Sheet No. 8 of 10

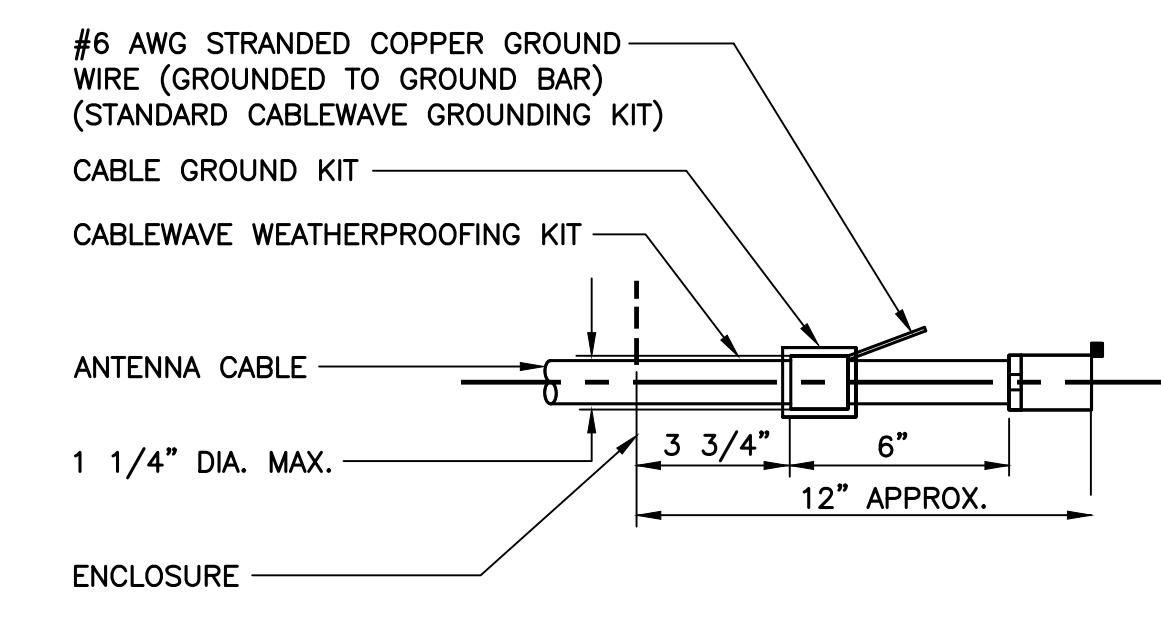


1 CONNECTION OF GROUND WIRES TO GROUND BAR  
E-2 SCALE: NOT TO SCALE

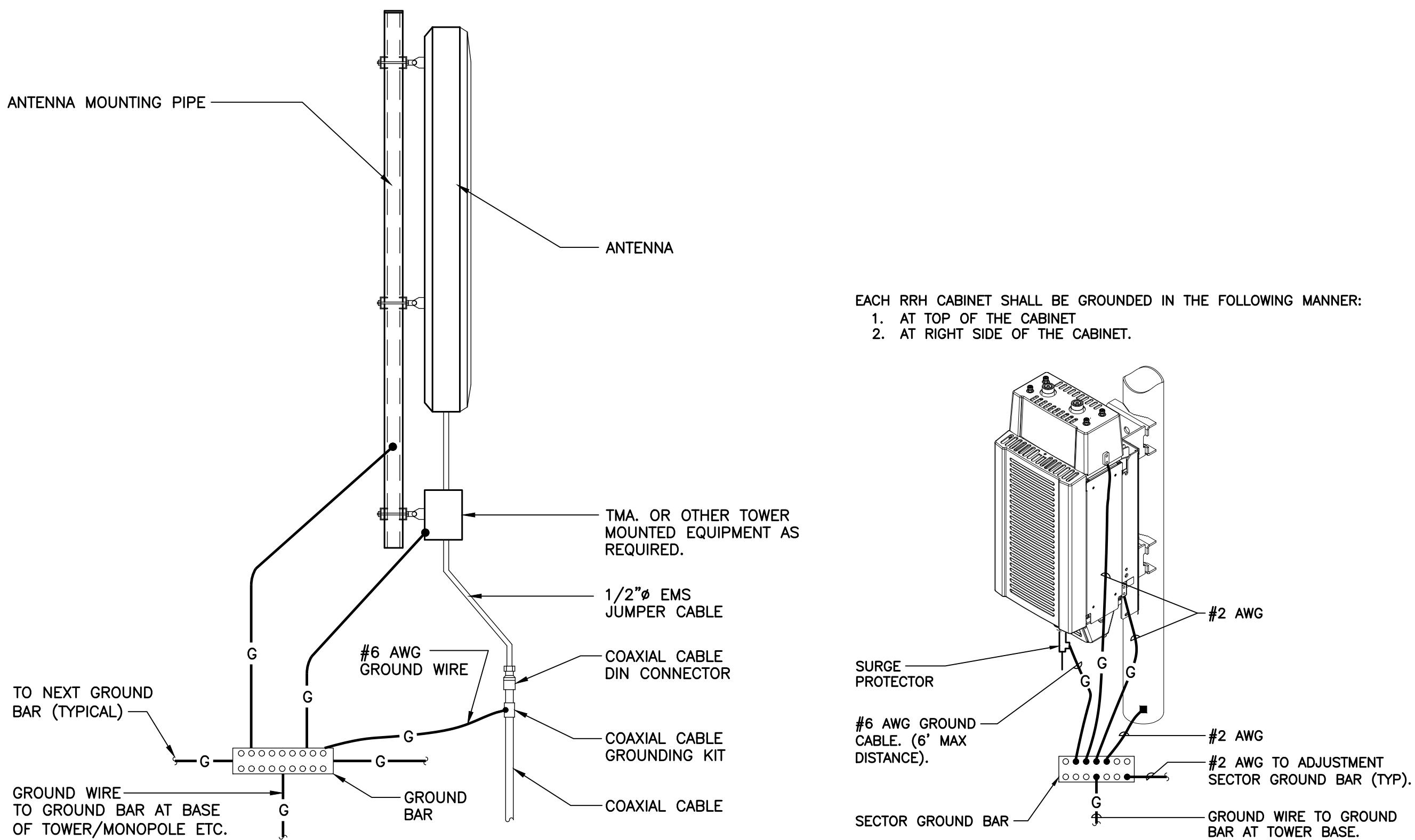


NOTES

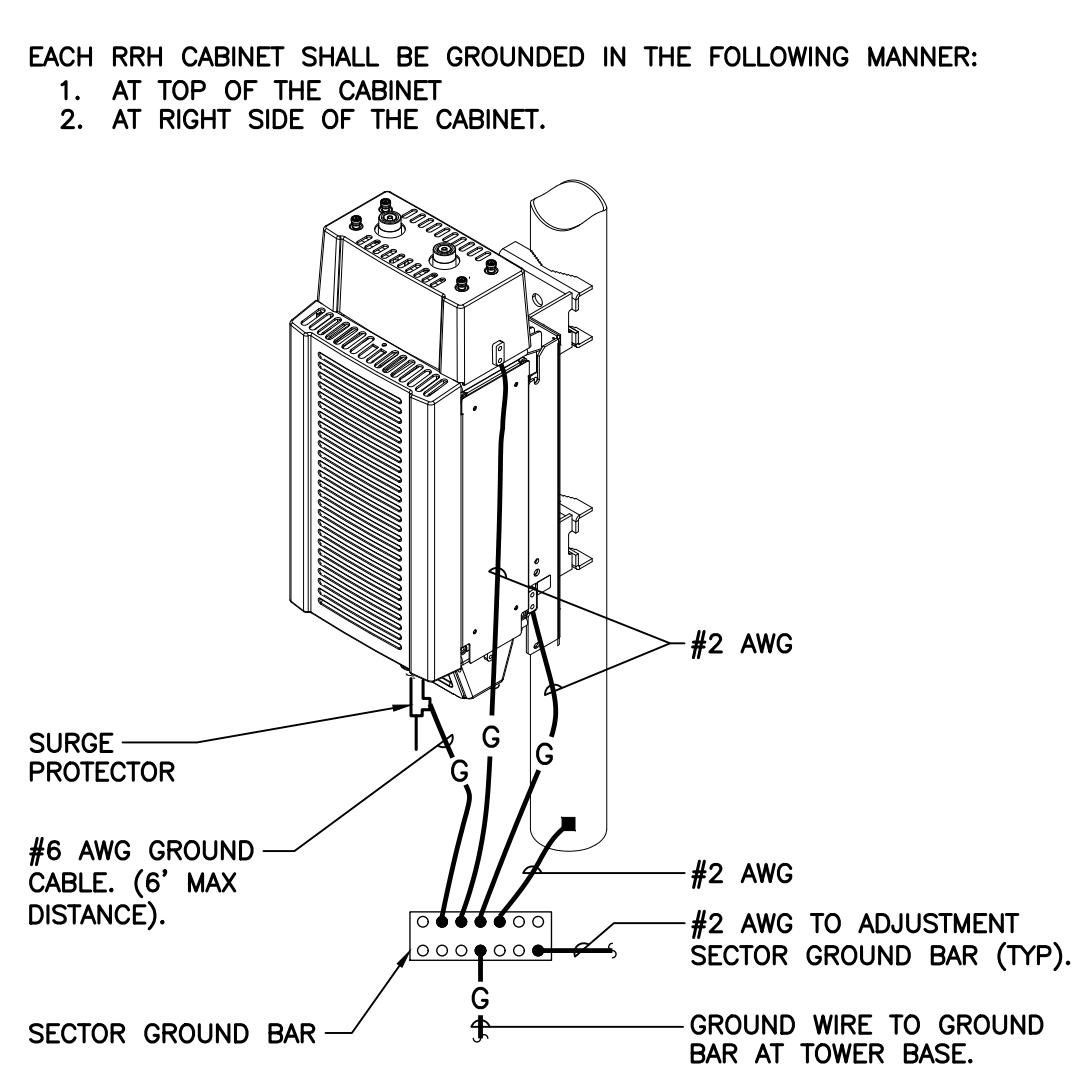
1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11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



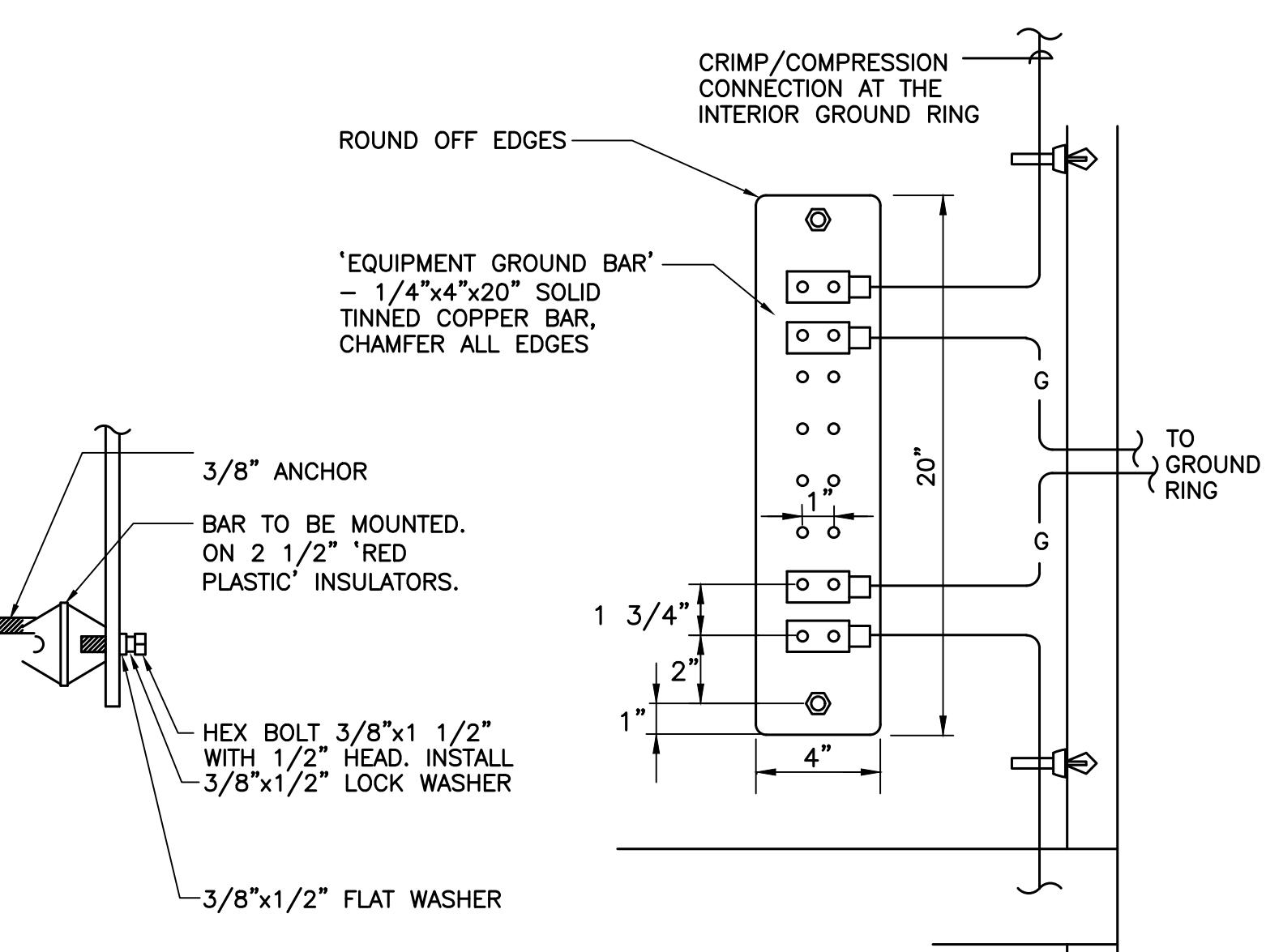
3 ANTENNA CABLE GROUNDING DETAIL  
E-2 SCALE: NOT TO SCALE



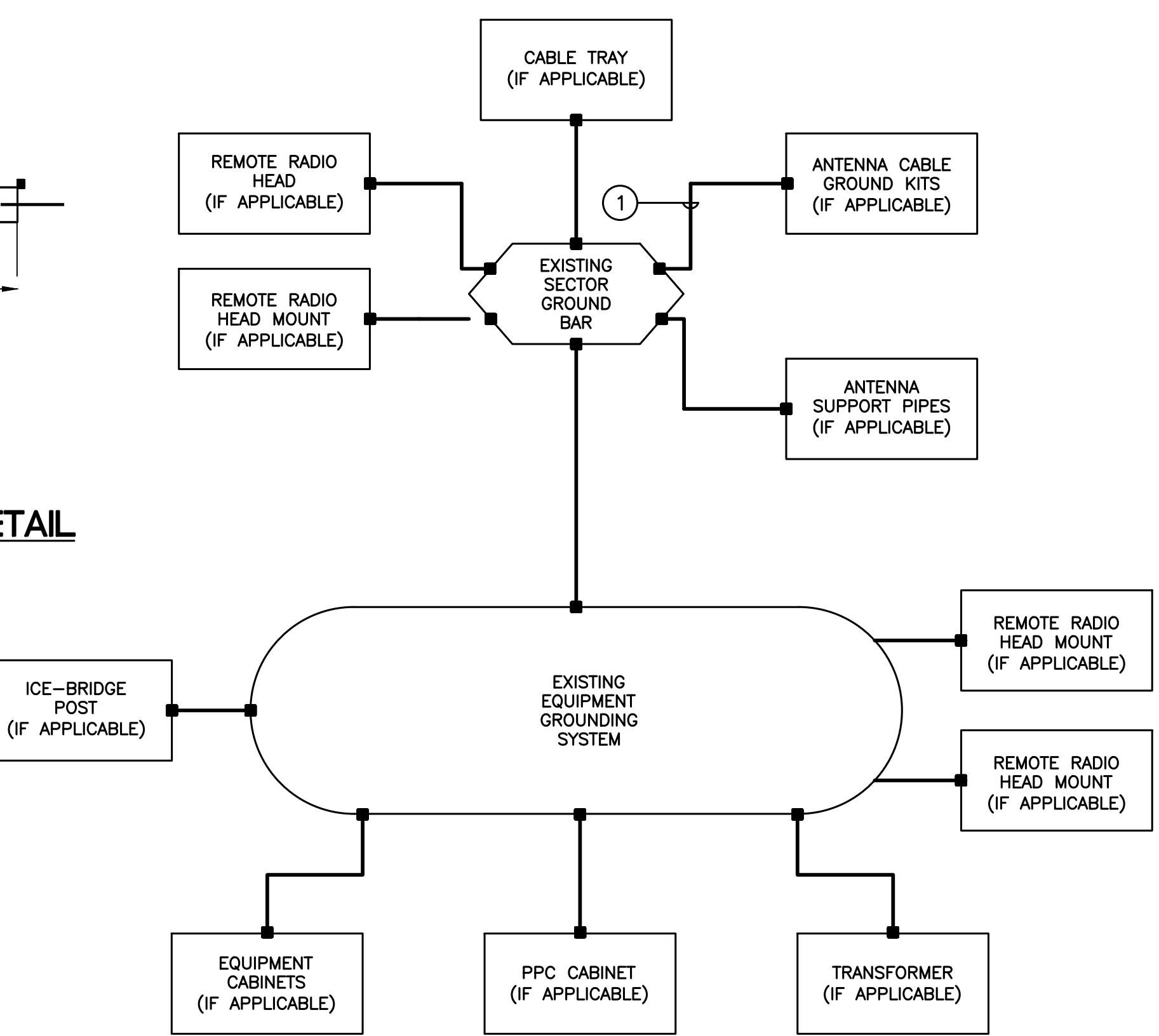
4 TYPICAL ANTENNA GROUNDING DETAIL  
E-2 SCALE: NOT TO SCALE



5 RRH POLE MOUNT GROUNDING  
E-2 SCALE: NOT TO SCALE



6 EQUIPMENT GROUND BAR DETAIL  
E-2 SCALE: NOT TO SCALE



GROUNDING SCHEMATIC NOTES

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

7 ELECTRICAL SCHEMATIC DIAGRAM  
E-2 SCALE: NOT TO SCALE

T-MOBILE NORTHEAST LLC		NH334/E AURORA SMOKESTACK SITE ID: CTNH334A		150 E AURORA STREET WATERBURY, CT 06708	
DATE:	09/24/21	DATE:	12/06/21	SCALE:	1/4" = 1'-0"
SCALE:	AS NOTED	SCALE:	1/4" = 1'-0"	JOB NO.:	21022.33
JOB NO.:		JOB NO.:		OWNER:	TRANSIENT WIRELESS
TYPICAL ELECTRICAL DETAILS					
E-2					
Sheet No. 9 of 10					

## ELECTRICAL SPECIFICATIONS

### SECTION 16010

#### 1.02. GENERAL REQUIREMENTS

- A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
- B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
- C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR THE SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.
- D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
- E. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.
- F. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
- G. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITAL OF BID.
- H. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.
- I. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.
- J. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.
- K. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.
- L. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.
- M. SHOP DRAWINGS:
  - 1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.
  - 2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.
- N. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

### SECTION 16111

#### 1.01. CONDUITS

- A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.
- B. THE INTERIOR OF RACEWAYS/ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION, INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.
- C. CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.
- D. PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS
- E. ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

CONDUIT SCHEDULE SECTION 16111			
CONDUIT TYPE	NEC REFERENCE	APPLICATION	MIN. BURIAL DEPTH (PER NEC TABLE 300.5) <sup>2</sup>
EMT	ARTICLE 358	INTERIOR CIRCUITING, EQUIPMENT ROOMS, SHELTERS	N/A
RMC, RIGID GALV. STEEL	ARTICLE 344, 300.5, 300.50	ALL INTERIOR/ EXTERIOR CIRCUITING, ALL UNDERGROUND INSTALLATIONS.	6 INCHES
PVC, SCHEDULE 40	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE. <sup>1</sup>	18 INCHES
PVC, SCHEDULE 80	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE SUBJECT TO PHYSICAL DAMAGE. <sup>1</sup>	18 INCHES
LIQUID TIGHT FLEX, METAL	ARTICLE 350	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A
FLEX. METAL	ARTICLE 348	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A

<sup>1</sup> PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

<sup>2</sup> UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, DRIVEWAYS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".

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

### SECTION 16123

#### 1.01. CONDUCTORS

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

LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

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

### SECTION 16130

#### 1.01. BOXES

- A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.
- B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

### SECTION 16140

#### 1.01. WIRING DEVICES

- A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.
  - 1. 15 MINUTE TIMER SWITCH - INTERMATIC #FF15M (INTERIOR LIGHTS)
  - 2. DUPLEX RECEPTACLE - P&S #2095 (GFCI) SPECIFICATION GRADE
  - 3. SINGLE POLE SWITCH - P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE
  - 4. DUPLEX RECEPTACLE - P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE
- B. PLATES - ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.
- C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

### SECTION 16170

#### 1.01. DISCONNECT SWITCHES

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

### SECTION 16190

#### 1.01. SEISMIC RESTRAINT

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

### SECTION 16195

#### 1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

- A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.
- B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.
- C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

### SECTION 16450

#### 1.01. GROUNDS

- A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
- B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

#### C. GROUNDING OF PANELBOARDS:

- 1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.
- 2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

#### D. EQUIPMENT GROUNDING CONDUCTOR:

- 1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.
- 2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.
- 3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

#### E. CELLULAR GROUNDING SYSTEM:

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

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

- 1. GROUND BARS
- 2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
- 3. ANTENNA GROUND CONNECTIONS AND PLATES.

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

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

### SECTION 16470

#### 1.01. DISTRIBUTION EQUIPMENT

- A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

### SECTION 16477

#### 1.01. FUSES

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

### SECTION 16960

#### 1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

- A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:
  - TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.
  - TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.
- THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:
  - 1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
  - 2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
  - 3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.
- B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.
- C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.
- D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

### SECTION 16961

#### 1.01. TESTS BY CONTRACTOR

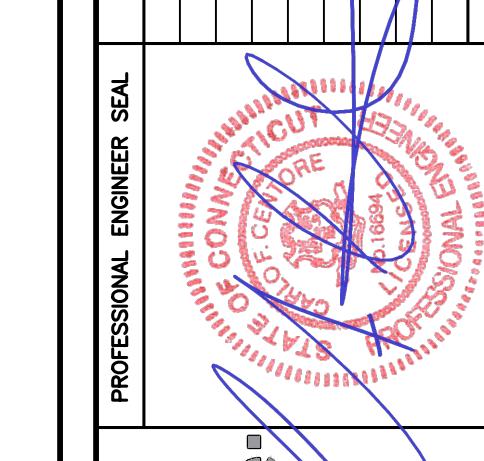
- A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.
- B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE CONNECTED TO THE PANELBOARDS SO THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.
- C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

**T-MOBILE NORTHEAST LLC**  
**SITE ID: CTNH334A**  
**150 E AURORA STREET**  
**WATERBURY, CT 06708**

**ELECTRICAL**  
**SPECIFICATIONS**

**E-3**

Sheet No. 10 of 10

PROFESSIONAL ENGINEER SEAL	
DATE:	09/24/21
SCALE:	AS NOTED
JOB NO.:	21022.33
CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION	
REV.	0
DATE:	12/06/21
JK'D BY:	JLW
CONTRACTOR DRAWING NUMBER:	150 E AURORA STREET

**S t r u c t u r a l A n a l y s i s R e p o r t**

*109-ft Existing Masonry Smokestack*

*T-Mobile Site Ref: CTNH334A*

*150 East Aurora Street  
Waterbury, CT 06708*

*Centek Project No. 21022.33*

*Date: October 7, 2021*



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

**CENTEK** Engineering, Inc.

Structural Analysis – 109-ft Existing Masonry Smokestack

T-Mobile Site Ref ~ CTNH334A

Waterbury, CT

October 7, 2021

## **Table of Contents**

### **SECTION 1 - REPORT**

- INTRODUCTION
- PRIMARY ASSUMPTIONS USED IN THE ANALYSIS
- ANTENNA AND EQUIPMENT SUMMARY
- DESIGN LOADING
- RESULTS
- CONCLUSION

### **SECTION 2 – CONDITIONS & SOFTWARE**

- STANDARD ENGINEERING CONDITIONS
- GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

### **SECTION 3 – CALCULATIONS**

- WIND LOADING
- SMOKESTACK ANALYSIS

### **SECTION 4 – REFERENCES**

- RF DATA SHEET

### *Introduction*

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

The host structure is a 109-ft tall masonry smokestack. The smokestack geometry and structural information was obtained from a structural report prepared by Infinigy dated March 9, 2016.

### *Primary Assumptions Used in the Analysis*

- The host structure's theoretical capacity not including any assessment of the condition of the host structure.
- The existing elevated steel antenna frames carry the horizontal and vertical loads due to the weight of equipment, and wind and transfers into host structure.
- Proposed reinforcement and support steel will be properly installed and maintained.
- Structure is in plumb condition.
- Loading for equipment and enclosure as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as observed during roof framing mapping.
- All members are “hot dipped” galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.

**CENTEK** Engineering, Inc.

Structural Analysis – 109-ft Existing Masonry Smokestack

T-Mobile Site Ref ~ CTNH334A

Waterbury, CT

October 7, 2021

## Antenna and Equipment Summary

Location	Appurtenance / Equipment	Rad Center Elevation (AGL)	Mount Type
Alpha Sector	(1) Ericsson AIR21 antennas (1) Ericsson AIR32 antennas (1) RFS-APXVAALL24_43 antenna <b>(1) Ericsson AIR6449 B41 antenna</b> (1) Ericsson 4449 RRU <b>(1) Ericsson 4460 RRU</b> (1) TMA	±95-ft ±105-ft	Antenna mount on smokestack
Beta Sector	(1) Ericsson AIR21 antennas (1) Ericsson AIR32 antennas (1) RFS-APXVAALL24_43 antenna <b>(1) Ericsson AIR6449 B41 antenna</b> (1) Ericsson 4449 RRU <b>(1) Ericsson 4460 RRU</b> (1) TMA	±95-ft ±105-ft	Antenna mount on smokestack
Gamma Sector	(1) Ericsson AIR21 antennas (1) Ericsson AIR32 antennas (1) RFS-APXVAALL24_43 antenna <b>(1) Ericsson AIR6449 B41 antenna</b> (1) Ericsson 4449 RRU <b>(1) Ericsson 4460 RRU</b> (1) TMA	±95-ft ±105-ft	Antenna mount on smokestack

## Design Loading

Loading was determined per the requirements of the 2015 International Building Code and ASCE 7-10 “Minimum Design Loads for Buildings and Other Structures”.

Wind Speed:	$V_{ult} = 125$ mph	<i>Appendix N of the 2018 CT State Building Code</i>
Risk Category:	II	<i>2015 IBC; Table 1604.05</i>
Exposure Category:	Surface Roughness B	<i>ASCE 7-10; Section 26.7.2</i>
Dead Load	50psf + equipment and framing self-weight	<i>Identified within SAR design calculations</i>

**CENTEK** Engineering, Inc.

Structural Analysis – 109-ft Existing Masonry Smokestack

T-Mobile Site Ref ~ CTNH334A

Waterbury, CT

October 7, 2021

## Results

Smokestack:

Component	Stress Ratio (percentage of capacity)	Result
Compression	35.0%	<b>PASS</b>
Tension of Mortar	94.0%	<b>PASS</b>

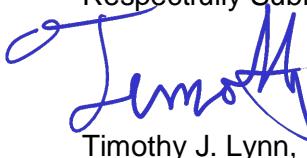
## Conclusion and Recommendations

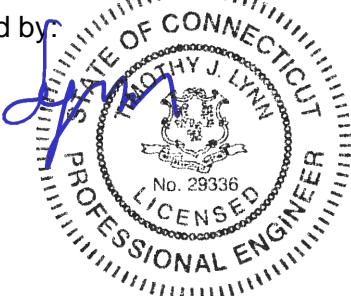
This analysis shows that the subject smokestack **is adequate** to support the proposed T-Mobile equipment upgrade.

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



STATE OF CONNECTICUT  
No. 29336  
LICENCED PROFESSIONAL ENGINEER  
DOTHY J. LYNN

Prepared by:

  
Fernando J. Palacios  
Engineer

**CENTEK** Engineering, Inc.

*Structural Analysis – 109-ft Existing Masonry Smokestack*

*T-Mobile Site Ref ~ CTNH334A*

*Waterbury, CT*

*October 7, 2021*

*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.

**Design Wind Load on Other Structures:**

(Based on IBC 2015, CSBC 2018 and ASCE 7-10)

Wind Speed =  $V := 125$  mph (User Input) (CSBC Appendix-N)Risk Category =  $BC := II$  (User Input) (IBC Table 1604.5)Exposure Category =  $Exp := B$  (User Input)Structure Type =  $StructureType := Round_Chimney$  (User Input)Structure Height =  $Height := 110$  ft (User Input)Horizontal Dimension of Structure =  $Width := 7.81$  ft (User Input)Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer =  $zg := \begin{cases} \text{if } Exp = B \\ 1200 \\ \text{if } Exp = C \\ 900 \\ \text{if } Exp = D \\ 700 \end{cases} = 1.2 \cdot 10^3$  (Table 26.9-1)

3-Sec Gust Speed Power Law Exponent =  $\alpha := \begin{cases} \text{if } Exp = B \\ 7 \\ \text{if } Exp = C \\ 9.5 \\ \text{if } Exp = D \\ 11.5 \end{cases} = 7$  (Table 26.9-1)

Integral Length Scale Factor =  $I := \begin{cases} \text{if } Exp = B \\ 320 \\ \text{if } Exp = C \\ 500 \\ \text{if } Exp = D \\ 650 \end{cases} = 320$  (Table 26.9-1)

Integral Length Scale Power Law Exponent =  $E := \begin{cases} \text{if } Exp = B \\ \frac{1}{3} \\ \text{if } Exp = C \\ \frac{1}{5} \\ \text{if } Exp = D \\ \frac{1}{8} \end{cases} = 0.333$  (Table 26.9-1)

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

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

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 =  $g_O := 3.4$  (Sec 26.9.4)

Peak Factor for Wind Response =  $g_v := 3.4$  (Sec 26.9.4)

Equivalent Height of Structure =  $z := \begin{cases} \text{if } Z_{min} > 0.6 \cdot \text{Height} \\ \quad \parallel Z_{min} \\ \text{else} \\ \quad \parallel 0.6 \cdot \text{Height} \end{cases} = 66$  (Sec 26.9.4)

Intensity of Turbulence =  $I_z := c \cdot \left( \frac{33}{z} \right)^{\left( \frac{1}{6} \right)} = 0.267$  (Eq. 26.9-7)

Integral Length Scale of Turbulence =  $L_z := l \cdot \left( \frac{z}{33} \right)^E = 403.175$  (Eq. 26.9-9)

Background Response Factor =  $Q := \sqrt{\frac{1}{1 + 0.63 \cdot \left( \frac{\text{Width} + \text{Height}}{L_z} \right)^{0.63}}} = 0.88$  (Eq. 26.9-8)

Gust Response Factor =  $G := 0.925 \cdot \left( \frac{(1 + 1.7 \cdot g_O \cdot I_z \cdot Q)}{1 + 1.7 \cdot g_v \cdot I_z} \right) = 0.858$  (Eq. 26.9-6)

Velocity Pressure =  $q_z := 0.00256 \cdot K_{zt} \cdot K_d \cdot V^2 = 38$  (Eq. 29.3-1)

Force Coefficient =  $C_f = 0.639$  (Fig 29.5-1 - 29.5-3)

Wind Force =  $F := q_z \cdot G \cdot C_f = 21$  psf

Height Above Grade =  $Z := 55$  ft (User Input)

Exposure Coefficient =  $K_z := \begin{cases} \text{if } 15 \leq Z \leq zg \\ \quad \parallel 2.01 \cdot \left( \frac{Z}{zg} \right)^{\left( \frac{2}{\alpha} \right)} \\ \text{if } Z < 15 \\ \quad \parallel 2.01 \cdot \left( \frac{15}{zg} \right)^{\left( \frac{2}{\alpha} \right)} \end{cases} = 0.83$  (Table 29.3-1)

$K_z = 0.83$

Job : CTNH334A  
 Address: 150 East Aurora Waterbury, CT 06708  
 Description: Smokestack Evaluation

Project No. 21022.33 Sheet 1 of 2  
 Computed by TJL Date 10/13/21  
 Checked by FJP Date

	Wind Force (lb)	Weight (lb)	Height Above Base (ft)	Height (in)
T-Mobile	1444.65	1312	105	1260

Section	Top Dia (in)	Bot Dia (in)	Average Wall Thk (in)	Wall Thk @ Base (in)	Sect Height (in)	Area At Base (in <sup>2</sup> )	Tot. Vol (ft <sup>3</sup> )	Unit Weight (pcf)	Weight of Section (lb)	Total Weight (lb)	Axial Stress fa (psi)
1	77	110.4	13	17	1312.5	4985.692	2500.6382	125	312579.7697	313891.7697	63.0

**CENTEK** engineering

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

Job : CTNH334A  
 Address: 150 East Aurora Waterbury, CT 06708  
 Description: Smokestack Evaluation

Project No. 18058.51  
 Computed by TJL  
 Checked by CAG  
 Sheet 2 of 2  
 Date 10/13/21  
 Date

Ultimate Wind Pressure (psf)	ASD Wind Pressure (psf)	KZ	Wind Area (sf)	Wind Force (lb)	Moment @ Base	Section Modulus @ Base	Bending Stress $f_b$ (psi)	Allowable $F_a$ (psi)	Allowable $F_b$ (psi)	$F_a/F_a+f_b/F_b$		ft	Ft	ft/Ft	
21	16	0.833	854.0	11382.6	9290088.883	101752.3738	91.3	375	500	0.35	OK	28.3	30	0.94	OK

RAN Template: 67D5A998E Hybrid	A&L Template: 67D5998E_1xAIR+1OP
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## Section 1 - Site Information

Site ID: CTNH334A  
 Status: Draft  
 Version: 5  
 Project Type: Anchor  
 Approved: Not Approved  
 Approved By: Not Approved  
 Last Modified: 9/13/2021 2:35:19 PM  
 Last Modified By: Hansraj.Rana4@T-Mobile.com

Site Name: NH334/E Aurora Smokestack  
 Site Class: Smokestack  
 Site Type: Structure Non Building  
 Plan Year: 2021  
 Market: CONNECTICUT CT  
 Vendor: Ericsson  
 Landlord: Stein Trustee

Latitude: 41.57500000  
 Longitude: -73.05830000  
 Address: 150 E. Aurora Street  
 City, State: Waterbury, CT  
 Region: NORTHEAST

RAN Template: 67D5A998E Hybrid

AL Template: 67D5998E\_1xAIR+1OP

Sector Count: 3

Antenna Count: 6

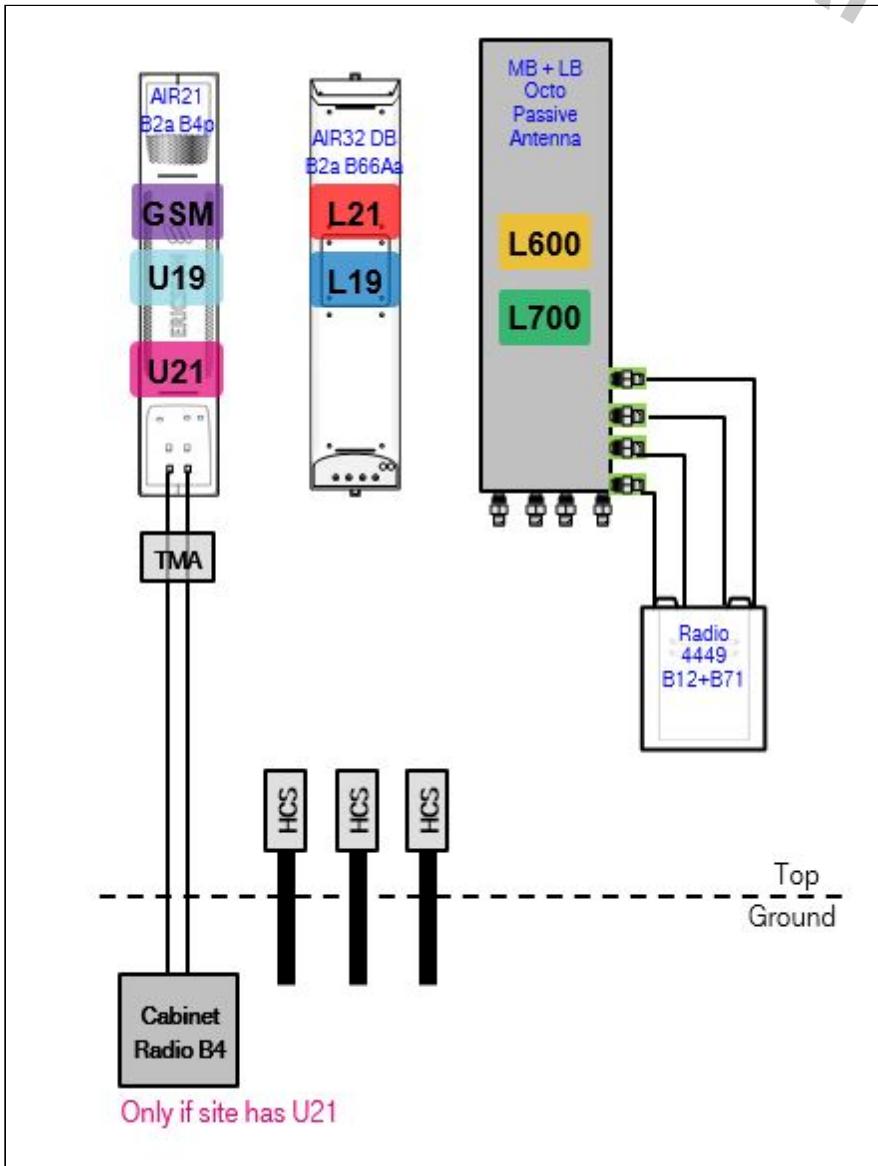
Coax Line Count: 0

TMA Count: 0

RRU Count: 6

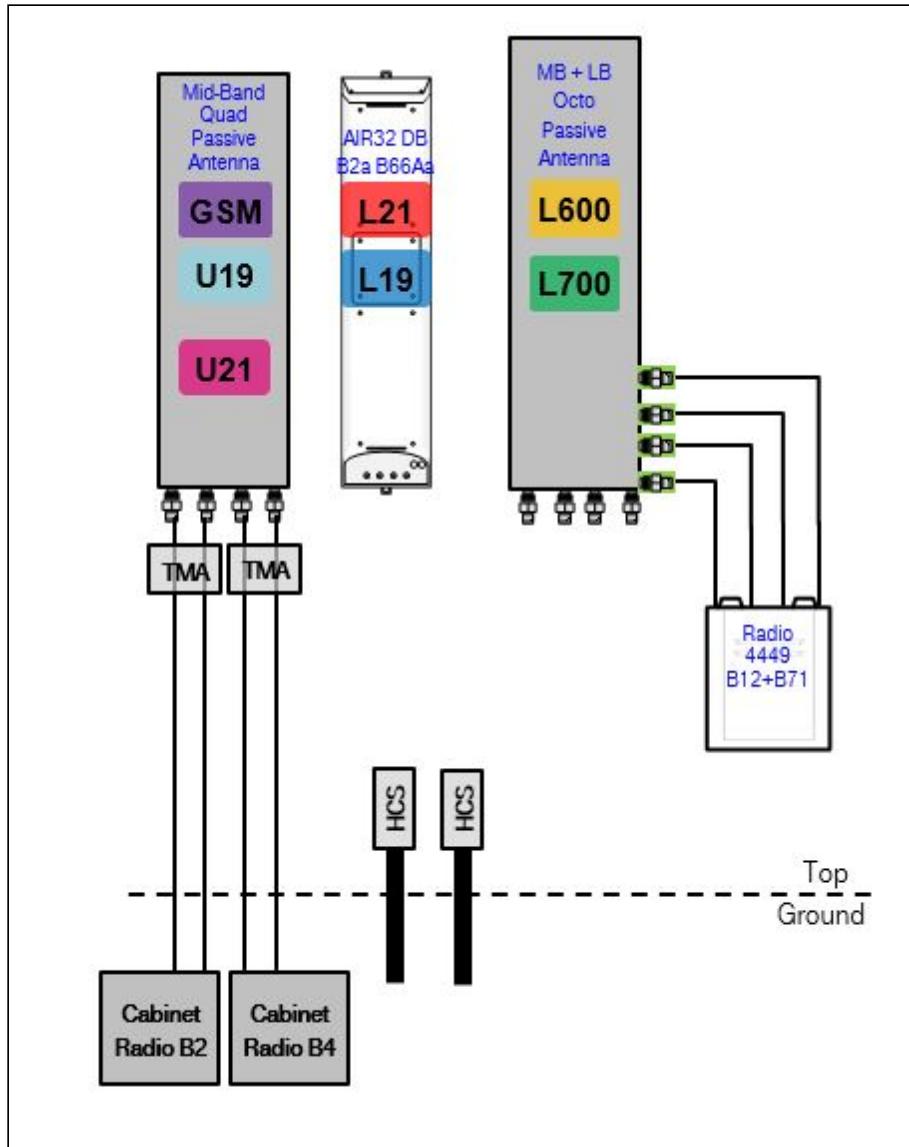
## Section 2 - Existing Template Images

67D92DB\_2xAIR+1OP.JPG



Notes:

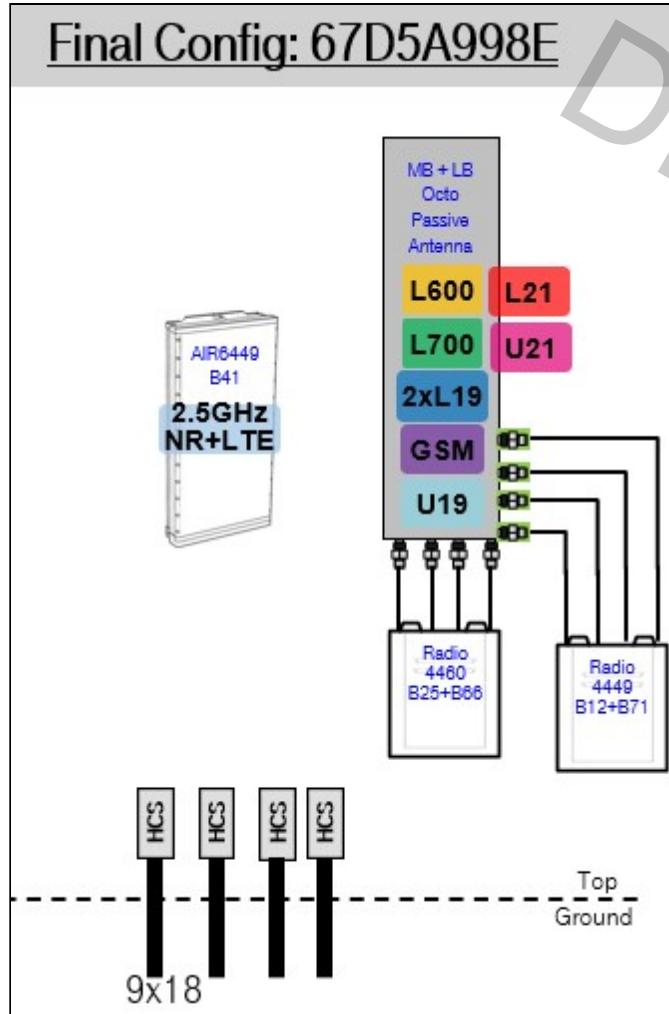
67D94DB\_1xAIR+1QP+1OP.JPG



Notes:

## Section 3 - Proposed Template Images

67D5A998E.jpg



## Section 4 - Siteplan Images

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

DRAFT

RAN Template: 67D5A998E Hybrid	A&L Template: 67D5998E_1xAIR+1OP
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## Section 5 - RAN Equipment

### Existing RAN Equipment

Template: 67D92DB Hybrid

Enclosure	1	2
Enclosure Type	RBS 6201	Ancillary Equipment (Ericsson)
Baseband	DUV30 U2100 DUV30 U1900 DUG20 G1900 BB 5216 L2100 L1900 BB 6630 L700 L600 N600	
Hybrid Cable System		Ericsson 9x18 HCS *Select Length* Ericsson 6x12 HCS *Select Length & AWG* Ericsson 6x12 HCS *Select AWG & Length*
Multiplexer	XMU L2100 L1900	
Radio	RUS01 B4 (x 6 ) U2100	

### Proposed RAN Equipment

Template: 67D5A998E Hybrid

Enclosure	1	2	3	4
Enclosure Type	RBS 6201	Ancillary Equipment (Ericsson)	19 Inch Rack (Ericsson)	Power 6230
Baseband	BB 6648 L2100 L1900 BB 6630 L700 L600 N600 DUV30 U2100 DUG20 G1900		BB 6648 L2500 N2500	
Hybrid Cable System		Ericsson 6x12 HCS *Select Length & AWG* (x 2 )	PSU 4813 vR2A (Kit) Ericsson Hybrid Trunk 6/24 4AWG 100m (x 2 )	
Transport System			CSR IXRe V2 (Gen2)	

#### RAN Scope of Work:

- Remove and return all cabinet radios from existing base station cabinet.
- Remove BB5216 and XMU from existing cabinet.
- Add (1) BB6648 for L1900 and L2100 to existing cabinet 6201.
- Add (1) 19 inch rack.
- Add (1) IXRe Router to new 19 Inch Rack.
- Add (1) BB6648 for L2500 and N2500 (MMBB - Mixed Mode Baseband) to new 19 Inch Rack.
- Add (1) PSU4813 Voltage Booster to new 19 Inch Rack.
- Existing : (2) 6X12 , (1) 9x18
- Remove (1) 9x18.
- Add (2) 6X24 HCS terminating at the Enclosure 6160. Connect DC for the AIR6449 B41 to the PSU4813 Voltage Booster.

RAN Template: 67D5A998E Hybrid	A&L Template: 67D5998E_1xAIR+1OP
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## Section 6 - A&amp;L Equipment

Existing Template: 67D92DB\_2xAIR+1OP  
Proposed Template: 67D5998E\_1xAIR+1OP

Sector 1 (Existing) view from behind										
Coverage Type	A - Outdoor Macro									
Antenna	1			2			3			
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)			RFS - APXVAARR24_43-U-NA20 (Octo)			Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			
Azimuth	60			60			60			
M. Tilt	0			0			0			
Height	105			105			105			
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Active Tech.	U1900	G1900	U2100	L700 L600 N600	L700 L600 N600		L2100	L2100	L1900	L1900
Dark Tech.										
Restricted Tech.										
Decomm. Tech.										
E. Tilt	2	2	2		2		2		2	
Cables		CABLE 1 5/8IN FOAM PREMIUM (x2)	Coax Jumper (x2)	Coax Jumper (x2)						
TMAs		Generic Twin Style 1B - AWS (AtAntenna)								
Diplexers / Combiners										
Radio			Radio 4449 B71+B8 5 (At Antenna )							
Sector Equipment										
Unconnected Equipment:										
Scope of Work:										

RAN Template: 67D5A998E Hybrid	A&L Template: 67D5998E_1xAIR+1OP
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## Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)				RFS - APXVAARR24_43-U-NA20 (Octo)	
Azimuth	60				60	
M. Tilt	0				0	
Height	105				95	
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	L2500 N2500	L2500 N2500	L700 L600 N600	L700 L600 N600	U2100 G1900 U1900 L2100 L1900	U2100 G1900 U1900 L2100 L1900
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	(2)	(2)	(2)	(2)	(2)	(2)
Cables	Fiber Jumper	Fiber Jumper	Coax Jumper (x2) Fiber Jumper (x2)	Coax Jumper (x2)	Coax Jumper (x2) Fiber Jumper (x2)	Coax Jumper (x2) Fiber Jumper (x2)
TMAs						
Diplexers / Combiners						
Radio			Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)
Sector Equipment						

## Unconnected Equipment:

## Scope of Work:

There will be Two antennae per sector.

Remove all TMAs.

Remove all Coaxial Lines.

Remove AIR21 B2A/B4P from Position 1.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 1.

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both carriers), U2100, U1900 and GSM to Position 2 at antenna.

Remove AIR32DB B2A/B66A from Position 3.

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

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

RAN Template: 67D5A998E Hybrid	A&L Template: 67D5998E_1xAIR+1OP
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Sector 2 (Existing) view from behind											
Coverage Type	A - Outdoor Macro										
Antenna	1	2	3								
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)	RFS - APXVAARR24_43-U-NA20 (Octo)						Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			
Azimuth	180	180	180								
M. Tilt	0	0	0								
Height	105	105	105								
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	
Active Tech.	U1900 G1900	U2100	L700 L600 N600	L700 L600 N600			L2100	L2100	L1900	L1900	
Dark Tech.											
Restricted Tech.											
Decomm. Tech.											
E. Tilt	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	
Cables		CABLE 1 5/8IN FOAM PREMIUM (x2)	Coax Jumper (x2)	Coax Jumper (x2)							
TMAs		Generic Twin Style 1B - AWS (AtAntenna)									
Diplexers / Combiners											
Radio			Radio 4449 B71+B8 5 (At Antenna )								
Sector Equipment											
Unconnected Equipment:											
Scope of Work:											

RAN Template: 67D5A998E Hybrid	A&L Template: 67D5998E_1xAIR+1OP
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## Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)				RFS - APXVAARR24_43-U-NA20 (Octo)	
Azimuth	180				180	
M. Tilt	0				0	
Height	105				95	
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	L2500 N2500	L2500 N2500	L700 L600 N600	L700 L600 N600	U2100 L2100 L1900 G1900 U1900	U2100 L2100 L1900 G1900 U1900
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables	Fiber Jumper	Fiber Jumper	Coax Jumper (x2) Fiber Jumper (x2)	Coax Jumper (x2)	Coax Jumper (x2) Fiber Jumper (x2)	Coax Jumper (x2) Fiber Jumper (x2)
TMAs						
Diplexers / Combiners						
Radio			Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)
Sector Equipment						

## Unconnected Equipment:

## Scope of Work:

There will be Two antennae per sector.

Remove all TMAs.

Remove all Coaxial Lines.

Remove AIR21 B2A/B4P from Position 1.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 1.

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both carriers), U2100, U1900 and GSM to Position 2 at antenna.

Remove AIR32DB B2A/B66A from Position 3.

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

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

RAN Template: 67D5A998E Hybrid	A&L Template: 67D5998E_1xAIR+1OP
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## Sector 3 (Existing) view from behind

Coverage Type	A - Outdoor Macro									
Antenna	1			2			3			
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)			RFS - APXVAARR24_43-U-NA20 (Octo)			Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			
Azimuth	300			300			300			
M. Tilt	0			0			0			
Height	105			105			105			
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Active Tech.	U1900	G1900	U2100	L700 L600 N600	L700 L600 N600		L2100	L2100	L1900	L1900
Dark Tech.										
Restricted Tech.										
Decomm. Tech.										
E. Tilt	(2)	(2)	(2)		(2)		(2)		(2)	
Cables		CABLE 1 5/8IN FOAM PREMIUM (x2)		Coax Jumper (x2)	Coax Jumper (x2)					
TMAs		Generic Twin Style 1B - AWS (AtAntenna)								
Diplexers / Combiners										
Radio			Radio 4449 B71+B8 5 (At Antenna )							
Sector Equipment										
Unconnected Equipment:										
Scope of Work:										

RAN Template: 67D5A998E Hybrid	A&L Template: 67D5998E_1xAIR+1OP
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## Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)				RFS - APXVAARR24_43-U-NA20 (Octo)	
Azimuth	300				300	
M. Tilt	0				0	
Height	105				95	
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	L2500 N2500	L2500 N2500	L700 L600 N600	L700 L600 N600	U2100 L2100 L1900 G1900 U1900	U2100 L2100 L1900 G1900 U1900
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables	Fiber Jumper	Fiber Jumper	Coax Jumper (x2) Fiber Jumper (x2)	Coax Jumper (x2)	Coax Jumper (x2) Fiber Jumper (x2)	Coax Jumper (x2) Fiber Jumper (x2)
TMAs						
Diplexers / Combiners						
Radio			Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)
Sector Equipment						

## Unconnected Equipment:

## Scope of Work:

There will be Two antennae per sector.

Remove all TMAs.

Remove all Coaxial Lines.

Remove AIR21 B2A/B4P from Position 1.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 1.

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both carriers), U2100, U1900 and GSM to Position 2 at antenna.

Remove AIR32DB B2A/B66A from Position 3.

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

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

RAN Template: 67D5A998E Hybrid	A&L Template: 67D5998E_1xAIR+1OP
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## Section 7 - Power Systems Equipment

### Existing Power Systems Equipment

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

### Proposed Power Systems Equipment

Enclosure	1
Enclosure Type	Power 6230

**Structural Analysis Report**

*Antenna Mount Analysis*

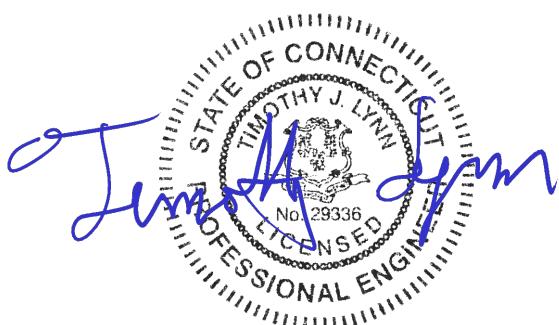
*Site Ref: CTN H 334 A*

*150 E. Aurora Street  
Waterbury, CT*

*Centek Project No. 21022.33*

*Date: October 6, 2021*

*Max Stress Ratio 46.5%*



***Prepared for:***

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

**CENTEK** Engineering, Inc.  
Structural Analysis – Mount Analysis  
T-Mobile Site Ref. ~ CTNH334A  
Waterbury, CT  
October 6, 2021

## **Table of Contents**

### **SECTION 1 – REPORT**

- ANTENNA AND APPURTENANCE SUMMARY
- STRUCTURE LOADING
- CONCLUSION

### **SECTION 2 – CALCULATIONS**

- WIND LOAD ON APPURTENANCES
- RISA3D OUTPUT REPORT

### **SECTION 3 – REFERENCE MATERIALS (NOT INCLUDED WITHIN REPORT)**

- RF DATA SHEET, DATED 09/13/2021

October 6, 2021

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

Re: *Structural Letter ~ Antenna Mount*  
T-Mobile – Site Ref: CTNH334A  
150 E. Aurora Street  
Waterbury, CT 06708

*Centek Project No. 21022.33*

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 mount, consisting of pipe masts banded to the exterior of the masonry smokestack 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) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

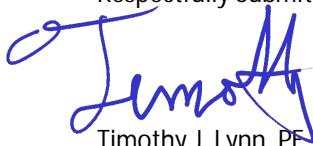
- **T-Mobile:**  
Pipe Frames: Three (3) RFS APXVAALL24\_43-U-NA20 panel antennas, three (3) Ericsson AIR6449 B41 panel antennas, three (3) Ericsson 4460 B25+B66 remote radio units and three (3) Ericsson 4449 B71+B85 remote radio units mounted on existing/proposed antenna mounts with a RAD center elevation of 105-ft & 95-ft +/- AGL.

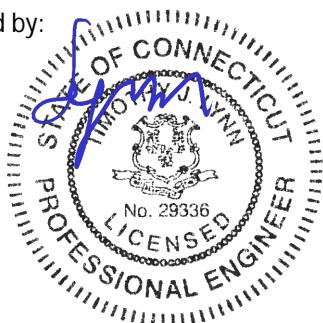
The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 97 mph for Waterbury as required in Appendix N of the 2018 Connecticut State Building Code.

A structural analysis of smokestack needs to be completed prior to any work.

Based on our review of the installation, it is our opinion that the subject antenna frames have 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



Prepared by:

  
Fernando J. Palacios  
Engineer

**CENTEK** Engineering, Inc.  
Structural Analysis – Mount Analysis  
T-Mobile Site Ref. ~ CTNH334A  
Waterbury, CT  
October 6, 2021

## **Section 2 - Calculations**



**Figure 1** Typical Antenna Mount

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

## Wind Speeds

Basic Wind Speed	$V := 97$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-G)

## Input

Structure Type =	Structure_Type := Pole	(User Input)
Structure Category =	SC := II	(User Input)
Exposure Category =	Exp := B	(User Input)
Structure Height =	h := 110	ft (User Input)
Height to Center of Antennas =	z := 105	ft (User Input)
Radial Ice Thickness =	t_i := 0.75	in (User Input per Annex B of TIA-222-G)
Radial Ice Density =	Id := 56.00	pcf (User Input)
Topographic Factor =	K_zt := 1.0	(User Input)
	K_a := 1.0	(User Input)
Gust Response Factor =	G_H = 1.1	(User Input)

## Output

$$\text{Wind Direction Probability Factor} = K_d := \begin{cases} 0.95 & \text{if Structure\_Type = Pole} \\ 0.95 & \text{if Structure\_Type = Lattice} \\ 0.85 & \end{cases} = 0.95 \quad \begin{array}{l} \text{(Per Table 2-2 of} \\ \text{TIA-222-G)} \end{array}$$

$$\text{Importance Factors} = \begin{array}{l|l} I_{\text{Wind}} := & \begin{array}{l} \text{if } SC = 1 \\ \parallel \\ 0.87 \\ \parallel \\ \text{if } SC = 2 \\ \parallel \\ 1.00 \\ \parallel \\ \text{if } SC = 3 \\ \parallel \\ 1.15 \\ \parallel \\ \end{array} \end{array} = 1$$

```
I_Wind_w_Ice := if SC = 1
  || 0
  if SC = 2
  || 1.00
  if SC = 3
  || 1.00
```

```
Iice := || if SC = 1 || = 1
          || 0
          || if SC = 2
          || 1.00
          || if SC = 3
          || 1.25
```

$$\text{Velocity Pressure Coefficient Antennas} = \frac{t_{iz} := 2.0 \cdot t_i \cdot l_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.684}{Kz := 2.01 \cdot \left( \left( \frac{z}{zg} \right) \right)^{\alpha} = 1.002}$$

$$\text{Velocity Pressure w/o Ice Antennas} = qz := 0.00256 \cdot K_d \cdot K_z \cdot V^2 \cdot l_{wind} = 23 \text{ psf}$$

$$\text{Velocity Pressure with Ice Antennas} = qz_{\text{ice}} := 0.00256 \cdot K_d \cdot K_z \cdot V_i^2 \cdot I_{\text{Wind}} = 6 \text{ psf}$$

**Development of Wind & Ice Load on Antennas**
**Antenna Data:**

Antenna Model =	RFS APXVAALL24_43-U-NA20		
Antenna Shape =	Flat	(User Input)	
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24.0$	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)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

**Wind Load (without ice)**

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 511$	lbs
Surface Area for One Antenna =	$SA_{ants} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.7$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ants} = 181$	lbs

**Wind Load (with ice)**

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 18.9$	sf
Total Antenna Wind Force w/ Ice Front =	$F_{Iant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 160$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEants} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.2$	sf
Total Antenna Wind Force w/ Ice Side =	$F_{Iant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEants} = 69$	lbs

**Gravity Load (without ice)**

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 150$	lbs
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**Gravity Loads (ice only)**

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

**Development of Wind & Ice Load on Antennas**

**Antenna Data:**

Antenna Model =	Ericsson AIR6449 B41		
Antenna Shape =	Flat	(User Input)	
Antenna Height =	$L_{ant} := 33.1$	in	(User Input)
Antenna Width =	$W_{ant} := 20.6$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 104$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.6$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

**Wind Load (without ice)**

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 143$	lbs
Surface Area for One Antenna =	$SA_{ants} := \frac{L_{ant} \cdot T_{ant}}{144} = 2$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ants} = 59$	lbs

**Wind Load (with ice)**

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.1$	sf
Total Antenna Wind Force w/ Ice Front =	$F_{Iant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 49$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEants} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3$	sf
Total Antenna Wind Force w/ Ice Side =	$F_{Iant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEants} = 24$	lbs

**Gravity Load (without ice)**

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 104$	lbs
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**Gravity Loads (ice only)**

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5796$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 4578$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot 1d = 148$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 148$	lbs

**Development of Wind & Ice Load on RRUS's**

**RRUS Data:**

RRUS Model =	Ericsson 4460 B25+B66	
RRUS Shape =	Flat	(User Input)
RRUS Height =	$L_{RRUS} := 19.6$	in (User Input)
RRUS Width =	$W_{RRUS} := 15.7$	in (User Input)
RRUS Thickness =	$T_{RRUS} := 12.1$	in (User Input)
RRUS Weight =	$WT_{RRUS} := 109$	lbs (User Input)
Number of RRUS's =	$N_{RRUS} := 1$	
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.2$	
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$	

**Wind Load (without ice)**

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 65$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.6$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 50$	lbs

**Wind Load (with ice)**

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3$	sf
Total RRUS Wind Force w/ Ice =	$F_{I_{RRUS}} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 24$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2.5$	sf
Total RRUS Wind Force w/ Ice =	$F_{I_{RRUS}} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 20$	lbs

**Gravity Load (without ice)**

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 109$	lbs
-----------------------	----------------------------------	-----

**Gravity Loads (ice only)**

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 3723$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 3051$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 99$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 99$	lbs

**Development of Wind & Ice Load on RRUS's**

**RRUS Data:**

RRUS Model =	Ericsson 44449 B71+B85		
RRUS Shape =	Flat	(User Input)	
RRUS Height =	$L_{RRUS} := 14.9$	in	(User Input)
RRUS Width =	$W_{RRUS} := 13.2$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 5.4$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 74$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

**Wind Load (without ice)**

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 41$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 0.6$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 17$	lbs

**Wind Load (with ice)**

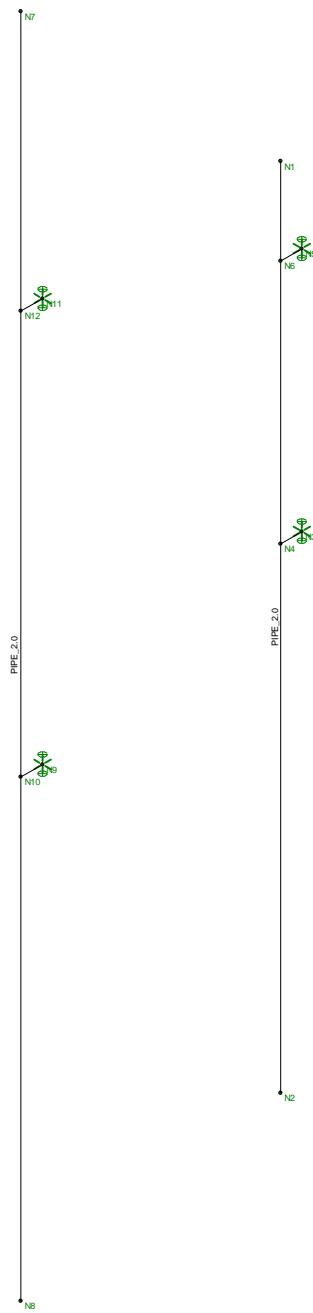
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$	sf
Total RRUS Wind Force w/ Ice =	$F_{I_{RRUS}} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 17$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.1$	sf
Total RRUS Wind Force w/ Ice =	$F_{I_{RRUS}} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 9$	lbs

**Gravity Load (without ice)**

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 74$	lbs
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**Gravity Loads (ice only)**

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 1062$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 1592$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 52$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 52$	lbs



Centek Engineering.

FJP

21022.33

CTNH334A - Alpha, Beta & Gamma Sectors - Mount  
Member Framing

Oct 6, 2021 at 8:30 PM

CTNH334A\_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 <sup>2</sup> )	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 <sup>2</sup> )	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

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

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parmer 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
2 A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58
3 A992	29000	11154	.3	.65	.49	50	1.1	58
4 A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58
5 A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58
6 A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58

## Hot Rolled Steel Section Sets

Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1 (E)Ant.Mast_Pipe 2.0 ...	PIPE_2.0	Column	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 PS.1	(E)Ant.Mast_Pipe 2...	9.333			Lbyy						Lateral
2 PS.2	(E)Ant.Mast_Pipe 2...	12.917			Lbyy						Lateral

## Member Primary Data

Label	I Joint	J Joint	K Joint	Rotate(...)	Section/Shape	Type	Design List	Material	Design R...
1 PS.1	N1	N2			(E)Ant.Mast_Pipe 2.0 SSTD Column	Pipe		A53 Grade B	Typical
2 M2	N5	N6			RIGID	None	None	RIGID	Typical
3 M3	N3	N4			RIGID	None	None	RIGID	Typical
4 PS.2	N7	N8			(E)Ant.Mast_Pipe 2.0 SSTD Column	Pipe		A53 Grade B	Typical
5 M5	N11	N12			RIGID	None	None	RIGID	Typical
6 M6	N9	N10			RIGID	None	None	RIGID	Typical

## Joint Coordinates and Temperatures

Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1 N8	-3	-10.333333	0	0	
2 N2	0	-6.75	0	0	
3 N3	0	-1.25	.25	0	
4 N4	0	-1.25	0	0	
5 N9	-3	-5.083333	.25	0	
6 N10	-3	-5.083333	0	0	
7 N5	0	1.583333	.25	0	
8 N6	0	1.583333	0	0	
9 N11	-3	-0.416667	.25	0	
10 N12	-3	-0.416667	0	0	
11 N1	0	2.583333	0	0	
12 N7	-3	2.583333	0	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 N3	Reaction	Reaction	Reaction		Reaction	
2 N5	Reaction	Reaction	Reaction		Reaction	
3 N9	Reaction	Reaction	Reaction		Reaction	
4 N11	Reaction	Reaction	Reaction		Reaction	

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

Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1 PS.2	Y	-.075	1
2 PS.2	Y	-.075	5.75
3 PS.1	Y	-.052	2.125

### **Member Point Loads (BLC 2 : Weight of Appurtenances) (Continued)**

Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
4 PS.1	Y	-.052	4.875
5 PS.2	Y	-.074	10.333
6 PS.2	Y	-.109	10.667

### **Member Point Loads (BLC 3 : Weight of Ice Only)**

Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1 PS.2	Y	-.206	1
2 PS.2	Y	-.206	5.75
3 PS.1	Y	-.074	2.125
4 PS.1	Y	-.074	4.875
5 PS.2	Y	-.052	10.333
6 PS.2	Y	-.099	10.667

### **Member Point Loads (BLC 4 : (x) TIA Wind with Ice (6 psf))**

Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1 PS.2	X	.035	1
2 PS.2	X	.035	5.75
3 PS.1	X	.012	2.125
4 PS.1	X	.012	4.875
5 PS.2	X	.017	10.333
6 PS.2	X	.024	10.667

### **Member Point Loads (BLC 5 : (x) TIA Wind (23 psf))**

Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1 PS.2	X	.091	1
2 PS.2	X	.091	5.75
3 PS.1	X	.03	2.125
4 PS.1	X	.03	4.875
5 PS.2	X	.041	10.333
6 PS.2	X	.065	10.667

### **Member Point Loads (BLC 6 : (z) TIA Wind with Ice (6 psf))**

Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1 PS.2	Z	.08	1
2 PS.2	Z	.08	5.75
3 PS.1	Z	.025	2.125
4 PS.1	Z	.025	4.875
5 PS.2	Z	.009	10.333
6 PS.2	Z	.02	10.667

### **Member Point Loads (BLC 7 : (z) TIA Wind (23 psf))**

Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1 PS.2	Z	.256	1
2 PS.2	Z	.256	5.75
3 PS.1	Z	.072	2.125
4 PS.1	Z	.072	4.875
5 PS.2	Z	.017	10.333
6 PS.2	Z	.05	10.667

### Member Distributed Loads (BLC 4 : (x) TIA Wind with Ice (6 psf))

Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft, %]	End Location[ft, %]
1	X	.00098	.00098	0	0
2	X	.00098	.00098	0	8

### Member Distributed Loads (BLC 5 : (x) TIA Wind (23 psf))

Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft, %]	End Location[ft, %]
1	X	.004	.004	0	0
2	X	.004	.004	0	8

### Member Distributed Loads (BLC 6 : (z) TIA Wind with Ice (6 psf))

Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft, %]	End Location[ft, %]
1	Z	.00098	.00098	0	2.125
2	Z	.00098	.00098	4.875	0
3	Z	.00098	.00098	0	1
4	Z	.00098	.00098	8	0

### Member Distributed Loads (BLC 7 : (z) TIA Wind (23 psf))

Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft, %]	End Location[ft, %]
1	Z	.004	.004	0	2.125
2	Z	.004	.004	4.875	0
3	Z	.004	.004	0	1
4	Z	.004	.004	8	0

### 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 Appurtenances	None							6	
3	Weight of Ice Only	None							6	
4	(x) TIA Wind with Ice (6 psf)	None							6	2
5	(x) TIA Wind (23 psf)	None							6	2
6	(z) TIA Wind with Ice (6 psf)	None							6	4
7	(z) TIA Wind (23 psf)	None							6	4

### Load Combinations

	Description	Solve	P...	S...	B...	Fa...	BLC	Fact...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-dir...	Yes	Y	1	1.2	2	1.2	5	1.6											
2	0.9D + 1.6W (X-dir...	Yes	Y	1	.9	2	.9	5	1.6											
3	1.2D + 1.0Di + 1.0...	Yes	Y	1	1.2	2	1.2	3	1	4	1									
4	1.2D + 1.6W (Z-dire...	Yes	Y	1	1.2	2	1.2	7	1.6											
5	0.9D + 1.6W (Z-dire...	Yes	Y	1	.9	2	.9	7	1.6											
6	1.2D + 1.0Di + 1.0...	Yes	Y	1	1.2	2	1.2	3	1	6	1									

### Envelope Joint Reactions

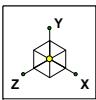
Joint			X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N3	max	0	6	.343	4	.027	3	0	6	0	6	0	6
2		min	-.165	2	.063	2	-.256	5	0	1	-.041	2	0	1
3	N5	max	.007	2	.152	3	-.011	2	0	6	.002	2	0	6
4		min	0	3	-.199	5	-.03	6	0	1	0	3	0	1
5	N9	max	0	6	1.685	4	.054	3	0	6	0	6	0	6
6		min	-.307	2	.174	2	-.27	5	0	1	-.077	2	0	1
7	N11	max	0	6	.501	3	-.018	2	0	6	0	6	0	6
8		min	-.207	1	-1.287	5	-.702	4	0	1	-.052	1	0	1
9	Totals:	max	0	6	1.328	6	0	3						
10		min	-.672	1	.463	2	-1.24	4						

### Envelope Joint Displacements

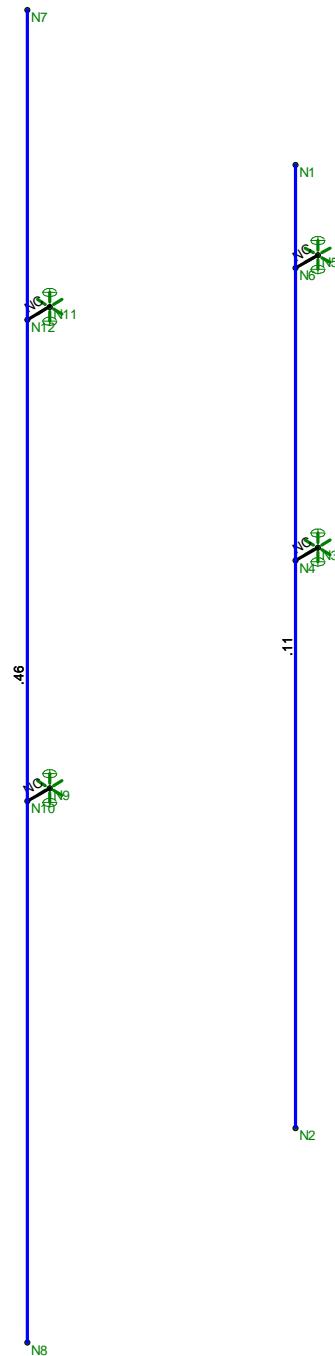
Joint			X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotation [rad]	LC
1	N8	max	.83	2	-.001	2	.193	5	9.826e-04	3	0	6	1.438e-02	2
2		min	0	4	-.006	4	-.062	3	-4.282e-03	5	0	1	0	4
3	N2	max	.182	2	.002	5	.163	5	1.983e-04	3	0	6	3.219e-03	2
4		min	0	4	0	3	-.013	3	-2.953e-03	5	0	1	0	4
5	N3	max	0	6	0	6	0	6	2.006e-04	3	0	6	1.151e-03	2
6		min	0	1	0	1	0	1	-5.353e-04	5	0	1	0	4
7	N4	max	0	6	.002	5	0	6	2.006e-04	3	0	6	1.151e-03	2
8		min	0	1	0	3	0	1	-5.353e-04	5	0	1	0	4
9	N9	max	0	6	0	6	0	6	1.906e-03	4	0	6	7.602e-03	2
10		min	0	1	0	1	0	1	3.511e-04	2	0	1	0	4
11	N10	max	0	6	-.001	2	0	6	1.906e-03	4	0	6	7.602e-03	2
12		min	0	1	-.006	4	0	1	3.511e-04	2	0	1	0	4
13	N5	max	0	6	0	6	0	6	1.722e-04	3	0	6	0	6
14		min	0	1	0	1	0	1	-4.227e-04	5	0	1	-4.168e-04	2
15	N6	max	0	6	.001	5	0	6	1.722e-04	3	0	6	0	6
16		min	0	1	0	3	0	1	-4.227e-04	5	0	1	-4.168e-04	2
17	N11	max	0	6	0	6	0	6	2.995e-03	4	0	6	0	6
18		min	0	1	0	1	0	1	3.085e-04	2	0	1	-6.595e-03	2
19	N12	max	0	6	0	2	0	6	2.995e-03	4	0	6	0	6
20		min	0	1	-.009	4	0	1	3.085e-04	2	0	1	-6.595e-03	2
21	N1	max	.005	2	.001	5	.002	3	1.722e-04	3	0	6	0	6
22		min	0	4	0	3	-.005	5	-4.117e-04	5	0	1	-4.278e-04	2
23	N7	max	.327	2	-.001	2	.343	4	1.133e-02	4	0	6	0	6
24		min	0	4	-.009	4	.011	2	3.09e-04	2	0	1	-9.789e-03	2

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

Memb...	Shape	Code Check	L...	LC	Sh...	L...	Dir	...phi*P...	phi*Pn...	phi*Mn y-y [k-ft]	phi*...Cb	Eqn
1	PS.1	PIPE_2.0	.113	3...	4	.015	3...	5	11.292	32.13	1.872	1 H1...
2	PS.2	PIPE_2.0	.465	3...	4	.043	1...	4	5.896	32.13	1.872	1 H1...



Code Check ( Env )	
No Calc	
> 1.0	
90-1.0	
75-90	
50-75	
0-50	



Member Code Checks Displayed (Enveloped)  
Envelope Only Solution

Centek Engineering.	CTNH334A - Alpha, Beta & Gamma Sectors - Mount Unity Check	
FJP		Oct 13, 2021 at 8:48 AM
21022.33		CTNH334A_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: CTNH334A

NH334/E Aurora Smokestack  
150 E. Aurora Street  
Waterbury, Connecticut 06708

**December 16, 2021**

**EBI Project Number: 6221007677**

<b>Site Compliance Summary</b>	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>23.78%</b>



December 16, 2021

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

## Emissions Analysis for Site: CTNH334A - NH334/E Aurora Smokestack

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **150 E. Aurora Street** in **Waterbury, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  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 ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400  $\mu\text{W}/\text{cm}^2$  and 467  $\mu\text{W}/\text{cm}^2$ , respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000  $\mu\text{W}/\text{cm}^2$ . 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 150 E. Aurora Street in Waterbury, 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 power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 7) 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.
- 8) 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.
- 9) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.
- 10) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.
- 11) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.
- 12) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.
- 13) 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.
- 14) 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.
- 15) The antennas used in this modeling are the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz channel(s) in Sector A, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the Ericsson



AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 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.

- 16) The antenna mounting height centerline of the proposed antennas is 105 feet above ground level (AGL).
- 17) Emissions from additional carriers were not included because emissions data for the site location are not available.
- 18) 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 #:	I	Antenna #:	I	Antenna #:	I
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd
Height (AGL):	105 feet	Height (AGL):	105 feet	Height (AGL):	105 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	36,356.09	ERP (W):	36,356.09	ERP (W):	36,356.09
Antenna A1 MPE %:	<b>13.34%</b>	Antenna B1 MPE %:	<b>13.34%</b>	Antenna C1 MPE %:	<b>13.34%</b>
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 15.65 dBd / 16.35 dBd
Height (AGL):	105 feet	Height (AGL):	105 feet	Height (AGL):	105 feet
Channel Count:	17	Channel Count:	17	Channel Count:	17
Total TX Power (W):	680 Watts	Total TX Power (W):	680 Watts	Total TX Power (W):	680 Watts
ERP (W):	22,844.84	ERP (W):	22,844.84	ERP (W):	22,844.84
Antenna A2 MPE %:	<b>10.44%</b>	Antenna B2 MPE %:	<b>10.44%</b>	Antenna C2 MPE %:	<b>10.44%</b>



Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	23.78%
no additional carriers	N/A
<b>Site Total MPE % :</b>	<b>23.78%</b>

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	23.78%
T-Mobile Sector B Total:	23.78%
T-Mobile Sector C Total:	23.78%
Site Total MPE % :	23.78%

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 ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
T-Mobile 2500 MHz LTE IC & 2C Traffic	1	11044.63	105.0	40.51	2500 MHz LTE IC & 2C Traffic	1000	4.05%
T-Mobile 2500 MHz LTE IC & 2C Broadcast	1	1074.06	105.0	3.94	2500 MHz LTE IC & 2C Broadcast	1000	0.39%
T-Mobile 2500 MHz NR Traffic	1	22089.26	105.0	81.03	2500 MHz NR Traffic	1000	8.10%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	105.0	7.88	2500 MHz NR Broadcast	1000	0.79%
T-Mobile 600 MHz LTE	2	591.73	105.0	4.34	600 MHz LTE	400	1.09%
T-Mobile 600 MHz NR	1	1577.94	105.0	5.79	600 MHz NR	400	1.45%
T-Mobile 700 MHz LTE	2	648.82	105.0	4.76	700 MHz LTE	467	1.02%
T-Mobile 1900 MHz GSM	4	1101.85	105.0	16.17	1900 MHz GSM	1000	1.62%
T-Mobile 1900 MHz UMTS	2	1101.85	105.0	8.08	1900 MHz UMTS	1000	0.81%
T-Mobile 1900 MHz LTE	2	2203.69	105.0	16.17	1900 MHz LTE	1000	1.62%
T-Mobile 2100 MHz UMTS	2	1294.56	105.0	9.50	2100 MHz UMTS	1000	0.95%
T-Mobile 2100 MHz LTE	2	2589.11	105.0	18.99	2100 MHz LTE	1000	1.90%
						<b>Total:</b>	<b>23.78%</b>

• 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:	23.78%
Sector B:	23.78%
Sector C:	23.78%
T-Mobile Maximum MPE % (Sector A):	23.78%
Site Total:	23.78%
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **23.78%** 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.