Filed by:
G. Scott Shepherd, Site Development Specialist II - SBA Communications
134 Flanders Rd., Suite 125, Westborough, MA 01581
508.251.0720 x 3807 - gshepherd@sbasite.com

March 23, 2021

Melanie A. Bachman
Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
35 Lower County Rd., Roxbury, CT 06783
Latitude: 41.559528
Longitude: -73.292305
Sprint, now a part of T-Mobile USA #: CTNH451A_Sprint Keep

Dear Ms. Bachman:

Sprint, now a part of T-Mobile USA, hereinafter referred to as "Sprint/T-Mobile"currently maintains six (6) antennas at the 177-foot level of the existing 180-foot Monopole Tower at 35 :ower County Rd. Roxbury, CT. The 180-foot tower is owned by SBA 2012 TC Assets, LLC. The property is owned by The Town of Roxbury, CT. Sprint/T-Mobile now intends to remove six (6) antennas and replace with six (6) new L700/L600/1900/2100 MHz antennas and install three (3) additional 2500 MHz antennas for a total of nine (9) antennas.

The new antennas support 5G services and would be installed at the 177-foot level of the tower.

Please note: Per the Connecticut Siting Council Website: CSC COVID 19 Guidelines.
In order to prevent the spread of Coronavirus and protect the health and safety of our members and staff, as of March 18, 2020, the Connecticut Siting Council shall convert to full remote operations until March 30, 2020. Please be advised that during this time period, all hard copy filing requirements will be waived in lieu of an electronic filing. Please also be advised that the March 26, 2020 regular meeting shall be held via teleconference. The Council's website is not equipped with an on-line filing fee receipt service. Therefore, filing fees and/or direct cost charges associated with matters received electronically during the above-mentioned time period will be directly invoiced at a later date.

Planned Modifications:

TOWER

Remove:

- N/A

Remove and Replace:

- (3) Commscope NNVV-65B-R4 Antennas (remove) – (3) Ericsson AIR32 KRD901146-1_B66A_B2A (1900/2100 MHz) antenna (replace)
- (3) RFS APXVTM14-C-I20 antennas (remove) – (3) RFS APXVAALL24_43-U-NA20 (600/700/1900 MHz) antennas (replace)
- (3) ALU 1900MHz RRH/RRU (remove) – (3) Ericsson 4415 B25 RRU (replace)
- (3) ALU TD-RRH8x20-25 RRU (remove) – (3) Ericsson 4449 B71 + B85 RRU (replace)
- (3) Sector Frame w/tie back (remove) – (3) V-Frames w/stiff Arms (Site Pro VFA12-HD) (replace)

Install New:

- (3) Ericsson AIR6449 B41 (2500 MHz) antennas
- (3) 2" Hybrid

Existing Equipment to Remain:

- (6) ALU 800MHz RRH/RRU

Entitlements:

- (4) 1-1/4" fiber

GROUND

Install New:

- Equipment rack with 6230 Power Supply

Remove:

- Existing Sprint equipment rack
- Existing fiber distribution box on H-Frame
- Existing Sprint MMBTS Cabinet

The Town of Roxbury approved the Building Permits and Land Use Approvals on April 20, 1999. The Roxbury Zoning Commission approved a Special Zoning Permit on October 21, 1999 to install a Telecommunications Tower in Roxbury. At its regular meeting on September 13, 1999 the Roxbury Zoning Commission voted to approve a Special Permit for Nextel Communications to construct a telecommunications tower and equipment shelter on Lower County Rd in Roxbury. This facility was approved by Application for Special Permit and Site Plan Approval approved 10/21/99 - by Zoning Commission Town of Roxbury - 180' "attached 12 panel antennas near the top of the Tower and install a 22'x26'x10.3' equip shelter near its base; SNET and Town antennas to be on tower as well. Nextel (orig) and SNET panel antennas each 4'4" in height and 8 5/16" in width and will not exceed height of tower - colored blue gray to blend with sky. There were no further post construction stipulations set. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-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. § 16.50j-73, a copy of this letter is being sent to the Town of Roxbury's First Selectman, Barbara Henry, Town of Roxbury's Building Official, John Blaney and Town Clerk, Peter A. Huribut. The property is owned by the Town of Roxbury. (Separate notice is not being sent to tower owner, as it belongs to SBA.)

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

Sincerely,

G. Scott Shepherd
Site Development Specialist II
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581
508.251.0720 x3807 + T
508.366.2610 + F
508.868.6000 + C
gshepherd@sbasite.com

Attachments
cc: Barbara Henry, First Selectman / with attachments
Town of Roxbury, 29 North St., Roxbury, CT 06783
P.O. Box 203
John Blaney, Building Official / with attachments
Town of Roxbury, 29 North St., Roxbury, CT 06783
P.O. Box 203
Peter A. Huribut, Town Clerk / with attachments
Town of Roxbury, 29 North St.,Roxbury, CT 06783
P.O. Box 203

EXHIBIT LIST

Exhibit 1	Check Copy	To be invoiced at a later date per COVID guidelines
Exhibit 2	Notification Receipts	x
Exhibit 3	Property Card	x
Exhibit 4	Property Map	x
Exhibit 5	Original Zoning Approval	Town of Roxbury Building & Land Use (4/20/99), Special Zoning Permit (10/21/99), Zoning Commission Special Permit Approval (9/13/99).
Exhibit 6	Construction Drawings	Centerline 2/3/21
Exhibit 7	Structural Analysis	TES 3/17/21
Exhibit 8	Antenna Mount Analysis	TES 2/24/21
Exhibit 9	EME Report	EBI Consulting 2/23/21

EXHIBIT 1

Normally, Exhibit 1 would contain a copy of the check for the filing fee.

EXHIBIT 2

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

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EXHIBIT 3

qPublic.net™ Town of Roxbury, CT

Summary

ParcelId	00059300
Location Address	35 LOWER COUNTY RD
Map-Block-Lot	27/029
Use Class/Description	Vacant
Assessing Neighborhood	C070
Survey	15/30
Acreage	4.78

Owner

Current Owner
ROXBURY TOWN OF
29 NORTH ST
ROXBURY, CT 06783

Current Appraised Value

		2019	2018	2017	2016
+	Building Value	$0	$0	$0	$0
+	OB/Misc	$16,842	$16,842	$16,842	$11,671
+	Land Value	$289,001	$289,001	$289,001	$289,001
=	Total Appraised Value	**$305,843**	**$305,843**	**$305,843**	**$300,672**

Assessment History

		2019	2018	2017	2016
+	Building Value	$0	$0	$0	$0
+	OB/Misc	$11,790	$11,790	$11,790	$8,170
+	Land Value	$202,300	$202,300	$157,630	$161,180
=	Total Assessment	**$214,090**	**$214,090**	**$169,420**	**$169,350**

Land

Use	Class	Land Type	Zoning	Area	Value
Vacant	C	Cell Site	C	0.01	$204,000
Vacant	C	Pub Util Excess	C	4.77	$85,001

Out Buildings\Extra Features

Description	Sub Description	Area	Year Built	Value
1 Story Barn	Barn	576	2002	$12,165
Frame Shed	Shed	384	2002	$4,677

Sales History

Sale Date	Sale Price	Deed Book/Page	Valid Sale	Owner
4/14/1992	$0	0057/0607	No	ROXBURY TOWN OF

Permit Information

Permit ID	Issue Date	Type	Amount	Inspection Date	% Complete	Date Complete	Comments
BP14-60	12-05-2013		$25,000	1/1/1900 12:00:00 AM	100	01-01-1900	REPLACE ANTENNAS/CELL TOWER
BP13-51	01-03-2013		$25,001	1/1/1900 12:00:00 AM	100	01-01-1900	CELL TOWER MODIFICATION
EP09-35	10-24-2008	Electrical	$890	1/1/1900 12:00:00 AM	100	10-01-2009	UNDER 100SF
BP09-36	10-17-2008	Outbuilding/Yard Item	$10,500	1/1/1900 12:00:00 AM	100	10-01-2009	UNDER 100SF
7922	06-05-2001	Review	$0	1/1/1900 12:00:00 AM	100	10-01-2002	shed
7280	12-16-1999	Review	$140,000	1/1/1900 12:00:00 AM	100	10-01-2002	radio rooms/tower

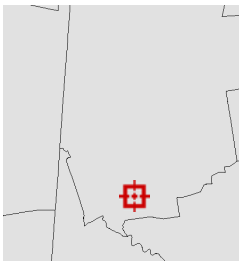
No data available for the following modules: Buildings Data, Commercial Building, Sketch, Photos.

Last Data Upload: 3/23/2021, 2:00:22 AM

Version 2.3.112

qPublic.net™ Town of Roxbury, CT

Overview



Legend

- Parcels
- Address Numbers
- Roads

Parcel ID	00059300	**Alternate ID**	109a64b4-ad90-49	**Owner Address**	ROXBURY TOWN OF
Sec/Twp/Rng	n/a	**Class**	Commercial		29 NORTH ST
Property Address	35 LOWER COUNTY RD	**Acreage**	4.78		ROXBURY, CT 06783
District	n/a				
Brief Tax Description	n/a				
	(Note: Not to be used on legal documents)				

Date created: 3/23/2021
Last Data Uploaded: 3/23/2021 2:00:22 AM

Developed by Schneider GEOSPATIAL

EXHIBIT 4

EXHIBIT 5

TOWN OF ROXBURY
APPLICATION FOR ZONING PERMIT

Fee $75 – Payable to Town of Roxbury

Office Use only: Wetlands Permit: _____ Date issued _____

Zoning Permit # _____ Date Issued_____ Fee Paid _____ Date _____

APPROVED BY: Chairman, Zoning _____ date _____

Zoning Enforcement Officer _____ date _____

Application is hereby made for permit as follows: (Description of building type or land use). If application is for a dwelling or dwelling addition, percolation test results MUST be attached. In addition, a complete set of construction plans showing floor plan and elevations must be submitted.

Section 7.1 of the Roxbury Zoning Regulations requires an A-2 survey prepared by a Licensed Surveyor showing to scale the size and location of all new construction and all existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades; and it shall be drawn in accordance with an accurate boundary line survey.

PROPERTY OWNER: Town of Roxbury phone 860-354-9938

ADDRESSS: 29 North Street, Roxbury, CT 06783

AGENT/BUILDER: Nextel Communications of the Mid-Atlantic, Inc., d/b/a Nextel Communications phone 860-513-5403

ADDRESS: 100 Corporate Place, Rocky Hill, CT 06067

PROPERTY (for which permit is requested):

Street location: Lower County Road Lot # 29 Assessor's Map 27 Zone: C

Is property within the Roxbury Historic District? No

DESCRIBE USE/ACTIVITY PROPOSED: Operation of a Personal Wireless Facility to provide Specialized Mobile Radio ("SMR") Services to Nextel's Customers living in and traveling through Roxbury, CT.

There are 4 existing buildings and structures on the lot as indicated below:

	TYPE/USE	GROUND COVERAGE	TOTAL FLOOR AREA
1.	Existing shed/storage	25'x18'	456 sq. ft.
2.	Existing moveable shed/storage	7'x8'	56 sq. ft.
3.	Existing moveable shed/storage	9'x6'	54 sq. ft.
4.	Existing moveable shed/storage	9'x6'	54 sq. ft.

Form Rev. 11/5/98

CATEGORY OF APPLICATIONS:

1. Proposed building or structure and use thereof: 180' Telecommunications Tower and associated building and equipment

2. Sign permit _____ 3. Other * 4. Change of use of existing building or structure: Yes or (No)

CONSTRUCTION OF STRUCTURE:

Frame: _____ Brick : _____ Concrete: _____ Other: steel lattice tower Height: 180 ft.

First floor area: _____ Second floor area: _____ No. bedrooms: _____ No. baths: _____

Building Lot Area: 208,030 sq. ft. Street Frontage 585.74 ft. Distance to Street Line: 27'

Distance to nearest Boundary Line: 10' Distance to Rear Boundary Line: 510' Estimated cost: $175,000

3. Special Permit for new tower construction and Site Plan Approval required.

PLEASE COMPLETE THE FOLLOWING:

Is an A-2 Survey map (with a Licensed CT Surveyor's original signature) showing lot location, surrounding parcels, road frontage and position and dimensions of existing and proposed buildings attached? Yes

Is the location of septic system and water supply designated on map? No

Will proposed construction and septic systems be staked out on the property?

Is lot in Federal Flood Hazard Zone? No Is this lot within an approved subdivision? No

If so, give subdivision name: _____

List below any additional data and/or plans submitted with this application:

1. "Memorandum In Support of Special Permit and Site Plan Application"
2. with supporting Exhibits and Sub-exhibits, prepared by Cuddy & Feder &
3. Worby LLP

Approval of this application or issuance of a zoning permit shall not be considered to constitute compliance with any other regulations, ordinances or law or relieve the undersigned from responsibility to obtain permit thereunder.

I declare that the above information is true, correct and complete:

Signature of Owner: See attached "Letter of Authorization" from Town of Roxbury date: _____

Signature of Agent/Builder: _____ date: 5/24/99
Cuddy & Feder & Worby LLP

FOR COMMISSION USE: Public Hearing Date: _____ To Planning Commission _____

Decision by Zoning Commission: Approved: _____ Permit issued: _____ Denied: _____

If denied, was decision appealed? _____

LETTER OF AUTHORIZATION

Municipality: Town of Roxbury

Tax Assessor's Parcel Number: Map 27, Lot 29

Re: Building Permits and Land Use Approvals

Town of Roxbury, the Owner of Transfer Station, Lower County Road (the "Property") does hereby appoint Nextel Communications of the Mid-Atlantic, Inc. ("Nextel") and its agents and representatives as Owner's Agent for the purpose of completing, executing, and/or filing any applications, form, map, approval, variance, special permit or other land use approval or building permit ("Approvals") required to provide Nextel with lawful access to, and the ability to use the Property for the purpose of installing, erecting, or otherwise placing antennae, support structures and related equipment on the Property. Owner shall fully cooperate with Nextel and its agents and representatives in obtaining any required Approvals. Nextel shall be responsible for all costs, filing fees, or any expense incurred in the connection with securing any Approvals.

Property Owner: Town of Roxbury

By: Barbara Henry

Name: Barbara Henry

Its: First Selectman

Date: April 20, 1999

STATE OF CONNECTICUT:

COUNTY OF LITCHFIELD :

Signed and Sworn to before me this 20 th day of April, 1999.

BROOKE J. WHEELER NOTARY PUBLIC CONNECTICUT

Notary Public

My Commission expires: My Commission Expires October 31, 2002

CUDDY & FEDER & WORBY LLP
ATTORNEY PROFESSIONAL ACCOUNT

20238

ACCOUNT NO.		VENDOR OTV			CHECK NO. 020238
VOUCHER	INVOICE NUMBER	INVOICE DATE	INVOICE AMOUNT	AMOUNT PAID	DISCOUNT TAKEN
	13614	05/24/99	285.00	285.00	
				CHECK TOTAL	$285.00

CUDDY & FEDER & WORBY LLP
ATTORNEY PROFESSIONAL ACCOUNT
90 MAPLE AVENUE
WHITE PLAINS, NY 10601
(914) 761-1300

THE BANK OF NEW YORK
WHITE PLAINS, NY 10601
50-235-219

20238

CHECK NO.	CHECK DATE	VENDOR NO.
020238	05/24/99	OTV

CHECK AMOUNT
285.00

PAY
TWO HUNDRED EIGHTY FIVE DOLLARS AND 00/100

TO THE ORDER OF Town of Roxbury

Security features included. Details on back.

⑈020238⑈ ⑆021902352⑆ ⑈0044261734⑈

Waterbury Republican American
P.O. Box 2090
389 Meadow Street
Waterbury, CT 06722
FAX: 1-203-754-0644 (Classified)

LEGAL NOTICE TO APPEAR IN WATERBURY REPUBLICAN FRIDAY, SEPTEMBER 24th

The Roxbury Zoning Commission at its regular meeting on September 13, 1999 voted to approve a Special Permit for NEXTEL Communications to construct a telecommunications tower and equipment shelter on Lower County Road in Roxbury.

The Commission approved the permit for the following reasons:

The application was referred to the Planning Commission and received a positive report as to its consistency with the Plan of Development.

The Zoning Commission held a duly warned Public Hearing on the application.

The Federal Communications Act of 1996 mandates municipalities cannot unreasonably deny the siting of personal wireless facilities within the Town's boundaries.

NEXTEL's application meets the standards set forth in Section 5.11 (Telecommunications Antenna, Facilities and Antenna Towers) and Section 6 (Authorization of Use by Special Permit) of the Town of Roxbury's Zoning regulations.

The facility meets the environmental requirements of the Federal Communications Act of 1996.

It preserves the character and appearance of the Town while allowing adequate Personal Wireless Service.

Provides excellent communications facilities for the Town's needs including those of the Fire and Ambulance Services and the Public Works Department.

NEXTEL has agreed to post a bond satisfactory in terms and amount to the Town Attorney and the Town's expert tower consultant. Therefore, this bond shall be a condition of the special permit approval.

Please send bill to:

Roxbury Zoning Commission
29 North Street
P. O. Box 203
Roxbury, CT 06783

Attn: Karen Eddy
FAX: (860) 355-4028

THE ROXBURY ZONING COMMISSION
ROXBURY, CONNECTICUT 06783

October 21, 1999

NEXTEL Communications
1 North Broadway, 2nd Floor
White Plains, NY 10601-2310

Dear Sirs:

The Special Zoning Permit to install a Telecommunications Tower in Roxbury has been prepared. The Special Permit will be forwarded to you upon receipt of the required fees. Please remit fees due as soon as possible.

Special Permit Application Fee	**$110.**
Public Hearing Fee	**$175.**
Total due	**$285.**

Sincerely,

A. Daniel Jonker
Chairman, Zoning

ADJ/kse

CC: Christopher Fisher
David Bass

Done! Pay Tectonic!

Waterbury Republican American
P.O. Box 2090
389 Meadow Street
Waterbury, CT 06722
FAX: 1-203-754-0644 (Classified)

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Roxbury Zoning Commission
29 North Street
P. O. Box 203
Roxbury, CT 06783

Attn: Karen Eddy
FAX: (860) 355-4028

EXHIBIT 6

PROJECT INFORMATION

TOWER OWNER:	SBA PROPERTIES, LLC 8501 CONGRESS AVENUE BOCA RATON, FL 33487 PHONE: 561-226-9523
SBA TOWER ID:	CT46125-A
SBA SITE NAME:	ROXBURY-LOWER COUNTY RD
T-MOBILE SITE NAME:	CTNH451A
T-MOBILE SITE NUMBER:	CTNH451A
SBA SITE ADDRESS:	LOWER COUNTY ROAD ROXBURY, CT 06783
LATITUDE:	41.55950000
LONGITUDE:	-73.29230000
TOWER HEIGHT:	180'-0"± AGL
RAD CENTER:	177'-0"± AGL
ZONING JURISDICTION:	TOWN OF ROXBURY
COUNTY:	LITCHFIELD/ROXBURY

DESCRIPTION OF WORK:

TELECOMMUNICATIONS FACILITY UPGRADE (SPRINT RETAIN):

SELF SUPPORT TOWER

COMPLIANCE CODES:

1.	BUILDING CODE: IBC 2015 & CONNECTICUT STATE BUILDING CODE 2018
2.	ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE
3.	CONCRETE CODE: AMERICAN CONCRETE INSTITUTE (ACI) 318
4.	STEEL CODE: AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), 14TH EDITION
5.	TELECOMMUNICATIONS CODE: EIA/TIA-222-G STRUCTURAL STANDARDS FOR STEEL

BASED ON INFORMATION PROVIDED BY T-MOBILE, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW).

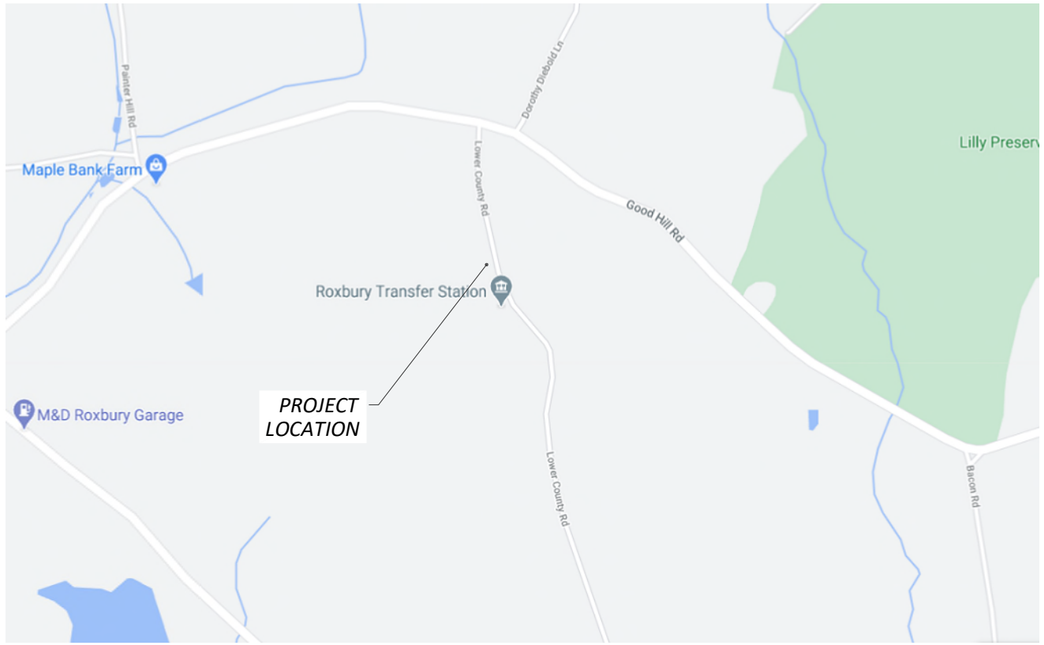
PROJECT DIRECTORY

A&E / PROJECT MANAGER:
CENTERLINE COMMUNICATIONS
750 WEST CENTER ST, SUITE 301
WEST BRIDGEWATER, MA 02379
PHONE 781.713.4725

APPLICANT:
T-MOBILE NORTHEAST, LLC.
15 COMMERCE WAY, SUITE B
NORTON, MA 02766
PHONE: (508) 286-2700
FAX: (508) 286-2893

SITE NAME: CTNH451A
LOWER COUNTY ROAD
ROXBURY, CT 06783

SITE NUMBER: CTNH451A
SBA SITE #: CT46125-A
PROJECT: SPRINT RETAIN
CONFIGURATION: 67D5A997DB HYBRID



VICINITY MAP
NOT TO SCALE

GENERAL NOTES:

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSE OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.

3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

DRAWING INDEX

NO.	DESCRIPTION	REV.	DATE
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SN-1	STRUCTURAL NOTES	1	02/03/21
RF-1	RF PLUMBING DIAGRAM	1	02/03/21
G-1	GROUNDING DETAILS	1	02/03/21

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REVISIONS		
1	02/03/21	ISSUED FOR CONSTRUCTION
0	12/22/20	ISSUED FOR REVIEW
NO.	DATE	DESCRIPTION
DESIGNED BY: TG		APPROVED BY: DC

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28557
LICENSED PROFESSIONAL ENGINEER

DATE: 02/03/21

CBYD.com 811 Call Before You Dig, Inc.

SITE NAME:	CTNH451A
SITE NUMBER:	CTNH451A
SITE ADDRESS:	LOWER COUNTY ROAD ROXBURY, CT 06783
PROJECT TYPE:	SPRINT RETAIN
SHEET TITLE:	TITLE SHEET
DRAWING #: T-1	REVISION: 1

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR – CENTERLINE COMMUNICATIONS
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – T–MOBILE

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR–ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T–MOBILE SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE: IBC 2015 & CONNECTICUT STATE BUILDING CODE 2018
ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE
LIGHTING CODE: NFPA 70–2017

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222–G, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE	TYP	TYPICAL
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED		

RF NOTES

1. ACTUAL LENGTHS SHALL BE DETERMINED PER SITE CONDITION BY SUBCONTRACTOR

2. THE DESIGN IS BASED ON RF DATA SHEETS, SIGNED AND APPROVED.

3. RADIO SIGNAL CABLE AND RACEWAY SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC, NFPA 70), CHAPTER 8.

4. ALL SPECIFIED MATERIAL FOR EACH LOCATION (E.G. OUT DOORS–OCCUPIED, INDOORS–UNOCCUPIED, PLENUMS, RISER SHAFTS, ETC.) SHALL BE APPROVED, LISTED, OR LABELED AS REQUIRED BY THE NEC.

5. RADIO SIGNAL CABLE SHALL BE SUPPORTED AT MINIMUM OF EVERY THREE (3) FEET EXCEPT INSIDE MONOPOLES OR MONOPOLES WHERE CABLE AND CONNECTOR MANUFACTURERS SUPPORT RECOMMENDATIONS SHALL BE FOLLOWED. MANUFACTURER RECOMMENDATION CABLES SUPPORT ACCESSORIES SHALL BE USED.

6. THE OUTDOOR CABLE SUPPORT SYSTEM SHALL BE PROVIDED WITH AN ICE SHIELD TO SUPPORT AND PROTECT ANTENNA CABLE RUNS.

7. DRIP LOOPS SHALL BE REQUIRED ON ALL OUTSIDE CABLES. CABLES SHALL BE SLOPED AWAY FROM BUILDING OR OUTDOOR BTS CABINETS TO PREVENT WATER FROM ENTERING THROUGH THE COAXIAL CABLE PORT.

8. ALL FEEDER LINE AND JUMPER CONNECTORS SHALL BE 7/16 DIN CABLE CONNECTORS THAT MEET IP68 STANDARDS.

9. 7/16 DIN CONNECTORS REQUIRE NO ADDITIONAL WEATHER PROOFING IN INDOOR APPLICATIONS IF INSTALLED AND TORQUED PROPERLY. IN OUTDOOR APPLICATIONS WEATHER PROOFING IS REQUIRED AND THE FOLLOWING PROCEDURE SHOULD BE FOLLOWED.

10. USING WEATHERPROOFING KIT APPROVED BY CABLE MANUFACTURER AND CONTRACTOR START TAPE APPROXIMATELY 5 INCHES FROM THE CONNECTOR, AND WRAP 2 INCHES TOWARD THE CONNECTOR, THEN REVERSE THE TAPE SO THAT THE STICKY SIDE IS UP. TAPE OVER THE CONNECTOR OR SURGE ARRESTOR UNTIL THREE (3) TO FOUR (4) INCHES BEYOND THE CONNECTOR AND REVERSE AGAIN WITH THE STICKY SIDE DOWN FOR ANOTHER INCH OR TWO. PASS THE BUTYL RUBBER AND FINISH WITH A FINAL LAYER OF TAPE.

11. ANTENNAS SHALL BE PAINTED,WHEN REQUIRED, BY THE LANDLORD OR AUTHORITY OF HAVING JURISDICTION IN ACCORDANCE WITH ANTENNA MANUFACTURERS' SURFACES PREPARATION AND PAINTING REQUIREMENTS.

12. CABLE SHIELDS AND TOWER CONDUITS SHALL BE GROUNDED AT THE TOP OF THE TOWER WITHIN 10 FEET OF THEIR CONNECTORS, AND AT THE BOTTOM OF THE TOWER ABOUT 6 INCHES BEFORE THEY TURN TOWARD THE FACILITY. THEY SHALL BE GROUNDED AT THE MIDPOINT OF THE TOWERS THAT ARE BETWEEN 60 FEET AND 200 FEET HIGH, AND AT INTERVALS OF 60 FEET OR LESS ON TOWERS THAT ARE HIGHER THAN 200 FEET.

ANTENNA CABLE AND SCHEDULING NOTES

1. SUBCONTRACTOR SHALL VERIFY THE ACTUAL LENGTH IN THE FIELD BEFORE INSTALLATION.

2. TAG AND COLOR CODE ALL MAIN CABLES AT LOCATIONS PER T–MOBILE ANTENNA CABLE MARKING STANDARD:

- TOP OF TOWER END OF MAIN COAX
- BOTTOM OF TOWER END OF MAIN COAX
- DIRECTLY BEFORE AND AFTER RF EQUIPMENT
- END OF JUMPERS AT BTS EQUIPMENT

3. ANTENNAS SHALL BE PROCURED AND INSTALLED WITH DOWN TILT MOUNTING BRACKETS SUPPLIED BY ANTENNA MANUFACTURER.

4. PRIOR APPROVAL IS REQUIRED BEFORE PERFORMING ANY WORK ON EXISTING CELL SITE EQUIPMENT.

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NO.	DATE	DESCRIPTION
DESIGNED BY: TG		APPROVED BY: DC

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28551
LICENSED PROFESSIONAL ENGINEER

DATE: 02/03/21

SITE NAME: CTNH451A

SITE NUMBER: CTNH451A

SITE ADDRESS: LOWER COUNTY ROAD
ROXBURY, CT 06783

PROJECT TYPE: SPRINT RETAIN

SHEET TITLE: GENERAL NOTES

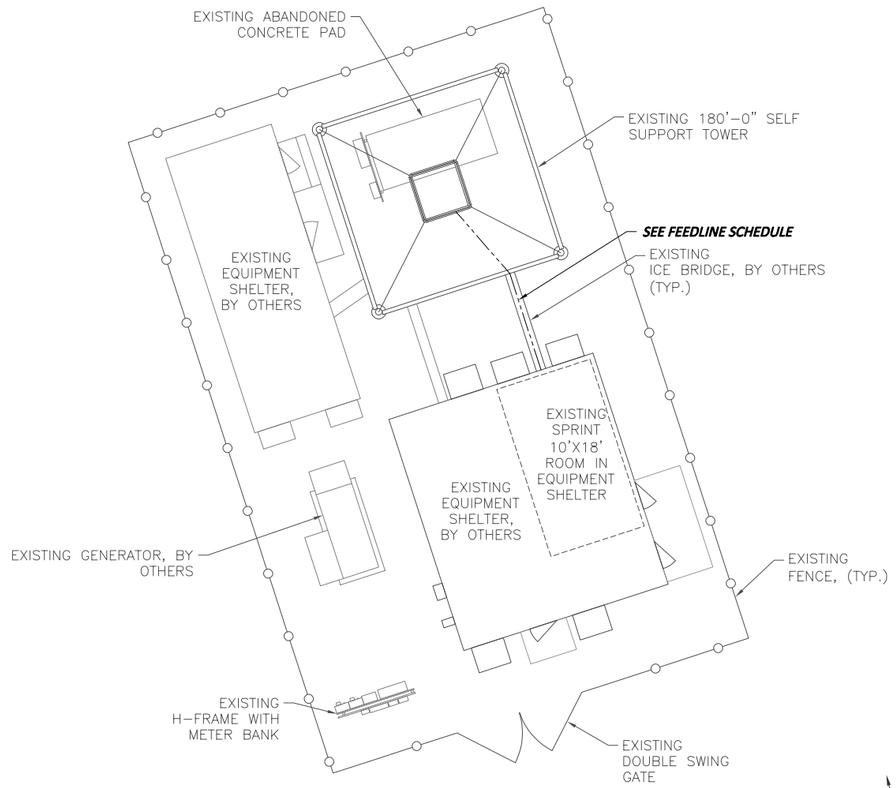
DRAWING #: GN–1 | REVISION: 1

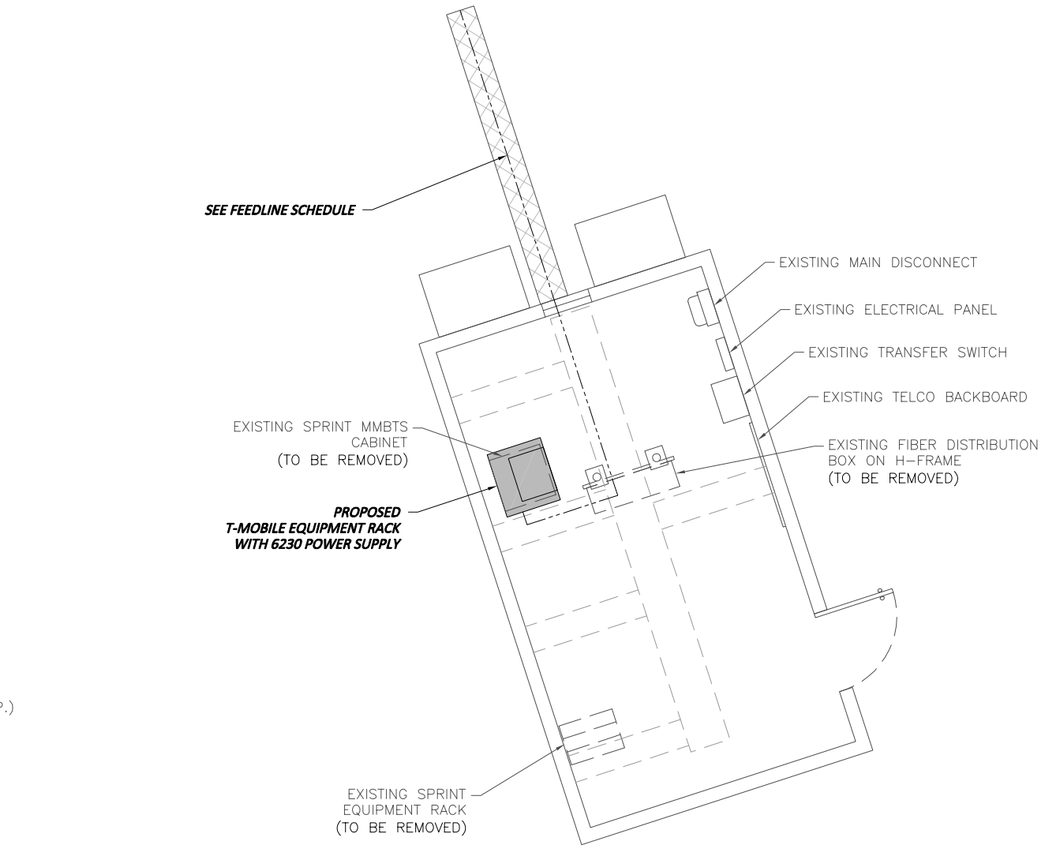
NOTES:

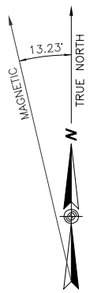
1. REFERENCE STRUCTURAL ANALYSIS BY OTHERS FOR FURTHER INFORMATION REGARDING THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THIS EQUIPMENT UPGRADE.
2. REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

FEEDLINE SCHEDULE	FEEDLINES	LOCATION
A	EXISTING TO BE REMOVED: (3) 1-5/8" COAX	FROM CABINET TO TOP RAD
B	PROPOSED: (3) 6x12 (1-5/8") HYBRID FIBER	FROM CABINET TO TOP RAD

NOTE:
EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON COLLOCATION APPLICATION AND SBA RECORD, NOT FIELD OBSERVATIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.
SEE STRUCTURAL ANALYSIS FOR FEEDLINE INSTALLATION.





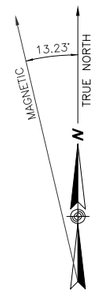


COMPOUND PLAN

SCALE: 1/8" = 1'-0" (22"X34")
1/16" = 1'-0" (11"X17")

GRAPHIC SCALE

8 0 4 8 16 32
(IN FEET)



EQUIPMENT PLAN

SCALE: 3/8" = 1'-0" (22"X34")
3/16" = 1'-0" (11"X17")

GRAPHIC SCALE

2'-8" 0 1'-4" 2'-8" 5'-4" 10'-8"
(IN FEET)

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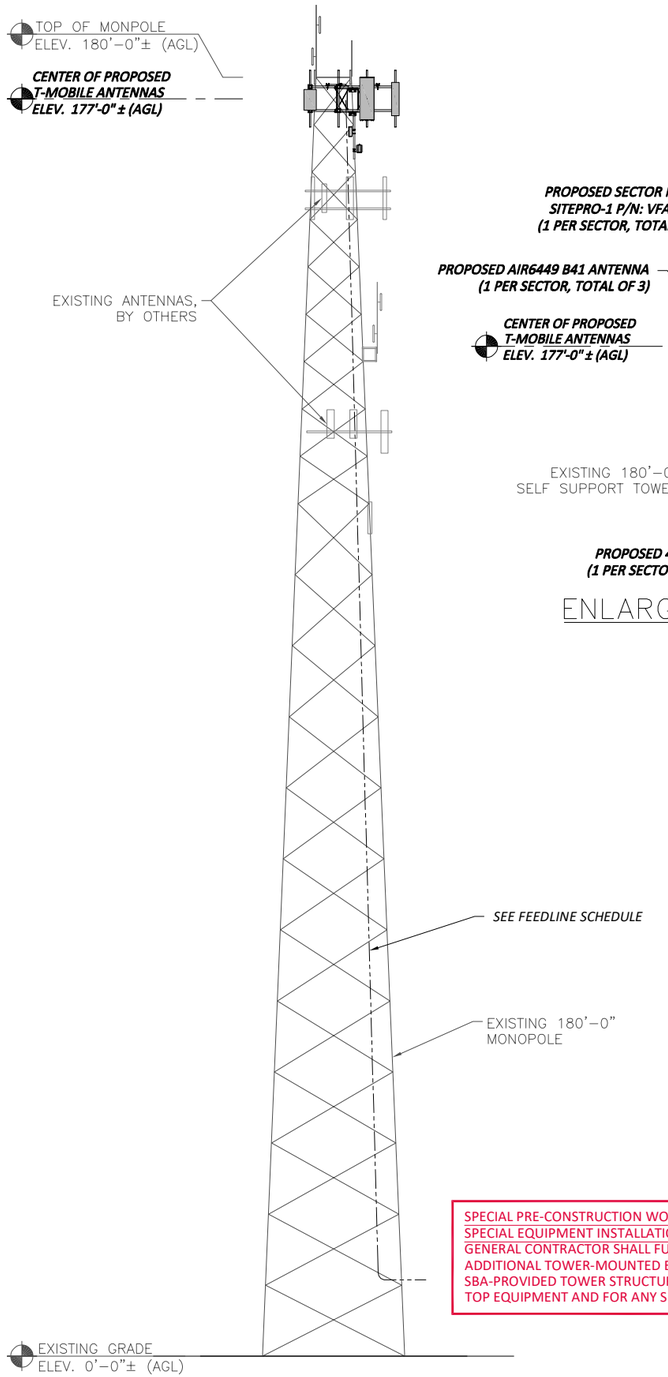
STATE OF CONNECTICUT
DEREK J. CREASER
No. 28551
LICENSED PROFESSIONAL ENGINEER

DATE: 02/03/21

SITE NAME:	CTNH451A
SITE NUMBER:	CTNH451A
SITE ADDRESS:	LOWER COUNTY ROAD ROXBURY, CT 06783
PROJECT TYPE:	SPRINT RETAIN
SHEET TITLE:	COMPOUND & EQUIPMENT PLANS
DRAWING #: A-1	REVISION: 1

NOTES:

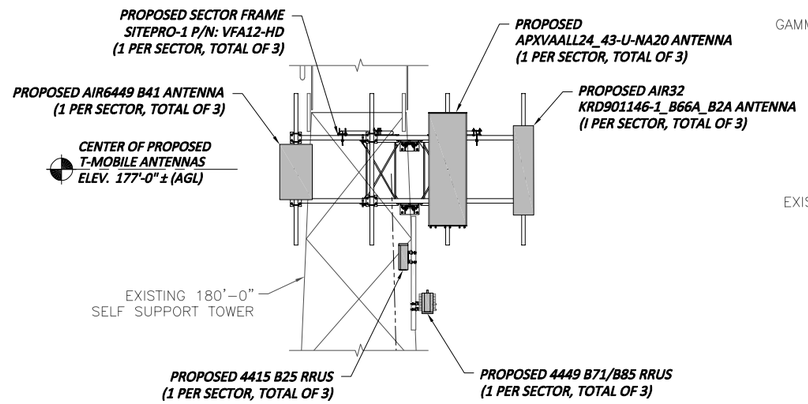
1. REFERENCE STRUCTURAL ANALYSIS BY OTHERS FOR FURTHER INFORMATION REGARDING THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THIS EQUIPMENT UPGRADE.
2. REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



TOWER ELEVATION

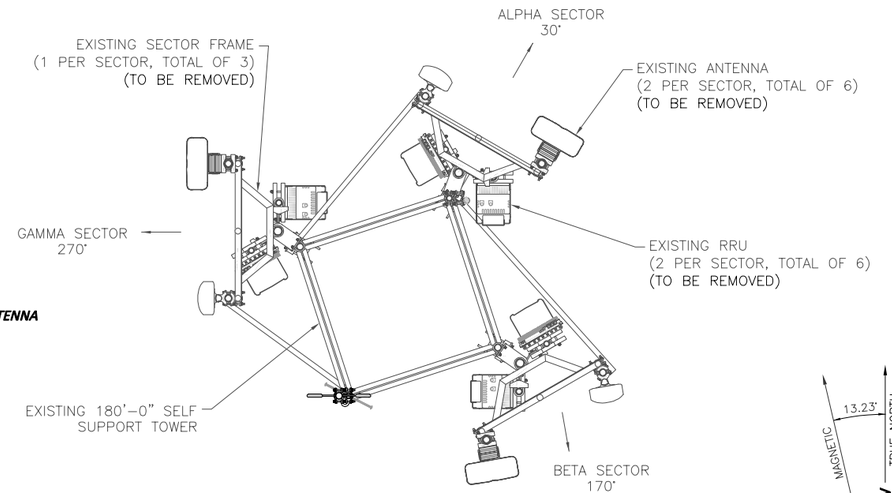
SCALE: 3/32" = 1'-0" (22"X34")
3/64" = 1'-0" (11"X17")

SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS)
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE OR RELOCATION.



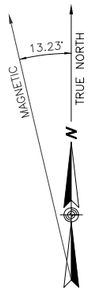
ENLARGED ANTENNA ELEVATION

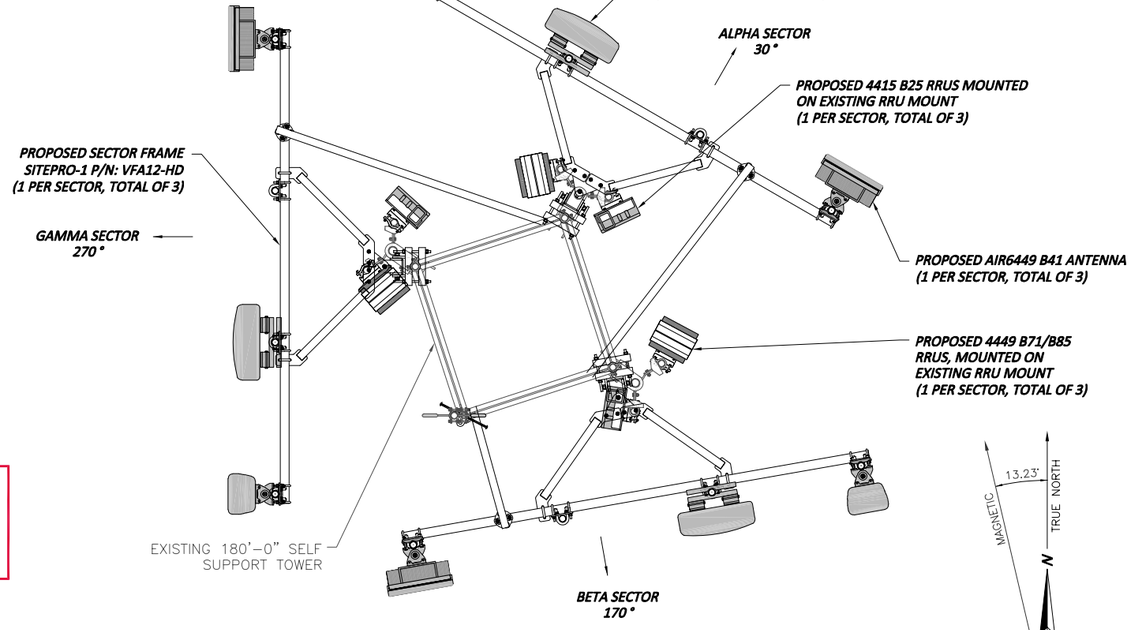
SCALE: N.T.S



EXISTING ANTENNA CONFIGURATION

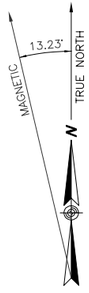
SCALE: N.T.S





PROPOSED ANTENNA CONFIGURATION

SCALE: N.T.S



GRAPHIC SCALE

5'-4" 0 5'-4" 10'-8" 21'-4" 42'-8"
(IN FEET)

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DESIGNED BY:	APPROVED BY:
TG	DC

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28551
LICENSED PROFESSIONAL ENGINEER

DATE: 02/03/21

SITE NAME:	CTNH451A
SITE NUMBER:	CTNH451A
SITE ADDRESS:	LOWER COUNTY ROAD ROXBURY, CT 06783
PROJECT TYPE:	SPRINT RETAIN
SHEET TITLE:	ANTENNA LAYOUT & ELEVATIONS
DRAWING #: A-2	REVISION: 1

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER
A1	PROPOSED	L2100, G1900, L1900	AIR32 KRD901146-1 B66A_B2	56.6x12.9x8.7	±177'	30°	–	–	–	(P) (3) 1-5/8" HCS
A2	PROPOSED	L700, L600, N600, L1900	APXVAALL24_43-U -NA20	95.9x24x8.5	±177'	30°	–	(P) (1) 4449 B71 B85 RRUS (P) (1) 4415 B25 RRUS	15x13.2x10.4 16.5x13.4x5.9	
A3	PROPOSED	L2500, N2500	AIR6449 B41	33.1x20.6x8.6	±177'	30°	–	–	–	
B1	PROPOSED	L2100, G1900, L1900	AIR32 KRD901146-1 B66A_B2	56.6x12.9x8.7	±177'	170°	–	–	–	
B2	PROPOSED	L700, L600, N600, L1900	APXVAALL24_43-U -NA20	95.9x24x8.5	±177'	170°	–	(P) (1) 4449 B71 B85 RRUS (P) (1) 4415 B25 RRUS	15x13.2x10.4 16.5x13.4x5.9	
B3	PROPOSED	L2500, N2500	AIR6449 B41	33.1x20.6x8.6	±177'	170°	–	–	–	
G1	PROPOSED	L2100, G1900, L1900	AIR32 KRD901146-1 B66A_B2	56.6x12.9x8.7	±177'	270°	–	–	–	
G2	PROPOSED	L700, L600, N600, L1900	APXVAALL24_43-U -NA20	95.9x24x8.5	±177'	270°	–	(P) (1) 4449 B71 B85 RRUS (P) (1) 4415 B25 RRUS	15x13.2x10.4 16.5x13.4x5.9	
G3	PROPOSED	L2500, N2500	AIR6449 B41	33.1x20.6x8.6	±177'	270°	–	–	–	

NOTES:

1. REFERENCE STRUCTURAL ANALYSIS BY OTHERS FOR FURTHER INFORMATION REGARDING THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THIS EQUIPMENT UPGRADE.
2. REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

RRU CHART				
QUANTITY	MODEL	L	W	D
3(P)	4449 B71/B85	15.0"	13.2"	10.4"
3(P)	4415 B25	16.5"	13.4"	5.9"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

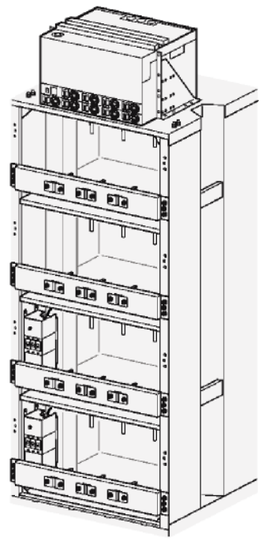
REFER TO THE FINAL RFDS AND TABLE FOR THE PROPOSED RRUS MODEL, QUANTITY, AND DIMENSIONS

RRUS DETAIL

N.T.S.

	Power 6230
Dimensions	6U / 19" rack mount / 15.5" depth
Mounting	Rack, wall
Input voltage	3P+N+PE: 346/200-415/240 VAC 2P+N+PE: 208/120-220/127 1P+N+PE: 200-250 VAC
Input power	<33 kW
Output load (-48VDC)	24 kW
Total capacity (-48VDC)	31.5 kW
PSU capacity	3500 W
PSU slots	9x
AC SPD	Class 2/Type 2
DC SPD	Class 2/Type 2
Ingress protection	IP20
Temperature range	0°C to +50°C
External alarms	32x

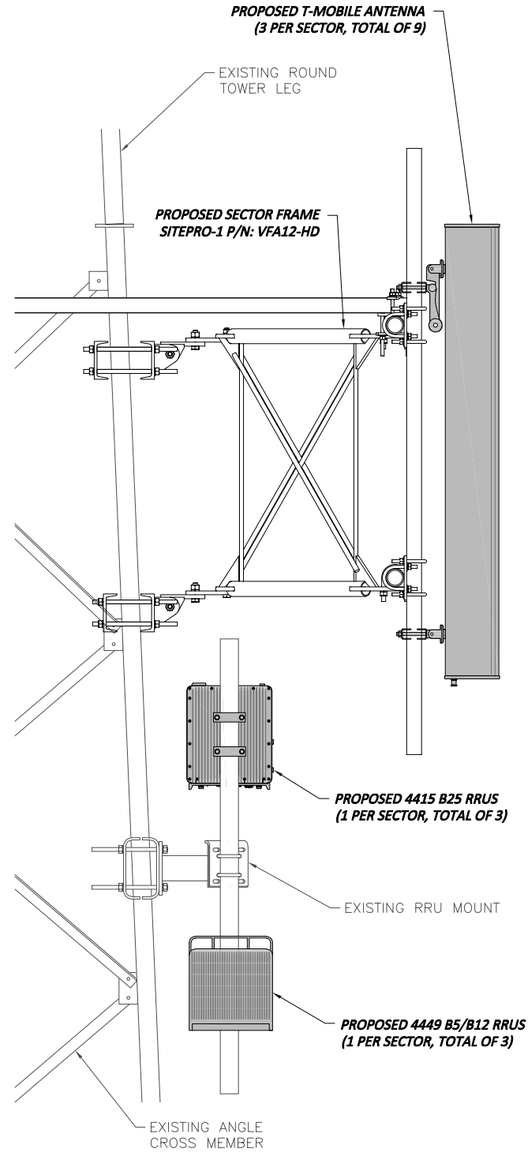
6230 POWER PLANT



EQUIPMENT RACK

EQUIPMENT CABINET DETAIL

N.T.S.



ANTENNA & RRU MOUNTING DETAIL

N.T.S.

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T-MOBILE NORTHEAST, LLC.
15 COMMERCE WAY, SUITE B
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REVISIONS		
1	02/03/21	ISSUED FOR CONSTRUCTION
0	12/22/20	ISSUED FOR REVIEW
NO.	DATE	DESCRIPTION
DESIGNED BY: TG		APPROVED BY: DC

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28551
LICENSED PROFESSIONAL ENGINEER

DATE: 02/03/21

SITE NAME:	CTNH451A
SITE NUMBER:	CTNH451A
SITE ADDRESS:	LOWER COUNTY ROAD ROXBURY, CT 06783
PROJECT TYPE:	SPRINT RETAIN
SHEET TITLE:	DETAILS
DRAWING #: A-3	REVISION: 1

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-G STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND DI.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
12. UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
15. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
16. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
17. ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
19. SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

SPECIAL INSPECTION CHECKLIST	
BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
N/A	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
N/A	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTES:

1. REQUIRED FOR ANY NEW SHOP FABRICATED FRP OR STEEL.
2. PROVIDED BY MANUFACTURER, REQUIRED IF HIGH STRENGTH BOLTS OR STEEL.
3. PROVIDED BY GENERAL CONTRACTOR; PROOF OF MATERIALS.
4. HIGH WIND ZONE INSPECTION CATB 120MPH OR CAT C,D 110MPH INSPECT FRAMING OF WALLS, ANCHORING, FASTENING SCHEDULE.
5. ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY B WITH INSTALLATIONS INTO DRY HOLES DRILLED USING A CARBIDE BIT INTO CRACKED CONCRETE THAT HAS CURED FOR AT LEAST 21 DAYS. ADHESIVE ANCHORS REQUIRING CERTIFIED INSTALLATIONS SHALL BE INSTALLED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER PER ACI 318-11 D.9.2.2. INSTALLATIONS REQUIRING CERTIFIED INSTALLERS SHALL BE INSPECTED PER ACI 318-11 D.8.2.4.
6. AS REQUIRED; FOR ANY FIELD CHANGES TO THE ITEMS IN THIS TABLE.

NOTES:

1. ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4"ø A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
2. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.
3. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED PRIOR TO STEEL FABRICATION.
4. VERIFICATION OF EXISTING ROOF CONSTRUCTION IS REQUIRED PRIOR TO THE INSTALLATION OF THE ROOF PLATFORM. ENGINEER OF RECORD IS TO APPROVE EXISTING CONDITIONS IN ORDER TO MOVE FORWARD.
5. CENTERLINE OF PROPOSED STEEL PLATFORM SUPPORT COLUMNS TO BE CENTRALLY LOCATED OVER THE EXISTING BUILDING COLUMNS.
6. EXISTING BRICK MASONRY COLUMNS/BEARING TO BE REPAIRED/REPLACED AT ALL PROPOSED PLATFORM SUPPORT POINTS. ENGINEER OF RECORD TO REVIEW AND APPROVE.

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CENTERLINE COMMUNICATIONS
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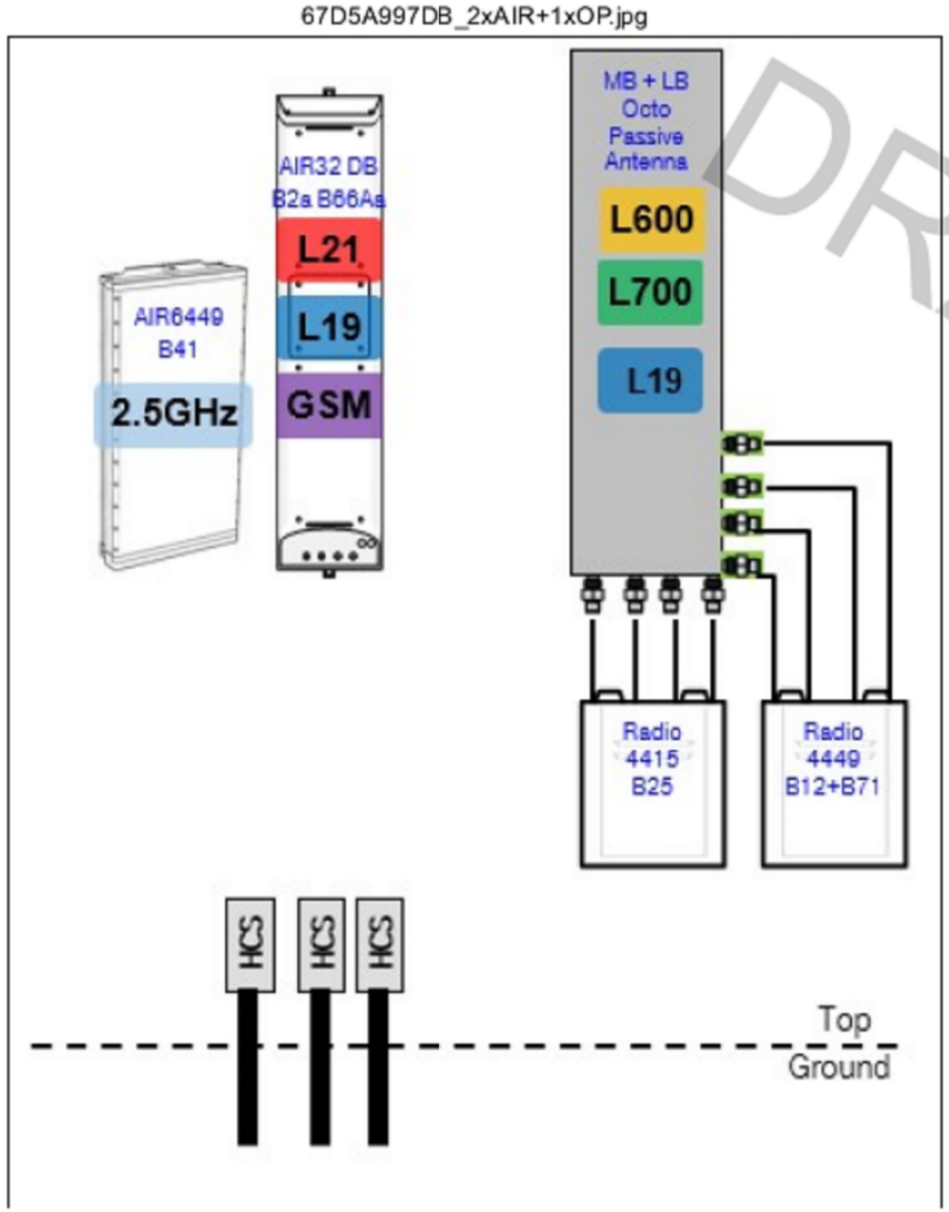
REVISIONS		
1	02/03/21	ISSUED FOR CONSTRUCTION
0	12/22/20	ISSUED FOR REVIEW
NO.	DATE	DESCRIPTION
DESIGNED BY: TG		APPROVED BY: DC

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28551
LICENSED PROFESSIONAL ENGINEER

DATE: 02/03/21

SITE NAME: CTNH451A
SITE NUMBER: CTNH451A
SITE ADDRESS: LOWER COUNTY ROAD ROXBURY, CT 06783
PROJECT TYPE: SPRINT RETAIN
SHEET TITLE: STRUCTURAL NOTES
DRAWING #: SN-1
REVISION: 1



PLUMBING DIAGRAM

N.T.S.

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 23551
LICENSED PROFESSIONAL ENGINEER

DATE: 02/03/21

SITE NAME: CTNH451A

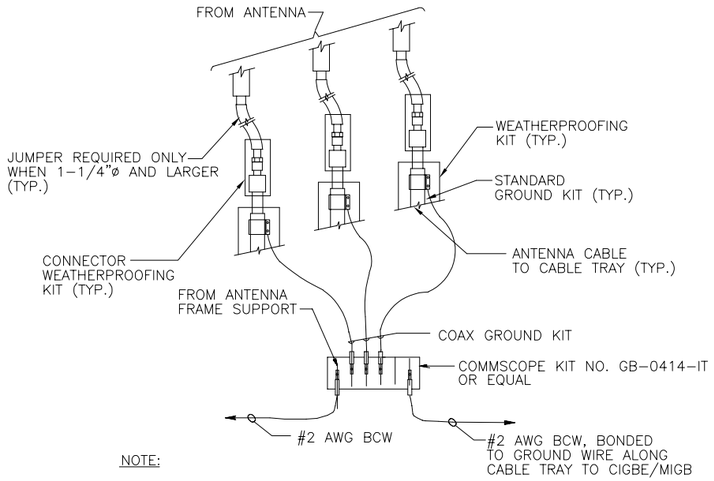
SITE NUMBER: CTNH451A

SITE ADDRESS: LOWER COUNTY ROAD
ROXBURY, CT 06783

PROJECT TYPE: SPRINT RETAIN

SHEET TITLE: RF PLUMBING DIAGRAM

DRAWING #: RF-1 | REVISION: 1

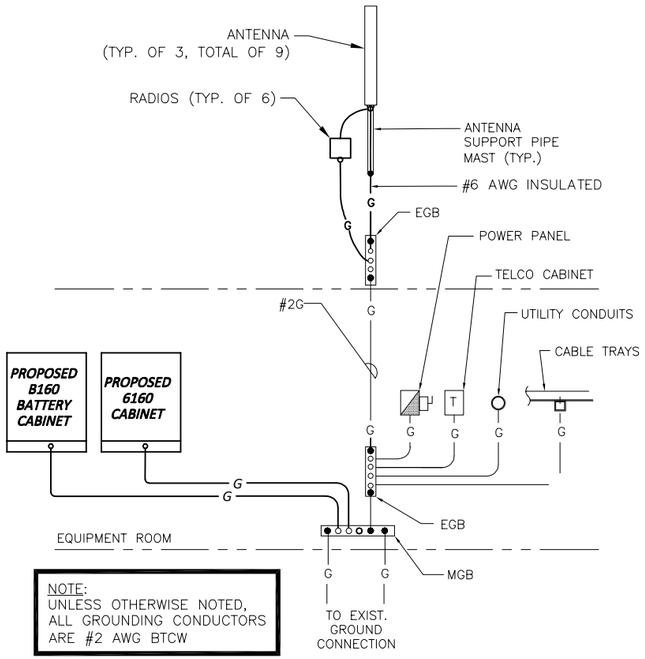


NOTE:

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

GROUNDING RISER DIAGRAM

N.T.S.



NOTE:
UNLESS OTHERWISE NOTED, ALL GROUNDING CONDUCTORS ARE #2 AWG BTCW

GROUNDING RISER DIAGRAM

N.T.S.

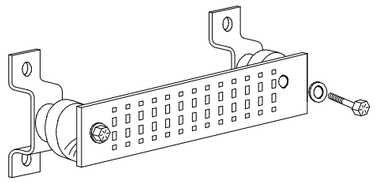
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

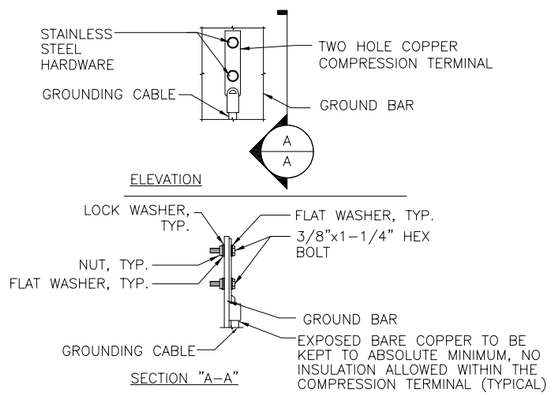
SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)



GROUND BAR DETAIL

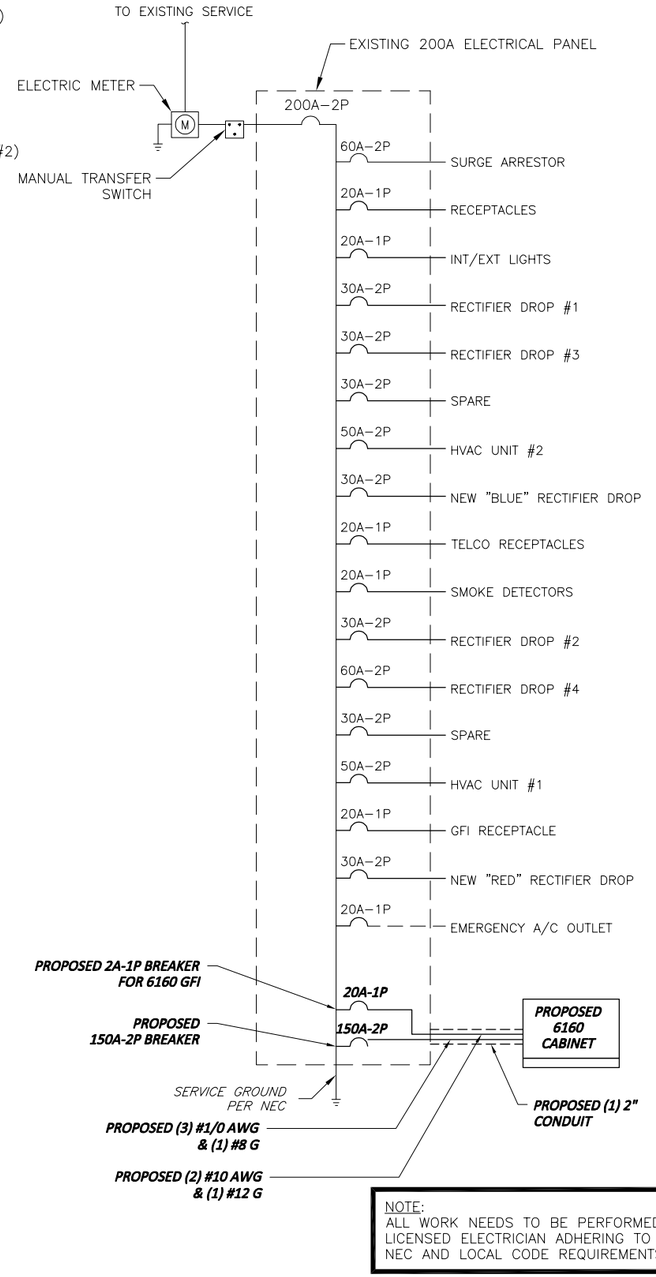
N.T.S.



NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATION.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB

GROUND BAR CONNECTION DETAIL

N.T.S.



NOTE:
ALL WORK NEEDS TO BE PERFORMED BY LICENSED ELECTRICIAN ADHERING TO THE NEC AND LOCAL CODE REQUIREMENTS

ONE LINE POWER DIAGRAM

N.T.S.

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STATE OF CONNECTICUT
DEREK J. CREASER
No. 23551
LICENSED PROFESSIONAL ENGINEER

DATE: 02/03/21

SITE NAME:	CTNH451A
SITE NUMBER:	CTNH451A
SITE ADDRESS:	LOWER COUNTY ROAD ROXBURY, CT 06783
PROJECT TYPE:	SPRINT RETAIN
SHEET TITLE:	GROUNDING DETAILS
DRAWING #: G-1	REVISION: 1

EXHIBIT 7

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 180 ft Nudd Corporation Self Supporting Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT46125-A

Customer Site Name: Roxbury-lower County Rd

Carrier Name: T-Mobile Sprint (App#: 147769, v1)

Carrier Site ID / Name: CT72XC031

Site Location: Lower County Road

Roxbury, Connecticut

Litchfield County

Latitude: 41.559528

Longitude: -73.292305

Analysis Result:

Max Structural Usage: 87.0% [Pass]

Max Foundation Usage: 69.5% [Pass]

Additional Usage Caused by New Mount: +1.0%

Report Prepared By: Walter Velez

3/17/21

Introduction

The purpose of this report is to summarize the analysis results on the 180 ft Nudd Corporation Self Supporting Tower to support the proposed antennas and transmission lines in addition to those currently installed.

The pending modification by **TES** listed under Sources of Information was also considered completed and was included in this analysis.

Sources of Information

Tower Drawings	Original tower profile drawings prepared by Fred. A. Nudd Corporation. Dated 10-12-1999. Drawing No 99-7018-1R. Previous structural report prepared by Tower Engineering Solutions. Dated 12-29-2020. TES Project No 101229.
Foundation Drawing	Original foundation drawings prepared by Fred. A. Nudd Corporation. Dated 09-02-1999. Drawing No 99-7018-2R.
Geotechnical Report	Geotechnical report prepared by Tectonic Engineering Consultants, P.C. Dated 08-04-1999. Work Order No 1170.C056.
Mount Analysis	Mount analysis prepared by Tower Engineering Solutions. Dated 02-24-2021. TES Project No 102644.
Modification Drawings	Previous modifications by URS Corporation. Dated 11-20-2003. Job No VZ1-052/F04. Project No 36921370.
Pending Modification	Tower Engineering Solutions Pending Job # 95831

Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the TIA-222-G**.** In accordance with this standard, the structure was analyzed using **TESTowers,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 120.0 mph (3-Sec. Gust)
(Based on IBC 2015)	Nominal Design Wind Speed V_{asd} = 93.0 mph (3-Sec. Gust)
Basic Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	TIA-222-G-2, 2015 IBC & 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	SS = 0.196, S1 = 0.065

This structural analysis is based upon the tower being classified as Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	179.3	1	10' Dipole	Pipe Mount	(1) 1/2"	Town of Roxbury
2	178.5	1	5' Omni - Whip	Pipe Mount	(1) 7/8"	
3	177.0	3	NNVV-65B-R4 - Panel	(3) Sector Frame w/ (3) Tie Back Kit	(4) 1-1/4" Fiber	Sprint Nextel
4		3	APXVTM14-C-120 - Panel			
5		3	1900 MHz RRU			
6		6	800 MHz RRU			
7		3	TD-RRH 8x20-25 RRU			
8	163.0	3	BXA-70063-6CF-2 - Panel	(3) Sector Frame	(12) 1 5/8"	Verizon
9		6	LPA-80080-6CF - Panel			
10		3	BXA-171085-8CF-2 - Panel			
11		6	FD9R6004/2C-3L			
12	141.5	1	18' Dipole	(2) Side Arms	(2) 1/2"	Town of Roxbury
13		1	10' Dipole			
14	130.0	3	Powerwave 7770 - Panel	(3) Sector Frame w/ (2) New 2" std pipe brace per each sector frame & (2) L3x3x1/4 angles per each Stand-Off Reinforcement	(6) 1 5/8" (1) 7/16" Fiber (2) 3/4" DC (1) 3" Conduit (Housing (1) 7/16" fiber & (2) 3/4" DC)	AT&T
15		2	CCI DMP65R-BU6DA - Panel			
16		2	CCI OPA65R-BU6DA - Panel			
17		1	CCI DMP65R-BU8DA - Panel			
18		1	CCI OPA65R-BU8DA - Panel			
19		3	Powerwave 7020.00 RET			
20		3	Ericsson RRUS 4478 B14			
21		3	Ericsson 4449 B5/B12			
22		3	Ericsson RRUS 8843 B2 B66A			
23		2	Raycap DC6-48-60-18-8F			
24	18.0	1	Yagi	Leg	(1) 1/2"	Town of Roxbury

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
25	177.0	3	Ericsson AIR32 KRD901146-1_B66A_B2A (Octo) - Panel	(3) 12'-6" Heavy Duty V-Frames w/ Stiff Arms (Site Pro VFA12-HD)	(3) 2" Hybrid	T-Mobile Sprint
26		3	RFS APXVAALL24_43-U-NA20 - Panel			
27		3	Ericsson AIR6449 B41 - Panel			
28		3	Ericsson 4415 B25 RRU's			
29		6	ALU 800 MHz RRH's			
30		3	Ericsson 4449 B71 + B85 RRU's			

Please see the attached coax layout for the line placement considered in the analysis.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

Tower Component	Legs	Diagonals	Horizontals	Anchor Bolts
Max. Usage:	**57.7%**	**53.8%**	**3.3%**	**87.0%**
Pass/Fail	**Pass**	**Pass**	**Pass**	**Pass**

Foundations

	Compression (Kips)	Uplift (Kips)	Shear (Kips)
Original Design Reactions	--	242.0	74.0
Analysis Reactions	204.4	188.4	21.6
Factored Reactions*	N/A	326.7	99.9

* Per section 15.5.1 of the TIA-222-G standard, factored reactions were obtained by multiplying a 1.35 factor to the original design reactions.

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.1497 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the structure and its foundation will be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the TIA-222-G-2 Standard, the 2015 IBC and the 2018 Connecticut State Building Code after the following pending modification is successfully completed.

- Pending modification design drawing by **TES** Job # 95831

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.

3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the ANSI/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Structure: CT46125-A-SBA

Site Name:	Roxbury-lower County Rd			**Code:**	EIA/TIA-222-G	3/17/2021
Type:	Self Support	**Base Shape:**	Square	**Basic WS:**	93.00	
Height:	180.00 (ft)	**Base Width:**	20.00	**Basic Ice WS:**	50.00	
Base Elev:	0.00 (ft)	**Top Width:**	5.00	**Operational WS:**	60.00	Page: 1

Section Properties

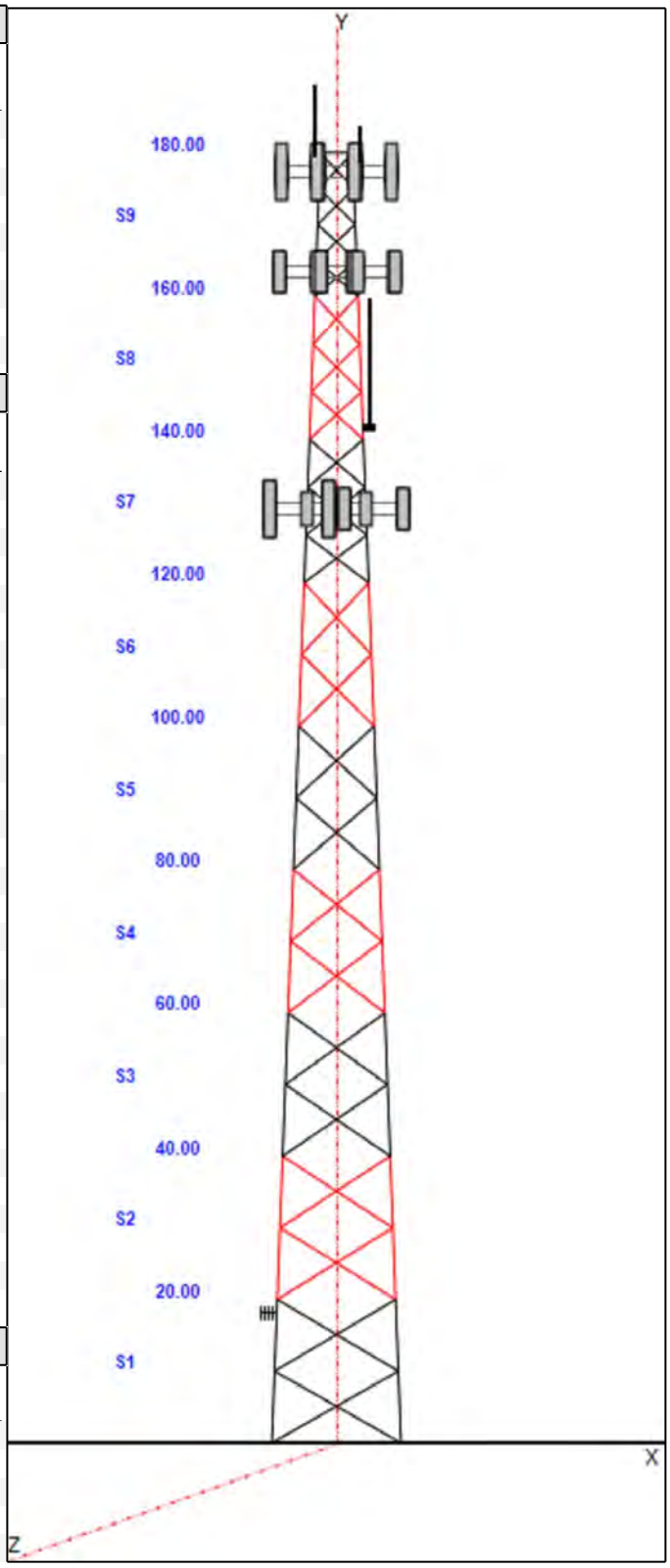
Sect	Leg Members	Diagonal Members	Horizontal Members
1	PST 8" DIA PIPE	SAE 5X5X0.3125	
2	PST 8" DIA PIPE	SAE 4X4X0.375	
3	PST 8" DIA PIPE	SAE 4X4X0.25	
4	PST 6" DIA PIPE	SAE 4X4X0.25	
5	PST 6" DIA PIPE	SAE 3.5X3.5X0.25	
6	PST 5" DIA PIPE	SAE 3.5X3.5X0.25	
7	PST 3-1/2" DIA PIPE	SAE 3X3X0.1875	
8	PST 3" DIA PIPE	SAE 2.5X2.5X0.1875	
9	PST 2-1/2" DIA PIPE	SAE 1.75X1.75X0.1875	SAE 1.75X1.75X0.1875

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description
179.25	184.25	1	10' Dipole
178.50	181.00	1	5' Omni
177.00	177.00	3	Ericsson AIR32 KRD901146-1_B66A_B2A (Octo)
177.00	177.00	3	RFS APXVAALL24_43-U-NA20
177.00	177.00	3	Ericsson AIR6449 B41
177.00	177.00	3	Ericsson 4415 B25 RRU's
177.00	177.00	6	ALU 800 MHz RRH's
177.00	177.00	3	Ericsson 4449 B71 + B85 RRU's
177.00	177.00	1	Heavy Duty V-Frame w/ Stiff Arms (VFA12-HD)
163.00	163.00	3	Sector Frame
163.00	163.00	3	BXA-70063-6CF-2
163.00	163.00	6	LPA-80080-6CF
163.00	163.00	3	BXA-171085-8CF-2
163.00	163.00	6	FD9R6004/2C-3L
141.50	150.50	1	18' Dipole
141.50	146.50	1	10' Dipole
141.50	141.50	2	Side Arm
130.00	130.00	3	Sector Frame
130.00	130.00	1	Mount Reinforcement
130.00	130.00	3	7770
130.00	130.00	2	DMP65R-BU6DA
130.00	130.00	2	OPA65R-BU6DA
130.00	130.00	1	DMP65R-BU8DA
130.00	130.00	1	OPA65R-BU8DA
130.00	130.00	3	RRUS 8843 B2 B66A
130.00	130.00	3	7020.00 RET
130.00	130.00	3	4449 B5/B12
130.00	130.00	3	RRUS 4478 B14
130.00	130.00	2	DC6-48-60-18-8F
18.00	18.00	1	Yagi

Linear Appurtenances

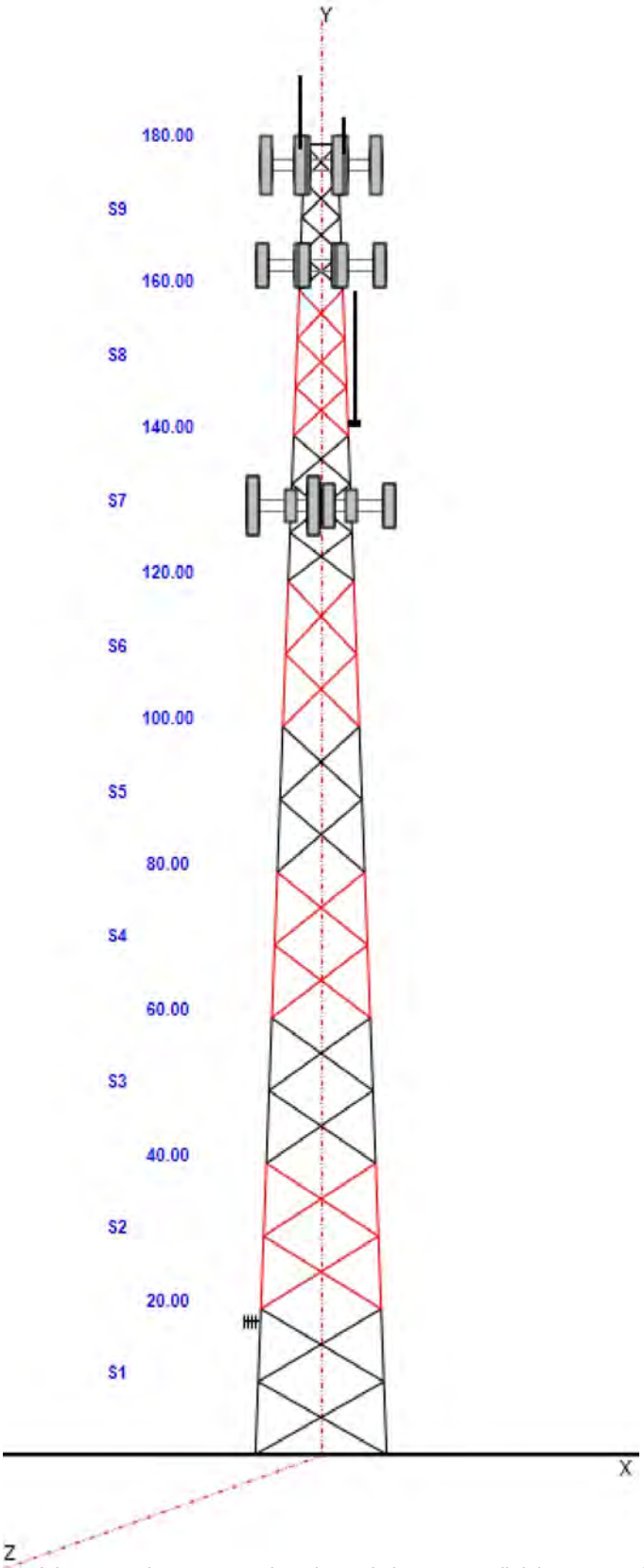
Elev From (ft)	Elev To (ft)	Qty	Description
0.00	180.00	1	W/G Ladder
0.00	179.25	1	1/2" Coax
0.00	178.50	1	7/8" Coax
0.00	177.00	3	2" Hybrid
0.00	163.00	12	1 5/8" Coax
0.00	163.00	1	W/G Ladder
0.00	141.50	1	1/2" Coax



0.00	141.50	1	1/2" Coax
0.00	130.00	6	1 5/8" Coax
0.00	130.00	1	3" Conduit
0.00	130.00	2	3/4" DC
0.00	130.00	1	7/16" Fiber
0.00	130.00	1	W/G Ladder
0.00	18.00	1	1/2" Coax

Base Reactions

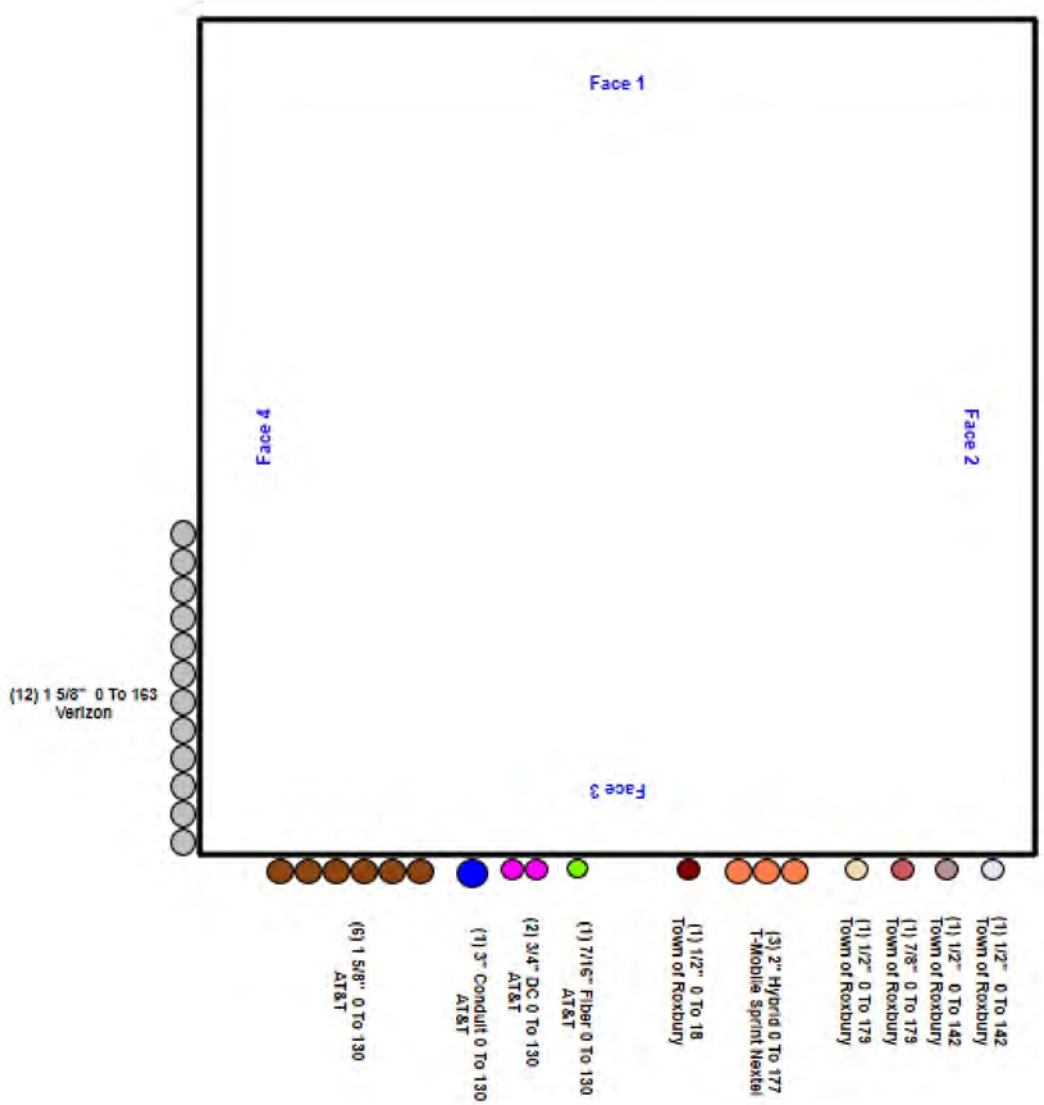
Leg			Overturning	
Max Uplift:	-188.41 (kips	Moment:	5509.69	(ft-kips)
Max Down:	204.41 (kips	Total Down:	54.24	(kips)
Max Shear:	21.56 (kips	Total Shear:	54.92	(kips)



Structure: CT46125-A-SBA - Coax Line Placement

Type: Self Support
Site Name: Roxbury-lower County Rd
Height: 180.00 (ft)

3/17/2021



Loading Summary

Structure:	CT46125-A-SBA		**Code:**	EIA/TIA-222-G	3/17/2021
Site Name:	Roxbury-lower County Rd		**Exposure:**	C	
Height:	180.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 5

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Discrete Appurtenances Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	Ice Weight (lb)	Ice CaAa (sf)	Len (in)	Width (in)	Depth (in)	Ka	Orientation Factor	Vert Ecc (ft)
179.25	10' Dipole	1	30.00	3.760	142.99	9.836	120.000	3.000	3.000	1.00	1.00	5.000
178.50	5' Omni	1	10.00	1.000	37.79	2.390	60.000	2.000	2.000	1.00	1.00	2.500
177.00	Ericsson AIR32	3	132.20	6.510	318.18	7.647	56.600	12.900	8.700	0.80	0.86	0.000
177.00	RFS APXVAALL24_43-U-NA20	3	122.80	20.240	556.57	22.165	95.900	24.000	8.500	0.80	0.72	0.000
177.00	Ericsson AIR6449 B41	3	103.00	5.650	241.85	6.612	33.100	20.500	8.300	0.80	0.71	0.000
177.00	Ericsson 4415 B25 RRU's	3	46.00	1.840	87.62	2.425	16.500	13.400	5.900	0.80	0.67	0.000
177.00	ALU 800 MHz RRH's	6	53.00	2.130	102.08	2.732	19.700	13.000	10.800	0.80	0.67	0.000
177.00	Ericsson 4449 B71 + B85 RRU's	3	75.00	1.950	128.02	2.570	17.900	13.100	10.600	0.80	0.67	0.000
177.00	Heavy Duty V-Frame w/ Stiff Arms	1	2322.0	50.700	4619.92	115.21	0.000	0.000	0.000	0.75	1.00	0.000
163.00	Sector Frame	3	500.00	17.500	1206.88	31.602	0.000	0.000	0.000	0.75	0.75	0.000
163.00	BXA-70063-6CF-2	3	17.00	7.570	167.16	10.369	71.000	11.200	5.200	0.80	0.73	0.000
163.00	LPA-80080-6CF	6	21.00	4.330	191.55	5.723	70.900	5.500	13.200	0.80	0.92	0.000
163.00	BXA-171085-8CF-2	3	10.50	2.940	76.87	4.619	48.500	6.100	4.100	0.80	0.84	0.000
163.00	FD9R6004/2C-3L	6	3.10	0.360	11.23	0.809	5.800	6.500	1.500	0.80	0.67	0.000
141.50	18' Dipole	1	55.00	6.770	251.89	17.327	216.000	3.000	3.000	1.00	1.00	9.000
141.50	10' Dipole	1	30.00	3.760	140.00	9.675	120.000	3.000	3.000	1.00	1.00	5.000
141.50	Side Arm	2	120.00	3.000	223.23	6.448	0.000	0.000	0.000	0.90	0.90	0.000
130.00	Sector Frame	3	500.00	17.500	1188.17	31.229	0.000	0.000	0.000	0.75	0.75	0.000
130.00	Mount Reinforcement	1	650.00	15.500	1455.16	31.500	0.000	0.000	0.000	0.75	1.00	0.000
130.00	7770	3	35.00	5.500	167.82	6.549	55.000	11.000	5.000	0.80	0.73	0.000
130.00	DMP65R-BU6DA	2	79.40	12.710	369.76	14.153	71.200	20.700	7.700	0.80	0.73	0.000
130.00	OPA65R-BU6DA	2	63.30	12.800	346.09	14.176	71.200	20.700	7.700	0.80	0.73	0.000
130.00	DMP65R-BU8DA	1	96.00	17.870	447.06	19.899	96.000	20.700	7.700	0.80	0.73	0.000
130.00	OPA65R-BU8DA	1	76.50	18.090	367.05	20.742	96.000	21.000	7.800	0.80	0.73	0.000
130.00	RRUS 8843 B2 B66A	3	72.00	1.640	118.18	2.130	14.900	13.200	10.900	0.80	0.67	0.000
130.00	7020.00 RET	3	2.20	0.400	12.28	0.877	4.900	8.300	2.400	0.80	0.67	0.000
130.00	4449 B5/B12	3	71.00	1.970	123.62	2.510	17.900	13.200	9.400	0.80	0.67	0.000
130.00	RRUS 4478 B14	3	59.40	1.650	100.28	2.161	15.000	13.200	7.300	0.80	0.67	0.000
130.00	DC6-48-60-18-8F	2	31.80	0.920	92.75	1.352	24.000	11.000	11.000	0.90	0.90	0.000
18.00	Yagi	1	5.00	1.310	36.73	3.246	24.000	24.000	2.000	1.00	1.00	0.000
	Totals:	**77**	**9,564.40**		**24,871.83**						**Number of Appurtenances :**	**30**

Linear Appurtenances Properties

Elev. From (ft)	Elev. To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Block	Spread On Faces	Bundling Arrangement	Cluster Dia (in)	Out of Zone	Spacing (in)	Orientation Factor	Ka Override
0.00	180.00	W/G Ladder	1	2.00	6.00	100.00	3	Individual NR		N	1.00	1.00	
0.00	179.25	1/2" Coax	1	0.65	0.16	100.00	3	Individual NR		N	1.00	1.00	
0.00	178.50	7/8" Coax	1	1.11	0.52	100.00	3	Individual NR		N	1.00	1.00	
0.00	177.00	2" Hybrid	3	2.00	1.61	100.00	3	Individual IR		N	1.00	1.00	
0.00	163.00	1 5/8" Coax	12	1.98	1.04	100.00	4	Individual IR		N	1.00	1.00	
0.00	163.00	W/G Ladder	1	2.00	6.00	100.00	4	Individual NR		N	1.00	1.00	
0.00	141.50	1/2" Coax	1	0.65	0.16	100.00	3	Individual NR		N	1.00	1.00	
0.00	141.50	1/2" Coax	1	0.65	0.16	100.00	3	Individual NR		N	1.00	1.00	
0.00	130.00	1 5/8" Coax	6	1.98	1.04	100.00	3	Individual IR		N	1.00	1.00	
0.00	130.00	3" Conduit	1	3.00	1.78	100.00	3	Individual NR		N	1.00	1.00	
0.00	130.00	3/4" DC	2	0.75	0.40	100.00	3	Individual IR		N	1.00	1.00	
0.00	130.00	7/16" Fiber	1	0.44	0.10	100.00	3	Individual NR		N	1.00	1.00	
0.00	130.00	W/G Ladder	1	2.00	6.00	100.00	3	Individual NR		N	1.00	1.00	
0.00	18.00	1/2" Coax	1	0.65	0.16	100.00	3	Individual NR		N	1.00	1.00	

Section Forces

Structure:	CT46125-A-SBA	**Code:**	EIA/TIA-222-G	3/17/2021	
Site Name:	Roxbury-lower County Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 7	

Load Case: 1.2D + 1.6W Normal Wind — 1.2D + 1.6W 93 mph Wind at Normal To Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	10.0	16.00	34.841	28.80	0.00	0.16	3.16	1.00	1.00	0.00	47.36	93.71	0.00	8,110.7	0.0	3254.04	1572.32	4,826.36
2	30.0	18.49	25.923	28.80	0.00	0.15	3.20	1.00	1.00	0.00	37.98	92.73	0.00	7,624.6	0.0	3059.85	1799.31	4,859.16
3	50.0	20.59	24.019	28.80	0.00	0.16	3.16	1.00	1.00	0.00	36.22	92.73	0.00	6,204.9	0.0	3204.65	2003.60	5,208.25
4	70.0	22.10	22.338	22.12	0.00	0.15	3.20	1.00	1.00	0.00	32.47	92.73	0.00	5,108.0	0.0	3122.56	2150.67	5,273.24
5	90.0	23.30	18.040	22.12	0.00	0.15	3.19	1.00	1.00	0.00	28.05	92.73	0.00	4,693.3	0.0	2831.94	2267.53	5,099.47
6	110.0	24.30	16.644	18.58	0.00	0.16	3.18	1.00	1.00	0.00	25.75	92.73	0.00	4,134.2	0.0	2704.59	2365.37	5,069.96
7	130.0	25.17	16.479	13.36	0.00	0.16	3.17	1.00	1.00	0.00	23.83	77.05	0.00	2,994.3	0.0	2588.31	2036.09	4,624.40
8	150.0	25.94	12.181	11.69	0.00	0.15	3.19	1.00	1.00	0.00	18.82	59.36	0.00	2,337.2	0.0	2117.92	1620.84	3,738.75
9	170.0	26.63	9.381	9.60	0.00	0.16	3.18	1.00	1.00	0.00	14.84	21.03	0.00	1,558.2	0.0	1706.59	615.05	2,321.64
														42,765.5	**0.0**			**41,021.24**

Load Case: 1.2D + 1.6W 45° Wind — 1.2D + 1.6W 93 mph Wind at 45° From Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	10.0	16.00	34.841	28.80	0.00	0.16	3.16	1.12	1.12	0.00	53.04	93.71	0.00	8,110.7	0.0	3644.58	1572.32	5,216.90
2	30.0	18.49	25.923	28.80	0.00	0.15	3.20	1.11	1.11	0.00	42.26	92.73	0.00	7,624.6	0.0	3404.51	1799.31	5,203.82
3	50.0	20.59	24.019	28.80	0.00	0.16	3.16	1.12	1.12	0.00	40.55	92.73	0.00	6,204.9	0.0	3588.13	2003.60	5,591.73
4	70.0	22.10	22.338	22.12	0.00	0.15	3.20	1.11	1.11	0.00	36.15	92.73	0.00	5,108.0	0.0	3476.27	2150.67	5,626.94
5	90.0	23.30	18.040	22.12	0.00	0.15	3.19	1.12	1.12	0.00	31.28	92.73	0.00	4,693.3	0.0	3158.72	2267.53	5,426.25
6	110.0	24.30	16.644	18.58	0.00	0.16	3.18	1.12	1.12	0.00	28.76	92.73	0.00	4,134.2	0.0	3020.78	2365.37	5,386.15
7	130.0	25.17	16.479	13.36	0.00	0.16	3.17	1.12	1.12	0.00	26.64	77.05	0.00	2,994.3	0.0	2893.15	2036.09	4,929.23
8	150.0	25.94	12.181	11.69	0.00	0.15	3.19	1.11	1.11	0.00	20.98	59.36	0.00	2,337.2	0.0	2361.20	1620.84	3,982.04
9	170.0	26.63	9.381	9.60	0.00	0.16	3.18	1.12	1.12	0.00	16.57	21.03	0.00	1,558.2	0.0	1906.61	615.05	2,521.66
														42,765.5	**0.0**			**43,884.72**

Section Forces

Structure:	CT46125-A-SBA	**Code:**	EIA/TIA-222-G	3/17/2021	
Site Name:	Roxbury-lower County Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W Normal Wind — 0.9D + 1.6W 93 mph Wind at Normal To Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	10.0	16.00	34.841	28.80	0.00	0.16	3.16	1.00	1.00	0.00	47.36	93.71	0.00	6,083.1	0.0	3254.04	1572.32	4,826.36
2	30.0	18.49	25.923	28.80	0.00	0.15	3.20	1.00	1.00	0.00	37.98	92.73	0.00	5,718.4	0.0	3059.85	1799.31	4,859.16
3	50.0	20.59	24.019	28.80	0.00	0.16	3.16	1.00	1.00	0.00	36.22	92.73	0.00	4,653.7	0.0	3204.65	2003.60	5,208.25
4	70.0	22.10	22.338	22.12	0.00	0.15	3.20	1.00	1.00	0.00	32.47	92.73	0.00	3,831.0	0.0	3122.56	2150.67	5,273.24
5	90.0	23.30	18.040	22.12	0.00	0.15	3.19	1.00	1.00	0.00	28.05	92.73	0.00	3,519.9	0.0	2831.94	2267.53	5,099.47
6	110.0	24.30	16.644	18.58	0.00	0.16	3.18	1.00	1.00	0.00	25.75	92.73	0.00	3,100.7	0.0	2704.59	2365.37	5,069.96
7	130.0	25.17	16.479	13.36	0.00	0.16	3.17	1.00	1.00	0.00	23.83	77.05	0.00	2,245.7	0.0	2588.31	2036.09	4,624.40
8	150.0	25.94	12.181	11.69	0.00	0.15	3.19	1.00	1.00	0.00	18.82	59.36	0.00	1,752.9	0.0	2117.92	1620.84	3,738.75
9	170.0	26.63	9.381	9.60	0.00	0.16	3.18	1.00	1.00	0.00	14.84	21.03	0.00	1,168.6	0.0	1706.59	615.05	2,321.64
														32,074.1	**0.0**			**41,021.24**

Load Case: 0.9D + 1.6W 45° Wind — 0.9D + 1.6W 93 mph Wind at 45° From Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	10.0	16.00	34.841	28.80	0.00	0.16	3.16	1.12	1.12	0.00	53.04	93.71	0.00	6,083.1	0.0	3644.58	1572.32	5,216.90
2	30.0	18.49	25.923	28.80	0.00	0.15	3.20	1.11	1.11	0.00	42.26	92.73	0.00	5,718.4	0.0	3404.51	1799.31	5,203.82
3	50.0	20.59	24.019	28.80	0.00	0.16	3.16	1.12	1.12	0.00	40.55	92.73	0.00	4,653.7	0.0	3588.13	2003.60	5,591.73
4	70.0	22.10	22.338	22.12	0.00	0.15	3.20	1.11	1.11	0.00	36.15	92.73	0.00	3,831.0	0.0	3476.27	2150.67	5,626.94
5	90.0	23.30	18.040	22.12	0.00	0.15	3.19	1.12	1.12	0.00	31.28	92.73	0.00	3,519.9	0.0	3158.72	2267.53	5,426.25
6	110.0	24.30	16.644	18.58	0.00	0.16	3.18	1.12	1.12	0.00	28.76	92.73	0.00	3,100.7	0.0	3020.78	2365.37	5,386.15
7	130.0	25.17	16.479	13.36	0.00	0.16	3.17	1.12	1.12	0.00	26.64	77.05	0.00	2,245.7	0.0	2893.15	2036.09	4,929.23
8	150.0	25.94	12.181	11.69	0.00	0.15	3.19	1.11	1.11	0.00	20.98	59.36	0.00	1,752.9	0.0	2361.20	1620.84	3,982.04
9	170.0	26.63	9.381	9.60	0.00	0.16	3.18	1.12	1.12	0.00	16.57	21.03	0.00	1,168.6	0.0	1906.61	615.05	2,521.66
														32,074.1	**0.0**			**43,884.72**

Section Forces

Structure:	CT46125-A-SBA	**Code:**	EIA/TIA-222-G	3/17/2021	
Site Name:	Roxbury-lower County Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 9	

Load Case: 1.2D + 1.0Di + 1.0Wi Normal Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	10.0	4.62	34.841	56.88	28.08	0.23	2.86	1.00	1.00	1.33	67.83	156.44	30.62	16,390.	8280.1	763.10	693.55	1,456.65
2	30.0	5.34	25.923	58.69	29.89	0.23	2.86	1.00	1.00	1.49	59.97	159.07	29.72	15,859.	8235.1	778.59	810.19	1,588.78
3	50.0	5.95	24.019	58.77	29.97	0.25	2.79	1.00	1.00	1.56	58.35	160.88	31.27	14,668.	8463.1	823.25	914.54	1,737.79
4	70.0	6.39	22.338	51.62	29.50	0.25	2.79	1.00	1.00	1.62	52.50	162.13	32.34	13,319.	8211.8	794.51	993.75	1,788.26
5	90.0	6.73	18.040	50.90	28.78	0.26	2.74	1.00	1.00	1.66	47.93	163.09	33.17	12,552.	7859.0	752.12	1054.06	1,806.19
6	110.0	7.02	16.644	46.51	27.94	0.27	2.69	1.00	1.00	1.69	44.13	163.88	33.84	11,773.	7639.1	708.38	1103.42	1,811.80
7	130.0	7.28	16.479	44.36	31.00	0.31	2.55	1.00	1.00	1.72	43.20	135.26	28.67	9,907.3	6913.0	681.96	937.98	1,619.94
8	150.0	7.50	12.181	40.87	29.18	0.33	2.49	1.00	1.00	1.75	37.04	104.30	12.51	7,756.5	5419.2	588.87	695.70	1,284.58
9	170.0	7.70	9.381	41.00	31.40	0.40	2.29	1.00	1.00	1.77	35.39	39.28	11.12	5,253.6	3695.4	530.77	301.76	832.53
														107,481.4	**64715.9**			**13,926.52**

Load Case: 1.2D + 1.0Di + 1.0Wi 45° Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at 45° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	10.0	4.62	34.841	56.88	28.08	0.23	2.86	1.17	1.17	1.33	79.43	156.44	30.62	16,390.	8280.1	893.64	693.55	1,587.19
2	30.0	5.34	25.923	58.69	29.89	0.23	2.86	1.17	1.17	1.49	70.28	159.07	29.72	15,859.	8235.1	912.37	810.19	1,722.56
3	50.0	5.95	24.019	58.77	29.97	0.25	2.79	1.18	1.18	1.56	69.12	160.88	31.27	14,668.	8463.1	975.27	914.54	1,889.81
4	70.0	6.39	22.338	51.62	29.50	0.25	2.79	1.19	1.19	1.62	62.21	162.13	32.34	13,319.	8211.8	941.53	993.75	1,935.28
5	90.0	6.73	18.040	50.90	28.78	0.26	2.74	1.19	1.19	1.66	57.22	163.09	33.17	12,552.	7859.0	898.02	1054.06	1,952.08
6	110.0	7.02	16.644	46.51	27.94	0.27	2.69	1.20	1.20	1.69	52.96	163.88	33.84	11,773.	7639.1	850.06	1103.42	1,953.48
7	130.0	7.28	16.479	44.36	31.00	0.31	2.55	1.20	1.20	1.72	51.84	135.26	28.67	9,907.3	6913.0	818.35	937.98	1,756.33
8	150.0	7.50	12.181	40.87	29.18	0.33	2.49	1.20	1.20	1.75	44.44	104.30	12.51	7,756.5	5419.2	706.65	695.70	1,402.35
9	170.0	7.70	9.381	41.00	31.40	0.40	2.29	1.20	1.20	1.77	42.47	39.28	11.12	5,253.6	3695.4	636.92	301.76	938.68
														107,481.4	**64715.9**			**15,137.77**

Section Forces

Structure:	CT46125-A-SBA	**Code:**	EIA/TIA-222-G	3/17/2021	
Site Name:	Roxbury-lower County Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 10	

Load Case: 1.0D + 1.0W Normal Wind — 1.0D + 1.0W 60 mph Wind at Normal To Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	10.0	6.66	34.841	28.80	0.00	0.16	3.16	1.00	1.00	0.00	50.21	93.71	0.00	6,759.0	0.0	897.46	409.03	1,306.49
2	30.0	7.69	25.923	28.80	0.00	0.15	3.20	1.00	1.00	0.00	40.83	92.73	0.00	6,353.8	0.0	855.66	468.08	1,323.74
3	50.0	8.57	24.019	28.80	0.00	0.16	3.16	1.00	1.00	0.00	38.68	92.73	0.00	5,170.8	0.0	890.43	521.23	1,411.66
4	70.0	9.20	22.338	22.12	0.00	0.15	3.20	1.00	1.00	0.00	34.50	92.73	0.00	4,256.7	0.0	862.99	559.49	1,422.48
5	90.0	9.70	18.040	22.12	0.00	0.15	3.19	1.00	1.00	0.00	30.11	92.73	0.00	3,911.1	0.0	790.93	589.89	1,380.81
6	110.0	10.12	16.644	18.58	0.00	0.16	3.18	1.00	1.00	0.00	27.20	92.73	0.00	3,445.2	0.0	743.05	615.34	1,358.39
7	130.0	10.48	16.479	13.36	0.00	0.16	3.17	1.00	1.00	0.00	24.07	77.05	0.00	2,495.3	0.0	679.97	529.68	1,209.65
8	150.0	10.80	12.181	11.69	0.00	0.15	3.19	1.00	1.00	0.00	18.82	59.36	0.00	1,947.7	0.0	550.97	421.65	972.62
9	170.0	11.09	9.381	9.60	0.00	0.16	3.18	1.00	1.00	0.00	14.84	21.03	0.00	1,298.5	0.0	443.96	160.00	603.97
														35,637.9	**0.0**			**10,989.81**

Load Case: 1.0D + 1.0W 45° Wind — 1.0D + 1.0W 60 mph Wind at 45° From Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

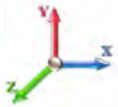
Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	10.0	6.66	34.841	28.80	0.00	0.16	3.16	1.12	1.12	0.00	56.23	93.71	0.00	6,759.0	0.0	1005.17	409.03	1,414.20
2	30.0	7.69	25.923	28.80	0.00	0.15	3.20	1.11	1.11	0.00	45.43	92.73	0.00	6,353.8	0.0	952.04	468.08	1,420.12
3	50.0	8.57	24.019	28.80	0.00	0.16	3.16	1.12	1.12	0.00	43.31	92.73	0.00	5,170.8	0.0	996.98	521.23	1,518.21
4	70.0	9.20	22.338	22.12	0.00	0.15	3.20	1.11	1.11	0.00	38.40	92.73	0.00	4,256.7	0.0	960.75	559.49	1,520.24
5	90.0	9.70	18.040	22.12	0.00	0.15	3.19	1.12	1.12	0.00	33.58	92.73	0.00	3,911.1	0.0	882.19	589.89	1,472.08
6	110.0	10.12	16.644	18.58	0.00	0.16	3.18	1.12	1.12	0.00	30.38	92.73	0.00	3,445.2	0.0	829.92	615.34	1,445.26
7	130.0	10.48	16.479	13.36	0.00	0.16	3.17	1.12	1.12	0.00	26.90	77.05	0.00	2,495.3	0.0	760.05	529.68	1,289.73
8	150.0	10.80	12.181	11.69	0.00	0.15	3.19	1.11	1.11	0.00	20.98	59.36	0.00	1,947.7	0.0	614.26	421.65	1,035.91
9	170.0	11.09	9.381	9.60	0.00	0.16	3.18	1.12	1.12	0.00	16.57	21.03	0.00	1,298.5	0.0	496.00	160.00	656.00
														35,637.9	**0.0**			**11,771.74**

Force/Stress Compression Summary

Structure:	CT46125-A-SBA	**Code:**	EIA/TIA-222-G	3/17/2021	
Site Name:	Roxbury-lower County Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 11	



Tower Engineering Solutions

LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	20	PST - 8" DIA PIPE	-197.62	1.2D + 1.6W 45° Wind	10.02	100	100	100	40.89	54.00	357.75	55.2	Member X
2	40	PST - 8" DIA PIPE	-174.79	1.2D + 1.6W 45° Wind	10.02	100	100	100	40.89	54.00	357.75	48.9	Member X
3	60	PST - 8" DIA PIPE	-149.95	1.2D + 1.6W 45° Wind	10.02	100	100	100	40.89	54.00	357.75	41.9	Member X
4	80	PST - 6" DIA PIPE	-124.98	1.2D + 1.6W 45° Wind	10.02	100	100	100	53.43	54.00	216.46	57.7	Member X
5	100	PST - 6" DIA PIPE	-99.99	1.2D + 1.6W 45° Wind	10.02	100	100	100	53.43	54.00	216.46	46.2	Member X
6	120	PST - 5" DIA PIPE	-74.70	1.2D + 1.6W 45° Wind	10.02	100	100	100	63.94	54.00	151.32	49.4	Member X
7	140	PST - 3-1/2" DIA PIPE	-51.12	1.2D + 1.6W 45° Wind	6.68	100	100	100	59.81	54.00	98.20	52.1	Member X
8	160	PST - 3" DIA PIPE	-29.52	1.2D + 1.6W 45° Wind	6.68	100	100	100	69.09	54.00	74.35	39.7	Member X
9	180	PST - 2-1/2" DIA PIPE	-11.71	1.2D + 1.6W 45° Wind	5.01	100	100	100	63.47	54.00	60.25	19.4	Member X

Splices

Sect	Top Elev	Top Splice Load Case	Top Force (kips)	Top Cap (kips)	Top Use %	Top Bolt Type	Top Num Bolts	Bottom Splice Load Case	Bottom Force (kips)	Bottom Cap (kips)	Bottom Use %	Bottom Bolt Type	Bottom Num Bolts
1	20	1.2D + 1.6W 45° Wind	181.29	0.00	0.0			1.2D + 1.6W 45° Wind	204.62	0.00			
2	40	1.2D + 1.6W 45° Wind	156.65	0.00	0.0			1.2D + 1.6W 45° Wind	181.29	0.00		1/4 A325	8
3	60	1.2D + 1.6W 45° Wind	131.57	0.00	0.0			1.2D + 1.6W 45° Wind	156.65	0.00		1/4 A325	8
4	80	1.2D + 1.6W 45° Wind	106.50	0.00	0.0			1.2D + 1.6W 45° Wind	131.57	0.00		1/4 A325	8
5	100	1.2D + 1.6W 45° Wind	81.28	0.00	0.0			1.2D + 1.6W 45° Wind	106.50	0.00		1 A325	8
6	120	1.2D + 1.6W 45° Wind	55.56	0.00	0.0			1.2D + 1.6W 45° Wind	81.28	0.00		1 A325	8
7	140	1.2D + 1.6W 45° Wind	32.78	0.00	0.0			1.2D + 1.6W 45° Wind	55.56	0.00		1 A325	6
8	160	1.2D + 1.6W 45° Wind	14.03	0.00	0.0			1.2D + 1.6W 45° Wind	32.78	0.00		3/4 A325	6
9	180	1.2D + 1.0E	0.54	0.00	0.0			1.2D + 1.6W 45° Wind	14.03	0.00		3/4 A325	4

HORIZONTAL MEMBERS

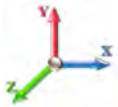
Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	20										0.00	0	0				
2	40										0.00	0	0				
3	60										0.00	0	0				
4	80										0.00	0	0				
5	100										0.00	0	0				
6	120										0.00	0	0				
7	140										0.00	0	0				
8	160										0.00	0	0				
9	180	SAE - 1.75X1.75X0.1875	-0.04	0.9D + 1.6W 45° Wind	5.00	100	100	100	174.93	36.00	4.58	1	1	7.95	7.50	1	Member Z

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	20	SAE - 5X5X0.3125	-8.28	1.2D + 1.6W Normal Wind	21.99	50	50	50	129.76	36.00	40.45	2	1	24.86	41.8	33	Bolt Shear
2	40	SAE - 4X4X0.375	-8.27	1.2D + 1.6W Normal Wind	20.52	50	50	50	147.67	36.00	29.63	2	1	24.86	50.2	33	Bolt Shear
3	60	SAE - 4X4X0.25	-7.81	1.2D + 1.6W Normal Wind	19.09	50	50	50	138.36	36.00	22.89	2	1	24.86	33.4	34	Member Z
4	80	SAE - 4X4X0.25	-7.35	1.2D + 1.6W Normal Wind	17.69	50	50	50	130.32	36.00	25.68	2	1	24.86	33.4	30	Bolt Shear
5	100	SAE - 3.5X3.5X0.25	-6.90	1.2D + 1.6W Normal Wind	16.34	50	50	50	136.25	36.00	20.57	2	1	24.86	33.4	34	Member Z
6	120	SAE - 3.5X3.5X0.25	-6.57	1.2D + 1.6W Normal Wind	15.06	50	50	50	127.80	36.00	23.17	2	1	24.86	33.4	28	Member Z
7	140	SAE - 3X3X0.1875	-5.27	1.2D + 1.6W Normal Wind	11.79	50	50	50	119.03	36.00	16.75	1	1	12.43	9.79	54	Bolt Bear
8	160	SAE - 2.5X2.5X0.1875	-3.52	1.2D + 1.6W Normal Wind	10.46	50	50	50	126.79	36.00	12.54	1	1	12.43	9.79	36	Bolt Bear
9	180	SAE - 1.75X1.75X0.1875	2.59	1.2D + 1.6W Normal Wind	8.17	50	50	50	142.92	36.00	6.86	1	1	7.95	7.50	38	Member Z

Force/Stress Compression Summary

Structure:	CT46125-A-SBA	**Code:**	EIA/TIA-222-G	3/17/2021	
Site Name:	Roxbury-lower County Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 12	



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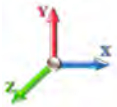
DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls

Force/Stress Tension Summary

Structure:	CT46125-A-SBA	**Code:**	EIA/TIA-222-G	3/17/2021	
Site Name:	Roxbury-lower County Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 13	



Tower Engineering Solutions

LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	20	PST - 8" DIA PIPE	182.58	0.9D + 1.6W 45° Wind	54	408.24	44.7	Member
2	40	PST - 8" DIA PIPE	160.19	0.9D + 1.6W 45° Wind	54	408.24	39.2	Member
3	60	PST - 8" DIA PIPE	136.98	0.9D + 1.6W 45° Wind	54	408.24	33.6	Member
4	80	PST - 6" DIA PIPE	113.28	0.9D + 1.6W 45° Wind	54	271.19	41.8	Member
5	100	PST - 6" DIA PIPE	89.34	0.9D + 1.6W 45° Wind	54	271.19	32.9	Member
6	120	PST - 5" DIA PIPE	65.19	0.9D + 1.6W 45° Wind	54	208.98	31.2	Member
7	140	PST - 3-1/2" DIA PIPE	42.67	0.9D + 1.6W 45° Wind	54	130.25	32.8	Member
8	160	PST - 3" DIA PIPE	24.03	0.9D + 1.6W 45° Wind	54	108.38	22.2	Member
9	180	PST - 2-1/2" DIA PIPE	7.47	0.9D + 1.6W 45° Wind	54	82.81	9.0	Member

Splices

		Top Splice					Bottom Splice				
Sect	Top Elev	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts
1	20	0.9D + 1.6W 45° Wind	165.72	0.00	0.0			0.9D + 1.6W 45° Wind	189.8	0.00			
2	40	0.9D + 1.6W 45° Wind	142.23	0.00	0.0			0.9D + 1.6W 45° Wind	165.7	610.56	27.1	1 1/4 A325	8
3	60	0.9D + 1.6W 45° Wind	118.70	0.00	0.0			0.9D + 1.6W 45° Wind	142.2	610.56	23.3	1 1/4 A325	8
4	80	0.9D + 1.6W 45° Wind	94.82	0.00	0.0			0.9D + 1.6W 45° Wind	118.7	610.56	19.4	1 1/4 A325	8
5	100	0.9D + 1.6W 45° Wind	70.74	0.00	0.0			0.9D + 1.6W 45° Wind	94.82	424.08	22.4	1 A325	8
6	120	0.9D + 1.6W 45° Wind	46.10	0.00	0.0			0.9D + 1.6W 45° Wind	70.74	424.08	16.7	1 A325	8
7	140	0.9D + 1.6W 45° Wind	26.41	0.00	0.0			0.9D + 1.6W 45° Wind	46.10	318.06	14.5	1 A325	6
8	160	0.9D + 1.6W 45° Wind	9.34	0.00	0.0			0.9D + 1.6W 45° Wind	26.41	180.60	14.6	3/4 A325	6
9	180		0.00	0.00	0.0			0.9D + 1.6W 45° Wind	9.34	120.40	7.8	3/4 A325	4

HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	20	-			36	0.00	0	0					
2	40	-			36	0.00	0	0					
3	60	-			36	0.00	0	0					
4	80	-			36	0.00	0	0					
5	100	-			36	0.00	0	0					
6	120	-			36	0.00	0	0					
7	140	-			36	0.00	0	0					
8	160	-			36	0.00	0	0					
9	180	SAE - 1.75X1.75X0.1875	0.24	1.2D + 1.6W Normal Wi	36	20.09	1	1	7.95	7.50	7.25	3.3	Blck Shear

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	20	SAE - 5X5X0.3125	8.29	1.2D + 1.6W Normal Wi	36	98.17	2	1	24.86	41.87	37.91	33.4	Bolt Shear
2	40	SAE - 4X4X0.375	8.07	0.9D + 1.6W Normal Wi	36	92.66	2	1	24.86	50.24	37.34	32.5	Bolt Shear
3	60	SAE - 4X4X0.25	7.65	0.9D + 1.6W Normal Wi	36	62.86	2	1	24.86	33.49	24.89	30.8	Bolt Shear
4	80	SAE - 4X4X0.25	7.15	0.9D + 1.6W Normal Wi	36	62.86	2	1	24.86	33.49	24.89	28.8	Bolt Shear
5	100	SAE - 3.5X3.5X0.25	6.66	0.9D + 1.6W Normal Wi	36	54.76	2	1	24.86	33.49	24.89	26.8	Bolt Shear
6	120	SAE - 3.5X3.5X0.25	6.40	1.2D + 1.6W Normal Wi	36	54.76	2	1	24.86	33.49	24.89	25.7	Bolt Shear
7	140	SAE - 3X3X0.1875	4.84	0.9D + 1.6W Normal Wi	36	35.32	1	1	12.43	9.79	10.55	49.4	Bolt Bear
8	160	SAE - 2.5X2.5X0.1875	3.13	1.2D + 1.6W Normal Wi	36	29.22	1	1	12.43	9.79	9.53	32.8	Blck Shear
9	180	SAE - 1.75X1.75X0.1875	2.51	0.9D + 1.6W Normal Wi	36	20.09	1	1	7.95	7.50	7.25	34.6	Blck Shear

Seismic Section Forces

Structure:	CT46125-A-SBA	**Code:**	EIA/TIA-222-G	3/17/2021	
Site Name:	Roxbury-lower County Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 14	

Load Case: 1.2D + 1.0E

Dead Load Factor	1.20	**Sds**	0.209	**Ss**	0.1960	**Fa**	1.6000	**Ke**	0.0000
Seismic Load Factor	1.00	**Sd1**	0.104	**S1**	0.0650	**Fv**	2.4000	**Kg**	0.0000
Seismic Importance Factor	1.00	**SA**	0.167	**R**	3.0000	**Vs**	3.0289	**f1**	1.6100

Sect #	Elev (ft)	Wz (lb)	a	b	c	Lateral Fsz (lb)
1	10.00	6763.9	0.01	0.05	0.03	29.21
2	30.00	6353.8	0.05	0.07	0.04	56.26
3	50.00	5170.7	0.15	0.07	0.03	71.14
4	70.00	4256.6	0.29	0.05	0.01	84.98
5	90.00	3911.0	0.47	-0.01	0.01	100.57
6	110.00	3445.2	0.71	-0.09	0.03	106.65
7	130.00	5885.5	0.99	-0.11	0.12	243.45
8	150.00	2272.7	1.31	0.14	0.35	156.19
9	170.00	7142.5	1.69	1.07	0.79	894.24

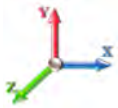
Load Case: 0.9D + 1.0E

Dead Load Factor	0.90	**Sds**	0.209	**Ss**	0.1960	**Fa**	1.6000	**Ke**	0.0000
Seismic Load Factor	1.00	**Sd1**	0.104	**S1**	0.0650	**Fv**	2.4000	**Kg**	0.0000
Seismic Importance Factor	1.00	**SA**	0.167	**R**	3.0000	**Vs**	3.0289	**f1**	1.6100

Sect #	Elev (ft)	Wz (lb)	a	b	c	Lateral Fsz (lb)
1	10.00	6763.9	0.01	0.05	0.03	29.21
2	30.00	6353.8	0.05	0.07	0.04	56.26
3	50.00	5170.7	0.15	0.07	0.03	71.14
4	70.00	4256.6	0.29	0.05	0.01	84.98
5	90.00	3911.0	0.47	-0.01	0.01	100.57
6	110.00	3445.2	0.71	-0.09	0.03	106.65
7	130.00	5885.5	0.99	-0.11	0.12	243.45
8	150.00	2272.7	1.31	0.14	0.35	156.19
9	170.00	7142.5	1.69	1.07	0.79	894.24

Support Forces Summary

Structure:	CT46125-A-SBA	**Code:**	EIA/TIA-222-G	3/17/2021	
Site Name:	Roxbury-lower County Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 15	



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Load Case	Node	FX (kips)	FY (kips)	FZ (kips)	(-) = Uplift (+) = Down
1.2D + 1.6W Normal Wind	1	-7.88	146.58	-13.78	
	1a	6.58	-119.44	-12.41	
	1b	-6.47	-116.92	-12.26	
	1c	7.77	144.03	-13.62	
1.2D + 1.6W 45° Wind	1	-15.22	204.41	-15.27	
	1a	-5.52	17.43	-3.33	
	1b	-14.82	-185.19	-14.76	
	1c	-3.27	17.59	-5.48	
0.9D + 1.6W Normal Wind	1	-7.70	143.08	-13.60	
	1a	6.76	-122.73	-12.59	
	1b	-6.65	-120.22	-12.43	
	1c	7.59	140.55	-13.44	
0.9D + 1.6W 45° Wind	1	-15.04	200.89	-15.09	
	1a	-5.34	14.01	-3.51	
	1b	-15.00	-188.41	-14.94	
	1c	-3.46	14.19	-5.30	
1.2D + 1.0Di + 1.0Wi Normal Wind	1	-1.91	76.60	-3.81	
	1a	2.90	-10.96	-4.78	
	1b	-2.85	-9.84	-4.72	
	1c	1.86	75.39	-3.73	
1.2D + 1.0Di + 1.0Wi 45° Wind	1	-4.46	97.38	-4.49	
	1a	-1.01	33.24	-1.89	
	1b	-5.57	-32.61	-5.55	
	1c	-1.87	33.17	-0.98	
1.2D + 1.0E	1	3.74	19.64	3.66	
	1a	4.43	7.49	-4.51	
	1b	-4.43	7.49	-4.51	
	1c	-3.74	19.64	3.66	
0.9D + 1.0E	1	3.93	16.24	3.84	
	1a	4.61	4.10	-4.70	
	1b	-4.61	4.10	-4.70	
	1c	-3.93	16.24	3.84	
1.0D + 1.0W Normal Wind	1	-2.50	46.31	-4.08	
	1a	1.31	-23.69	-2.89	
	1b	-1.28	-23.07	-2.85	
	1c	2.47	45.66	-4.04	
1.0D + 1.0W 45° Wind	1	-4.53	62.27	-4.55	
	1a	-1.82	11.58	-0.57	
	1b	-3.42	-40.21	-3.41	
	1c	-0.55	11.57	-1.80	

Max Reactions

Leg			Overturning		
Max Uplift:	-188.41	(kips)	Moment:	5509.69	(ft-kips)
Max Down:	204.41	(kips)	Total Down:	54.24	(kips)
Max Shear:	21.56	(kips)	Total Shear:	54.92	(kips)

Analysis Summary

Structure:	CT46125-A-SBA	**Code:**	EIA/TIA-222-G	3/17/2021	
Site Name:	Roxbury-lower County Rd	**Exposure:**	C		
Height:	180.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 17	

Max Reactions

Leg			Overturning		
Max Uplift:	-188.41	(kips)	Moment:	5509.69	(ft-kips)
Max Down:	204.41	(kips)	Total Down:	54.24	(kips)
Max Shear:	21.56	(kips)	Total Shear:	54.92	(kips)

Anchor Bolts

Bolt Size (in.):	1.50	Number Bolts:	4
Yield Strength (Ksi):	36.00	Tensile Strength (Ksi):	58.00
Detail Type:	C		

Interaction Ratio: 0.87

Max Usages

Max Leg: 57.7% (1.2D + 1.6W 45° Wind - Sect 4)
Max Diag: 53.8% (1.2D + 1.6W Normal Wind - Sect 7)
Max Horiz: 3.3% (1.2D + 1.6W Normal Wind - Sect 9)

Max Deflection, Twist and Sway

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
0.9D + 1.0E - Normal To Face	20.00	0.0025	0.0001	0.0185
	126.67	0.0265	0.0011	0.0265
	140.00	0.0329	0.0013	0.0310
	165.00	0.0479	0.0016	0.0392
	175.00	0.0546	0.0016	0.0394
	180.00	0.0579	0.0016	0.0390
0.9D + 1.6W 93 mph Wind at 45° From Face	20.00	0.0159	-0.0025	0.0651
	126.67	0.4961	0.0715	0.4551
	140.00	0.6074	0.1095	0.5156
	165.00	0.8447	-0.1804	0.5755
	175.00	0.9456	-0.2582	0.5775
	180.00	0.9792	-0.2860	0.6042
0.9D + 1.6W 93 mph Wind at Normal To Face	20.00	0.0151	0.0008	0.0715
	126.67	0.4688	-0.1371	0.4531
	140.00	0.5764	-0.2175	0.6508
	165.00	0.8082	-0.2151	0.5750
	175.00	0.9074	-0.2176	0.5735
	180.00	0.9564	-0.2278	0.7625
1.0D + 1.0W 60 mph Wind at 45° From Face	20.00	0.0044	-0.0005	0.0172
	126.67	0.1271	0.0147	0.1168
	140.00	0.1556	0.0226	0.1349
	165.00	0.2164	-0.0409	0.1496
	175.00	0.2422	-0.0620	0.1496
	180.00	0.2552	-0.0699	0.1602

1.0D + 1.0W 60 mph Wind at Normal To Face	20.00	0.0041	0.0004	0.0185
	126.67	0.1228	-0.0310	0.1181
	140.00	0.1508	-0.0496	0.1692
	165.00	0.2112	-0.0432	0.1493
	175.00	0.2370	-0.0435	0.1497
	180.00	0.2497	-0.0495	0.1989
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 45° From Face	20.00	0.0044	-0.0010	0.0286
	126.67	0.1625	0.0280	0.1484
	140.00	0.1983	0.0430	0.1782
	165.00	0.2746	-0.0817	0.1887
	175.00	0.3069	-0.1210	0.1895
	180.00	0.3231	-0.1354	0.2164
1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face	20.00	0.0042	0.0003	0.0280
	126.67	0.1544	-0.0575	0.1501
	140.00	0.1893	-0.0908	0.2341
	165.00	0.2644	-0.0795	0.1874
	175.00	0.2965	-0.0825	0.1889
	180.00	0.3123	-0.0933	0.2791
1.2D + 1.0E - Normal To Face	20.00	0.0024	0.0001	0.0183
	126.67	0.0265	0.0011	0.0266
	140.00	0.0330	-0.0013	0.0311
	165.00	0.0480	0.0016	0.0394
	175.00	0.0546	0.0016	0.0396
	180.00	0.0580	0.0016	0.0392
1.2D + 1.6W 93 mph Wind at 45° From Face	20.00	0.0160	-0.0025	0.0650
	126.67	0.4967	0.0715	0.4558
	140.00	0.6081	0.1096	0.5162
	165.00	0.8459	-0.1803	0.5765
	175.00	0.9469	-0.2581	0.5790
	180.00	0.9804	-0.2859	0.6053
1.2D + 1.6W 93 mph Wind at Normal To Face	20.00	0.0152	0.0008	0.0714
	126.67	0.4693	-0.1371	0.4537
	140.00	0.5770	-0.2175	0.6515
	165.00	0.8091	-0.2150	0.5758
	175.00	0.9084	-0.2176	0.5747
	180.00	0.9576	-0.2277	0.7636

EXHIBIT 8

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Antenna Mount Analysis Report

Existing 180-Ft Self Support Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT46125-A-SBA / Roxbury-lower County Rd

Customer Site Name: Roxbury-lower County Rd

Carrier Name: T-Mobile Sprint (App#: 147769, V1)

Carrier Site ID / Name: CT72XC031 / _

Site Location: Lower County Road

Roxbury, Connecticut

Litchfield County

Latitude: 41.559528

Longitude: -73.292305

Analysis Result:

Max Structural Usage: 51.7% [Pass]

Report Prepared By : Prakash Koirala

NOTE: The proposed mount (SitePro VFA12-HD) is not currently installed on the tower. The proposed mount is assumed to be installed per the manufacturer's instructions, and it is assumed that the mount can be installed properly on the existing self-support tower. TES cannot verify that the proposed mount will fit properly and is not liable for any fit-up issues during installation.

Introduction

The purpose of this report is to summarize the analysis results on the (1) VFA12-HD at 177.00' elevation to support the proposed antenna configuration. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Mount Drawings	Mount Structural Information is as per SitePro1, Drawing # VFA12-HD, dated 08/04/2017.
Antenna Loading	Provided by SBA Application #: 147769, v1
Modification Drawings	N/A

Analysis Criteria

Basic Wind Speed Used in the Analysis: V_{ULT} = 120 mph (3-Sec. Gust) / Equivalent to
V_{ASD} = 93 mph (3-Sec. Gust)
Basic Wind Speed with Ice: 40 mph (3-Sec. Gust) with 0.75" radial ice concurrent
Operational Wind Speed: 60 mph +0" Radial ice
Standard/Codes: ANSI/TIA/EIA 222-G
Exposure Category: C
Structure Class: II
Topographic Category: 1
Crest Height (Ft): 0

Mount Information

(3) SitePro VFA12-HD at 177.00' elevation

Final Antenna Configuration

3 Ericsson AIR32 KRD901146-1_B66A_B2A
3 RFS APXVAALL24_43-U-NA20
3 Ericsson AIR6449 B41
3 Ericsson 4415 B25
6 Alcatel-Lucent 800 MHz RRH
3 Ericsson 4449 B71 + B85

In addition to the proposed equipment loading, a 500 lb serviceability load was also considered in this analysis in accordance with TIA requirements.

Analysis Results

Our calculations have determined that under design wind load the existing mounts will be structurally adequate to support the proposed antenna configuration. The maximum structural usage is 51.7%, which occurs in the support arm diagonals. The proposed equipment must be installed as stipulated in the Final Antenna Configuration section of this report. The analysis results are void if the proposed equipment is not installed in accordance with this report.

The proposed mount (SitePro VFA12-HD) is not currently installed on the tower. The proposed mount is assumed to be installed per the manufacturer's instructions, and it is assumed that the mount can be installed properly on the existing self-support tower. TES cannot verify that the proposed mount will fit properly and is not liable for any fit-up issues during installation.

Attachments

1. Mount Photos
2. Antenna Placement Diagram
3. Analysis Calculations

Standard Conditions

1. The loading configuration as analyzed in this report is as provided from the customer. Any deviation from this design shall be communicated to TES to verify deviation will not adversely impact the analysis.

2. The analysis is based on the presumption that the antenna mount members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion. The mount analysis is not a condition assessment of the mount.

4. The mount analysis was performed in accordance with the loading provided, and if applicable the modification required to support the additional loading.

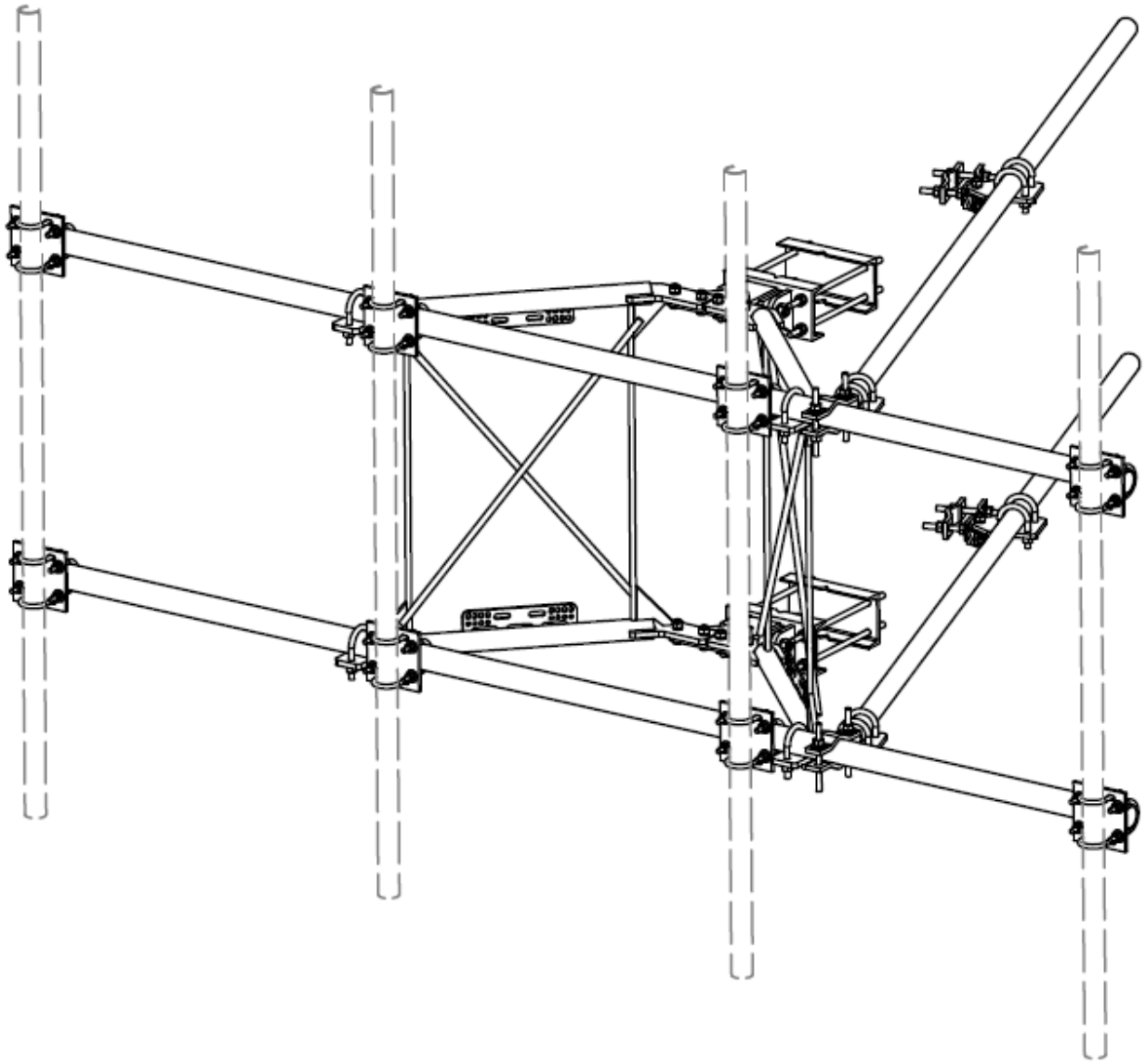
5. If the mount is modified, installation must adhere to the configuration communicated in the modification drawings.

6. The modification drawings are not intended to convey means or methods. These are the responsibility of the installing contractor.

7. Rigging plan review is available if the contractor requires for a construction class IV or other if required. Review fee would apply.

8. The mount modification package was created based upon information provided for the mount loading. The underlying tower is assumed to provide support and sufficient rigidity to support the mount loads as a tower analysis was not part of the mount analysis.

9. TES is not responsible for modifications to climbing facilities unless communicated to TES in writing.



SITE PRO 1

A valmont COMPANY

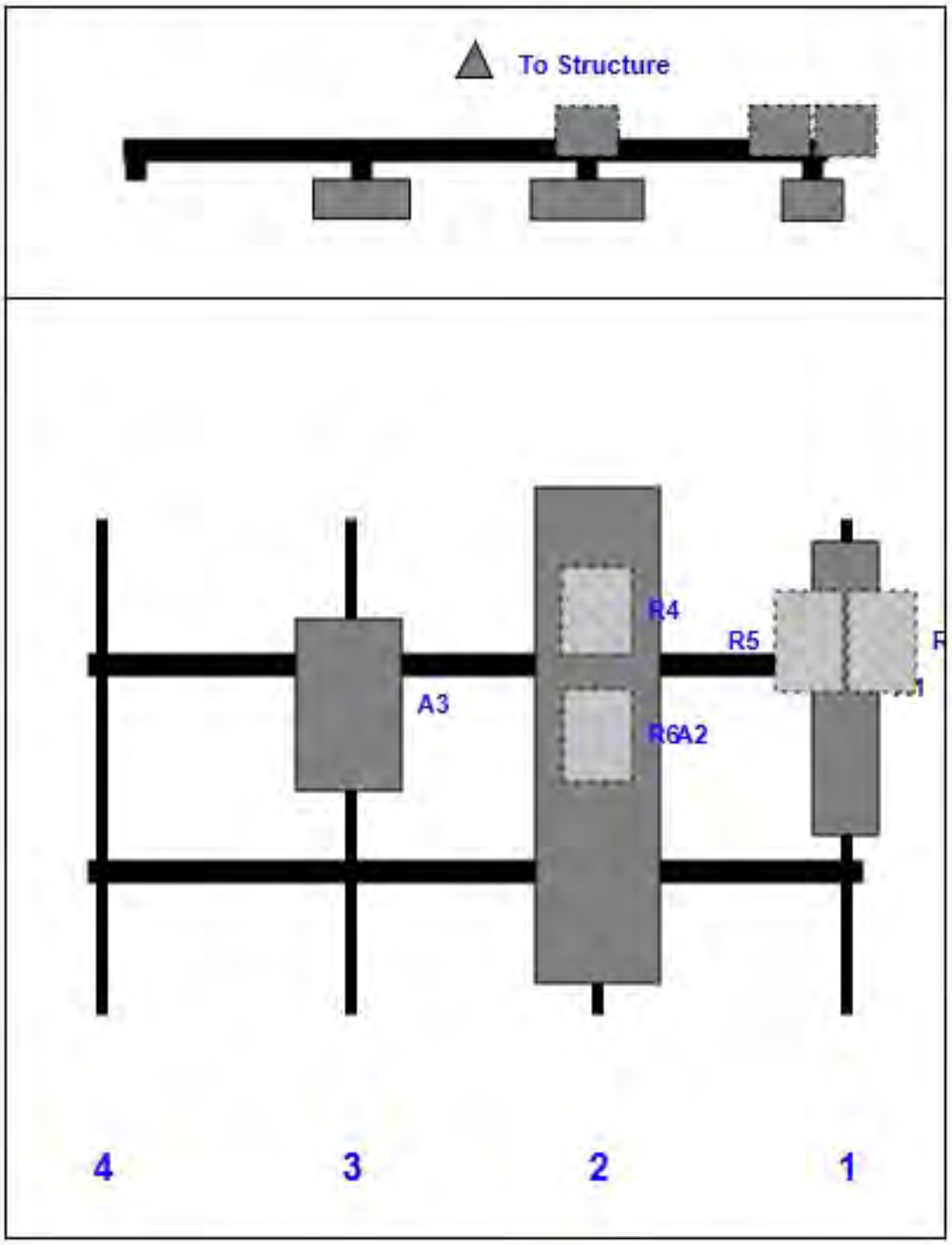
VFA12-HD

Sector: A
Structure Type: Self Support
Mount Elev: 177.00

2/24/2021

Tower Engineering Solutions

Plan View

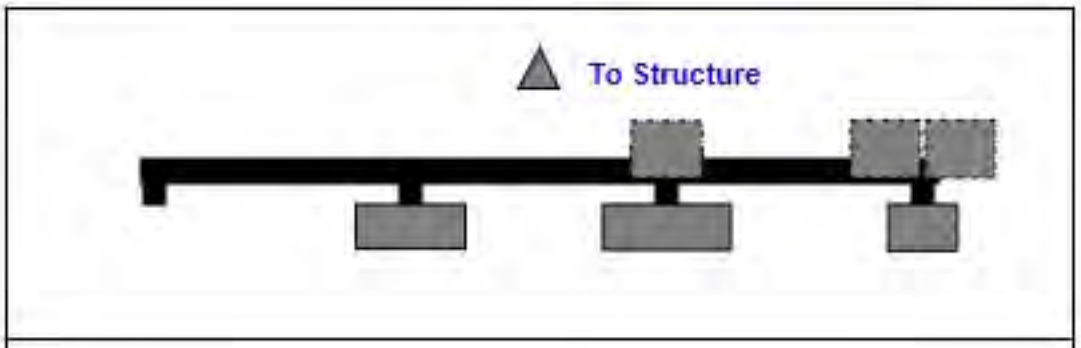


Front View

Looking Toward Structure

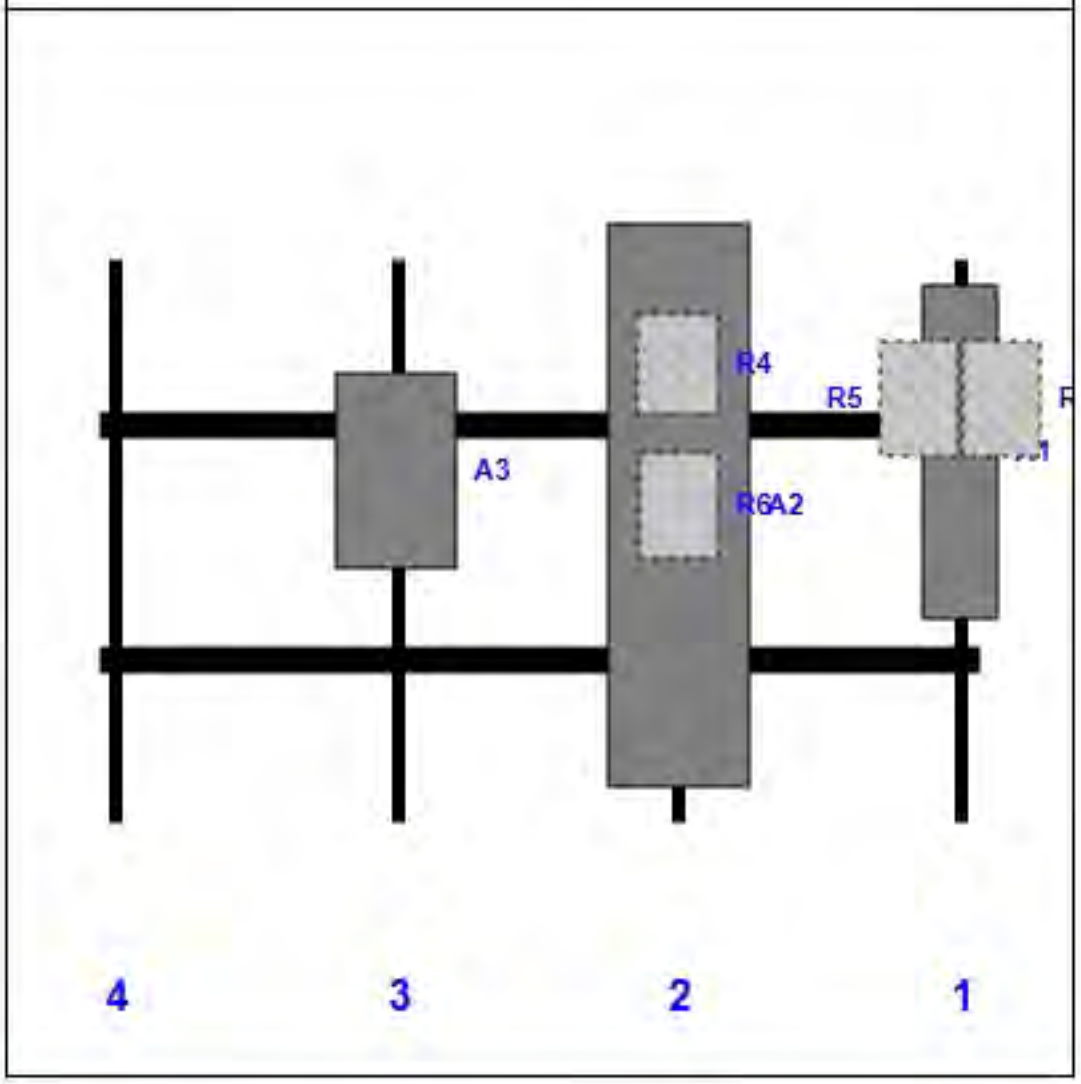
Ref #	Model	Height (in)	Width (in)	H Dist Left	Pipe #	Pipe Pos V	Pos	From Top	H Offset	Status	Validation
A1	AIR32 KRD901146-1_B66A_B2A	57.00	12.90	147.00	1	a	Front	33.00		Retained	
R5	800 MHz RRH	19.70	13.00	147.00	1	a	Behind	24.00	-7.00	Retained	
R5	800 MHz RRH	19.70	13.00	147.00	1	b	Behind	24.00	7.00	Retained	
A2	APXVAALL24_43-U-NA20	95.90	24.00	99.00	2	a	Front	42.00		Retained	
R4	4415 B25	16.50	13.50	99.00	2	a	Behind	18.00		Retained	
R6	4449 B71 + B85	17.90	13.20	99.00	2	a	Behind	42.00		Retained	
A3	AIR6449 B41	33.10	20.50	51.00	3	a	Front	36.00		Retained	

Plan View



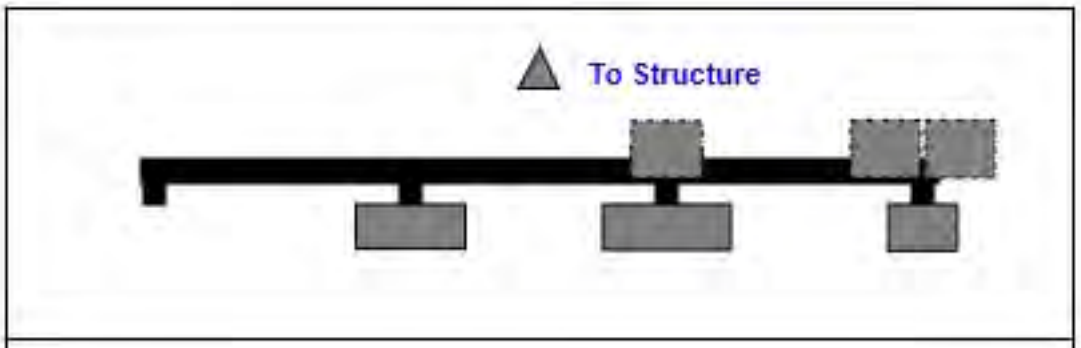
Front View

Looking Toward Structure



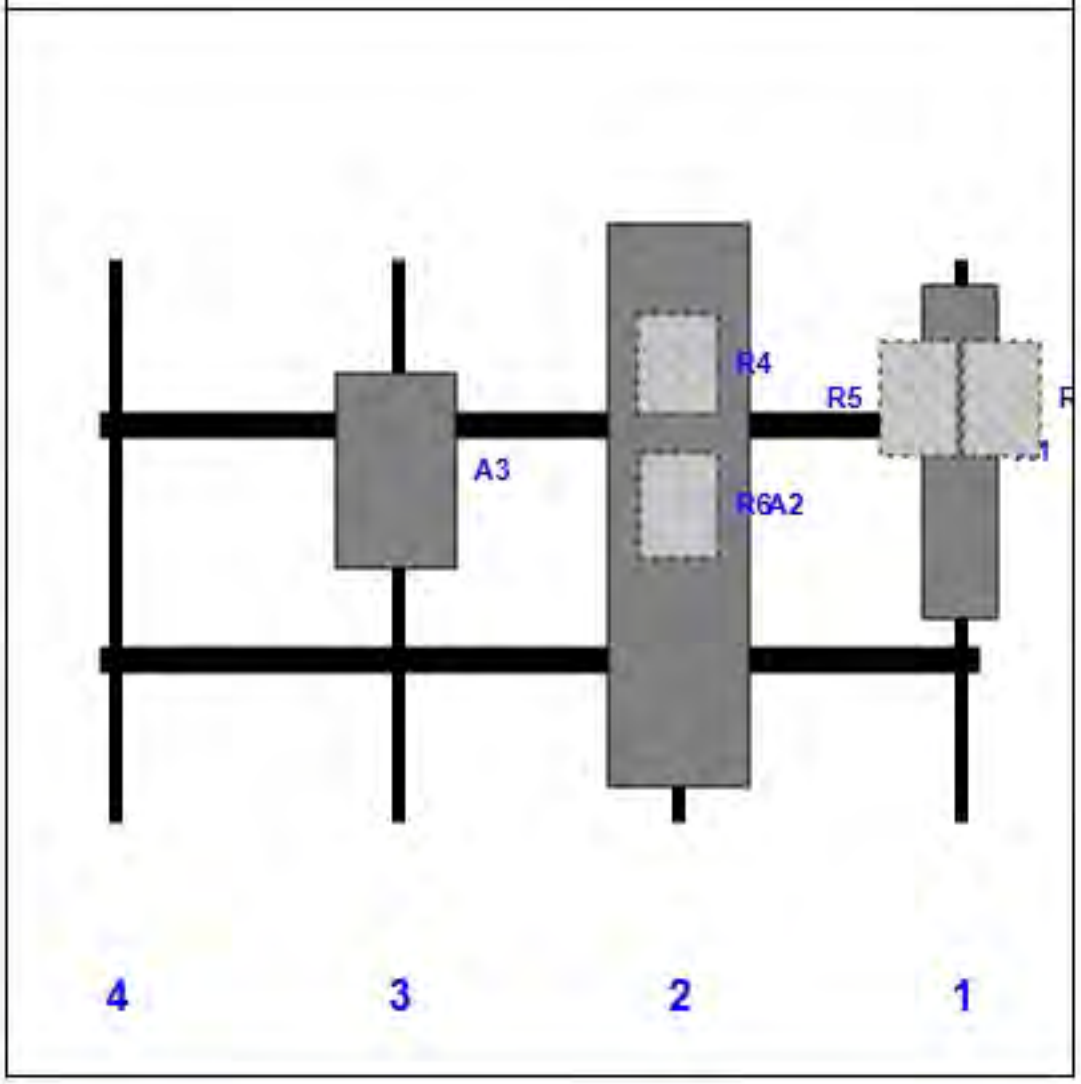
Ref #	Model	Height (in)	Width (in)	H Dist Left	Pipe #	Pipe Pos V	Pos	From Top	H Offset	Status	Validation
A1	AIR32 KRD901146-1_B66A_B2A	57.00	12.90	147.00	1	a	Front	33.00		Retained	
R5	800 MHz RRH	19.70	13.00	147.00	1	a	Behind	24.00	-7.00	Retained	
R5	800 MHz RRH	19.70	13.00	147.00	1	b	Behind	24.00	7.00	Retained	
A2	APXVAALL24_43-U-NA20	95.90	24.00	99.00	2	a	Front	42.00		Retained	
R4	4415 B25	16.50	13.50	99.00	2	a	Behind	18.00		Retained	
R6	4449 B71 + B85	17.90	13.20	99.00	2	a	Behind	42.00		Retained	
A3	AIR6449 B41	33.10	20.50	51.00	3	a	Front	36.00		Retained	

Plan View

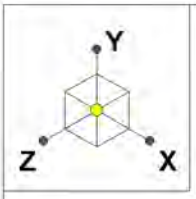


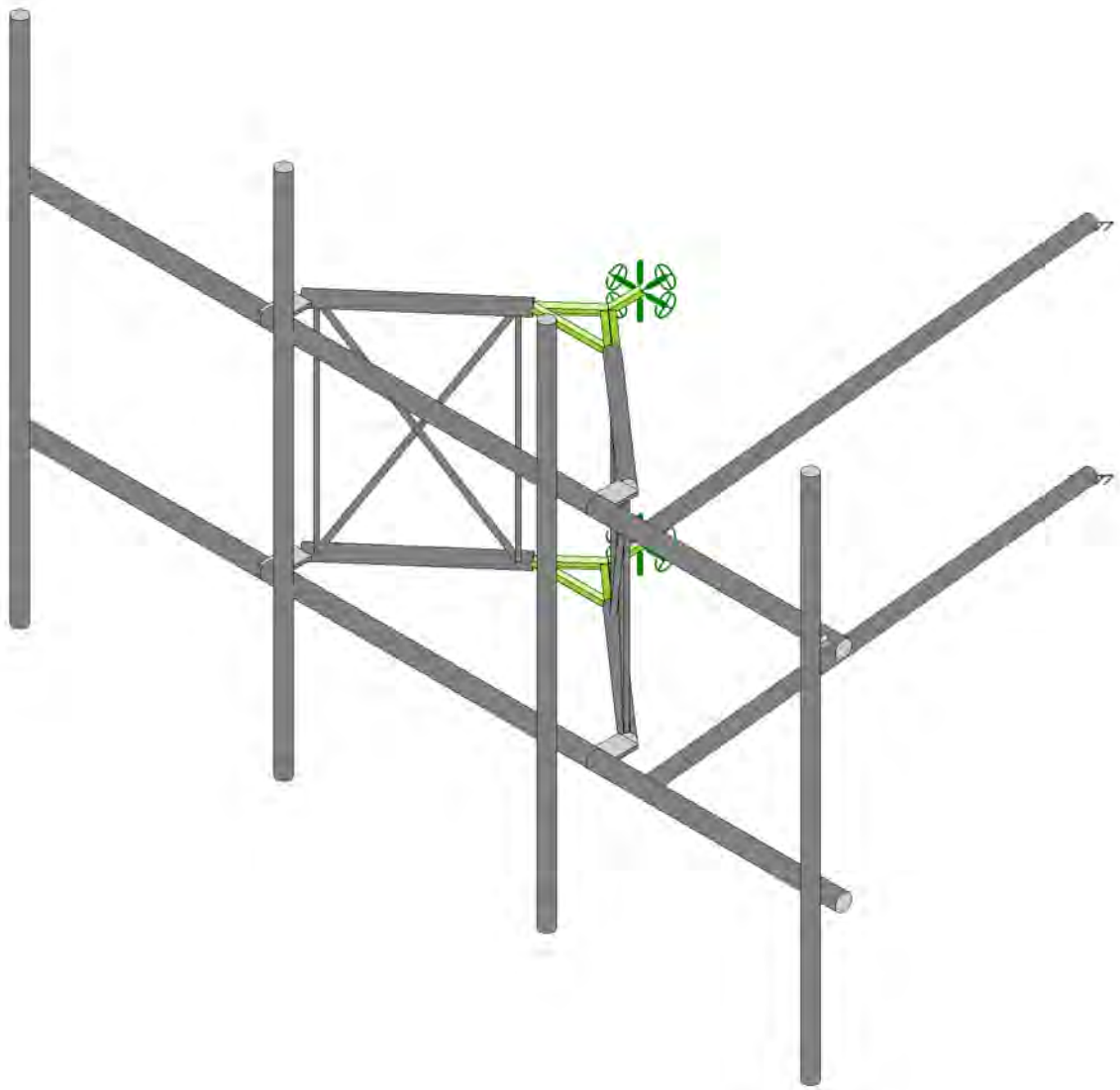
Front View

Looking Toward Structure

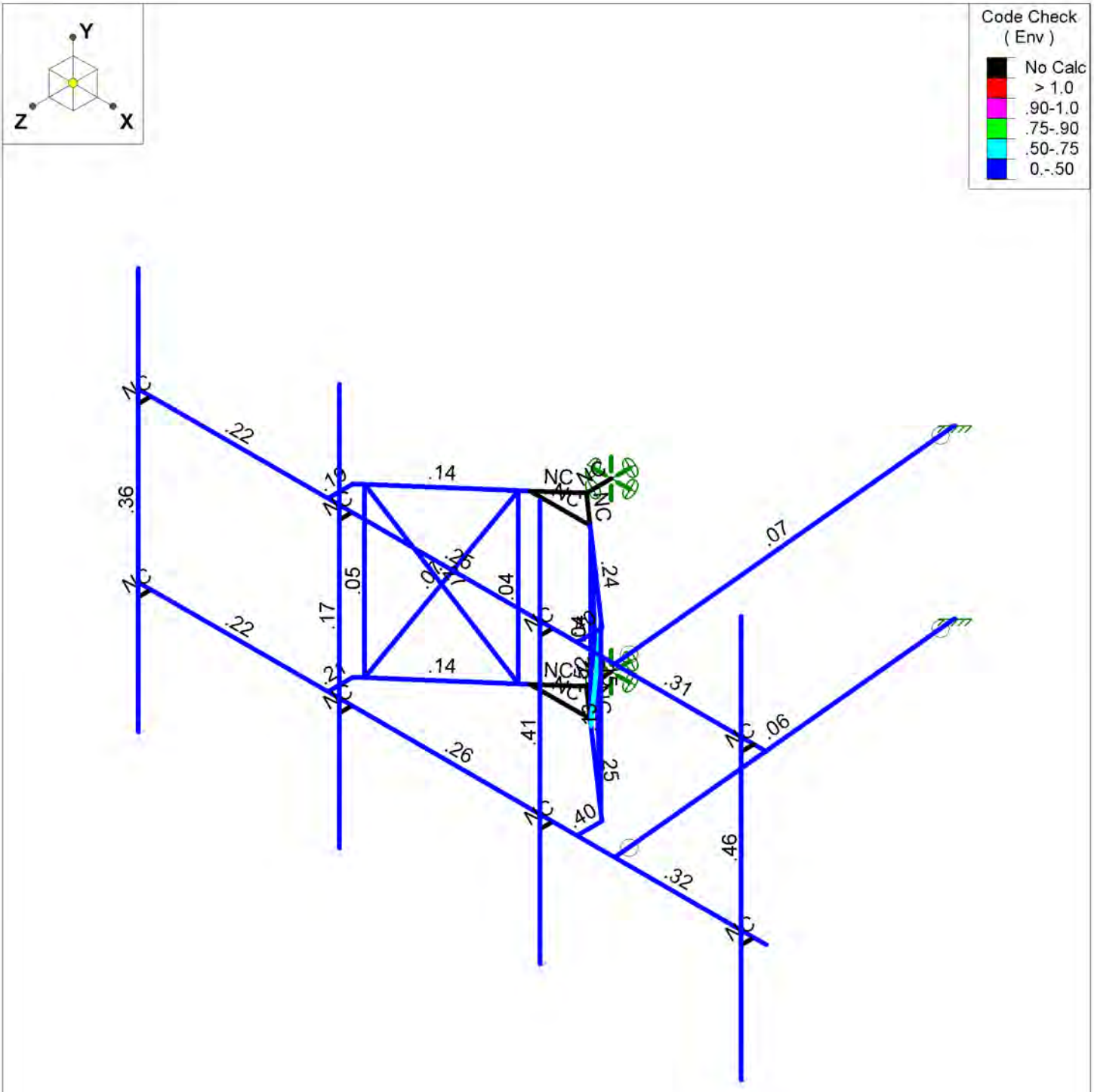


Ref #	Model	Height (in)	Width (in)	H Dist Left	Pipe #	Pipe Pos V	Pos	From Top	H Offset	Status	Validation
A1	AIR32 KRD901146-1_B66A_B2A	57.00	12.90	147.00	1	a	Front	33.00		Retained	
R5	800 MHz RRH	19.70	13.00	147.00	1	a	Behind	24.00	-7.00	Retained	
R5	800 MHz RRH	19.70	13.00	147.00	1	b	Behind	24.00	7.00	Retained	
A2	APXVAALL24_43-U-NA20	95.90	24.00	99.00	2	a	Front	42.00		Retained	
R4	4415 B25	16.50	13.50	99.00	2	a	Behind	18.00		Retained	
R6	4449 B71 + B85	17.90	13.20	99.00	2	a	Behind	42.00		Retained	
A3	AIR6449 B41	33.10	20.50	51.00	3	a	Front	36.00		Retained	





Tower Engineering Solutio...	CT46125-A-SBA_MT_LOT_Loads Only_Sector A_G	SK - 1
		Feb 24, 2021 at 2:03 PM
TES Project No. 102644		CT46125-A-SBA_102644_G_RISA_...



Member Code Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.6W (Front)

Tower Engineering Solutio...	CT46125-A-SBA_MT_LOT_Loads Only_Sector A_G	SK - 2
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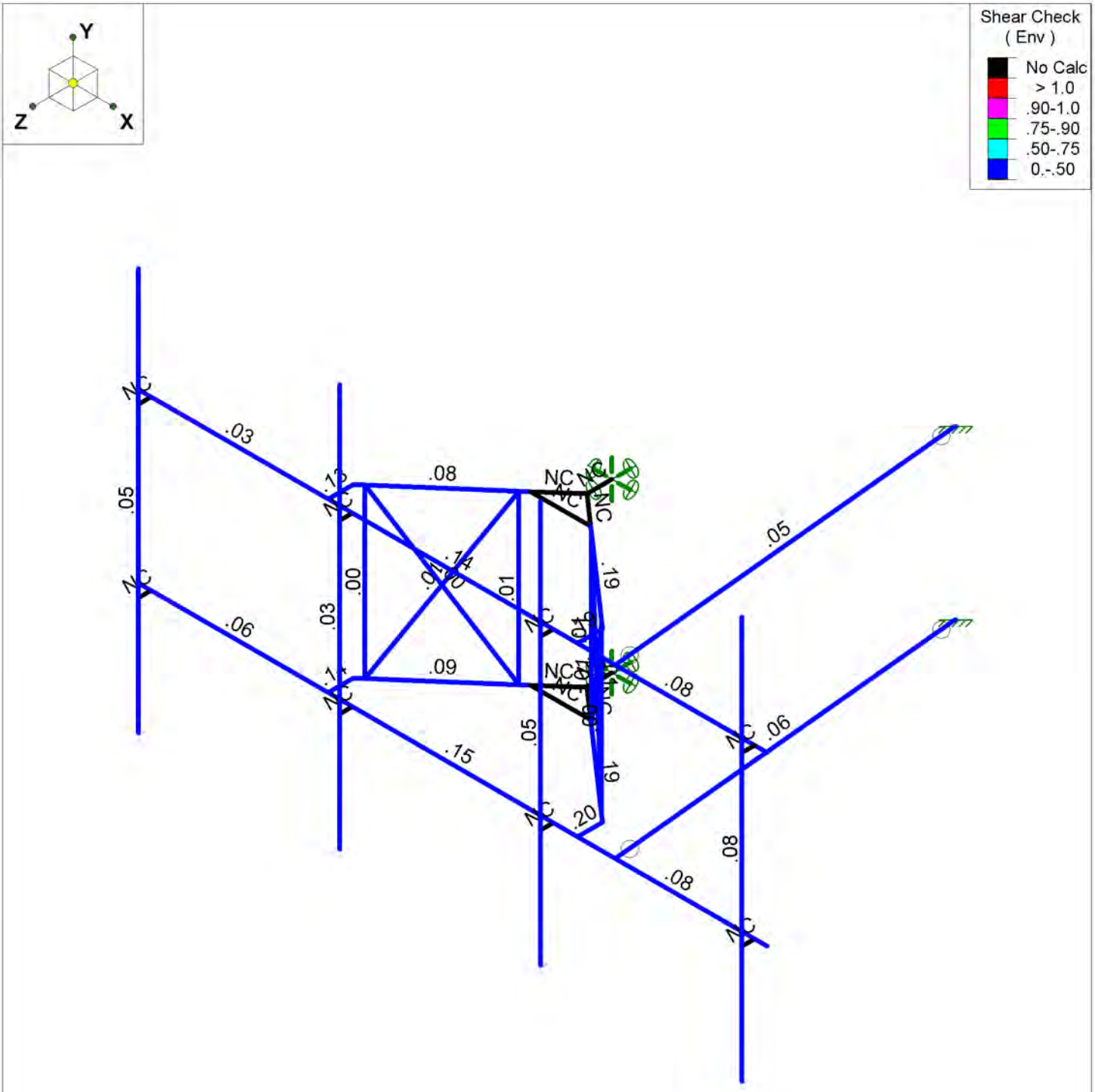
TES Project No. 102644		CT46125-A-SBA_102644_G_RISA_...



Member Shear Checks Displayed (Enveloped)
Results for LC 1, 1.2D+1.6W (Front)

Tower Engineering Solutio...	CT46125-A-SBA_MT_LOT_Loads Only_Sector A_G	SK - 3
		Feb 24, 2021 at 2:03 PM
TES Project No. 102644		CT46125-A-SBA_102644_G_RISA_...

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Antenna D	None					10			
2	Antenna Di	None					10			
3	Antenna W Front	None					10			
4	Antenna Wi Front	None					10			
5	Antenna W Side	None					10			
6	Antenna Wi Side	None					10			
7	Service Lm1	None					1			
8	Service Lm2	None					1			
9	Structure D	None		-1						
10	Structure Di	None						28		
11	Structure W Front	None						28		
12	Structure Wi Front	None						28		
13	Structure W Side	None						28		
14	Structure Wi Side	None						28		

Load Combinations

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.2D+1.6W (Front)	Yes	Y		1	1.2	9	1.2	3	1.6	11	1.6												
2	1.2D+1.6W (Back)	Yes	Y		1	1.2	9	1.2	3	-1.6	11	-1.6												
3	1.2D+1.6W (Left)	Yes	Y		1	1.2	9	1.2	5	1.6	13	1.6												
4	1.2D+1.6W (Right)	Yes	Y		1	1.2	9	1.2	5	-1.6	13	-1.6												
5	1.2D+1.0Di+1.0Wi (...	Yes	Y		1	1.2	9	1.2	2	1	10	1	4	1	12	1								
6	1.2D+1.0Di+1.0Wi (...	Yes	Y		1	1.2	9	1.2	2	1	10	1	4	-1	12	-1								
7	1.2D+1.0Di+1.0Wi (...	Yes	Y		1	1.2	9	1.2	2	1	10	1	6	1	14	1								
8	1.2D+1.0Di+1.0Wi (...	Yes	Y		1	1.2	9	1.2	2	1	10	1	6	-1	14	-1								
9	1.2D+1.5L1+.16W (...	Yes	Y		1	1.2	9	1.2	7	1.5	3	.16	11	.16										
10	1.2D+1.5L2+.16W (...	Yes	Y		1	1.2	9	1.2	8	1.5	3	.16	11	.16										
11	1.4D	Yes	Y		1	1.4	9	1.4																

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N2	0	0	.5	0	
2	N3	-2.479167	0	2.665361	0	
3	N5	2.479167	0	2.665361	0	
4	N5A	-2.479167	0	3.165361	0	
5	N6	2.479167	0	3.165361	0	
6	N7	-6.25	0	3.165361	0	
7	N9	6.25	0	3.165361	0	
8	N16	0	3.333333	.5	0	
9	N17	-2.479167	3.333333	2.665361	0	
10	N18	2.479167	3.333333	2.665361	0	
11	N19	-2.479167	3.333333	3.165361	0	
12	N20	2.479167	3.333333	3.165361	0	
13	N21	-6.25	3.333333	3.165361	0	
14	N22	6.25	3.333333	3.165361	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
15	N29	-6	0	3.165361	0	
16	N30	-6	3.333333	3.165361	0	
17	N19A	-0.596256	3.333333	1.020783	0	
18	N20A	-0.596256	0	1.020783	0	
19	N21A	0.596256	3.333333	1.020783	0	
20	N22A	0.596256	0	1.020783	0	
21	N23	-2	0	3.165361	0	
22	N24	-2	3.333333	3.165361	0	
23	N25	6	0	3.165361	0	
24	N26	6	3.333333	3.165361	0	
25	N27	2	0	3.165361	0	
26	N28	2	3.333333	3.165361	0	
27	N29A	-6	5.666667	3.415361	0	
28	N30A	-2	5.666667	3.415361	0	
29	N31	6	5.666667	3.415361	0	
30	N32	2	5.666667	3.415361	0	
31	N33	-6	-2.333333	3.415361	0	
32	N34	-2	-2.333333	3.415361	0	
33	N35	6	-2.333333	3.415361	0	
34	N36	2	-2.333333	3.415361	0	
35	N41	0	0	0	0	
36	N42	0	3.333333	0	0	
37	N45	-0.721783	3.333333	1.130421	0	
38	N46	-0.721783	0	1.130421	0	
39	N47	0.721783	3.333333	1.130421	0	
40	N48	0.721783	0	1.130421	0	
41	N49	-2.353641	3.333333	2.555723	0	
42	N50	-2.353641	0	2.555723	0	
43	N51	2.353641	3.333333	2.555723	0	
44	N52	2.353641	0	2.555723	0	
45	N50A	3.229167	0	3.165361	0	
46	N51A	-6	0	3.415361	0	
47	N52A	-6	3.333333	3.415361	0	
48	N53B	-2	0	3.415361	0	
49	N54A	-2	3.333333	3.415361	0	
50	N55	6	0	3.415361	0	
51	N56	6	3.333333	3.415361	0	
52	N57	2	0	3.415361	0	
53	N58	2	3.333333	3.415361	0	
54	N57A	0	0	-4.33	0	
55	N59	2.5	0	-4.33	0	
56	N56A	3.229167	3.333333	3.165361	0	
57	N57B	2.5	3.333333	-4.33	0	

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mount Pipe	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	Standoff Horizo...	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	Stanodff Vertical	SR_0.625	Beam	BAR	A36 Gr.36	Typical	.307	.007	.007	.015
4	Standoff Diagonal	SR_0.75	Beam	BAR	A36 Gr.36	Typical	.442	.016	.016	.031

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
5	Face Horizontal	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
6	Tie-back	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
7	Connection Plate	PL5/8x3.5	Beam	RECT	A36 Gr.36	Typical	2.188	.071	2.233	.253

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M3	N3	N5A		90	Connection ...	Beam	RECT	A36 Gr.36	Typical
2	M4	N5	N6		90	Connection ...	Beam	RECT	A36 Gr.36	Typical
3	M7	N17	N19		90	Connection ...	Beam	RECT	A36 Gr.36	Typical
4	M8	N18	N20		90	Connection ...	Beam	RECT	A36 Gr.36	Typical
5	M13	N21	N19			Face Horizo...	Beam	Pipe	A53 Gr.B	Typical
6	M14	N19	N20			Face Horizo...	Beam	Pipe	A53 Gr.B	Typical
7	M15	N20	N22			Face Horizo...	Beam	Pipe	A53 Gr.B	Typical
8	M16	N7	N5A			Face Horizo...	Beam	Pipe	A53 Gr.B	Typical
9	M17	N5A	N6			Face Horizo...	Beam	Pipe	A53 Gr.B	Typical
10	M18	N6	N9			Face Horizo...	Beam	Pipe	A53 Gr.B	Typical
11	M15A	N19A	N17			Standoff Hori...	Beam	Pipe	A53 Gr.B	Typical
12	M16A	N20A	N3			Standoff Hori...	Beam	Pipe	A53 Gr.B	Typical
13	M17A	N21A	N18			Standoff Hori...	Beam	Pipe	A53 Gr.B	Typical
14	M18A	N22A	N5			Standoff Hori...	Beam	Pipe	A53 Gr.B	Typical
15	M15B	N16	N19A			RIGID	Beam	None	RIGID	DR1
16	M16B	N16	N21A			RIGID	Beam	None	RIGID	DR1
17	M17B	N2	N20A			RIGID	Beam	None	RIGID	DR1
18	M18B	N2	N22A			RIGID	Beam	None	RIGID	DR1
19	MP4A	N29A	N33			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
20	MP3A	N30A	N34			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
21	MP2A	N32	N36			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
22	MP1A	N31	N35			Mount Pipe	Beam	Pipe	A53 Gr.B	Typical
23	M24	N42	N16			RIGID	Beam	None	RIGID	DR1
24	M25	N41	N2			RIGID	Beam	None	RIGID	DR1
25	M27	N45	N46			Stanodff Ver...	Beam	BAR	A36 Gr.36	Typical
26	M28	N49	N50			Stanodff Ver...	Beam	BAR	A36 Gr.36	Typical
27	M29	N47	N48			Stanodff Ver...	Beam	BAR	A36 Gr.36	Typical
28	M30	N51	N52			Stanodff Ver...	Beam	BAR	A36 Gr.36	Typical
29	M31	N45	N50			Standoff Dia...	Beam	BAR	A36 Gr.36	Typical
30	M32	N49	N46			Standoff Dia...	Beam	BAR	A36 Gr.36	Typical
31	M33	N47	N52			Standoff Dia...	Beam	BAR	A36 Gr.36	Typical
32	M34	N51	N48			Standoff Dia...	Beam	BAR	A36 Gr.36	Typical
33	M34A	N19A	N21A			RIGID	Beam	None	RIGID	DR1

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
34	M35	N20A	N22A			RIGID	Beam	None	RIGID	DR1
35	M36	N50A	N59			Tie-back	Beam	Pipe	A53 Gr.B	Typical
36	M37	N26	N56			RIGID	Beam	None	RIGID	DR1
37	M38	N25	N55			RIGID	Beam	None	RIGID	DR1
38	M39	N28	N58			RIGID	Beam	None	RIGID	DR1
39	M40	N27	N57			RIGID	Beam	None	RIGID	DR1
40	M41	N24	N54A			RIGID	Beam	None	RIGID	DR1
41	M42	N23	N53B			RIGID	Beam	None	RIGID	DR1
42	M43	N30	N52A			RIGID	Beam	None	RIGID	DR1
43	M44	N29	N51A			RIGID	Beam	None	RIGID	DR1
44	M44A	N56A	N57B			Tie-back	Beam	Pipe	A53 Gr.B	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
1	M3						Yes			None
2	M4						Yes			None
3	M7						Yes			None
4	M8						Yes			None
5	M13						Yes			None
6	M14						Yes			None
7	M15						Yes			None
8	M16						Yes			None
9	M17						Yes			None
10	M18						Yes			None
11	M15A						Yes			None
12	M16A						Yes			None
13	M17A						Yes			None
14	M18A						Yes			None
15	M15B						Yes			None
16	M16B						Yes			None
17	M17B						Yes			None
18	M18B						Yes			None
19	MP4A						Yes			None
20	MP3A						Yes			None
21	MP2A						Yes			None
22	MP1A						Yes			None
23	M24						Yes			None
24	M25						Yes			None
25	M27						Yes			None
26	M28						Yes			None
27	M29						Yes			None
28	M30						Yes			None
29	M31						Yes			None
30	M32						Yes			None
31	M33						Yes			None
32	M34						Yes			None
33	M34A						Yes			None
34	M35						Yes			None
35	M36	BenPIN	BenPIN				Yes			None
36	M37						Yes			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
37	M38						Yes			None
38	M39						Yes			None
39	M40						Yes			None
40	M41						Yes			None
41	M42						Yes			None
42	M43						Yes			None
43	M44						Yes			None
44	M44A	BenPIN	BenPIN				Yes			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M3	Connection ...	.5			Lbyy						Lateral
2	M4	Connection ...	.5			Lbyy						Lateral
3	M7	Connection ...	.5			Lbyy						Lateral
4	M8	Connection ...	.5			Lbyy						Lateral
5	M13	Face Horizo...	3.771			Lbyy			2.1	2.1		Lateral
6	M14	Face Horizo...	4.958			Lbyy						Lateral
7	M15	Face Horizo...	3.771			Lbyy			2.1	2.1		Lateral
8	M16	Face Horizo...	3.771			Lbyy			2.1	2.1		Lateral
9	M17	Face Horizo...	4.958			Lbyy						Lateral
10	M18	Face Horizo...	3.771			Lbyy			2.1	2.1		Lateral
11	M15A	Standoff Ho...	2.5			Lbyy						Lateral
12	M16A	Standoff Ho...	2.5			Lbyy						Lateral
13	M17A	Standoff Ho...	2.5			Lbyy						Lateral
14	M18A	Standoff Ho...	2.5			Lbyy						Lateral
15	MP4A	Mount Pipe	8			Lbyy						Lateral
16	MP3A	Mount Pipe	8			Lbyy						Lateral
17	MP2A	Mount Pipe	8			Lbyy						Lateral
18	MP1A	Mount Pipe	8			Lbyy						Lateral
19	M27	Stanodff Ve...	3.333			Lbyy			.65	.65		Lateral
20	M28	Stanodff Ve...	3.333			Lbyy			.65	.65		Lateral
21	M29	Stanodff Ve...	3.333			Lbyy			.65	.65		Lateral
22	M30	Stanodff Ve...	3.333			Lbyy			.65	.65		Lateral
23	M31	Standoff Dia...	3.976			Lbyy			.65	.65		Lateral
24	M32	Standoff Dia...	3.976			Lbyy			.65	.65		Lateral
25	M33	Standoff Dia...	3.976			Lbyy			.65	.65		Lateral
26	M34	Standoff Dia...	3.976			Lbyy			.65	.65		Lateral
27	M36	Tie-back	7.531			Lbyy						Lateral
28	M44A	Tie-back	7.531			Lbyy						Lateral

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
No Data to Print ...			

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	N42	Reaction	Reaction	Reaction	Reaction		Reaction
2	N41	Reaction	Reaction	Reaction	Reaction		Reaction
3	N57A						
4	N59	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N57B	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N42	max	616.629	9	1592.516	6	43.184	4	-.428	1	0	1	.63	10
2		min	-1628.962	10	362.688	1	-2417.219	7	-1.813	6	0	1	-.23	9
3	N41	max	1618.038	10	1591.498	5	2365.117	8	-.443	2	0	1	.625	10
4		min	-627.358	9	362.702	2	310.347	3	-1.81	5	0	1	-.186	9
5	N59	max	36.374	9	50.033	8	409.148	3	.009	10	0	1	.09	10
6		min	-55.365	10	15.482	3	-691.958	4	.002	4	0	1	.021	4
7	N57B	max	89.026	1	49.397	8	1041.446	3	.009	10	0	1	.088	10
8		min	-61.63	2	14.891	10	-759.472	4	.002	4	0	1	.022	4
9	Totals:	max	1375.75	4	3212.084	7	2033.886	1						
10		min	-1375.749	3	1165.469	2	-2033.885	2						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N2	max	.004	9	0	2	0	3	0	5	6.825e-04	9	0	9
2		min	-.011	10	0	5	0	8	0	2	-1.896e-03	10	0	10
3	N3	max	.008	9	.012	10	.004	3	2.061e-03	9	3.198e-04	6	1.155e-03	9
4		min	-.026	10	-.014	9	-.016	8	-5.417e-05	10	-4.226e-05	1	-6.056e-04	7
5	N5	max	.009	9	0	9	.013	4	4.612e-03	6	7.534e-05	2	-1.537e-04	9
6		min	-.024	10	-.027	6	-.006	3	2.577e-04	1	-1.884e-04	9	-1.746e-03	10
7	N5A	max	.008	9	.01	10	.004	3	1.475e-03	5	2.712e-04	2	3.394e-03	9
8		min	-.024	10	-.03	9	-.016	8	4.651e-04	2	-1.706e-04	1	-3.379e-04	2
9	N6	max	.008	9	-.008	9	.013	4	2.561e-03	5	2.04e-04	4	-1.051e-03	2
10		min	-.024	10	-.061	6	-.006	3	2.439e-04	2	-2.417e-04	9	-4.609e-03	10
11	N7	max	.009	9	.027	10	.045	2	1.105e-03	5	1.392e-03	2	4.198e-03	9
12		min	-.024	10	-.281	9	-.059	1	-8.041e-04	9	-1.447e-03	1	-7.346e-04	10
13	N9	max	.007	9	-.096	9	.093	2	2.045e-03	6	3.992e-03	1	-1.244e-03	9
14		min	-.025	10	-.394	10	-.115	1	1.817e-04	10	-3.577e-03	2	-5.986e-03	10
15	N16	max	.012	3	0	1	0	7	0	6	2.021e-03	3	0	9
16		min	-.005	4	0	6	0	4	0	1	-8.27e-04	4	0	10
17	N17	max	.031	3	.012	10	.022	3	1.933e-03	9	1.178e-05	3	1.125e-03	9
18		min	-.014	4	-.014	9	-.01	4	-2.183e-05	10	-2.98e-04	5	-5.795e-04	8
19	N18	max	.031	3	0	9	.011	4	4.533e-03	5	1.721e-04	9	-1.389e-04	9
20		min	-.016	4	-.027	7	-.017	3	9.111e-04	2	-7.249e-05	1	-1.713e-03	10
21	N19	max	.031	3	.009	10	.022	3	1.609e-03	6	1.912e-04	3	3.343e-03	9
22		min	-.016	4	-.029	9	-.01	4	-4.682e-04	1	-2.905e-04	4	-2.604e-04	10
23	N20	max	.031	3	-.009	9	.011	4	4.079e-03	2	2.459e-04	9	-8.203e-04	4
24		min	-.015	4	-.061	7	-.017	3	-2.243e-03	1	-2.339e-04	3	-4.534e-03	10
25	N21	max	.031	3	.027	10	.068	2	1.183e-03	6	1.601e-03	2	4.11e-03	9
26		min	-.016	4	-.275	9	-.054	1	-2.497e-04	1	-1.547e-03	1	-7.255e-04	10
27	N22	max	.031	3	-.098	9	.202	2	4.983e-03	2	6.134e-03	1	-8.971e-04	4
28		min	-.016	4	-.389	10	-.181	1	-3.416e-03	1	-6.521e-03	2	-5.915e-03	10

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
29	N29	max	.009	9	.025	10	.041	2	1.105e-03	5	1.392e-03	2	4.198e-03	9
30		min	-.024	10	-.268	9	-.055	1	-8.041e-04	9	-1.447e-03	1	-7.346e-04	10
31	N30	max	.031	3	.024	10	.063	2	1.183e-03	6	1.601e-03	2	4.11e-03	9
32		min	-.016	4	-.263	9	-.049	1	-2.497e-04	1	-1.547e-03	1	-7.256e-04	10
33	N19A	max	.025	3	0	10	.014	3	0	6	2.021e-03	3	0	9
34		min	-.01	4	0	9	-.006	4	0	1	-8.27e-04	4	0	10
35	N20A	max	.008	9	0	10	.005	9	0	5	6.825e-04	9	0	9
36		min	-.023	10	0	9	-.014	10	0	2	-1.896e-03	10	0	10
37	N21A	max	.025	3	0	9	.006	4	0	6	2.021e-03	3	0	9
38		min	-.01	4	0	6	-.014	3	0	1	-8.27e-04	4	0	10
39	N22A	max	.008	9	0	9	.014	10	0	5	6.825e-04	9	0	9
40		min	-.023	10	0	5	-.005	9	0	2	-1.896e-03	10	0	10
41	N23	max	.008	9	.008	10	.003	3	1.398e-03	5	3.206e-04	3	2.066e-03	9
42		min	-.024	10	-.014	9	-.016	8	3.611e-04	2	-3.659e-04	4	-4.595e-04	2
43	N24	max	.031	3	.008	10	.02	3	1.708e-03	2	4.781e-04	3	2.031e-03	9
44		min	-.016	4	-.014	9	-.008	4	-6.579e-04	1	-4.357e-04	4	-4.177e-04	5
45	N25	max	.007	9	-.093	9	.082	2	2.045e-03	6	3.992e-03	1	-1.244e-03	9
46		min	-.025	10	-.376	10	-.103	1	1.817e-04	10	-3.577e-03	2	-5.986e-03	10
47	N26	max	.031	3	-.094	9	.182	2	4.983e-03	2	6.134e-03	1	-8.97e-04	4
48		min	-.016	4	-.371	10	-.162	1	-3.416e-03	1	-6.521e-03	2	-5.915e-03	10
49	N27	max	.008	9	-.003	9	.013	4	1.997e-03	5	4.489e-05	2	-5.794e-04	2
50		min	-.024	10	-.047	6	-.007	3	-4.903e-04	2	-3.055e-04	5	-2.923e-03	10
51	N28	max	.031	3	-.004	9	.011	4	4.104e-03	2	4.141e-04	2	-1.235e-04	4
52		min	-.015	4	-.046	5	-.017	3	-2.757e-03	1	-1.871e-04	1	-2.874e-03	10
53	N29A	max	.047	3	.022	10	.097	2	1.254e-03	2	1.601e-03	2	4.111e-03	9
54		min	-.127	9	-.265	9	-.06	1	-4.316e-04	1	-1.547e-03	1	-7.257e-04	10
55	N30A	max	.045	3	.006	10	.074	2	2.247e-03	2	4.781e-04	3	2.033e-03	9
56		min	-.067	9	-.016	9	-.033	1	-1.196e-03	1	-4.357e-04	4	-5.166e-04	3
57	N31	max	.191	10	-.094	9	.369	2	7.212e-03	2	6.134e-03	1	8.015e-04	4
58		min	-.026	4	-.376	10	-.305	1	-5.641e-03	1	-6.521e-03	2	-5.933e-03	10
59	N32	max	.137	3	-.006	9	.243	2	1.057e-02	2	4.141e-04	2	2.819e-03	4
60		min	-.074	4	-.053	6	-.211	1	-9.221e-03	1	-1.871e-04	1	-4.504e-03	3
61	N33	max	.127	9	.022	10	.037	2	1.157e-03	5	1.392e-03	2	4.197e-03	9
62		min	-.045	10	-.266	9	-.073	1	-7.859e-04	9	-1.447e-03	1	-7.345e-04	10
63	N34	max	.067	9	.006	10	-.009	2	1.45e-03	5	3.206e-04	3	2.066e-03	9
64		min	-.035	8	-.016	9	-.055	5	1.792e-04	2	-3.659e-04	4	-4.594e-04	2
65	N35	max	-.026	9	-.094	9	.048	2	1.998e-03	7	3.992e-03	1	-1.244e-03	9
66		min	-.191	10	-.376	10	-.112	1	1.999e-04	10	-3.577e-03	2	-5.985e-03	10
67	N36	max	.002	3	-.006	9	.05	2	3.279e-03	1	4.489e-05	2	-7.343e-05	3
68		min	-.107	10	-.052	6	-.081	1	-1.941e-03	2	-3.055e-04	5	-2.919e-03	10
69	N41	max	0	9	0	2	0	3	0	5	6.825e-04	9	0	9
70		min	0	10	0	5	0	8	0	2	-1.896e-03	10	0	10
71	N42	max	0	10	0	1	0	7	0	6	2.021e-03	3	0	9
72		min	0	9	0	6	0	4	0	1	-8.27e-04	4	0	10
73	N45	max	.027	3	0	10	.017	3	4.347e-05	5	1.633e-03	3	-2.86e-05	2
74		min	-.011	4	0	9	-.007	4	-2.641e-05	10	-6.763e-04	4	-1.062e-04	5
75	N46	max	.009	9	0	10	.006	9	4.457e-05	6	4.851e-04	9	-5.426e-06	1
76		min	-.025	10	0	9	-.016	10	-2.808e-05	10	-1.494e-03	10	-1.089e-04	6
77	N47	max	.027	3	0	9	.007	4	1.506e-04	5	1.592e-03	3	9.859e-05	1
78		min	-.011	4	0	6	-.017	3	4.195e-06	9	-7.137e-04	4	-4.038e-05	2
79	N48	max	.009	9	0	2	.016	10	1.529e-04	6	5.399e-04	9	1.325e-04	2
80		min	-.026	10	0	5	-.006	9	2.451e-06	9	-1.413e-03	10	-7.522e-05	1

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
81	N49	max	.031	3	.011	10	.022	3	1.683e-03	9	4.184e-05	9	9.251e-04	9
82		min	-.014	4	-.01	9	-.01	4	-5.167e-05	10	-3.703e-04	10	-6.345e-04	8
83	N50	max	.008	9	.011	10	.004	3	1.796e-03	9	3.704e-04	6	9.474e-04	9
84		min	-.026	10	-.01	9	-.017	10	-8.254e-05	10	-6.712e-05	9	-6.598e-04	7
85	N51	max	.031	3	.001	9	.011	4	4.041e-03	5	1.909e-04	9	-3.696e-05	9
86		min	-.015	4	-.02	7	-.018	3	7.859e-04	2	-2.685e-04	10	-1.44e-03	10
87	N52	max	.009	9	.002	9	.013	4	4.111e-03	6	2.606e-04	10	-5.677e-05	9
88		min	-.025	10	-.02	10	-.006	3	2.038e-04	1	-2.13e-04	9	-1.471e-03	10
89	N50A	max	.008	9	-.023	9	.005	4	2.447e-03	5	1.389e-03	1	-1.725e-03	4
90		min	-.024	10	-.105	10	-.002	3	4.896e-04	2	-7.384e-04	2	-7.157e-03	10
91	N51A	max	.009	9	.022	10	.041	2	1.105e-03	5	1.392e-03	2	4.198e-03	9
92		min	-.025	10	-.266	9	-.055	1	-8.041e-04	9	-1.447e-03	1	-7.346e-04	10
93	N52A	max	.032	3	.022	10	.063	2	1.183e-03	6	1.601e-03	2	4.11e-03	9
94		min	-.017	4	-.265	9	-.049	1	-2.497e-04	1	-1.547e-03	1	-7.256e-04	10
95	N53B	max	.009	9	.006	10	.003	3	1.398e-03	5	3.206e-04	3	2.066e-03	9
96		min	-.025	10	-.016	9	-.016	8	3.611e-04	2	-3.659e-04	4	-4.595e-04	2
97	N54A	max	.033	3	.006	10	.02	3	1.708e-03	2	4.781e-04	3	2.031e-03	9
98		min	-.017	4	-.016	9	-.008	4	-6.579e-04	1	-4.357e-04	4	-4.177e-04	5
99	N55	max	.008	9	-.094	9	.082	2	2.045e-03	6	3.992e-03	1	-1.244e-03	9
100		min	-.024	10	-.376	10	-.103	1	1.817e-04	10	-3.577e-03	2	-5.986e-03	10
101	N56	max	.03	3	-.094	9	.182	2	4.983e-03	2	6.134e-03	1	-8.97e-04	4
102		min	-.015	4	-.376	10	-.162	1	-3.416e-03	1	-6.521e-03	2	-5.915e-03	10
103	N57	max	.007	9	-.005	9	.013	4	1.997e-03	5	4.489e-05	2	-5.794e-04	2
104		min	-.025	10	-.052	6	-.007	3	-4.903e-04	2	-3.055e-04	5	-2.923e-03	10
105	N58	max	.032	3	-.005	9	.011	4	4.104e-03	2	4.141e-04	2	-1.235e-04	4
106		min	-.016	4	-.052	6	-.017	3	-2.757e-03	1	-1.871e-04	1	-2.874e-03	10
107	N57A	max	0	1	0	1	0	1	0	1	0	1	0	1
108		min	0	1	0	1	0	1	0	1	0	1	0	1
109	N59	max	0	10	0	3	0	4	0	4	0	1	0	4
110		min	0	9	0	8	0	3	0	10	0	1	0	10
111	N56A	max	.031	3	-.024	9	.004	4	4.277e-03	2	1.779e-03	1	-1.78e-03	4
112		min	-.015	4	-.105	10	-.007	3	-2.485e-03	1	-2.419e-03	2	-7.048e-03	10
113	N57B	max	0	2	0	10	0	4	0	4	0	1	0	4
114		min	0	1	0	8	0	3	0	10	0	1	0	10

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

	Member	Shape	Code Check	Loc[ft]	LC	She...	Loc[ft]	.....	phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
1	M4	PL5/8x3.5	.395	.5	6	.198	0	y	...	6686...	70875	.923	5.168	2.256	H1-...
2	M18A	PIPE_2.0	.246	2.318	6	.194	2.344		6	2981...	32130	1.872	1.872	2.001	H1-...
3	M8	PL5/8x3.5	.400	.5	5	.194	0	y	...	6686...	70875	.923	5.168	2.248	H1-...
4	M17A	PIPE_2.0	.242	2.318	7	.193	2.344		5	2981...	32130	1.872	1.872	2.004	H1-...
5	M17	PIPE_2.5	.262	4.958	10	.149	4.958		2	4147...	50715	3.596	3.596	2.88	H1-...
6	M14	PIPE_2.5	.255	4.958	10	.142	4.958		5	4147...	50715	3.596	3.596	2.895	H1-...
7	M3	PL5/8x3.5	.209	.5	9	.136	0	y	9	6686...	70875	.923	5.168	1.261	H1-...
8	M7	PL5/8x3.5	.186	.5	9	.133	0	y	9	6686...	70875	.923	5.168	1.055	H1-...
9	M16A	PIPE_2.0	.143	2.318	9	.087	2.344		9	2981...	32130	1.872	1.872	2.044	H1-...
10	M15A	PIPE_2.0	.139	0	10	.080	0		9	2981...	32130	1.872	1.872	1.972	H1-...
11	M18	PIPE_2.5	.322	0	10	.078	0		...	3035...	50715	3.596	3.596	2.179	H1-...
12	M15	PIPE_2.5	.307	0	10	.076	0		3	3035...	50715	3.596	3.596	2.182	H1-...
13	MP1A	PIPE_2.0	.458	2.333	10	.075	2.333		2	1491...	32130	1.872	1.872	4.97	H1-...

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

	Member	Shape	Code Check	Loc[ft]	LC	She...	Loc[ft]	.....		phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
14	M16	PIPE_2.5	.225	3.771	9	.059	3.771		9	3035...	50715	3.596	3.596	2.287	H1-...
15	M36	PIPE_2.0	.058	3.765	8	.056	0		...	1627...	32130	1.872	1.872	1.136	H1-...
16	M44A	PIPE_2.0	.068	3.765	3	.055	0		...	1627...	32130	1.872	1.872	1.136	H1-...
17	MP4A	PIPE_2.0	.356	2.333	9	.052	5.667		9	1491...	32130	1.872	1.872	4.967	H1-...
18	MP2A	PIPE_2.0	.406	2.333	2	.050	2.333		2	1491...	32130	1.872	1.872	3.711	H1-...
19	M13	PIPE_2.5	.216	3.771	9	.031	3.771		9	3035...	50715	3.596	3.596	2.283	H1-...
20	MP3A	PIPE_2.0	.169	5.667	9	.029	5.667		9	1491...	32130	1.872	1.872	4.966	H1-...
21	M27	SR_0.625	.040	3.333	7	.014	0		...	2503...	9940...	.104	.104	2.471	H1-...
22	M29	SR_0.625	.045	3.333	7	.013	3.333		...	2503...	9940...	.104	.104	2.45	H1-...
23	M33	SR_0.75	.147	3.976	5	.012	3.976		7	3648...	1431...	.179	.179	3.211	H1-...
24	M34	SR_0.75	.517	0	8	.011	0		8	3648...	1431...	.179	.179	3.317	H1-...
25	M31	SR_0.75	.067	3.976	9	.006	3.976		3	3648...	1431...	.179	.179	2.88	H1-...
26	M32	SR_0.75	.267	0	9	.004	0		...	3648...	1431...	.179	.179	2.733	H1-...
27	M28	SR_0.625	.045	3.333	9	.004	3.333		7	2503...	9940...	.104	.104	2.27	H1-...
28	M30	SR_0.625	.129	3.333	1	.004	0		6	2503...	9940...	.104	.104	2.185	H1-...

EXHIBIT 9

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: CTNH451A

CT72XC031
Lower County Road
Roxbury, Connecticut 06783

February 23, 2021

EBI Project Number: 6221000652

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**17.54%**

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

February 23, 2021

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

Emissions Analysis for Site: CTNH451A - CT72XC031

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **Lower County Road** in **Roxbury, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

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

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

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

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

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

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

5) 4 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) 1 LTE channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

8) 1 NR channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

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

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

11) The antennas used in this modeling are the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

12) The antenna mounting height centerline of the proposed antennas is 177 feet above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd
Height (AGL):	177 feet	Height (AGL):	177 feet	Height (AGL):	177 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts
ERP (W):	12,841.53	ERP (W):	12,841.53	ERP (W):	12,841.53
Antenna A1 MPE %:	**1.47%**	Antenna B1 MPE %:	**1.47%**	Antenna C1 MPE %:	**1.47%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd
Height (AGL):	177 feet	Height (AGL):	177 feet	Height (AGL):	177 feet
Channel Count:	7	Channel Count:	7	Channel Count:	7
Total TX Power (W):	320 Watts	Total TX Power (W):	320 Watts	Total TX Power (W):	320 Watts
ERP (W):	8,360.85	ERP (W):	8,360.85	ERP (W):	8,360.85
Antenna A2 MPE %:	**1.62%**	Antenna B2 MPE %:	**1.62%**	Antenna C2 MPE %:	**1.62%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd
Height (AGL):	177 feet	Height (AGL):	177 feet	Height (AGL):	177 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	38,477.89	ERP (W):	38,477.89	ERP (W):	38,477.89
Antenna A3 MPE %:	**4.42%**	Antenna B3 MPE %:	**4.42%**	Antenna C3 MPE %:	**4.42%**

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	7.51%
Town	0.13%
Alltel	0.41%
Sprint	1.87%
AT&T	6.14%
Verizon	1.48%
Site Total MPE % :	17.54%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	7.51%
T-Mobile Sector B Total:	7.51%
T-Mobile Sector C Total:	7.51%
Site Total MPE % :	17.54%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz GSM	4	1028.30	177.0	4.72	1900 MHz GSM	1000	0.47%
T-Mobile 1900 MHz LTE	2	2056.61	177.0	4.72	1900 MHz LTE	1000	0.47%
T-Mobile 2100 MHz LTE	2	2307.55	177.0	5.30	2100 MHz LTE	1000	0.53%
T-Mobile 600 MHz LTE	2	591.73	177.0	1.36	600 MHz LTE	400	0.34%
T-Mobile 600 MHz NR	1	1577.94	177.0	1.81	600 MHz NR	400	0.45%
T-Mobile 700 MHz LTE	2	695.22	177.0	1.60	700 MHz LTE	467	0.34%
T-Mobile 1900 MHz LTE	2	2104.51	177.0	4.83	1900 MHz LTE	1000	0.48%
T-Mobile 2500 MHz LTE	1	19238.94	177.0	22.08	2500 MHz LTE	1000	2.21%
T-Mobile 2500 MHz NR	1	19238.94	177.0	22.08	2500 MHz NR	1000	2.21%
						Total:	**7.51%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	7.51%
Sector B:	7.51%
Sector C:	7.51%
T-Mobile Maximum MPE % (Sector A):	7.51%
Site Total:	17.54%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **17.54%** 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.

EXHIBIT 10