CENTERLINE COMMUNICATIONS

750 West Center Street, Floor 3 / Suite 301
West Bridgewater, MA 02379 *Corporate Headquarters*
781.713.4725
617.249.0819

Centerline Communications
Ryan Clark
750 West Center Street, Floor 3
West Bridgewater, MA 02379
203-300-7310
rclark@clinellc.com

April 28, 2021

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

Notice of Exempt Modification
1679 Stanley Street New Britain, CT 06053
Latitude: 41.691916
Longitude: -72.770862
T-Mobile Site#: CTHA783A_Sprint Retain

Dear Ms. Bachman:

T-Mobile/Sprint currently maintains nine (9) antennas at the 138-foot level of the existing 143-foot rooftop guyed tower at 1679 Stanley Street New Britain, CT 06053. The 143-foot tower and property is owned by Central Connecticut State University. T-Mobile/Sprint now intends to replace nine (9) of its existing antennas with three (3) new 600/700 MHz antenna, (3) 2100 MHz antenna and (3) 2500 MHz antennas. The new antennas would be installed at the 138-foot level of the tower. The Mount Analysis Report recommends replacing the pipe mounts. The proposed modifications will make the site available for 5G at some point in the future.

Planned Modifications:

Remove and Replace:
(3) RFS-APXVSPP18-C-A20 Antennas **(Remove)** - (3) APXVAALL24_43-U-NA20 Antennas L600/700 MHz **(Replace)**
(3) RFS-APXVSPP18-C-A20 Antennas **(Remove**)- (3) APX16DWV-16DWV-S-E-A20/ 2100 MHz (**Replace**)
(3) RFS-APXVTMM14-C-120 Antennas **(Remove) -** (3) AIR 6449-B41 Antennas 2500 MHz (**Replace**)
(3) ALU-800 MHz RRH **(Remove) –** (3) 4415 B66A RRH (**Replace**)
(3) ALU 1900 MHz RRH **(Remove)-** (3) 4449 B71+B85 RRH (**Replace**)
(3) ALU TD-RRH (**Remove**)**-** (3) 4424 B25 RRH (**Replace**)

Remove:
(3) Samsung FDD001 RRH **(Remove)**
(6) Coax

Install New:
(3) Fiber Hybrid Line

Ground:

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(4) Replace existing cabinets
(1) Replace existing conduit

This facility was approved by the State of Connecticut Department of Public Safety with building permit #03-97 on February 10, 1997 for CCSU Vance Hall on 1516 Stanley Street New Britain, CT. Please see the attached approval letter.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mayor Erin Stewart, Chief Elected Official and the Office of Planning and Development for the City of New Britain, as well as the property owner and the tower owner.

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

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

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

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

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

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

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

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

Sincerely,

Ryan Clark
Mobile: 203-300-7310
Fax: 508-819-3017
Office: 750 West Center Street, Floor 3 West Bridgewater, MA 02379
Email: rclark@clinellc.com

Attachments
cc: Mayor Erin Stewart, City of New Britain -chief elected official
Office of Planning and Development for the City of New Britain
Central Connecticut State University- tower and property owner

Exhibit A

Original Facility Approval

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC SAFETY

DIVISION OF FIRE, EMERGENCY AND BUILDING SERVICES

BUILDING PERMIT #03-97 (FULL)

The Agency named below is hereby granted permission to perform work as described herein at:

PROJECT: Lucent Technologies
Bechtel Alliance
SSLP Project

LOCATION: CCSU, Vance Hall
1516 Stanley Street
New Britain, Connecticut

USE GROUP: U-Utility

CONSTRUCTION TYPE: 2C

PROJECT #: Sprint PCS No. CT 03XC-098

In accordance with the Application for Full Building Permit dated January 3, 1997 and related plans dated October 1, 1996, January 20, 1997 and February 10, 1997, as approved by the Department of Public Safety.

TYPE OF WORK: (Permit will be valid only for those items checked)

Architectural		Foundation	
Structural	✓	Repair	
Electrical	✓	Renovation	
Mechanical		Other	
Plumbing			

AGENCY: Sprint PCS

AGENCY REPRESENTATIVE: Sprint Spectrum L.P., Mike Evanchick

JOB DESCRIPTION: 80 Foot Guyed Tower, Roof Mounted

STIPULATION: Provide tax information regarding contractors and subcontractors pursuant to C.G.S. 29-252a(b) as it becomes available.

NOTE: In no way does this permit relieve the designer of the ultimate responsibility for compliance of the entire project with requirements of the Connecticut Building Code and applicable referenced standards. The contractor must give seven (7) days advance notification to the State Building Inspector of the intention to start work and schedule all required on-site inspections during construction as hereafter required.

Date: 2/10/97

Ramon A. Serbia
State Building Inspector

RAS:MDG:ps

1111 Country Club Road
P.O. Box 2794
Middletown, CT 06457-9294
An Equal Opportunity Employer

Exhibit B

Property Card

1615 STANLEY ST

Location	1615 STANLEY ST	**Mblu**	A4C/ 3/ / /
Acct#	81301615	**Owner**	CONNECTICUT STATE OF- CCSU
Assessment	$363,252,120	**Appraisal**	$518,931,600
PID	1532	**Building Count**	39

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$507,333,700	$11,597,900	$518,931,600
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$355,133,590	$8,118,530	$363,252,120

Owner of Record

Owner	CONNECTICUT STATE OF- CCSU	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	1615 STANLEY ST NEW BRITAIN, CT 06053	**Book & Page**	1568/0005
		Sale Date	12/10/2004

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
CONNECTICUT STATE OF- CCSU	$0		1568/0005	12/10/2004
CENTRAL CONN STATE UNIV	$0		1490/0544	10/14/2003
CENTRAL CONN STATE UNIV	$0		1490/0004	12/24/2002
CENTRAL CONN STATE UNIV	$0		1490/0001	12/24/2002
CENTRAL CONN STATE UNIV	$0		1197/0252	04/13/1995
CENTRAL CONN STATE UNIV	$0		1178/0695	06/07/1994
CENTRAL CONN STATE UNIV	$0		0678/0337	09/03/1971
CENTRAL CONN STATE UNIV	$0		0667/0476	01/07/1971
CENTRAL CONN STATE UNIV	$0		0661/0415	06/26/1970
CENTRAL CONN STATE UNIV	$0		0661/0241	06/17/1970
CENTRAL CONN STATE UNIV	$0		0565/0503	12/23/1969

Building 27 : Section 1

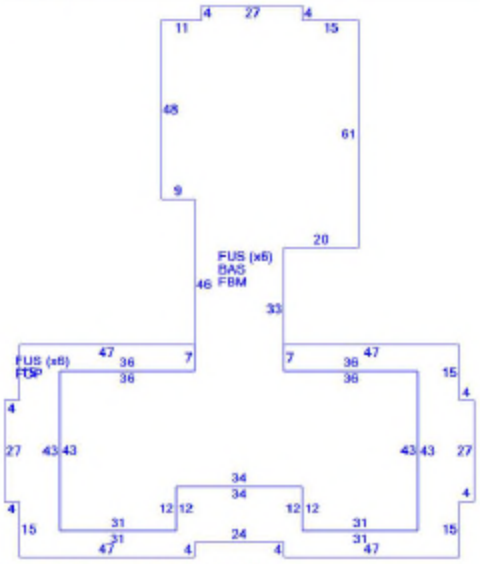
Year Built: 1970
Living Area: 79,636
Replacement Cost: $14,870,264
Building Percent Good: 86
Replacement Cost Less Depreciation: $12,788,400

Building Attributes : Bldg 27 of 39	
Field	**Description**
Style:	Dormitory
Model	Comm/Ind
Grade	A-
Stories:	7
Occupancy	1.00
Exterior Wall 1	Brick/Masonry
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	T&G/Rubber
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Vinyl/Asphalt
Interior Floor 2	
Central Heat	Yes
AC Type	None
Struct Class	
Bldg Use	CCSU MDL-94
Apt Units	
Total Bedrms	00
Total Baths	0
Comm Units	
Ind Units	
1st Floor Use:	
Heat/AC	Cent Heat
Frame Type	Masonry
Baths/Plumbing	Average
Ceiling/Wall	Ceil & Walls
Rooms/Prtns	Average
Wall Height	12.00
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos/NewBritainCTPhotos//\00\03\55\16.jpg)

Building Layout



(ParcelSketch.ashx?pid=1532&bid=102476)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
FUS	Finished Upper Story	64,164	64,164
BAS	First Floor	7,736	7,736
FBM	Finished Bsmt Area	7,736	7,736
FOP	Open Porch	2,958	0
		82,594	79,636


1615 STANLEY ST
MBL : A4C 3
Owner : CONNECTICUT STATE OF-CCSU
Acres : 118.77
Land Use : CCSU MDL-94
Zoning : OP
Details Quick Map VISION NEGEO Card BirdsEye Photo
Generate Mailing List: 100 Ft: Submit
FAIRWAY DR
BARBOUR RD
DENNIS DR
MARLIN RD
HAZELMERE RD
SILVAN RD
LYLE RD
PENDLETON RD
STANLEY ST
KILBOURNE AVE
WELLS RD
SERVICE RD
BILTMORE ST
EAST ST
FRANCIS ST
STRATFORD RD
175
Newington

Exhibit C

Construction Drawings

PROJECT INFORMATION

SITE NAME:	VANCE HALL CCSU (CT03XC098-0)
SITE NUMBER:	CTHA783A
SITE ADDRESS:	1679 STANLEY STREET NEW BRITAIN, CONNECTICUT 06053
COUNTY	HARTFORD COUNTY
MUNICIPALITY:	HARTFORD COUNTY
ZONING:	A4C 3
LATITUDE:	N 41°41'30.89" (41.691916°) (NAD83)
LONGITUDE:	W 72°46'15.10" (-72.770862°) (NAD83)
TYPE OF SITE:	TOWER
STRUCTURE HEIGHT:	143'-0" ± AGL (T.O. TOWER)
ANTENNA CENTER:	138'-0" AGL
GROUND ELEVATION:	145.2' (NAVD 88)
BUILDING OWNER NAME:	CONNECTICUT STATE OF - CCSU
BUILDING OWNER ADDRESS:	1615 STANLEY STREET NEW BRITAIN, CT 06053
APPLICANT:	T-MOBILE NORTHEAST, LLC. 15 COMMERCE WAY, SUITE B NORTON, MASSACHUSETTS 02766
APPLICANT PHONE:	(508) 286-2700
APPLICANT FAX:	(508) 286-2893

PROJECT DIRECTORY

ENGINEERING FIRM:
CENTERLINE COMMUNICATIONS
750 WEST CENTER ST, SUITE 301
WEST BRIDGEWATER, MA 02379
DEREK CREASER (617) 306-3034

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

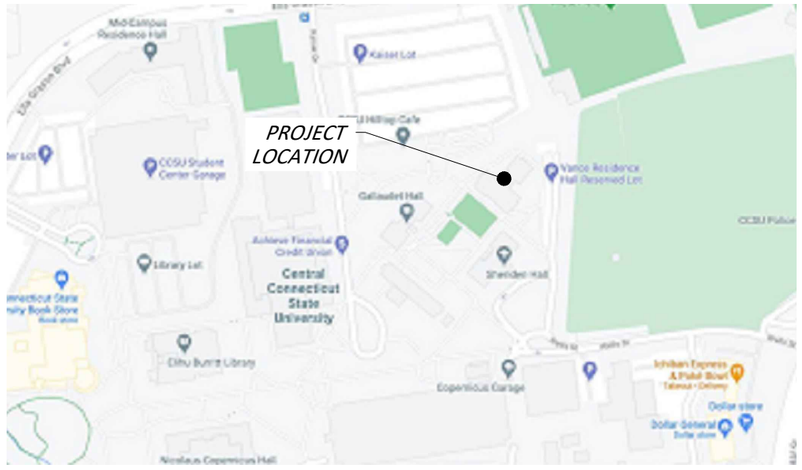
811 Know what's **below.** **Call** before you dig.

CENTERLINE COMMUNICATIONS

T - Mobile NORTHEAST LLC

SITE NAME: VANCE HALL CCSU (CT03XC098-0)
SITE ID: CTHA783A
ADDRESS: 1679 STANLEY STREET
NEW BRITAIN, CT 06053

TECHNOLOGY: 67D5A998C 6160 (GSM ONLY)
MODIFICATION: NEW BUILD SPRINT KEEP



VICINITY MAP
N.T.S.

LOCATION MAP
N.T.S.

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.

SCOPE OF WORK

1. REMOVE NINE EXISTING ANTENNAS AND INSTALL NINE NEW ANTENNAS
2. INSTALL NINE NEW RRUS
3. INSTALL ONE NEW 6160 AC ENCLOSURE
4. INSTALL ONE NEW B160 BATTERY ENCLOSURE
5. INSTALL ONE NEW ERICSSON 2416 ENCLOSURE
6. INSTALL THREE NEW 6x24 HYBRID CABLE
7. REMOVE ALL UNUSED CABLES AND EQUIPMENT
8. INSTALL ONE NEW GEN PLUG PPC CABINET

DRAWING INDEX

NO.	DESCRIPTION
T–1	TITLE SHEET
GN–1	GENERAL NOTES, RF NOTES, CABLING NOTES
A–1	PARTIAL ROOFTOP PLAN
A–2	EQUIPMENT LAYOUT
A–2.1	EQUIPMENT & ANTENNA DETAILS
A–3	EAST ELEVATION
A–4	ANTENNA PLAN & SCHEDULE
A–5	GENERAL DETAILS
SN–1	STRUCTURAL NOTES & SPECIAL INSPECTIONS
E–1	ONE–LINE DIAGRAM & GROUNDING DETAILS

DRAWING SCALE NOTES:

THESE DRAWINGS ARE FORMATTED TO BE FULL SIZE AT 22"x34". CONTRACTOR SHALL VERIFY ALL PLANS & EXISTING DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

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

CENTERLINE COMMUNICATIONS
750 W CENTER ST, SUITE 301
WEST BRIDGEWATER, MA 02379
PHONE: 781.713.4725

REVISIONS

REV	DATE	DESCRIPTION	BY
0	04/27/21	ISSUED FOR PERMITTING	MP
A	03/30/21	ISSUED FOR REVIEW	NMT

DESIGNED BY: NMT | APPROVED BY: MK

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

DATE: 04/27/21

SITE NAME: VANCE HALL CCSU (CT03XC098-0)
SITE ID: CTHA783A
SITE ADDRESS: 1679 STANLEY STREET NEW BRITAIN, CONNECTICUT 06053
SHEET TITLE: **TITLE SHEET**
DRAWING: **T-1**

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 & 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.

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR - CENTERLINE COMMUNICATIONS
   SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER - T-MOBILE MOBILITY
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 MOBILITY 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 & CT STATE BUILDING CODES
    ELECTRICAL CODE: 2020 NATIONAL ELECTRICAL CODE
    LIGHTING CODE: NFPA 780-2020

    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 GROUND LEVEL	GRC	GALVANIZED RIDGID CONDUIT	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAGE	MGB	MASTER GROUND BUSS	R&R	REMOVE AND REPLACE
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBR	TO BE REMOVED
BTS	BASE TRANSCEIVER STATION	NEC	NATIONAL ELEC. CODE	TYP	TYPICAL
EG	EQUIPMENT GROUND	NTS	NOT TO SCALE		
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		
G.C.	GENERAL CONTRACTOR	REQ	REQUIRED		

T - Mobile
NORTHEAST LLC

T-MOBILE NORTHEAST, LLC.
15 COMMERCE WAY, SUITE B
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FAX: (508) 286-2893

CENTERLINE COMMUNICATIONS
750 W CENTER ST, SUITE 301
WEST BRIDGEWATER, MA 02379
PHONE: 781.713.4725

REVISIONS

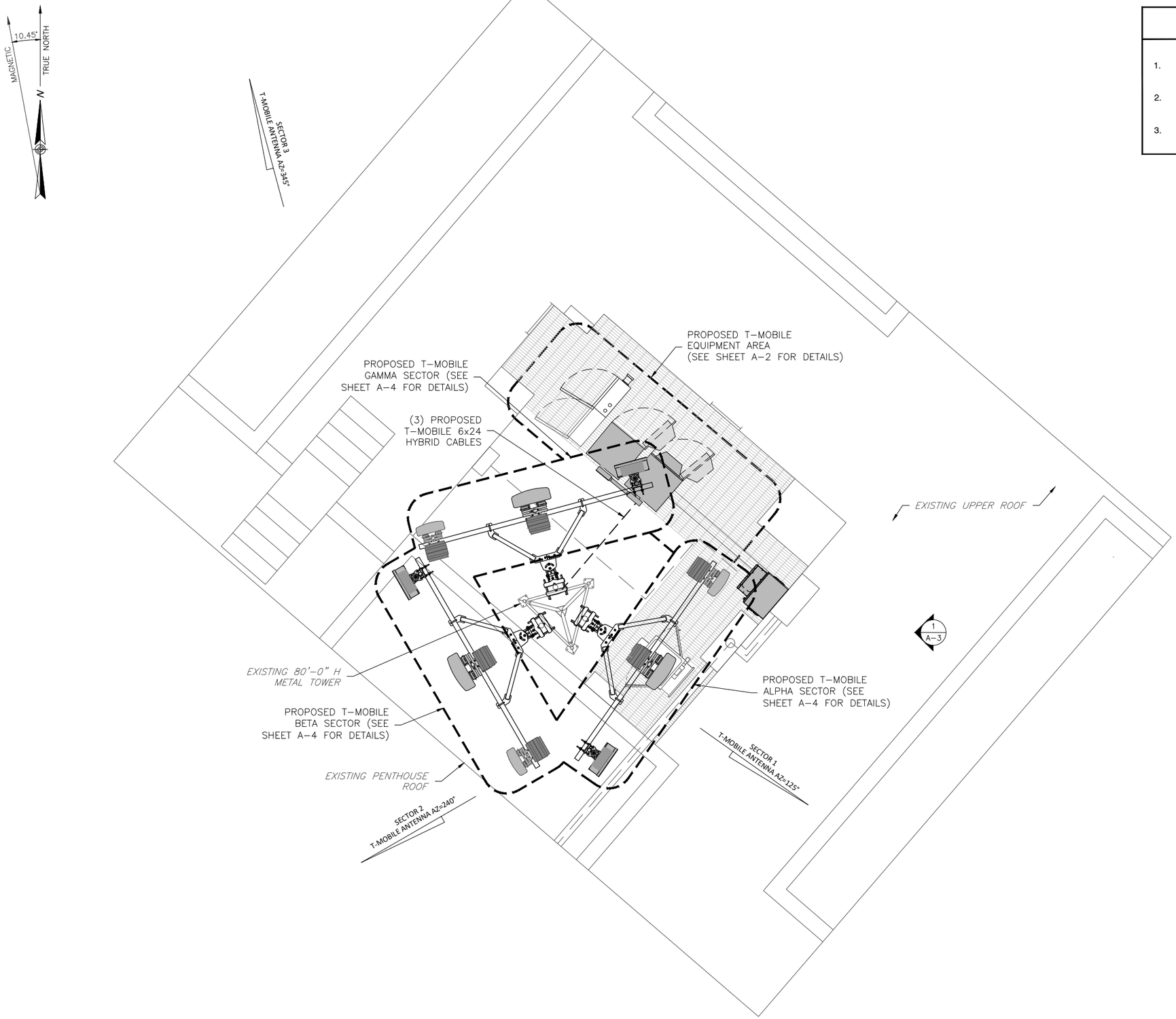
REV	DATE	DESCRIPTION	BY
0	04/27/21	ISSUED FOR PERMITTING	MP
A	03/30/21	ISSUED FOR REVIEW	NMT

DESIGNED BY: NMT | APPROVED BY: MK

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

DATE: 04/27/21

SITE NAME: VANCE HALL CCSU (CT03XC098-0)
SITE ID: CTHA783A
SITE ADDRESS: 1679 STANLEY STREET NEW BRITAIN, CONNECTICUT 06053
SHEET TITLE: **GENERAL NOTES, RF NOTES, CABLING NOTES**
DRAWING: **GN-1**



1 A-1 PARTIAL ROOFTOP PLAN

NOTES

1. CONTRACTOR SHALL MAKE A UTILITY "ONE CALL" TO LOCATE ALL UTILITIES PRIOR TO EXCAVATING.
2. CONSTRUCTION TO COMMENCE UPON COMPLETION OF A PASSING STRUCTURAL ANALYSIS.
3. REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA MODELS AND SETTINGS.

GRAPHIC SCALE

4 0 1 2 4 8

3/8 INCH = 1 FOOT (22X34)
3/16 INCH = 1 FOOT (11X17)

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NORTHEAST LLC

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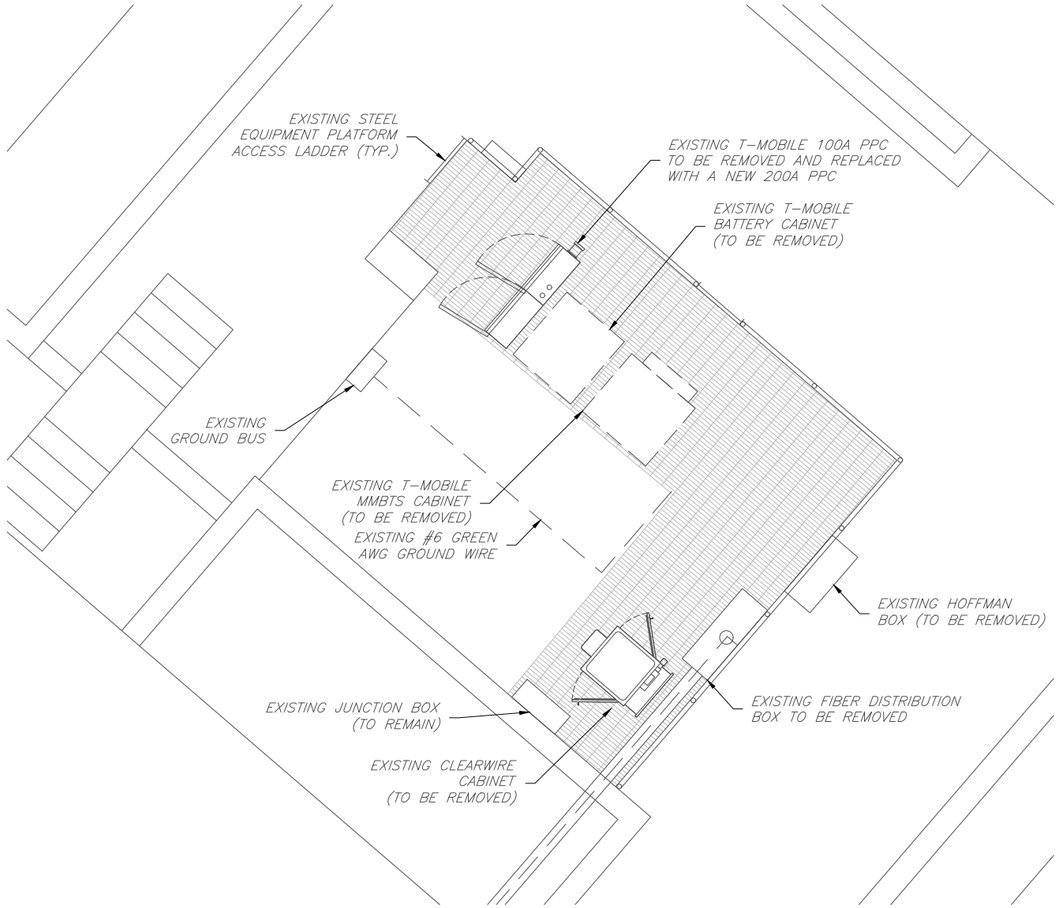
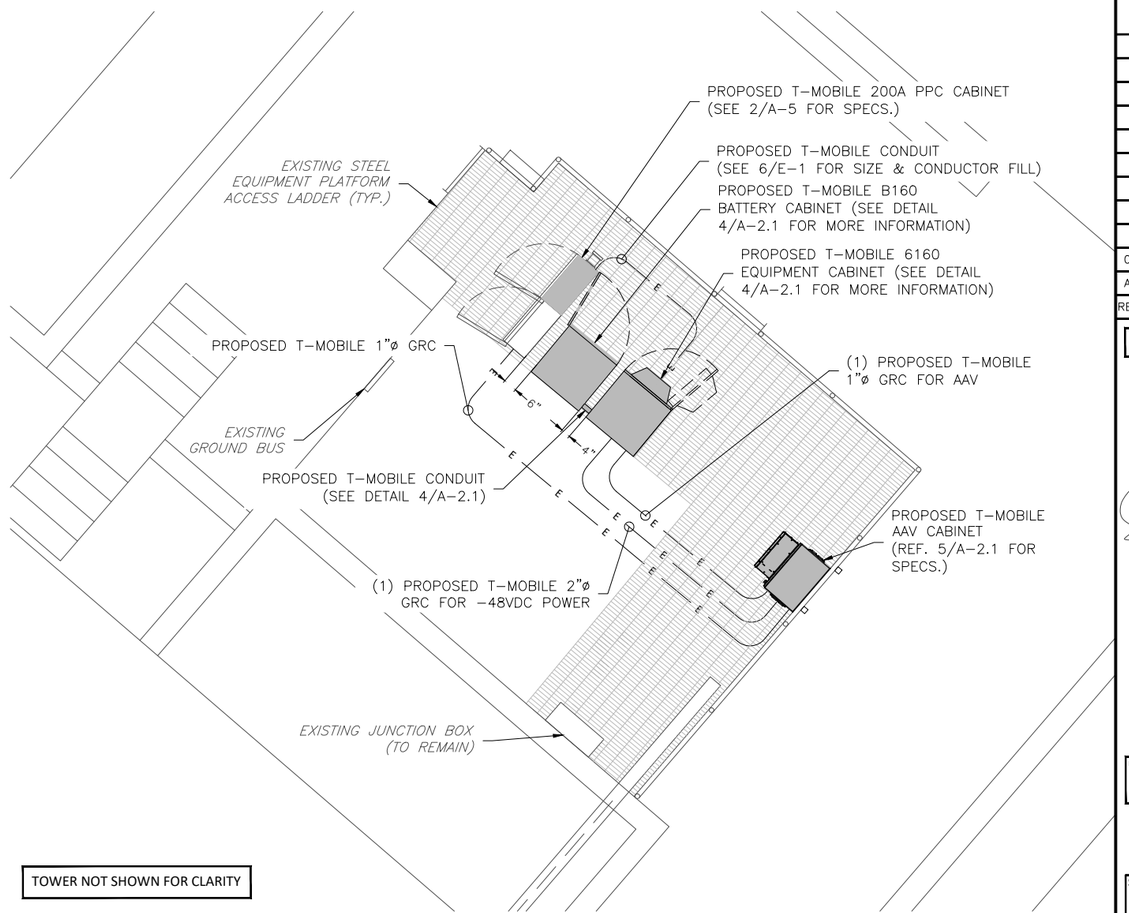
SHEET TITLE:
PARTIAL ROOFTOP PLAN

DRAWING:
A-1



1 A-2 EXISTING EQUIPMENT LAYOUT

TOWER NOT SHOWN FOR CLARITY



2 A-2 PROPOSED EQUIPMENT LAYOUT

GRAPHIC SCALE

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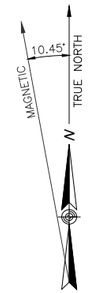
3/8 INCH = 1 FOOT (22X34)
3/16 INCH = 1 FOOT (11X17)



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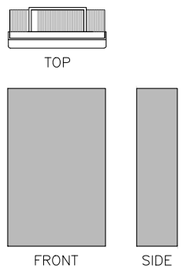
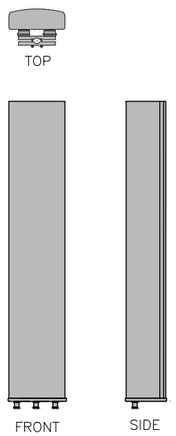
SHEET TITLE:
EQUIPMENT LAYOUT

DRAWING:
A-2

ERICSSON AIR6449-B41 ANTENNA DETAILS	
MODEL #	AIR6449
MANUF.	ERICSSON
WIDTH	20.6"(1'-8 ½")
DEPTH (W/ DOOR)	8.6" (8 ½")
HEIGHT	33.1"(2'9 ⅛")
WEIGHT	104± LBS
(INSTALL PER MANUFACTURER'S INSTALLATION GUIDELINES)	

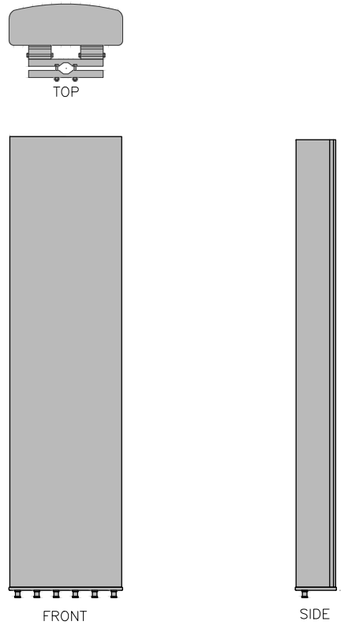


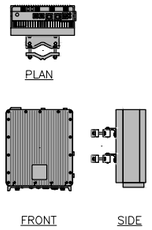
APX16DWV-16DWV-S-E-A20	
MODEL #	APX16DWV-16DWV-S-E-A20
MANUF.	RFS
HEIGHT	55.9"
WIDTH	13.0"
DEPTH	3.15"
WEIGHT	40.7 LBS



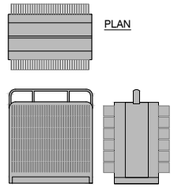
1 A-2.1 ANTENNA DETAILS
NOT TO SCALE

RFS APXVAALL24_43-U-NA20	
MODEL #	APXVAALL24_43-U-NA20 (OCTA)
MANUF.	RFS
HEIGHT	95.9"
WIDTH	24"
DEPTH	8.7"
WEIGHT	128/153.3 LBS with Mounting Hardware

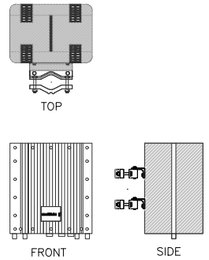




RADIO 4415 DIMENSIONS	
MODEL #	RADIO 4415 B66A RADIO 4415 B25
MANUF.	ERICSSON
WIDTH	13.47"
DEPTH	5.9"
HEIGHT	16.54"
WEIGHT	49.6 LBS

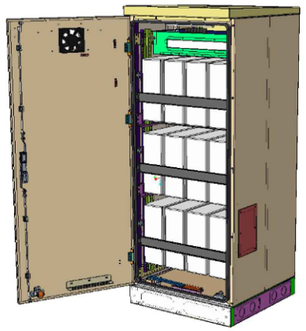


RADIO 4449 DIMENSIONS	
MODEL #	RADIO 4449 B71+B85
MANUF.	ERICSSON
WIDTH	15.0"
DEPTH	13.2"
HEIGHT	10.4"
WEIGHT	75.0 LBS



RADIO 4424 DIMENSIONS	
MODEL #	RADIO 4424 B25
MANUF.	ERICSSON
WIDTH	13.2"
DEPTH	5.4"
HEIGHT	14.9"
WEIGHT	46.3 LBS

2 A-2.1 RADIO DETAILS
NOT TO SCALE



Preliminary technical specification for Enclosure 6160 AC

CAPACITY	
Rack space user equipment	19U (19" rack)
Hardware capabilities	Power and CPRI support for multi-standard remote radios (RRU or AIR) ERS Baseband and Transport units Li-Ion batteries 3PP equipment Additional power feed available as option
MECHANICAL SPECIFICATION	
Weight	145 kg (excluding active equipment) 320 lbs (excluding active equipment)
Dimension (H x W x D)	1600 x 650 x 650 mm (incl. Base frame) 63 x 26 x 26 in. (incl. Base frame)
Base frame height	150 mm 6 in.
Mounting position	Ground
Enclosure material	Aluminum
Color	Power paint NCS 2002-B
Door	Front access
Rack type	19" (IEC 60297-3-100)
Locking type	Pad lock or Cylinder
POWER SYSTEM	
Input voltage	3P+N+PE: 346/200-415/240 VAC 2P+N+PE: 208/120-220/127 VAC 1P+N+PE: 200-250 VAC

6160 EQUIPMENT ENCLOSURE

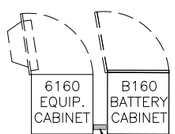
Capacity
- VRLA 12V: 100Ah / 150Ah / 170Ah / 190Ah / 210Ah
- Li-Ion: 24U 19" / 23"
- Sodium-Nickel: 3x FIAMM

Electrical specification
- DC Output: -48VDC/200A
- Battery breakers: 2x 125/2p
- Alarms: Door open, Climate failure, MCB Connection

Mechanical specification
- Weight: 134kg
- Dimensions: 63 x 26 x 26 in. (incl. Base frame)
- Base frame height: 6 in.
- Material: Galvanized steel (180g/m²)
- Color: Powder paint NCS 2002-B
- Door: Front access
- Locking type: Pad lock / cylinder

B160 BATTERY ENCLOSURE

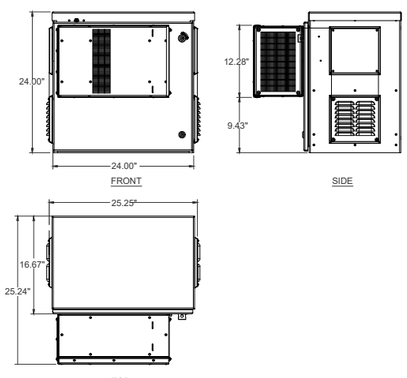
4 A-2.1 PROPOSED EQUIPMENT CABINET SPECIFICATIONS
NOT TO SCALE



(1) PROPOSED 2"øx 8" GALV. NIPPLE, (4) 2"ø LOCK RINGS. & (2) 2"ø PLASTIC BUSHING (NOT SHOWN)

4 A-2.1 PROPOSED EQUIPMENT CONDUIT DETAIL
NOT TO SCALE

2416 CABINET DIMENSIONS	
MODEL #	2416 CABINET
MANUF.	ERICSSON
WIDTH	24"
DEPTH (W/ DOOR)	16"
HEIGHT	24"
WEIGHT	ENCLOSURE 64 LBS., WITHOUT FOUR(4) BATTERIES: 36LBS. TOTAL
(INSTALL PER MANUFACTURER'S INSTALLATION GUIDELINES)	



5 A-2.1 2416 CABINET SPECS.
NOT TO SCALE

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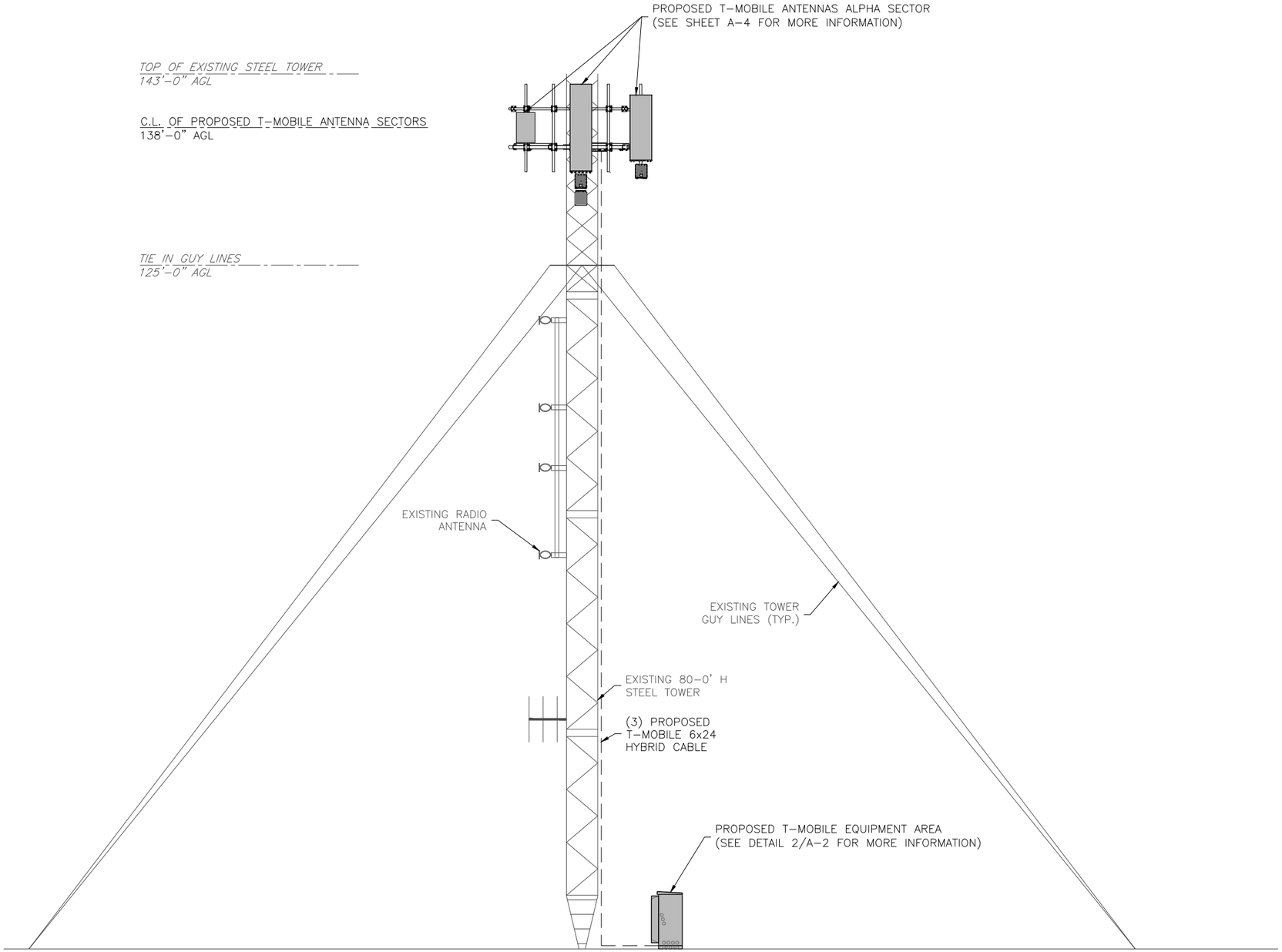
SHEET TITLE: **EQUIPMENT & ANTENNA DETAILS**

DRAWING: **A-2.1**



1 / A-3 EAST ELEVATION

GRAPHIC SCALE

8 4 0 1 2 4 8

3/16 INCH = 1 FOOT (22X34)
3/32 INCH = 1 FOOT (11X17)

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06053

SHEET TITLE:
EAST ELEVATION

DRAWING:
A-3

Pxxx: Bulk Pipe

Features:
- Factory cut end, hot-dip galvanized pipe

Construction:
- ASTM A53 Grade B
- Schedule 40

Design Criteria:
- ASTM A53 Grade B (Yield Fy = 35 ksi [240 MPa] / Tensile Fu = 60 ksi [415 MPa])
- Hot dip galvanized in accordance with ASTM A123 requirements

P296	8'-0"	2-3/8" x 96"	30 lb

3 / A-4 PROPOSED PIPE MAST SPECS

ANTENNA & CABLE NOTES:

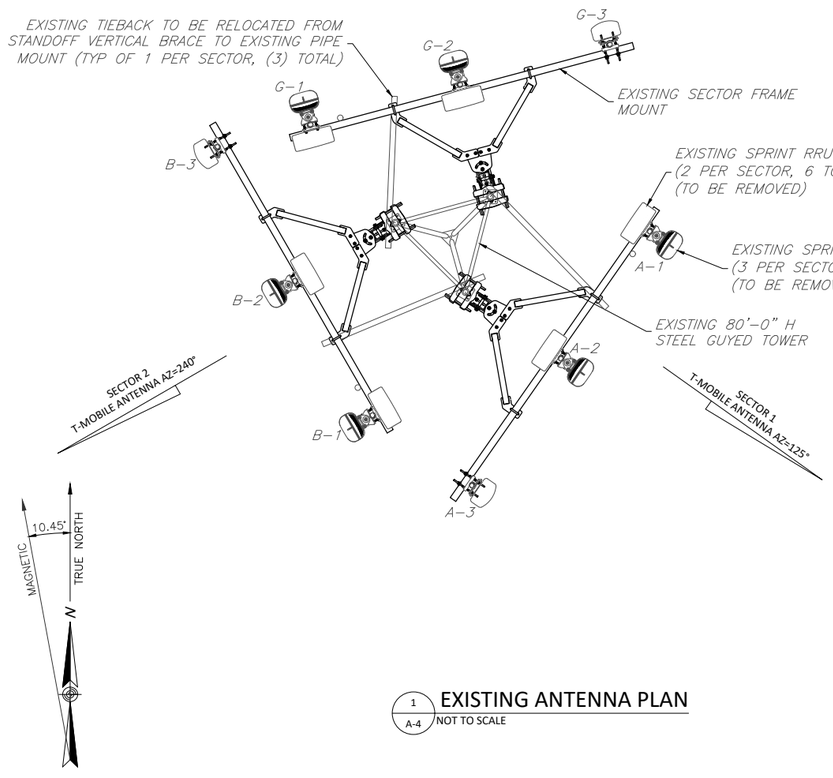
1. REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.
2. REMOVE ALL UNUSED CABLE, RRUs AND TMAs.
3. PAINT ANTENNAS AND EQUIP. TO MATCH EXISTING.

ANTENNA & CABLE SCHEDULE

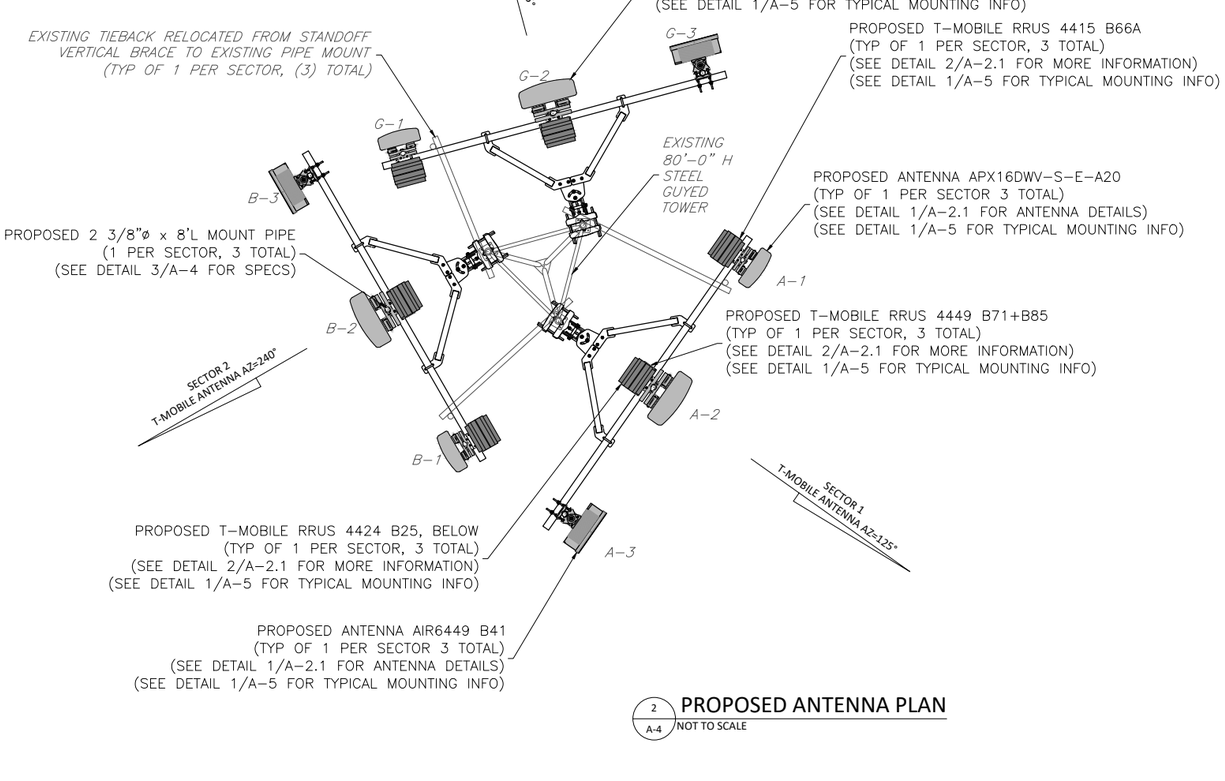
	LOCATION	AZIMUTH	RAD CENTER	STATUS	TECHNOLOGY	ANTENNA MODEL	MECH. DOWN-TILT	ELEC. DOWN-TILT	CABLES	DIPLEXERS	TMA/RRU MODEL	CABLE SIZE	CABLE LENGTH
ALPHA	A-1	125°	138'-0"	PROPOSED	L2100	APX16DWV-16DWV -S-E-A20	0°	2°/2°	(1) COAX JUMPER (X4)	N/A	RRUS 4415 B66A	6x24	±120'
	A-2	125°	138'-0"	PROPOSED	L700, L600, N600, L1900, G1900	APXVAALL24_ 43-U-NA20 (OCTO)	0°	2°/2°/2°/2°	(4) COAX JUMPER (X2)	N/A	RRUS 4449 B71+B85 RRUS 4424 B25	SHARED	SHARED
	A-3	125°	138'-0"	PROPOSED	L2500, N2500	AIR6449 B41	0°	2°/2°	N/A	N/A	N/A	SHARED	SHARED
BETA	B-1	240°	138'-0"	PROPOSED	L2100	APX16DWV-16DWV -S-E-A20	0°	2°/2°	(1) COAX JUMPER (X4)	N/A	RRUS 4415 B66A	6x24	±190'
	B-2	240°	138'-0"	PROPOSED	L700, L600, N600, L1900, G1900	APXVAALL24_ 43-U-NA20 (OCTO)	0°	2°/2°/2°/2°	(4) COAX JUMPER (X2)	N/A	RRUS 4449 B71+B85 RRUS 4424 B25	SHARED	SHARED
	B-3	240°	138'-0"	PROPOSED	L2500, N2500	AIR6449 B41	0°	2°/2°	N/A	N/A	N/A	SHARED	SHARED
GAMMA	C-1	345°	138'-0"	PROPOSED	L2100	APX16DWV-16DWV -S-E-A20	0°	2°/2°	(1) COAX JUMPER (X4)	N/A	RRUS 4415 B66A	6x24	±120'
	C-2	345°	138'-0"	PROPOSED	L700, L600, N600, L1900, G1900	APXVAALL24_ 43-U-NA20 (OCTO)	0°	2°/2°/2°/2°	(4) COAX JUMPER (X2)	N/A	RRUS 4449 B71+B85 RRUS 4424 B25	SHARED	SHARED
	C-3	345°	138'-0"	PROPOSED	L2500, N2500	AIR6449 B41	0°	2°/2°	N/A	N/A	N/A	SHARED	SHARED
NOTE: DARK TEXT IN TABLE ABOVE DENOTES PROPOSED EQUIPMENT											TOTAL 6x24 HYBRID CABLE		430±

STRUCTURAL NOTES:

1. REFERENCE STRUCTURAL ANALYSIS BY CENTERLINE COMMUNICATIONS FOR FURTHER INFORMATION REGARDING THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THIS EQUIPMENT UPGRADE DATED 04/06/2021.
2. REMOVE AND REPLACE EXISTING MOUNT PIPES FROM POSITION 2 WITH (1) 2" STD. x 8' L MOUNT PIPE AND USE EXISTING CROSSOVER PLATE KIT FOR THE INSTALLATION OF APXVAALL24_43-U-NA20.
3. RELOCATE EXISTING TIEBACK FROM THE STANDOFF VERTICAL BRACE TO THE MOUNT PIPE IN EACH SECTOR



1 / A-4 EXISTING ANTENNA PLAN
NOT TO SCALE



2 / A-4 PROPOSED ANTENNA PLAN
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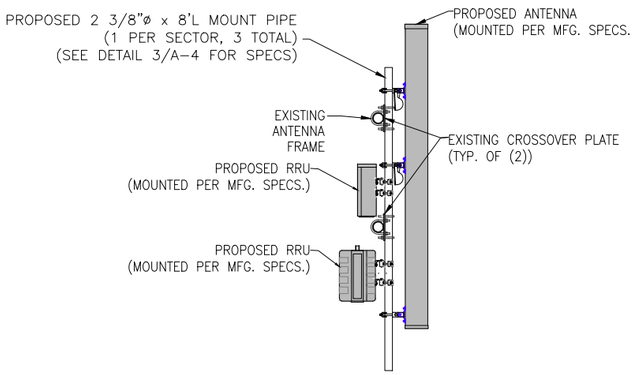
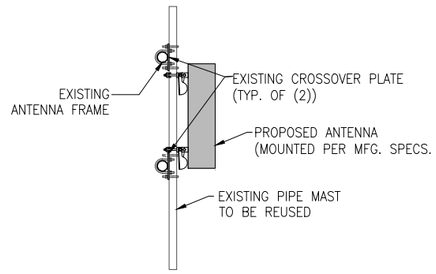
SHEET TITLE: ANTENNA PLANS & SCHEDULE

DRAWING: A-4



POSITION 1 & 2 ANTENNA MOUNT DETAIL



POSITION 3 ANTENNA MOUNT DETAIL

NOTES FOR ANTENNA MOUNTS:

1. AIR 32: KATHREIN SCALA PIPE MOUNT KIT
   # P/N 85010070
2. AIR6449: ERICSSON R2A PIPE MOUNT KIT
3. APXVAALL24-43-U-NA20: APM40-5E PIPE MOUNT KIT

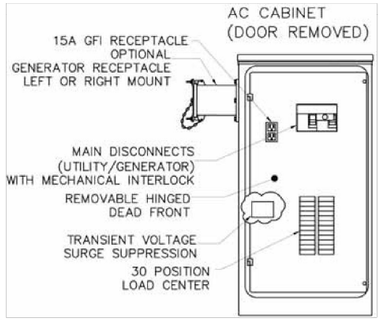
1/A-5 ANTENNA MOUNTING DETAILS
NOT TO SCALE

EMERSON Network Power

CAC-A75201090
Specifications

Cabinet Configuration
- 120/240 VAC, 1 Phase, 3 Wire & Ground
- Cabinet Dimensions: 20"W x 10"D x 40"H
- Weight: approx. 80 lbs.
- NEMA 3R Type Enclosure
- Wall or Bracket Mount
- Suitable For Use As Service Equipment
- UL Listed 891, Dead Front Switch Boards

Component Configuration
- Service: 200 Amp Utility/Standby
- Slide Bar Mechanical Interlock (prevents both source from being energized simultaneously)
- 65kAIC Rated Utility Service Disconnect
- 30 Position Square-D Load Center (12 position shown)
- 15Amp, 120Vac GFI duplex receptacle
- N-G Bonding Jumper Kit (customer installed if required)
- Standby Power Receptacle Appleton AR20044RS
- Transient Voltage Surge Suppression rated 100kA



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www.northern-tech.com
D0315-A-0822 Rev. 1 (04/09/07)

NORTHERN TECHNOLOGIES

2/A-5 PROPOSED PPC SPECS.
NOT TO SCALE

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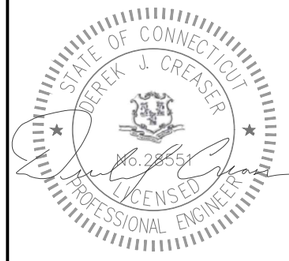

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CTHA783A

SITE ADDRESS:
1679 STANLEY STREET
NEW BRITAIN, CONNECTICUT
06053

SHEET TITLE:
GENERAL DETAILS

DRAWING:
A-5

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 BOLTON/MANCHESTER WATER CO., 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
750 W CENTER ST, SUITE 301
WEST BRIDGEWATER, MA 02379
PHONE: 781.713.4725

REVISIONS

REV	DATE	DESCRIPTION	BY
0	04/27/21	ISSUED FOR PERMITTING	MP
A	03/30/21	ISSUED FOR REVIEW	NMT

DESIGNED BY: NMT | APPROVED BY: MK

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

DATE: 04/27/21

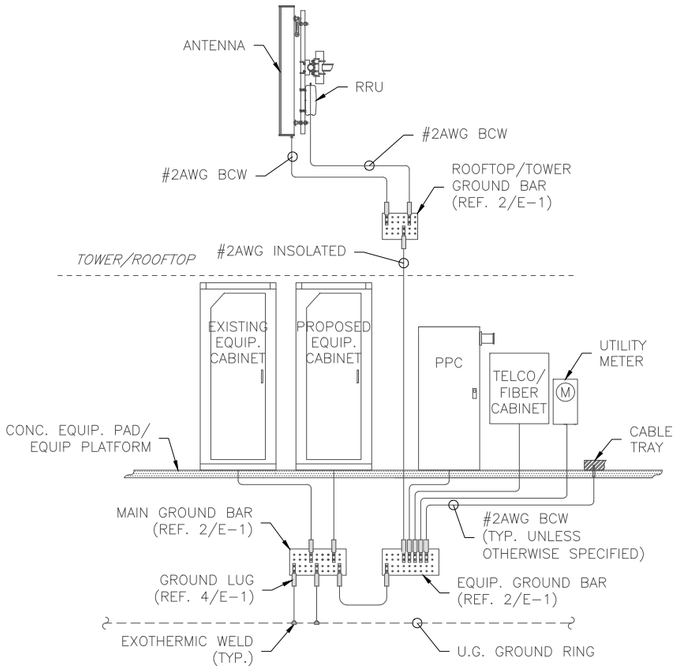
SITE NAME: VANCE HALL CCSU (CT03XC098-0)

SITE ID: CTHA783A

SITE ADDRESS: 1679 STANLEY STREET NEW BRITAIN, CONNECTICUT 06053

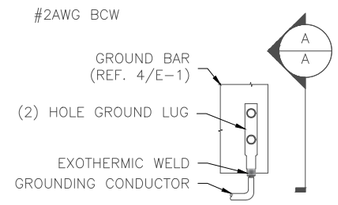
SHEET TITLE: **STRUCTURAL NOTES & SPECIAL INSPECTIONS**

DRAWING: **SN-1**

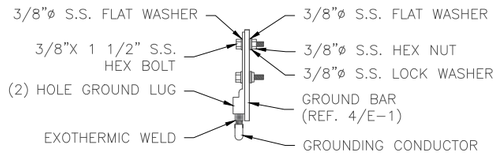


GROUNDING RISER NOTE:
UNLESS OTHERWISE SPECIFIED ALL GROUNDING CONDUCTORS ARE TO BE #2AWG BCW

1 / E-1 GROUNDING RISER DIAGRAM
NOT TO SCALE

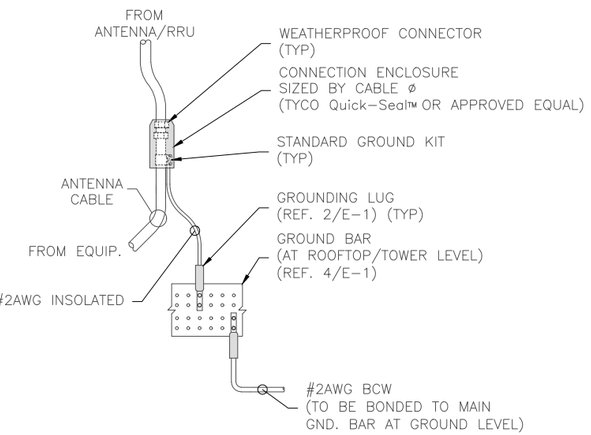


SECTION "A-A"



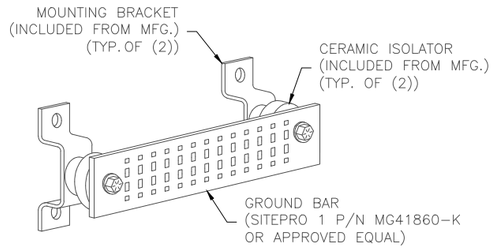
GROUNDING LUG NOTES:
1. DO NOT DOUBLE UP OR STACK LUGS.
2. OXIDE INHIBITING COMPOUND TO BE APPLIED TO ALL LUGS.
3. ALL LUGS ARE TO BE EXOTHERMIC WELDED TO GROUNDING CONDUCTORS.
4. FOR INSOLATED GROUNDING CONDUCTORS, EXPOSED BARE COPPER TO BE KEPT TO ABSOLUTE MINIMUM.
5. NO INSULATION IS ALLOWED WITHIN THE BARREL OF THE COMPRESSION TERMINAL.

2 / E-1 GROUND LUG DETAIL
NOT TO SCALE



NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT BEND IN CABLE.
2. GROUND CABLES DIRECTLY TO CIGBE
3. JUMPER REQUIRED ONLY WHEN CABLE IS 1 1/4" OR LARGER

3 / E-1 ANTENNA/RRU GROUNDING DETAIL
NOT TO SCALE



4 / E-1 GROUND BAR DETAIL
NOT TO SCALE

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

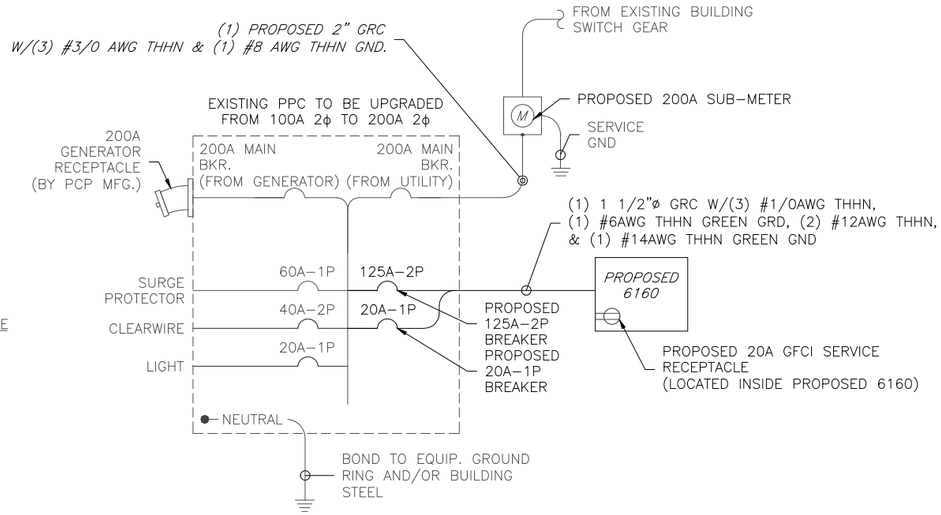
SECTION "P" – SURGE PRODUCERS

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)

5 / E-1 GROUND WIRE SCHEDULE
NOT TO SCALE



ELECTRICAL NOTES:
1. ALL ELECTRICAL WORK TO BE PERFORMED BY LICENSED ELECTRICAL CONTRACTOR.
2. ALL ELECTRICAL WORK TO BE COMPLIANT WITH 2020 NEC AND ALL RELEVANT LOCAL CODES AND AMENDMENTS..
3. ELECTRICAL CONTRACTOR TO LABEL PANEL TO REFLECT CORRECT CIRCUITRY.
4. T-MOBILES ELECTRICAL CONTRACTOR SHALL COORDINATE AVAILABILITY OF UPGRADED POWER WITH BUILDING OWNER.

5 / E-1 ONE LINE DIAGRAM
NOT TO SCALE

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NORTHEAST LLC

T-MOBILE NORTHEAST, LLC.
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WEST BRIDGEWATER, MA 02379
PHONE: 781.713.4725

REVISIONS

REV	DATE	DESCRIPTION	BY
0	04/27/21	ISSUED FOR PERMITTING	MP
A	03/30/21	ISSUED FOR REVIEW	NMT

DESIGNED BY:	APPROVED BY:
NMT	MK

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

DATE: 04/27/21

SITE NAME:
VANCE HALL CCSU (CT03XC098-0)

SITE ID:
CTHA783A

SITE ADDRESS:
1679 STANLEY STREET
NEW BRITAIN, CONNECTICUT 06053

SHEET TITLE:
ONE-LINE DIAGRAM & GROUNDING DETAILS

DRAWING:
E-1

Exhibit D

Structural Analysis Report

CENTERLINE COMMUNICATIONS
750 West Center Street, Suite 301
West Bridgewater, MA 02379
781.713.4725

Revised Structural Analysis Report

Site ID: CTHA783A
Site Name: CTHA783A
Project Name: SPRINT RETAIN
Address: 1679 Stanley Street
New Britain, CT 06053

Client:

T - Mobile

NORTHEAST, LLC
15 Commerce Way, Suite B
Norton, MA 02766

Date: 4/6/2021 (Rev.1)
3/31/2021 (Rev.0)

Scope of Work:

Centerline Communications was authorized by T-Mobile Northeast LLC to perform an analysis of the existing structure to determine its capacity to support the proposed and existing T-Mobile equipment/appurtenances listed in this report.

Existing & Proposed Equipment:

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	Number of Appurtenances	Antenna Manufacturer	Appurtenance Model	Feed Lines (in)
-	143.0	143.0	1	-	Lightning Rod	-
T-Mobile	138.0	138.0	**3**	**RFS**	**APX16DWV-16DWV-S-E-A20 Panel Antenna**	**(3) 6x12 Hybrid**
			3	**RFS**	**APXVAALL24_43-U-NA20 Panel Antenna**	
			3	**Ericsson**	**AIR6449 B41 Panel Antenna**	
			3	**Ericsson**	**4415 B66A RRH**	
			3	**Ericsson**	**Radio 4449 B71+B85 RRH**	
			3	**Ericsson**	**4424 B25 RRH**	
			3	-	13’ Sector Mount	
-	94.0	94.0	1	-	MF-900B Dish	
-	94.0	94.0	1	-	Pipe Mount	(1) 3/8
-	93.0	108.0	1	-	4-Bay FM Antenna	(1) 7/8
-	84.0	84.0	1	-	4’ Yagi	(1) 3/8

*Note: Proposed equipment shown in **bold**.*

Design Criteria:

Design Codes:

2018 Connecticut State Building Code
2015 International Building Code
ASCE 7-10
TIA-222-G Standards

Ultimate Design Wind Speed (V_{ult})	125 mph
Wind Speed with Ice	50 mph
Ice Thickness	1.00 in.
Exposure Category	B
Topographic Category	1
Risk Category	II
Site Soil Class (Assumed)	D – Stiff Soil
Seismic Design Category	B
Spectral Response Acceleration Parameter at a Short Periods, S_S	0.183 g
Spectral Response Acceleration Parameter at a Period of 1 Second, S_1	0.064 g
Short Period Site Coefficient, F_a	1.60
Long Period Site Coefficient, F_v	2.40

***Refer to calculations for additional design criteria.**

Conclusion:

Section Capacity (Summary)

Section No.	*Elevation ft*	*Component Type*	*Size*	*Critical Element*	*P lb*	*øP$_{allow}$ lb*	*% Capacity*	*Pass Fail*
T1	143 - 123	Leg	ROHN 2.5 X-STR	1	-15953	94407	16.9	Pass
T2	123 - 103	Leg	ROHN 2.5 STD	58	-14906	58406	25.5	Pass
T3	103 - 83	Leg	ROHN 2.5 STD	91	-16815	58406	28.8	Pass
T4	83 - 67.82	Leg	ROHN 2.5 X-STR	124	-16537	76177	21.7	Pass
T5	67.82 - 63	Leg	ROHN 2.5 X-STR	151	-15514	88193	17.6	Pass
T1	143 - 123	Diagonal	ROHN TS1.5x16 ga	27	-1631	5479	29.8 43.1 (b)	Pass
T2	123 - 103	Diagonal	ROHN TS1.5x16 ga	88	-1994	5479	36.4 46.2 (b)	Pass
T3	103 - 83	Diagonal	ROHN TS1.5x16 ga	122	-1090	5479	19.9 25.7 (b)	Pass
T4	83 - 67.82	Diagonal	ROHN TS1.5x16 ga	136	-1204	5479	22.0 33.1 (b)	Pass
T5	67.82 - 63	Horizontal	L4x4x1/4	162	17	62856	16.2	Pass
T1	143 - 123	Top Girt	ROHN TS1.5x16 ga	4	6	8513	0.5	Pass
T2	123 - 103	Top Girt	ROHN TS1.5x16 ga	61	759	8513	8.9 19.8 (b)	Pass
T3	103 - 83	Top Girt	ROHN TS1.5x16 ga	95	-313	6341	4.9 9.2 (b)	Pass
T4	83 - 67.82	Top Girt	ROHN TS1.5x16 ga	129	-326	6341	5.1 10.4 (b)	Pass
T5	67.82 - 63	Top Girt	L4x4x1/4	156	1776	62856.00	12.2	Pass

T1	143 - 123	Bottom Girt	ROHN TS1.5x16 ga	9	600	8513	7.1 15.7 (b)	Pass
T2	123 - 103	Bottom Girt	ROHN TS1.5x16 ga	64	-331	6341	5.2 8.9 (b)	Pass
T3	103 - 83	Bottom Girt	ROHN TS1.5x16 ga	97	-312	6341	4.9 7.1 (b)	Pass
T4	83 - 67.82	Bottom Girt	ROHN TS1.5x16 ga	130	1093	8513	12.8 28.5 (b)	Pass
T5	67.82 - 63	Bottom Girt	L4x4x1/4	159	-209	48854	15.7	Pass
T1	143 - 123	Guy A@125.5	7/16	175	12335	12480	98.8	Pass
T1	143 - 123	Guy B@125.5	7/16	172	10612	12480	85.0	Pass
T1	143 - 123	Guy C@125.5	7/16	166	10722	12480	85.9	Pass
T1	143 - 123	Top Guy Pull-Off@125.5	2L2x2x1/4x3/8	170	-3576	36044	9.9	Pass
T1	143 - 123	Torque Arm Top@125.5	C12x20.7	176	3899	197316	35.3	Pass
							Summary	
						Leg (T3)	28.8	Pass
						Diagonal (T2)	46.2	Pass
						Horizontal (T5)	16.2	Pass
						Top Girt (T2)	19.8	Pass
						Bottom Girt (T4)	28.5	Pass
						Guy A (T1)	98.8	Pass
						Guy B (T1)	85.0	Pass
						Guy C (T1)	85.9	Pass
						Top Guy Pull-Off (T1)	9.9	Pass
						Torque Arm Top (T1)	35.3	Pass
						Bolt Checks	46.2	Pass
						RATING =	**98.8**	**Pass**

Structure Rating (max from all components) =	**98.8%**

Foundation Capacity

Component	Original Design Reaction (kips)[1]	Design Reaction (kips)	Capacity	Overall Result
Axial	41.2	41.1	99.8%	Pass
Shear	-	-	-	Pass
Anchor Uplift	15.4	9.4	61.0%	Pass
Anchor Lateral	14.8	8.0	54.1%	Pass

Foundation Rating (max from all components) =	**99.8%**

[1]Original design reactions multiplied by factor of 1.35 per TIA-222-G paragraph 15.3.

Recommendations:

The existing tower and its foundation have sufficient capacity to support the existing and proposed loading for the final loading configuration. Modifications to the tower structure are not required.

Reference Documents:

- T-Mobile RFDS CTHA783A_Sprint Retain_1, dated January 15, 2021
- Site Photos and Notes by Centerline Communications, dated December 22, 2020
- Construction Drawings by Crown Castle, dated October 19, 2018
- Structural Analysis by Ramaker & Associates, dated July 10, 2014
- Third Party Review of Structural Analysis by URS, dated September 3, 2013

Assumptions and Limitations:

- The tower and structures were built and maintained with the manufacturer's specifications.
- The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in this report and the referenced drawings.
- The proposed structural modifications specified by Ramaker & Associates have been completed.

Design Calculations

ASCE 7 Hazards Report

Address:
1679 Stanley St
New Britain, Connecticut
06053

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 151.95 ft (NAVD 88)
Latitude: 41.69204
Longitude: -72.77081

Wind

Results:

Wind Speed:	117 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Tue Apr 06 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

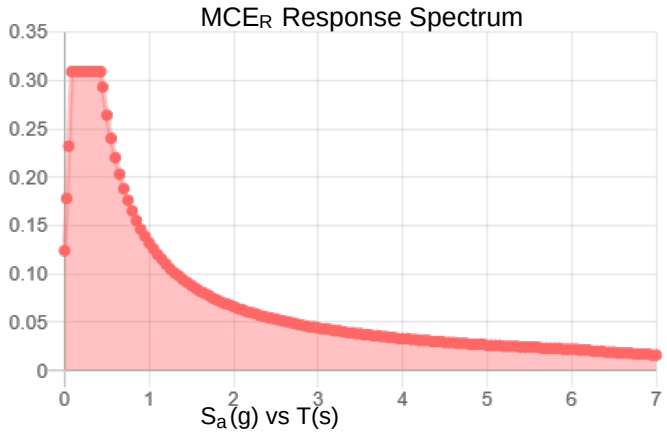
Seismic

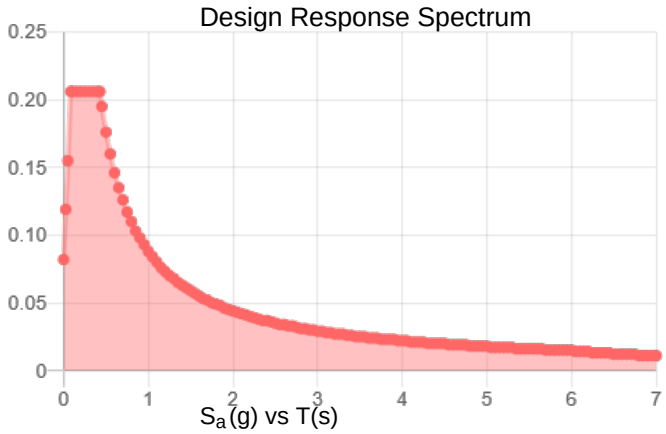
Site Soil Class: D - Default (see Section 11.4.3)

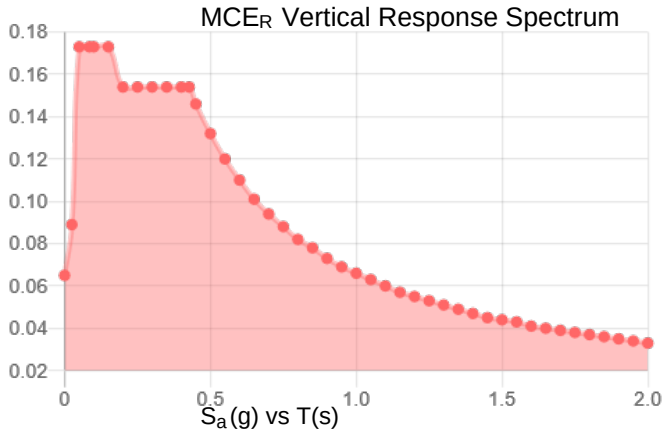
Results:

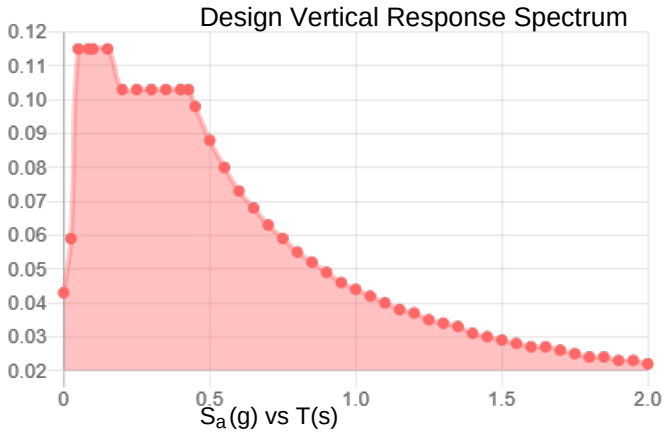
S_S :	0.193	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.105
F_v :	2.4	PGA_M :	0.167
S_{MS} :	0.309	F_{PGA} :	1.59
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.206	C_v :	0.7

Seismic Design Category B









Data Accessed: Tue Apr 06 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.50 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Tue Apr 06 2021

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Snow

Results:

Ground Snow Load, p_g:	30 lb/ft^2
Elevation:	152.0 ft
Data Source:	ASCE/SEI 7-16, Table 7.2-8
Date Accessed:	Tue Apr 06 2021

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

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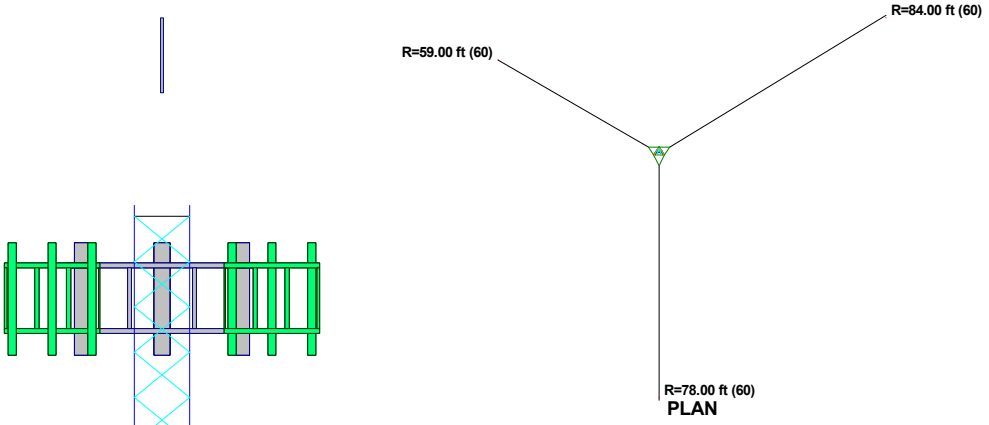
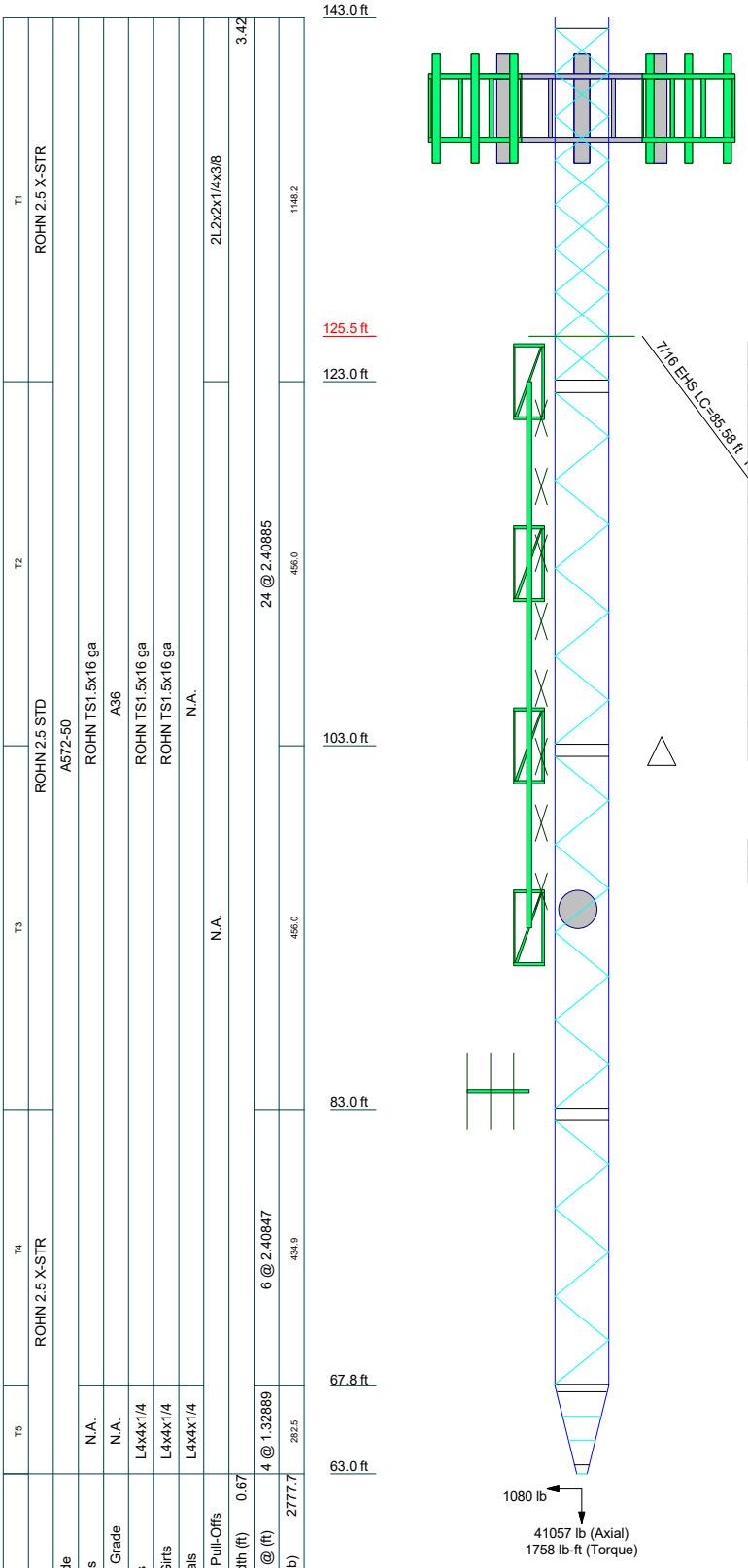




Section		T1	T2	T3	T4	T5
Legs		ROHN 2.5 X-STR	ROHN 2.5 STD		ROHN 2.5 X-STR	
Leg Grade		A572-50				
Diagonals	N.A.	ROHN TS1.5x16 ga				
Diagonal Grade	N.A.	A36				
Top Girts	L4x4x1/4	ROHN TS1.5x16 ga				
Bottom Girts	L4x4x1/4	ROHN TS1.5x16 ga				
Horizontals	L4x4x1/4	N.A.				
Top Guy Pull-Offs		2L2x2x1/4x3/8		N.A.		
Face Width (ft)	0.67	3.42				
# Panels @ (ft)	4 @ 1.32889	24 @ 2.40885			6 @ 2.40847	
Weight (lb)	2777.7	1148.2	456.0	456.0	434.9	282.5

DESIGNED APPURTENANCE LOADING

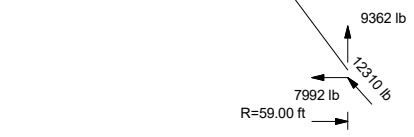
TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4'	143	AIR 6449 B41 W/ MOUNT PIPE (T-Mobile)	138
7'x2 1/2" Pipe Mount	143	4415 B66A (T-Mobile)	138
13' Sector Frame (T-Mobile)	138	4415 B66A (T-Mobile)	138
13' Sector Frame (T-Mobile)	138	4415 B66A (T-Mobile)	138
13' Sector Frame (T-Mobile)	138	RADIO 4449 B71+B85 (T-Mobile)	138
APX16DWV-16DWV-S-E-A20 (T-Mobile)	138	RADIO 4449 B71+B85 (T-Mobile)	138
APX16DWV-16DWV-S-E-A20 (T-Mobile)	138	RADIO 4449 B71+B85 (T-Mobile)	138
APX16DWV-16DWV-S-E-A20 (T-Mobile)	138	4424 B25 (T-Mobile)	138
APXVAALL24_43-U-NA20 W/ MP (T-Mobile)	138	4424 B25 (T-Mobile)	138
APXVAALL24_43-U-NA20 W/ MP (T-Mobile)	138	4424 B25 (T-Mobile)	138
APXVAALL24_43-U-NA20 W/ MP (T-Mobile)	138	(3) 7'x2 1/2" Pipe Mount (T-Mobile)	136
AIR 6449 B41 W/ MOUNT PIPE (T-Mobile)	138	2' Standoff	123
AIR 6449 B41 W/ MOUNT PIPE (T-Mobile)	138	30'x2" Pipe Mount	123 - 93
		100-4(M/F)	123 - 93
		2' Standoff	113
		2' Standoff	103
		2" x 4' Pipe Mount	94
		MF-900B	94
		2' Standoff	93
		4' Yagi	84

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 98.8%



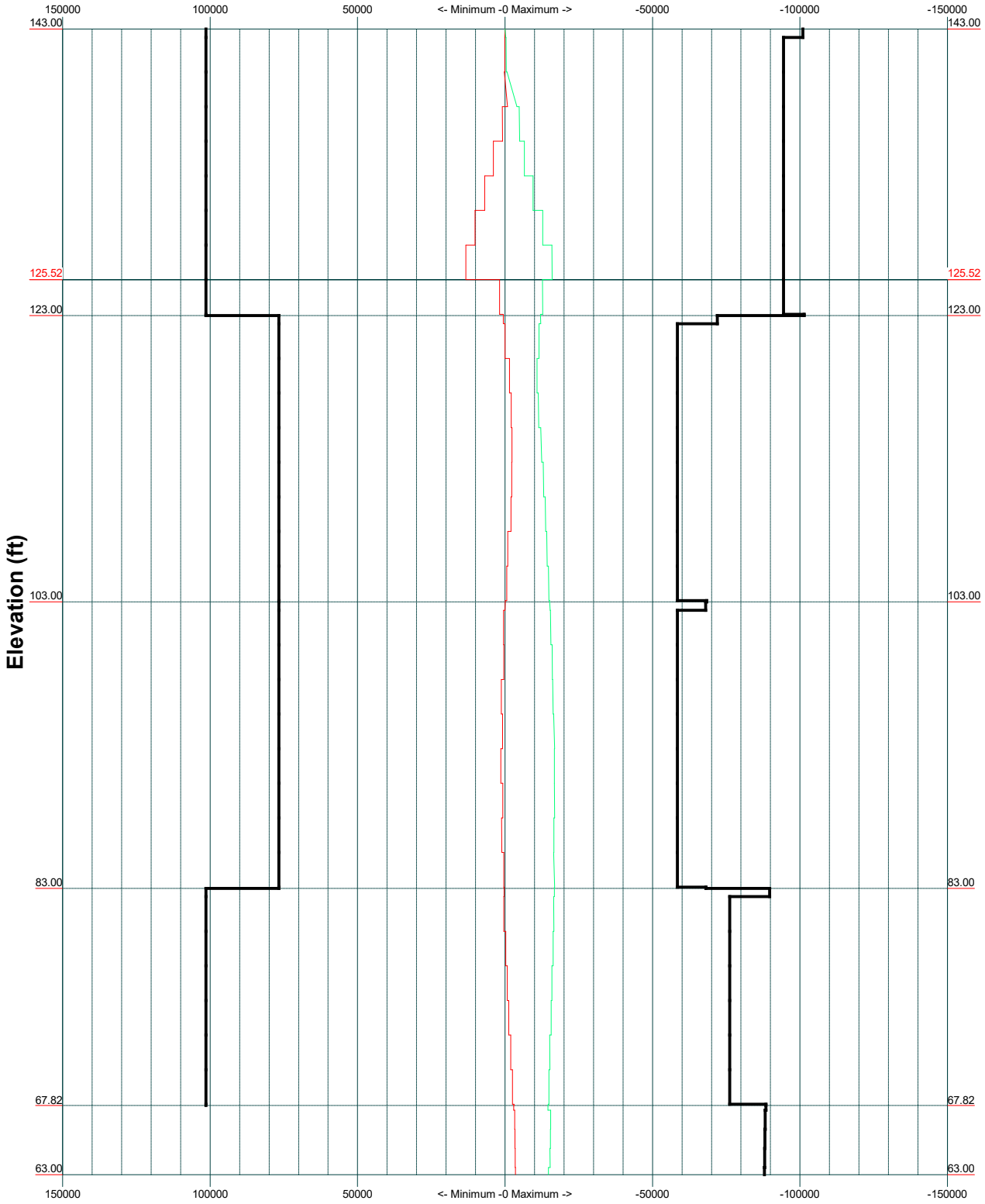
ALL REACTIONS ARE FACTORED

Centerline Communications
750 West Center Street, Suite 301
West Bridgewater, MA 02379
Phone: (781) 713-4725
FAX:

Job: ***CTHA783A***			
Project: ***Anchor***			
Client: T-Mobile	Drawn by: Joshua Gildert		App'd:
Code: TIA-222-G	Date: 03/31/21		Scale: NTS
Path:			Dwg No. E-1

TIA-222-G - 97 mph/50 mph 1.0000 in Ice Exposure B

Leg Capacity ——— **Leg Compression (lb)**



Centerline Communications
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Phone: (781) 713-4725
FAX:

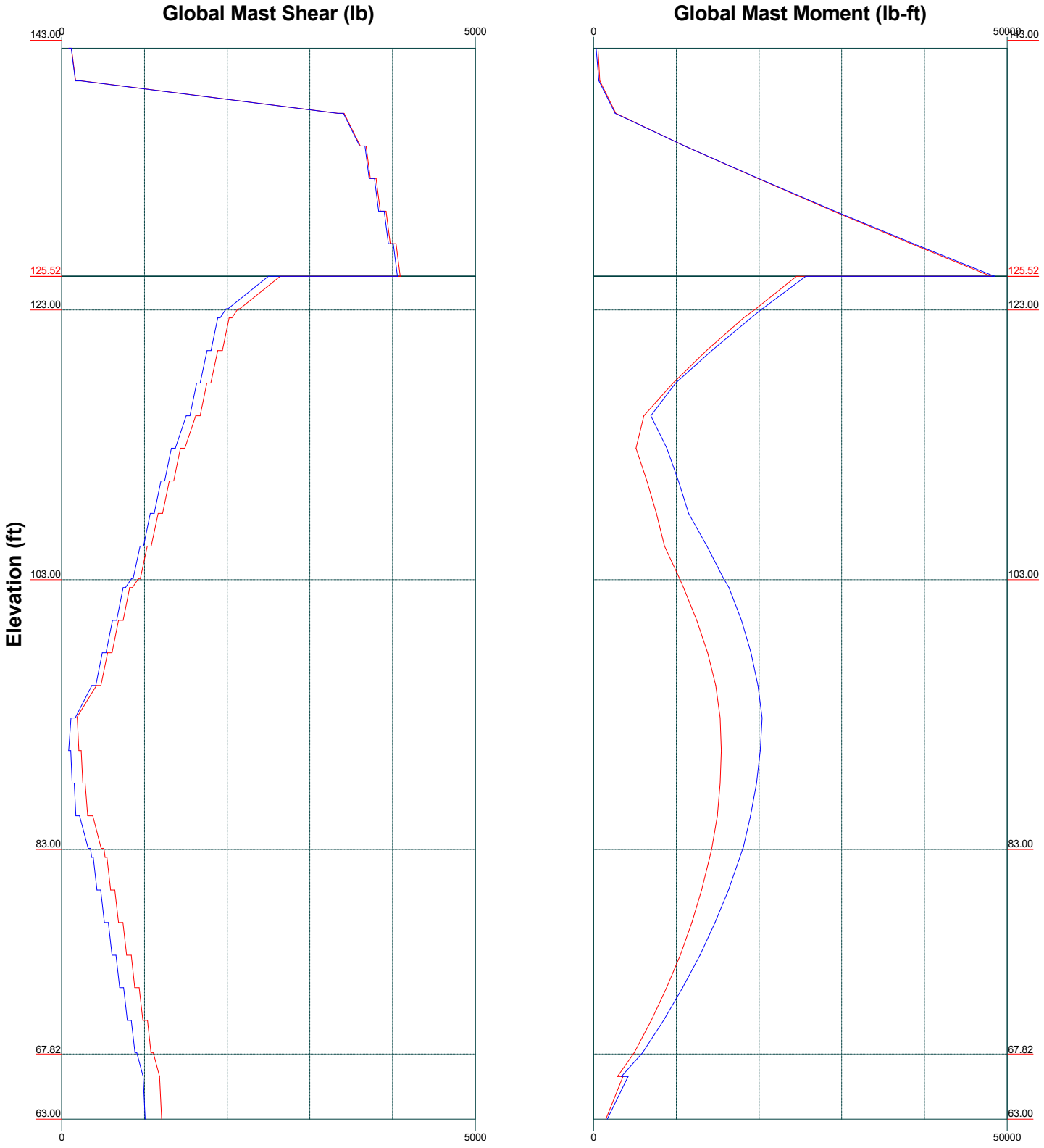
Job: ***CTHA783A***			
Project: ***Anchor***			
Client: T-Mobile	Drawn by: Joshua Gildert		App'd:
Code: TIA-222-G	Date: 03/31/21		Scale: NTS
Path:			Dwg No. E-3

TIA-222-G - 97 mph/50 mph 1.0000 in Ice Exposure B

Vx Vz

Maximum Values

Mx Mz



Centerline Communications
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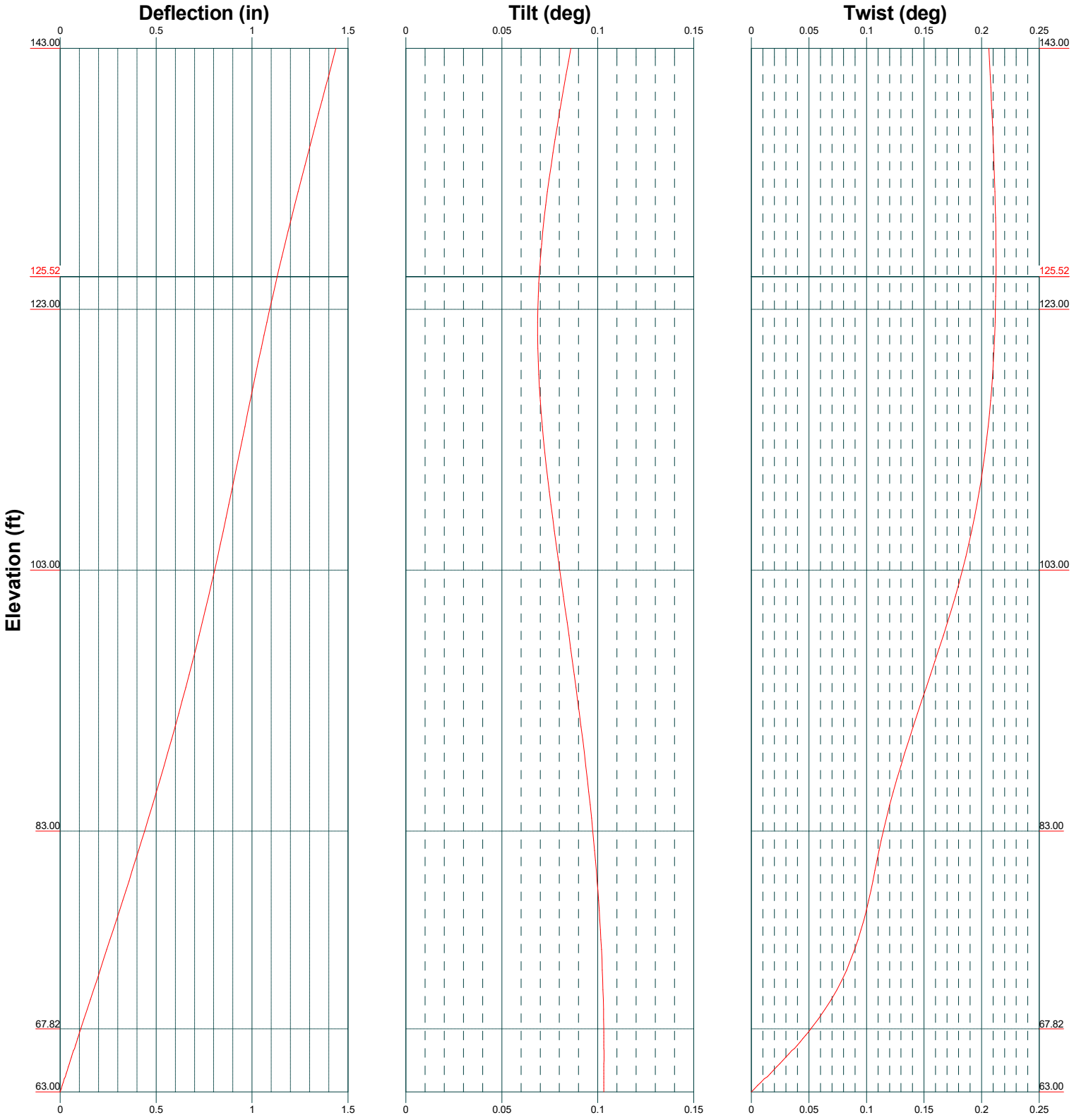
Phone: (781) 713-4725
FAX:

Job: ***CTHA783A***			
Project: ***Anchor***			
Client: T-Mobile	Drawn by: Joshua Gildert		App'd:
Code: TIA-222-G	Date: 03/31/21		Scale: NTS
Path:			Dwg No. E-4

TIA-222-G - Service - 60 mph

Maximum Values



Centerline Communications
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West Bridgewater, MA 02379
Phone: (781) 713-4725
FAX:

Job: ***CTHA783A***			
Project: ***Anchor***			
Client: T-Mobile	Drawn by: Joshua Gildert		App'd:
Code: TIA-222-G	Date: 03/31/21		Scale: NTS
Path:			Dwg No. E-5

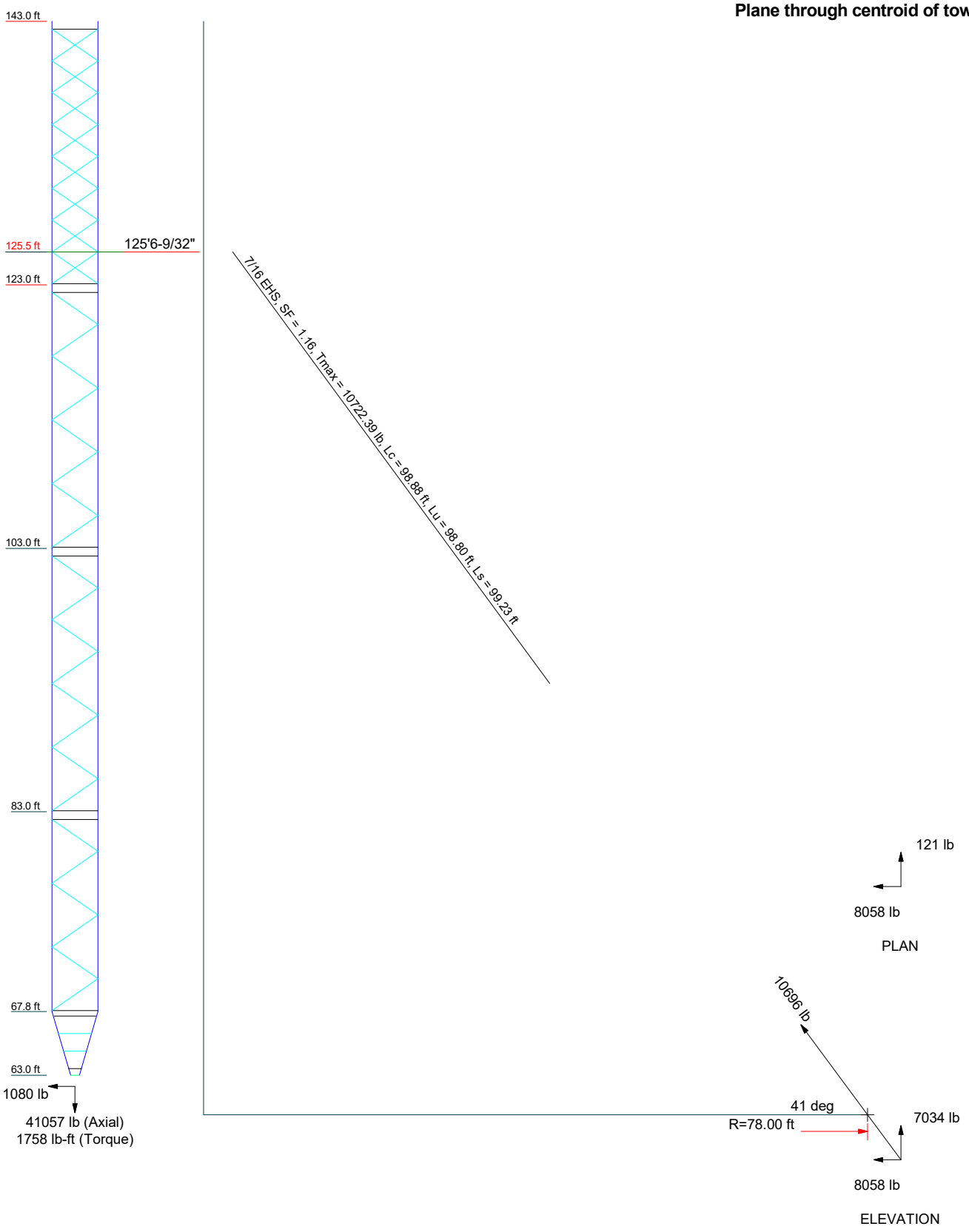
Guy Tensions and Tower Reactions

TIA-222-G - 97 mph/50 mph 1.0000 in Ice Exposure B

Maximum Values

Anchor 'C'@78 ft Azimuth 180 deg Elev 60 ft

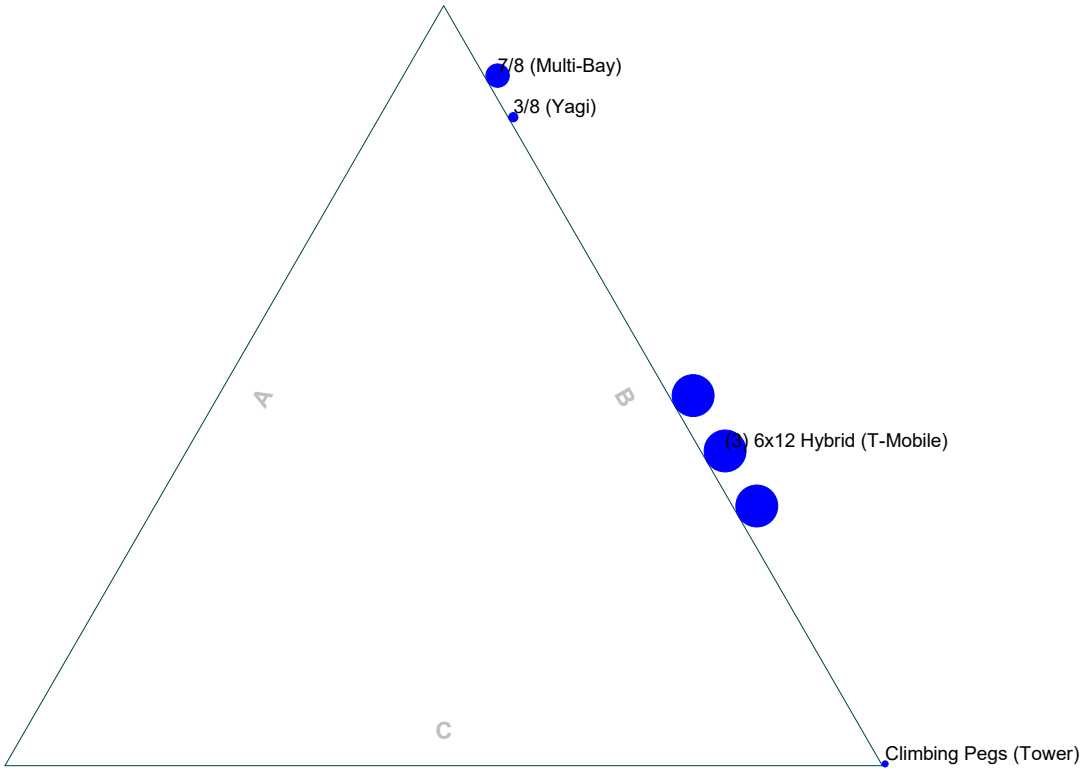
Plane through centroid of tower



Centerline Communications	Job: ***CTHA783A***		
750 West Center Street, Suite 301	Project: ***Anchor***		
West Bridgewater, MA 02379	Client: T-Mobile	Drawn by: Joshua Gildert	App'd:
Phone: (781) 713-4725	Code: TIA-222-G	Date: 03/31/21	Scale: NTS
FAX:	Path:		Dwg No. E-6

Feed Line Plan

Round Flat App In Face App Out Face

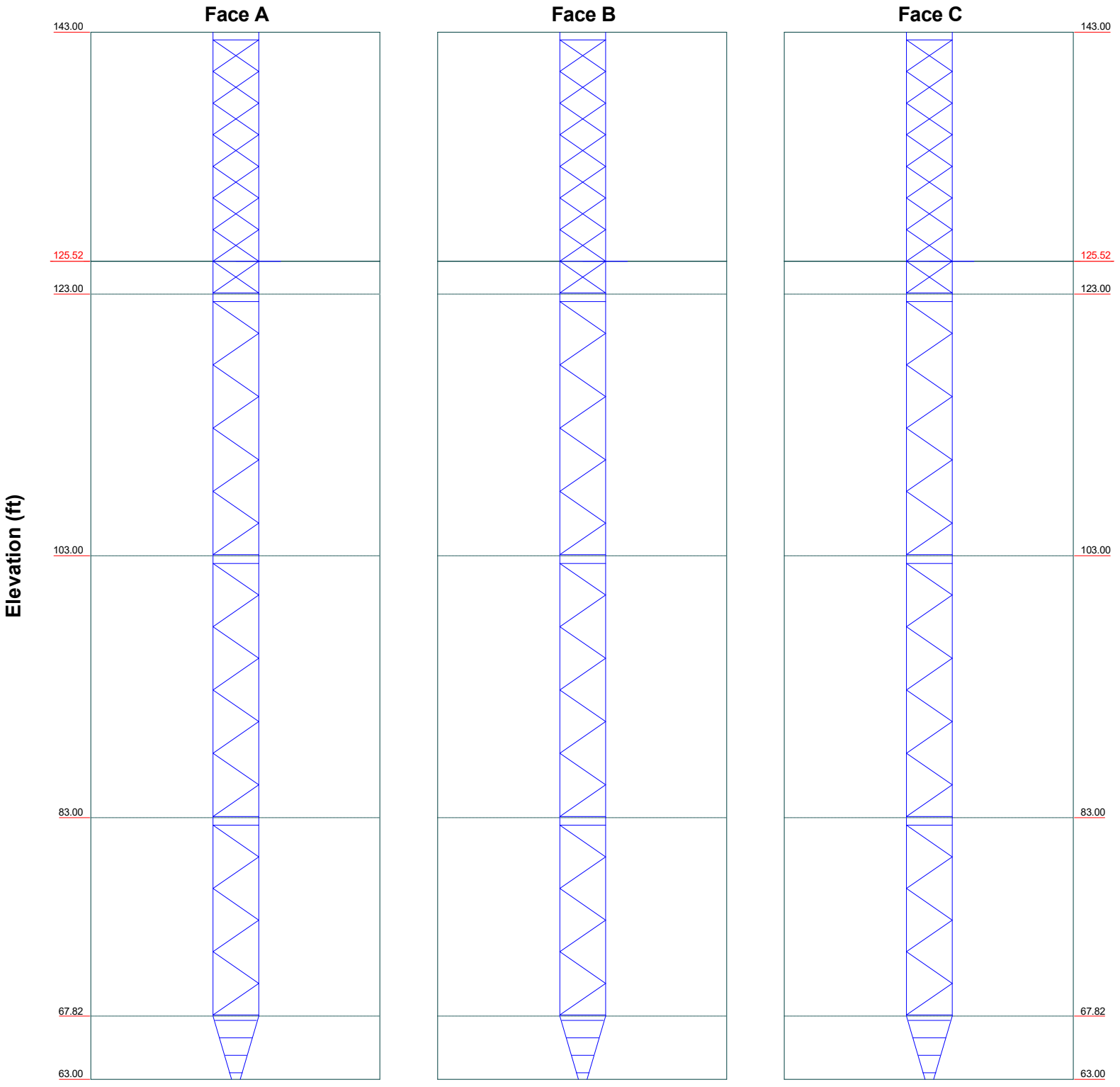


Centerline Communications
750 West Center Street, Suite 301
West Bridgewater, MA 02379
Phone: (781) 713-4725
FAX:

Job: ***CTHA783A***			
Project: ***Anchor***			
Client: T-Mobile	Drawn by: Joshua Gildert	App'd:	
Code: TIA-222-G	Date: 03/31/21	Scale: NTS	
Path:		Dwg No. E-7	

Stress Distribution Chart
63' - 143'

> 100% | 90%-100% | 75%-90% | 50%-75% | < 50% Overstress

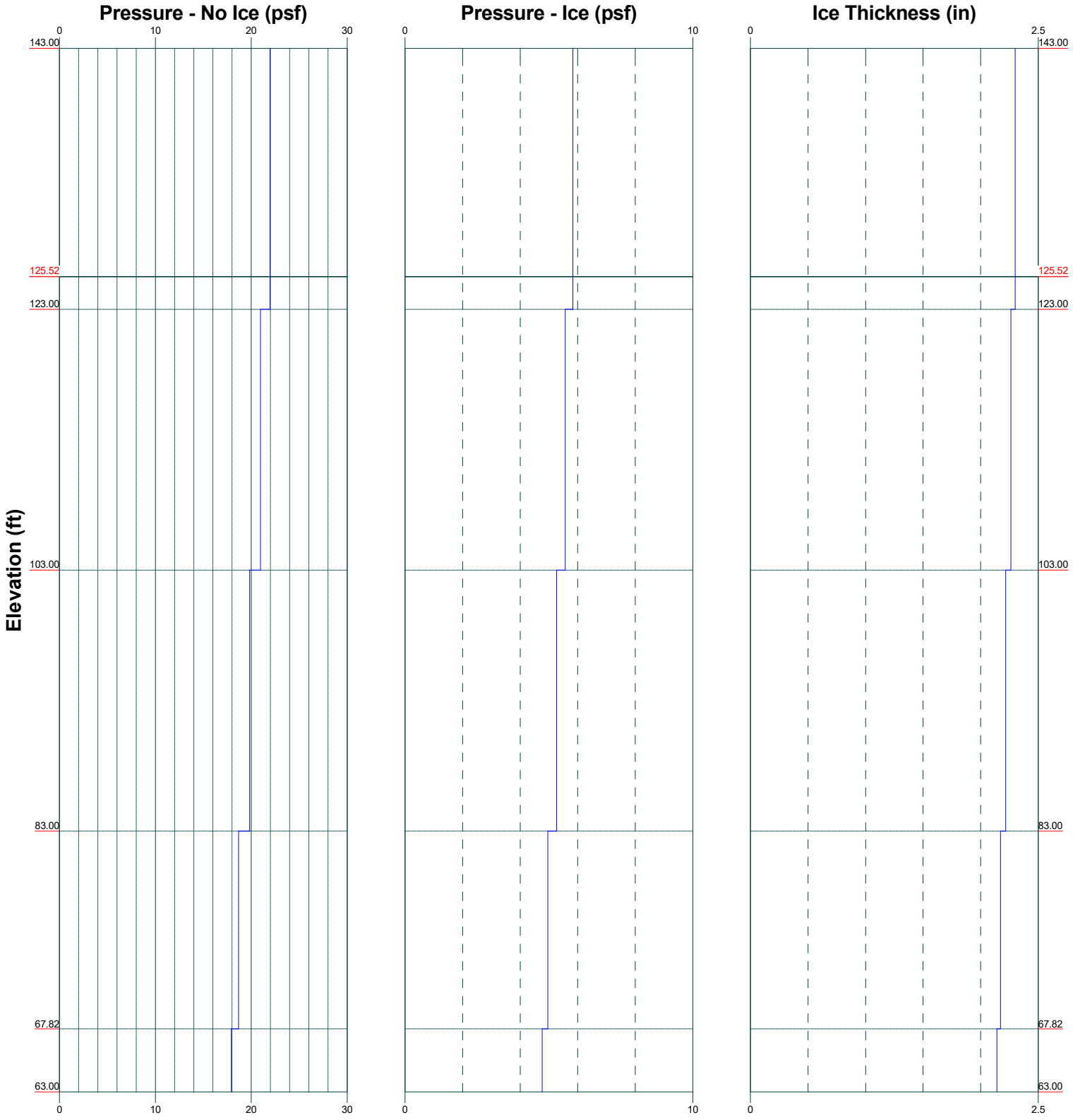


Centerline Communications
750 West Center Street, Suite 301
West Bridgewater, MA 02379
Phone: (781) 713-4725
FAX:

Job: ***CTHA783A***			
Project: ***Anchor***			
Client: T-Mobile	Drawn by: Joshua Gildert	App'd:	
Code: TIA-222-G	Date: 03/31/21	Scale: NTS	
Path:		Dwg No. E-8	

Wind Pressures and Ice Thickness

TIA-222-G - 97 mph/50 mph 1.0000 in Ice Exposure B



Centerline Communications
750 West Center Street, Suite 301
West Bridgewater, MA 02379
Phone: (781) 713-4725
FAX:

Job: ***CTHA783A***			
Project: ***Anchor***			
Client: T-Mobile	Drawn by: Joshua Gildert		App'd:
Code: TIA-222-G	Date: 03/31/21		Scale: NTS
Path:			Dwg No. E-9

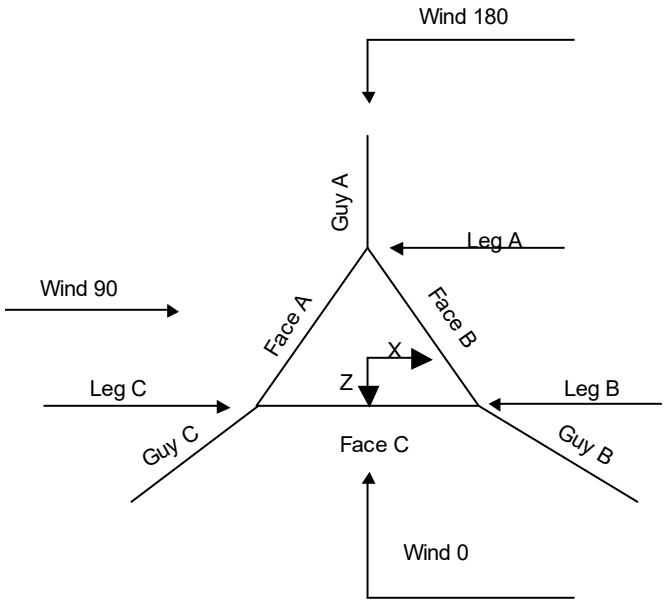
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 143.00 ft above the ground line.
The base of the tower is set at an elevation of 63.00 ft above the ground line.
The face width of the tower is 3.42 ft at the top and 0.67 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Corner & Starmount Guyed Tower

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	143.00-123.00			3.42	1	20.00
T2	123.00-103.00			3.42	1	20.00
T3	103.00-83.00			3.42	1	20.00
T4	83.00-67.82			3.42	1	15.18
T5	67.82-63.00			3.42	1	4.82

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation*	*Diagonal Spacing*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset*	*Bottom Girt Offset*
	ft	*ft*				*in*	*in*
T1	143.00-123.00	2.41	CX Brace	No	No	7.3750	1.3750
T2	123.00-103.00	2.41	K Brace Left	No	No	7.3750	1.3750
T3	103.00-83.00	2.41	K Brace Left	No	No	7.3750	1.3750
T4	83.00-67.82	2.41	K Brace Left	No	No	7.3750	1.3750
T5	67.82-63.00	1.33	CX Brace	No	Yes	4.0000	6.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 143.00-123.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T2 123.00-103.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T3 103.00-83.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T4 83.00-67.82	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T5 67.82-63.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 143.00-123.00	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T2 123.00-103.00	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T3 103.00-83.00	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T4 83.00-67.82	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)
T5 67.82-63.00	Equal Angle	L4x4x1/4	A36 (36 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T5 67.82-63.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 143.00-123.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 123.00-103.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 103.00-83.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 83.00-67.82	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 67.82-63.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
143.00-123.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
123.00-103.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
103.00-83.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
83.00-67.82				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
67.82-63.00				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 143.00-123.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 123.00-103.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 103.00-83.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 83.00-67.82	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 67.82-63.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 143.00-123.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 123.00-103.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 103.00-83.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 83.00-67.82	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 67.82-63.00	Flange	0.7500 A325N	4	0.5000 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
125.523	EHS	A	7/16	2080.00	10%	21000	0.399	85.51	59.00	0.0000	60.00	100%
		B	7/16	2080.00	10%	21000	0.399	103.36	84.00	-1.0000	60.00	100%
		C	7/16	2080.00	10%	21000	0.399	98.80	78.00	0.0000	60.00	100%

Guy Data*(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
125.523	Torque Corner	6.83	0.0000	Channel	A36 (36 ksi)	Channel	C12x20.7

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
125.52	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Double Equal Angle	2L2x2x1/4x3/8

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
125.523	34.12	41.24	39.42		0.70 1.4 sec/pulse	1.02 1.7 sec/pulse	0.93 1.7 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
125.523	No	No	1	1	1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
125.523	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
125.523	A	92.76	20	5	2.2178
	B	92.76	20	5	2.2178
	C	92.76	20	5	2.2178

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
7/8 (Multi-Bay)	B	No	No	Ar (CaAa)	94.00 - 69.00	0.0000	-0.4	1	1	1.1100	1.1100		0.54
3/8 (Yagi)	B	No	No	Ar (CaAa)	84.00 - 69.00	0.0000	-0.35	1	1	0.4400	0.4400		0.08
Climbing Pegs (Tower) ***	B	No	No	Ar (CaAa)	143.00 - 69.00	0.0000	0.5	1	1	0.3000	0.3000		0.00

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
6x12 Hybrid (T-Mobile)	B	No	No	Ar (CaAa)	138.00 - 69.00	0.0000	0.1	3	3	1.0000	1.9800		0.82

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	143.00-123.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	9.510	0.000	36.90
		C	0.000	0.000	0.000	0.000	0.00
T2	123.00-103.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	12.480	0.000	49.20
		C	0.000	0.000	0.000	0.000	0.00
T3	103.00-83.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	13.745	0.000	55.22
		C	0.000	0.000	0.000	0.000	0.00
T4	83.00-67.82	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	10.906	0.000	43.12
		C	0.000	0.000	0.000	0.000	0.00
T5	67.82-63.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	143.00-123.00	A	2.299	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	36.345	0.000	555.99
		C		0.000	0.000	0.000	0.000	0.00
T2	123.00-103.00	A	2.262	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	44.795	0.000	678.85
		C		0.000	0.000	0.000	0.000	0.00
T3	103.00-83.00	A	2.218	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	50.915	0.000	775.27
		C		0.000	0.000	0.000	0.000	0.00
T4	83.00-67.82	A	2.172	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	45.017	0.000	679.98
		C		0.000	0.000	0.000	0.000	0.00
T5	67.82-63.00	A	2.142	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	143.00-123.00	1.8782	-0.3399	0.9558	0.1317
T2	123.00-103.00	2.8192	-0.5604	3.0199	0.2179
T3	103.00-83.00	2.8120	-1.0672	3.0325	-0.6121
T4	83.00-67.82	2.6254	-1.6195	2.8014	-1.9464
T5	67.82-63.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	8	Climbing Pegs	123.00 - 143.00	0.6000	0.2391
T1	10	6x12 Hybrid	123.00 - 138.00	0.6000	0.2391
T2	8	Climbing Pegs	103.00 - 123.00	0.6000	0.4614
T2	10	6x12 Hybrid	103.00 - 123.00	0.6000	0.4614
T3	6	7/8	83.00 - 94.00	0.6000	0.4675
T3	7	3/8	83.00 - 84.00	0.6000	0.4675
T3	8	Climbing Pegs	83.00 - 103.00	0.6000	0.4675
T3	10	6x12 Hybrid	83.00 - 103.00	0.6000	0.4675
T4	6	7/8	69.00 - 83.00	0.6000	0.4638
T4	7	3/8	69.00 - 83.00	0.6000	0.4638
T4	8	Climbing Pegs	69.00 - 83.00	0.6000	0.4638
T4	10	6x12 Hybrid	69.00 - 83.00	0.6000	0.4638

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Lightning Rod 5/8x4'	A	From Leg	0.00	0.00	0.0000	143.00	No Ice	0.25	0.25	10.00
			0.00	8.00			1/2" Ice	0.66	0.66	13.00
							1" Ice	0.97	0.97	16.00
7'x2 1/2" Pipe Mount	A	From Leg	0.00	0.00	0.0000	143.00	No Ice	2.01	2.01	40.50
			0.00	3.00			1/2" Ice	2.59	2.59	55.31
							1" Ice	3.02	3.02	74.85
***										
(3) 7'x2 1/2" Pipe Mount (T-Mobile)	C	None			0.0000	136.00	No Ice	2.01	2.01	40.50
							1/2" Ice	2.59	2.59	55.31
							1" Ice	3.02	3.02	74.85
***										
***										

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
***									
13' Sector Frame	A	From Leg	2.00	0.0000	138.00	No Ice	15.00	12.00	400.00
(T-Mobile)			0.00			1/2" Ice	20.60	17.40	550.00
			0.00			1" Ice	26.20	22.80	700.00
13' Sector Frame	B	From Leg	2.00	0.0000	138.00	No Ice	15.00	12.00	400.00
(T-Mobile)			0.00			1/2" Ice	20.60	17.40	550.00
			0.00			1" Ice	26.20	22.80	700.00
13' Sector Frame	C	From Leg	2.00	0.0000	138.00	No Ice	15.00	12.00	400.00
(T-Mobile)			0.00			1/2" Ice	20.60	17.40	550.00
			0.00			1" Ice	26.20	22.80	700.00
***									
100-4(M/F)	C	From Leg	2.00	0.0000	123.00 - 93.00	No Ice	7.00	7.00	70.00
			0.00			1/2" Ice	14.00	14.00	170.00
			0.00			1" Ice	21.00	21.00	270.00
30'x2" Pipe Mount	C	From Leg	2.00	0.0000	123.00 - 93.00	No Ice	7.13	7.13	109.50
			0.00			1/2" Ice	10.15	10.15	162.48
			0.00			1" Ice	13.20	13.20	234.17
2' Standoff	C	From Leg	2.00	0.0000	123.00	No Ice	1.80	1.80	33.00
			0.00			1/2" Ice	3.30	3.30	49.00
			0.00			1" Ice	4.80	4.80	65.00
2' Standoff	C	From Leg	2.00	0.0000	113.00	No Ice	1.80	1.80	33.00
			0.00			1/2" Ice	3.30	3.30	49.00
			0.00			1" Ice	4.80	4.80	65.00
2' Standoff	C	From Leg	2.00	0.0000	103.00	No Ice	1.80	1.80	33.00
			0.00			1/2" Ice	3.30	3.30	49.00
			0.00			1" Ice	4.80	4.80	65.00
2' Standoff	C	From Leg	2.00	0.0000	93.00	No Ice	1.80	1.80	33.00
			0.00			1/2" Ice	3.30	3.30	49.00
			0.00			1" Ice	4.80	4.80	65.00
***									
4' Yagi	C	From Leg	2.00	0.0000	84.00	No Ice	2.08	2.08	25.00
			0.00			1/2" Ice	5.43	5.43	47.97
			0.00			1" Ice	8.79	8.79	91.53
***									
APX16DWV-16DWV-S-E-A20	A	From Leg	4.00	0.0000	138.00	No Ice	6.46	2.15	40.70
(T-Mobile)			0.00			1/2" Ice	6.83	2.49	73.65
			0.00			1" Ice	7.21	2.84	111.47
APX16DWV-16DWV-S-E-A20	B	From Leg	4.00	0.0000	138.00	No Ice	6.46	2.15	40.70
(T-Mobile)			0.00			1/2" Ice	6.83	2.49	73.65
			0.00			1" Ice	7.21	2.84	111.47
APX16DWV-16DWV-S-E-A20	C	From Leg	4.00	0.0000	138.00	No Ice	6.46	2.15	40.70
(T-Mobile)			0.00			1/2" Ice	6.83	2.49	73.65
			0.00			1" Ice	7.21	2.84	111.47
APXVAALL24_43-U-NA20 W/ MP	A	From Leg	4.00	0.0000	138.00	No Ice	20.24	10.79	182.50
(T-Mobile)			0.00			1/2" Ice	20.89	12.21	316.19
			0.00			1" Ice	21.55	13.49	460.50
APXVAALL24_43-U-NA20 W/ MP	B	From Leg	4.00	0.0000	138.00	No Ice	20.24	10.79	182.50
(T-Mobile)			0.00			1/2" Ice	20.89	12.21	316.19
			0.00			1" Ice	21.55	13.49	460.50
APXVAALL24_43-U-NA20 W/ MP	C	From Leg	4.00	0.0000	138.00	No Ice	20.24	10.79	182.50
(T-Mobile)			0.00			1/2" Ice	20.89	12.21	316.19
			0.00			1" Ice	21.55	13.49	460.50
AIR 6449 B41 W/ MOUNT PIPE	A	From Leg	4.00	0.0000	138.00	No Ice	5.95	3.36	118.60
(T-Mobile)			0.00			1/2" Ice	6.33	3.83	168.39
			0.00			1" Ice	6.72	4.32	223.69
AIR 6449 B41 W/ MOUNT PIPE	B	From Leg	4.00	0.0000	138.00	No Ice	5.95	3.36	118.60
			0.00			1/2" Ice	6.33	3.83	168.39

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(T-Mobile)			0.00			1" Ice	6.72	4.32	223.69
AIR 6449 B41 W/ MOUNT	C	From Leg	4.00	0.0000	138.00	No Ice	5.95	3.36	118.60
PIPE			0.00			1/2" Ice	6.33	3.83	168.39
(T-Mobile)			0.00			1" Ice	6.72	4.32	223.69
4415 B66A	A	From Leg	3.00	0.0000	138.00	No Ice	1.84	0.82	46.00
(T-Mobile)			0.00			1/2" Ice	2.01	0.94	60.07
			0.00			1" Ice	2.19	1.07	76.66
4415 B66A	B	From Leg	3.00	0.0000	138.00	No Ice	1.84	0.82	46.00
(T-Mobile)			0.00			1/2" Ice	2.01	0.94	60.07
			0.00			1" Ice	2.19	1.07	76.66
4415 B66A	C	From Leg	3.00	0.0000	138.00	No Ice	1.84	0.82	46.00
(T-Mobile)			0.00			1/2" Ice	2.01	0.94	60.07
			0.00			1" Ice	2.19	1.07	76.66
RADIO 4449 B71+B85	A	From Leg	3.00	0.0000	138.00	No Ice	1.63	1.00	74.00
(T-Mobile)			0.00			1/2" Ice	1.79	1.13	89.91
			0.00			1" Ice	1.95	1.27	108.43
RADIO 4449 B71+B85	B	From Leg	3.00	0.0000	138.00	No Ice	1.63	1.00	74.00
(T-Mobile)			0.00			1/2" Ice	1.79	1.13	89.91
			0.00			1" Ice	1.95	1.27	108.43
RADIO 4449 B71+B85	C	From Leg	3.00	0.0000	138.00	No Ice	1.63	1.00	74.00
(T-Mobile)			0.00			1/2" Ice	1.79	1.13	89.91
			0.00			1" Ice	1.95	1.27	108.43
4424 B25	A	From Leg	3.00	0.0000	138.00	No Ice	2.05	1.61	86.00
(T-Mobile)			0.00			1/2" Ice	2.23	1.77	106.93
			0.00			1" Ice	2.42	1.94	130.84
4424 B25	B	From Leg	3.00	0.0000	138.00	No Ice	2.05	1.61	86.00
(T-Mobile)			0.00			1/2" Ice	2.23	1.77	106.93
			0.00			1" Ice	2.42	1.94	130.84
4424 B25	C	From Leg	3.00	0.0000	138.00	No Ice	2.05	1.61	86.00
(T-Mobile)			0.00			1/2" Ice	2.23	1.77	106.93
			0.00			1" Ice	2.42	1.94	130.84
***									
2" x 4' Pipe Mount	A	From Face	0.00	0.0000	94.00	No Ice	1.46	1.46	14.60
			0.00			1/2" Ice	1.75	1.75	23.91
			0.00			1" Ice	2.05	2.05	36.84

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
MF-900B	A	Grid	From Face	0.50	0.0000		94.00	2.66	No Ice	5.55	13.00
				2.00					1/2" Ice	5.90	44.67
				0.00					1" Ice	6.25	76.34

Load Combinations

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

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Guy C @ 78 ft Elev 60 ft Azimuth 180 deg	Max. Vert	8	-39.70	-0.06	29.30
	Max. H_x	24	-2417.51	112.16	3149.15
	Max. H_z	3	-7034.37	-75.24	8058.03
	Min. Vert	3	-7034.37	-75.24	8058.03
	Min. H_x	18	-2642.33	-121.21	3405.38
	Min. H_z	8	-39.70	-0.06	29.30
Guy B @ 84 ft Elev 60 ft Azimuth 59 deg	Max. Vert	4	-28.09	18.39	-11.79
	Max. H_x	11	-6651.42	7096.72	-4178.58
	Max. H_z	4	-28.09	18.39	-11.79
	Min. Vert	11	-6651.42	7096.72	-4178.58

Location	*Condition*	*Gov. Load Comb.*	*Vertical lb*	*Horizontal, X lb*	*Horizontal, Z lb*
	Min. H_x	4	-28.09	18.39	-11.79
	Min. H_z	9	-6497.44	6861.78	-4200.29
Guy A @ 59 ft Elev 60 ft Azimuth -60 deg	Max. Vert	12	-81.52	-38.46	-22.18
	Max. H_x	12	-81.52	-38.46	-22.18
	Max. H_z	12	-81.52	-38.46	-22.18
	Min. Vert	5	-9361.99	-6967.61	-3916.59
	Min. H_x	5	-9361.99	-6967.61	-3916.59
	Min. H_z	5	-9361.99	-6967.61	-3916.59
Mast	Max. Vert	17	41056.87	-495.45	226.19
	Max. H_x	11	18257.69	887.97	-14.68
	Max. H_z	2	14817.48	-26.88	963.34
	Max. M_x	1	0.00	-41.75	-2.60
	Max. M_z	1	0.00	-41.75	-2.60
	Max. Torsion	13	1349.56	328.89	729.94
	Min. Vert	37	10537.45	179.14	128.19
	Min. H_x	5	20770.16	-1026.00	-113.37
	Min. H_z	8	21062.97	-133.96	-810.99
	Min. M_x	1	0.00	-41.75	-2.60
	Min. M_z	1	0.00	-41.75	-2.60
	Min. Torsion	7	-1758.26	-570.38	-681.19

Tower Mast Reaction Summary

Load Combination	*Vertical lb*	*Shear$_x$ lb*	*Shear$_z$ lb*	*Overturning Moment, M_x lb-ft*	*Overturning Moment, M_z lb-ft*	*Torque lb-ft*
Dead Only	10738.33	41.75	2.60	0.00	0.00	90.38
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	14817.48	26.88	-963.34	0.00	0.00	-1323.57
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	19576.64	474.42	-780.28	0.00	0.00	-662.42
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	21857.22	829.64	-364.36	0.00	0.00	-58.38
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	20770.16	1026.00	113.37	0.00	0.00	573.25
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	16769.37	952.46	509.86	0.00	0.00	1254.58
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	19984.46	570.38	681.19	0.00	0.00	1758.26
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	21062.97	133.96	810.99	0.00	0.00	1558.44
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	18899.14	-403.04	763.05	0.00	0.00	1082.52
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	14472.60	-849.86	477.00	0.00	0.00	450.16
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	18257.69	-887.97	14.68	0.00	0.00	-197.43
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	19630.63	-668.42	-437.13	0.00	0.00	-780.68
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	18032.86	-328.89	-729.94	0.00	0.00	-1349.56
1.2 Dead+1.0 Ice+1.0 Temp+Guy	39083.57	52.69	-29.13	0.00	0.00	159.56
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	39423.68	31.34	-516.84	0.00	0.00	-1049.65

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	40337.35	283.76	-440.46	0.00	0.00	-594.74
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	41056.87	495.45	-226.19	0.00	0.00	73.44
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	40888.46	573.82	27.77	0.00	0.00	802.57
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	40510.43	518.64	246.41	0.00	0.00	1259.53
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	40558.80	343.22	388.10	0.00	0.00	1418.91
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	40552.67	102.74	441.85	0.00	0.00	1298.39
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	39869.47	-186.87	386.85	0.00	0.00	951.06
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	39092.86	-401.50	220.29	0.00	0.00	231.30
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	38894.33	-474.21	-46.95	0.00	0.00	-487.02
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	39017.53	-390.64	-287.31	0.00	0.00	-958.06
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	39038.22	-213.41	-453.90	0.00	0.00	-1161.63
Dead+Wind 0 deg - Service+Guy	10698.02	31.15	-238.56	0.00	0.00	-287.98
Dead+Wind 30 deg - Service+Guy	10825.50	161.68	-210.15	0.00	0.00	-151.96
Dead+Wind 60 deg - Service+Guy	10958.56	260.49	-113.97	0.00	0.00	11.88
Dead+Wind 90 deg - Service+Guy	11007.17	303.25	10.80	0.00	0.00	197.44
Dead+Wind 120 deg - Service+Guy	11000.41	261.08	130.23	0.00	0.00	377.28
Dead+Wind 150 deg - Service+Guy	10941.41	162.49	196.92	0.00	0.00	519.92
Dead+Wind 180 deg - Service+Guy	10854.01	51.09	236.77	0.00	0.00	474.07
Dead+Wind 210 deg - Service+Guy	10726.63	-80.17	212.64	0.00	0.00	340.77
Dead+Wind 240 deg - Service+Guy	10617.34	-182.90	120.51	0.00	0.00	171.19
Dead+Wind 270 deg - Service+Guy	10547.77	-222.00	-10.47	0.00	0.00	-15.79
Dead+Wind 300 deg - Service+Guy	10537.45	-179.14	-128.19	0.00	0.00	-190.42
Dead+Wind 330 deg - Service+Guy	10598.50	-83.24	-194.55	0.00	0.00	-333.80

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	-0.00	-6456.37	0.00	-1.05	6456.37	-1.20	0.025%
2	-26.14	-7711.28	-7821.73	13.74	7711.32	7822.41	0.113%
3	3967.12	-7724.33	-6888.98	-3973.26	7724.65	6891.37	0.060%
4	6910.23	-7737.15	-3967.36	-6914.19	7737.45	3970.43	0.045%
5	8014.91	-7722.08	13.73	-8019.90	7722.43	-7.10	0.075%
6	6812.42	-7709.07	3935.98	-6820.69	7709.09	-3922.34	0.145%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
7	3822.28	-7723.33	6595.51	-3820.05	7723.53	-6600.28	0.049%
8	21.79	-7738.09	7788.32	-20.50	7738.52	-7795.88	0.070%
9	-3980.31	-7725.04	6881.36	3979.74	7725.24	-6885.71	0.040%
10	-6941.34	-7712.22	3980.29	6946.58	7712.23	-3971.24	0.094%
11	-8014.89	-7727.29	-18.46	8017.67	7727.46	21.22	0.035%
12	-6792.70	-7740.30	-3924.60	6797.71	7740.63	3927.45	0.052%
13	-3826.36	-7726.04	-6593.13	3829.75	7726.18	6594.01	0.032%
14	0.00	-31572.04	0.00	-0.49	31572.03	6.13	0.019%
15	-28.34	-31547.23	-3507.92	21.16	31547.31	3509.61	0.023%
16	1758.00	-31571.38	-3050.30	-1770.67	31571.70	3056.72	0.045%
17	3131.93	-31595.09	-1738.90	-3140.91	31595.39	1746.06	0.036%
18	3597.41	-31567.22	42.49	-3603.39	31567.38	-35.74	0.028%
19	3095.98	-31543.15	1792.70	-3099.12	31543.16	-1787.85	0.018%
20	1802.12	-31569.54	3041.20	-1799.94	31569.60	-3046.52	0.018%
21	64.67	-31596.84	3516.27	-63.22	31596.99	-3523.37	0.023%
22	-1758.65	-31572.69	3049.93	1758.44	31572.85	-3058.36	0.027%
23	-3106.52	-31548.98	1766.19	3103.72	31549.04	-1774.62	0.028%
24	-3582.55	-31576.85	-18.38	3589.29	31576.92	26.71	0.034%
25	-3078.20	-31600.93	-1782.43	3087.24	31601.05	1787.09	0.032%
26	-1773.82	-31574.54	-3040.40	1782.61	31574.57	3040.96	0.028%
27	-6.25	-6453.16	-1870.43	5.55	6453.16	1870.37	0.011%
28	948.67	-6456.28	-1647.38	-949.67	6456.29	1647.88	0.017%
29	1652.46	-6459.35	-948.73	-1653.02	6459.35	949.38	0.013%
30	1916.63	-6455.74	3.28	-1917.12	6455.75	-1.64	0.025%
31	1629.07	-6452.63	941.22	-1627.77	6452.62	-939.90	0.028%
32	914.03	-6456.04	1577.20	-913.43	6456.04	-1577.70	0.012%
33	5.21	-6459.57	1862.44	-4.68	6459.58	-1863.57	0.019%
34	-951.82	-6456.45	1645.56	951.87	6456.46	-1646.22	0.010%
35	-1659.90	-6453.39	951.82	1659.36	6453.39	-953.05	0.020%
36	-1916.62	-6456.99	-4.41	1917.25	6456.99	4.87	0.011%
37	-1624.36	-6460.10	-938.50	1626.47	6460.12	939.63	0.036%
38	-915.01	-6456.69	-1576.63	916.92	6456.70	1577.31	0.030%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	9	0.00000001	0.00014103
2	Yes	27	0.00000001	0.00014492
3	Yes	22	0.00000001	0.00010361
4	Yes	23	0.00000001	0.00006550
5	Yes	22	0.00000001	0.00011851
6	Yes	26	0.00000001	0.00013737
7	Yes	22	0.00000001	0.00008221
8	Yes	22	0.00000001	0.00010709
9	Yes	22	0.00000001	0.00007447
10	Yes	26	0.00000001	0.00012223
11	Yes	22	0.00000001	0.00006771
12	Yes	22	0.00000001	0.00008821
13	Yes	22	0.00000001	0.00006240
14	Yes	13	0.00000001	0.00008675
15	Yes	17	0.00000001	0.00010707
16	Yes	18	0.00000001	0.00013678
17	Yes	19	0.00000001	0.00010215
18	Yes	19	0.00000001	0.00010033
19	Yes	17	0.00000001	0.00008031

20	Yes	19	0.00000001	0.00007341
21	Yes	19	0.00000001	0.00007043
22	Yes	18	0.00000001	0.00008503
23	Yes	16	0.00000001	0.00013809
24	Yes	16	0.00000001	0.00014628
25	Yes	17	0.00000001	0.00009954
26	Yes	16	0.00000001	0.00013313
27	Yes	11	0.00000001	0.00006234
28	Yes	12	0.00000001	0.00008347
29	Yes	13	0.00000001	0.00004875
30	Yes	12	0.00000001	0.00011112
31	Yes	11	0.00000001	0.00009432
32	Yes	12	0.00000001	0.00005453
33	Yes	12	0.00000001	0.00007067
34	Yes	12	0.00000001	0.00005463
35	Yes	10	0.00000001	0.00010185
36	Yes	11	0.00000001	0.00006379
37	Yes	10	0.00000001	0.00011151
38	Yes	10	0.00000001	0.00014176

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
T1	143 - 123	1.437	31	0.0832	0.2075
T2	123 - 103	1.092	31	0.0716	0.2093
T3	103 - 83	0.805	30	0.0781	0.1835
T4	83 - 67.82	0.440	30	0.0972	0.1135
T5	67.82 - 63	0.107	30	0.1046	0.0528

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	°	°	*ft*
143.00	Lightning Rod 5/8x4'	31	1.437	0.0832	0.2075	117109
138.00	13' Sector Frame	31	1.346	0.0794	0.2087	117109
136.00	(3) 7'x2 1/2" Pipe Mount	31	1.310	0.0780	0.2091	83649
125.52	Guy	31	1.131	0.0722	0.2097	33988
123.00	100-4(M/F)	31	1.092	0.0716	0.2093	32616
118.00	100-4(M/F)	31	1.018	0.0713	0.2073	46044
113.00	100-4(M/F)	31	0.948	0.0723	0.2031	107749
108.00	100-4(M/F)	30	0.878	0.0746	0.1956	73272
103.00	100-4(M/F)	30	0.805	0.0781	0.1835	41359
98.00	100-4(M/F)	30	0.724	0.0826	0.1667	40508
94.00	MF-900B	30	0.654	0.0866	0.1513	43310
93.00	100-4(M/F)	30	0.636	0.0877	0.1473	44073
84.00	4' Yagi	30	0.460	0.0964	0.1161	53542

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	143 - 123	12.654	4	0.7690	0.6509
T2	123 - 103	9.448	4	0.7170	0.6626
T3	103 - 83	6.561	4	0.7210	0.6190
T4	83 - 67.82	3.417	4	0.7880	0.3909
T5	67.82 - 63	0.829	4	0.8148	0.1803

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
143.00	Lightning Rod 5/8x4'	4	12.654	0.7690	0.6509	29317
138.00	13' Sector Frame	4	11.830	0.7478	0.6535	29317
136.00	(3) 7'x2 1/2" Pipe Mount	4	11.502	0.7400	0.6545	20941
125.52	Guy	4	9.832	0.7163	0.6608	8513
123.00	100-4(M/F)	4	9.448	0.7170	0.6626	8201
118.00	100-4(M/F)	4	8.712	0.7263	0.6656	11975
113.00	100-4(M/F)	4	7.996	0.7376	0.6632	32717
108.00	100-4(M/F)	4	7.284	0.7395	0.6497	21793
103.00	100-4(M/F)	4	6.561	0.7210	0.6190	11216
98.00	100-4(M/F)	4	5.813	0.6796	0.5682	10844
94.00	MF-900B	4	5.195	0.6520	0.5187	11545
93.00	100-4(M/F)	4	5.038	0.6487	0.5058	11734
84.00	4' Yagi	4	3.583	0.7549	0.3998	14081

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	143	Leg	A325N	0.7500	4	1001.95	29820.60	0.034 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	1651.14	3834.96	0.431 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	7.56	3834.96	0.002 ✔	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	600.23	3834.96	0.157 ✔	1	Member Bearing
T2	123	Leg	A325N	0.7500	4	1259.37	29820.60	0.042 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	1769.90	3834.96	0.462 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	759.08	3834.96	0.198 ✔	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	342.49	3834.96	0.089 ✔	1	Member Bearing
T3	103	Leg	A325N	0.7500	4	1393.02	29820.60	0.047 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	984.03	3834.96	0.257 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	353.25	3834.96	0.092 ✔	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	273.63	3834.96	0.071 ✔	1	Member Bearing
T4	83	Leg	A325N	0.7500	4	1215.96	29820.60	0.041 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	1268.49	3834.96	0.331 ✔	1	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Top Girt	A325N	0.5000	1	399.61	3834.96	0.104 ✔	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	1093.18	3834.96	0.285 ✔	1	Member Bearing
T5	67.82	Leg	A325N	0.7500	4	1229.02	29820.60	0.041 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T1	125.52 (A) (175)	7/16 EHS	2080.00	20800.02	12335.40	12480.00	1.000	1.012 ✔
	125.52 (B) (172)	7/16 EHS	2080.00	20800.02	10611.80	12480.00	1.000	1.176 ✔
	125.52 (C) (166)	7/16 EHS	2080.00	20800.02	10722.40	12480.00	1.000	1.164 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	143 - 123	ROHN 2.5 X-STR	20.00	2.41	31.3 K=1.00	2.2535	1.00	-15953.10	94406.90	0.169 [1]
T2	123 - 103	ROHN 2.5 STD	20.00	2.41	61.0 K=2.00	1.7040	1.00	-14905.70	58405.60	0.255 [1]
T3	103 - 83	ROHN 2.5 STD	20.00	2.41	61.0 K=2.00	1.7040	1.00	-16815.50	58405.60	0.288 [1]
T4	83 - 67.82	ROHN 2.5 X-STR	15.18	2.41	62.6 K=2.00	2.2535	1.00	-16536.60	76176.60	0.217 [1]
T5	67.82 - 63	ROHN 2.5 X-STR	5.07	1.40	18.2 K=1.00	2.2535	0.89	-15514.30	88193.40	0.176 [1]

[1] P_u / ϕP_n controls

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	143 - 123	ROHN 2.5 X-STR	0.00	7017.50	0.000	0.00	7017.50	0.000
T2	123 - 103	ROHN 2.5 STD	0.00	5445.47	0.000	0.00	5445.47	0.000
T3	103 - 83	ROHN 2.5 STD	0.00	5445.47	0.000	0.00	5445.47	0.000
T4	83 - 67.82	ROHN 2.5 X-STR	0.00	7017.50	0.000	0.00	7017.50	0.000
T5	67.82 - 63	ROHN 2.5 X-STR	104.69	7017.50	0.015	0.00	7017.50	0.000

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	143 - 123	ROHN 2.5 X-STR	0.169	0.000	0.000	0.169 [1] ✔	1.000	4.8.1 ✔
T2	123 - 103	ROHN 2.5 STD	0.255	0.000	0.000	0.255 [1] ✔	1.000	4.8.1 ✔
T3	103 - 83	ROHN 2.5 STD	0.288	0.000	0.000	0.288 [1] ✔	1.000	4.8.1 ✔
T4	83 - 67.82	ROHN 2.5 X-STR	0.217	0.000	0.000	0.217 [1] ✔	1.000	4.8.1 ✔
T5	67.82 - 63	ROHN 2.5 X-STR	0.176	0.015	0.000	0.176 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	143 - 123	ROHN TS1.5x16 ga	4.18	3.89	91.5 K=1.00	0.2627	-1630.57	5479.15	0.298 [1] ✔
T2	123 - 103	ROHN TS1.5x16 ga	4.18	3.89	91.5 K=1.00	0.2627	-1993.92	5479.15	0.364 [1] ✔
T3	103 - 83	ROHN TS1.5x16 ga	4.18	3.89	91.5 K=1.00	0.2627	-1089.91	5479.15	0.199 [1] ✔
T4	83 - 67.82	ROHN TS1.5x16 ga	4.18	3.89	91.5 K=1.00	0.2627	-1203.83	5479.40	0.220 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	67.82 - 63	L4x4x1/4	1.71	1.47	71.1 K=3.20	1.9400	-12.35	46951.70	0.000

Horizontal Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T5	67.82 - 63	L4x4x1/4	399.35	6931.57	0.058	297.14	3462.58	0.086

Horizontal Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T5	67.82 - 63	L4x4x1/4	0.000	0.058	0.086	0.144 ✔	1.000	4.8.1 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	143 - 123	ROHN TS1.5x16 ga	3.42	3.18	74.8 K=1.00	0.2627	-3.92	6341.21	0.001 [1]
T2	123 - 103	ROHN TS1.5x16 ga	3.42	3.18	74.8 K=1.00	0.2627	-564.88	6341.21	0.089 [1]
T3	103 - 83	ROHN TS1.5x16 ga	3.42	3.18	74.8 K=1.00	0.2627	-313.17	6341.21	0.049 [1]
T4	83 - 67.82	ROHN TS1.5x16 ga	3.42	3.18	74.8 K=1.00	0.2627	-326.18	6341.21	0.051 [1]

[1] P_u / ϕP_n controls

Top Girt Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	143 - 123	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T2	123 - 103	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T3	103 - 83	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T4	83 - 67.82	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$

Top Girt Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	143 - 123	ROHN TS1.5x16 ga	0.001	0.000	0.000	0.001 [1] ✔	1.000	4.8.1 ✔
T2	123 - 103	ROHN TS1.5x16 ga	0.089	0.000	0.000	0.089 [1] ✔	1.000	4.8.1 ✔
T3	103 - 83	ROHN TS1.5x16 ga	0.049	0.000	0.000	0.049 [1] ✔	1.000	4.8.1 ✔
T4	83 - 67.82	ROHN TS1.5x16 ga	0.051	0.000	0.000	0.051 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	143 - 123	ROHN TS1.5x16 ga	3.42	3.18	74.8 K=1.00	0.2627	-319.86	6341.21	0.050 [1]
T2	123 - 103	ROHN TS1.5x16 ga	3.42	3.18	74.8 K=1.00	0.2627	-331.44	6341.21	0.052 [1]
T3	103 - 83	ROHN TS1.5x16 ga	3.42	3.18	74.8 K=1.00	0.2627	-311.67	6341.21	0.049 [1]
T5	67.82 - 63	L4x4x1/4	0.96	0.72	65.4 K=6.05	1.9400	-208.97	48854.90	0.004

[1] P_u / ϕP_n controls

Bottom Girt Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	143 - 123	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T2	123 - 103	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T3	103 - 83	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T5	67.82 - 63	L4x4x1/4	401.46	6931.57	0.058	334.03	3462.58	0.096

Bottom Girt Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	143 - 123	ROHN TS1.5x16 ga	0.050	0.000	0.000	0.050 [1] ✔	1.000	4.8.1 ✔
T2	123 - 103	ROHN TS1.5x16 ga	0.052	0.000	0.000	0.052 [1] ✔	1.000	4.8.1 ✔
T3	103 - 83	ROHN TS1.5x16 ga	0.049	0.000	0.000	0.049 [1] ✔	1.000	4.8.1 ✔
T5	67.82 - 63	L4x4x1/4	0.004	0.058	0.096	0.157 ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	143 - 123	2L2x2x1/4x3/8 2L 'a' > 18.3775 in - 170	3.42	3.18	99.8 K=1.00	1.8800	-3575.78	36044.60	0.099 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	143 - 123	2L2x2x1/4x3/8	0.00	2000.70	0.000	0.00	3391.69	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	143 - 123	2L2x2x1/4x3/8	0.099	0.000	0.000	0.099 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	143 - 123	ROHN 2.5 X-STR	20.00	2.41	31.3	2.2535	13302.00	101409.00	0.131 [1]
T2	123 - 103	ROHN 2.5 STD	20.00	0.61	7.8	1.7040	634.84	76682.30	0.008 [1]
T3	103 - 83	ROHN 2.5 STD	20.00	2.41	30.5	1.7040	1456.95	76682.30	0.019 [1]
T4	83 - 67.82	ROHN 2.5 X-STR	15.18	2.41	31.3	2.2535	447.86	101409.00	0.004 [1]

[1] $P_u / \phi P_n$ controls

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	143 - 123	ROHN 2.5 X-STR	0.00	7017.50	0.000	0.00	7017.50	0.000
T2	123 - 103	ROHN 2.5 STD	0.00	5445.47	0.000	0.00	5445.47	0.000
T3	103 - 83	ROHN 2.5 STD	0.00	5445.47	0.000	0.00	5445.47	0.000
T4	83 - 67.82	ROHN 2.5 X-STR	0.00	7017.50	0.000	0.00	7017.50	0.000

Leg Interaction Design Data (Tension)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	143 - 123	ROHN 2.5 X-STR	0.131	0.000	0.000	0.131 [1] ✔	1.000	4.8.1 ✔
T2	123 - 103	ROHN 2.5 STD	0.008	0.000	0.000	0.008 [1] ✔	1.000	4.8.1 ✔
T3	103 - 83	ROHN 2.5 STD	0.019	0.000	0.000	0.019 [1] ✔	1.000	4.8.1 ✔
T4	83 - 67.82	ROHN 2.5 X-STR	0.004	0.000	0.000	0.004 [1] ✔	1.000	4.8.1 ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	143 - 123	ROHN TS1.5x16 ga	4.18	3.89	91.5	0.2627	1651.14	8513.11	0.194 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	123 - 103	ROHN TS1.5x16 ga	4.18	3.89	91.5	0.2627	1769.90	8513.11	0.208 [1]
T3	103 - 83	ROHN TS1.5x16 ga	4.18	3.89	91.5	0.2627	984.03	8513.11	0.116 [1]
T4	83 - 67.82	ROHN TS1.5x16 ga	4.18	3.89	91.5	0.2627	1268.49	8513.11	0.149 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	67.82 - 63	L4x4x1/4	1.71	1.47	14.1	1.9400	17.03	62856.00	0.000

Horizontal Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T5	67.82 - 63	L4x4x1/4	360.39	6931.57	0.052	381.13	3462.58	0.110

Horizontal Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T5	67.82 - 63	L4x4x1/4	0.000	0.052	0.110	0.162	1.000	4.8.1

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	143 - 123	ROHN TS1.5x16 ga	3.42	3.18	74.8	0.2627	7.56	8513.11	0.001 [1]
T2	123 - 103	ROHN TS1.5x16 ga	3.42	3.18	74.8	0.2627	759.08	8513.11	0.089 [1]
T3	103 - 83	ROHN TS1.5x16 ga	3.42	3.18	74.8	0.2627	353.25	8513.11	0.041 [1]
T4	83 - 67.82	ROHN TS1.5x16 ga	3.42	3.18	74.8	0.2627	399.61	8513.11	0.047 [1]
T5	67.82 - 63	L4x4x1/4	3.23	2.99	28.7	1.9400	1775.59	62856.00	0.028

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$

[1] P_u / ϕP_n controls

Top Girt Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	143 - 123	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T2	123 - 103	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T3	103 - 83	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T4	83 - 67.82	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T5	67.82 - 63	L4x4x1/4	280.93	6931.57	0.041	231.86	3462.58	0.067

Top Girt Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	143 - 123	ROHN TS1.5x16 ga	0.001	0.000	0.000	0.001 [1] ✔	1.000	4.8.1 ✔
T2	123 - 103	ROHN TS1.5x16 ga	0.089	0.000	0.000	0.089 [1] ✔	1.000	4.8.1 ✔
T3	103 - 83	ROHN TS1.5x16 ga	0.041	0.000	0.000	0.041 [1] ✔	1.000	4.8.1 ✔
T4	83 - 67.82	ROHN TS1.5x16 ga	0.047	0.000	0.000	0.047 [1] ✔	1.000	4.8.1 ✔
T5	67.82 - 63	L4x4x1/4	0.028	0.041	0.067	0.122 ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	143 - 123	ROHN TS1.5x16 ga	3.42	3.18	74.8	0.2627	600.23	8513.11	0.071 [1]
T2	123 - 103	ROHN TS1.5x16 ga	3.42	3.18	74.8	0.2627	342.49	8513.11	0.040 [1]
T3	103 - 83	ROHN TS1.5x16 ga	3.42	3.18	74.8	0.2627	273.63	8513.11	0.032 [1]
T4	83 - 67.82	ROHN TS1.5x16 ga	3.42	3.18	74.8	0.2627	1093.18	8513.11	0.128 [1]
T5	67.82 - 63	L4x4x1/4	0.96	0.72	6.9	1.9400	54.11	62856.00	0.001

[1] P_u / ϕP_n controls

Bottom Girt Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	143 - 123	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T2	123 - 103	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T3	103 - 83	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T4	83 - 67.82	ROHN TS1.5x16 ga	0.00	325.80	0.000	0.00	325.80	0.000
T5	67.82 - 63	L4x4x1/4	-487.85	6931.57	0.070	-282.22	3462.58	0.082

Bottom Girt Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	143 - 123	ROHN TS1.5x16 ga	0.071	0.000	0.000	0.071 [1] ✔	1.000	4.8.1 ✔
T2	123 - 103	ROHN TS1.5x16 ga	0.040	0.000	0.000	0.040 [1] ✔	1.000	4.8.1 ✔
T3	103 - 83	ROHN TS1.5x16 ga	0.032	0.000	0.000	0.032 [1] ✔	1.000	4.8.1 ✔
T4	83 - 67.82	ROHN TS1.5x16 ga	0.128	0.000	0.000	0.128 [1] ✔	1.000	4.8.1 ✔
T5	67.82 - 63	L4x4x1/4	0.001	0.070	0.082	0.152 ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	143 - 123	2L2x2x1/4x3/8 2L 'a' > 18.3775 in - 170	3.42	3.18	62.7	1.8800	3876.57	60912.00	0.064 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	143 - 123	2L2x2x1/4x3/8	0.00	2000.70	0.000	0.00	3391.69	0.000

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	143 - 123	2L2x2x1/4x3/8	0.064	0.000	0.000	0.064 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	143 - 123 (167)	C12x20.7	3.41	3.30	49.5	6.0900	4007.27	197316.00	0.020
T1	143 - 123 (168)	C12x20.7	3.41	3.30	49.5	6.0900	3976.93	197316.00	0.020
T1	143 - 123 (173)	C12x20.7	3.41	3.30	49.5	6.0900	4179.66	197316.00	0.021
T1	143 - 123 (174)	C12x20.7	3.41	3.30	49.5	6.0900	3873.52	197316.00	0.020
T1	143 - 123 (176)	C12x20.7	3.41	3.30	49.5	6.0900	3899.34	197316.00	0.020
T1	143 - 123 (177)	C12x20.7	3.41	3.30	49.5	6.0900	3707.76	197316.00	0.019

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	143 - 123 (167)	C12x20.7	-19667.92	68580.00	0.287	-0.00	7006.50	0.000
T1	143 - 123 (168)	C12x20.7	-23284.67	68580.00	0.340	-0.00	7006.50	0.000
T1	143 - 123 (173)	C12x20.7	-19564.58	68580.00	0.285	-0.00	7006.50	0.000
T1	143 - 123 (174)	C12x20.7	-21957.58	68580.00	0.320	0.00	7006.50	0.000
T1	143 - 123 (176)	C12x20.7	-23556.75	68580.00	0.343	-0.00	7006.50	0.000
T1	143 - 123 (177)	C12x20.7	-22209.83	68580.00	0.324	0.00	7006.50	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	143 - 123 (167)	C12x20.7	0.020	0.287	0.000	0.297 ✔	1.000	4.8.1 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	143 - 123 (168)	C12x20.7	0.020	0.340	0.000	0.350 ✔	1.000	4.8.1 ✔
T1	143 - 123 (173)	C12x20.7	0.021	0.285	0.000	0.296 ✔	1.000	4.8.1 ✔
T1	143 - 123 (174)	C12x20.7	0.020	0.320	0.000	0.330 ✔	1.000	4.8.1 ✔
T1	143 - 123 (176)	C12x20.7	0.020	0.343	0.000	0.353 ✔	1.000	4.8.1 ✔
T1	143 - 123 (177)	C12x20.7	0.019	0.324	0.000	0.333 ✔	1.000	4.8.1 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	143 - 123	Leg	ROHN 2.5 X-STR	1	-15953.10	94406.90	16.9	Pass
T2	123 - 103	Leg	ROHN 2.5 STD	58	-14905.70	58405.60	25.5	Pass
T3	103 - 83	Leg	ROHN 2.5 STD	91	-16815.50	58405.60	28.8	Pass
T4	83 - 67.82	Leg	ROHN 2.5 X-STR	124	-16536.60	76176.60	21.7	Pass
T5	67.82 - 63	Leg	ROHN 2.5 X-STR	151	-15514.30	88193.40	17.6	Pass
T1	143 - 123	Diagonal	ROHN TS1.5x16 ga	27	-1630.57	5479.15	29.8 43.1 (b)	Pass
T2	123 - 103	Diagonal	ROHN TS1.5x16 ga	88	-1993.92	5479.15	36.4 46.2 (b)	Pass
T3	103 - 83	Diagonal	ROHN TS1.5x16 ga	122	-1089.91	5479.15	19.9 25.7 (b)	Pass
T4	83 - 67.82	Diagonal	ROHN TS1.5x16 ga	136	-1203.83	5479.40	22.0 33.1 (b)	Pass
T5	67.82 - 63	Horizontal	L4x4x1/4	162	17.03	62856.00	16.2	Pass
T1	143 - 123	Top Girt	ROHN TS1.5x16 ga	4	5.99	8513.11	0.5	Pass
T2	123 - 103	Top Girt	ROHN TS1.5x16 ga	61	759.08	8513.11	8.9 19.8 (b)	Pass
T3	103 - 83	Top Girt	ROHN TS1.5x16 ga	95	-313.17	6341.21	4.9 9.2 (b)	Pass
T4	83 - 67.82	Top Girt	ROHN TS1.5x16 ga	129	-326.18	6341.21	5.1 10.4 (b)	Pass
T5	67.82 - 63	Top Girt	L4x4x1/4	156	1775.59	62856.00	12.2	Pass
T1	143 - 123	Bottom Girt	ROHN TS1.5x16 ga	9	600.23	8513.11	7.1 15.7 (b)	Pass
T2	123 - 103	Bottom Girt	ROHN TS1.5x16 ga	64	-331.44	6341.21	5.2 8.9 (b)	Pass
T3	103 - 83	Bottom Girt	ROHN TS1.5x16 ga	97	-311.67	6341.21	4.9 7.1 (b)	Pass
T4	83 - 67.82	Bottom Girt	ROHN TS1.5x16 ga	130	1093.18	8513.11	12.8 28.5 (b)	Pass
T5	67.82 - 63	Bottom Girt	L4x4x1/4	159	-208.97	48854.90	15.7	Pass
T1	143 - 123	Guy A@125.523	7/16	175	12335.40	12480.00	98.8	Pass
T1	143 - 123	Guy B@125.523	7/16	172	10611.80	12480.00	85.0	Pass
T1	143 - 123	Guy C@125.523 (-1 deg)	7/16	166	10722.40	12480.00	85.9	Pass
T1	143 - 123	Top Guy Pull-Off@125.523	2L2x2x1/4x3/8	170	-3575.78	36044.60	9.9	Pass
T1	143 - 123	Torque Arm Top@125.523	C12x20.7	176	3899.34	197316.00	35.3	Pass

Summary

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						Leg (T3)	28.8	Pass
						Diagonal (T2)	46.2	Pass
						Horizontal (T5)	16.2	Pass
						Top Girt (T2)	19.8	Pass
						Bottom Girt (T4)	28.5	Pass
						Guy A (T1)	98.8	Pass
						Guy B (T1)	85.0	Pass
						Guy C (T1)	85.9	Pass
						Top Guy Pull-Off (T1)	9.9	Pass
						Torque Arm Top (T1)	35.3	Pass
						Bolt Checks	46.2	Pass
						RATING =	**98.8**	**Pass**

Exhibit E

Mount Analysis

CENTERLINE COMMUNICATIONS
750 West Center Street, Suite 301
West Bridgewater, MA 02379
781.713.4725

Revised Mount Analysis Report

Site Address	1679 Stanley Street New Britain, CT 06053
Site Name	CTHA783A
Site ID	CTHA783A
Project Name	Sprint Retain
Design Codes	2015 International Building Code ASCE 7-10 TIA-222-G Standards 2018 CT State Building Code

	Stress Ratio	Overall Result
Existing Mount with Modifications	**86%**	**PASS**

Client:

T - Mobile

NORTHEAST, LLC
15 Commerce Way, Suite B
Norton, MA 02766

Date: 04/06/2021 (Rev.1)
03/31/2021 (Rev.0)

Scope of Work:

Centerline Communications was authorized by T-Mobile Northeast LLC to perform an analysis of the existing antenna mounts to determine their capacity to support the proposed T-Mobile equipment listed in this report. These mounts were analyzed using RISA 3D v17.0.4.

Final Appurtenances Configuration:

Elevation (ft)	Position[1]	Azimuth (degrees)	Quantity	Appurtenance	Sector
138	**MP1**	**125**	**1**	**APX16DWV-16DWV-S-E-A20 Antenna**	Sector 1
138	**MP3**	**125**	**1**	**APXVAALL24_43-U-NA20 Antenna**	
138	**MP4**	**125**	**1**	**AIR6449 B41 Antenna**	
138	**MP1**	**125**	**1**	**4415 B66A RRH**	
138	**MP3**	**125**	**1**	**4449 B71+B85 RRH**	
138	**MP3**	**125**	**1**	**4424 B25 RRH**	
138	**-**	**240**	**1**	**APX16DWV-16DWV-S-E-A20 Antenna**	Sector 2
138	**-**	**240**	**1**	**APXVAALL24_43-U-NA20 Antenna**	
138	**-**	**240**	**1**	**AIR6449 B41 Antenna**	
138	**-**	**240**	**1**	**4415 B66A RRH**	
138	**-**	**240**	**1**	**4449 B71+B85 RRH**	
138	**-**	**240**	**1**	**4424 B25 RRH**	
138	**-**	**345**	**1**	**APX16DWV-16DWV-S-E-A20 Antenna**	Sector 3
138	**-**	**345**	**1**	**APXVAALL24_43-U-NA20 Antenna**	
138	**-**	**345**	**1**	**AIR6449 B41 Antenna**	
138	**-**	**345**	**1**	**4415 B66A RRH**	
138	**-**	**345**	**1**	**4449 B71+B85 RRH**	
138	**-**	**345**	**1**	**4424 B25 RRH**	

Notes:

1. MP represent Mount Pipe.
2. Existing Appurtenance
3. **Proposed Appurtenance**

Design Criteria:

Design Codes:

2015 International Building Code
ASCE 7-10
TIA-222-G Standards
2018 CT State Building Code

Ultimate Wind Speed	125 mph
Nominal Wind Speed	97 mph
Wind Speed with Ice	50 mph
Ice Thickness	1.00 in.
Exposure Category	B
Topographic Category	1
Structure Class	II
Site Soil Class (Assumed)	D – Stiff Soil
Seismic Design Category	B
Spectral Response Acceleration Parameter at a Short Periods, S_S	0.183 g
Spectral Response Acceleration Parameter at a Period of 1 Second, S_1	0.064 g
Short Period Site Coefficient, F_a	1.6
Long Period Site Coefficient, F_v	2.4

***Refer to calculations for additional design criteria.**

Conclusion:

The results of the analysis concluded that the proposed T-Mobile mounts *are adequate* to support the proposed T-Mobile equipment loading *upon completion* of the following modifications. Centerline Communications recommends the following:

- Remove and replace the existing Position 2 mount pipes with 2" STD. x 8 ft mount pipes in all sectors.
- Relocate existing tieback to the mount pipe. See the attached drawings for details.

	Stress Ratio	Overall Result
Existing Mount with Modifications	**86%**	**PASS**

Reference Documents:

- T-Mobile RFDS CTHA783A_Sprint Retain_1_draft, dated 01/15/2021
- Structural Assessment by Ramaker & Associates, Inc., dated 07/10/2014

Assumptions and Limitations:

- The calculations performed by Centerline Communications are limited to the structural members in these calculations only.
- Structural calculations in this report do not check the adequacy of the supporting structure, other mounts, or coax mounting attachments.
- The calculation assumes all structural members to be in good condition i.e. no damage, rust, or other defects.

Photos:

Existing Alpha Sector

Existing Beta Sector

Existing Gamma Sector

Overall

Design Calculations

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West Bridgewater, MA 02379
781.713.4725

Site Details	
Site Name	CTHA783A
Carrier	T-Mobile
City, State	New Britain, CT
Project	Sprint Retain

Mount Details		
Mount Type	Sector Frame	
Mount Height, z	138	ft
Number of Sectors	3	
Tower Type	Guyed	
Tower Height, h	143	ft

Topographic Factors		
Topographic Category	1	
Feature	Flat	
Crest Height, H	N/A	ft
Distance from Crest, x	N/A	ft
Slope (H/L)	N/A	
Topographic Factor, K_{zt}	1.00	

Seismic Factors		
Importance Factor, I_E	1	
Short Period Spectral Acceleration, S_s	0.183	g
1 Second Period Spectral Acceleration, S_1	0.064	g
Long-Period Transition Period, T_L	6	
Design Category	B	
Short Period Site Coefficient, F_a	1.60	
Long-Period Site Coefficient, F_v	2.4	

Site Parameters		
Ultimate Wind Speed, V_{ULT}	125	mph
Nominal Wind Speed, V	97	mph
Wind Speed with Ice, V_i	50	mph
Design Ice Thickness, t_i	1	in
Structural Class	II	
Exposure Category	B	
Site Soil Class	D-Stiff Soil (Assumed)	

Code	
Building Code	2015 IBC
TIA Code	TIA-222-G
ASCE Code	7-10

Site Constants		
Importance Factor, I (Wind no Ice)	1.00	
Importance Factor, I (Ice Thickness)	1.00	
Importance Factor, I (wind with Ice)	1.00	
Wind Direction Prob. Factor, K_d	0.95	
Velocity Pressure Coefficient, K_z	1.08	
Gust Effect Factor, G_h	1.00	
Design Ice Thickness, t_{iz}	2.31	in
Velocity Pressure, q_z	24.79	psf
Velocity Pressure with Ice, q_{zi}	6.59	psf
Shielding Factor, K_a	1.00	
Flat Velocity Pressure (Ca =2.0)	49.59	psf
Round Velocity Pressure (Ca = 1.2)	29.75	psf
Round Velocity Pressure with Ice (Ca = 1.2)	7.91	psf
Engineer Initials	**AP**	

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Members Forces							
Member Label	**Shape**	**Type**	**w, lbs/ft**	**q_z, psf**	**w_i, lbs/ft**	**q_{zi}, psf**	**V_s, lbs/ft**
Pipe 3.0	PIPE_3.0	Beam	7.04	29.75	16.37	7.91	0.92
Pipe 2.5	PIPE_2.5	Beam	5.48	29.75	14.61	7.91	0.71
Pipe 2.0	PIPE_2.0	Beam	3.47	29.75	13.20	7.91	0.45
Pipe 1.0	PIPE_1.0	Beam	1.60	29.75	10.17	7.91	0.21

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Sector 1							
		Wind Force				Dimensions	Weights
Appurtenances	Rad. Ht., ft	Front EPA ft^2	Side EPA ft^2	0° Force lbs.	90° Force lbs.	H/W/D, in	$Wt./Wt._{ice}$, lbs.
APX16DWV-16DWV-S-E-A20 Antenna	138	6.46	2.15	160.15	53.30	55.9\13\3.15	40.7\194.08
APXVAALL24_43-U-NA20 Antenna	138	20.24	8.89	501.88	220.37	95.9\24\8.7	153.3\592.23
AIR6449 B41 Antenna	138	5.68	2.49	140.88	61.75	33.1\20.6\8.6	104\217.25
4415 B66A RRH	138	1.86	0.82	46.03	20.39	16.54\13.47\5.9	49.6\87.78
4449 B71+B85 RRH	138	1.65	1.30	40.91	32.23	15\13.2\10.4	75\103.31
4424 B25 RRH	138	1.64	0.67	40.64	16.62	14.9\13.2\5.4	46.3\78.42

*Dish force coefficient is calculated per Annex C.2 of TIA-222-G, if available.

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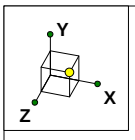
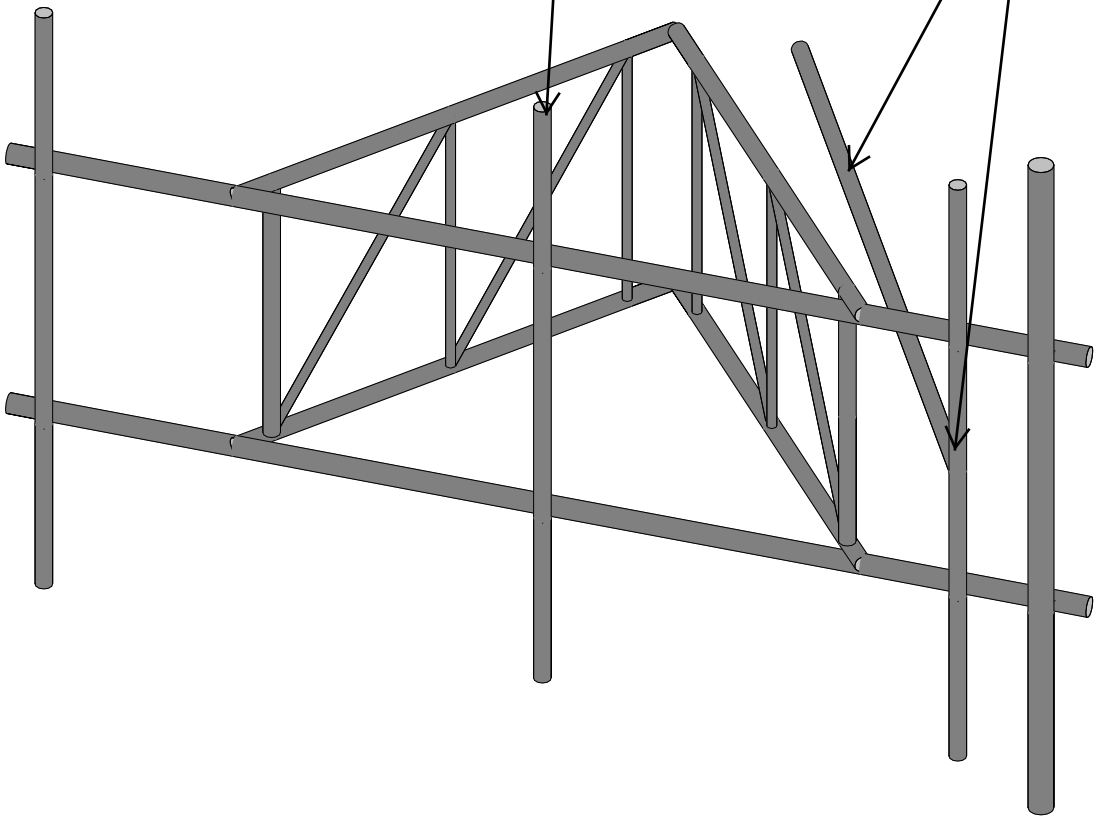
Sector 1 Continue…								
		Wind Force with Ice				Wind Force V = 30 mph		Seismic Force
Appurtenances	Rad. Ht., ft	Front EPA ft^2	Side EPA ft^2	0° Force lbs.	90° Force lbs.	0° Force lbs.	90° Force lbs.	Vs, lbs
APX16DWV-16DWV-S-E-A20 Antenna	138	5.34	2.67	77.70	31.74	15.32	5.10	5.30
APXVAALL24_43-U-NA20 Antenna	138	14.43	7.55	228.42	108.28	48.01	21.08	19.95
AIR6449 B41 Antenna	138	4.62	2.45	67.89	32.55	13.48	5.91	13.53
4415 B66A RRH	138	1.86	1.08	24.48	12.54	4.40	1.95	6.45
4449 B71+B85 RRH	138	1.70	1.43	22.06	18.00	3.91	3.08	9.76
4424 B25 RRH	138	1.69	0.95	21.93	10.68	3.89	1.59	6.03

Existing Mount with Modifications Results



Remove and replace existing mount pipes from Position 2 with (1) 2" STD. x 8 ft mount pipe and use existing crossover plate kit for the installation of APXVAALL24_43-U-NA20 antenna in all sectors.

Relocate existing tieback to the mount pipe.



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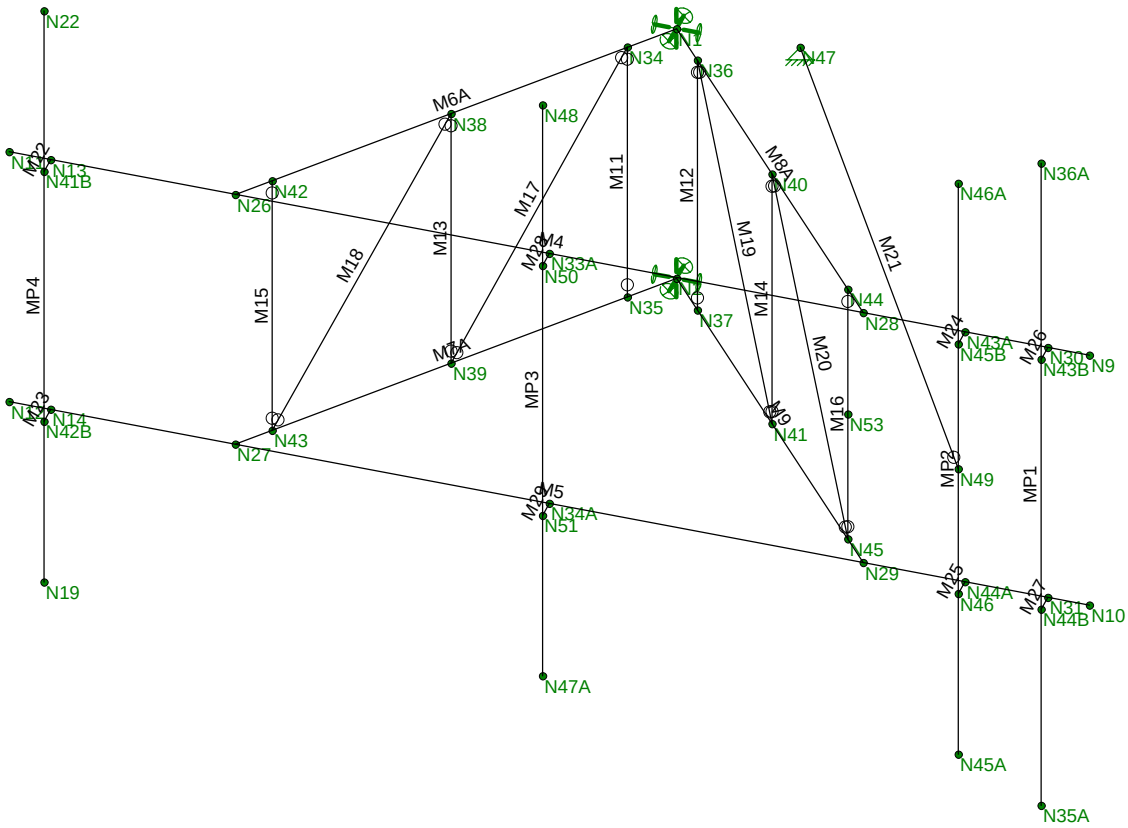

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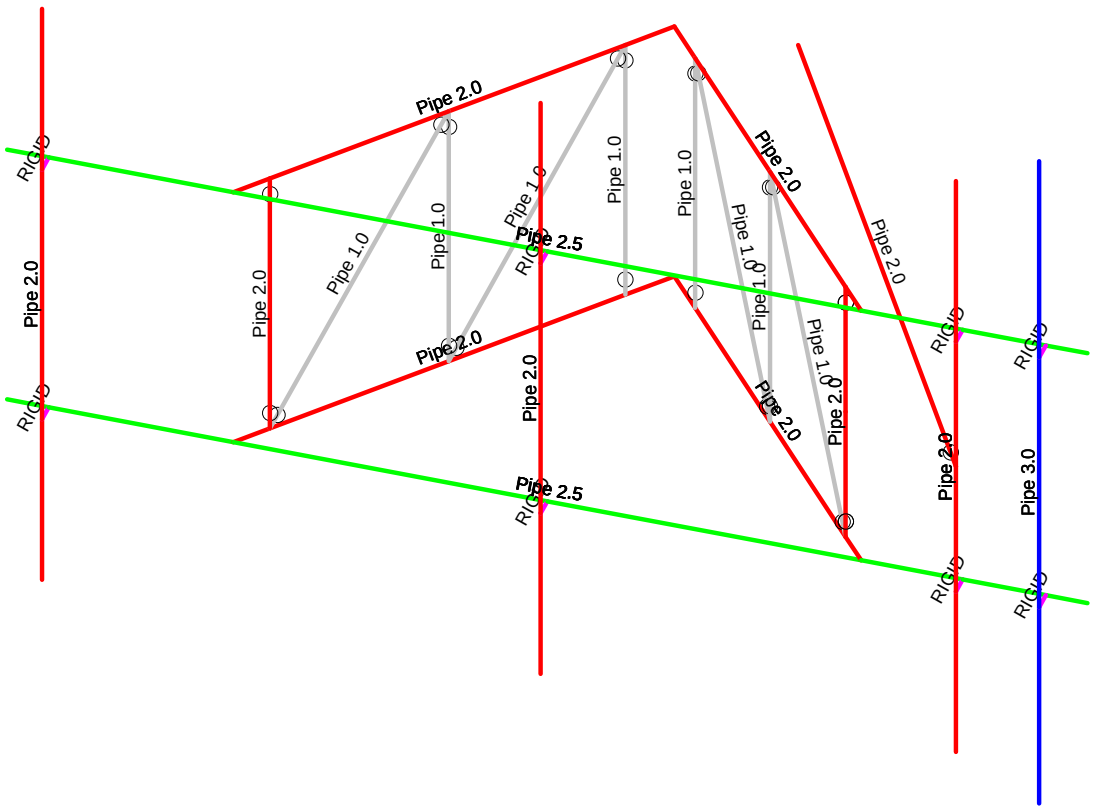

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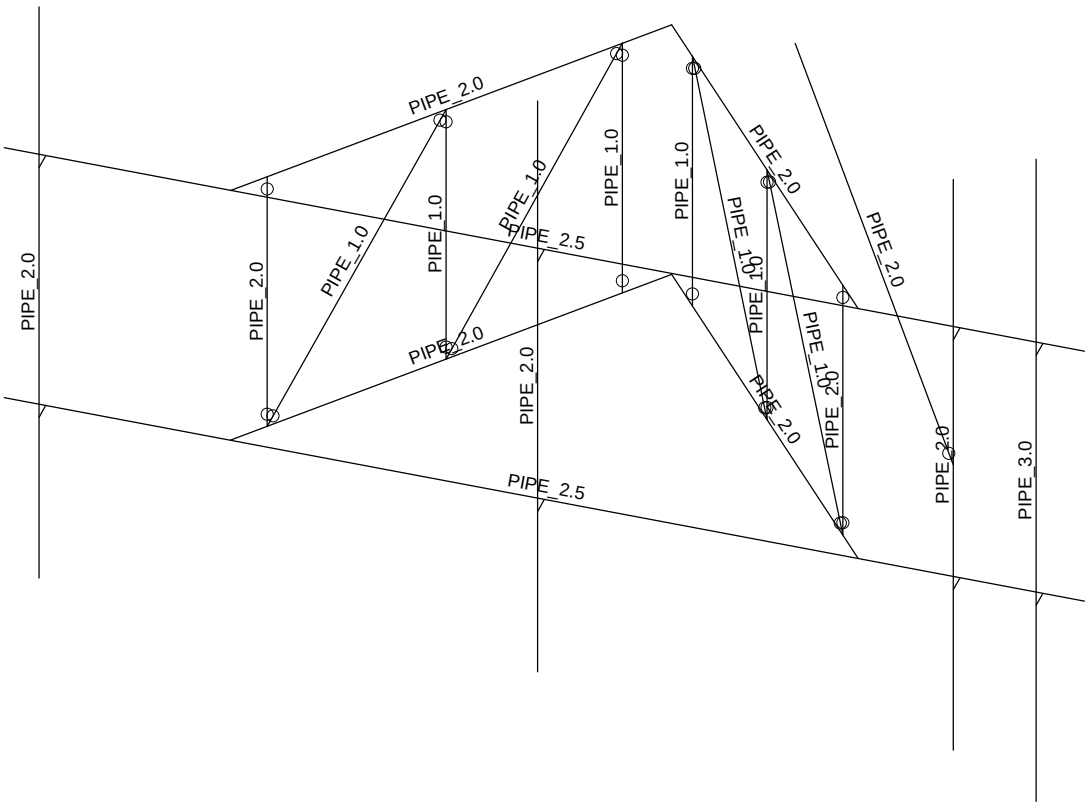

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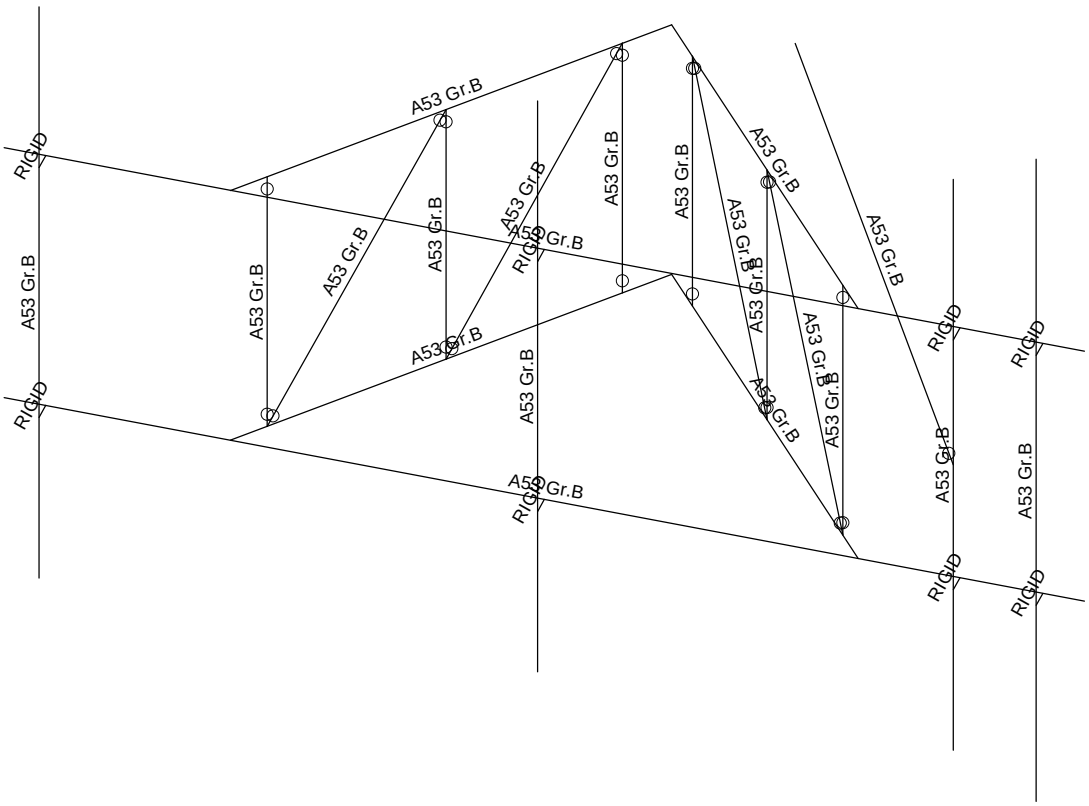

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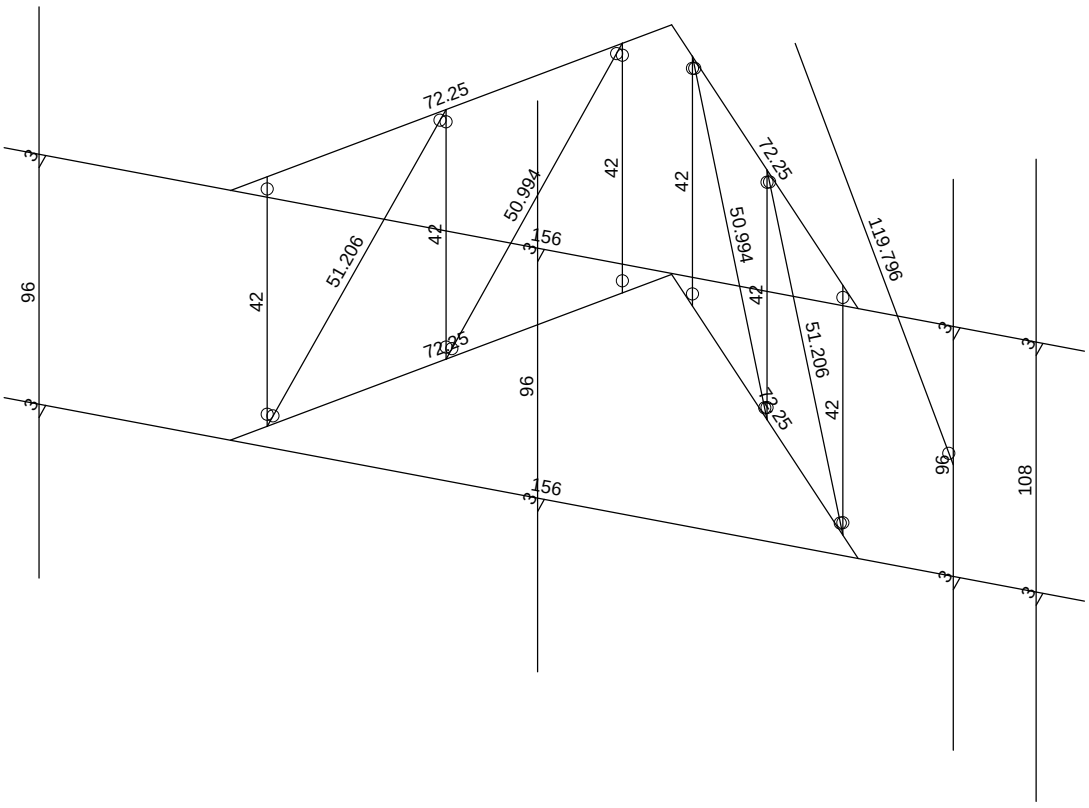

Member Length (in) Displayed

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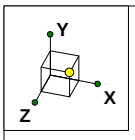

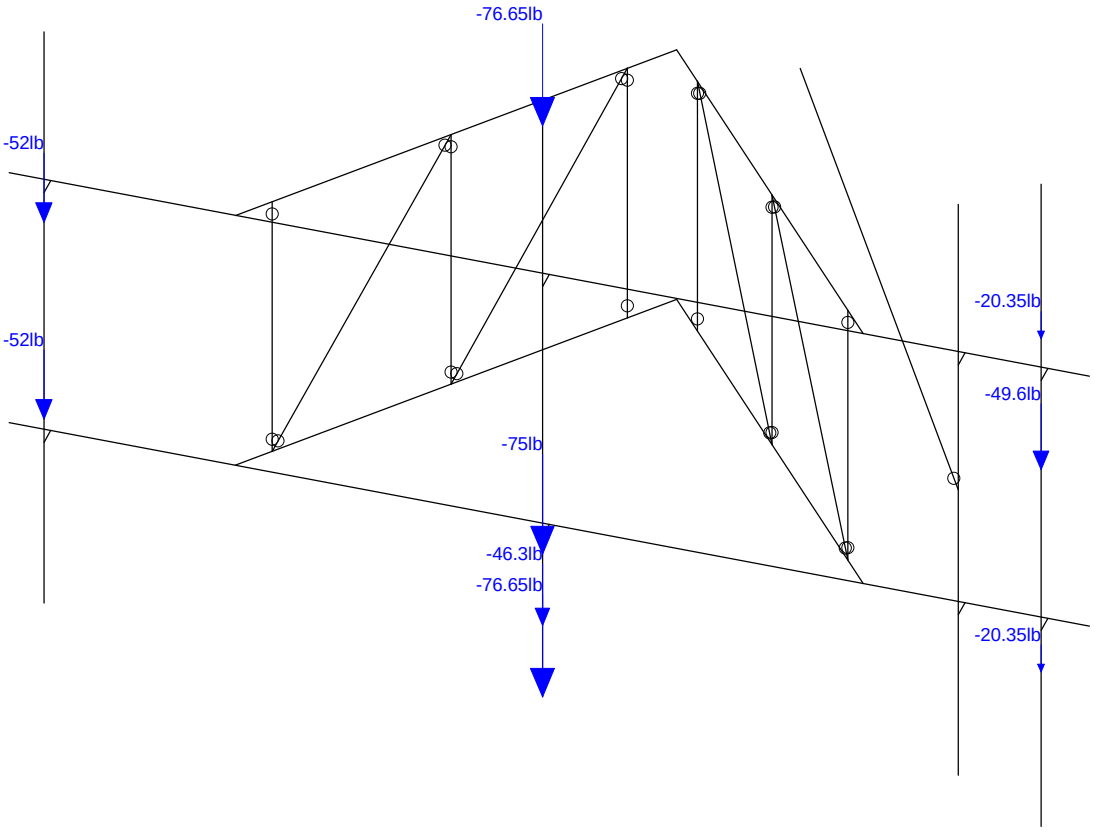

Loads: BLC 1, Dead Load

Centerline Communcation...	CTHA783A_MA	Dead Load
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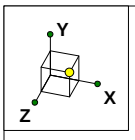

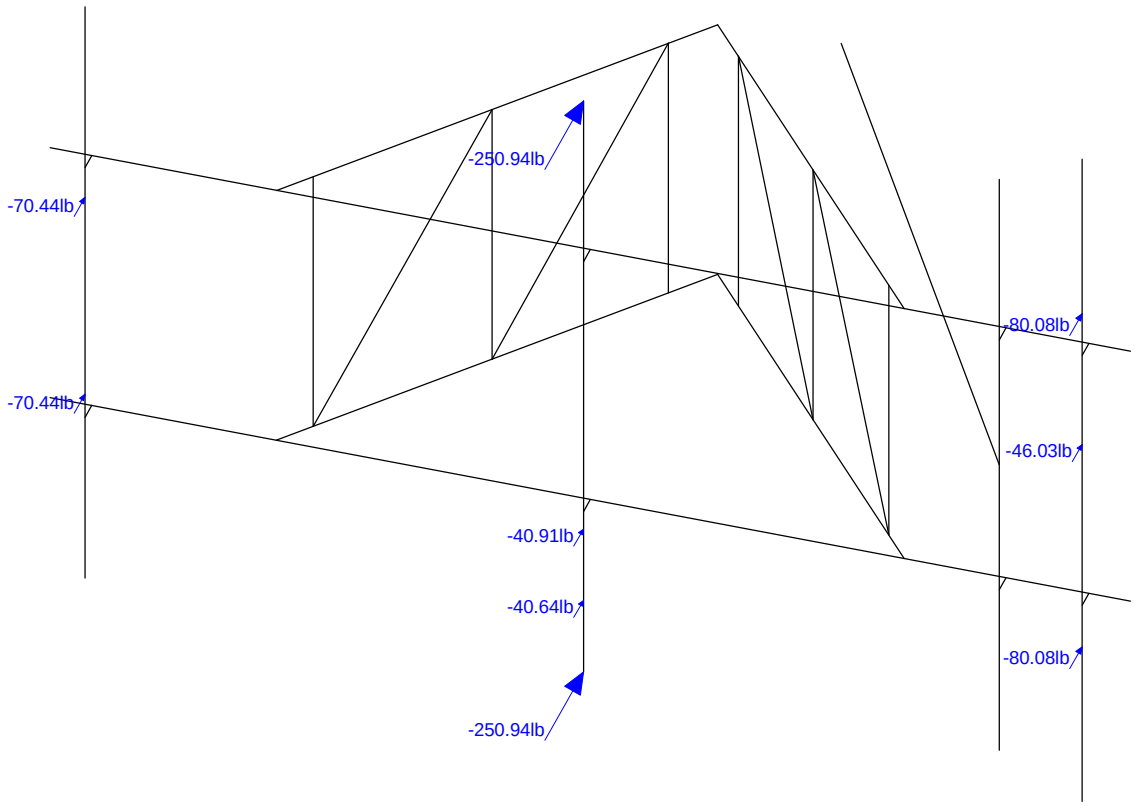

Loads: BLC 2, Wind 0

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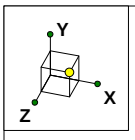

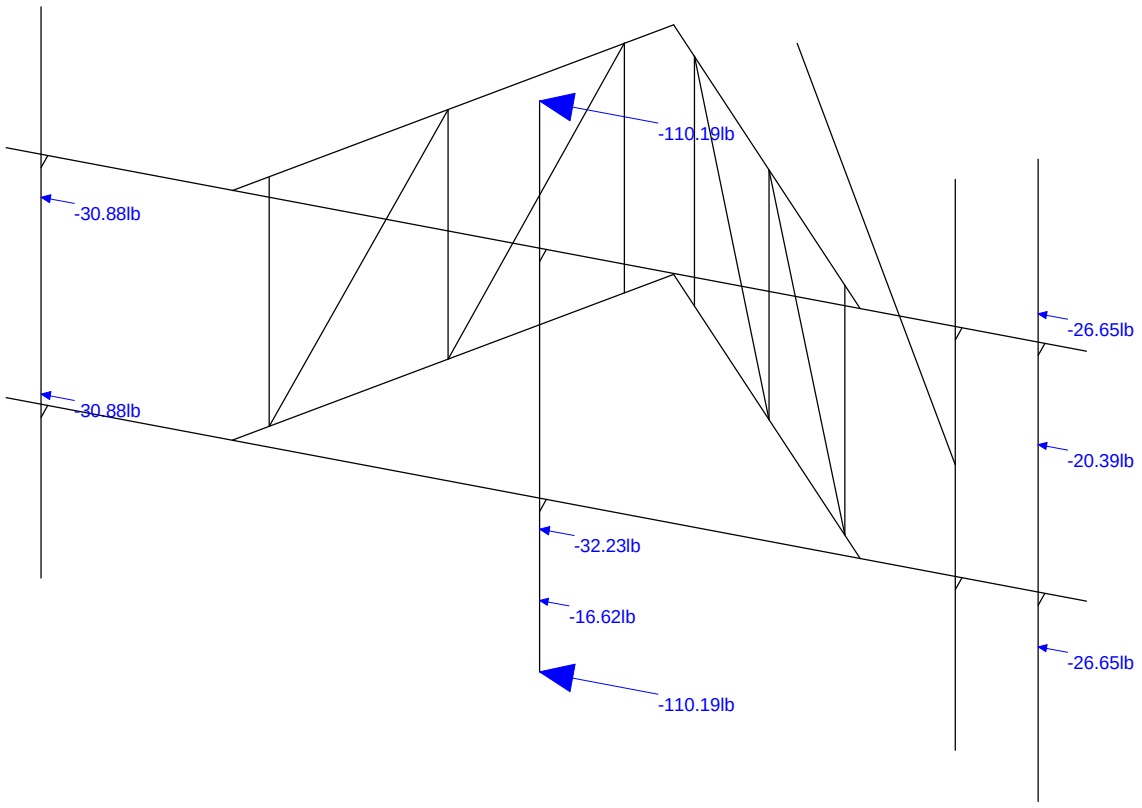

Loads: BLC 5, Wind 90

Centerline Communcation...	CTHA783A_MA	Wind 90
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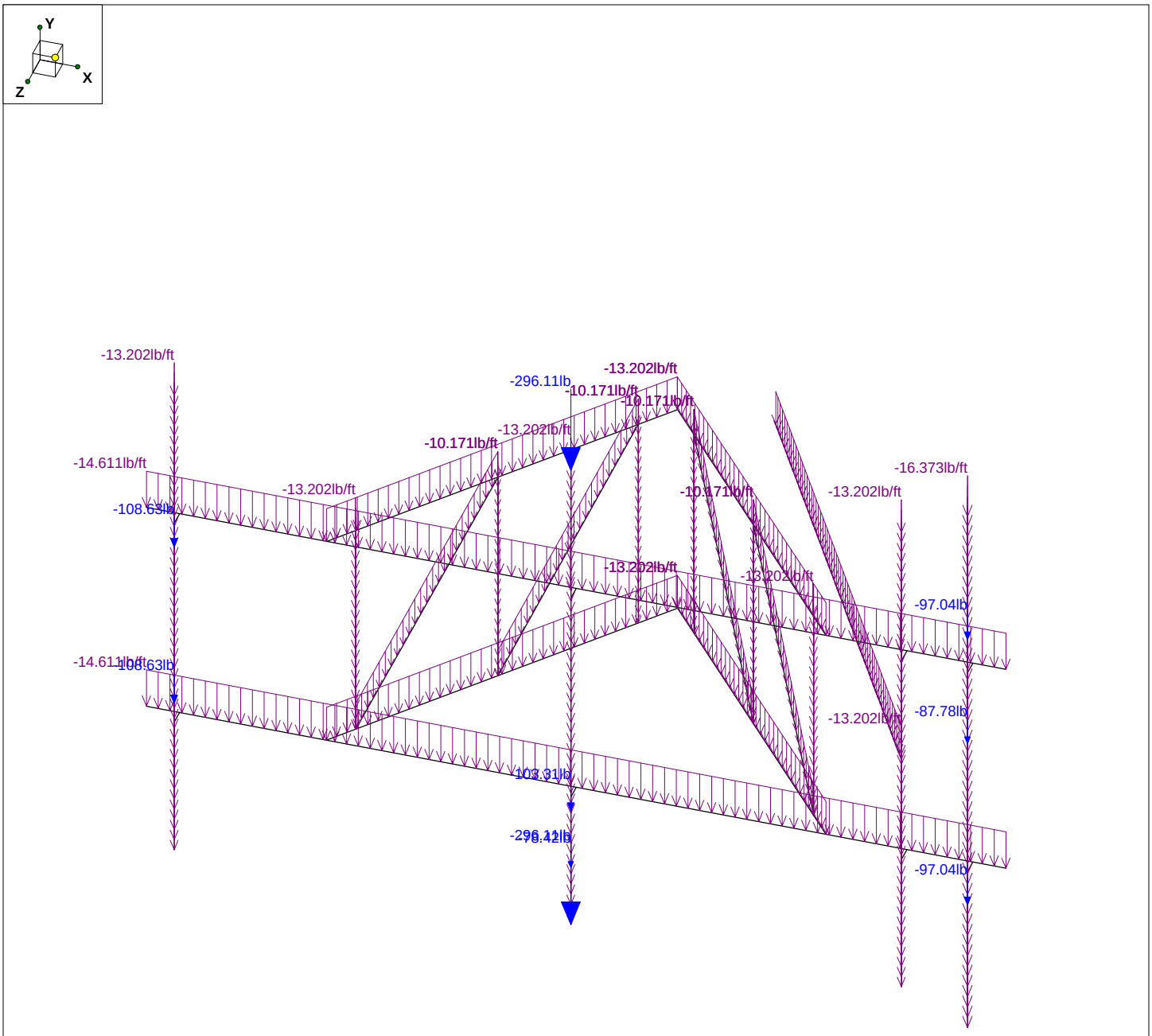

Loads: BLC 9, Ice Weight

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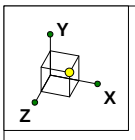

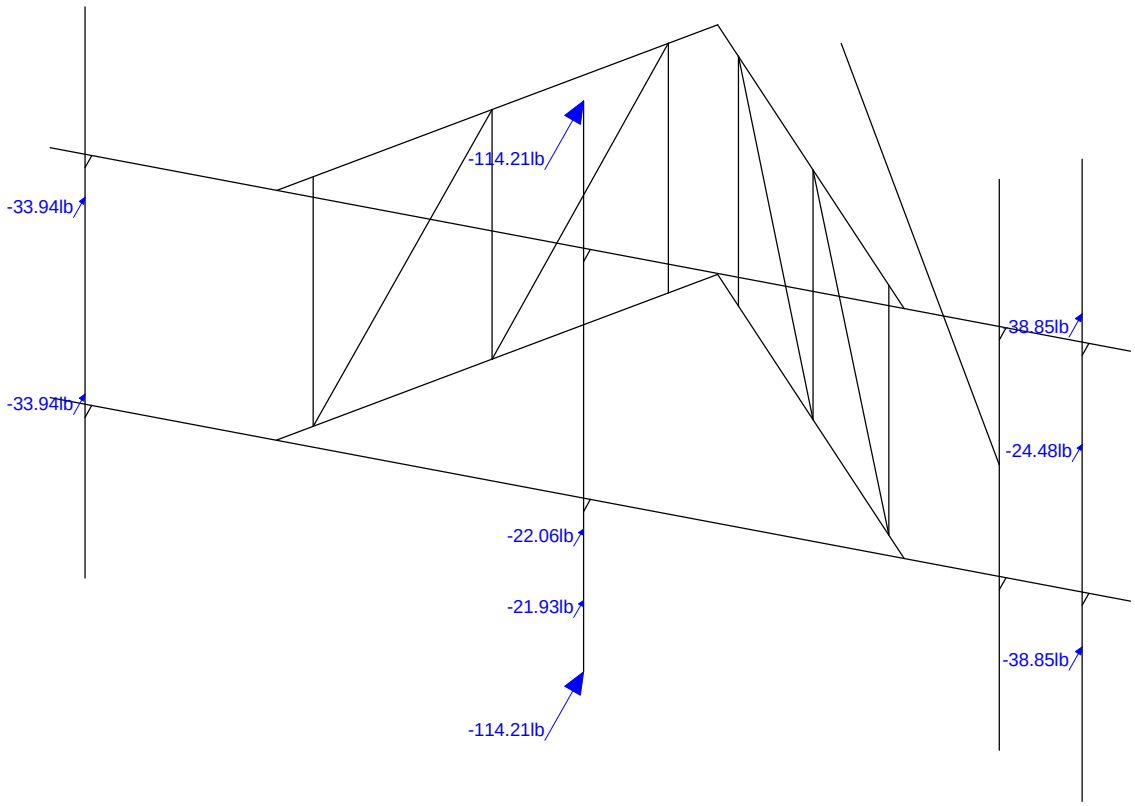

Loads: BLC 10, Ice + Wind 0

Centerline Communcation...	CTHA783A_MA	Ice + Wind 0
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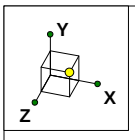

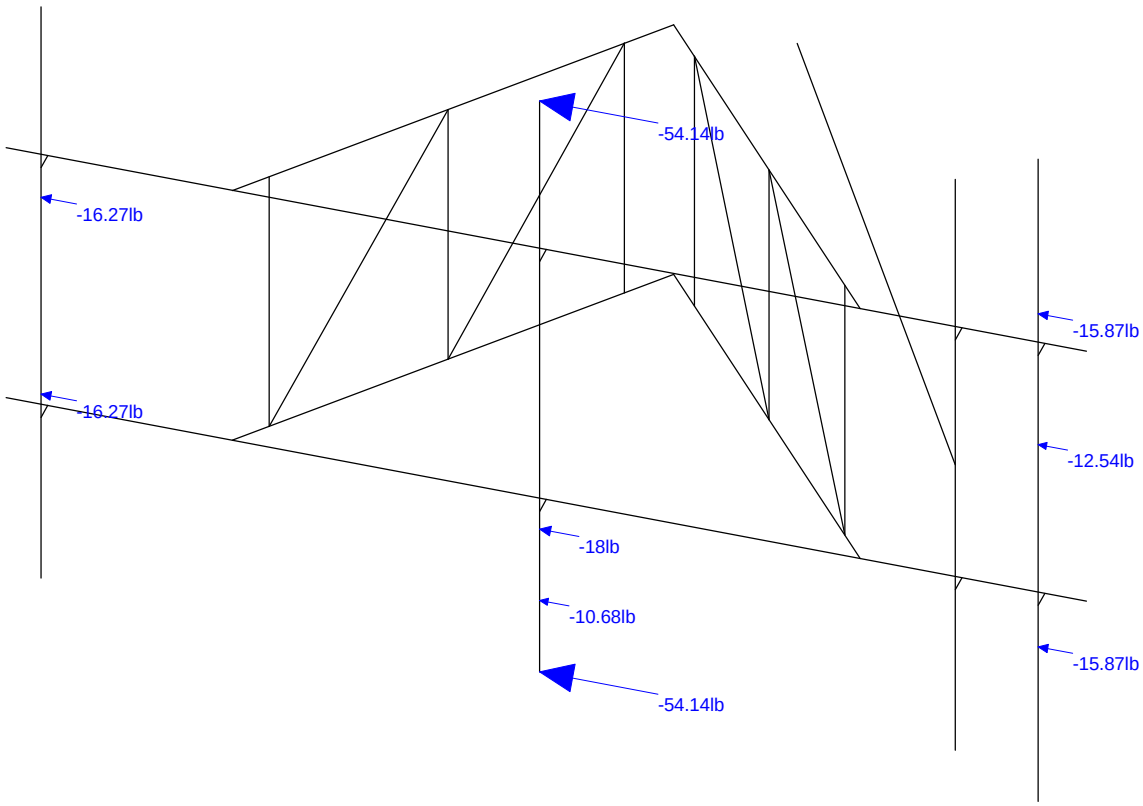

Loads: BLC 13, Ice + Wind 90

Centerline Communcation...	CTHA783A_MA	Ice + Wind 90
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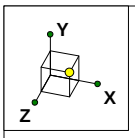

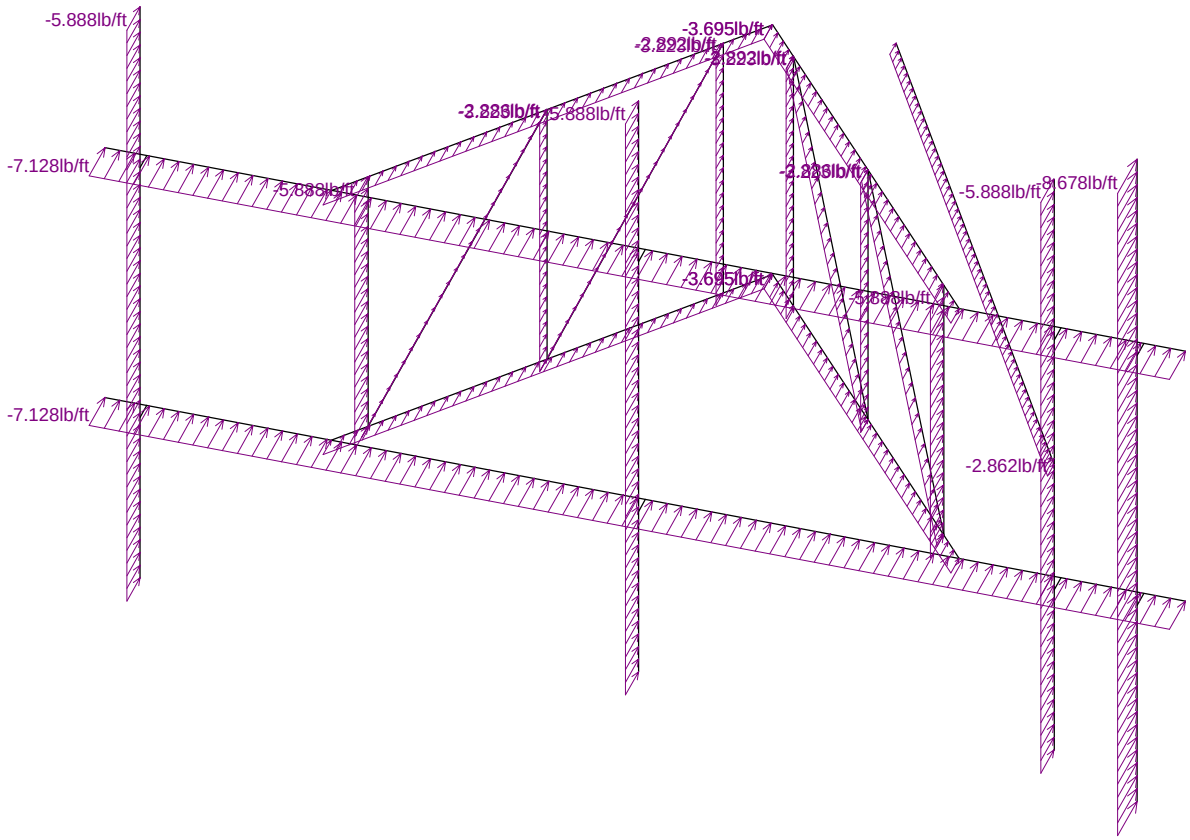

Loads: BLC 17, Distri. Wind Z

Centerline Communcation...	CTHA783A_MA	Distr. Wind 0
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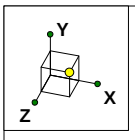
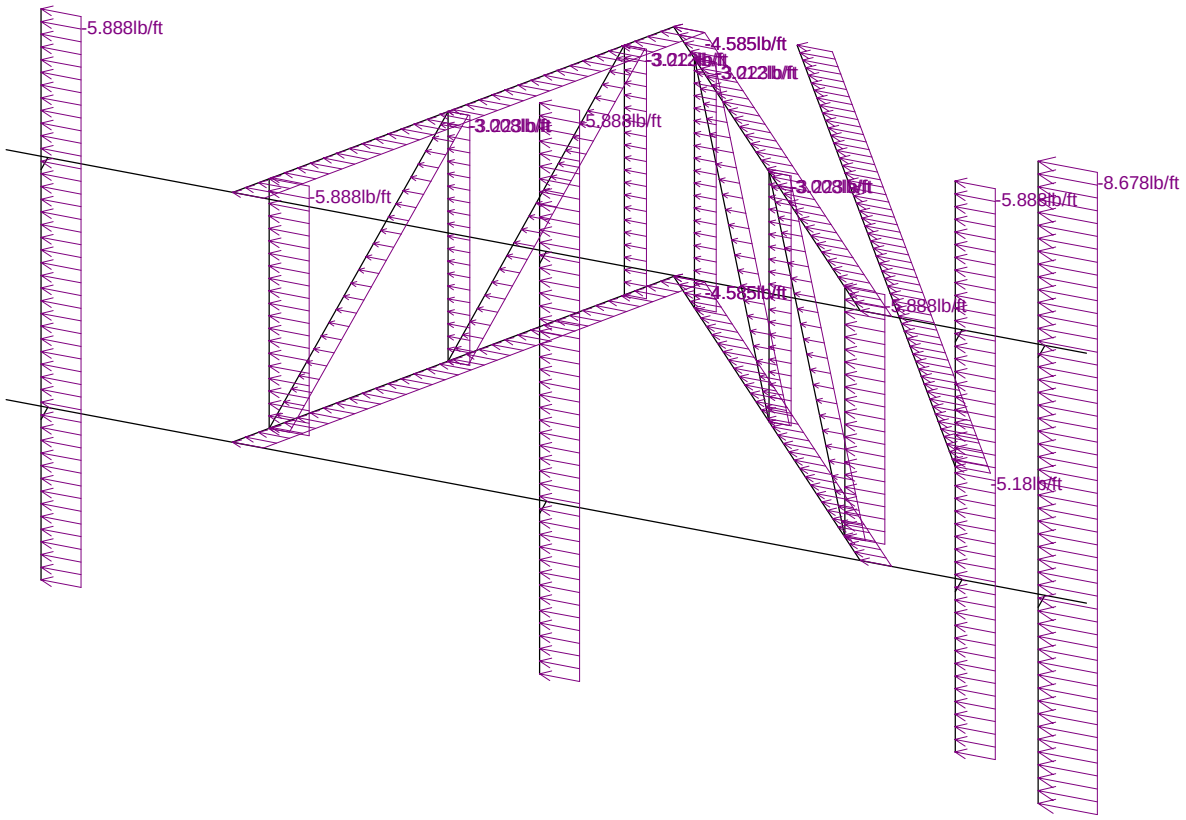
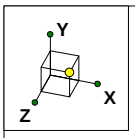
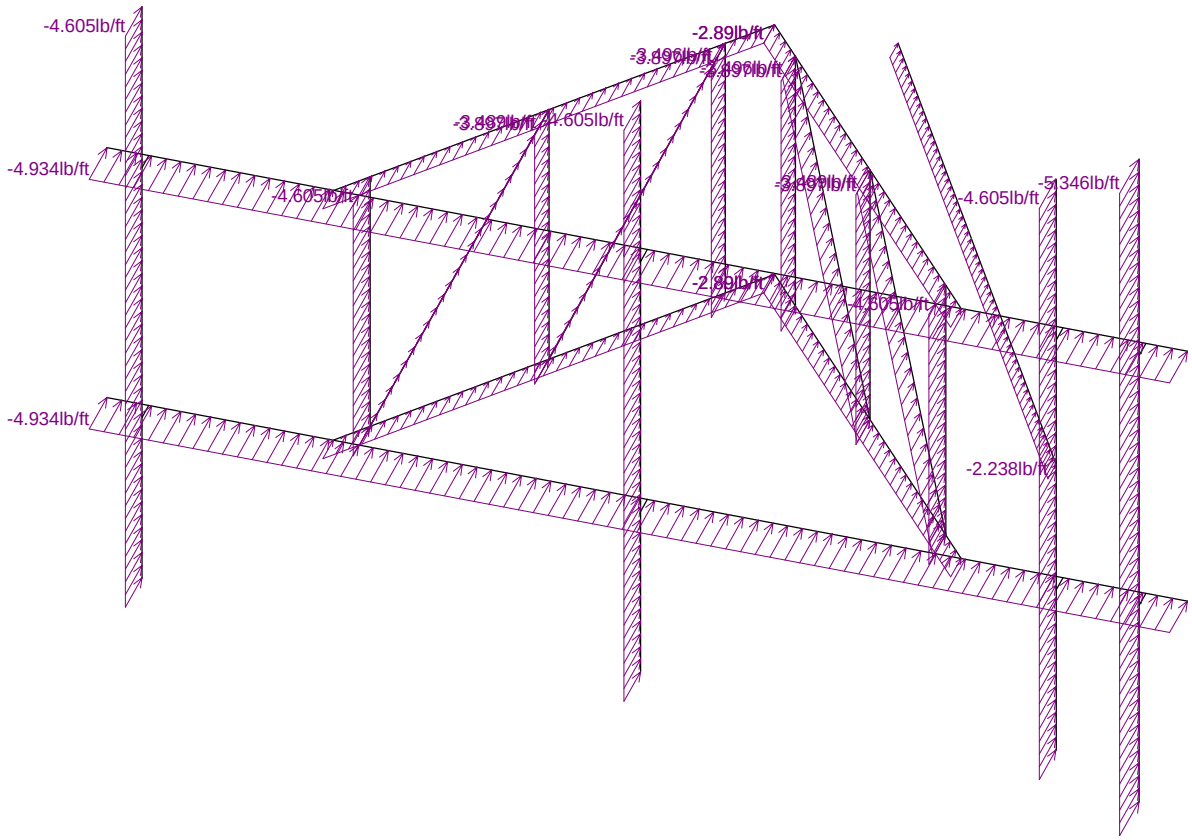




Loads: BLC 18, Distri. Wind X

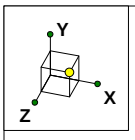
Centerline Communcation...	CTHA783A_MA	Distr. Wind 90
AP		Mar 30, 2021 at 4:18 PM
		CTHA783A_MA.r3d

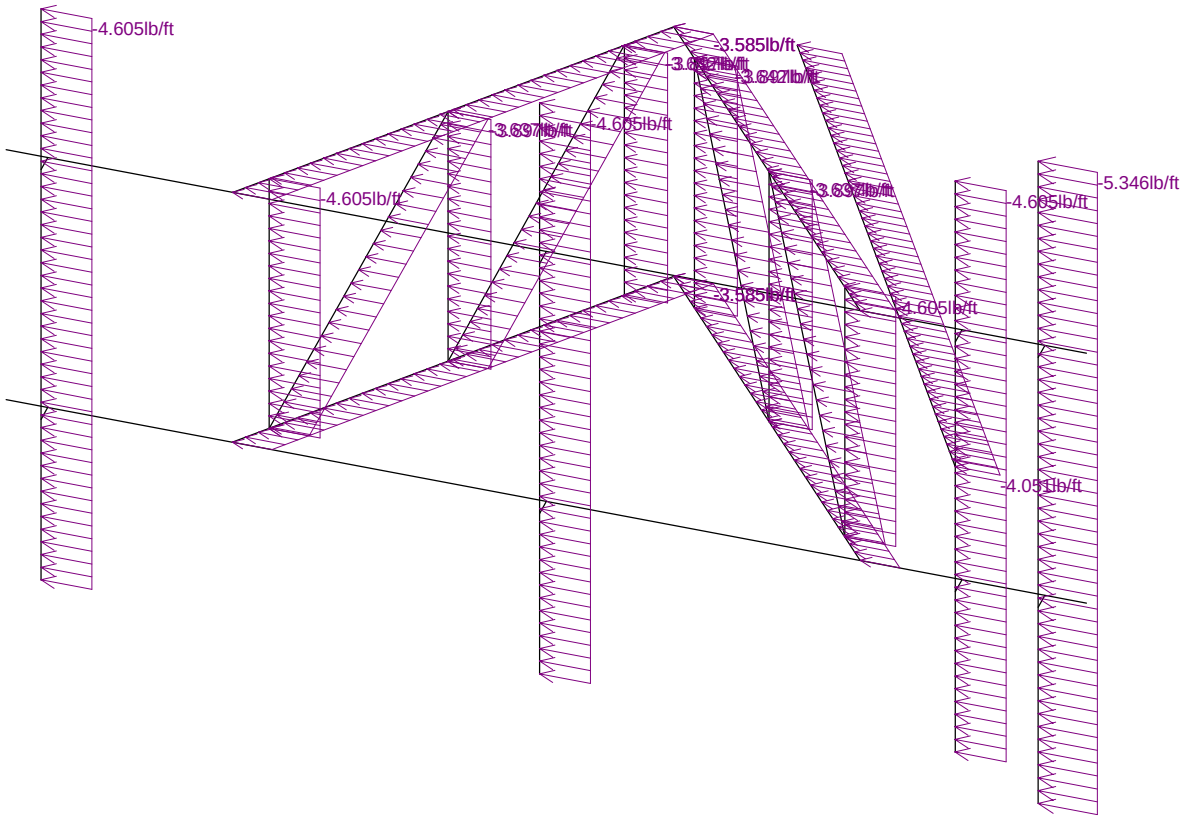




Loads: BLC 19, Distri. Ice + Wind Z

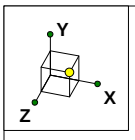
Centerline Communcation...	CTHA783A_MA	Distr. Ice + Wind 0
AP		Mar 30, 2021 at 4:18 PM
		CTHA783A_MA.r3d

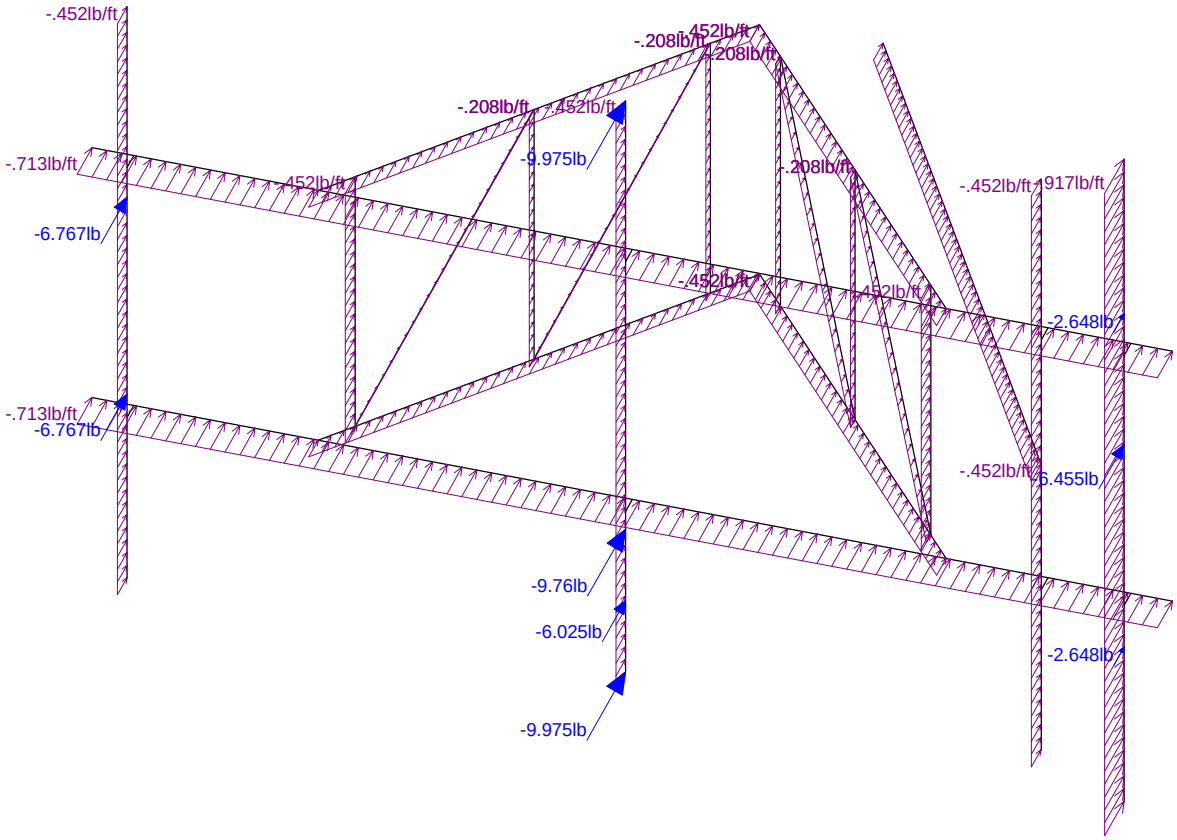




Loads: BLC 20, Distrr. Ice + Wind X

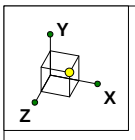
Centerline Communcation...	CTHA783A_MA	Distr. Ice + Wind 90
AP		Mar 30, 2021 at 4:19 PM
		CTHA783A_MA.r3d

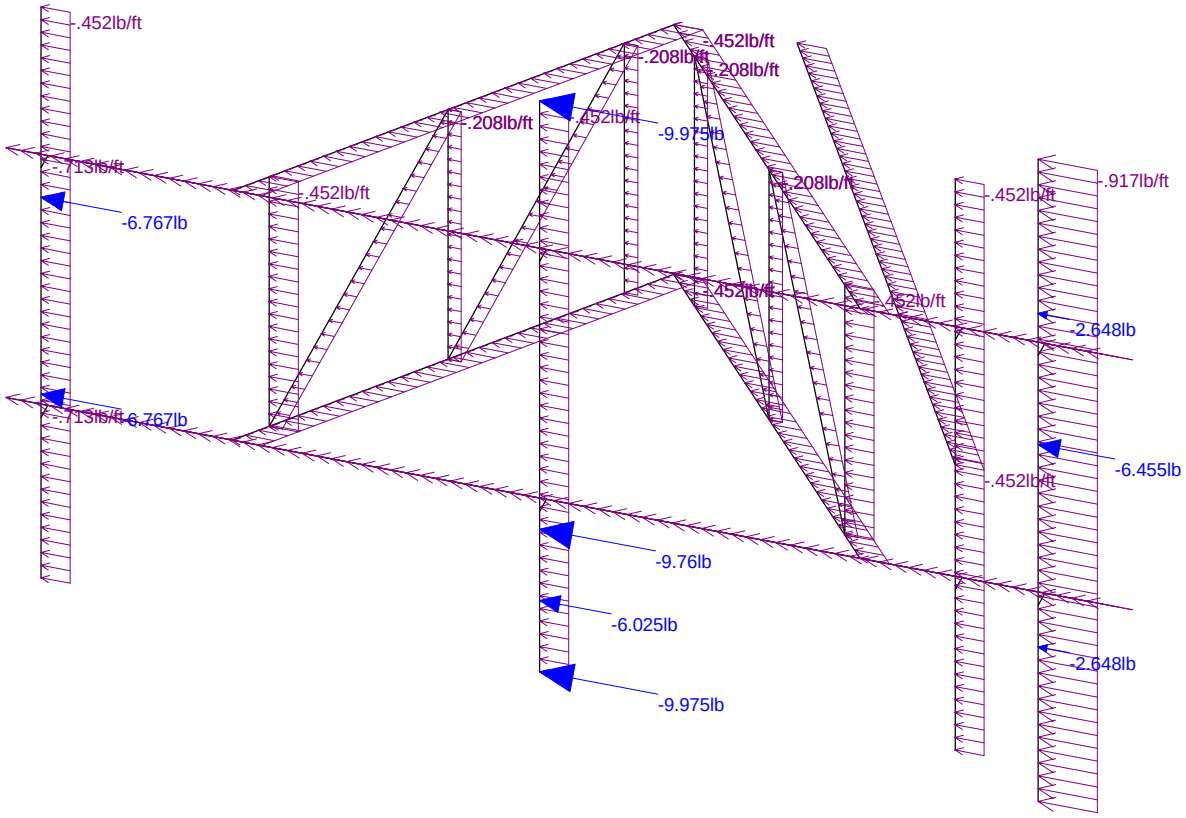




Loads: BLC 21, Seismic Load Z

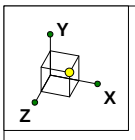
Centerline Communcation...	CTHA783A_MA	Seismic Z
AP		Mar 30, 2021 at 4:19 PM
		CTHA783A_MA.r3d

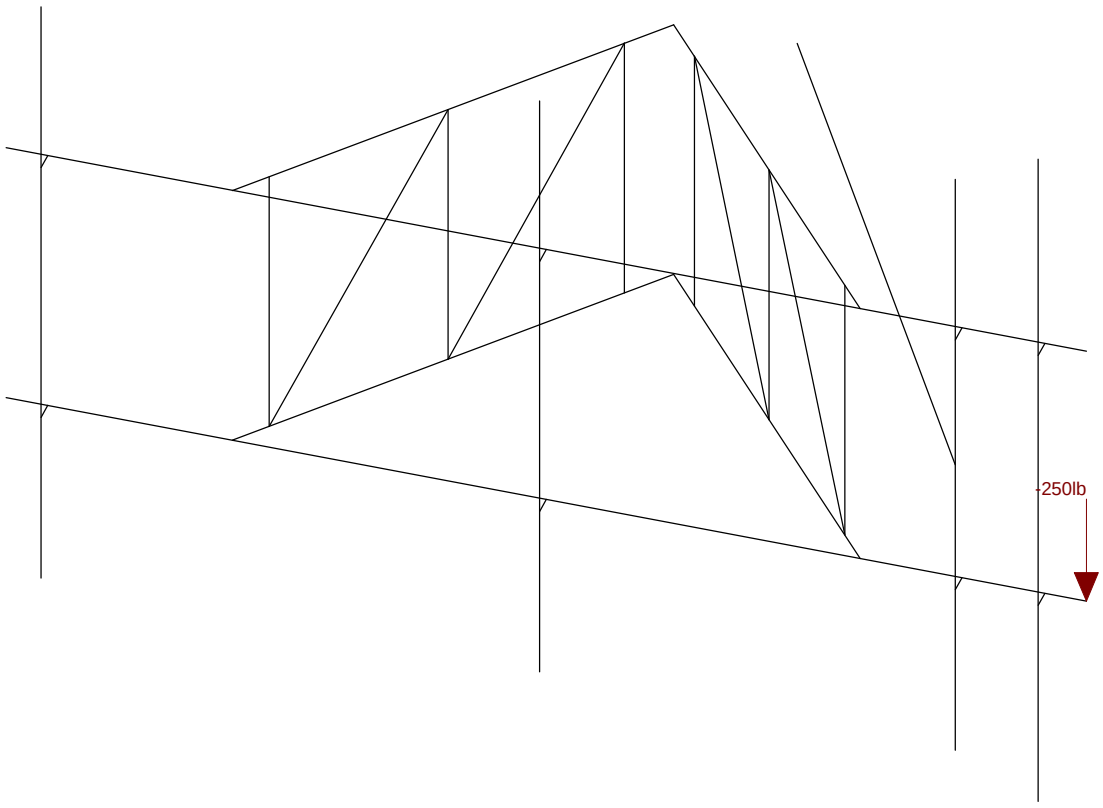




Loads: BLC 22, Seismic Load X

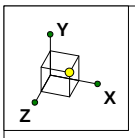
Centerline Communcation...	CTHA783A_MA	Seismic X
AP		Mar 30, 2021 at 4:19 PM
		CTHA783A_MA.r3d

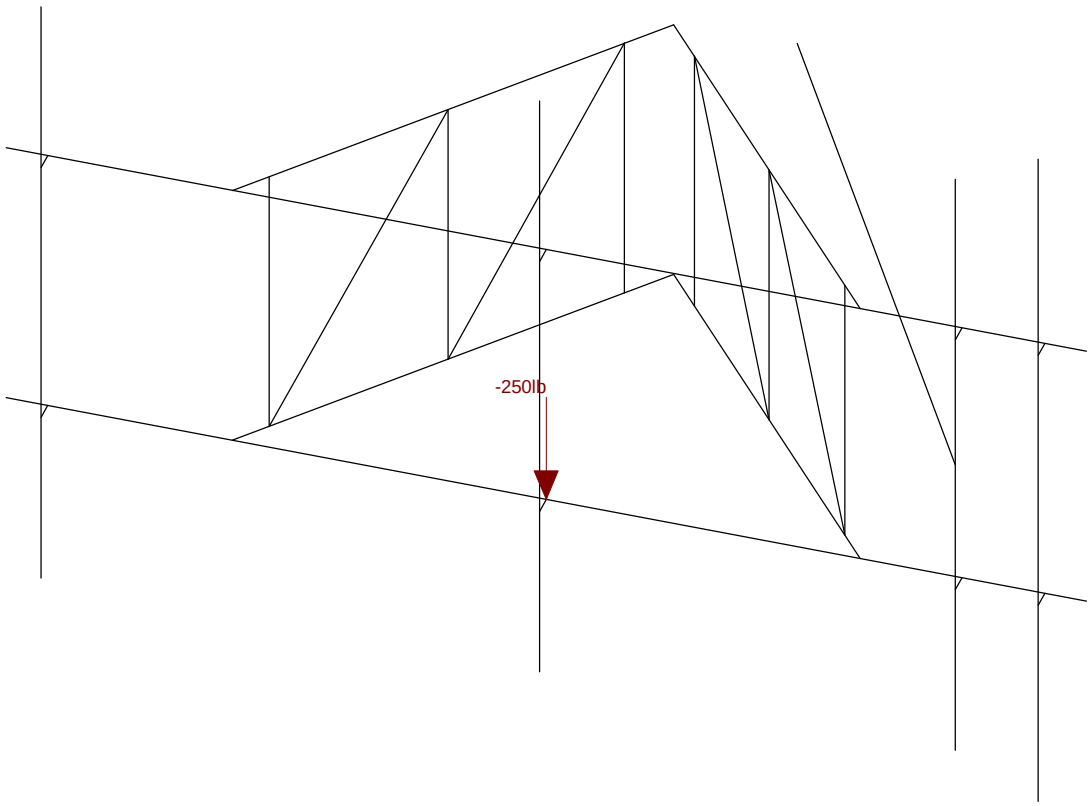




Loads: BLC 23, Live Load 1

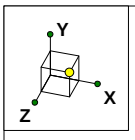
Centerline Communcation...	CTHA783A_MA	Live Load
AP		Mar 30, 2021 at 4:19 PM
		CTHA783A_MA.r3d

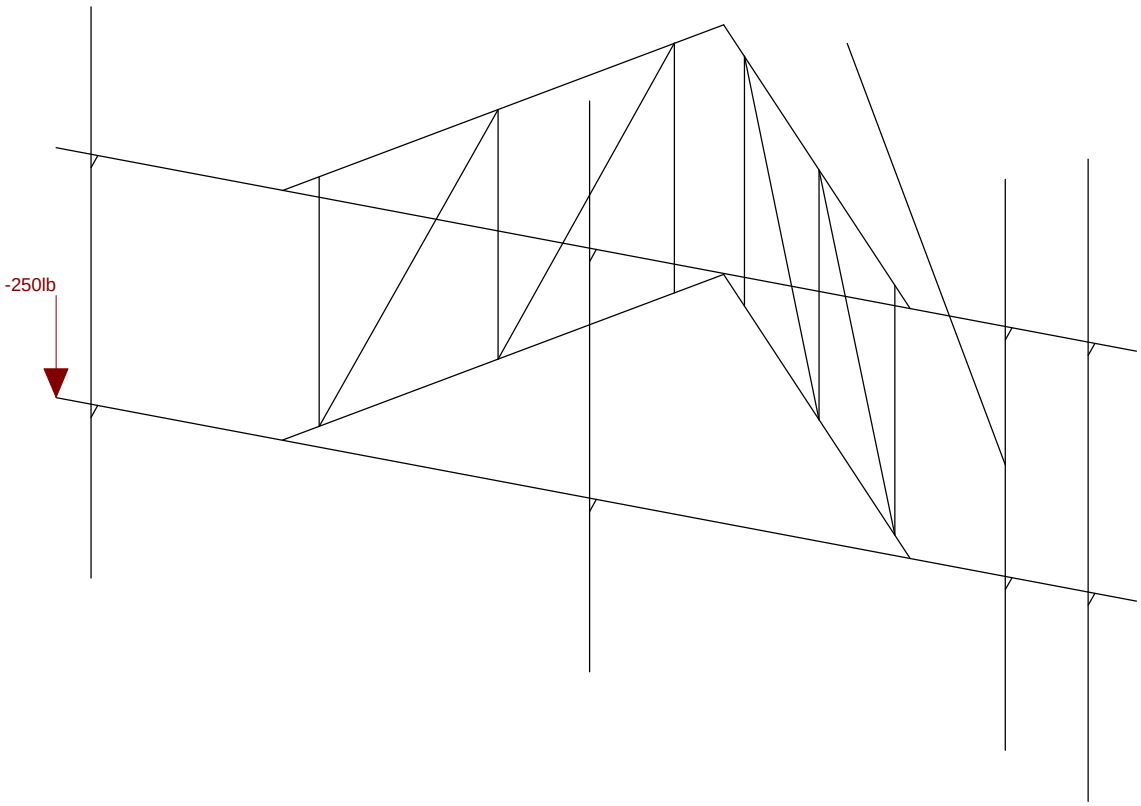




Loads: BLC 24, Live Load 2

Centerline Communcation...	CTHA783A_MA	Live Load 2
AP		Mar 30, 2021 at 4:19 PM
		CTHA783A_MA.r3d





Loads: BLC 25, Live Load 3

Centerline Communcation...	CTHA783A_MA	Live Load 3
AP		Mar 30, 2021 at 4:19 PM
		CTHA783A_MA.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/...	Density[lb/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	490	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	490	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	490	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	490	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	490	50	1.25	65	1.15
8	A913 Gr.65	29000	11154	.3	.65	490	65	1.1	80	1.1

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Pipe 3.0	PIPE_3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
2	Pipe 2.5	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
3	Pipe 2.0	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
4	Pipe 1.0	PIPE_1.0	Beam	Pipe	A53 Gr.B	Typical	.469	.083	.083	.166

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
1	N1	0	-3	-36	0	
2	N2	0	-45	-36	0	
3	N9	78	-3	20.254284	0	
4	N10	78	-45	20.254284	0	
5	N11	-78	-3	20.254284	0	
6	N12	-78	-45	20.254284	0	
7	N13	-72	-3	20.254284	0	
8	N14	-72	-45	20.254284	0	
9	N19	-72	-72	23.254284	0	
10	N22	-72	24	23.254284	0	
11	N26	-45.33714	-3	20.254284	0	
12	N27	-45.33714	-45	20.254284	0	
13	N28	45.33714	-3	20.254284	0	
14	N29	45.33714	-45	20.254284	0	
15	N30	72	-3	20.254284	0	
16	N31	72	-45	20.254284	0	
17	N34	-5.04516	-3	-29.739972	0	
18	N35	-5.04516	-45	-29.739972	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
19	N36	5.04516	-3	-29.739972	0	
20	N37	5.04516	-45	-29.739972	0	
21	N38	-23.192676	-3	-7.222548	0	
22	N39	-23.192676	-45	-7.222548	0	
23	N40	23.192676	-3	-7.222548	0	
24	N41	23.192676	-45	-7.222548	0	
25	N42	-41.573616	-3	15.584508	0	
26	N43	-41.573616	-45	15.584508	0	
27	N44	41.573616	-3	15.584508	0	
28	N45	41.573616	-45	15.584508	0	
29	N47	3.029448	-36	-81.442332	0	
30	N33A	0	-3	20.254284	0	
31	N34A	0	-45	20.254284	0	
32	N35A	72	-78	23.254284	0	
33	N36A	72	30	23.254284	0	
34	N43A	60	-3	20.254284	0	
35	N44A	60	-45	20.254284	0	
36	N45A	60	-72	23.254284	0	
37	N46A	60	24	23.254284	0	
38	N41B	-72	-3	23.254284	0	
39	N42B	-72	-45	23.254284	0	
40	N43B	72	-3	23.254284	0	
41	N44B	72	-45	23.254284	0	
42	N45B	60	-3	23.254284	0	
43	N46	60	-45	23.254284	0	
44	N53	41.573616	-24	15.584508	0	
45	N47A	0	-72	23.254284	0	
46	N48	0	24	23.254284	0	
47	N50	0	-3	23.254284	0	
48	N51	0	-45	23.254284	0	
49	N49	60	-24	23.254284	0	

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N1	max	936.028	12	2422.715	20	341.748	10	-188.566	9	0	78	177.855	40
2		min	-733.834	37	464.05	9	-4831.081	22	-1129.108	20	0	1	-131.094	51
3	N2	max	1968.444	5	1768.633	20	5296.888	18	-151.085	15	0	78	143.729	40
4		min	-583.009	51	304.415	9	15.548	15	-822.943	18	0	1	-107.36	51
5	N47	max	338.367	9	111.932	16	642.908	9	0	78	0	78	0	78

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
6		min	-1402.162	5	-290.868	12	-2696.032	5	0	1	0	1	0	1
7	Totals:	max	1478.149	5	4115.068	18	2541.378	9						
8		min	0	51	855.084	15	-2541.379	8						

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction		Reaction
2	N2	Reaction	Reaction	Reaction	Reaction		Reaction
3	N47	Reaction	Reaction	Reaction			

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torq...	Kyy	Kzz	Cb	Function
1	M4	Pipe 2.5	156			Lbyy						Lateral
2	M5	Pipe 2.5	156			Lbyy						Lateral
3	MP4	Pipe 2.0	96			Lbyy						Lateral
4	M6A	Pipe 2.0	72.25			Lbyy						Lateral
5	M7A	Pipe 2.0	72.25			Lbyy						Lateral
6	M8A	Pipe 2.0	72.25			Lbyy						Lateral
7	M9	Pipe 2.0	72.25			Lbyy						Lateral
8	M11	Pipe 1.0	42			Lbyy						Lateral
9	M12	Pipe 1.0	42			Lbyy						Lateral
10	M13	Pipe 1.0	42			Lbyy						Lateral
11	M14	Pipe 1.0	42			Lbyy						Lateral
12	M15	Pipe 2.0	42			Lbyy						Lateral
13	M16	Pipe 2.0	42	22	22	Lbyy						Lateral
14	M17	Pipe 1.0	50.994			Lbyy						Lateral
15	M18	Pipe 1.0	51.206			Lbyy						Lateral
16	M19	Pipe 1.0	50.994			Lbyy						Lateral
17	M20	Pipe 1.0	51.206			Lbyy						Lateral
18	M21	Pipe 2.0	119.796			Lbyy						Lateral
19	MP1	Pipe 3.0	108			Lbyy						Lateral
20	MP2	Pipe 2.0	96			Lbyy						Lateral
21	MP3	Pipe 2.0	96			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M4	N11	N9			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
2	M5	N12	N10			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
3	MP4	N22	N19			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
4	M6A	N1	N26			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
5	M7A	N2	N27			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
6	M8A	N1	N28			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
7	M9	N2	N29			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
8	M11	N34	N35			Pipe 1.0	Beam	Pipe	A53 Gr.B	Typical
9	M12	N36	N37			Pipe 1.0	Beam	Pipe	A53 Gr.B	Typical
10	M13	N38	N39			Pipe 1.0	Beam	Pipe	A53 Gr.B	Typical
11	M14	N40	N41			Pipe 1.0	Beam	Pipe	A53 Gr.B	Typical
12	M15	N42	N43			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
13	M16	N44	N45			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
14	M17	N34	N39			Pipe 1.0	Beam	Pipe	A53 Gr.B	Typical
15	M18	N38	N43			Pipe 1.0	Beam	Pipe	A53 Gr.B	Typical
16	M19	N36	N41			Pipe 1.0	Beam	Pipe	A53 Gr.B	Typical
17	M20	N40	N45			Pipe 1.0	Beam	Pipe	A53 Gr.B	Typical
18	M21	N49	N47			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
19	MP1	N36A	N35A			Pipe 3.0	Beam	Pipe	A53 Gr.B	Typical
20	MP2	N46A	N45A			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
21	M22	N13	N41B			RIGID	None	None	RIGID	Typical
22	M23	N14	N42B			RIGID	None	None	RIGID	Typical
23	M24	N43A	N45B			RIGID	None	None	RIGID	Typical
24	M25	N44A	N46			RIGID	None	None	RIGID	Typical
25	M26	N30	N43B			RIGID	None	None	RIGID	Typical
26	M27	N31	N44B			RIGID	None	None	RIGID	Typical
27	MP3	N48	N47A			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
28	M28	N33A	N50			RIGID	None	None	RIGID	Typical
29	M29	N34A	N51			RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M4						Yes				None
2	M5						Yes				None
3	MP4						Yes				None
4	M6A						Yes				None
5	M7A						Yes				None
6	M8A						Yes				None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
7	M9						Yes				None
8	M11	BenPIN	BenPIN				Yes				None
9	M12	BenPIN	BenPIN				Yes				None
10	M13	BenPIN	BenPIN				Yes				None
11	M14	BenPIN	BenPIN				Yes				None
12	M15	BenPIN	BenPIN				Yes				None
13	M16	BenPIN	BenPIN				Yes	Default			None
14	M17	BenPIN	BenPIN				Yes				None
15	M18	BenPIN	BenPIN				Yes				None
16	M19	BenPIN	BenPIN				Yes				None
17	M20	BenPIN	BenPIN				Yes				None
18	M21	BenPIN					Yes	Default			None
19	MP1						Yes				None
20	MP2						Yes				None
21	M22						Yes	** NA **			None
22	M23						Yes	** NA **			None
23	M24						Yes	** NA **			None
24	M25						Yes	** NA **			None
25	M26						Yes	** NA **			None
26	M27						Yes	** NA **			None
27	MP3						Yes				None
28	M28						Yes	** NA **			None
29	M29						Yes	** NA **			None

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead Load	DL		-1			9			
2	Wind 0	WLZ					18			
3	Wind 30	None					18			
4	Wind 60	None					18			
5	Wind 90	WLX					18			
6	Wind 120	None					18			
7	Wind 150	None					18			
8	Wind 180	WLZ					18			
9	Ice Weight	DL					9	29		
10	Ice + Wind 0	WLZ					18			
11	Ice + Wind 30	None					18			
12	Ice + Wind 60	None					18			
13	Ice + Wind 90	WLX					18			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
14	Ice + Wind 120	None					18			
15	Ice + Wind 150	None					18			
16	Ice + Wind 180	WLZ					18			
17	Distri. Wind Z	WLZ						29		
18	Distri. Wind X	WLX						29		
19	Distri. Ice + Wind Z	WLZ						29		
20	Distrr. Ice + Wind X	WLX						29		
21	Seismic Load Z	ELZ					9	29		
22	Seismic Load X	ELX					9	29		
23	Live Load 1	LL				1				
24	Live Load 2	LL				1				
25	Live Load 3	LL				1				

Load Combinations

	Description	Solve	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4D	Yes	Y		1	1.4																		
2	1.2D + 1.6W 0°	Yes	Y		1	1.2	2	1.6	17	1.6	18													
3	1.2D + 1.6W 30°	Yes	Y		1	1.2	3	1.6	17	1.3...	18	.8												
4	1.2D + 1.6W 60°	Yes	Y		1	1.2	4	1.6	17	.8	18	1.3...												
5	1.2D + 1.6W 90°	Yes	Y		1	1.2	5	1.6	17		18	1.6												
6	1.2D + 1.6W 120°	Yes	Y		1	1.2	6	1.6	17	-.8	18	1.3...												
7	1.2D + 1.6W 150°	Yes	Y		1	1.2	7	1.6	17	-1....	18	.8												
8	1.2D + 1.6W 180°	Yes	Y		1	1.2	8	1.6	17	-1.6	18													
9	0.9D + 1.6W 0°	Yes	Y		1	.9	2	1.6	17	1.6	18													
10	0.9D + 1.6W 30°	Yes	Y		1	.9	3	1.6	17	1.3...	18	.8												
11	0.9D + 1.6W 60°	Yes	Y		1	.9	4	1.6	17	.8	18	1.3...												
12	0.9D + 1.6W 90°	Yes	Y		1	.9	5	1.6	17		18	1.6												
13	0.9D + 1.6W 120°	Yes	Y		1	.9	6	1.6	17	-.8	18	1.3...												
14	0.9D + 1.6W 150°	Yes	Y		1	.9	7	1.6	17	-1....	18	.8												
15	0.9D + 1.6W 180°	Yes	Y		1	.9	8	1.6	17	-1.6	18													
16	1.2D + 1.0Di + 1.0Wi 0°	Yes	Y		1	1.2	9	1	10	1	19	1	20											
17	1.2D + 1.0Di + 1.0Wi 3...	Yes	Y		1	1.2	9	1	11	1	19	.866	20	.5										
18	1.2D + 1.0Di + 1.0Wi 6...	Yes	Y		1	1.2	9	1	12	1	19	.5	20	.866										
19	1.2D + 1.0Di + 1.0Wi 9...	Yes	Y		1	1.2	9	1	13	1	19		20	1										
20	1.2D + 1.0Di + 1.0Wi 1...	Yes	Y		1	1.2	9	1	14	1	19	-.5	20	.866										
21	1.2D + 1.0Di + 1.0Wi 1...	Yes	Y		1	1.2	9	1	15	1	19	-.866	20	.5										
22	1.2D + 1.0Di + 1.0Wi 1...	Yes	Y		1	1.2	9	1	16	1	19	-1	20											
23	1.2D + 1.0Eh 0°	Yes	Y		1	1.2	21	1	22															
24	1.2D + 1.0Eh 30°	Yes	Y		1	1.2	21	.866	22	.5														

Load Combinations (Continued)

	Description	Solve	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
25	1.2D + 1.0Eh 60°	Yes	Y		1	1.2	21	.5	22	.866														
26	1.2D + 1.0Eh 90°	Yes	Y		1	1.2	21		22	1														
27	1.2D + 1.0Eh 120°	Yes	Y		1	1.2	21	-.5	22	.866														
28	1.2D + 1.0Eh 150°	Yes	Y		1	1.2	21	-.866	22	.5														
29	1.2D + 1.0Eh 180°	Yes	Y		1	1.2	21	-1	22															
30	0.9D + 1.0Eh 0°	Yes	Y		1	.9	21	1	22															
31	0.9D + 1.0Eh 30°	Yes	Y		1	.9	21	.866	22	.5														
32	0.9D + 1.0Eh 60°	Yes	Y		1	.9	21	.5	22	.866														
33	0.9D + 1.0Eh 90°	Yes	Y		1	.9	21		22	1														
34	0.9D + 1.0Eh 120°	Yes	Y		1	.9	21	-.5	22	.866														
35	0.9D + 1.0Eh 150°	Yes	Y		1	.9	21	-.866	22	.5														
36	0.9D + 1.0Eh 180°	Yes	Y		1	.9	21	-1	22															
37	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	2	.342	17	.342	18											
38	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	3	.342	17	.296	18	.171										
39	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	4	.342	17	.171	18	.296										
40	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	5	.342	17		18	.342										
41	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	6	.342	17	-.171	18	.296										
42	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	7	.342	17	-.296	18	.171										
43	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	23	1.5	8	.342	17	-.342	18											
44	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	2	.342	17	.342	18											
45	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	3	.342	17	.296	18	.171										
46	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	4	.342	17	.171	18	.296										
47	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	5	.342	17		18	.342										
48	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	6	.342	17	-.171	18	.296										
49	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	7	.342	17	-.296	18	.171										
50	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	24	1.5	8	.342	17	-.342	18											
51	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	2	.342	17	.342	18											
52	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	3	.342	17	.296	18	.171										
53	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	4	.342	17	.171	18	.296										
54	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	5	.342	17		18	.342										
55	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	6	.342	17	-.171	18	.296										
56	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	7	.342	17	-.296	18	.171										
57	1.0D +1.5Lv + 1.0W (6...	Yes	Y		1	1	25	1.5	8	.342	17	-.342	18											
58	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	23	1	2	.096	17	.096	18											
59	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	23	1	3	.096	17	.083	18	.048										
60	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	23	1	4	.096	17	.048	18	.083										
61	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	23	1	5	.096	17		18	.096										
62	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	23	1	6	.096	17	-.048	18	.083										
63	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	23	1	7	.096	17	-.083	18	.048										
64	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	23	1	8	.096	17	-.096	18											

Load Combinations (Continued)

	Description	Solve	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
65	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	24	1	2	.096	17	.096	18											
66	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	24	1	3	.096	17	.083	18	.048										
67	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	24	1	4	.096	17	.048	18	.083										
68	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	24	1	5	.096	17		18	.096										
69	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	24	1	6	.096	17	-.048	18	.083										
70	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	24	1	7	.096	17	-.083	18	.048										
71	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	24	1	8	.096	17	-.096	18											
72	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	25	1	2	.096	17	.096	18											
73	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	25	1	3	.096	17	.083	18	.048										
74	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	25	1	4	.096	17	.048	18	.083										
75	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	25	1	5	.096	17		18	.096										
76	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	25	1	6	.096	17	-.048	18	.083										
77	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	25	1	7	.096	17	-.083	18	.048										
78	1.2D + 1.0Lv + 1.0W (...	Yes	Y		1	1.2	25	1	8	.096	17	-.096	18											

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*P...	phi*P...	phi*M...	phi*M...	...	Eqn
1	MP2	PIPE_2.0	.858	48	5	.175	69		5	14916...	32130	1871....	1871....	...	H1-1b
2	MP3	PIPE_2.0	.552	69	15	.059	69		8	14916...	32130	1871....	1871....	...	H1-1b
3	M9	PIPE_2.0	.505	0	20	.168	66.9...		6	20804...	32130	1871....	1871....	...	H1-1a
4	M8A	PIPE_2.0	.478	0	20	.164	0		20	20804...	32130	1871....	1871....	...	H1-1b
5	M5	PIPE_2.5	.463	123.5	5	.259	123.5		5	13460...	50715	3596....	3596....	...	H1-1b
6	M4	PIPE_2.5	.399	123.5	12	.179	136.5		12	13460...	50715	3596....	3596....	...	H1-1b
7	M6A	PIPE_2.0	.358	0	22	.133	0		22	20804...	32130	1871....	1871....	...	H1-1b
8	M7A	PIPE_2.0	.302	0	16	.106	0		16	20804...	32130	1871....	1871....	...	H1-1b
9	M14	PIPE_1.0	.275	23.188	20	.009	0		41	8869....	14773...	464.6...	464.6...	...	H1-1a
10	M13	PIPE_1.0	.192	42	16	.010	0		40	8869....	14773...	464.6...	464.6...	1	H1-1...
11	MP4	PIPE_2.0	.189	69	56	.035	27		20	14916...	32130	1871....	1871....	...	H1-1b
12	M21	PIPE_2.0	.143	59.898	20	.009	0		20	9870....	32130	1871....	1871....	...	H1-1b
13	M19	PIPE_1.0	.142	25.497	18	.014	50.9...		12	6964....	14773...	464.6...	464.6...	...	H1-1b
14	M20	PIPE_1.0	.138	25.603	18	.062	51.2...		13	6920....	14773...	464.6...	464.6...	...	H1-1b
15	M12	PIPE_1.0	.117	42	20	.011	0		40	8869....	14773...	464.6...	464.6...	...	H1-1...
16	M17	PIPE_1.0	.116	25.497	16	.012	0		4	6964....	14773...	464.6...	464.6...	...	H1-1b
17	M18	PIPE_1.0	.112	25.603	16	.024	0		14	6920....	14773...	464.6...	464.6...	...	H1-1b
18	MP1	PIPE_3.0	.110	33.75	6	.024	74.25		20	42263...	65205	5748....	5748....	...	H1-1b
19	M11	PIPE_1.0	.086	42	22	.011	0		40	8869....	14773...	464.6...	464.6...	1	H1-1...
20	M16	PIPE_2.0	.038	42	16	.007	42		38	30860...	32130	1871....	1871....	1	H1-1...
21	M15	PIPE_2.0	.031	42	16	.010	0		20	27741...	32130	1871....	1871....	1	H1-1...

Exhibit F

Power Density/RF Emissions Report

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: CTHA783A

Vance Hall CCSU (CT03XC098-0)
1679 Stanley Street
New Britain, Connecticut 06053

April 6, 2021

EBI Project Number: 6221001664

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**8.79%**

April 6, 2021

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

Emissions Analysis for Site: CTHA783A - Vance Hall CCSU (CT03XC098-0)

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **1679 Stanley Street** in **New Britain, 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 1679 Stanley Street in New Britain, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower. For power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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

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

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

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

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

5) 2 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 RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 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 138 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:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	138 feet	Height (AGL):	138 feet	Height (AGL):	138 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE %:	**0.96%**	Antenna B1 MPE %:	**0.96%**	Antenna C1 MPE %:	**0.96%**
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 / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd
Height (AGL):	138 feet	Height (AGL):	138 feet	Height (AGL):	138 feet
Channel Count:	11	Channel Count:	11	Channel Count:	11
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	12,569.87	ERP (W):	12,569.87	ERP (W):	12,569.87
Antenna A2 MPE %:	**3.78%**	Antenna B2 MPE %:	**3.78%**	Antenna C2 MPE %:	**3.78%**
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:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd
Height (AGL):	138 feet	Height (AGL):	138 feet	Height (AGL):	138 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):	12,888.76	ERP (W):	12,888.76	ERP (W):	12,888.76
Antenna A3 MPE %:	**2.66%**	Antenna B3 MPE %:	**2.66%**	Antenna C3 MPE %:	**2.66%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	7.40%
Sprint	1.29%
Clearwire	0.1%
Site Total MPE % :	8.79%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	7.40%
T-Mobile Sector B Total:	7.40%
T-Mobile Sector C Total:	7.40%
Site Total MPE % :	8.79%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 2100 MHz LTE	2	2334.27	138.0	9.63	2100 MHz LTE	1000	0.96%
T-Mobile 600 MHz LTE	2	591.73	138.0	2.44	600 MHz LTE	400	0.61%
T-Mobile 600 MHz NR	1	1577.94	138.0	3.26	600 MHz NR	400	0.81%
T-Mobile 700 MHz LTE	2	695.22	138.0	2.87	700 MHz LTE	467	0.61%
T-Mobile 1900 MHz GSM	4	1052.26	138.0	8.68	1900 MHz GSM	1000	0.87%
T-Mobile 1900 MHz LTE	2	2104.51	138.0	8.68	1900 MHz LTE	1000	0.87%
T-Mobile 2500 MHz LTE	1	6444.38	138.0	13.30	2500 MHz LTE	1000	1.33%
T-Mobile 2500 MHz NR	1	6444.38	138.0	13.30	2500 MHz NR	1000	1.33%
						Total:	**7.40%**

• 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:	7.40%
Sector B:	7.40%
Sector C:	7.40%
T-Mobile Maximum MPE % (Sector A):	7.40%
Site Total:	8.79%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **8.79%** 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 G

Mailing Receipts/Proof of Notice

UPS CampusShip: View/Print Label

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

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

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

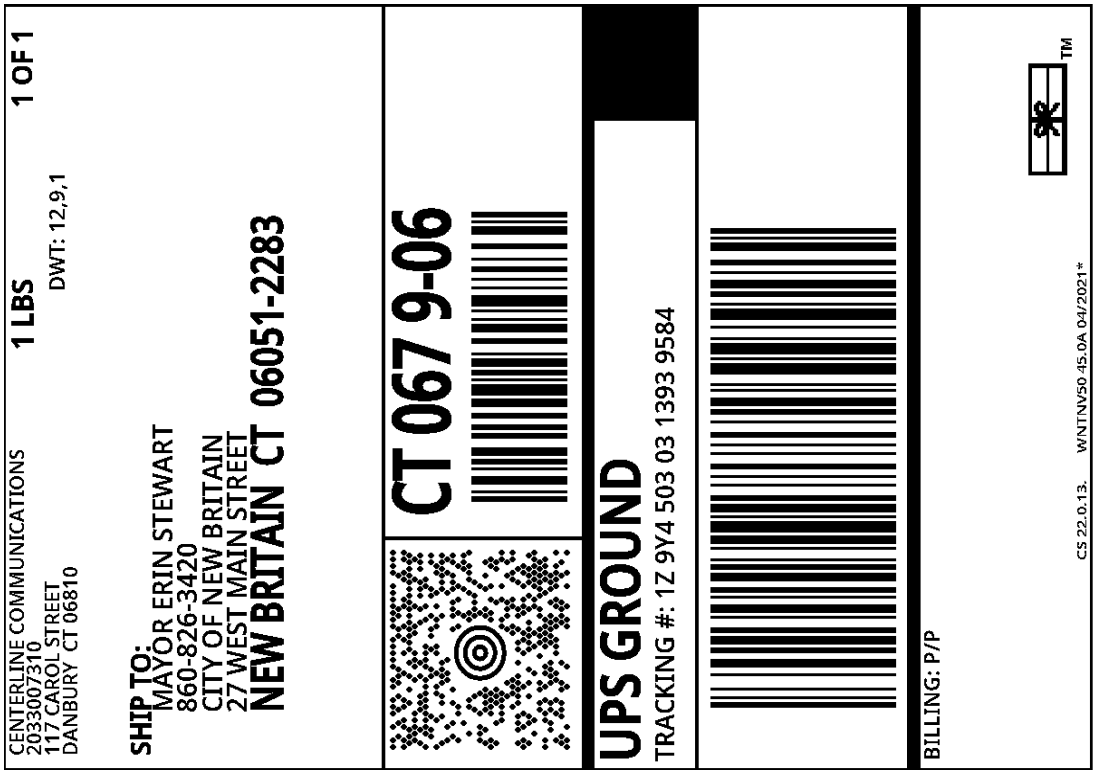
   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To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

UPS Access Point™
TIENDA ECUADOR
72 LAKE AVE
DANBURY ,CT 06810

UPS Access Point™
THE UPS STORE
42 LAKE AVENUE EXT
DANBURY ,CT 06811

UPS Access Point™
CVS STORE # 1109
7 DURANT AVE
BETHEL ,CT 06801

FOLD HERE



UPS CampusShip: View/Print Label

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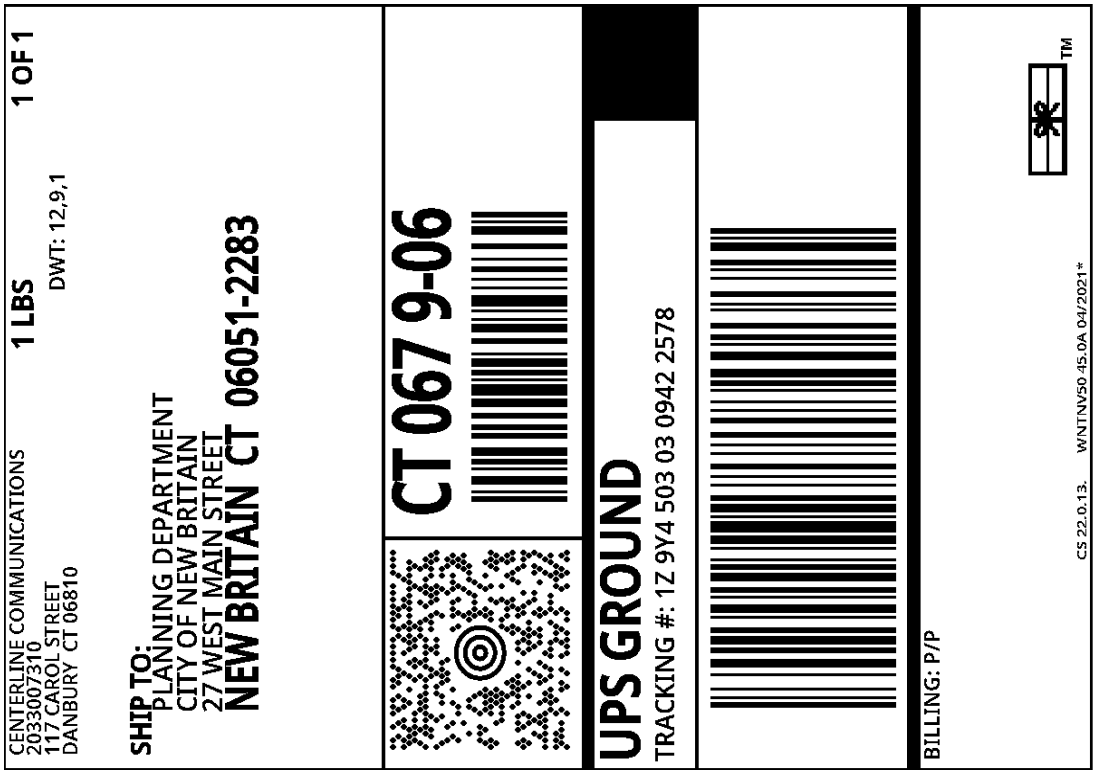

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