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

Centerline Communications
Mark Appleby
750 West Center Street, Floor 3
West Bridgewater, MA 02379
860-209-4694
mappleby@clinellc.com

September 28, 2022

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

Notice of Exempt Modification
125 Wildcat Hill Rd Hawinton, Connecticut 06791
Latitude: 41 ’45 24.89” N
Longitude: -73’05 42.84” W
T-Mobile Site#: CT11358A _Anchor

Dear Ms. Bachman:

T-Mobile currently maintains Six (6) antennas at the 96-foot level of the existing 100-foot Guyed tower at 125 Wildcat Hill Rd Harwinton CT, 06791. The 100-foot Guyed Tower is owned by the Everest Communications and property is owned by Southern New England Telephone Company. T-Mobile now intends to replace Three (3) of its existing Six (6) antennas with Three (3) new 2500 MHz antennas. The new antennas would be installed at the 96-foot level of the lattice. The proposed upgrades will make the site available for 5G deployment in the future.

Planned Modifications:

Remove and Replace:
(3) APXV18-206516S-C-A20 **(Remove)** (3) RFS APXVAARR24_43-U-NA20 Antennas **(Relocate)**

Install New:
(3) Ericsson Air 6419-B41 Antennas

(3) RRU 4460-B25/B66 Radios Antenna Level
(3) RRU 4449 B71 B85 Radios Antenna Level

(3) Fiber Cables

Ground: Install (2) New Cabinets

CENTERLINE COMMUNICATIONS

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

This facility was originally approved by the Connecticut Siting Council on February 23, 1989 in Petition 79. The proposed modification complies with the original approval a copy of this approval is attached

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Town of Harwinton, Michael Criss First Selectman, Polly Redmond Land Use, EIP Communications Tower Owner, Southern New England Telephone Land 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,

Mark Appleby

Mobile: 860-209-4694
Fax: 508-819-3017
Office: 750 W. Center Street Suite 301
West Bridgewater, MA 02379
Email: mappleby@clinellc.com

Attachments
cc: Town of Harwinton Michael Criss First Selectman
Town of Harwinton Polly Redmond Land Use
Southern New England Telephone Company Property Owner
EIP Communications Tower Owner

Exhibit A

Original Facility Approval

March 24, 1982

Ms. Eva Thurman
Attorney
Southern New England
Telephone Company
227 Church Street
New Haven, Connecticut 06506

RE: Petition No. 79 - The Southern New England Telephone Company's 1982 microwave digital plan which consists of changes on the Bristol, Harwinton, Torrington microwave route.

Dear Ms. Thurman:

The Connecticut Siting Council at a meeting held on March 4, 1982 ruled that no Certificate of Environmental Compatibility and Public Need is required, pursuant to section 16-50k(a) of the General Statutes of Connecticut, for the proposed project regarding SNET's 1982 microwave plan which consist of (1) replacing one antenna with another at the Bristol Central Office in Bristol, (2) replacing three reflectors (periscopic antennae) with three antennae on the Harwinton microwave tower in Harwinton, and (3) replacing one antenna on roof at front of building and locating new antenna on roof at the rear of the building at the Torrington Central Office in Torrington.

This construction is to be exactly as specified in the above referenced Petition dated February 9, 1982. Please notify Council upon completion of construction.

This decision applies only to Petition No. 79 and is not applicable to any other tower facility, modification, or construction.

Yours very truly,

Gloria Dibble Pond
Chairperson

GDP:RVC:go

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

1 CENTRAL PARK PLAZA • NEW BRITAIN, CONN. 06051

PHONE: 827-2604

PETITION NO. 79
Field Review
February 23, 1982

Christopher S. Wood, Sarah M. Bates and Owen L. Clark met Jim Baily and Dick Tischel of Southern New England Telephone (SNET) to review the facilities involved with a petition for declaratory ruling filed by SNET. The petition asserts that the work involved will not have substantial adverse environmental effect, as described in 16-50 k(a), nor does it constitute new facilities or modifications to existing facilities, as defined in 16-50i.

The proposed project involves upgrading equipment on the Bristol, Harwinton, Torrington microwave route, and is similar to the project considered by the Council in Petition No. 67. The actual work, described in detail in the subject petition, essentially entails replacement of existing antenna with new, slightly larger, and more efficient equipment.

At the Bristol office, the existing antenna sits on the SNET office building roof, supported by a welded pipe frame structure. The new antenna dish will be 12 feet in diameter, compared to the 10 foot diameter existing dish. The support structure will be replaced by a new galvanized frame, equivalent in size.

The Bristol site is urban, surrounded by other buildings, both commerical and industrial, with houses and/or apartments in the vicinity.

At the Harwinton site, an existing 100 foot guyed tower now supports three periscopic antenna which reflect signals from antennas on the equipment building roof. These antennas will be removed along with the reflectors, and three new "drum" antennas will be mounted on the existing tower at approximately the same heights. The tower will not be altered, although it may need reinforcement.

The area around the Harwinton site is residential. The tower stands near the middle of a 400' x 500' lot which is surrounded by trees. Five houses have a view of the facility in winter, but likely would be completely screened in summer.

The Torrington site is very similar to that in Bristol, and the proposed work also would be done on the roof of the SNET building. Here an eight foot antenna dish would replace an existing five foot dish, but the facility would be relocated to the rear of the building and supported by a new steel structure. The overall height of the facility will increase perhaps seven feet. The development in the area is such that the facility's visability from off site will be minimal.

Other than the structure and antenna replacement discussed above, no additional construction or vegetation clearing at any of the sites will be required. The power density levels at all three sites, existing and with the new equipment, are listed in the petition. In all cases the levels at the antenna base fall as a result of the improved antenna technology. Levels at roof edge and the nearest building increase slightly at Bristol and Torrington because of more powerful radio equipment (5 watts instead of 1/2 watt).

At the Harwinton tower site all power levels would decline as a result of improved technology and reduction of scattered signals. The petition notes that all power levels are well below the strictest safety standards.

Christopher S. Wood
Executive Director

CSW:go

Exhibit B

Property Card

qPublic.net™ Town of Harwinton, CT

Summary

ParcelId	2678
Account Number	2619
Location Address	125 WILDCAT HILL RD
Map-Block-Lot	B5 /02 /0015
Use Class/Description	2-1 COMM LAND
Assessing Neighborhood	0001A
Census Tract	2984
Acreage	5.3
Utilities	

Owner

SOUTHERN N E TELEPHONE CO
PO BOX 2629
ADDISON, TX 75001

Current Appraised Value

		2020	2019
+	Building Value	$14,620	$14,620
+	XF Value	$0	$0
+	OB Value	$0	$0
+	Land Value	$145,670	$145,670
+	Special Land Value		
+	Total Appraised Value	$160,290	$160,290
+	Net Appraised Value	$0	$160,290
+	Current Assessment	$112,200	$112,200

Assessment History

		2019	2017	2016
+	Building Value	$10,230	$12,990	$12,990
+	OB/Misc	$0	$0	$0
+	Land	$101,970	$98,500	$98,500
+	Total Assessment	$112,200	$111,490	$111,490

Land

Use	Class	Zoning	Area	Value
2-1 COMM LAND	C	CR2	2 AC	$133,790
5-2 EX COMM	C		3.3 AC	$11,880

Commercial Building

Building #	1
Style	Warehouse
Actual Year Built	1988
Effective Year Built	1983
Gross Area	368
Stories	1
Grade	Average
Exterior Wall	Stucco/Masonry
Interior Wall	Drywall/Sheet
Wall Height	9
Units	1
Roof Cover	Rolled Compos
Roof Structure	Flat
Floor Type	Average
Heat Type	Solar Assisted
Heat Fuel	None
AC Type	NONE
Sprinkler	01
Construction	MASONRY
Plumbing	NONE
Comm Walls	0

Building Sub Areas

Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	368	368	368
	Totals	368	368	368

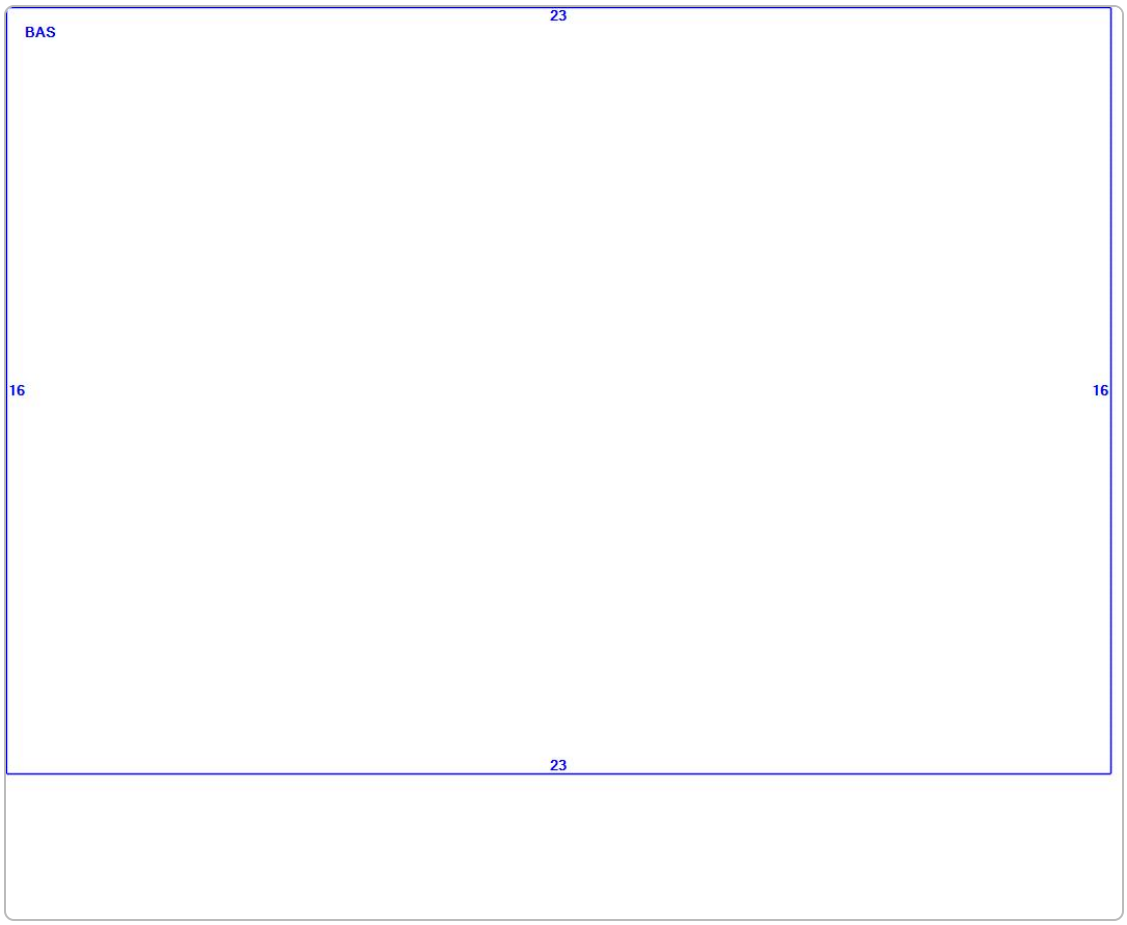
Sales History

Sales Date	Type of Document	Grantee	Vacant/Improved	Book/Page	Amount
01-30-1958		SOUTHERN N E TELEPHONE CO	Vacant	0050/0546	$0

Permit Information

Permit ID	Issue Date	Type	Description	Amount	Inspection Date	% Complete	Date Complete	Comments
224CA	03-25-2022	CO	CO ISSUED	$0		100		GENERATOR
226E	01-20-2022	EL	Electric	$15,000		100		
21205B	11-29-2021	EL	Electric	$25,000		100		
218CA	07-22-2021	CO	CO ISSUED	$0		100		200 AMP SERVICE
215CA	05-19-2021	CO	CO ISSUED	$0		100		
2122E	03-09-2021	EL	Electric	$8,000		100		
20210B	12-18-2020	RP	REPAIRS	$20,000		100		
CO	03-28-2018	EL	Electric	$0		0		
185E	01-25-2018		FUSE PANEL	$1,200		100		
	01-25-2018	EL	Electric	$1,200		100		
174B	12-22-2016		3 ANTENNAS	$20,000		100		

Sketch



Photos

No data available for the following modules: Building Data, Out Buildings\Extra Features.

Last Data Upload: 9/25/2022, 9:30:40 PM

Version 2.3.223

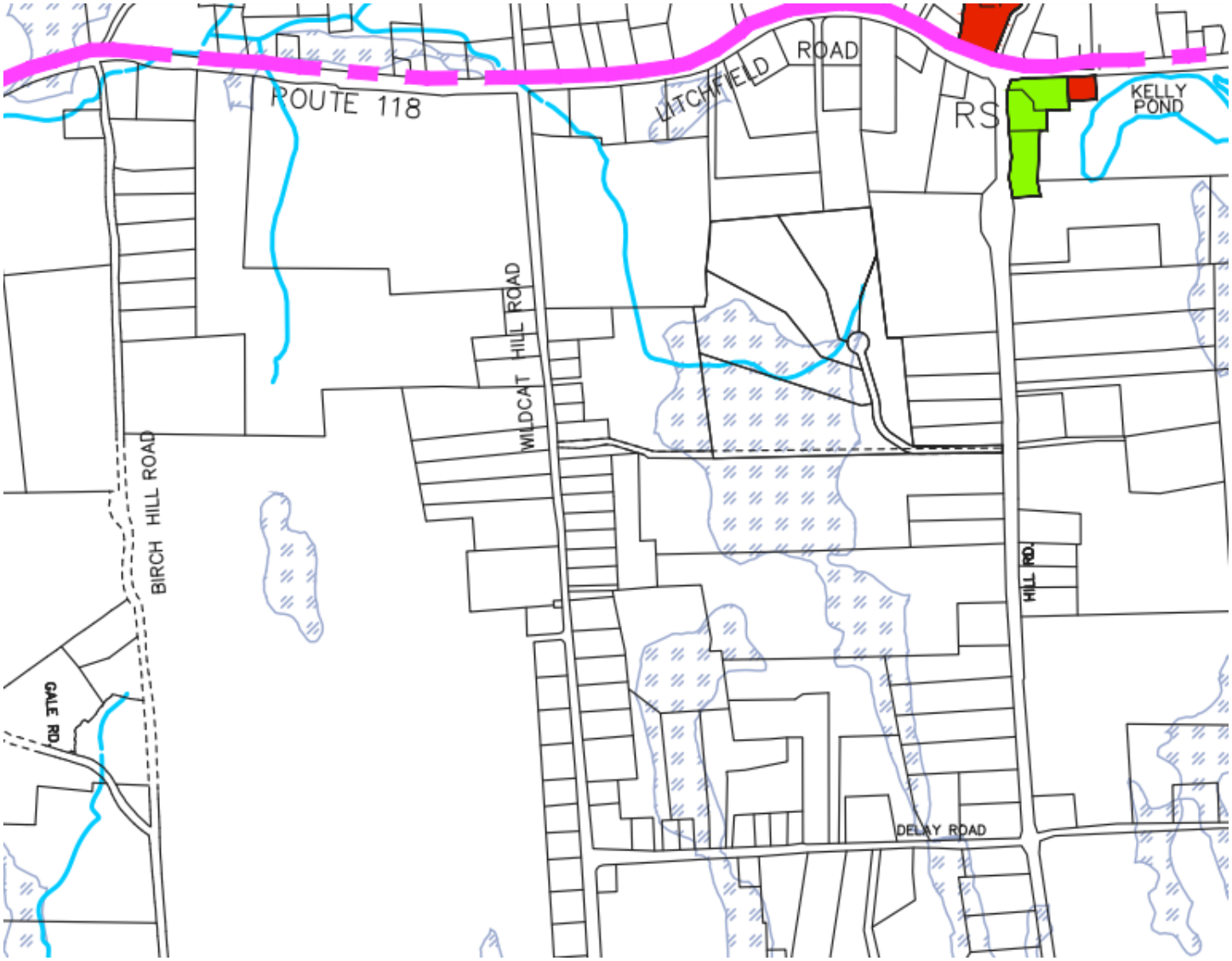

ROUTE 118
LITCHFIELD ROAD
KELLY POND
WILDCAT HILL ROAD
BIRCH HILL ROAD
GALE RD
DELAY ROAD

Exhibit C

Construction Drawings

PROJECT INFORMATION

SITE NAME:	HARWINTON SNET_1
SITE NUMBER:	CT11358A
SITE ADDRESS:	125 WILDCAT HILL ROAD HARWINTON, CT 06791
COUNTY	LITCHFIELD
MUNICIPALITY:	TOWN OF HARWINTON
ZONING:	N/A
LATITUDE:	N 41°45'24.89" (41.75691500°) (NAD83)
LONGITUDE:	W 73°05'42.84" (-73.09523400°) (NAD83)
TYPE OF SITE:	GUYED TOWER
STRUCTURE HEIGHT:	100'-0" AGL
ANTENNA CENTER:	96'-0" AGL
GROUND ELEVATION:	1099'-2" (NAVD 88)
BUILDING OWNER NAME:	N/A
BUILDING OWNER ADDRESS:	N/A N/A
APPLICANT:	T-MOBILE NORTHEAST, LLC. 35 GRIFFIN RD S BLOOMFIELD, CONNECTICUT 06002
APPLICANT PHONE:	(860) 692-7100

PROJECT DIRECTORY

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

CARRIER:
T-MOBILE NORTHEAST, LLC.
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
PHONE: (860) 692-1700

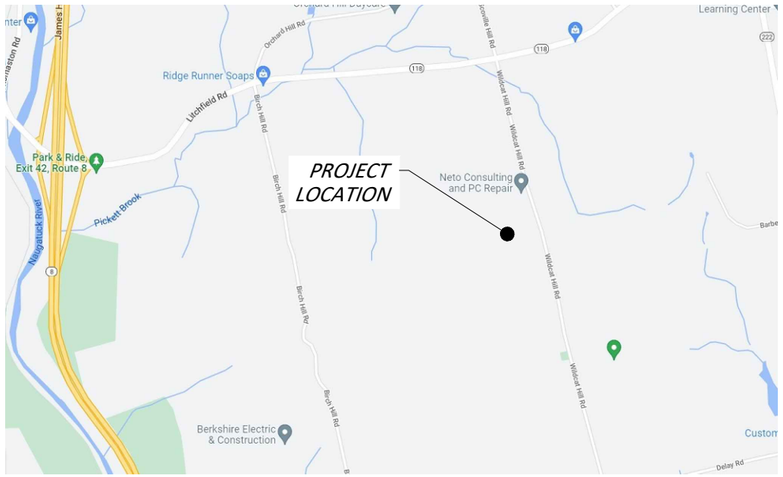
811
Know what's **below.**
Call before you dig.

CENTERLINE ENGINEERING SERVICES, PA

T - Mobile NORTHEAST LLC

SITE NAME: HARWINTON SNET_1
SITE ID: CT11358A
ADDRESS: 125 WILDCAT HILL ROAD
HARWINTON, CT 06791

TECHNOLOGY: 67D5D998E ODE+6160
MODIFICATION: ANCHOR_PHASE 3



VICINITY MAP
NOT TO SCALE

LOCATION MAP
NOT TO SCALE

GENERAL NOTES

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

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

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

SCOPE OF WORK

1. REMOVE THREE EXISTING ANTENNAS
2. INSTALL THREE NEW ANTENNAS
3. INSTALL THREE NEW RRUS
4. REMOVE THREE EXISTING TMAS
5. INSTALL TWO NEW 6x24 HYBRID CABLES
6. INSTALL ONE B160 BATTERY CABINET
7. INSTALL ONE 6160 EQUIPMENT CABINET
8. REMOVE ALL UNUSED CABLES AND EQUIPMENT

DRAWING INDEX

NO.	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES, RF NOTES, CABLING NOTES
A-1	COMPOUND PLAN
A-2	EQUIPMENT LAYOUT
A-3	EQUIPMENT DETAILS
A-4	SOUTHWEST ELEVATION
A-5	ANTENNA LAYOUT
SN-1	STRUCTURAL NOTES & SPECIAL INSPECTIONS
S-1	ANTENNA & RRU MOUNTING DETAILS
G-1	GROUNDING & ONE LINE DIAGRAM

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.
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
PHONE: (860) 629-1700

CENTERLINE ENGINEERING SERVICES, PA
750 W CENTER ST, SUITE 301
WEST BRIDGEWATER, MA 02379
PHONE: 781.713.4725

REVISIONS

REV	DATE	DESCRIPTION	BY
1	09/01/22	FOR FINAL	SS
0	06/28/22	ISSUED FOR CONSTRUCTION	AB
A	06/06/22	ISSUED FOR REVIEW	RL

DESIGNED BY:	APPROVED BY:
RL	WRD

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

DATE: 09/01/2022

SITE NAME: HARWINTON SNET_1
SITE ID: CT11358A
SITE ADDRESS: 125 WILDCAT HILL ROAD
HARWINTON, CT 06791
LITCHFIELD COUNTY

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 & CONNECTICUT STATE BUILDING CODE 2018
ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE
LIGHTNING CODE: NFPA 780-2017

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

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

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, FIFTEENTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-H, STRUCTURAL STANDARDS FOR STEEL

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

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

ABBREVIATIONS

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

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CENTERLINE ENGINEERING SERVICES, PA

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

REVISIONS

REV	DATE	DESCRIPTION	BY
1	09/01/22	FOR FINAL	SS
0	06/28/22	ISSUED FOR CONSTRUCTION	AB
A	06/06/22	ISSUED FOR REVIEW	RL

DESIGNED BY:	APPROVED BY:
RL	WRD

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

DATE: 09/01/2022

SITE NAME: HARWINTON SNET_1

SITE ID: CT11358A

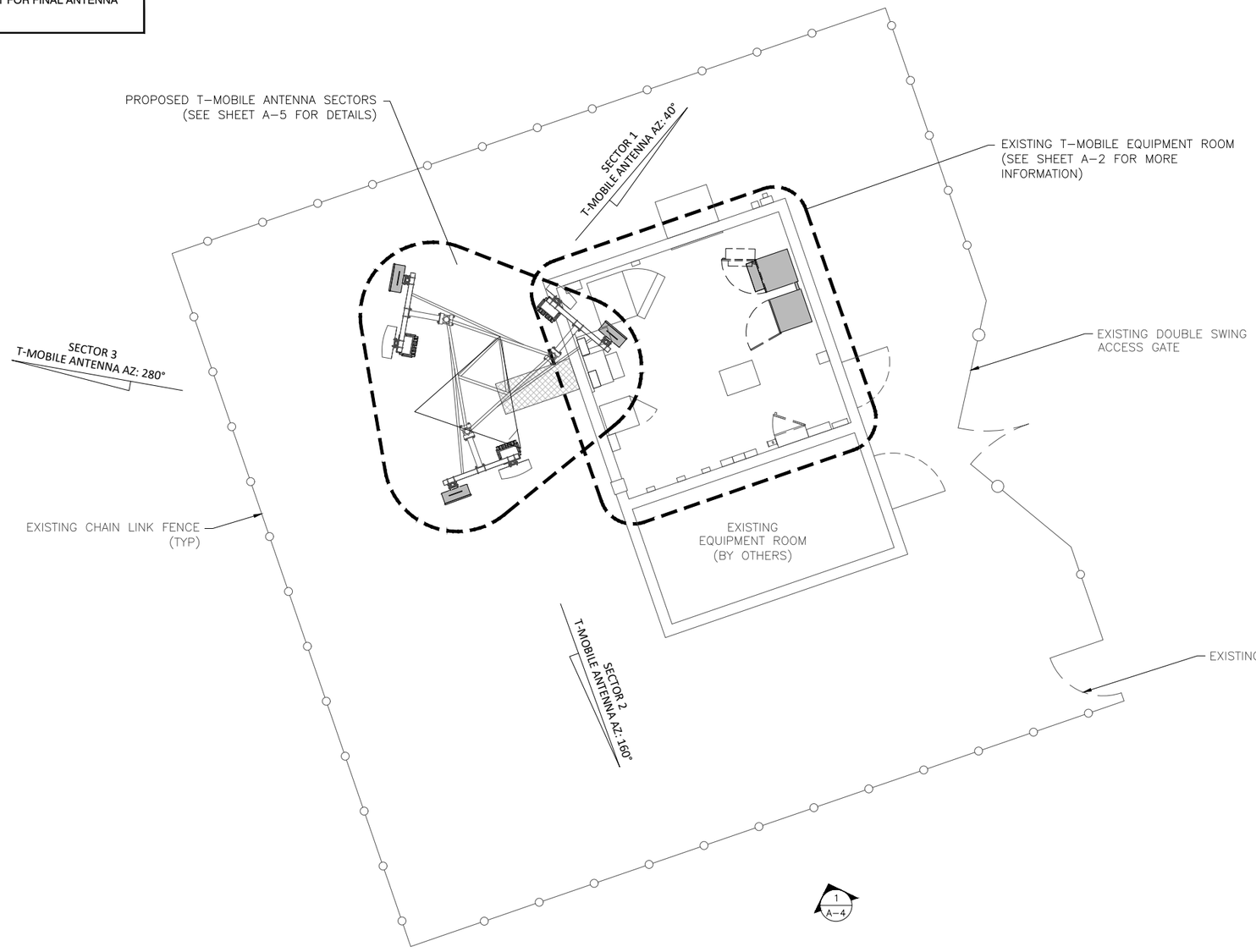
SITE ADDRESS:
125 WILDCAT HILL ROAD
HARWINTON, CT 06791
LITCHFIELD COUNTY

SHEET TITLE: GENERAL NOTES, RF NOTES, CABLING NOTES

DRAWING: GN-1

NOTES

1. CONTRACTOR SHALL MAKE A UTILITY 811 DIG SAFE CALL TO LOCATE ALL UTILITIES PRIOR TO EXCAVATING.
2. CONSTRUCTION TO COMMENCE UPON COMPLETION OF ANY REQUIREMENTS STATED IN CENTERLINE PASSING MOUNT ANALYSIS DATED 06/22/2022.
3. REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA MODELS AND SETTINGS.



1 A-1 COMPOUND PLAN

GRAPHIC SCALE

8 4 0 1 2 4 8

1/4 INCH = 1 FOOT (22X34)
1/8 INCH = 1 FOOT (11X17)

N TRUE NORTH

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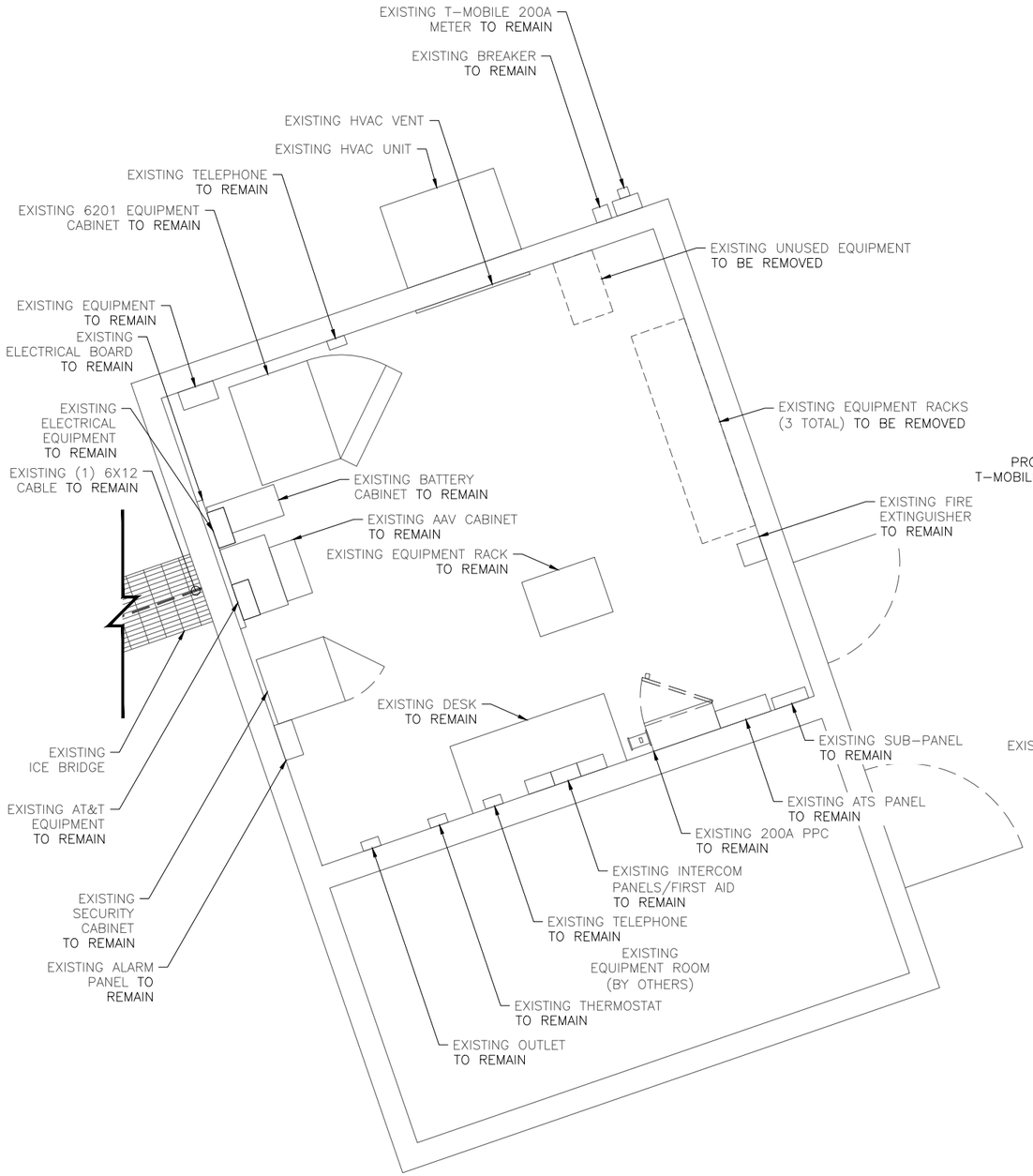
LITCHFIELD COUNTY

SHEET TITLE:
COMPOUND PLAN

DRAWING:
A-1

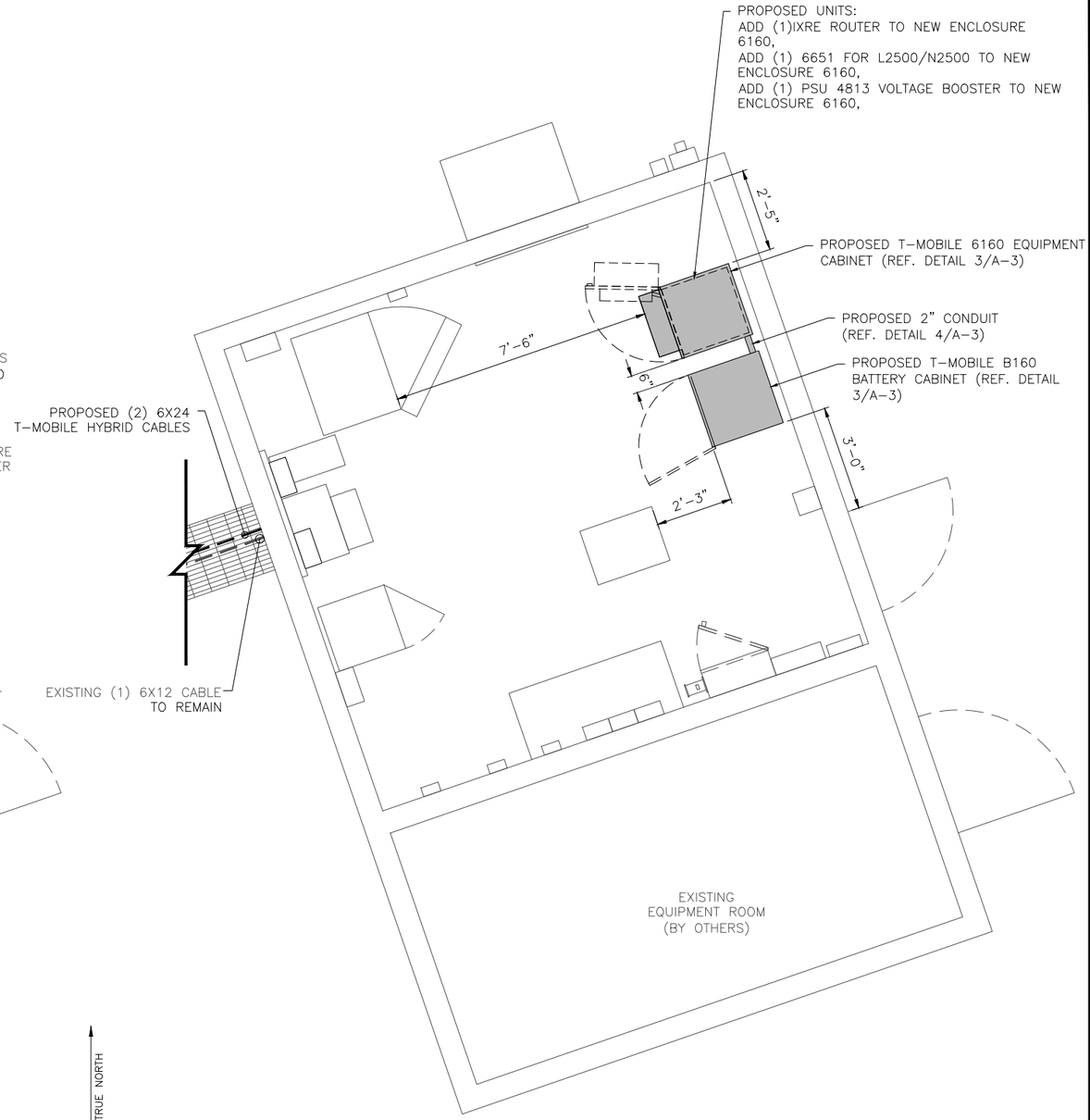


1 A-2 EXISTING EQUIPMENT PLAN

GRAPHIC SCALE

4 2 0 1 2 4

1/2 INCH = 1 FOOT (22X34)
1/4 INCH = 1 FOOT (11X17)



2 A-2 PROPOSED EQUIPMENT PLAN

GRAPHIC SCALE

4 2 0 1 2 4

1/2 INCH = 1 FOOT (22X34)
1/4 INCH = 1 FOOT (11X17)

TRUE NORTH

N

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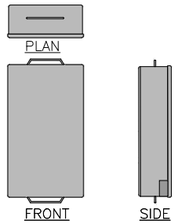
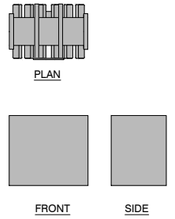
LITCHFIELD COUNTY

SHEET TITLE:
EQUIPMENT LAYOUT

DRAWING:
A-2

ERICSSON AIR 6419 B41	
MODEL #	AIR 6419 B41
MANUF.	ERICSSON
HEIGHT	36.3"
WIDTH	20.9"
DEPTH	9.0"
WEIGHT	83.3 LBS
FRONT EPA:	5.27 FT^2
SIDE EPA:	2.27 FT^2





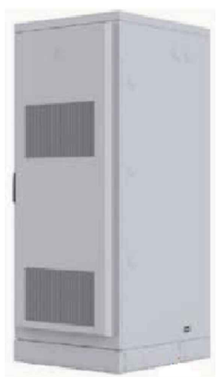
RADIO DIMENSIONS	
MODEL #	RADIO 4460 B25_B66
MANUF.	ERICSSON
HEIGHT	15.1"
WIDTH	17.0"
DEPTH	11.9"
WEIGHT	108 LBS
FRONT EPA:	
SIDE EPA:	

2 A-3 RADIO DETAILS

1 A-3 ANTENNA DETAILS

6160 AC ENCLOSURE

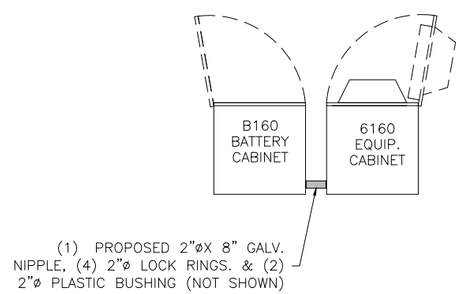
CAPACITY	
RACK SPACE USER EQUIP.	19U(19" RACK)
HARDWARE CAPABILITIES	POWER AND CPRI SUPPORT FOR MULTI-STANDARD REMOTE RADIOS (RRU OR AIR) ERS BASEBAND AND TRANSPORT UNITS Li-ION BATTERIES 3PP EQUIPMENT ADDITIONAL POWER FEED OPTIONS AVAILABLE
MECHANICAL SPECIFICATIONS	
WEIGHT	320lbs (INCLUDING ACTIVE EQUIPMENT)
DIMENSIONS (HWD)	63"x26"x26" (INCLUDING BASE FRAME)
BASE FRAME HEIGHT	6"
MOUNTING POSITION	GROUND
ENCLOSURE MATERIAL	ALUMINUM
COLOR	POWDER PAINT NCS 2002-B
DOOR	FRONT ACCESS
RACK TYPE	19" (IEC 60297-3-100)
LOCK TYPE	CYLINDER/PAD LOCK
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



B160 BATTERY ENCLOSURE

CAPACITY	
VRLA12V:	100Ah/150Ah/170Ah/190Ah/210Ah
Li-ION	24U 19"/23"
SODIUM-NICKEL	3xFIAMM
ELECTRICAL SPECIFICATIONS	
DC OUTPUT	-48VDC/200A
BATTERY BREAKERS	2x125/2p
ALARMS	DOOR OPEN, CLIMATE FAILURE, MCB CONNECTION
MECHANICAL SPECIFICATIONS	
WEIGHT	295 lbs (PLUS 3 STRINGS OF RECOMMENDED 190 aHR FOR ADDITIONAL 1588LBS)
DIMENSIONS (HWD)	63"x26"x26" (INCLUDING BASE FRAME)
BASE FRAME HEIGHT	6"
MATERIAL	GALVANIZED STEEL (180g/m^2)
COLOR	POWDER PAINT NCS 2002-B
LOCKING TYPE	CYLINDER/PAD LOCK

3 A-3 PROPOSED EQUIPMENT CABINET SPECIFICATIONS



4 A-3 PROPOSED EQUIPMENT CONDUIT DETAIL

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DESIGNED BY:	APPROVED BY:
RL	WRD

DATE: 09/01/2022

SITE NAME: HARWINTON SNET_1

SITE ID: CT11358A

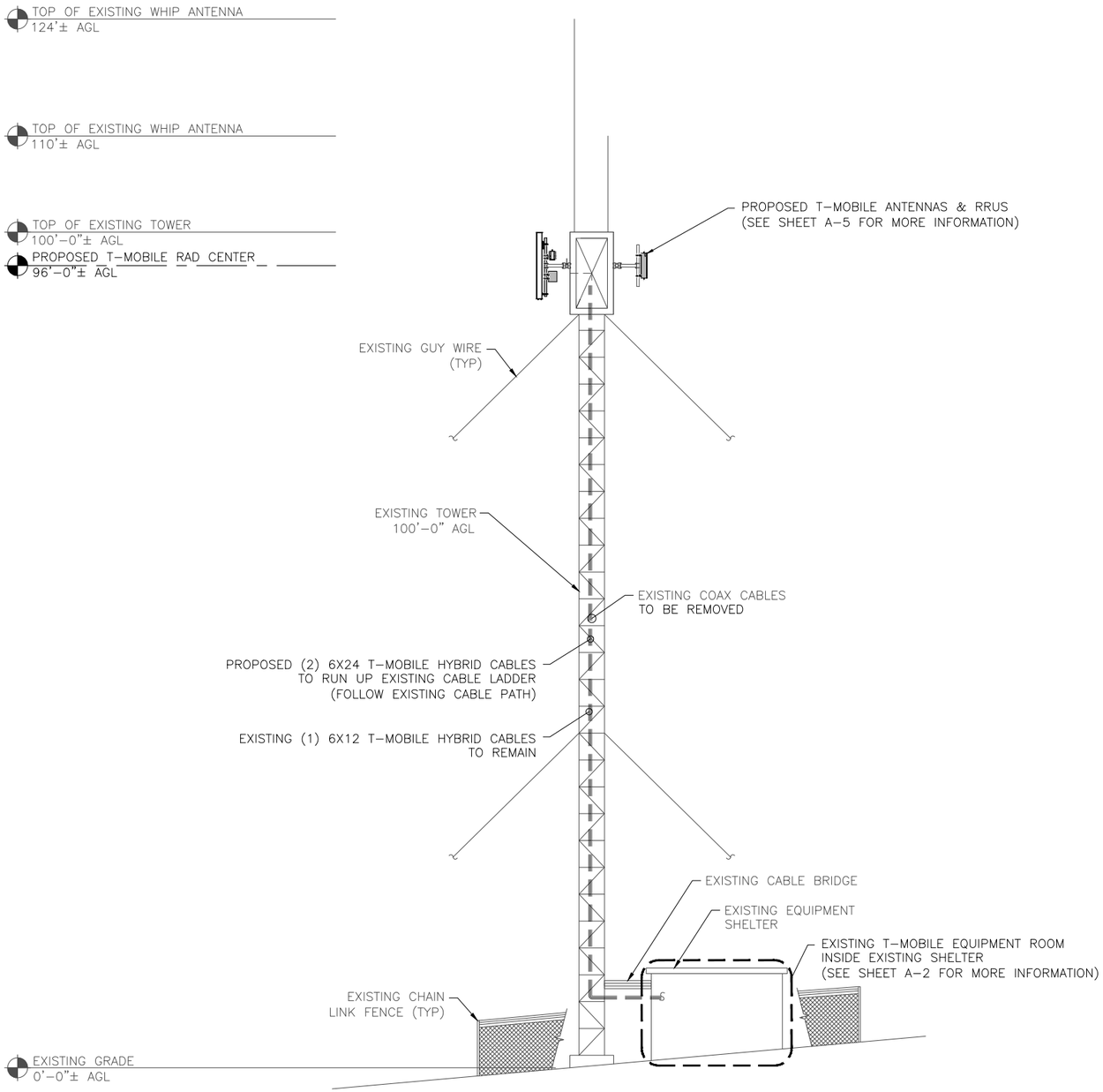
SITE ADDRESS: 125 WILDCAT HILL ROAD
HARWINTON, CT 06791
LITCHFIELD COUNTY

SHEET TITLE: EQUIPMENT DETAILS

DRAWING: A-3

NOTE:

1. PASSING STRUCTURAL ANALYSIS DATED 08/26/2022 BY PAUL J. FOR.



1 / A-4 SOUTHWEST ELEVATION

GRAPHIC SCALE

16 8 0 1 2 4 8 16

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

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125 WILDCAT HILL ROAD
HARWINTON, CT 06791
LITCHFIELD COUNTY

SHEET TITLE:
SOUTHWEST ELEVATION

DRAWING:
A-4

STRUCTURAL & MOUNT ANALYSIS NOTES:

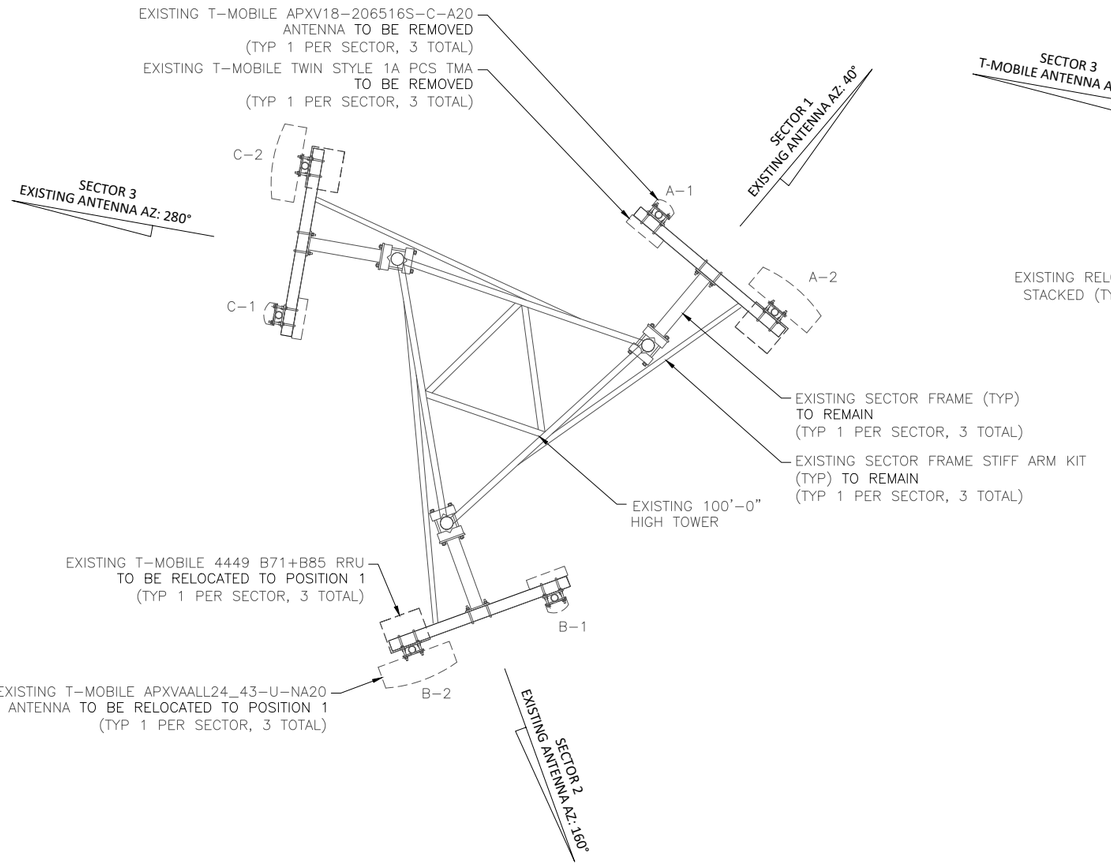
BASED ON THE RESULTS OF THE MOUNT ANALYSIS PERFORMED BY CENTERLINE COMMUNICATIONS DATED 06/22/2022 THE EXISTING MOUNTS HAVE BEEN DETERMINED TO BE ADEQUATE TO SUPPORT THE PROPOSED T-MOBILE EQUIPMENT LOADING. NO MODIFICATIONS TO THE EXISTING MOUNTS REQUIRED.

ANTENNA & CABLE NOTES:

1. REFERENCE PASSING STRUCTURAL ANALYSIS BY PAUL J. FORD DATED 08/26/2022 FOR FURTHER INFORMATION REGARDING THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THIS EQUIPMENT UPGRADE.
2. REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.
3. REMOVE ALL UNUSED CABLE, RRUs AND TMAs.

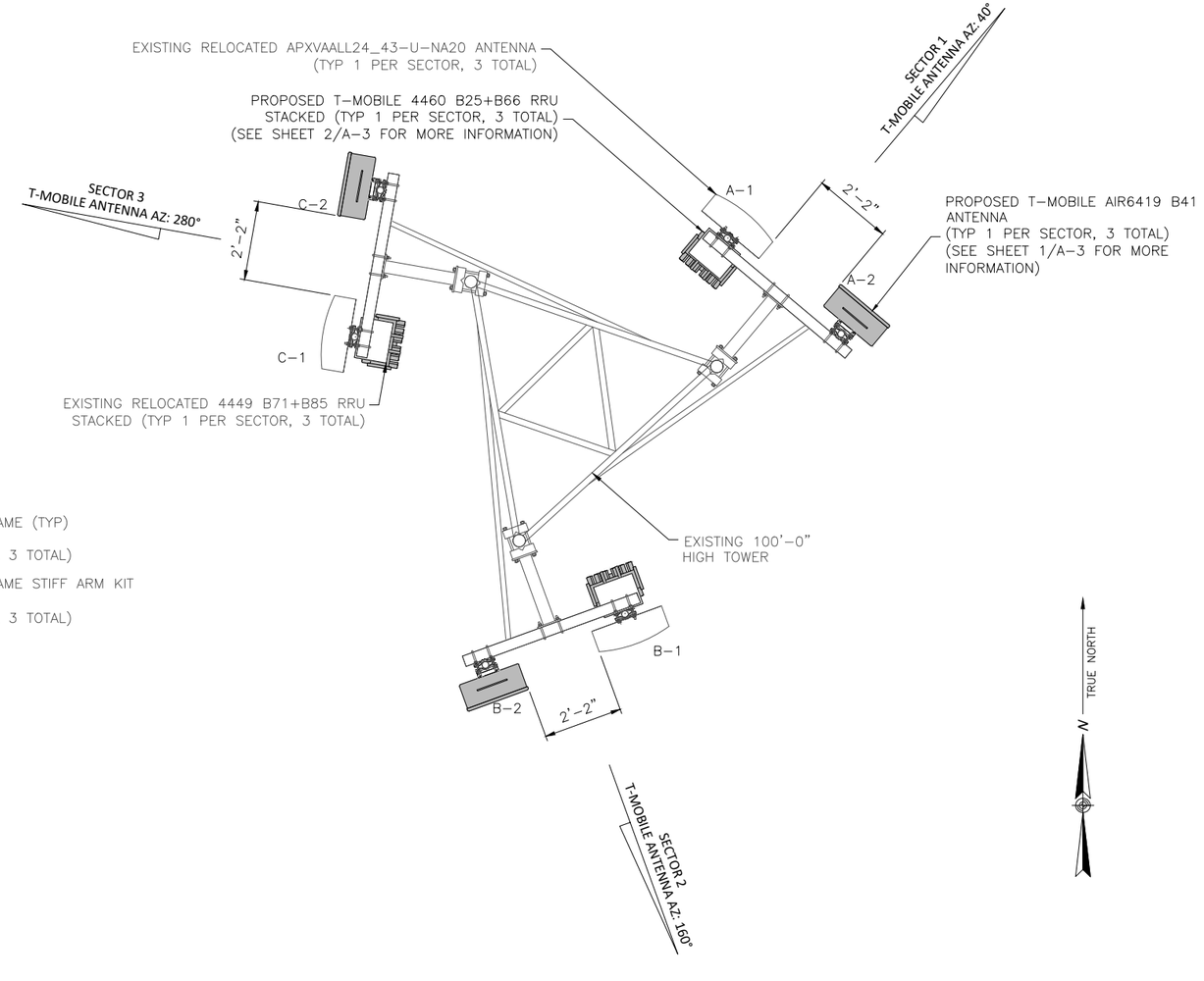
ANTENNA & CABLE SCHEDULE:

	LOCATION	AZIMUTH	RAD CENTER	STATUS	TECHNOLOGY	ANTENNA MODEL NO.	MECH DOWNTILT	ELEC DOWNTILT	CABLES	DIPLEXERS	TMA/RRU	CABLE SIZE	CABLE LENGTH
ALPHA	A-1	40°	96'-0"	EXISTING	L700,L600,N600	APXVAALL24_43-U-NA20	0°	2°/2°/ 2°/2°	(4)COAX JUMPERS(X8), (2)FIBER JUMPERS(X4)	N/A	4449 B71+B85 **RRUS 4460 B25+B66**	6X12 HYBRID	104'
	A-2	**40°**	**96'-0"**	**PROPOSED**	**N2500, L2500**	**AIR 6419 B41**	**0°**	**2°/2°**	**(2)FIBER JUMPERS(X4)**	**N/A**	**N/A**	**SHARED**	**N/A**
BETA	B-1	160°	96'-0"	EXISTING	L700,L600,N600	APXVAALL24_43-U-NA20	0°	2°/2°/ 2°/2°	(4)COAX JUMPERS(X8), (2)FIBER JUMPERS(X4)	N/A	4449 B71+B85 **RRUS 4460 B25+B66**	SHARED	N/A
	B-2	**160°**	**96'-0"**	**PROPOSED**	**N2500, L2500**	**AIR 6419 B41**	**0°**	**2°/2°**	**(2)FIBER JUMPERS(X4)**	**N/A**	**N/A**	**6x24 HYBRID**	**32m**
GAMMA	C-1	280°	96'-0"	EXISTING	L700,L600,N600	APXVAALL24_43-U-NA20	0°	2°/2°/ 2°/2°	(4)COAX JUMPERS(X8), (2)FIBER JUMPERS(X4)	N/A	4449 B71+B85 **RRUS 4460 B25+B66**	SHARED	N/A
	C-2	**280°**	**96'-0"**	**PROPOSED**	**N2500, L2500**	**AIR 6419 B41**	**0°**	**2°/2°**	**(2)FIBER JUMPERS(X4)**	**N/A**	**N/A**	**6x24 HYBRID**	**32m**
NOTE: DARK TEXT IN TABLE ABOVE DENOTES PROPOSED EQUIPMENT											(2) TOTAL 6x24 HYBRID CABLES		64m



1 A-5 EXISTING ANTENNA PLAN

GRAPHIC SCALE
4 2 0 1 2 4
1/2 INCH = 1 FOOT (22X34)
1/4 INCH = 1 FOOT (11X17)



2 A-5 PROPOSED ANTENNA PLAN

GRAPHIC SCALE
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DATE: 09/01/2022

SITE NAME: HARWINTON SNET_1

SITE ID: CT11358A

SITE ADDRESS: 125 WILDCAT HILL ROAD HARWINTON, CT 06791 LITCHFIELD COUNTY

SHEET TITLE: ANTENNA PLAN & SCHEDULE

DRAWING: A-5

STRUCTURAL NOTES:

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

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

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

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

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

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

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

NOTES:

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

NOTES:

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

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CENTERLINE
ENGINEERING SERVICES, PA

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

REVISIONS

REV	DATE	DESCRIPTION	BY
1	09/01/22	FOR FINAL	SS
0	06/28/22	ISSUED FOR CONSTRUCTION	AB
A	06/06/22	ISSUED FOR REVIEW	RL

DESIGNED BY:	APPROVED BY:
RL	WRD

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

DATE: 09/01/2022

SITE NAME: HARWINTON SNET_1

SITE ID: CT11358A

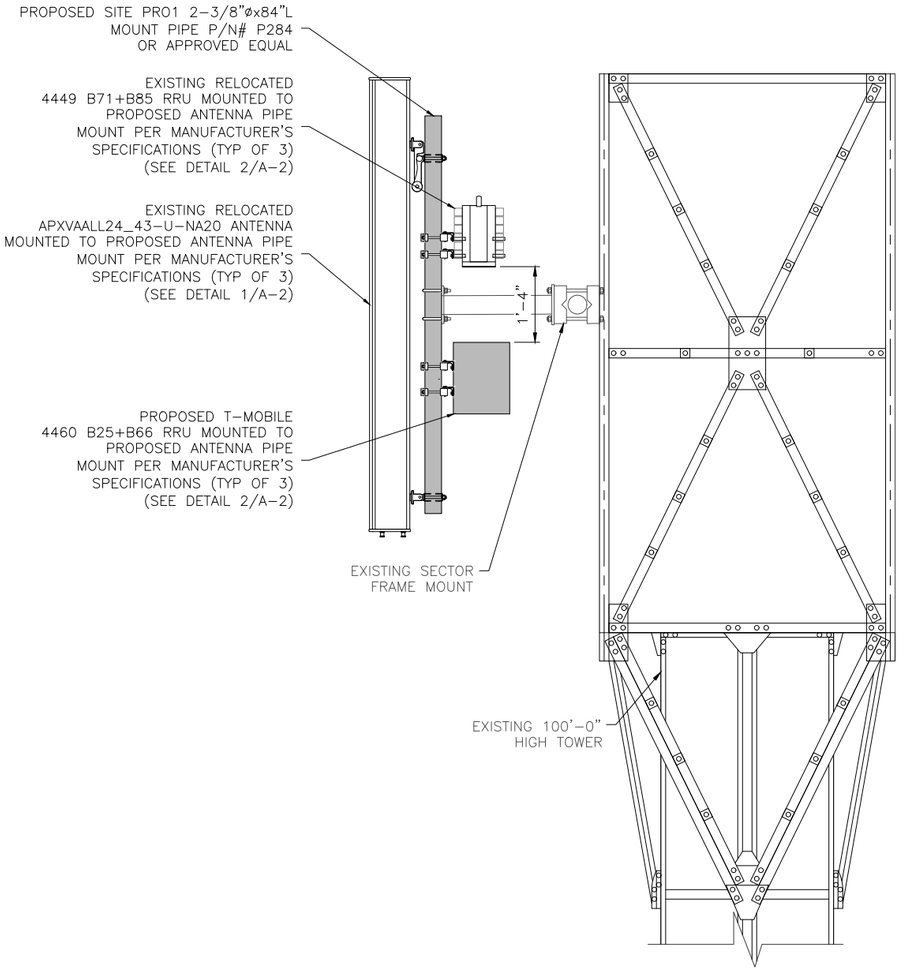
SITE ADDRESS:
125 WILDCAT HILL ROAD
HARWINTON, CT 06791
LITCHFIELD COUNTY

SHEET TITLE: STRUCTURAL NOTES & SPECIAL INSPECTIONS

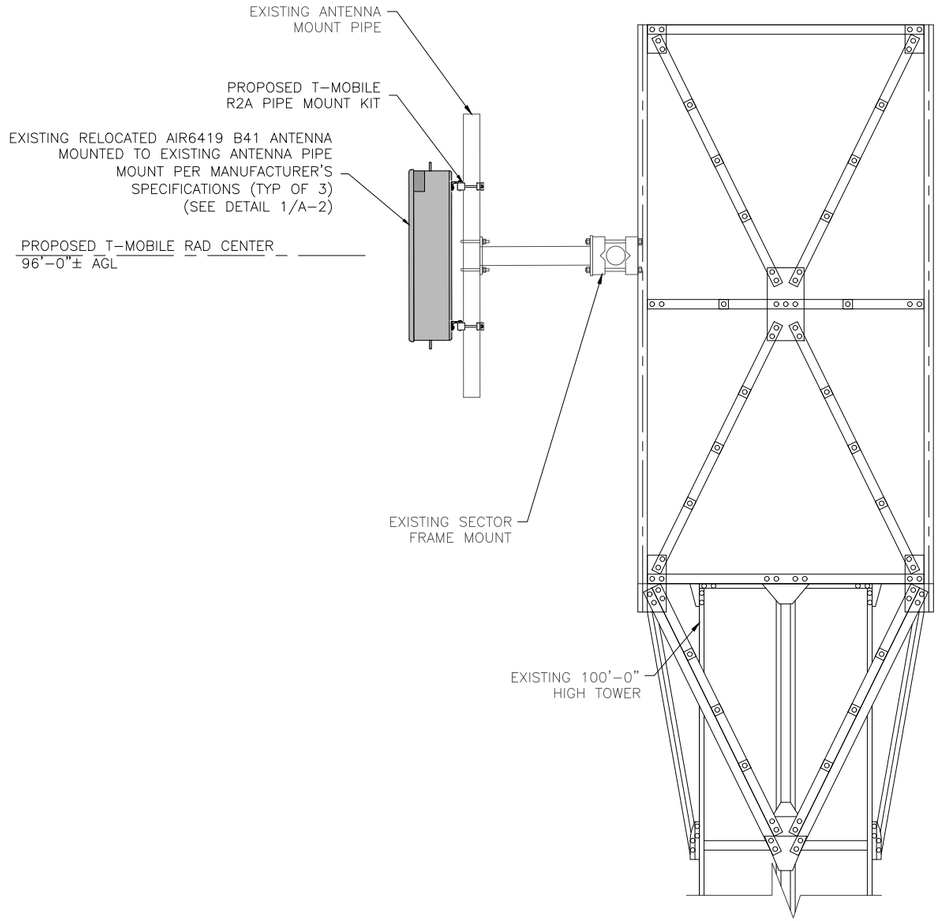
DRAWING: SN-1

NOTES FOR ANTENNA MOUNTS:

1. AIR6419: ERICSSON R2A PIPE MOUNT KIT



AT POSITION A1, B1 & C1



AT POSITION A2, B2 & C2

1 / S-1 TYPICAL ANTENNA & RRU MOUNTING DETAIL

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

DATE: 09/01/2022

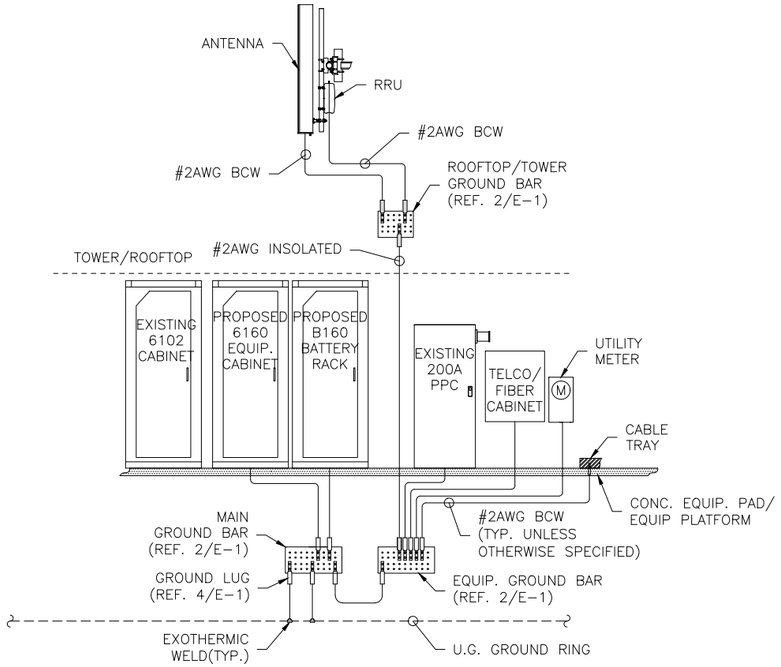
SITE NAME: HARWINTON SNET_1

SITE ID: CT11358A

SITE ADDRESS: 125 WILDCAT HILL ROAD
HARWINTON, CT 06791
LITCHFIELD COUNTY

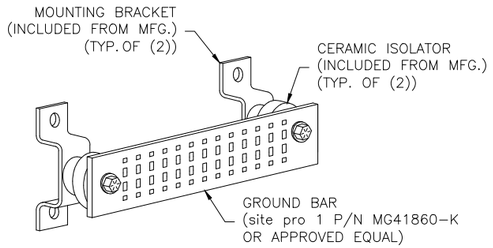
SHEET TITLE: ANTENNA & RRU MOUNTING DETAILS

DRAWING: S-1



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

1 / G-1 GROUNDING RISER DIAGRAM



2 / G-1 GROUND BAR DETAIL

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

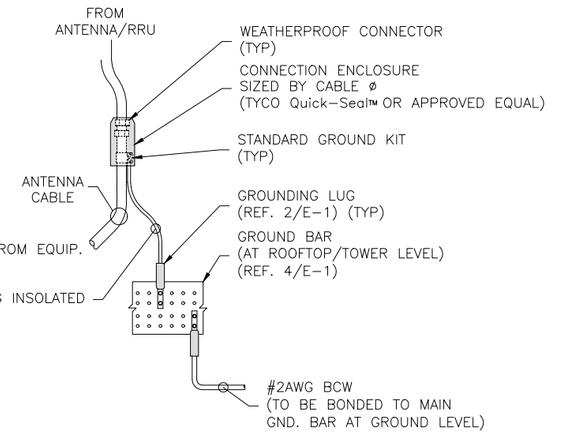
SECTION "P" – SURGE PRODUCERS

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

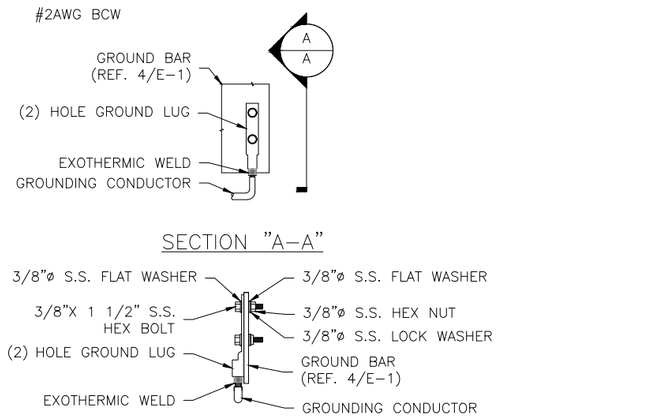
INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

3 / G-1 GROUND WIRE SCHEDULE



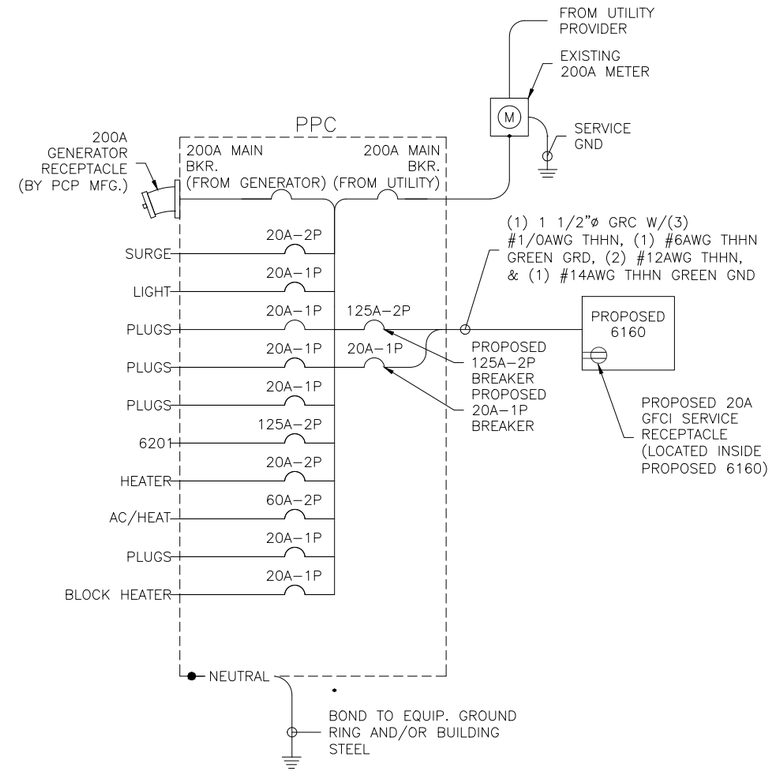
NOTES:
1. DO NOT INSTALL CABLE GROUND KIT AT BEND IN CABLE.
2. GROUND CABLES DIRECTLY TO CIGBE
3. JUMPER REQUIRED ONLY WHEN CABLE IS 1 1/4" OR LARGER

4 / G-1 ANTENNA/RRU GROUNDING DETAIL



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.

5 / G-1 GROUND LUG DETAIL



6 / G-1 ONE LINE DIAGRAM

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DESIGNED BY:	APPROVED BY:
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STATE OF CONNECTICUT
DEREK J. CREASER
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LICENSED PROFESSIONAL ENGINEER

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SITE NAME: HARWINTON SNET_1

SITE ID: CT11358A

SITE ADDRESS: 125 WILDCAT HILL ROAD
HARWINTON, CT 06791
LITCHFIELD COUNTY

SHEET TITLE: GROUNDING & ONE LINE DIAGRAM

DRAWING: G-1

Exhibit D

Structural &Mount Analysis Report

PAUL J. FORD & COMPANY

Report Date: August 26, 2022

Client: Everest Infrastructure Partners
Two Allegheny Center
Pittsburgh, PA 15212
Attn: Andy Dykstra
(412) 489-0348
andrew.dykstra@everestinfrastructure.com

Structure: Existing 100-ft Guyed Tower
Site Name: Wildcat Hill
Site Reference #: CT11358A
Site Address: 125 WildCat Hill Rd
City, County, State: Harwinton, Litchfield County, CT
Latitude, Longitude: 41.7568°, -73.0952°

PJF Project: A13322-0019.001.8700

Paul J. Ford and Company is pleased to submit this "**Structural Analysis Report**" to determine the tower stress level.

Analysis Criteria:
This analysis utilizes an ultimate 3-second gust wind speed of 117 mph as required by the 2015 International Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Proposed Appurtenance Loads:
The structure was analyzed with the equipment configuration shown in Table 1 of this report.

Summary of Analysis Results:
Existing Structure: Pass – 89.9%
Existing Foundation: Pass – 64.7%

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and Everest Infrastructure Partners. If you have any questions or need further assistance on this or any other projects, please give us a call.

Respectfully Submitted by:
Paul J. Ford and Company

Anna Trudo, EI
Structural Designer OFH
atrudo@pauljford.com

08/26/2022

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2) ANALYSIS CRITERIA
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Table 4 – Tower Component Stresses vs. Capacity
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1) INTRODUCTION

This tower is a 100 ft Guyed tower designed by Trylon Tower. All information on the guyed tower was obtained from the mapping referenced in Table 3 of this report. The tower has been modified per reinforcement drawings prepared by MEI in August of 2019. Reinforcement consists of adding additional angles to create double angles for diagonals and secondary horizontals 100'-90' and torque arm kickers at 90'.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	117 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Equipment Configuration

Status	Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Coax Location	Owner/ Tenant
Existing	104.6	114.6	1	generic	20 ft x 2" omni whip	1	0.4	Leg A	-
Existing	100.3	105.3	1	generic	10 ft x 1.5" Omni	1	1-5/8	Leg A	-
Existing	98.0	99.3	1	pole mounts	2.375" OD x 2.5' Mount Pipe	-	-	-	-
Existing	97.4	97.4	1	tower mounts	Side Arm Mount	-	-	-	-
Existing	96.6	101.6	1	tower mounts	2.375" OD x 10' Mount Pipe	-	-	-	-
Proposed	96.0	96.0	3	ericsson	AIR 6419 w/ Mount Pipe	3	1-5/8	Face C	TMO
			3	ericsson	RADIO 4460 B2/B25 B66_TMO				
Existing	96.0	96.0	3	ericsson	RADIO 4449 B71 B85A_T-MOBILE	-	-	-	TMO
			3	rfs celwave	APXVAALL24_43-U-NA20				
			1	tower mounts	T-Arm Mount [TA 702-3]				
Existing	76.5	76.5	1	tower mounts	Side Arm Mount	-	-		-
			1	tower mounts	4.5" Diameter x 90" Pipe				

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference
Previous Structural Analysis	Malouf Engineering International, INC. 05/28/2019	CT05213G-19V0
Tower Mapping Report	Hightower Solutions, 10/04/2016	CT11358A
Geotechnical Report	Tower Engineering Professionals, 07/19/2017	78431-123086
Foundation Mapping	Tower Engineering Professionals, 06/29/2017	78431-123086
Tower Modification Drawings	Malouf Engineering International, 8/19/2019	CT05213G-19V0
Collocation Application	T-Mobile, 7/15/2022	CT11358A

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were maintained in accordance with the TIA-222 Standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) Tower steel material assumed to be A7 with minimum yield stress of 33ksi.
4) The foundation (structural) capacity was unable to be determined due to the lack of existing reinforcing steel information. Therefore, it was assumed that the foundation was properly designed to meet the minimum amount of steel per ACI requirements. The minimum steel values were then used for the foundation analysis.
5) The modification does not have a post modification inspection. It was assumed based on photos that the structure was modified in conformance with the referenced modification drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	100 - 90	Latticed Pole Leg	Pipe 4.0" x 0.226" (3.5 STD)	2	-3.01	76.14	4.0	Pass
L1	100 - 90	Latticed Pole Diagonal	2L 2 x 1.5 x 1/8 LLV (1/4)	10	-2.90	15.89	18.3	Pass
L1	100 - 90	Latticed Pole Secondary Horizontal	2L 2 x 1.5 x 1/8 LLH (1/4)	16	-1.25	22.19	5.6 10.4 (b)	Pass
L1	100 - 90	Latticed Pole Top Girt	L 2 x 2 x 3/16	6	-0.09	8.30	1.0 1.6 (b)	Pass
L1	100 - 90	Latticed Pole Bottom Girt	L 2 x 2 x 3/16	7	-0.05	7.68	0.7	Pass
T1	90 - 86.6667	Leg	PL 6" x .25"	20	-10.28	40.06	25.7	Pass
T2	86.6667 - 83.3333	Leg	PL 6" x .25"	29	-10.92	45.19	24.2	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T3	83.3333 - 80	Leg	PL 6" x .25"	38	-11.18	45.19	24.7	Pass
T4	80 - 70	Leg	PL 6" x .25"	46	-12.82	45.19	28.4	Pass
T5	70 - 66.6667	Leg	PL 6" x .25"	67	-13.00	45.19	28.8	Pass
T6	66.6667 - 63.3334	Leg	PL 6" x .25"	76	-12.98	45.19	28.7	Pass
T7	63.3334 - 60	Leg	PL 6" x .25"	85	-12.95	45.19	28.7	Pass
T8	60 - 50	Leg	PL 6" x .25"	94	-12.91	45.19	28.6	Pass
T9	50 - 40	Leg	PL 6" x .25"	117	-19.14	45.19	42.3	Pass
T10	40 - 36.6667	Leg	PL 6" x .25"	138	-20.67	45.19	45.7	Pass
T11	36.6667 - 33.3334	Leg	PL 6" x .25"	147	-19.66	45.19	43.5	Pass
T12	33.3334 - 30	Leg	PL 6" x .25"	156	-19.73	45.19	43.7	Pass
T13	30 - 20	Leg	PL 6" x .25"	165	-19.81	45.19	43.8	Pass
T14	20 - 16.6667	Leg	PL 6" x .25"	186	-20.85	45.19	46.1	Pass
T15	16.6667 - 13.3334	Leg	PL 6" x .25"	195	-21.10	45.19	46.7	Pass
T16	13.3334 - 10	Leg	PL 6" x .25"	204	-22.78	45.19	50.4	Pass
T17	10 - 0	Leg	PL 6" x .25"	213	-26.56	45.19	58.8	Pass
T1	90 - 86.6667	Diagonal	L 2 x 2 x 1/8	27	-2.60	8.00	32.5 57.7 (b)	Pass
T2	86.6667 - 83.3333	Diagonal	L 2 x 2 x 1/8	36	-2.72	8.00	34.0 57.4 (b)	Pass
T3	83.3333 - 80	Diagonal	L 2 x 2 x 1/8	45	-2.74	8.00	34.2 49.3 (b)	Pass
T4	80 - 70	Diagonal	L 1.5 x 1.5 x 1/8	66	-2.25	3.30	68.3	Pass
T5	70 - 66.6667	Diagonal	L 1.5 x 1.5 x 1/8	75	-0.67	3.30	20.4	Pass
T6	66.6667 - 63.3334	Diagonal	L 1.5 x 1.5 x 1/8	84	-0.77	3.30	23.4	Pass
T7	63.3334 - 60	Diagonal	L 2 x 2 x 1/8	93	-1.18	8.00	14.7 16.4 (b)	Pass
T8	60 - 50	Diagonal	L 2 x 2 x 1/8	102	-1.73	8.00	21.6 29.5 (b)	Pass
T9	50 - 40	Diagonal	L 2 x 2 x 1/8	123	-2.52	8.00	31.4 40.5 (b)	Pass
T10	40 - 36.6667	Diagonal	L 1.5 x 1.5 x 1/8	143	-1.07	3.30	32.5	Pass
T11	36.6667 - 33.3334	Diagonal	L 1.5 x 1.5 x 1/8	152	-1.05	3.30	31.9	Pass
T12	33.3334 - 30	Diagonal	L 1.5 x 1.5 x 1/8	160	-0.86	3.30	26.2	Pass
T13	30 - 20	Diagonal	L 1.5 x 1.5 x 1/8	171	-1.08	3.30	32.8	Pass
T14	20 - 16.6667	Diagonal	L 1.5 x 1.5 x 1/8	192	-0.95	3.30	29.0	Pass
T15	16.6667 - 13.3334	Diagonal	L 1.5 x 1.5 x 1/8	201	-1.43	3.30	43.5	Pass
T16	13.3334 - 10	Diagonal	L 1.5 x 1.5 x 1/8	210	-1.28	3.30	38.9	Pass
T17	10 - 0	Diagonal	L 1.5 x 1.5 x 1/8	222	-1.75	3.30	53.0	Pass
T3	83.3333 - 80	Horizontal	L 1.25 x 1.25 x 1/8	40	-0.19	4.19	4.6 10.9 (b)	Pass
T4	80 - 70	Horizontal	L 1.25 x 1.25 x 1/8	63	0.76	7.38	10.3 30.9 (b)	Pass
T5	70 - 66.6667	Horizontal	L 1.25 x 1.25 x 1/8	72	-0.23	4.19	5.4 11.3 (b)	Pass
T6	66.6667 - 63.3334	Horizontal	L 1.25 x 1.25 x 1/8	81	-0.22	4.19	5.4 11.7 (b)	Pass
T7	63.3334 - 60	Horizontal	L 1.25 x 1.25 x 1/8	90	-0.22	4.19	5.4 12.1 (b)	Pass
T8	60 - 50	Horizontal	L 1.25 x 1.25 x 1/8	99	-0.22	4.19	5.3	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
							13.0 (b)	
T9	50 - 40	Horizontal	L 1.25 x 1.25 x 1/8	119	-0.33	4.19	7.9 13.5 (b)	Pass
T11	36.6667 - 33.3334	Horizontal	L 1.25 x 1.25 x 1/8	149	-0.34	4.19	8.1 13.9 (b)	Pass
T12	33.3334 - 30	Horizontal	L 1.25 x 1.25 x 1/8	158	-0.34	4.19	8.2 14.1 (b)	Pass
T13	30 - 20	Horizontal	L 1.25 x 1.25 x 1/8	167	-0.34	4.19	8.2 14.9 (b)	Pass
T14	20 - 16.6667	Horizontal	L 1.25 x 1.25 x 1/8	188	-0.36	4.19	8.6 15.0 (b)	Pass
T15	16.6667 - 13.3334	Horizontal	L 1.25 x 1.25 x 1/8	197	-0.37	4.19	8.7 15.2 (b)	Pass
T16	13.3334 - 10	Horizontal	L 1.25 x 1.25 x 1/8	206	-0.39	4.19	9.4 16.1 (b)	Pass
T17	10 - 0	Horizontal	L 1.25 x 1.25 x 1/8	215	-0.46	4.19	11.0 18.8 (b)	Pass
T17	10 - 0	Bottom Girt	L 3 x 3 x 3/8	218	19.89	62.67	31.7 75.0 (b)	Pass
T1	90 - 86.6667	Guy A@90	1/2	248	7.31	14.53	50.3	Pass
T10	40 - 36.6667	Guy A@40	7/16	255	4.33	11.23	38.5	Pass
T1	90 - 86.6667	Guy B@90	1/2	241	7.29	14.53	50.2	Pass
T10	40 - 36.6667	Guy B@40	7/16	254	4.20	11.23	37.4	Pass
T1	90 - 86.6667	Guy C@90	1/2	236	7.52	14.53	51.7	Pass
T10	40 - 36.6667	Guy C@40	7/16	253	4.40	11.23	39.2	Pass
T1	90 - 86.6667	Top Guy Pull-Off@90	L 3 x 2 x 1/4 LLV	22	-0.00	27.84	0.2	Pass
T10	40 - 36.6667	Top Guy Pull-Off@40	L 1.25 x 1.25 x 1/8	140	2.20	8.82	25.0 89.9 (b)	Pass
T2	86.6667 - 83.3333	Bottom Guy Pull-Off@90	L 2.5 x 2.5 x 1/4	31	1.12	35.34	3.2 13.1 (b)	Pass
T1	90 - 86.6667	Torque Arm Top@90	L 2 x 2 x 3/16	249	7.28	21.44	34.0 41.2 (b)	Pass
T1	90 - 86.6667	Torque Arm Bottom@90	2L 2 x 2 x 3/16 (1/4)	245	-8.13	29.02	28.0 46.0 (b)	Pass
							Summary	
						Latticed Pole Leg (L1)	4.0	Pass
						Latticed Pole Diagonal (L1)	18.3	Pass
						Latticed Pole Secondary Horizontal (L1)	10.4	Pass
						Latticed Pole Top Girt (L1)	1.6	Pass
						Latticed Pole Bottom Girt (L1)	0.7	Pass
						Leg (T17)	58.8	Pass
						Diagonal (T4)	68.3	Pass
						Horizontal (T4)	30.9	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
						Bottom Girt (T17)	75.0	Pass
						Guy A (T1)	50.3	Pass
						Guy B (T1)	50.2	Pass
						Guy C (T1)	51.7	Pass
						Top Guy Pull-Off (T10)	89.9	Pass
						Bottom Guy Pull-Off (T2)	13.1	Pass
						Torque Arm Top (T1)	41.2	Pass
						Torque Arm Bottom (T1)	46.0	Pass
						Bolt Checks	89.9	Pass
						Rating =	89.9	Pass

Table 4 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	10.2	Pass
1	Base Foundation Soil Interaction	0	63.9	Pass
1	Anchor Shaft	-	27.2	Pass
1,2	Guy Anchor Soil Interaction	-	64.7	Pass
1,2	Guy Anchor Structural Steel	-	2.6	Pass

Structure Rating (max from all components) =	89.9%

Notes:

1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) See assumption #4

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

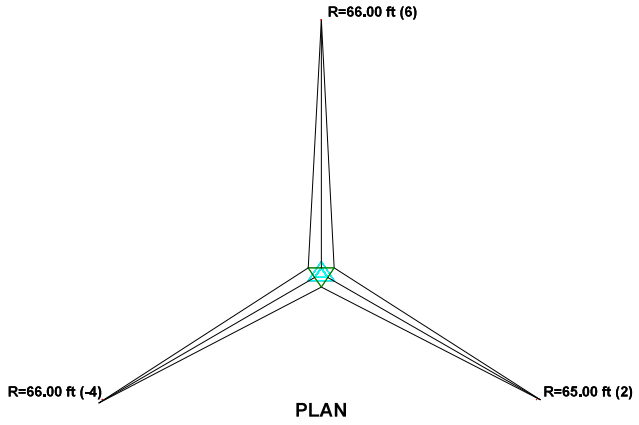
APPENDIX A

TNXTOWER OUTPUT

Section	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1	L1
Legs									PL 6" x .25"									A
Leg Grade									A7-33									A53-B-35
Diagonals				L 1.5 x 1.5 x 1/8						L 2 x 2 x 1/8				L 1.5 x 1.5 x 1/8				B
Diagonal Grade									A7-33									
Top Girts									N.A.									L 2 x 2 x 3/16
Bottom Girts	L 3 x 3 x 3/8								N.A.									L 2 x 2 x 3/16
Horizontals				L 1.25 x 1.25 x 1/8				N.A.				L 1.25 x 1.25 x 1/8					N.A.	
Sec. Horizontals									N.A.									C
Top Guy Pull-Offs				N.A.				E				N.A.				D		N.A.
Bot Guy Pull-Offs									N.A.							F		N.A.
Face Width (ft)									3.125									6.25
# Panels @ (ft)	3 @ 3.33334	2 @ 3.33333		G						21 @ 3.33333								1 @ 10
Weight (K)	3.2																	

100.0 ft
90.0 ft
86.7 ft
83.3 ft
80.0 ft
70.0 ft
66.7 ft
63.3 ft
60.0 ft
50.0 ft
40.0 ft
36.7 ft
33.3 ft
30.0 ft
20.0 ft
16.7 ft
13.3 ft
10.0 ft
0.0 ft

7/16 EHS LC=113.87 ft IT=10%
7/16 EHS LC=113.87 ft IT=10%
7/16 EHS LC=7.83



PLAN

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pipe 4.0" x 0.226" (3.5 STD)	E	L 1.25 x 1.25 x 1/8
B	2L 2 x 1.5 x 1/8 LLV (1/4)	F	L 2.5 x 2.5 x 1/4
C	2L 2 x 1.5 x 1/8 LLH (1/4)	G	1 @ 3.33334
D	L 3 x 2 x 1/4 LLV		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A7-33	33 ksi	60 ksi

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 117 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 89.9%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 28 K
SHEAR: 1 K

UPLIFT: -2 K
SHEAR: 0 K

AXIAL 50 K
SHEAR 0 K *MOMENT 13 kip-ft*
TORQUE 0 kip-ft
50 mph WIND - 1.5000 in ICE

AXIAL 34 K
SHEAR 1 K *MOMENT 45 kip-ft*
TORQUE 1 kip-ft
REACTIONS - 117 mph WIND

15 K
19 K
12 K
R=66.00 ft

ALL REACTIONS ARE FACTORED

Paul J. Ford and Company
250 East Broad St., Suite 600
Columbus, OH 43215
Phone: 614-221-6679
FAX:

Job: *100-ft Guyed Tower; Hawinton, CT*			
Project: *13322-0019*			
Client: Everest	Drawn by: Anna Trudo	App'd:	
Code: TIA-222-H	Date: 08/26/22	Scale: NTS	
Path:		Dwg No. E-1	

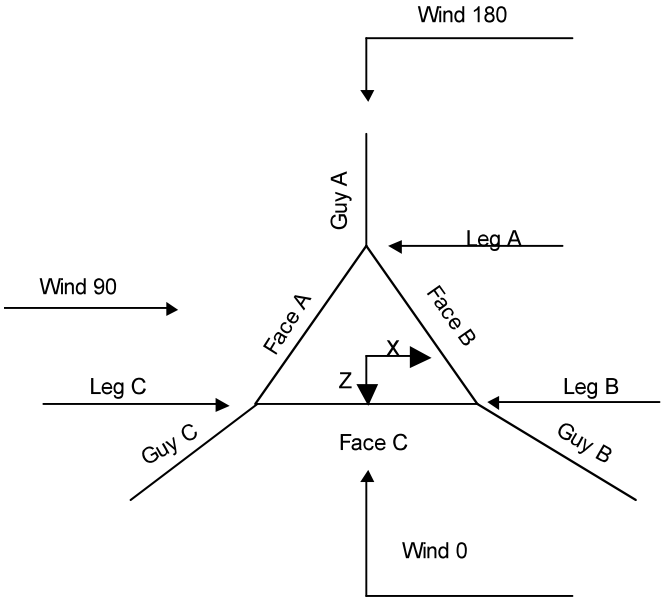
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 100.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.13 ft at the top and 3.13 ft at the base.
An index plate is provided at the 3 sided -tower connection.
There is a 3 sided latticed pole with a face width of 6.25 ft.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

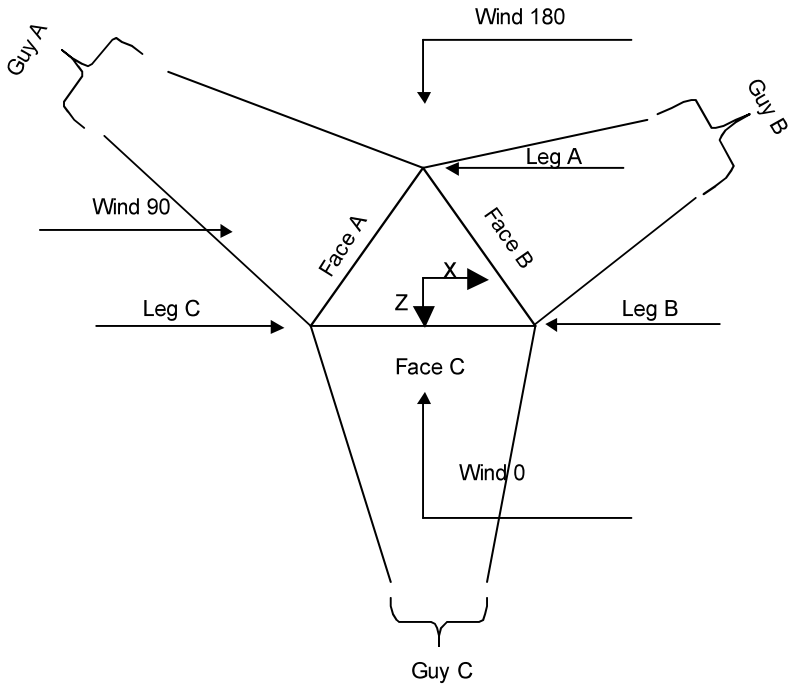
- Tower is located in Litchfield County, Connecticut.
- Tower base elevation above sea level: 1089.42 ft.
- Basic wind speed of 117 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.5000 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.
- Stress ratio used in latticed pole member design is 1.
- Stress ratio used in tower member design is 1.
- Safety factor used in guy 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-H Bracing Resist. Exemption
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Use TIA-222-H Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	**Poles**
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
√ SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known



Corner & Starmount Guyed Tower



Face Guyed

3 Sided Latticed Pole Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
L1	100.00-90.00			6.25	1	10.00

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
L1	100.00-90.00	10.00	X Brace	No	Yes	0.0000	0.0000

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
L1 100.00-90.00	Pipe	Pipe 4.0" x 0.226" (3.5 STD)	A53-B-35 (35 ksi)	Double Angle	2L 2 x 1.5 x 1/8 LLV (1/4)	A7-33 (33 ksi)

3 Sided Latticed Pole 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
L1 100.00-90.00	Equal Angle	L 2 x 2 x 3/16	A7-33 (33 ksi)	Equal Angle	L 2 x 2 x 3/16	A7-33 (33 ksi)

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
L1 100.00-90.00	Double Angle	2L 2 x 1.5 x 1/8 LLH (1/4)	A7-33 (33 ksi)	Equal Angle		A7-33 (33 ksi)

3 Sided Latticed Pole 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
L1 100.00-90.00	0.00	0.2500	A7-33 (33 ksi)	1.03	1	1.03	15.0000	Mid-Pt	36.0000

3 Sided Latticed Pole 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
L1 100.00-90.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 0.5	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.*

3 Sided Latticed Pole 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
L1 100.00-90.00	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 Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	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
L1 100.00-90.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

3 Sided Latticed Pole 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.
L1 100.00-90.00	Sleeve SS	0.5000 A325N	0	0.5000 A325N	2	0.5000 A325N	2	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.5000 A325N	2

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	90.00-86.67			3.13	1	3.33
T2	86.67-83.33			3.13	1	3.33
T3	83.33-80.00			3.13	1	3.33
T4	80.00-70.00			3.13	1	10.00
T5	70.00-66.67			3.13	1	3.33
T6	66.67-63.33			3.13	1	3.33
T7	63.33-60.00			3.13	1	3.33
T8	60.00-50.00			3.13	1	10.00
T9	50.00-40.00			3.13	1	10.00
T10	40.00-36.67			3.13	1	3.33
T11	36.67-33.33			3.13	1	3.33
T12	33.33-30.00			3.13	1	3.33
T13	30.00-20.00			3.13	1	10.00
T14	20.00-16.67			3.13	1	3.33
T15	16.67-13.33			3.13	1	3.33
T16	13.33-10.00			3.13	1	3.33
T17	10.00-0.00			3.13	1	10.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	90.00-86.67	3.33	K Brace Left	No	Yes	0.0000	0.0000
T2	86.67-83.33	3.33	K Brace Right	No	Yes	0.0000	0.0000
T3	83.33-80.00	3.33	K Brace Left	No	Yes	0.0000	0.0000
T4	80.00-70.00	3.33	K Brace Right	No	Yes	0.0000	0.0000
T5	70.00-66.67	3.33	K Brace Left	No	Yes	0.0000	0.0000
T6	66.67-63.33	3.33	K Brace Right	No	Yes	0.0000	0.0000
T7	63.33-60.00	3.33	K Brace Left	No	Yes	0.0000	0.0000
T8	60.00-50.00	3.33	K Brace Right	No	Yes	0.0000	0.0000
T9	50.00-40.00	3.33	K Brace Left	No	Yes	0.0000	0.0000
T10	40.00-36.67	3.33	K Brace Right	No	Yes	0.0000	0.0000
T11	36.67-33.33	3.33	K Brace Left	No	Yes	0.0000	0.0000
T12	33.33-30.00	3.33	K Brace Right	No	Yes	0.0000	0.0000
T13	30.00-20.00	3.33	K Brace Left	No	Yes	0.0000	0.0000
T14	20.00-16.67	3.33	K Brace Right	No	Yes	0.0000	0.0000
T15	16.67-13.33	3.33	K Brace Left	No	Yes	0.0000	0.0000
T16	13.33-10.00	3.33	K Brace Right	No	Yes	0.0000	0.0000
T17	10.00-0.00	3.33	K Brace Left	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 90.00-86.67	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 2 x 2 x 1/8	A7-33 (33 ksi)
T2 86.67-83.33	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 2 x 2 x 1/8	A7-33 (33 ksi)
T3 83.33-80.00	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 2 x 2 x 1/8	A7-33 (33 ksi)
T4 80.00-70.00	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 1.5 x 1.5 x 1/8	A7-33 (33 ksi)
T5 70.00-66.67	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 1.5 x 1.5 x 1/8	A7-33 (33 ksi)
T6 66.67-63.33	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 1.5 x 1.5 x 1/8	A7-33 (33 ksi)
T7 63.33-60.00	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 2 x 2 x 1/8	A7-33 (33 ksi)
T8 60.00-50.00	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 2 x 2 x 1/8	A7-33 (33 ksi)
T9 50.00-40.00	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 2 x 2 x 1/8	A7-33 (33 ksi)
T10 40.00-36.67	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 1.5 x 1.5 x 1/8	A7-33 (33 ksi)
T11 36.67-33.33	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 1.5 x 1.5 x 1/8	A7-33 (33 ksi)
T12 33.33-30.00	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 1.5 x 1.5 x 1/8	A7-33 (33 ksi)
T13 30.00-20.00	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 1.5 x 1.5 x 1/8	A7-33 (33 ksi)
T14 20.00-16.67	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 1.5 x 1.5 x 1/8	A7-33 (33 ksi)
T15 16.67-13.33	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 1.5 x 1.5 x 1/8	A7-33 (33 ksi)
T16 13.33-10.00	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 1.5 x 1.5 x 1/8	A7-33 (33 ksi)
T17 10.00-0.00	60 Bent Plate	PL 6" x .25"	A7-33 (33 ksi)	Equal Angle	L 1.5 x 1.5 x 1/8	A7-33 (33 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 90.00-86.67	Single Angle	L 3 x 2 x 1/4 LLV	A7-33 (33 ksi)	Equal Angle		A36 (36 ksi)
T2 86.67-83.33	Single Angle	L 2.5 x 2.5 x 3/16	A7-33 (33 ksi)	Equal Angle		A36 (36 ksi)
T17 10.00-0.00	Equal Angle		A7-33 (33 ksi)	Equal Angle	L 3 x 3 x 3/8	A7-33 (33 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*
T2 86.67-83.33	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T3 83.33-80.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T4 80.00-70.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T5 70.00-66.67	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T6 66.67-63.33	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T7 63.33-60.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T8 60.00-50.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T9 50.00-40.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T10 40.00-36.67	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T11 36.67-33.33	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T12 33.33-30.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T13 30.00-20.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T14 20.00-16.67	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T15 16.67-13.33	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T16 13.33-10.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)
T17 10.00-0.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Secondary Horizontal Type*	*Secondary Horizontal Size*	*Secondary Horizontal Grade*	*Inner Bracing Type*	*Inner Bracing Size*	*Inner Bracing Grade*
T15 16.67-13.33	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)	Single Angle		A572-50 (50 ksi)
T16 13.33-10.00	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)	Single Angle		A572-50 (50 ksi)
T17 10.00-0.00	Equal Angle	L 1.25 x 1.25 x 1/8	A7-33 (33 ksi)	Single Angle		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
T1 90.00-86.67	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T2 86.67-83.33	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T3 83.33-80.00	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T4 80.00-70.00	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T5 70.00-66.67	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T6 66.67-63.33	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T7 63.33-60.00	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T8 60.00-50.00	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T9 50.00-40.00	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T10 40.00-36.67	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T11 36.67-33.33	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T12 33.33-30.00	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T13 30.00-20.00	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T14 20.00-16.67	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T15 16.67-13.33	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T16 13.33-10.00	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T17 10.00-0.00	0.00	0.2500	A7-33 (33 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry *(cont'd)*

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
ft															
T1 90.00-86.67	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 86.67-83.33	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 83.33-80.00	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 80.00-70.00	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 70.00-66.67	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 66.67-63.33	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 63.33-60.00	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1

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
T8 60.00-50.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 50.00-40.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 40.00-36.67	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 36.67-33.33	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T12 33.33-30.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T13 30.00-20.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T14 20.00-16.67	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T15 16.67-13.33	Yes	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T16 13.33-10.00	Yes	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T17 10.00-0.00	Yes	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	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 90.00-86.67	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 86.67-83.33	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 83.33-80.00	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 80.00-70.00	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
T5 70.00-66.67	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
T6 66.67-63.33	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
T7 63.33-60.00	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
T8 60.00-50.00	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
T9 50.00-40.00	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
T10 40.00-36.67	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
T11 36.67-33.33	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
T12 33.33-30.00	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
T13 30.00-20.00	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
T14 20.00-16.67	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
T15 16.67-13.33	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 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
T16 13.33-10.00	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
T17 10.00-0.00	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 Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	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 90.00-86.67	0.0000	0.75	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 86.67-83.33	0.0000	0.75	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 83.33-80.00	0.0000	0.75	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 80.00-70.00	0.0000	0.75	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 70.00-66.67	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 66.67-63.33	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 63.33-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 60.00-50.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 50.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 40.00-36.67	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 36.67-33.33	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 33.33-30.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 30.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 20.00-16.67	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 16.67-13.33	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 13.33-10.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 10.00-0.00	0.0000	0.75	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 90.00-86.67	Sleeve SS	0.5000 A325N	0	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T2 86.67-83.33	Sleeve SS	0.5000 A325N	0	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0

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.
T3 83.33-80.00	Sleeve SS	0.5000 A325N	12	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T4 80.00-70.00	Sleeve SS	0.5000 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T5 70.00-66.67	Sleeve SS	0.5000 A325N	0	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T6 66.67-63.33	Sleeve SS	0.5000 A325N	0	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T7 63.33-60.00	Sleeve SS	0.5000 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T8 60.00-50.00	Sleeve SS	0.5000 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T9 50.00-40.00	Sleeve SS	0.5000 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T10 40.00-36.67	Sleeve SS	0.5000 A325N	0	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T11 36.67-33.33	Sleeve SS	0.5000 A325N	0	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T12 33.33-30.00	Sleeve SS	0.5000 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T13 30.00-20.00	Sleeve SS	0.5000 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T14 20.00-16.67	Sleeve SS	0.5000 A325N	0	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0
T15 16.67-13.33	Sleeve SS	0.5000 A325N	0	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	1
T16 13.33-10.00	Sleeve SS	0.5000 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	1
T17 10.00-0.00	Sleeve SS	0.5000 A325N	0	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	3	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	1

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
90	EHS	A	1/2	2.69	10%	23000	0.517	105.69	66.00	0.0000	6.00	90%
		B	1/2	2.69	10%	23000	0.517	108.30	65.00	0.0000	2.00	90%
		C	1/2	2.69	10%	23000	0.517	113.78	66.00	0.0000	-4.00	90%
40	EHS	A	7/16	2.08	10%	23000	0.399	72.59	66.00	0.0000	6.00	90%
		B	7/16	2.08	10%	23000	0.399	73.68	65.00	0.0000	2.00	90%
		C	7/16	2.08	10%	23000	0.399	77.77	66.00	0.0000	-4.00	90%

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
90	Torque Arm	6.25	30.0000	Bat Ear	A7-33 (33 ksi)	Arbitrary Shape	L 2 x 2 x 3/16 2L 2 x 2 x 3/16 (1/4)
40	Corner						

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
90.00	A572-50 (50 ksi)	Solid Round			No	A7-33 (33 ksi)	Single Angle	L 3 x 2 x 1/4 LLV L 2.5 x 2.5 x 1/4
40.00	A572-50 (50 ksi)	Solid Round			No	A7-33 (33 ksi)	Single Angle	L 1.25 x 1.25 x 1/8

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
90	0.05	0.06	0.06		1.07 1.8 sec/pulse	1.12 1.8 sec/pulse	1.23 1.9 sec/pulse	
40	0.03	0.03	0.03		0.50 1.2 sec/pulse	0.52 1.2 sec/pulse	0.58 1.3 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
90	Yes	No	1	1	1	1	1	1
40	No	No			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
90	0.5000 A325N	2	0.0000	0.75	0.5000 A325N	1	0.0000	1	0.6250 A325N	0	0.0000	0.75
40	0.0000 A325N	0	0.0000	1	0.5000 A325N	1	0.0000	1	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
90	A	48.00	31	6	1.5573
	B	46.00	31	6	1.5507
	C	43.00	30	6	1.5402
40	A	23.00	27	5	1.4468
	B	21.00	26	5	1.4337
	C	18.00	25	5	1.4118

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
***													
HB158-1-08U8-S8F18(1 5/8")	C	No	No	Ar (CaAa)	96.00 - 10.00	- 1.0000	0.2	3	3	1.0000 1.9800	1.9800		1.70
HS2RP-50 (3/8" air)	A	No	No	Ar (CaAa)	100.00 - 10.00	- 0.2500	0.48	1	1	0.4150	0.4150		0.08
LDF7-50A(1-5/8")	A	No	No	Ar (CaAa)	100.00 - 10.00	0.0000	0.5	1	1	1.9800	1.9800		0.82
***													
Safety Line 3/8	A	No	No	Ar (CaAa)	100.00 - 10.00	0.0000	0	1	1	0.3750	0.3750		0.22
1.5" flat Climb Ladder Rail	A	No	No	Af (CaAa)	100.00 - 10.00	0.0000	0	2	2	18.0000 1.5000	1.5000		1.80

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 K
L1	100.00-90.00	A	0.000	0.000	7.770	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.564	0.000	0.03
T1	90.00-86.67	A	0.000	0.000	2.590	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T2	86.67-83.33	A	0.000	0.000	2.590	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T3	83.33-80.00	A	0.000	0.000	2.590	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T4	80.00-70.00	A	0.000	0.000	7.770	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	5.940	0.000	0.05
T5	70.00-66.67	A	0.000	0.000	2.590	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T6	66.67-63.33	A	0.000	0.000	2.590	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T7	63.33-60.00	A	0.000	0.000	2.590	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T8	60.00-50.00	A	0.000	0.000	7.770	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	5.940	0.000	0.05
T9	50.00-40.00	A	0.000	0.000	7.770	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	5.940	0.000	0.05
T10	40.00-36.67	A	0.000	0.000	2.590	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T11	36.67-33.33	A	0.000	0.000	2.590	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T12	33.33-30.00	A	0.000	0.000	2.590	0.000	0.02

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 K
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T13	30.00-20.00	A	0.000	0.000	7.770	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	5.940	0.000	0.05
T14	20.00-16.67	A	0.000	0.000	2.590	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T15	16.67-13.33	A	0.000	0.000	2.590	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T16	13.33-10.00	A	0.000	0.000	2.590	0.000	0.02
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T17	10.00-0.00	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 K
L1	100.00-90.00	A	1.667	0.000	0.000	24.443	0.000	0.37
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	9.348	0.000	0.13
T1	90.00-86.67	A	1.655	0.000	0.000	8.107	0.000	0.12
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.180	0.000	0.07
T2	86.67-83.33	A	1.649	0.000	0.000	8.086	0.000	0.12
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.173	0.000	0.07
T3	83.33-80.00	A	1.642	0.000	0.000	8.064	0.000	0.12
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.166	0.000	0.07
T4	80.00-70.00	A	1.628	0.000	0.000	24.053	0.000	0.35
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.451	0.000	0.22
T5	70.00-66.67	A	1.613	0.000	0.000	7.968	0.000	0.12
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.134	0.000	0.07
T6	66.67-63.33	A	1.605	0.000	0.000	7.941	0.000	0.12
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.125	0.000	0.07
T7	63.33-60.00	A	1.597	0.000	0.000	7.913	0.000	0.11
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.115	0.000	0.07
T8	60.00-50.00	A	1.579	0.000	0.000	23.556	0.000	0.34
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.286	0.000	0.21
T9	50.00-40.00	A	1.547	0.000	0.000	23.243	0.000	0.33
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	15.182	0.000	0.21
T10	40.00-36.67	A	1.523	0.000	0.000	7.665	0.000	0.11
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.033	0.000	0.07
T11	36.67-33.33	A	1.509	0.000	0.000	7.619	0.000	0.11
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.018	0.000	0.07
T12	33.33-30.00	A	1.494	0.000	0.000	7.569	0.000	0.10
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.002	0.000	0.07
T13	30.00-20.00	A	1.459	0.000	0.000	22.359	0.000	0.31
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	14.889	0.000	0.20
T14	20.00-16.67	A	1.414	0.000	0.000	7.305	0.000	0.10

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 K
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	4.914	0.000	0.07
T15	16.67-13.33	A	1.386	0.000	0.000	7.211	0.000	0.10
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	4.883	0.000	0.06
T16	13.33-10.00	A	1.352	0.000	0.000	7.096	0.000	0.09
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	4.845	0.000	0.06
T17	10.00-0.00	A	1.242	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 ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	100.00-90.00	-2.8405	-2.7129	-3.8862	-4.7063
T1	90.00-86.67	-2.0011	-1.5010	-2.2937	-2.2232
T2	86.67-83.33	-2.0399	-1.5311	-2.3645	-2.2917
T3	83.33-80.00	-2.1490	-1.6161	-2.5378	-2.4608
T4	80.00-70.00	-2.2225	-1.6734	-2.6460	-2.5644
T5	70.00-66.67	-2.2225	-1.6734	-2.6543	-2.5693
T6	66.67-63.33	-2.2225	-1.6734	-2.6587	-2.5719
T7	63.33-60.00	-2.1490	-1.6161	-2.5629	-2.4762
T8	60.00-50.00	-2.1490	-1.6161	-2.5728	-2.4820
T9	50.00-40.00	-2.1490	-1.6161	-2.5895	-2.4916
T10	40.00-36.67	-2.2225	-1.6734	-2.7024	-2.5964
T11	36.67-33.33	-2.2225	-1.6734	-2.7095	-2.6001
T12	33.33-30.00	-2.2225	-1.6734	-2.7172	-2.6040
T13	30.00-20.00	-2.2225	-1.6734	-2.7347	-2.6126
T14	20.00-16.67	-2.2225	-1.6734	-2.7565	-2.6224
T15	16.67-13.33	-2.2225	-1.6734	-2.7699	-2.6280
T16	13.33-10.00	-2.2225	-1.6734	-2.7860	-2.6342
T17	10.00-0.00	-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
L1	3	HB158-1-08U8-S8F18(1 5/8")	90.00 - 96.00	0.6000	0.5629
L1	4	HS2RP-50 (3/8" air)	90.00 - 100.00	0.6000	0.5629
L1	5	LDF7-50A(1-5/8")	90.00 - 100.00	0.6000	0.5629
L1	7	Safety Line 3/8	90.00 - 100.00	0.6000	0.5629
L1	8	1.5" flat Climb Ladder Rail	90.00 - 100.00	0.6000	0.5629
T1	3	HB158-1-08U8-S8F18(1 5/8")	86.67 - 90.00	0.6000	0.4223
T1	4	HS2RP-50 (3/8" air)	86.67 - 90.00	0.6000	0.4223
T1	5	LDF7-50A(1-5/8")	86.67 - 90.00	0.6000	0.4223
T1	7	Safety Line 3/8	86.67 - 90.00	0.6000	0.4223

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	8	1.5" flat Climb Ladder Rail	86.67 - 90.00	0.6000	0.4223
T2	3	HB158-1-08U8-S8F18(1 5/8")	83.33 - 86.67	0.6000	0.4335
T2	4	HS2RP-50 (3/8" air)	83.33 - 86.67	0.6000	0.4335
T2	5	LDF7-50A(1-5/8")	83.33 - 86.67	0.6000	0.4335
T2	7	Safety Line 3/8	83.33 - 86.67	0.6000	0.4335
T2	8	1.5" flat Climb Ladder Rail	83.33 - 86.67	0.6000	0.4335
T3	3	HB158-1-08U8-S8F18(1 5/8")	80.00 - 83.33	0.6000	0.4597
T3	4	HS2RP-50 (3/8" air)	80.00 - 83.33	0.6000	0.4597
T3	5	LDF7-50A(1-5/8")	80.00 - 83.33	0.6000	0.4597
T3	7	Safety Line 3/8	80.00 - 83.33	0.6000	0.4597
T3	8	1.5" flat Climb Ladder Rail	80.00 - 83.33	0.6000	0.4597
T4	3	HB158-1-08U8-S8F18(1 5/8")	70.00 - 80.00	0.6000	0.4768
T4	4	HS2RP-50 (3/8" air)	70.00 - 80.00	0.6000	0.4768
T4	5	LDF7-50A(1-5/8")	70.00 - 80.00	0.6000	0.4768
T4	7	Safety Line 3/8	70.00 - 80.00	0.6000	0.4768
T4	8	1.5" flat Climb Ladder Rail	70.00 - 80.00	0.6000	0.4768
T5	3	HB158-1-08U8-S8F18(1 5/8")	66.67 - 70.00	0.6000	0.4793
T5	4	HS2RP-50 (3/8" air)	66.67 - 70.00	0.6000	0.4793
T5	5	LDF7-50A(1-5/8")	66.67 - 70.00	0.6000	0.4793
T5	7	Safety Line 3/8	66.67 - 70.00	0.6000	0.4793
T5	8	1.5" flat Climb Ladder Rail	66.67 - 70.00	0.6000	0.4793
T6	3	HB158-1-08U8-S8F18(1 5/8")	63.33 - 66.67	0.6000	0.4807
T6	4	HS2RP-50 (3/8" air)	63.33 - 66.67	0.6000	0.4807
T6	5	LDF7-50A(1-5/8")	63.33 - 66.67	0.6000	0.4807
T6	7	Safety Line 3/8	63.33 - 66.67	0.6000	0.4807
T6	8	1.5" flat Climb Ladder Rail	63.33 - 66.67	0.6000	0.4807
T7	3	HB158-1-08U8-S8F18(1 5/8")	60.00 - 63.33	0.6000	0.4673
T7	4	HS2RP-50 (3/8" air)	60.00 - 63.33	0.6000	0.4673
T7	5	LDF7-50A(1-5/8")	60.00 - 63.33	0.6000	0.4673
T7	7	Safety Line 3/8	60.00 - 63.33	0.6000	0.4673
T7	8	1.5" flat Climb Ladder Rail	60.00 - 63.33	0.6000	0.4673
T8	3	HB158-1-08U8-S8F18(1 5/8")	50.00 - 60.00	0.6000	0.4704
T8	4	HS2RP-50 (3/8" air)	50.00 - 60.00	0.6000	0.4704
T8	5	LDF7-50A(1-5/8")	50.00 - 60.00	0.6000	0.4704

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T8	7	Safety Line 3/8	50.00 - 60.00	0.6000	0.4704
T8	8	1.5" flat Climb Ladder Rail	50.00 - 60.00	0.6000	0.4704
T9	3	HB158-1-08U8-S8F18(1 5/8")	40.00 - 50.00	0.6000	0.4757
T9	4	HS2RP-50 (3/8" air)	40.00 - 50.00	0.6000	0.4757
T9	5	LDF7-50A(1-5/8")	40.00 - 50.00	0.6000	0.4757
T9	7	Safety Line 3/8	40.00 - 50.00	0.6000	0.4757
T9	8	1.5" flat Climb Ladder Rail	40.00 - 50.00	0.6000	0.4757
T10	3	HB158-1-08U8-S8F18(1 5/8")	36.67 - 40.00	0.6000	0.4946
T10	4	HS2RP-50 (3/8" air)	36.67 - 40.00	0.6000	0.4946
T10	5	LDF7-50A(1-5/8")	36.67 - 40.00	0.6000	0.4946
T10	7	Safety Line 3/8	36.67 - 40.00	0.6000	0.4946
T10	8	1.5" flat Climb Ladder Rail	36.67 - 40.00	0.6000	0.4946
T11	3	HB158-1-08U8-S8F18(1 5/8")	33.33 - 36.67	0.6000	0.4970
T11	4	HS2RP-50 (3/8" air)	33.33 - 36.67	0.6000	0.4970
T11	5	LDF7-50A(1-5/8")	33.33 - 36.67	0.6000	0.4970
T11	7	Safety Line 3/8	33.33 - 36.67	0.6000	0.4970
T11	8	1.5" flat Climb Ladder Rail	33.33 - 36.67	0.6000	0.4970
T12	3	HB158-1-08U8-S8F18(1 5/8")	30.00 - 33.33	0.6000	0.4996
T12	4	HS2RP-50 (3/8" air)	30.00 - 33.33	0.6000	0.4996
T12	5	LDF7-50A(1-5/8")	30.00 - 33.33	0.6000	0.4996
T12	7	Safety Line 3/8	30.00 - 33.33	0.6000	0.4996
T12	8	1.5" flat Climb Ladder Rail	30.00 - 33.33	0.6000	0.4996
T13	3	HB158-1-08U8-S8F18(1 5/8")	20.00 - 30.00	0.6000	0.5055
T13	4	HS2RP-50 (3/8" air)	20.00 - 30.00	0.6000	0.5055
T13	5	LDF7-50A(1-5/8")	20.00 - 30.00	0.6000	0.5055
T13	7	Safety Line 3/8	20.00 - 30.00	0.6000	0.5055
T13	8	1.5" flat Climb Ladder Rail	20.00 - 30.00	0.6000	0.5055
T14	3	HB158-1-08U8-S8F18(1 5/8")	16.67 - 20.00	0.6000	0.5131
T14	4	HS2RP-50 (3/8" air)	16.67 - 20.00	0.6000	0.5131
T14	5	LDF7-50A(1-5/8")	16.67 - 20.00	0.6000	0.5131
T14	7	Safety Line 3/8	16.67 - 20.00	0.6000	0.5131
T14	8	1.5" flat Climb Ladder Rail	16.67 - 20.00	0.6000	0.5131
T15	3	HB158-1-08U8-S8F18(1 5/8")	13.33 - 16.67	0.6000	0.5180
T15	4	HS2RP-50 (3/8" air)	13.33 - 16.67	0.6000	0.5180

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T15	5	LDF7-50A(1-5/8")	13.33 - 16.67	0.6000	0.5180
T15	7	Safety Line 3/8	13.33 - 16.67	0.6000	0.5180
T15	8	1.5" flat Climb Ladder Rail	13.33 - 16.67	0.6000	0.5180
T16	3	HB158-1-08U8-S8F18(1 5/8")	10.00 - 13.33	0.6000	0.5239
T16	4	HS2RP-50 (3/8" air)	10.00 - 13.33	0.6000	0.5239
T16	5	LDF7-50A(1-5/8")	10.00 - 13.33	0.6000	0.5239
T16	7	Safety Line 3/8	10.00 - 13.33	0.6000	0.5239
T16	8	1.5" flat Climb Ladder Rail	10.00 - 13.33	0.6000	0.5239
T17	3	HB158-1-08U8-S8F18(1 5/8")	10.00 - 10.00	0.6000	0.5054
T17	4	HS2RP-50 (3/8" air)	10.00 - 10.00	0.6000	0.5054
T17	5	LDF7-50A(1-5/8")	10.00 - 10.00	0.6000	0.5054
T17	7	Safety Line 3/8	10.00 - 10.00	0.6000	0.5054
T17	8	1.5" flat Climb Ladder Rail	10.00 - 10.00	0.6000	0.5054

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
76.5									
(4) Side Arm Mount	A	From Face	2.00 0.00 0.00	0.0000	76.50	No Ice 1/2" Ice 1" Ice 2" Ice	1.04 1.41 1.78 2.52	5.32 6.43 7.67 10.67	0.16 0.20 0.24 0.36
4.5" Diameter x 90" Pipe	A	From Face	2.00 0.00 0.00	0.0000	76.50	No Ice 1/2" Ice 1" Ice 2" Ice	2.60 3.52 3.98 4.94	2.60 3.52 3.98 4.94	0.03 0.05 0.08 0.16
96									
AIR 6419_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.38 4.71 5.05 5.75	2.76 3.19 3.64 4.58	0.06 0.10 0.14 0.24
AIR 6419_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.38 4.71 5.05 5.75	2.76 3.19 3.64 4.58	0.06 0.10 0.14 0.24
AIR 6419_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.38 4.71 5.05 5.75	2.76 3.19 3.64 4.58	0.06 0.10 0.14 0.24

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVAALL24_43-U-NA20_TIA	A	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.24 20.89 21.54 22.87	8.73 9.33 9.93 11.17	0.15 0.26 0.38 0.65
APXVAALL24_43-U-NA20_TIA	B	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.24 20.89 21.54 22.87	8.73 9.33 9.93 11.17	0.15 0.26 0.38 0.65
APXVAALL24_43-U-NA20_TIA	C	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.24 20.89 21.54 22.87	8.73 9.33 9.93 11.17	0.15 0.26 0.38 0.65
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.14 2.32 2.51 2.91	1.69 1.85 2.02 2.39	0.11 0.13 0.16 0.22
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.14 2.32 2.51 2.91	1.69 1.85 2.02 2.39	0.11 0.13 0.16 0.22
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.14 2.32 2.51 2.91	1.69 1.85 2.02 2.39	0.11 0.13 0.16 0.22
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.59 1.75 1.92 2.28	0.07 0.09 0.12 0.17
T-Arm Mount [TA 702-3]	C	None		0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.75 5.82 6.98 9.72	4.75 5.82 6.98 9.72	0.34 0.43 0.55 0.87
2.375" OD x 9' Mount Pipe	A	From Face	1.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.14 3.07 4.01 5.13	2.14 3.07 4.01 5.13	0.03 0.04 0.06 0.13
2.375" OD x 9' Mount Pipe	B	From Face	1.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.14 3.07 4.01 5.13	2.14 3.07 4.01 5.13	0.03 0.04 0.06 0.13
2.375" OD x 9' Mount Pipe	C	From Face	1.00 0.00 0.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.14 3.07 4.01 5.13	2.14 3.07 4.01 5.13	0.03 0.04 0.06 0.13

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 K
104.583									
20 ft x 2" omni whip	B	From Leg	2.00 0.00 10.00	0.0000	104.58	No Ice 1/2" Ice 1" Ice 2" Ice	4.07 6.13 8.20 12.40	4.07 6.13 8.20 12.40	0.04 0.07 0.12 0.24
Side Arm Mount	B	From Leg	0.50 0.00 0.00	0.0000	97.42	No Ice 1/2" Ice 1" Ice 2" Ice	1.04 1.41 1.78 2.52	5.32 6.43 7.67 10.67	0.16 0.20 0.24 0.36
2.375" OD x 10' Mount Pipe	B	From Leg	2.00 0.00 5.00	0.0000	96.58	No Ice 1/2" Ice 1" Ice 2" Ice	2.38 3.40 4.45 5.91	2.38 3.40 4.45 5.91	0.03 0.04 0.07 0.14
98									
2.375" OD x 2.5' Mount Pipe	C	From Leg	0.50 0.00 1.25	0.0000	98.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.46 0.62 0.78 1.15	0.46 0.62 0.78 1.15	0.02 0.03 0.03 0.05
10 ft x 1.5" Omni	C	From Leg	0.50 0.00 5.00	0.0000	100.25	No Ice 1/2" Ice 1" Ice 2" Ice	1.50 2.52 3.56 5.42	1.50 2.52 3.56 5.42	0.02 0.03 0.05 0.11
***									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.0 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

Comb. No.	Description
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 K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	24.74	0.54	-0.04
	Max. H_x	12	14.09	0.68	-0.04
	Max. H_z	20	15.97	-30.00	17.17
	Min. Vert	4	-1.95	-0.36	-0.02
	Min. H_x	19	13.79	-30.04	17.17
	Min. H_z	13	8.91	0.64	-0.04
Leg B	Max. Vert	6	24.82	-0.42	-0.64
	Max. H_x	25	13.28	29.85	17.35
	Max. H_z	25	13.28	29.85	17.35
	Min. Vert	12	-0.54	0.24	0.46
	Min. H_x	6	24.82	-0.42	-0.64
	Min. H_z	6	24.82	-0.42	-0.64
Leg A	Max. Vert	2	27.86	-0.53	1.03
	Max. H_x	10	4.20	0.43	-0.69
	Max. H_z	2	27.86	-0.53	1.03
	Min. Vert	8	-0.66	0.42	-0.68
	Min. H_x	2	27.86	-0.53	1.03
	Min. H_z	23	15.28	0.14	-34.59
Guy C @ 66 ft Elev -4 ft Azimuth 240 deg	Max. Vert	10	-0.62	-0.30	0.18
	Max. H_x	10	-0.62	-0.30	0.18
	Max. H_z	3	-14.61	-10.42	6.14
	Min. Vert	3	-14.61	-10.42	6.14
	Min. H_x	3	-14.61	-10.42	6.14
	Min. H_z	10	-0.62	-0.30	0.18
Guy B @ 65 ft Elev 2 ft Azimuth 120 deg	Max. Vert	6	-0.56	0.31	0.18
	Max. H_x	13	-13.59	10.35	6.09
	Max. H_z	13	-13.59	10.35	6.09
	Min. Vert	13	-13.59	10.35	6.09
	Min. H_x	6	-0.56	0.31	0.18
	Min. H_z	6	-0.56	0.31	0.18
Guy A @ 66 ft Elev 6 ft Azimuth 0 deg	Max. Vert	2	-0.43	-0.00	-0.30
	Max. H_x	24	-6.58	0.24	-7.15
	Max. H_z	2	-0.43	-0.00	-0.30
	Min. Vert	8	-13.30	0.01	-12.64
	Min. H_x	18	-6.37	-0.24	-6.95
	Min. H_z	8	-13.30	0.01	-12.64

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	23.15	0.03	-0.02	-0.75	-0.74	-0.01
1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy	34.20	0.04	-1.35	-44.54	-2.61	-0.77
1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy	31.01	0.59	-0.82	-29.23	-15.95	-0.54
1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy	27.79	0.96	-0.52	-15.78	-25.93	-0.62
1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy	29.68	1.01	-0.10	-1.07	-30.64	-0.42
1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy	32.17	1.13	0.59	16.43	-34.58	0.06
1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy	29.63	0.53	0.93	24.13	-17.02	0.52
1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy	27.79	0.04	1.05	26.84	0.48	0.70
1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy	30.22	-0.40	0.84	23.43	15.63	0.48
1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy	32.83	-1.02	0.57	18.26	32.57	0.56
1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy	30.01	-0.94	-0.10	1.14	28.11	0.39
1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy	27.60	-0.89	-0.53	-13.14	22.85	-0.10
1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy	30.72	-0.57	-0.91	-29.37	12.80	-0.57
1.2 Dead+1.0 Ice+1.0 Temp+Guy	49.41	0.08	-0.04	-1.74	-1.72	0.01
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	50.09	0.09	-0.49	-12.89	-2.13	-0.24
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	50.05	0.27	-0.36	-10.14	-7.39	-0.18
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	50.04	0.40	-0.21	-7.15	-10.78	-0.23
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	49.96	0.46	-0.03	-2.68	-11.56	-0.19
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	49.91	0.46	0.17	2.98	-10.62	-0.02
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	49.93	0.29	0.30	7.12	-6.22	0.17
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	49.97	0.09	0.34	8.83	-1.33	0.25
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	49.89	-0.11	0.28	6.93	3.03	0.19
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	49.87	-0.28	0.17	3.63	7.42	0.25
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	49.94	-0.29	-0.03	-1.87	8.01	0.20
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	50.04	-0.23	-0.21	-6.41	6.92	0.03
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	50.07	-0.11	-0.38	-10.28	3.60	-0.16
Dead+Wind 0 deg - Service+Guy	23.11	0.03	-0.38	-8.92	-1.06	-0.20
Dead+Wind 30 deg - Service+Guy	23.10	0.18	-0.27	-6.70	-4.57	-0.15
Dead+Wind 60 deg - Service+Guy	23.11	0.28	-0.16	-4.38	-7.01	-0.16

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 90 deg - Service+Guy	23.13	0.32	-0.02	-1.11	-7.75	-0.12
Dead+Wind 120 deg - Service+Guy	23.18	0.34	0.15	2.88	-7.77	0.00
Dead+Wind 150 deg - Service+Guy	23.25	0.19	0.25	5.39	-4.27	0.12
Dead+Wind 180 deg - Service+Guy	23.31	0.03	0.27	6.24	-0.46	0.17
Dead+Wind 210 deg - Service+Guy	23.33	-0.12	0.23	5.23	2.98	0.12
Dead+Wind 240 deg - Service+Guy	23.32	-0.28	0.15	3.46	6.56	0.13
Dead+Wind 270 deg - Service+Guy	23.29	-0.26	-0.02	-0.50	6.25	0.09
Dead+Wind 300 deg - Service+Guy	23.25	-0.22	-0.16	-3.85	5.23	-0.03
Dead+Wind 330 deg - Service+Guy	23.18	-0.13	-0.29	-6.86	2.86	-0.15

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-6.99	0.00	0.00	6.99	-0.00	0.004%
2	0.29	-8.34	-12.26	-0.29	8.34	12.26	0.002%
3	5.60	-8.31	-9.69	-5.60	8.31	9.69	0.001%
4	9.40	-8.27	-5.76	-9.40	8.27	5.76	0.001%
5	10.69	-8.30	-0.29	-10.69	8.30	0.29	0.003%
6	10.00	-8.33	5.77	-10.00	8.33	-5.77	0.001%
7	5.33	-8.29	9.80	-5.33	8.29	-9.80	0.002%
8	-0.29	-8.26	11.23	0.29	8.26	-11.23	0.002%
9	-5.60	-8.29	9.69	5.60	8.29	-9.69	0.002%
10	-10.29	-8.32	6.27	10.29	8.32	-6.27	0.001%
11	-10.69	-8.29	0.29	10.69	8.29	-0.29	0.002%
12	-9.11	-8.26	-5.25	9.11	8.26	5.25	0.001%
13	-5.33	-8.30	-9.80	5.33	8.30	9.80	0.001%
14	0.00	-28.96	0.00	0.00	28.96	-0.00	0.001%
15	0.09	-29.01	-4.48	-0.09	29.01	4.48	0.001%
16	2.14	-28.97	-3.70	-2.14	28.97	3.70	0.001%
17	3.63	-28.92	-2.19	-3.63	28.92	2.19	0.001%
18	4.13	-28.96	-0.09	-4.13	28.96	0.09	0.001%
19	3.66	-29.00	2.10	-3.66	29.00	-2.10	0.001%
20	2.04	-28.95	3.71	-2.04	28.95	-3.70	0.000%
21	-0.09	-28.91	4.34	0.09	28.91	-4.34	0.000%
22	-2.14	-28.95	3.70	2.14	28.95	-3.70	0.001%
23	-3.75	-28.99	2.26	3.75	28.99	-2.26	0.001%
24	-4.13	-28.95	0.09	4.13	28.95	-0.09	0.001%
25	-3.53	-28.91	-2.03	3.53	28.91	2.03	0.001%
26	-2.04	-28.96	-3.71	2.04	28.96	3.70	0.001%
27	0.08	-7.00	-3.23	-0.08	7.00	3.23	0.002%
28	1.48	-6.99	-2.55	-1.48	6.99	2.55	0.002%
29	2.48	-6.98	-1.52	-2.48	6.98	1.52	0.002%
30	2.82	-6.99	-0.08	-2.82	6.99	0.08	0.007%
31	2.63	-6.99	1.52	-2.63	6.99	-1.52	0.002%
32	1.40	-6.99	2.58	-1.40	6.99	-2.58	0.006%
33	-0.08	-6.98	2.96	0.08	6.98	-2.96	0.005%
34	-1.48	-6.98	2.55	1.48	6.98	-2.55	0.006%
35	-2.71	-6.99	1.65	2.71	6.99	-1.65	0.007%
36	-2.82	-6.98	0.08	2.82	6.98	-0.08	0.006%
37	-2.40	-6.98	-1.38	2.40	6.98	1.38	0.006%
38	-1.40	-6.99	-2.58	1.40	6.99	2.58	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	7	0.00000001	0.00011714
2	Yes	12	0.00000001	0.00010869
3	Yes	12	0.00000001	0.00005866
4	Yes	10	0.00000001	0.00006545
5	Yes	11	0.00000001	0.00014209
6	Yes	12	0.00000001	0.00006702
7	Yes	11	0.00000001	0.00012317
8	Yes	9	0.00000001	0.00009760
9	Yes	11	0.00000001	0.00009439
10	Yes	12	0.00000001	0.00004797
11	Yes	11	0.00000001	0.00009050
12	Yes	9	0.00000001	0.00004956
13	Yes	12	0.00000001	0.00005126
14	Yes	8	0.00000001	0.00005542
15	Yes	9	0.00000001	0.00010514
16	Yes	9	0.00000001	0.00008821
17	Yes	9	0.00000001	0.00007679
18	Yes	9	0.00000001	0.00006150
19	Yes	9	0.00000001	0.00005616
20	Yes	9	0.00000001	0.00004215
21	Yes	9	0.00000001	0.00003682
22	Yes	9	0.00000001	0.00004834
23	Yes	9	0.00000001	0.00005347
24	Yes	9	0.00000001	0.00004723
25	Yes	9	0.00000001	0.00005160
26	Yes	9	0.00000001	0.00007614
27	Yes	7	0.00000001	0.00006061
28	Yes	7	0.00000001	0.00005772
29	Yes	7	0.00000001	0.00005412
30	Yes	6	0.00000001	0.00012030
31	Yes	7	0.00000001	0.00004900
32	Yes	6	0.00000001	0.00012447
33	Yes	6	0.00000001	0.00009280
34	Yes	6	0.00000001	0.00010711
35	Yes	6	0.00000001	0.00013967
36	Yes	6	0.00000001	0.00010252
37	Yes	6	0.00000001	0.00011043
38	Yes	7	0.00000001	0.00005069

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	100 - 90	0.849	29	0.0457	0.0170
T1	90 - 86.6667	0.749	29	0.0448	0.0185
T2	86.6667 - 83.3333	0.724	29	0.0394	0.0189
T3	83.3333 - 80	0.700	29	0.0389	0.0507
T4	80 - 70	0.674	29	0.0397	0.0413
T5	70 - 66.6667	0.590	27	0.0459	0.0736
T6	66.6667 - 63.3334	0.559	27	0.0487	0.0548
T7	63.3334 - 60	0.526	27	0.0512	0.0740
T8	60 - 50	0.490	27	0.0533	0.0528
T9	50 - 40	0.372	27	0.0554	0.0721
T10	40 - 36.6667	0.253	27	0.0483	0.0573
T11	36.6667 - 33.3334	0.222	27	0.0450	0.0707
T12	33.3334 - 30	0.192	27	0.0422	0.0429
T13	30 - 20	0.164	27	0.0395	0.0649
T14	20 - 16.6667	0.088	27	0.0313	0.0314

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T15	16.6667 - 13.3334	0.066	27	0.0279	0.0526
T16	13.3334 - 10	0.047	27	0.0240	0.0240
T17	10 - 0	0.030	27	0.0194	0.0450

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
104.58	20 ft x 2" omni whip	29	0.849	0.0457	0.0170	43294
100.25	10 ft x 1.5" Omni	29	0.849	0.0457	0.0170	43294
98.00	2.375" OD x 2.5' Mount Pipe	29	0.827	0.0470	0.0198	43294
97.42	Side Arm Mount	29	0.821	0.0474	0.0206	43294
96.58	2.375" OD x 10' Mount Pipe	29	0.812	0.0478	0.0216	43294
96.00	AIR 6419_TIA w/ Mount Pipe	29	0.806	0.0480	0.0221	43294
90.00	Guy	29	0.749	0.0448	0.0185	32737
76.50	(4) Side Arm Mount	29	0.647	0.0408	0.0503	52040
40.00	Guy	27	0.253	0.0483	0.0573	28111

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	100 - 90	5.980	2	0.3582	0.0935
T1	90 - 86.6667	5.214	2	0.3554	0.0995
T2	86.6667 - 83.3333	4.989	2	0.3335	0.1014
T3	83.3333 - 80	4.766	2	0.3324	0.1528
T4	80 - 70	4.540	2	0.3357	0.1693
T5	70 - 66.6667	3.824	2	0.3584	0.2375
T6	66.6667 - 63.3334	3.569	2	0.3659	0.2148
T7	63.3334 - 60	3.307	2	0.3719	0.2359
T8	60 - 50	3.041	2	0.3759	0.2119
T9	50 - 40	2.234	2	0.3671	0.2232
T10	40 - 36.6667	1.478	2	0.3119	0.1901
T11	36.6667 - 33.3334	1.274	2	0.2881	0.2001
T12	33.3334 - 30	1.084	2	0.2659	0.1595
T13	30 - 20	0.907	2	0.2445	0.1775
T14	20 - 16.6667	0.458	2	0.1802	0.1087
T15	16.6667 - 13.3334	0.336	2	0.1566	0.1232
T16	13.3334 - 10	0.230	2	0.1312	0.0777
T17	10 - 0	0.141	2	0.1032	0.0908

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
104.58	20 ft x 2" omni whip	2	5.980	0.3582	0.0935	11375
100.25	10 ft x 1.5" Omni	2	5.980	0.3582	0.0935	11375
98.00	2.375" OD x 2.5' Mount Pipe	2	5.820	0.3635	0.0933	11375
97.42	Side Arm Mount	2	5.773	0.3649	0.0933	11375

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
96.58	2.375" OD x 10' Mount Pipe	2	5.707	0.3665	0.0934	11375
96.00	AIR 6419_TIA w/ Mount Pipe	2	5.661	0.3674	0.0935	11375
90.00	Guy	2	5.214	0.3554	0.0995	8871
76.50	(4) Side Arm Mount	2	4.297	0.3419	0.1956	18074
40.00	Guy	2	1.478	0.3119	0.1901	5178

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
L1	100	Latticed Pole Diagonal	A325N	0.5000	2	1.33	7.34	0.181 ✔	1	Member Block Shear
		Latticed Pole Secondary Horizontal	A325N	0.5000	2	0.62	5.93	0.104 ✔	1	Member Block Shear
		Latticed Pole Top Girt	A325N	0.5000	2	0.09	5.51	0.016 ✔	1	Member Block Shear
T1	90	Diagonal	A325N	0.5000	1	2.47	4.28	0.577 ✔	1	Member Bearing
		Top Guy Pull-Off@90	A325N	0.5000	1	0.00	8.55	0.000 ✔	1	Gusset Bearing
		Torque Arm Top@90	A325N	0.5000	2	3.64	8.84	0.412 ✔	1	Bolt Shear
		Torque Arm Bottom@90	A325N	0.5000	2	4.06	8.84	0.460 ✔	1	Bolt Shear
T2	86.6667	Diagonal	A325N	0.5000	1	2.45	4.28	0.574 ✔	1	Member Bearing
		Bottom Guy Pull-Off@90	A325N	0.5000	1	1.12	8.55	0.131 ✔	1	Member Bearing
T3	83.3333	Leg	A325N	0.5000	12	1.86	8.84	0.211 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	2.11	4.28	0.493 ✔	1	Member Bearing
		Horizontal	A325N	0.5000	1	0.27	2.45	0.109 ✔	1	Member Block Shear
T4	80	Leg	A325N	0.5000	12	2.14	8.84	0.242 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	1.88	3.15	0.598 ✔	1	Member Block Shear
		Horizontal	A325N	0.5000	1	0.76	2.45	0.309 ✔	1	Member Block Shear
T5	70	Diagonal	A325N	0.5000	1	0.67	7.20	0.093 ✔	1	Member Bearing
		Horizontal	A325N	0.5000	1	0.28	2.45	0.113 ✔	1	Member Block Shear
T6	66.6667	Diagonal	A325N	0.5000	1	0.35	3.15	0.112 ✔	1	Member Block Shear
		Horizontal	A325N	0.5000	1	0.29	2.45	0.117 ✔	1	Member Block Shear
T7	63.3334	Leg	A325N	0.5000	12	2.16	8.84	0.244 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	1.18	7.20	0.164 ✔	1	Member Bearing
		Horizontal	A325N	0.5000	1	0.30	2.45	0.121 ✔	1	Member Block Shear
T8	60	Leg	A325N	0.5000	12	2.13	8.84	0.241 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	1.26	4.28	0.295 ✔	1	Member Bearing
		Horizontal	A325N	0.5000	1	0.32	2.45	0.130 ✔	1	Member Block Shear
T9	50	Leg	A325N	0.5000	12	3.19	8.84	0.361 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	1.73	4.28	0.405 ✔	1	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Horizontal	A325N	0.5000	1	0.33	2.45	0.135 ✔	1	Member Block Shear
T10	40	Diagonal	A325N	0.5000	1	0.57	3.15	0.182 ✔	1	Member Block Shear
		Top Guy Pull-Off@40	A325N	0.5000	1	2.20	2.45	0.899 ✔	1	Member Block Shear
T11	36.6667	Diagonal	A325N	0.5000	1	1.05	7.20	0.146 ✔	1	Member Bearing
		Horizontal	A325N	0.5000	1	0.34	2.45	0.139 ✔	1	Member Block Shear
T12	33.3334	Leg	A325N	0.5000	12	3.29	8.84	0.372 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	0.86	7.20	0.120 ✔	1	Member Bearing
		Horizontal	A325N	0.5000	1	0.34	2.45	0.141 ✔	1	Member Block Shear
T13	30	Leg	A325N	0.5000	12	3.28	8.84	0.371 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	1.08	7.20	0.150 ✔	1	Member Bearing
		Horizontal	A325N	0.5000	1	0.37	2.45	0.149 ✔	1	Member Block Shear
T14	20	Diagonal	A325N	0.5000	1	0.49	3.15	0.156 ✔	1	Member Block Shear
		Horizontal	A325N	0.5000	1	0.37	2.45	0.150 ✔	1	Member Block Shear
T15	16.6667	Diagonal	A325N	0.5000	1	1.43	7.20	0.199 ✔	1	Member Bearing
		Horizontal	A325N	0.5000	1	0.37	2.45	0.152 ✔	1	Member Block Shear
T16	13.3334	Leg	A325N	0.5000	12	3.80	8.84	0.430 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	0.82	3.15	0.259 ✔	1	Member Block Shear
		Horizontal	A325N	0.5000	1	0.39	2.45	0.161 ✔	1	Member Block Shear
T17	10	Diagonal	A325N	0.5000	1	1.14	3.15	0.362 ✔	1	Member Block Shear
		Horizontal	A325N	0.5000	1	0.46	2.45	0.188 ✔	1	Member Block Shear
		Bottom Girt	A325N	0.5000	3	6.63	8.84	0.750 ✔	1	Bolt Shear

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T1	90.00 (A) (247)	1/2 EHS	2.69	24.21	7.18	14.53	1.000	2.024 ✔
	90.00 (A) (248)	1/2 EHS	2.69	24.21	7.31	14.53	1.000	1.987 ✔
	90.00 (B) (241)	1/2 EHS	2.69	24.21	7.29	14.53	1.000	1.993 ✔
	90.00 (B) (242)	1/2 EHS	2.69	24.21	7.18	14.53	1.000	2.022 ✔
	90.00 (C) (235)	1/2 EHS	2.69	24.21	7.45	14.53	1.000	1.951 ✔
	90.00 (C) (236)	1/2 EHS	2.69	24.21	7.52	14.53	1.000	1.933 ✔
T10	40.00 (A) (255)	7/16 EHS	2.08	18.72	4.33	11.23	1.000	2.597 ✔
	40.00 (B) (254)	7/16 EHS	2.08	18.72	4.20	11.23	1.000	2.674 ✔

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
	40.00 (C) (253)	7/16 EHS	2.08	18.72	4.40	11.23	1.000	2.552 ✔

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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	100 - 90	Pipe 4.0" x 0.226" (3.5 STD)	10.00	5.00	44.9 K=1.00	2.6795	1.00	-3.01	76.14	0.040 [1] ✔
T1	90 - 86.6667	PL 6" x .25"	3.33	3.33	81.4 K=2.00	1.5000	1.00	-10.28	40.06	0.257 [1] ✔
T2	86.6667 - 83.3333	PL 6" x .25"	3.33	3.33	55.0 K=1.00	1.5000	1.00	-10.92	45.19	0.242 [1] ✔
T3	83.3333 - 80	PL 6" x .25"	3.33	3.33	55.0 K=1.00	1.5000	1.00	-11.18	45.19	0.247 [1] ✔
T4	80 - 70	PL 6" x .25"	10.00	3.33	55.0 K=1.00	1.5000	1.00	-12.82	45.19	0.284 [1] ✔
T5	70 - 66.6667	PL 6" x .25"	3.33	3.33	55.0 K=1.00	1.5000	1.00	-13.00	45.19	0.288 [1] ✔
T6	66.6667 - 63.3334	PL 6" x .25"	3.33	3.33	55.0 K=1.00	1.5000	1.00	-12.98	45.19	0.287 [1] ✔
T7	63.3334 - 60	PL 6" x .25"	3.33	3.33	55.0 K=1.00	1.5000	1.00	-12.95	45.19	0.287 [1] ✔
T8	60 - 50	PL 6" x .25"	10.00	3.33	55.0 K=1.00	1.5000	1.00	-12.91	45.19	0.286 [1] ✔
T9	50 - 40	PL 6" x .25"	10.00	3.33	55.0 K=1.00	1.5000	1.00	-19.14	45.19	0.423 [1] ✔
T10	40 - 36.6667	PL 6" x .25"	3.33	3.33	55.0 K=1.00	1.5000	1.00	-20.67	45.19	0.457 [1] ✔
T11	36.6667 - 33.3334	PL 6" x .25"	3.33	3.33	55.0 K=1.00	1.5000	1.00	-19.66	45.19	0.435 [1] ✔
T12	33.3334 - 30	PL 6" x .25"	3.33	3.33	55.0 K=1.00	1.5000	1.00	-19.73	45.19	0.437 [1] ✔
T13	30 - 20	PL 6" x .25"	10.00	3.33	55.0 K=1.00	1.5000	1.00	-19.81	45.19	0.438 [1] ✔
T14	20 - 16.6667	PL 6" x .25"	3.33	3.33	55.0 K=1.00	1.5000	1.00	-20.85	45.19	0.461 [1] ✔
T15	16.6667 - 13.3334	PL 6" x .25"	3.33	3.33	55.0 K=1.00	1.5000	1.00	-21.10	45.19	0.467 [1] ✔
T16	13.3334 - 10	PL 6" x .25"	3.33	3.33	55.0 K=1.00	1.5000	1.00	-22.78	45.19	0.504 [1] ✔
T17	10 - 0	PL 6" x .25"	10.00	3.33	55.0 K=1.00	1.5000	1.00	-26.56	45.19	0.588 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	100 - 90	2L 2 x 1.5 x 1/8 LLV (1/4)	11.79	5.73	113.0 K=1.00	0.8438	-2.90	15.89	0.183 [1] ✔
T1	90 - 86.6667	L 2 x 2 x 1/8	4.57	4.36	131.6 K=1.00	0.4844	-2.60	8.00	0.325 [1] ✔
T2	86.6667 - 83.3333	L 2 x 2 x 1/8	4.57	4.36	131.6 K=1.00	0.4844	-2.72	8.00	0.340 [1] ✔
T3	83.3333 - 80	L 2 x 2 x 1/8	4.57	4.36	131.6 K=1.00	0.4844	-2.74	8.00	0.342 [1] ✔
T4	80 - 70	L 1.5 x 1.5 x 1/8	4.57	4.36	176.7 K=1.00	0.3594	-2.25	3.30	0.683 [1] ✔
T5	70 - 66.6667	L 1.5 x 1.5 x 1/8	4.57	4.36	176.7 K=1.00	0.3594	-0.67	3.30	0.204 [1] ✔
T6	66.6667 - 63.3334	L 1.5 x 1.5 x 1/8	4.57	4.36	176.7 K=1.00	0.3594	-0.77	3.30	0.234 [1] ✔
T7	63.3334 - 60	L 2 x 2 x 1/8	4.57	4.36	131.6 K=1.00	0.4844	-1.18	8.00	0.147 [1] ✔
T8	60 - 50	L 2 x 2 x 1/8	4.57	4.36	131.6 K=1.00	0.4844	-1.73	8.00	0.216 [1] ✔
T9	50 - 40	L 2 x 2 x 1/8	4.57	4.36	131.6 K=1.00	0.4844	-2.52	8.00	0.314 [1] ✔
T10	40 - 36.6667	L 1.5 x 1.5 x 1/8	4.57	4.36	176.7 K=1.00	0.3594	-1.07	3.30	0.325 [1] ✔
T11	36.6667 - 33.3334	L 1.5 x 1.5 x 1/8	4.57	4.36	176.7 K=1.00	0.3594	-1.05	3.30	0.319 [1] ✔
T12	33.3334 - 30	L 1.5 x 1.5 x 1/8	4.57	4.36	176.7 K=1.00	0.3594	-0.86	3.30	0.262 [1] ✔
T13	30 - 20	L 1.5 x 1.5 x 1/8	4.57	4.36	176.7 K=1.00	0.3594	-1.08	3.30	0.328 [1] ✔
T14	20 - 16.6667	L 1.5 x 1.5 x 1/8	4.57	4.36	176.7 K=1.00	0.3594	-0.95	3.30	0.290 [1] ✔
T15	16.6667 - 13.3334	L 1.5 x 1.5 x 1/8	4.57	4.36	176.7 K=1.00	0.3594	-1.43	3.30	0.435 [1] ✔
T16	13.3334 - 10	L 1.5 x 1.5 x 1/8	4.57	4.36	176.7 K=1.00	0.3594	-1.28	3.30	0.389 [1] ✔
T17	10 - 0	L 1.5 x 1.5 x 1/8	4.57	4.36	176.7 K=1.00	0.3594	-1.75	3.30	0.530 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	83.3333 - 80	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.19	4.19	0.046 [1] ✔
T4	80 - 70	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.41	4.19	0.099 [1] ✔
T5	70 - 66.6667	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.23	4.19	0.054 [1] ✔
T6	66.6667 - 63.3334	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.22	4.19	0.054 [1] ✔
T7	63.3334 - 60	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.22	4.19	0.054 [1] ✔
T8	60 - 50	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.22	4.19	0.053 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	50 - 40	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.33	4.19	0.079 [1] ✔
T11	36.6667 - 33.3334	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.34	4.19	0.081 [1] ✔
T12	33.3334 - 30	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.34	4.19	0.082 [1] ✔
T13	30 - 20	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.34	4.19	0.082 [1] ✔
T14	20 - 16.6667	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.36	4.19	0.086 [1] ✔
T15	16.6667 - 13.3334	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.37	4.19	0.087 [1] ✔
T16	13.3334 - 10	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.39	4.19	0.094 [1] ✔
T17	10 - 0	L 1.25 x 1.25 x 1/8	3.13	2.92	142.4 K=1.00	0.2969	-0.46	4.19	0.110 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	100 - 90	2L 2 x 1.5 x 1/8 LLH (1/4)	6.25	2.96	79.2 K=1.00	0.8438	-1.25	22.19	0.056 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	100 - 90	L 2 x 2 x 3/16	6.25	5.92	157.0 K=0.87	0.7150	-0.09	8.30	0.010 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	100 - 90	L 2 x 2 x 3/16	6.25	6.25	163.3 K=0.86	0.7150	-0.05	7.68	0.007 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	90 - 86.6667	L 3 x 2 x 1/4 LLV	3.13	2.92	100.2 K=1.25	1.1875	-0.00	27.84	0.000 [1] ✔

[1] P_u / ϕP_n controls

Bottom Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	86.6667 - 83.3333	L 2.5 x 2.5 x 1/4	3.13	2.92	95.6 K=1.34	1.1900	-0.77	28.92	0.026 [1] ✔

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	90 - 86.6667 (239)	2L 2 x 2 x 3/16 (1/4)	4.57	4.57	88.8 K=1.00	1.4297	-7.92	29.02	0.273 [1] ✔
T1	90 - 86.6667 (240)	2L 2 x 2 x 3/16 (1/4)	4.57	4.57	88.8 K=1.00	1.4297	-7.99	29.02	0.275 [1] ✔
T1	90 - 86.6667 (245)	2L 2 x 2 x 3/16 (1/4)	4.57	4.57	88.8 K=1.00	1.4297	-8.13	29.02	0.280 [1] ✔
T1	90 - 86.6667 (246)	2L 2 x 2 x 3/16 (1/4)	4.57	4.57	88.8 K=1.00	1.4297	-7.59	29.02	0.262 [1] ✔
T1	90 - 86.6667 (251)	2L 2 x 2 x 3/16 (1/4)	4.57	4.57	88.8 K=1.00	1.4297	-8.02	29.02	0.276 [1] ✔
T1	90 - 86.6667 (252)	2L 2 x 2 x 3/16 (1/4)	4.57	4.57	88.8 K=1.00	1.4297	-7.05	29.02	0.243 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	100 - 90	Pipe 4.0" x 0.226" (3.5 STD)	10.00	5.00	44.9	2.6795	0.97	84.41	0.012 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	90 - 86.6667	PL 6" x .25"	3.33	3.33	48.7	1.5000	8.52	44.55	0.191 [1] ✔
T17	10 - 0	PL 6" x .25"	10.00	3.33	48.7	1.5000	1.65	44.55	0.037 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	100 - 90	2L 2 x 1.5 x 1/8 LLV (1/4)	11.79	5.73	110.5	0.5156	2.66	23.20	0.115 [1] ✔
T1	90 - 86.6667	L 2 x 2 x 1/8	4.57	4.36	87.6	0.3047	2.47	13.71	0.180 [1] ✔
T2	86.6667 - 83.3333	L 2 x 2 x 1/8	4.57	4.36	87.6	0.3047	2.45	13.71	0.179 [1] ✔
T3	83.3333 - 80	L 2 x 2 x 1/8	4.57	4.36	87.6	0.3047	2.11	13.71	0.154 [1] ✔
T4	80 - 70	L 1.5 x 1.5 x 1/8	4.57	4.36	117.9	0.2109	1.88	9.49	0.198 [1] ✔
T6	66.6667 - 63.3334	L 1.5 x 1.5 x 1/8	4.57	4.36	117.9	0.2109	0.35	9.49	0.037 [1] ✔
T7	63.3334 - 60	L 2 x 2 x 1/8	4.57	4.36	87.6	0.3047	0.44	13.71	0.032 [1] ✔
T8	60 - 50	L 2 x 2 x 1/8	4.57	4.36	87.6	0.3047	1.26	13.71	0.092 [1] ✔
T9	50 - 40	L 2 x 2 x 1/8	4.57	4.36	87.6	0.3047	1.73	13.71	0.126 [1] ✔
T10	40 - 36.6667	L 1.5 x 1.5 x 1/8	4.57	4.36	117.9	0.2109	0.57	9.49	0.061 [1] ✔
T11	36.6667 - 33.3334	L 1.5 x 1.5 x 1/8	4.57	4.36	117.9	0.2109	0.45	9.49	0.047 [1] ✔
T12	33.3334 - 30	L 1.5 x 1.5 x 1/8	4.57	4.36	117.9	0.2109	0.24	9.49	0.025 [1] ✔
T13	30 - 20	L 1.5 x 1.5 x 1/8	4.57	4.36	117.9	0.2109	0.19	9.49	0.020 [1] ✔
T14	20 - 16.6667	L 1.5 x 1.5 x 1/8	4.57	4.36	117.9	0.2109	0.49	9.49	0.052 [1] ✔
T15	16.6667 - 13.3334	L 1.5 x 1.5 x 1/8	4.57	4.36	117.9	0.2109	0.51	9.49	0.053 [1] ✔
T16	13.3334 - 10	L 1.5 x 1.5 x 1/8	4.57	4.36	117.9	0.2109	0.82	9.49	0.086 [1] ✔
T17	10 - 0	L 1.5 x 1.5 x 1/8	4.57	4.36	117.9	0.2109	1.14	9.49	0.120 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	83.3333 - 80	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.27	7.38	0.036 [1] ✔
T4	80 - 70	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.76	7.38	0.103 [1] ✔
T5	70 - 66.6667	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.28	7.38	0.038 [1] ✔
T6	66.6667 - 63.3334	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.29	7.38	0.039 [1] ✔
T7	63.3334 - 60	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.30	7.38	0.040 [1] ✔
T8	60 - 50	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.32	7.38	0.043 [1] ✔
T9	50 - 40	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.33	7.38	0.045 [1] ✔
T11	36.6667 - 33.3334	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.34	7.38	0.046 [1] ✔
T12	33.3334 - 30	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.34	7.38	0.047 [1] ✔
T13	30 - 20	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.37	7.38	0.050 [1] ✔
T14	20 - 16.6667	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.37	7.38	0.050 [1] ✔
T15	16.6667 - 13.3334	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.37	7.38	0.050 [1] ✔
T16	13.3334 - 10	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.39	7.38	0.053 [1] ✔
T17	10 - 0	L 1.25 x 1.25 x 1/8	3.13	2.92	97.5	0.1641	0.46	7.38	0.062 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	100 - 90	2L 2 x 1.5 x 1/8 LLH (1/4)	6.25	2.96	83.7	0.5156	1.23	23.20	0.053 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	100 - 90	L 2 x 2 x 3/16	6.25	5.92	121.6	0.4484	0.18	20.18	0.009 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
L1	100 - 90	L 2 x 2 x 3/16	6.25	6.25	121.6	0.7150	0.05	21.24	0.002 [1] ✔
T17	10 - 0	L 3 x 3 x 3/8	3.13	2.67	41.1	2.1100	19.89	62.67	0.317*[1] ✔

* DL controls
[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	90 - 86.6667	L 3 x 2 x 1/4 LLV	3.13	2.92	65.3	1.1875	0.00	35.27	0.000 [1] ✔
T10	40 - 36.6667	L 1.25 x 1.25 x 1/8	3.13	3.13	97.5	0.2969	2.20	8.82	0.250 [1] ✔

[1] P_u / ϕP_n controls

Bottom Guy Pull-Off Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T2	86.6667 - 83.3333	L 2.5 x 2.5 x 1/4	3.13	2.92	48.8	1.1900	1.12	35.34	0.032 [1] ✔

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	90 - 86.6667 (237)	L 2 x 2 x 3/16	3.13	3.13	96.4	0.7220	6.45	21.44	0.301 [1] ✔
T1	90 - 86.6667 (238)	L 2 x 2 x 3/16	3.13	3.13	96.4	0.7220	6.63	21.44	0.309 [1] ✔
T1	90 - 86.6667 (243)	L 2 x 2 x 3/16	3.13	3.13	96.4	0.7220	7.26	21.44	0.339 [1] ✔
T1	90 - 86.6667 (244)	L 2 x 2 x 3/16	3.13	3.13	96.4	0.7220	6.81	21.44	0.318 [1] ✔
T1	90 - 86.6667 (249)	L 2 x 2 x 3/16	3.13	3.13	96.4	0.7220	7.28	21.44	0.340 [1] ✔
T1	90 - 86.6667 (250)	L 2 x 2 x 3/16	3.13	3.13	96.4	0.7220	6.34	21.44	0.295 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	100 - 90	Latticed Pole Leg	Pipe 4.0" x 0.226" (3.5 STD)	2	-3.01	76.14	4.0	Pass
L1	100 - 90	Latticed Pole Diagonal	2L 2 x 1.5 x 1/8 LLV (1/4)	10	-2.90	15.89	18.3	Pass
L1	100 - 90	Latticed Pole Secondary Horizontal	2L 2 x 1.5 x 1/8 LLH (1/4)	16	-1.25	22.19	5.6 10.4 (b)	Pass
L1	100 - 90	Latticed Pole Top Girt	L 2 x 2 x 3/16	6	-0.09	8.30	1.0 1.6 (b)	Pass
L1	100 - 90	Latticed Pole Bottom Girt	L 2 x 2 x 3/16	7	-0.05	7.68	0.7	Pass
T1	90 - 86.6667	Leg	PL 6" x .25"	20	-10.28	40.06	25.7	Pass
T2	86.6667 - 83.3333	Leg	PL 6" x .25"	29	-10.92	45.19	24.2	Pass
T3	83.3333 - 80	Leg	PL 6" x .25"	38	-11.18	45.19	24.7	Pass
T4	80 - 70	Leg	PL 6" x .25"	46	-12.82	45.19	28.4	Pass
T5	70 - 66.6667	Leg	PL 6" x .25"	67	-13.00	45.19	28.8	Pass
T6	66.6667 - 63.3334	Leg	PL 6" x .25"	76	-12.98	45.19	28.7	Pass
T7	63.3334 - 60	Leg	PL 6" x .25"	85	-12.95	45.19	28.7	Pass
T8	60 - 50	Leg	PL 6" x .25"	94	-12.91	45.19	28.6	Pass
T9	50 - 40	Leg	PL 6" x .25"	117	-19.14	45.19	42.3	Pass
T10	40 - 36.6667	Leg	PL 6" x .25"	138	-20.67	45.19	45.7	Pass
T11	36.6667 - 33.3334	Leg	PL 6" x .25"	147	-19.66	45.19	43.5	Pass
T12	33.3334 - 30	Leg	PL 6" x .25"	156	-19.73	45.19	43.7	Pass
T13	30 - 20	Leg	PL 6" x .25"	165	-19.81	45.19	43.8	Pass
T14	20 - 16.6667	Leg	PL 6" x .25"	186	-20.85	45.19	46.1	Pass
T15	16.6667 - 13.3334	Leg	PL 6" x .25"	195	-21.10	45.19	46.7	Pass
T16	13.3334 - 10	Leg	PL 6" x .25"	204	-22.78	45.19	50.4	Pass
T17	10 - 0	Leg	PL 6" x .25"	213	-26.56	45.19	58.8	Pass
T1	90 - 86.6667	Diagonal	L 2 x 2 x 1/8	27	-2.60	8.00	32.5 57.7 (b)	Pass
T2	86.6667 - 83.3333	Diagonal	L 2 x 2 x 1/8	36	-2.72	8.00	34.0 57.4 (b)	Pass
T3	83.3333 - 80	Diagonal	L 2 x 2 x 1/8	45	-2.74	8.00	34.2 49.3 (b)	Pass
T4	80 - 70	Diagonal	L 1.5 x 1.5 x 1/8	66	-2.25	3.30	68.3	Pass
T5	70 - 66.6667	Diagonal	L 1.5 x 1.5 x 1/8	75	-0.67	3.30	20.4	Pass
T6	66.6667 - 63.3334	Diagonal	L 1.5 x 1.5 x 1/8	84	-0.77	3.30	23.4	Pass
T7	63.3334 - 60	Diagonal	L 2 x 2 x 1/8	93	-1.18	8.00	14.7 16.4 (b)	Pass
T8	60 - 50	Diagonal	L 2 x 2 x 1/8	102	-1.73	8.00	21.6 29.5 (b)	Pass
T9	50 - 40	Diagonal	L 2 x 2 x 1/8	123	-2.52	8.00	31.4 40.5 (b)	Pass
T10	40 - 36.6667	Diagonal	L 1.5 x 1.5 x 1/8	143	-1.07	3.30	32.5	Pass
T11	36.6667 - 33.3334	Diagonal	L 1.5 x 1.5 x 1/8	152	-1.05	3.30	31.9	Pass
T12	33.3334 - 30	Diagonal	L 1.5 x 1.5 x 1/8	160	-0.86	3.30	26.2	Pass
T13	30 - 20	Diagonal	L 1.5 x 1.5 x 1/8	171	-1.08	3.30	32.8	Pass
T14	20 - 16.6667	Diagonal	L 1.5 x 1.5 x 1/8	192	-0.95	3.30	29.0	Pass
T15	16.6667 - 13.3334	Diagonal	L 1.5 x 1.5 x 1/8	201	-1.43	3.30	43.5	Pass
T16	13.3334 - 10	Diagonal	L 1.5 x 1.5 x 1/8	210	-1.28	3.30	38.9	Pass
T17	10 - 0	Diagonal	L 1.5 x 1.5 x 1/8	222	-1.75	3.30	53.0	Pass
T3	83.3333 - 80	Horizontal	L 1.25 x 1.25 x 1/8	40	-0.19	4.19	4.6 10.9 (b)	Pass
T4	80 - 70	Horizontal	L 1.25 x 1.25 x 1/8	63	0.76	7.38	10.3 30.9 (b)	Pass
T5	70 - 66.6667	Horizontal	L 1.25 x 1.25 x 1/8	72	-0.23	4.19	5.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							11.3 (b)	
T6	66.6667 - 63.3334	Horizontal	L 1.25 x 1.25 x 1/8	81	-0.22	4.19	5.4	Pass
							11.7 (b)	
T7	63.3334 - 60	Horizontal	L 1.25 x 1.25 x 1/8	90	-0.22	4.19	5.4	Pass
							12.1 (b)	
T8	60 - 50	Horizontal	L 1.25 x 1.25 x 1/8	99	-0.22	4.19	5.3	Pass
							13.0 (b)	
T9	50 - 40	Horizontal	L 1.25 x 1.25 x 1/8	119	-0.33	4.19	7.9	Pass
							13.5 (b)	
T11	36.6667 - 33.3334	Horizontal	L 1.25 x 1.25 x 1/8	149	-0.34	4.19	8.1	Pass
							13.9 (b)	
T12	33.3334 - 30	Horizontal	L 1.25 x 1.25 x 1/8	158	-0.34	4.19	8.2	Pass
							14.1 (b)	
T13	30 - 20	Horizontal	L 1.25 x 1.25 x 1/8	167	-0.34	4.19	8.2	Pass
							14.9 (b)	
T14	20 - 16.6667	Horizontal	L 1.25 x 1.25 x 1/8	188	-0.36	4.19	8.6	Pass
							15.0 (b)	
T15	16.6667 - 13.3334	Horizontal	L 1.25 x 1.25 x 1/8	197	-0.37	4.19	8.7	Pass
							15.2 (b)	
T16	13.3334 - 10	Horizontal	L 1.25 x 1.25 x 1/8	206	-0.39	4.19	9.4	Pass
							16.1 (b)	
T17	10 - 0	Horizontal	L 1.25 x 1.25 x 1/8	215	-0.46	4.19	11.0	Pass
							18.8 (b)	
T17	10 - 0	Bottom Girt	L 3 x 3 x 3/8	218	19.89	62.67	31.7	Pass
							75.0 (b)	
T1	90 - 86.6667	Guy A@90	1/2	248	7.31	14.53	50.3	Pass
T10	40 - 36.6667	Guy A@40	7/16	255	4.33	11.23	38.5	Pass
T1	90 - 86.6667	Guy B@90	1/2	241	7.29	14.53	50.2	Pass
T10	40 - 36.6667	Guy B@40	7/16	254	4.20	11.23	37.4	Pass
T1	90 - 86.6667	Guy C@90	1/2	236	7.52	14.53	51.7	Pass
T10	40 - 36.6667	Guy C@40	7/16	253	4.40	11.23	39.2	Pass
T1	90 - 86.6667	Top Guy Pull-Off@90	L 3 x 2 x 1/4 LLV	22	-0.00	27.84	0.2	Pass
T10	40 - 36.6667	Top Guy Pull-Off@40	L 1.25 x 1.25 x 1/8	140	2.20	8.82	25.0	Pass
							89.9 (b)	
T2	86.6667 - 83.3333	Bottom Guy Pull-Off@90	L 2.5 x 2.5 x 1/4	31	1.12	35.34	3.2	Pass
							13.1 (b)	
T1	90 - 86.6667	Torque Arm Top@90	L 2 x 2 x 3/16	249	7.28	21.44	34.0	Pass
							41.2 (b)	
T1	90 - 86.6667	Torque Arm Bottom@90	2L 2 x 2 x 3/16 (1/4)	245	-8.13	29.02	28.0	Pass
							46.0 (b)	
							Summary	
						Latticed Pole Leg (L1)	4.0	Pass
						Latticed Pole Diagonal (L1)	18.3	Pass
						Latticed Pole Secondary Horizontal (L1)	10.4	Pass
						Latticed Pole Top Girt (L1)	1.6	Pass
						Latticed Pole Bottom Girt (L1)	0.7	Pass
						Leg (T17)	58.8	Pass
						Diagonal (T4)	68.3	Pass
						Horizontal (T4)	30.9	Pass
						Bottom Girt (T17)	75.0	Pass
						Guy A (T1)	50.3	Pass
						Guy B (T1)	50.2	Pass

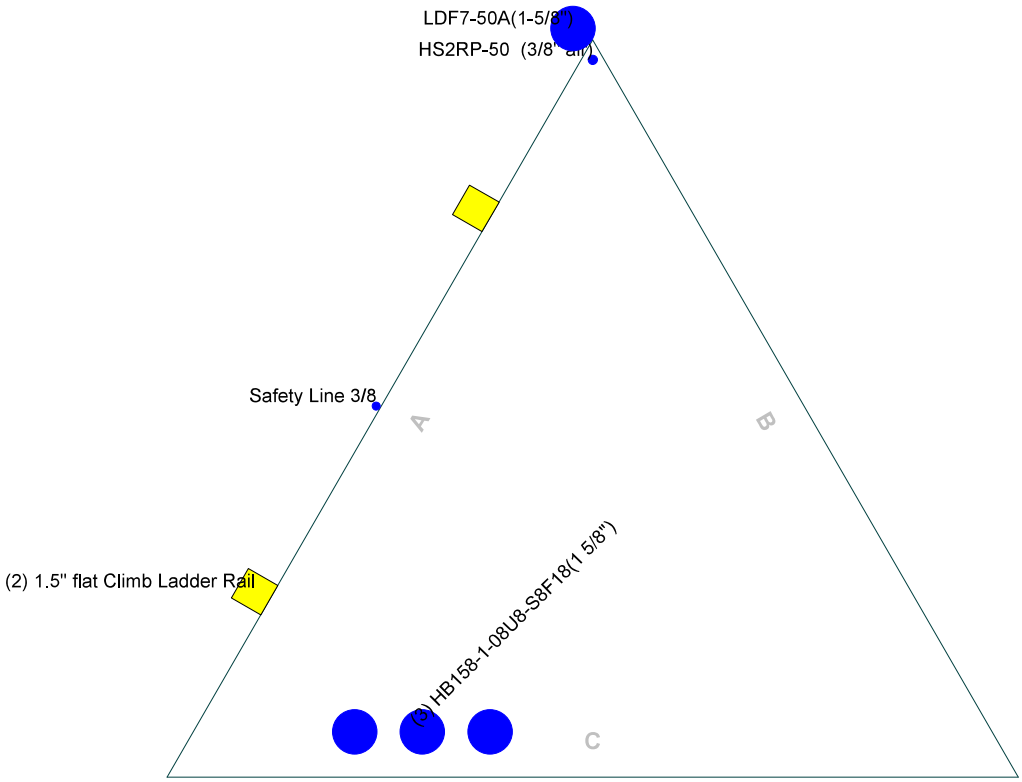
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						Guy C (T1)	51.7	Pass
						Top Guy Pull-Off (T10)	89.9	Pass
						Bottom Guy Pull-Off (T2)	13.1	Pass
						Torque Arm Top (T1)	41.2	Pass
						Torque Arm Bottom (T1)	46.0	Pass
						Bolt Checks	89.9	Pass
						RATING =	**89.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

Feed Line Plan

Round Flat App In Face App Out Face



Paul J. Ford and Company
250 East Broad St., Suite 600
Columbus, OH 43215
Phone: 614-221-6679
FAX:

Job: ***100-ft Guyed Tower; Hawinton, CT***			
Project: ***13322-0019***			
Client: Everest	Drawn by: Anna Trudo	App'd:	
Code: TIA-222-H	Date: 08/25/22	Scale: NTS	
Path:		Dwg No. E-7	

APPENDIX C

ADDITIONAL CALCULATIONS

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

By AKT Date 8/25/2022
Project # 13322-0019.001.8700

Self-Support Tower Anchor Rod Capacity - TIA-H

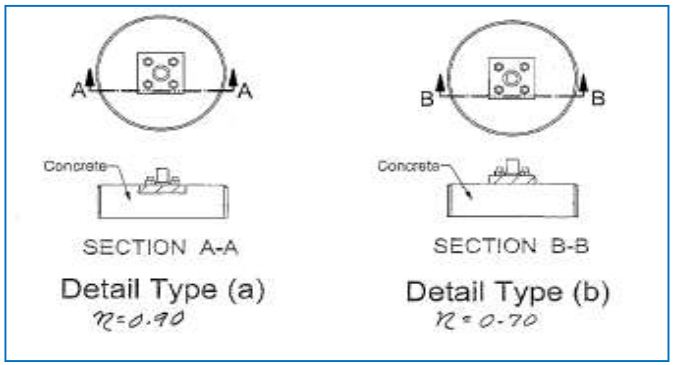
Loads

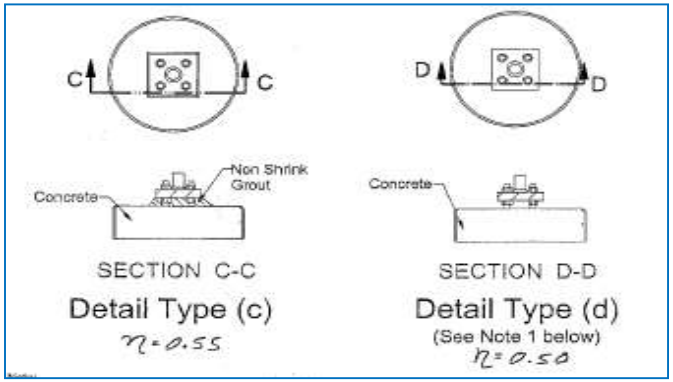
Compression :		kips	Tension :	2	kips
Comp. Shear :		kips	Ten.Shear :	0	kips

Code: TIA-H
Maximum Ratio: 1.00
Grout f'c ≥ 5000 psi:

Existing Anchor Rods

Anchor Rod ø :	5/8	in	l_{ar} :		inches		
Anchor Rod Quantity :	2		Comp. M_u :	0.00	k-in	Ten. M_u :	0.00 k-in
Anchor Rod Grade :	A36		ϕ_c :	0.90			
F_y :	36	ksi	ϕ_v :	0.75			
F_u :	58	ksi	ϕ_f :	0.90			
Threads per Inch	11		$\phi_v R_{nv}$:	13.35	kips		
Net Tensile Area	0.23	in^2					
ϕ_t :	0.75		$\phi_f M_n$:	2.49	k-in		
$\phi_t R_{nt}$:	19.66	kip	$\phi_c R_{nc}$:	19.88	kips		
Anchor Rod Ratio :	0.102		$\phi_c R_{nvc}$:	8.95	kips		





PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

By AKT Date 8/26/2022
Project # 13322-0019.001.8700

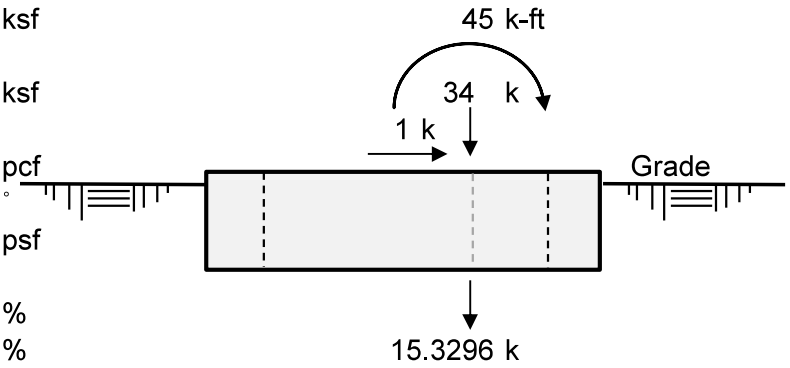
Structure Axial Load :	34.00	kip
Structure Shear Load :	1.00	kip
Structure OTM :	45	kip-ft
Structure Face Width :	3.13	ft
Compression Capacity of Pier :		kip
Tension Capacity of Pier :		kip
Additional Resisting OTM :		kip-ft

Foundation Width :	7.333	ft
Corner Width :	1.167	ft
Foundation Depth :	4.75	ft
Depth Below Grade :	3.75	ft

Ultimate Bearing Capacity :	16.5	ksf
Factor of Safety :	0.6	
Design Bearing Capacity :	9.9	ksf

Soil Density :	113	pcf
Friction Angle :	36	°
Cohesion :	0	psf

Max. Overturning Ratio :	100	%
Max. Bearing Pressure Ratio :	100	%



Wind into the face = Maximum bearing in corner

Total Overturning Moment :	49.75	kip-ft
Resisting Moment :	144.3	kip-ft
Overturning Moment Ratio :	0.34	

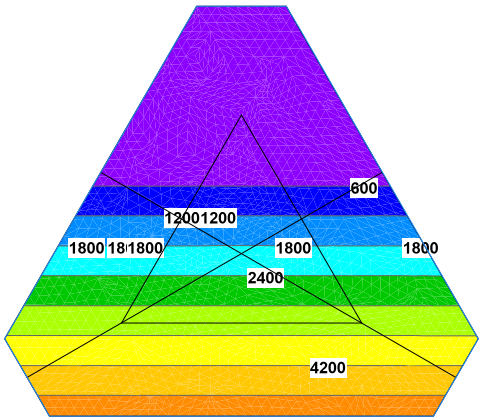
Wind into the corner = Maximum bearing at face

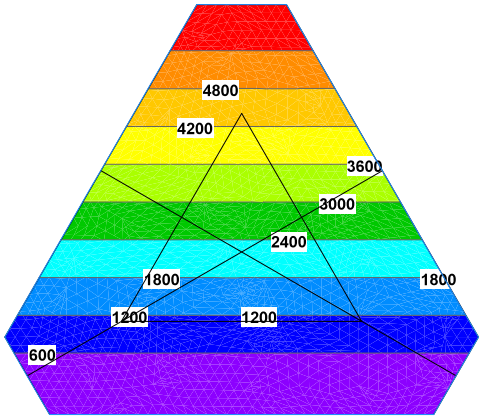
Total Overturning Moment :	49.75	kip-ft
Resisting Moment :	100.876	kip-ft
Overturning Moment Ratio :	0.49	

Factored LC: 0.9D + 1.6W (Uplift): Max Soil Bearing Pressure Plan Plan

Factored LC: 0.9D + 1.6W (Uplift): User Notes; User Lines; User Dimensions;
Drawing Import: User Notes; User Lines; User Dimensions;
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Elements Above; Column Elements Below; Slab Elements; Slab Element Outline Only;
Soil Bearing Design: Latitude Span Designs; Longitude Span Designs; Span Design Spine; Span Design Numbers; Span Design Status; Span Design Detailed Status; Span Design Top Bars; Span Design Bottom Bars; Span Design Shear Bars; Sp
Scale = 1:30
Factored LC: 0.9D + 1.6W (Uplift) - Area Spring Vertical Reactions Plot (Maximum Values)

Min Value = -4.529e-13 psf @ (23.46,26.87) Max Value = 6136 psf @ (35.41,27.4)





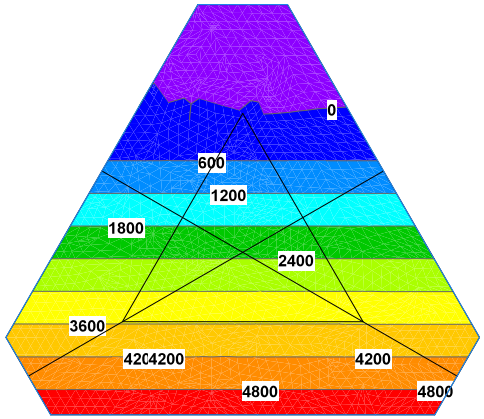
BEARING RATIO = 6136/9900 = 62.0%

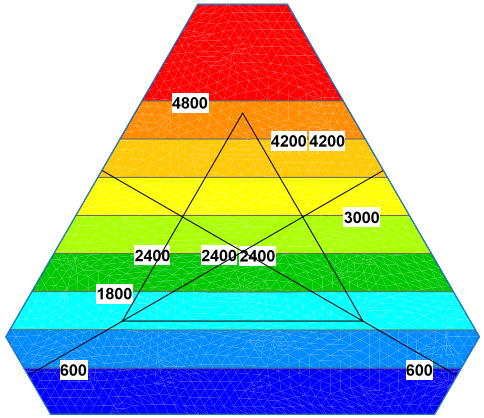
Factored LC: 1.2D + 1.6W (Compression): Max Soil Bearing Pressure Plan

Factored LC: 1.2D + 1.6W (Compression): User Lines; User Notes; User Dimensions;
Drawing Import: User Lines; User Notes; User Dimensions;
Element: Wall Elements Below; Wall Elements Above; Wall Element Outline Only; Column Elements Below; Column Elements Above; Slab Elements; Slab Element Outline Only;
Scale = 1:30
Factored LC: 1.2D + 1.6W (Compression) - Area Spring Vertical Reactions Plot (Maximum Values)

Min Value = -9.058e-13 psf @ (22.49,26.53) Max Value = 6322 psf @ (36.58,27.4)

BEARING RATIO = 6322/9900 = 63.9%





Guyed Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.

Project #:	13322-0019.001.8700
Site Name:	Wildcat Hill
Order Number:	
Location:	A

TIA-222 Revision:	H

Design Reactions		
Shear, **S**:	12.00	kips
Uplift, **Ua**:	15.00	kips
Resultant Force, **Rf**:	19.21	kips
Tower Height, **H**:	100.00	ft
Guy Anchor Radius, **R**:	66.00	ft
Resultant Angle to Horizontal, **θ**:	51.3	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, **Da**:	8.5417	ft
Anchor Width, **Wa**:	3	ft
Anchor Thickness, **Ta**:	3.375	ft
Anchor Length, **La**:	3	ft
Concrete Volume, **Vc**:	1.1	yd^3
Toe Width, **toe**:	0	ft
Guyed Anchor Top Rebar Size, **Sat**:	6	
No. of Bars in Top of Block:	3	
Guyed Anchor Front Rebar Size, **Saf**:	6	
No. of Bars in Front of Block:	3	
Stirrup Size:	4	

Anchor Shaft Area Override:	2.68	in^2
Shear Lag Factor, **u**:	0.75	
Section Type (Reference Only):	C4x5.4	

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Strength, **F'c**:	3	ksi
Wt. Avg.Concrete Density, **δx**:	0.150	kcf
Clear Cover, **cc**:	3	in
Anchor Shaft Grade, **Fy'**:	33	ksi
Anchor Shaft Ultimate Strength, **Fu'**:	58	ksi

Design Checks	Capacity	Demand	Rating	Check
Lateral Capacity (kips):	43.84	12.00	**27.4%**	**Pass**
Uplift Capacity (kips):	45.19	15.00	**33.2%**	**Pass**
*Lateral Flexural Capacity (ft*kips):*	188.54	4.50	**2.4%**	**Pass**
*Uplift Flexural Capacity (ft*kips):*	214.99	5.63	**2.6%**	**Pass**
Anchor Shaft (kips):	70.75	19.21	**27.2%**	**Pass**

Anchor Shaft Rating:	**27.2%**
Structural Rating:	**2.6%**
Soil Rating:	**33.2%**

Neglect Depth, **Neg**:	3.333	ft
Groundwater Level, **gw**:	N/A	ft

Soil Properties:			No. of Soil Layers:	4		
Layer	**φ, deg**	**cu, ksf**	**δ, pcf**		**Ultimate fs (ksf)**	**N (blows/ft)**
1	0		100	0.25		
2	30		110	2.00	0.050	
3	45		115	5.00	0.260	
4	45		118	8.54	0.570	

*key: φ = *Internal Angle of Friction*
cu = Cohesion / Undrained Shear Strength
δ = *Buoyant Soil Unit Weight*
d = Depth to Bottom of Layer
Ultimate fs = Geotechnical Report-provided skin friction / adhesion
N = SPT Blow Count

Guyed Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.

Project #:	13322-0019.001.8700
Site Name:	Wildcat Hill
Order Number:	
Location:	B

TIA-222 Revision:	H

Design Reactions		
Shear, **S**:	12.00	kips
Uplift, **Ua**:	15.00	kips
Resultant Force, **Rf**:	19.21	kips
Tower Height, **H**:	100.00	ft
Guy Anchor Radius, **R**:	67.50	ft
Resultant Angle to Horizontal, **θ**:	51.3	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, **Da**:	7.5	ft
Anchor Width, **Wa**:	3	ft
Anchor Thickness, **Ta**:	2.5	ft
Anchor Length, **La**:	3	ft
Concrete Volume, **Vc**:	0.8	yd^3
Toe Width, **toe**:	0	ft
Guyed Anchor Top Rebar Size, **Sat**:	5	
No. of Bars in Top of Block:	3	
Guyed Anchor Front Rebar Size, **Saf**:	5	
No. of Bars in Front of Block:	3	
Stirrup Size:	4	

Anchor Shaft Area Override:	2.68	in^2
Shear Lag Factor, **u**:	0.75	
Section Type (Reference Only):	C4x5.4	

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Strength, **F'c**:	3	ksi
Wt. Avg.Concrete Density, **δx**:	0.150	kcf
Clear Cover, **cc**:	3	in
Anchor Shaft Grade, **Fy'**:	33	ksi
Anchor Shaft Ultimate Strength, **Fu'**:	58	ksi

Design Checks	Capacity	Demand	Rating	Check
Lateral Capacity (kips):	25.20	12.00	**47.6%**	**Pass**
Uplift Capacity (kips):	33.98	15.00	**44.1%**	**Pass**
*Lateral Flexural Capacity (ft*kips):*	133.18	4.50	**3.4%**	**Pass**
*Uplift Flexural Capacity (ft*kips):*	108.32	5.63	**5.2%**	**Pass**
Anchor Shaft (kips):	70.75	19.21	**27.2%**	**Pass**

Anchor Shaft Rating:	**27.2%**
Structural Rating:	**5.2%**
Soil Rating:	**47.6%**

Neglect Depth, **Neg**:	3.333	ft
Groundwater Level, **gw**:	N/A	ft

Soil Properties:			No. of Soil Layers:	4		
Layer	**φ, deg**	**cu, ksf**	**δ, pcf**		**Ultimate fs (ksf)**	**N (blows/ft)**
1	0		100	2.00		
2	41		114	5.00	0.220	
3	45		115	7.00	0.430	
4	0		114	7.50	2.250	

*key: φ = *Internal Angle of Friction*
cu = Cohesion / Undrained Shear Strength
δ = *Buoyant Soil Unit Weight*
d = Depth to Bottom of Layer
Ultimate fs = Geotechnical Report-provided skin friction / adhesion
N = SPT Blow Count

Version 4.0.0

Guyed Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.

Project #:	13322-0019.001.8700
Site Name:	Wildcat Hill
Order Number:	
Location:	C

TIA-222 Revision:	H

Design Reactions		
Shear, **S**:	12.00	kips
Uplift, **Ua**:	15.00	kips
Resultant Force, **Rf**:	19.21	kips
Tower Height, **H**:	100.00	ft
Guy Anchor Radius, **R**:	66.50	ft
Resultant Angle to Horizontal, **θ**:	51.3	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, **Da**:	6.875	ft
Anchor Width, **Wa**:	3	ft
Anchor Thickness, **Ta**:	3.375	ft
Anchor Length, **La**:	3	ft
Concrete Volume, **Vc**:	1.1	yd^3
Toe Width, **toe**:	0	ft
Guyed Anchor Top Rebar Size, **Sat**:	6	
No. of Bars in Top of Block:	3	
Guyed Anchor Front Rebar Size, **Saf**:	6	
No. of Bars in Front of Block:	3	
Stirrup Size:	4	

Anchor Shaft Area Override:	2.68	in^2
Shear Lag Factor, **u**:	0.75	
Section Type (Reference Only):	C4x5.4	

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Strength, **F'c**:	3	ksi
Wt. Avg.Concrete Density, **δx**:	0.150	kcf
Clear Cover, **cc**:	3	in
Anchor Shaft Grade, **Fy'**:	33	ksi
Anchor Shaft Ultimate Strength, **Fu'**:	58	ksi

Design Checks	Capacity	Demand	Rating	Check
Lateral Capacity (kips):	30.34	12.00	**39.6%**	**Pass**
Uplift Capacity (kips):	23.18	15.00	**64.7%**	**Pass**
*Lateral Flexural Capacity (ft*kips):*	188.54	4.50	**2.4%**	**Pass**
*Uplift Flexural Capacity (ft*kips):*	214.99	5.63	**2.6%**	**Pass**
Anchor Shaft (kips):	70.75	19.21	**27.2%**	**Pass**

Anchor Shaft Rating:	**27.2%**
Structural Rating:	**2.6%**
Soil Rating:	**64.7%**

Neglect Depth, **Neg**:	3.333	ft
Groundwater Level, **gw**:	N/A	ft

Soil Properties:			No. of Soil Layers:	4		
Layer	**φ, deg**	**cu, ksf**	**δ, pcf**		**Ultimate fs (ksf)**	**N (blows/ft)**
1	0		100	0.25		
2	30		110	2.00	0.050	
3	43		113	5.00	0.240	
4	45		115	6.88	0.560	

*key: φ = *Internal Angle of Friction*
cu = Cohesion / Undrained Shear Strength
δ = *Buoyant Soil Unit Weight*
d = Depth to Bottom of Layer
Ultimate fs = Geotechnical Report-provided skin friction / adhesion
N = SPT Blow Count

Version 4.0.0

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 1089.42 ft (NAVD 88)
Latitude: 41.7568
Longitude: -73.0952

Wind

Results:

Wind Speed	117 Vmph
10-year MRI	76 Vmph
25-year MRI	85 Vmph
50-year MRI	90 Vmph
100-year MRI	96 Vmph

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

Date Accessed: Wed Aug 24 2022

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 7-10 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 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

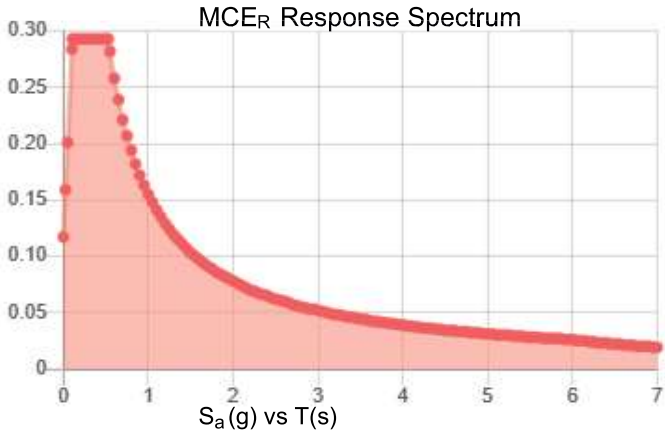
Seismic

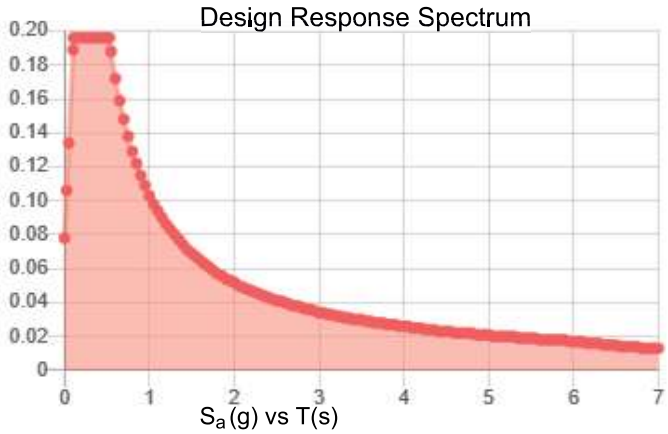
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.183	S_{DS} :	0.196
S_1 :	0.065	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.093
S_{MS} :	0.293	PGA_M :	0.149
S_{M1} :	0.155	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: **Wed Aug 24 2022**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	5 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Aug 24 2022

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 50-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.

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY PAUL J. FORD AND COMPANY

1) Paul J. Ford and Company has not made a field inspection to verify the tower member sizes or the antenna/coax loading. If the existing conditions are not as represented on these drawings, we should be contacted immediately to evaluate the significance of the deviation.

2) No allowance was made for any damaged, missing, or rusted members. The analysis of this tower assumes that no physical deterioration has occurred in any of the structural components of the tower and that all the tower members have the same load carrying capacity as the day the tower was erected.

3) It is not possible to have all the detailed information to perform a thorough analysis of every structural sub-component of an existing tower. The structural analysis by Paul J. Ford and Company verifies the adequacy of the main structural members of the tower. Paul J. Ford and Company provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc.

4) This tower has been analyzed according to the minimum design wind loads recommended by the Telecommunications Industry Association Standard ANSI/TIA-222-H. If the owner or local or state agencies require a higher design wind load, Paul J. Ford and Company should be made aware of this requirement.

5) The enclosed sketches are a schematic representation of the tower that we have analyzed. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions and for the proper fit and clearance in the field.

6) Miscellaneous items such as antenna mounts etc. have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

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Mount Analysis Report

Site Address	Wildcat Hill Rd Harwinton, CT 06791
Site Name	Harwinton SNET_1
Site ID	CT11358A
Project Name	ANCHOR
Design Codes	2015 International Building Code ASCE 7-10 TIA-222-G Standards 2018 CT State Building Code

	Stress Ratio	Overall Result
Existing Mounts	**70%**	**PASS**

Client:

T - Mobile

NORTHEAST, LLC
35 GRIFFIN RD S
BLOOMFIELD, CT 06002

Date: 6/22/2022

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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 existing and 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
96	MP1	40	1	APXVAALL24_43-U-NA20 Antenna	Sector 1
96	**MP2**	**40**	**1**	**AIR 6419 B41 Antenna**	
96	MP1	40	1	4449 B71+B85 RRH	
96	**MP1**	**40**	**1**	**4460 B25+B66 RRH**	
96	-	160	1	APXVAALL24_43-U-NA20 Antenna	Sector 2
96	**-**	**160**	**1**	**AIR 6419 B41 Antenna**	
96	-	160	1	4449 B71+B85 RRH	
96	**-**	**160**	**1**	**4460 B25+B66 RRH**	
96	-	280	1	APXVAALL24_43-U-NA20 Antenna	Sector 3
96	**-**	**280**	**1**	**AIR 6419 B41 Antenna**	
96	-	280	1	4449 B71+B85 RRH	
96	**-**	**280**	**1**	**4460 B25+B66 RRH**	

Notes:

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

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Design Criteria:

Design Codes:

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

Ultimate Wind Speed	120 mph
Nominal Wind Speed	93 mph
Wind Speed with Ice	50 mph
Ice Thickness	0.75 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	0.065 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:

Based on the results of the analysis, we have determined that the existing T-Mobile mounts *are adequate* to support the existing and proposed T-Mobile equipment loading.

	Stress Ratio	Overall Result
Existing Mounts	**70%**	**PASS**

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Reference Documents:

- T-Mobile RFDS CT11358A_Anchor_5_draft, dated 05/26/2022
- Mount Analysis by Centek Engineering, Inc., dated 04/25/2019
- Construction Drawings by Centek Engineering, Inc., dated 11/23/2020

Assumptions and Limitations:

- The calculations performed by Centerline Communications are limited to the structural members in these calculations only.
- The existing mounts are assumed to have been correctly designed and installed.
- 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.

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Design Calculations

CENTERLINE COMMUNICATIONS

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Site Details	
Site Name	Harwinton SNET_1
Carrier	T-Mobile
City, State	Harwinton, CT
Project	Anchor

Mount Details		
Mount Type	Sector Frame	
Mount Height, z	96	ft
Number of Sectors	3	
Tower Type	Guyed	
Tower Height, h	100	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	0.065	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}	120	mph
Nominal Wind Speed, V	93	mph
Wind Speed with Ice, V_i	50	mph
Design Ice Thickness, t_i	0.75	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	0.98	
Gust Effect Factor, G_h	1.00	
Design Ice Thickness, t_{iz}	1.67	in
Velocity Pressure, q_z	20.55	psf
Velocity Pressure with Ice, q_{zi}	5.94	psf
Shielding Factor, K_a	1.00	
Flat Velocity Pressure (Ca =2.0)	41.09	psf
Round Velocity Pressure (Ca = 1.2)	24.65	psf
Round Velocity Pressure with Ice (Ca = 1.2)	7.13	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**
HSS4x4x4	HSS4X4X4	Beam	12.33	41.09	14.94	7.13	1.60
Pipe_3.0	PIPE_3.0	Beam	7.04	24.65	10.54	7.13	0.92
Pipe_2.0	PIPE_2.0	Beam	3.47	24.65	8.25	7.13	0.45

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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.
APXVAALL24_43-U-NA20 Antenna	96	20.24	8.73	415.90	179.43	95.9\24\8.5	153.3\406.81
AIR 6419 B41 Antenna	96	6.32	2.88	129.90	59.11	36.3\20.9\9	83.3\162.87
4449 B71+B85 RRH	96	1.65	1.30	33.90	26.71	15\13.2\10.4	75\68.29
4460 B25+B66 RRH	96	2.14	1.50	43.95	30.77	15.1\17\11.9	108\86.19

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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
APXVAALL24_43-U-NA20 Antenna	96	13.66	6.78	201.35	92.11	43.28	18.67	19.95
AIR 6419 B41 Antenna	96	4.67	2.43	65.28	31.52	13.52	6.15	10.84
4449 B71+B85 RRH	96	1.47	1.22	18.55	14.99	3.53	2.78	9.76
4460 B25+B66 RRH	96	1.82	1.37	23.53	17.00	4.57	3.20	14.05

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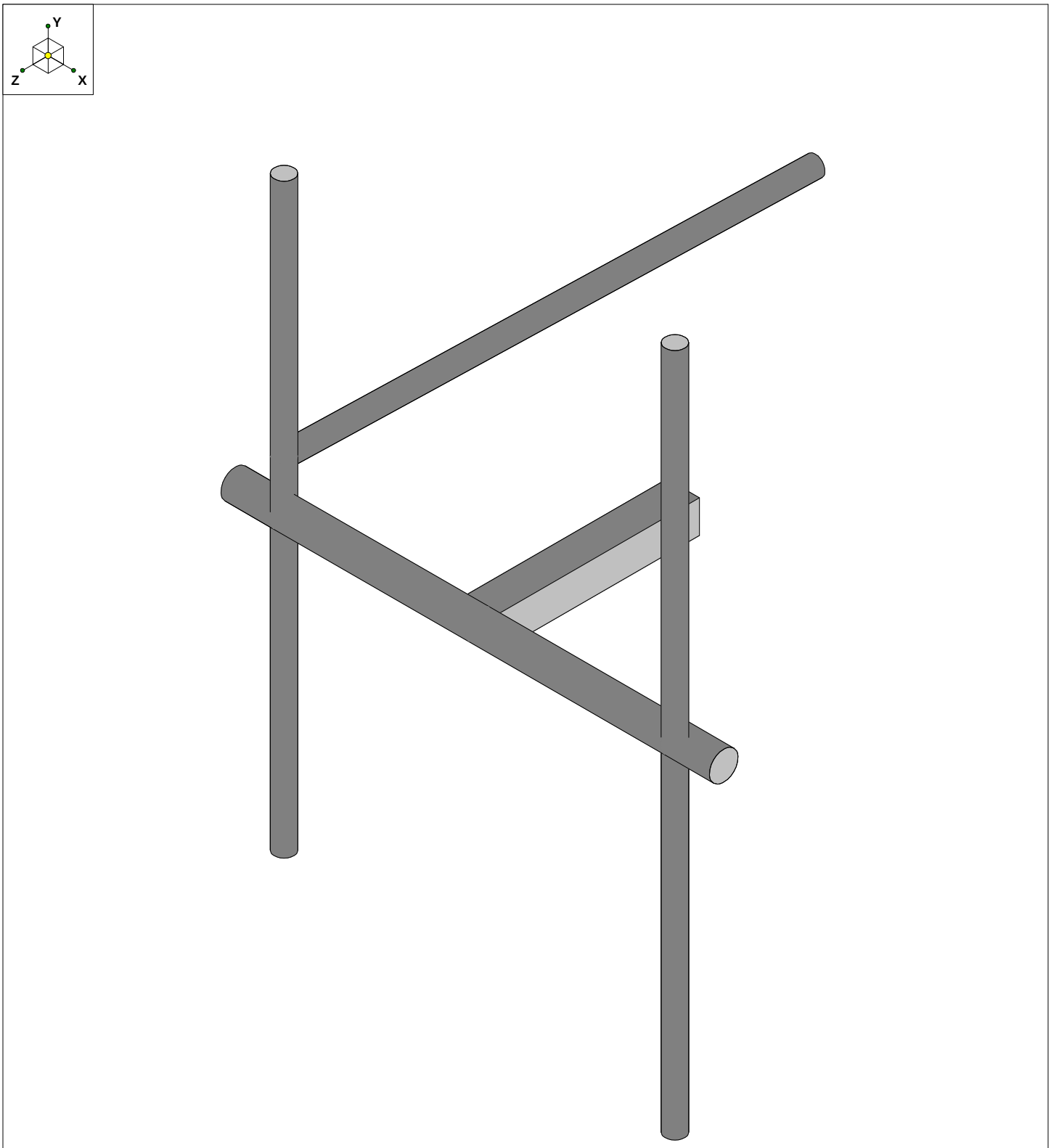
Existing Mounts Results



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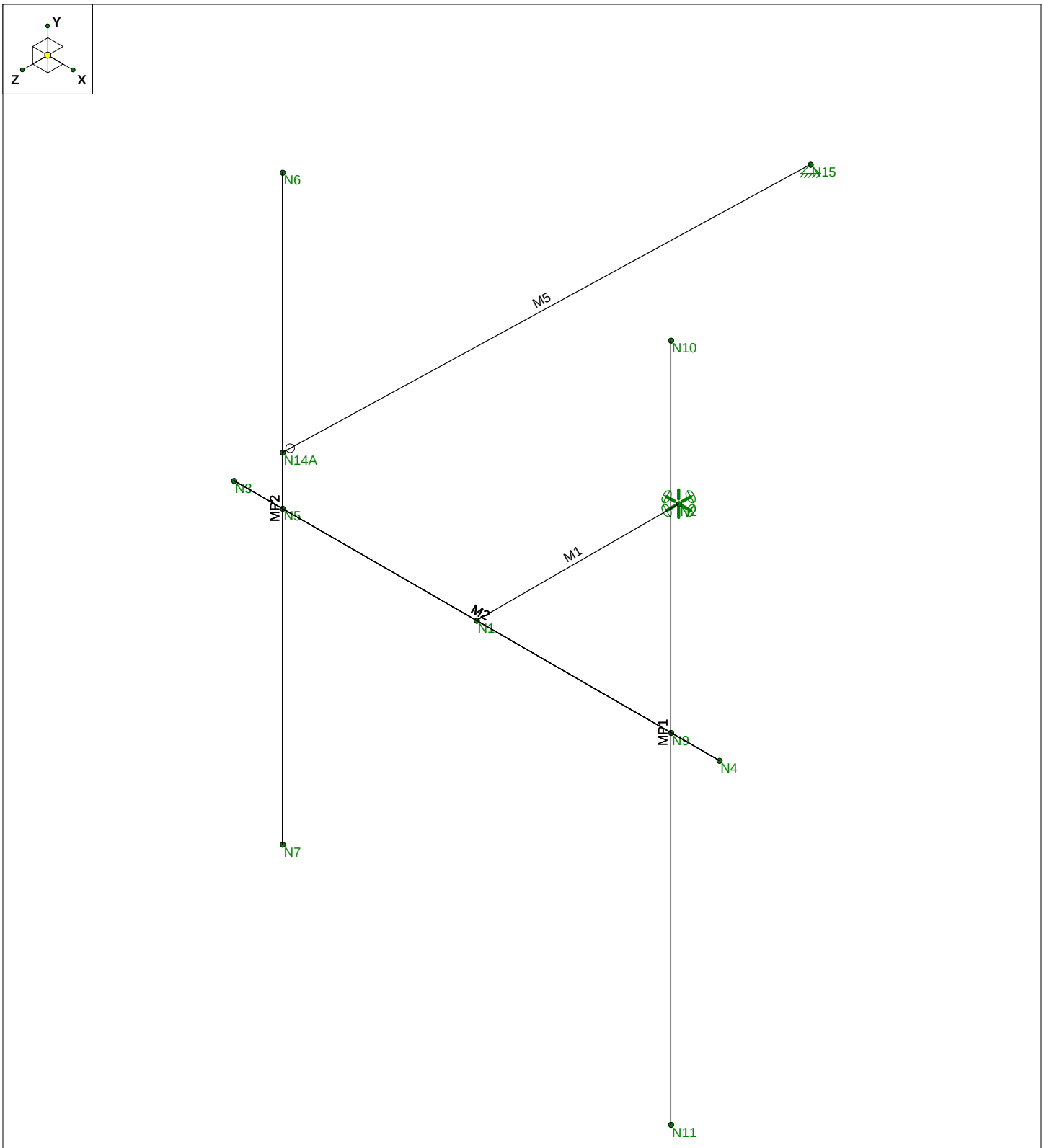
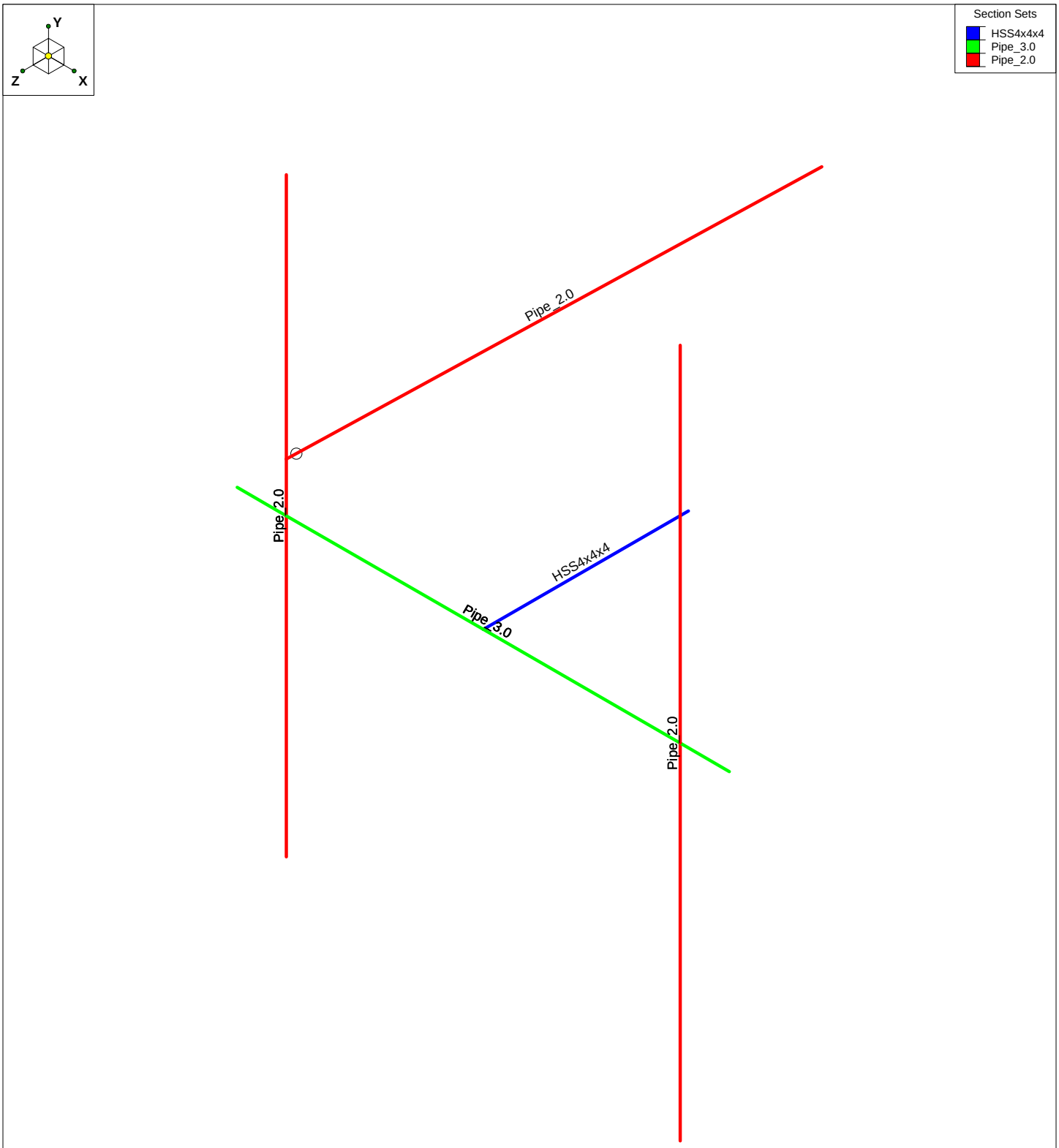
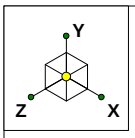
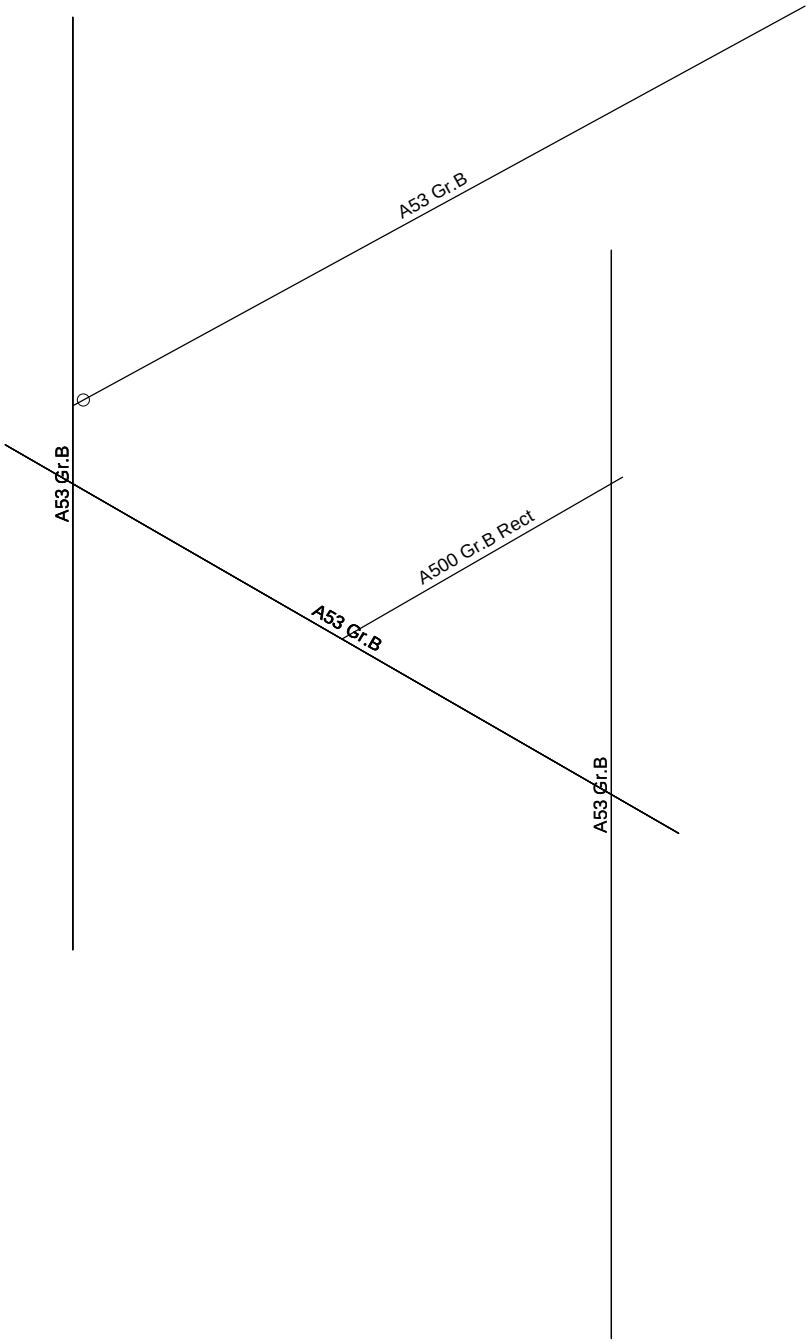


Centerline Communcation...	CT11358A_MA	Wireframe
AP		June 22, 2022 at 3:31 PM
		CT11358A_MA.r3d

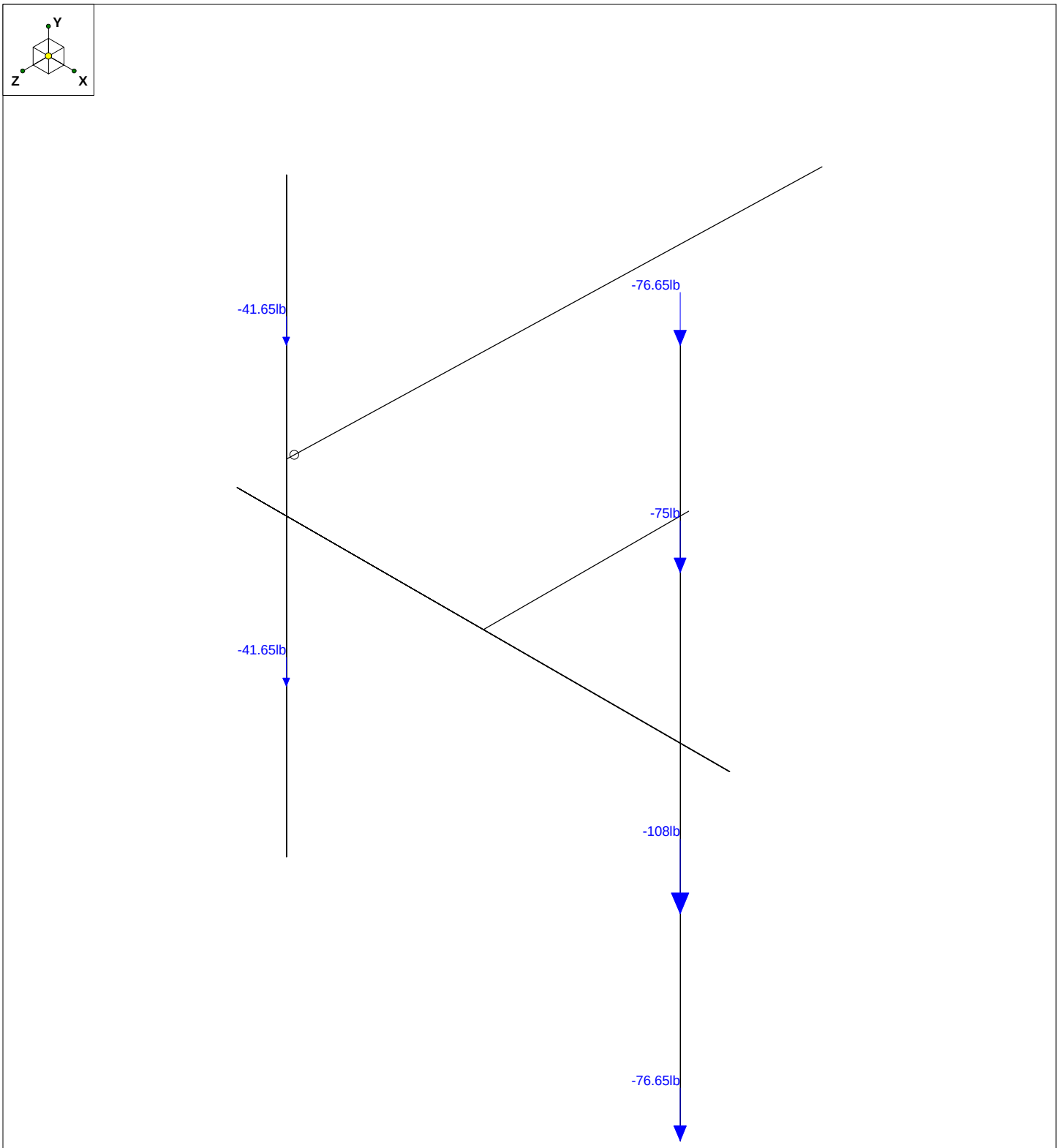


Centerline Communcation...	CT11358A_MA	Section Sets
AP		June 22, 2022 at 3:32 PM
		CT11358A_MA.r3d



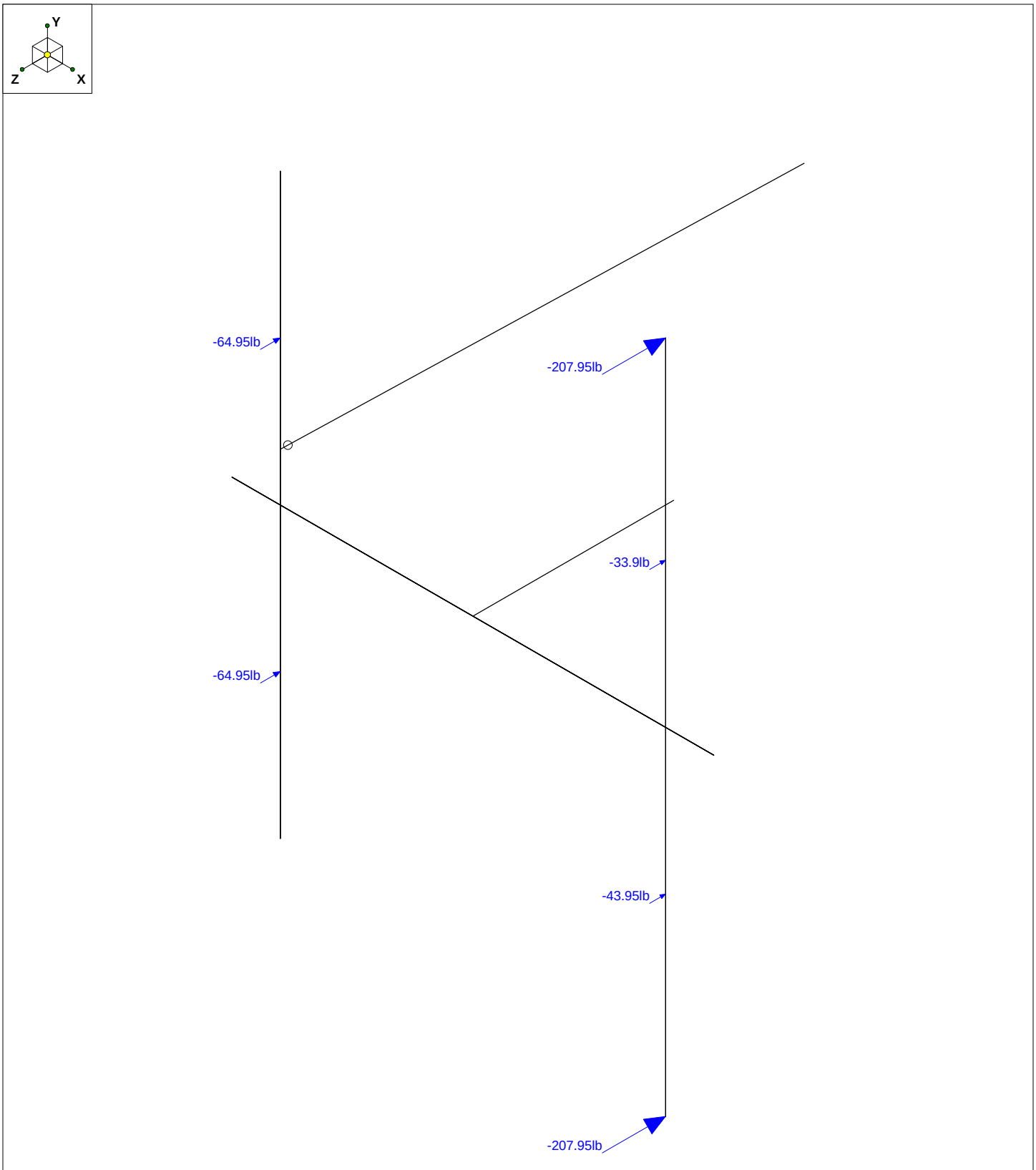


Centerline Communcation...	CT11358A_MA	Material Sets
AP		June 22, 2022 at 3:32 PM
		CT11358A_MA.r3d



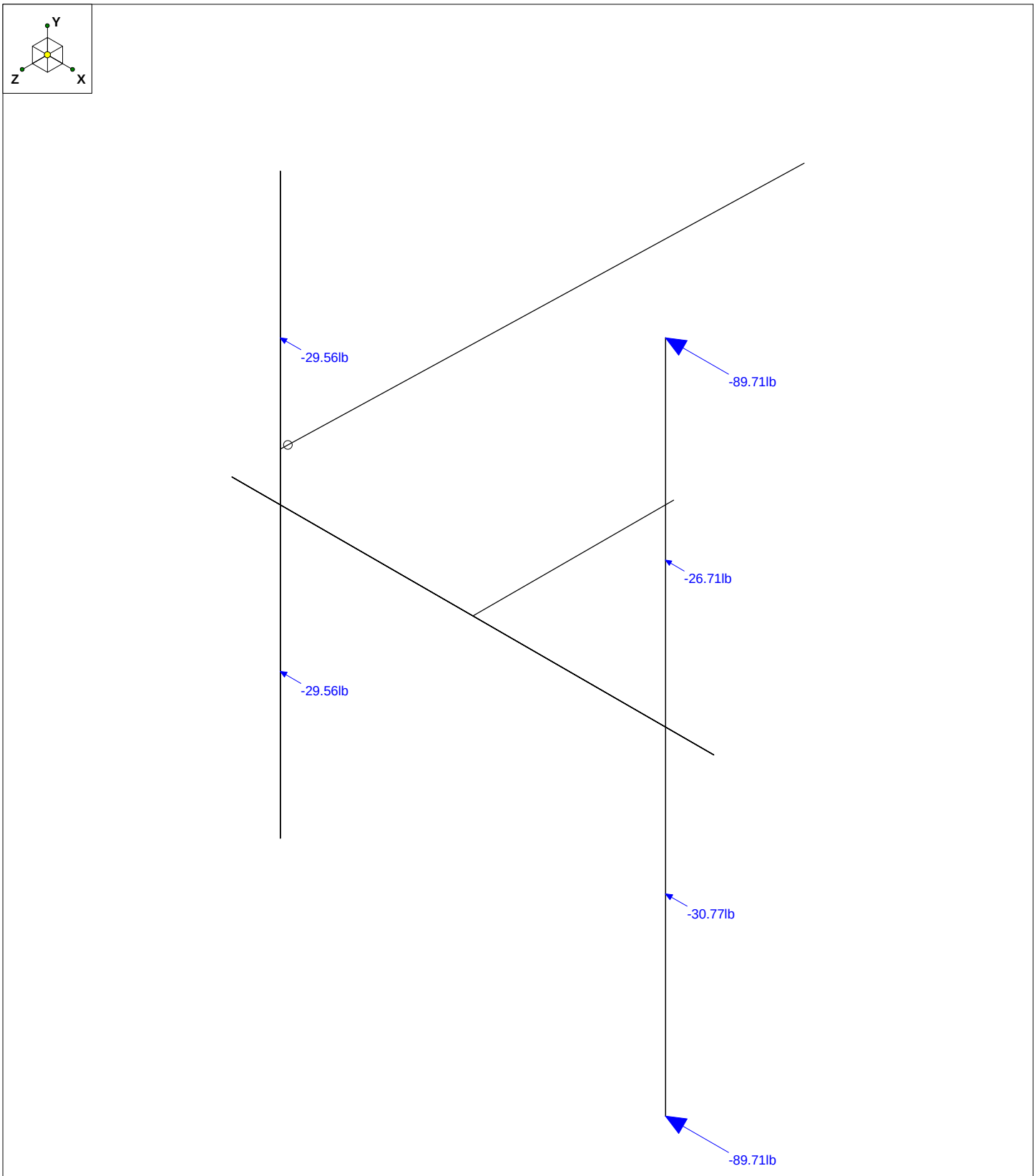
Loads: BLC 1, Dead Load

Centerline Communcation...	CT11358A_MA	Dead Load
AP		June 22, 2022 at 3:32 PM
		CT11358A_MA.r3d



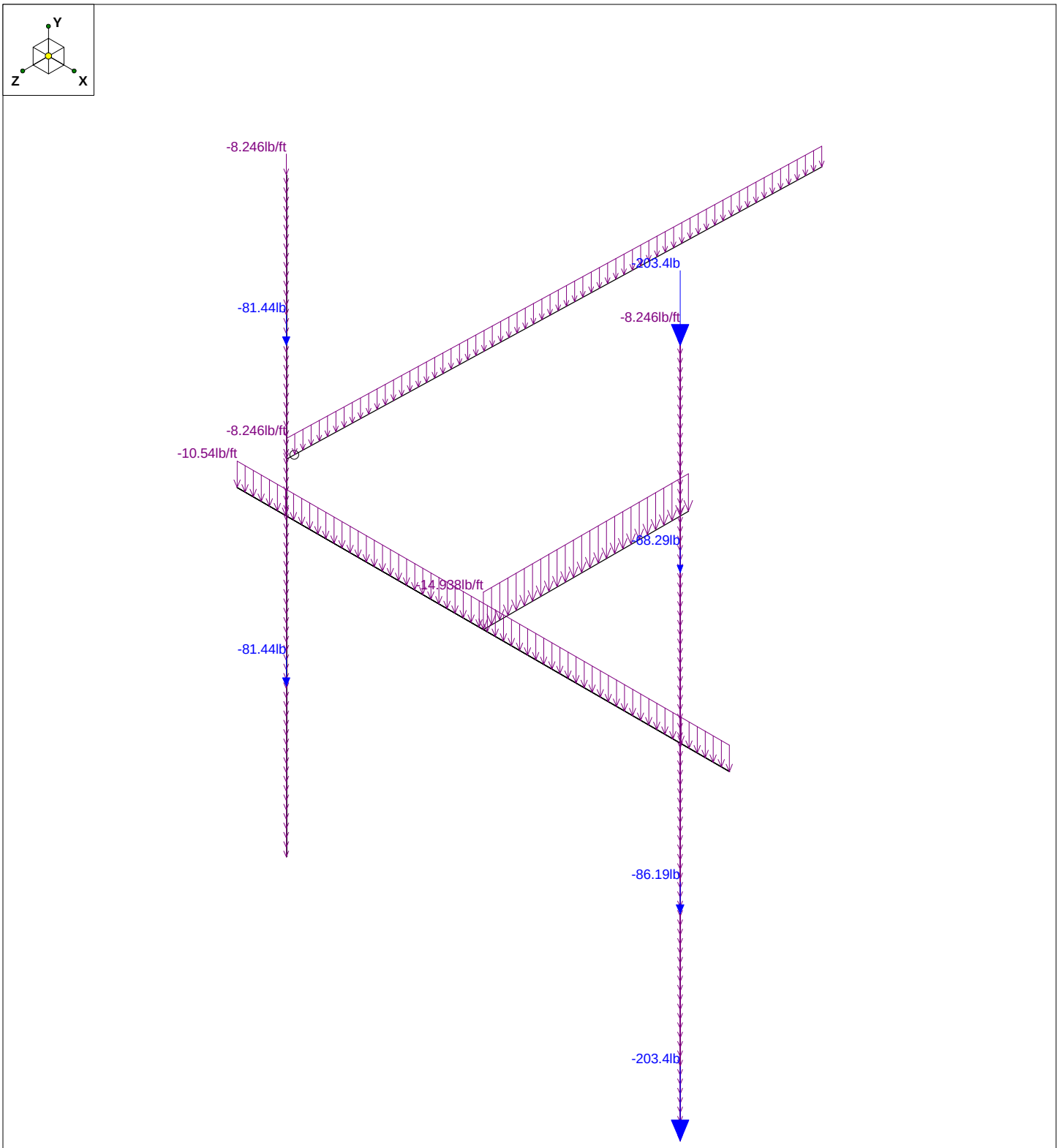
Loads: BLC 2, Wind 0

Centerline Communcation...	CT11358A_MA	Wind 0
AP		June 22, 2022 at 3:32 PM
		CT11358A_MA.r3d



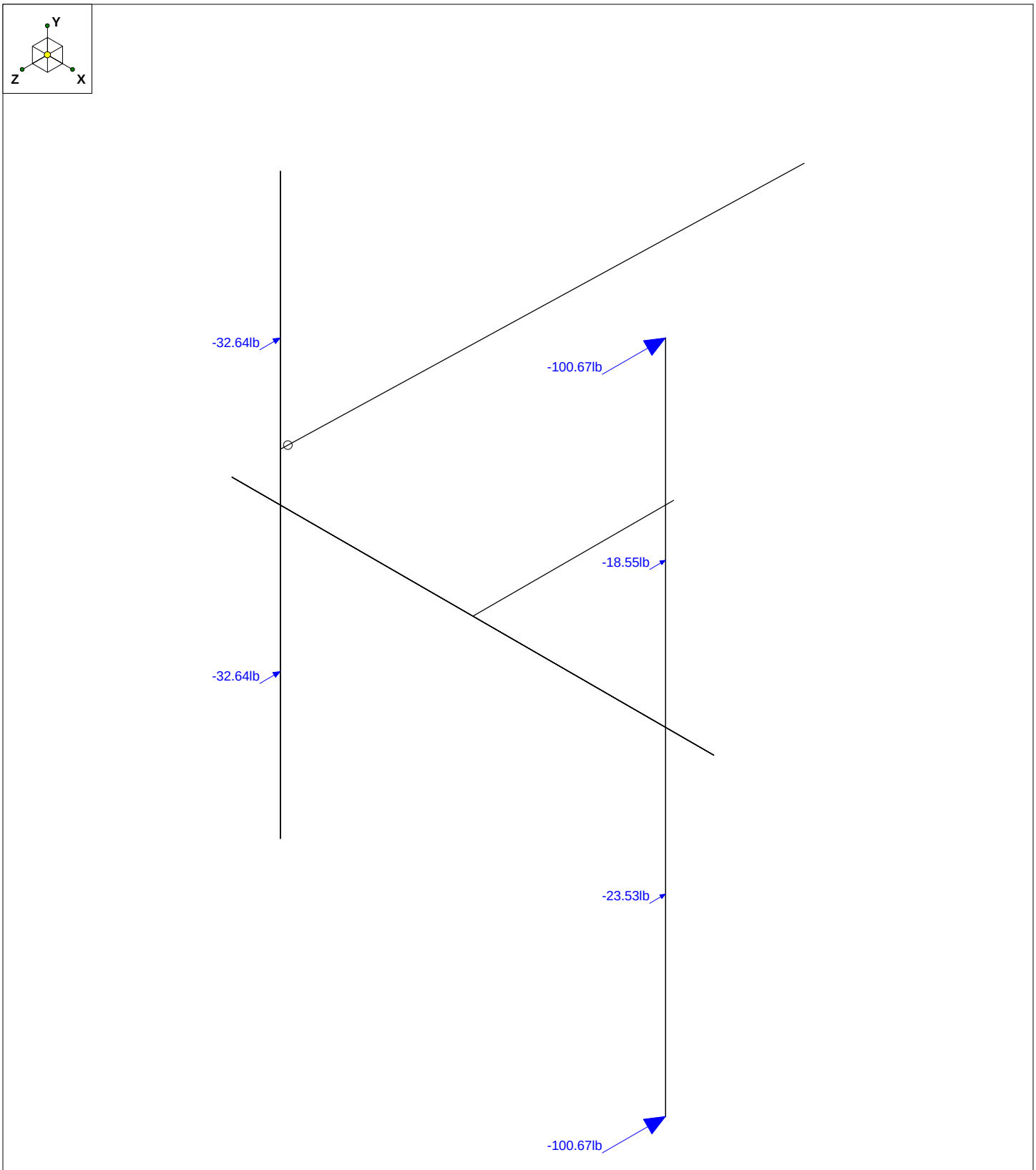
Loads: BLC 5, Wind 90

Centerline Communcation...	CT11358A_MA	Wind 90
AP		June 22, 2022 at 3:32 PM
		CT11358A_MA.r3d



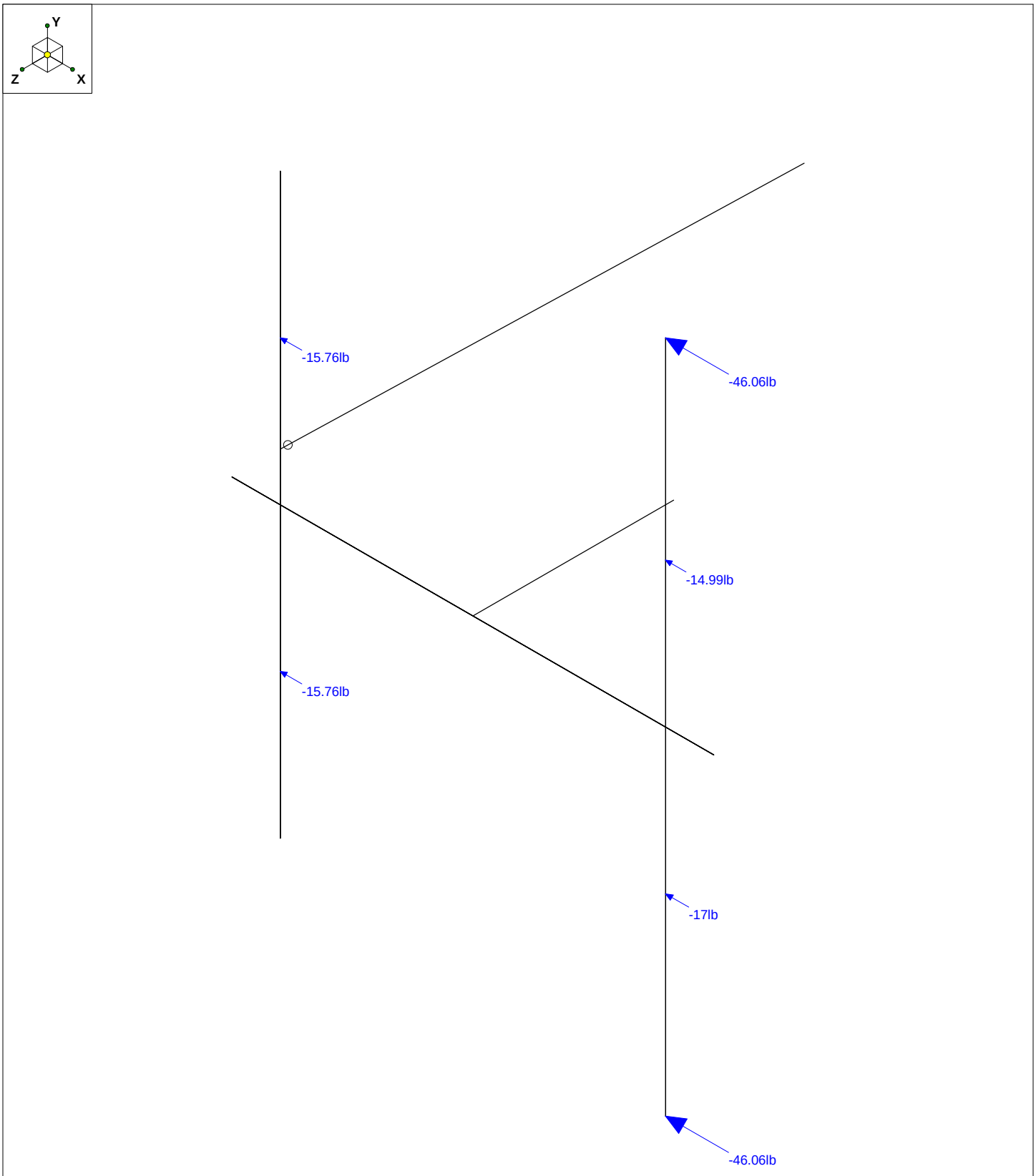
Loads: BLC 9, Ice Weight

Centerline Communcation...	CT11358A_MA	Ice Weight
AP		June 22, 2022 at 3:32 PM
		CT11358A_MA.r3d



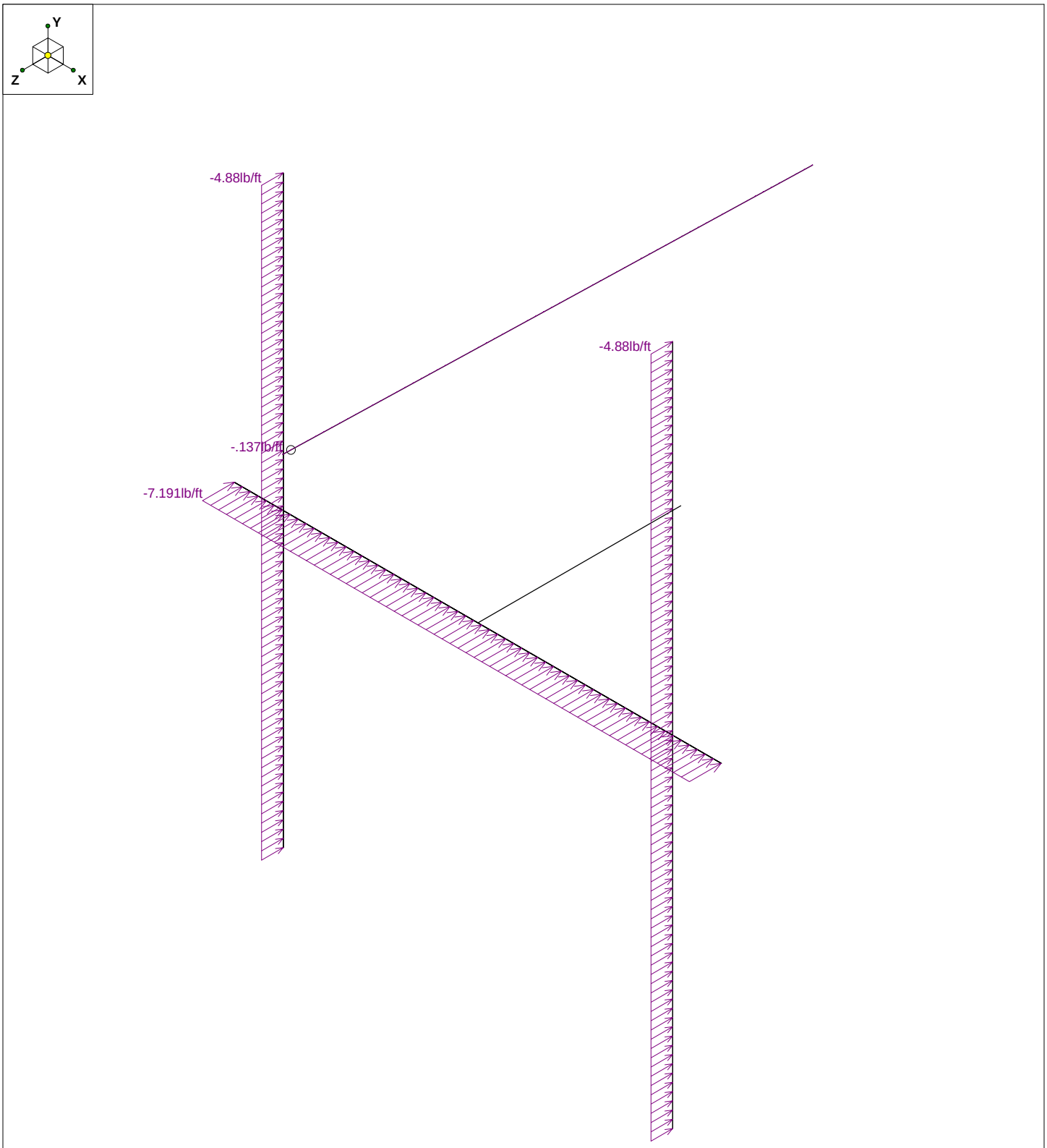
Loads: BLC 10, Ice + Wind 0

Centerline Communcation...	CT11358A_MA	Ice + Wind 0
AP		June 22, 2022 at 3:33 PM
		CT11358A_MA.r3d



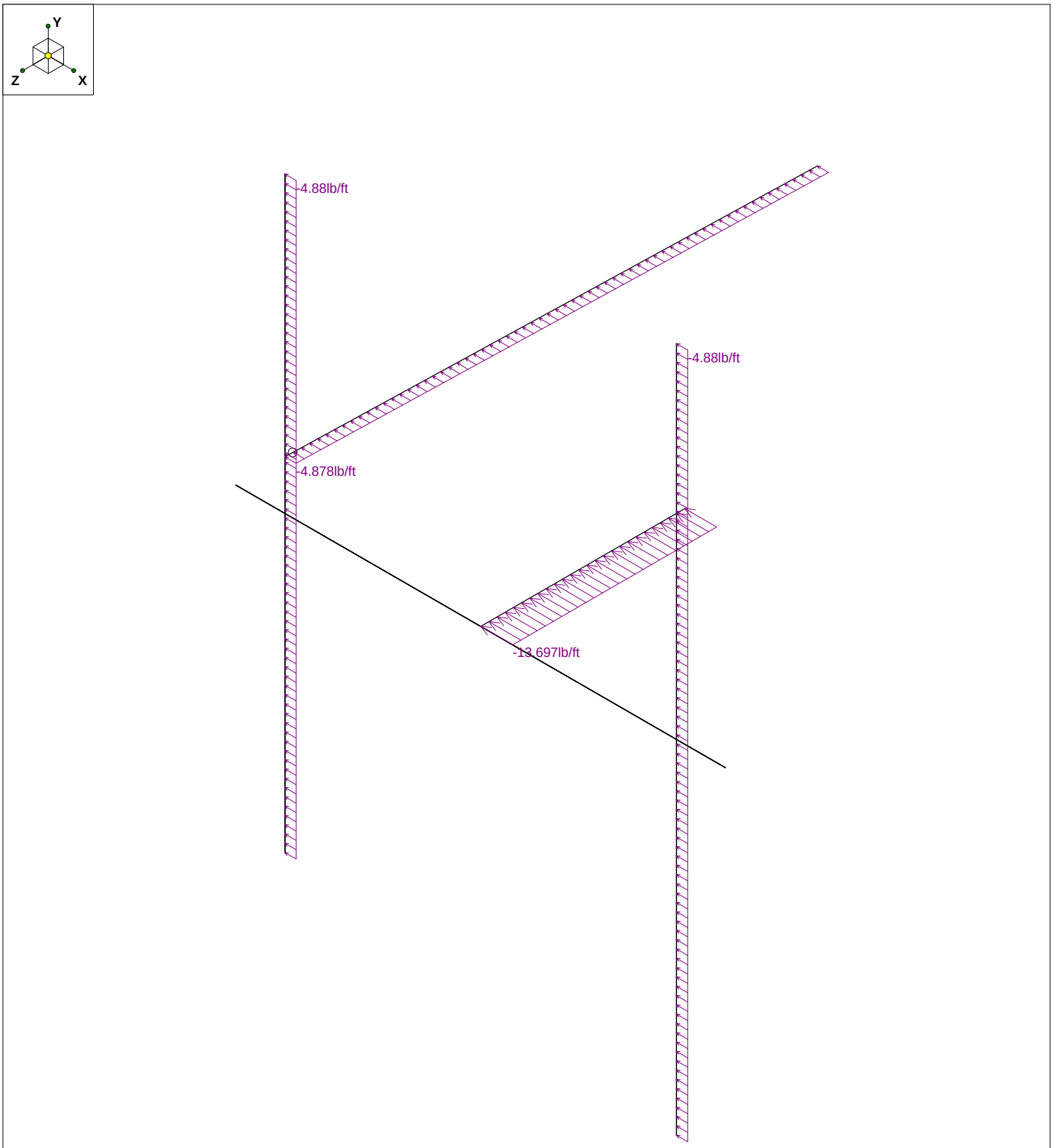
Loads: BLC 13, Ice + Wind 90

Centerline Communcation...	CT11358A_MA	Ice + Wind 90
AP		June 22, 2022 at 3:33 PM
		CT11358A_MA.r3d



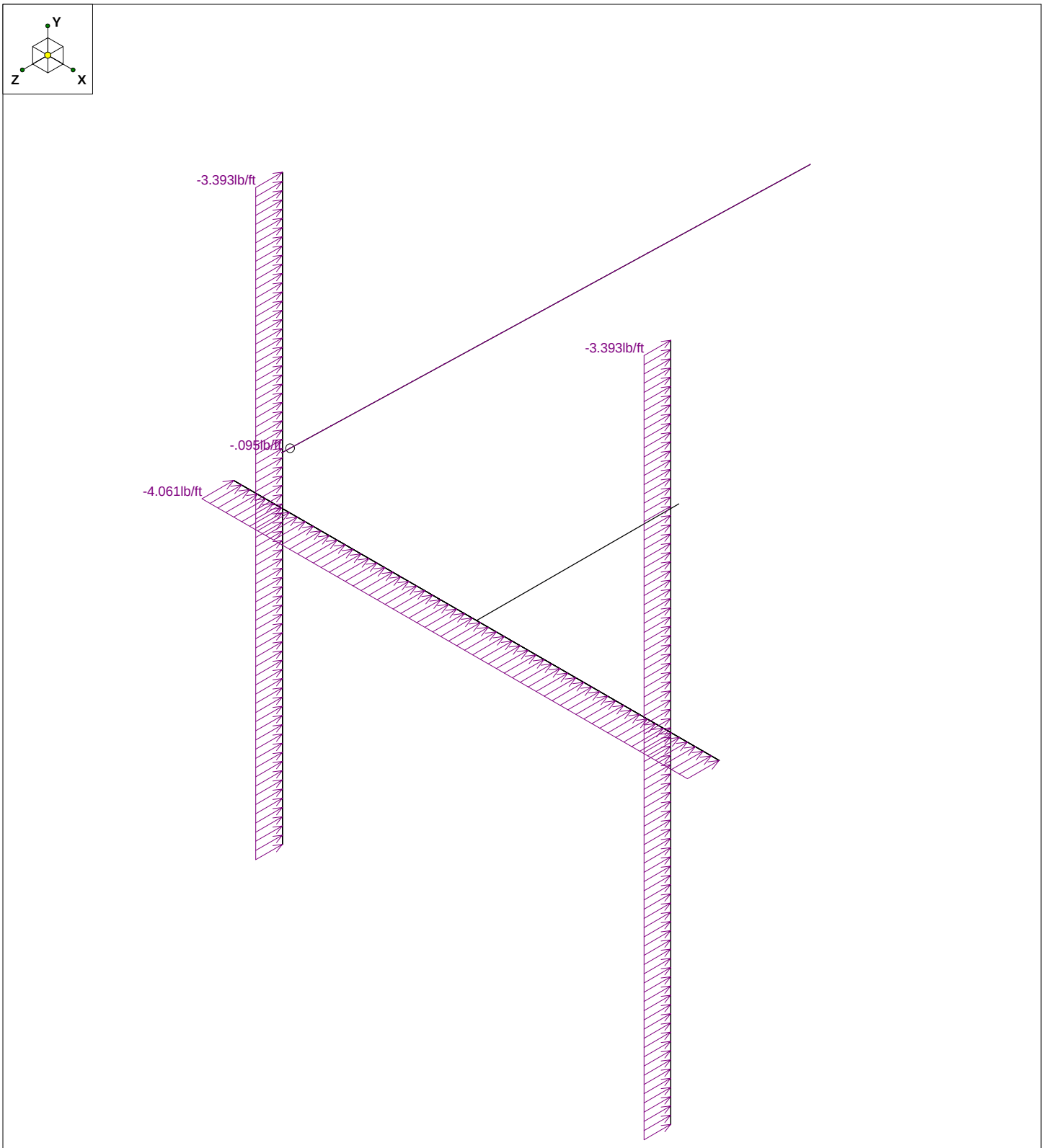
Loads: BLC 17, Distri. Wind Z

Centerline Communcation...	CT11358A_MA	Distr. Wind 0
AP		June 22, 2022 at 3:33 PM
		CT11358A_MA.r3d



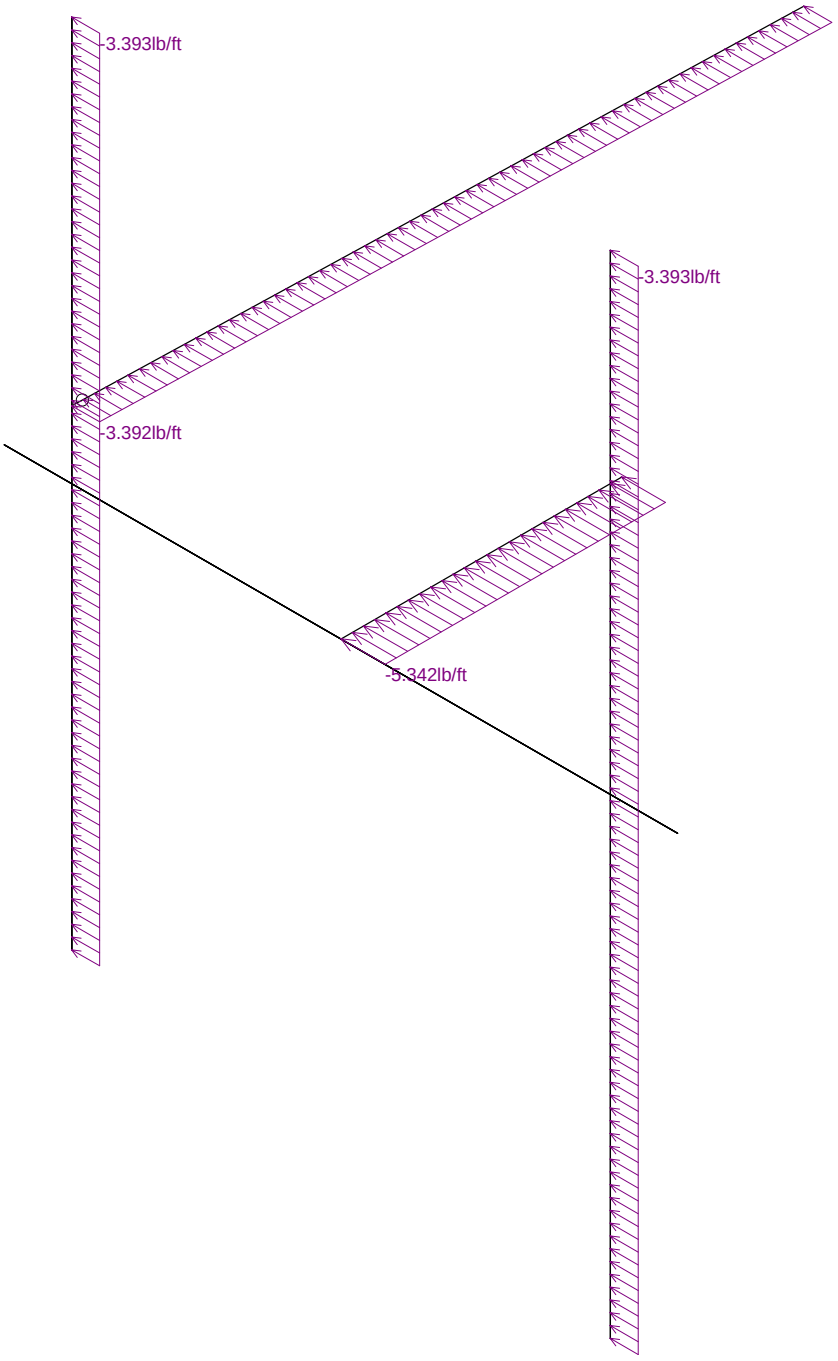
Loads: BLC 18, Distri. Wind X

Centerline Communcation...	CT11358A_MA	Distr. Wind 90
AP		June 22, 2022 at 3:33 PM
		CT11358A_MA.r3d



Loads: BLC 19, Distri. Ice + Wind Z

Centerline Communcation...	CT11358A_MA	Distr. Ice + Wind 0
AP		June 22, 2022 at 3:33 PM
		CT11358A_MA.r3d



Loads: BLC 20, Distrr. Ice + Wind X

Centerline Communcation...	CT11358A_MA	Distr. Ice + Wind 90
AP		June 22, 2022 at 3:33 PM
		CT11358A_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	HSS4x4x4	HSS4X4X4	Beam	None	A500 Gr.B R...	Typical	3.37	7.8	7.8	12.8
2	Pipe_3.0	PIPE_3.0	Beam	None	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
3	Pipe_2.0	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	0	-25	0	
3	N3	-30	0	0	0	
4	N4	30	0	0	0	
5	N5	-24	0	0	0	
6	N6	-24	36	0	0	
7	N7	-24	-36	0	0	
8	N9	24	0	0	0	
9	N10	24	42	0	0	
10	N11	24	-42	0	0	
11	N14A	-24	6	0	0	
12	N15	-22.214418	6	-63.4765	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	N15	max	16.39	2	32.85	16	874.08	13	0	78	0	78	0	78
2		min	-17.775	8	8.12	13	-612.137	9	0	1	0	1	0	1
3	N2	max	661.102	5	1578.831	20	1770.163	9	-685.477	9	0	78	1433.55	51

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
4		min	-16.39	2	481.336	36	-1853.244	14	-3371.647	20	0	1	-447.73	41
5	Totals:	max	662.084	12	1611.623	22	1158.026	9						
6		min	0	1	489.601	9	-1158.026	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	N15	Reaction	Reaction	Reaction			
2	N2	Reaction	Reaction	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	M1	HSS4x4x4	25			Lbyy						Lateral
2	M2	Pipe_3.0	60			Lbyy						Lateral
3	MP2	Pipe_2.0	72			Lbyy						Lateral
4	MP1	Pipe_2.0	84			Lbyy						Lateral
5	M5	Pipe_2.0	63.502			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N1	N2			HSS4x4x4	Beam	None	A500 Gr...	Typical
2	M2	N3	N4			Pipe_3.0	Beam	None	A53 Gr.B	Typical
3	MP2	N6	N7			Pipe_2.0	Beam	None	A53 Gr.B	Typical
4	MP1	N10	N11			Pipe_2.0	Beam	None	A53 Gr.B	Typical
5	M5	N14A	N15			Pipe_2.0	Beam	None	A53 Gr.B	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	M1						Yes				None
2	M2						Yes				None
3	MP2						Yes				None
4	MP1						Yes				None
5	M5	BenPIN					Yes	Default			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			6			
2	Wind 0	WLZ					12			
3	Wind 30	None					12			
4	Wind 60	None					12			
5	Wind 90	WLX					12			
6	Wind 120	None					12			
7	Wind 150	None					12			
8	Wind 180	WLZ					12			
9	Ice Weight	DL					6	5		
10	Ice + Wind 0	WLZ					12			
11	Ice + Wind 30	None					12			
12	Ice + Wind 60	None					12			
13	Ice + Wind 90	WLX					12			
14	Ice + Wind 120	None					12			
15	Ice + Wind 150	None					12			
16	Ice + Wind 180	WLZ					12			
17	Distri. Wind Z	WLZ						5		
18	Distri. Wind X	WLX						5		
19	Distri. Ice + Wind Z	WLZ						5		
20	Distrr. Ice + Wind X	WLX						5		
21	Seismic Load Z	ELZ					6	5		
22	Seismic Load X	ELX					6	5		
23	Live Load 1	LL					1			
24	Live Load 2	LL					1			
25	Live Load 3	LL					1			

Load Combinations

	Description	Solve	PDelta	S...	B...	Fa...	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....	18	.8														
4	1.2D + 1.6W 60°	Yes	Y		1	1.2	4	1.6	17	.8	18	1....														
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....														
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....	18	.8														

Load Combinations (Continued)

	Description	Solve	PDelta	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
11	0.9D + 1.6W 60°	Yes	Y		1	.9	4	1.6	17	.8	18	1....														
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....														
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 + 1.0...	Yes	Y		1	1.2	9	1	10	1	19	1	20													
17	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	9	1	11	1	19	.866	20	.5												
18	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	9	1	12	1	19	.5	20	.866												
19	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	9	1	13	1	19		20	1												
20	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	9	1	14	1	19	-.5	20	.866												
21	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	9	1	15	1	19	-.8...	20	.5												
22	1.2D + 1.0Di + 1.0...	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																
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	-.8...	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	-.8...	22	.5																
36	0.9D + 1.0Eh 180°	Yes	Y		1	.9	21	-1	22																	
37	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	23	1.5	2	.372	17	.372	18													
38	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	23	1.5	3	.372	17	.323	18	.186												
39	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	23	1.5	4	.372	17	.186	18	.323												
40	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	23	1.5	5	.372	17		18	.372												
41	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	23	1.5	6	.372	17	-.1...	18	.323												
42	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	23	1.5	7	.372	17	-.3...	18	.186												
43	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	23	1.5	8	.372	17	-.3...	18													
44	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	2	.372	17	.372	18													
45	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	3	.372	17	.323	18	.186												
46	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	4	.372	17	.186	18	.323												
47	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	5	.372	17		18	.372												
48	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	6	.372	17	-.1...	18	.323												
49	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	7	.372	17	-.3...	18	.186												
50	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	24	1.5	8	.372	17	-.3...	18													

Load Combinations (Continued)

	Description	Solve	PDelta	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
51	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	2	.372	17	.372	18											
52	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	3	.372	17	.323	18	.186										
53	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	4	.372	17	.186	18	.323										
54	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	5	.372	17		18	.372										
55	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	6	.372	17	-.1...	18	.323										
56	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	7	.372	17	-.3...	18	.186										
57	1.0D +1.5Lv + 1.0...	Yes	Y		1	1	25	1.5	8	.372	17	-.3...	18											
58	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	23	1	2	.104	17	.104	18											
59	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	23	1	3	.104	17	.09	18	.052										
60	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	23	1	4	.104	17	.052	18	.09										
61	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	23	1	5	.104	17		18	.104										
62	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	23	1	6	.104	17	-.0...	18	.09										
63	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	23	1	7	.104	17	-.09	18	.052										
64	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	23	1	8	.104	17	-.1...	18											
65	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	24	1	2	.104	17	.104	18											
66	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	24	1	3	.104	17	.09	18	.052										
67	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	24	1	4	.104	17	.052	18	.09										
68	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	24	1	5	.104	17		18	.104										
69	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	24	1	6	.104	17	-.0...	18	.09										
70	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	24	1	7	.104	17	-.09	18	.052										
71	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	24	1	8	.104	17	-.1...	18											
72	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	25	1	2	.104	17	.104	18											
73	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	25	1	3	.104	17	.09	18	.052										
74	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	25	1	4	.104	17	.052	18	.09										
75	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	25	1	5	.104	17		18	.104										
76	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	25	1	6	.104	17	-.0...	18	.09										
77	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	25	1	7	.104	17	-.09	18	.052										
78	1.2D + 1.0Lv + 1.0...	Yes	Y		1	1.2	25	1	8	.104	17	-.1...	18											

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[...	Dir	LC	phi*P...	phi*P...	phi*M...	phi*M.....	Eqn
1	MP1	PIPE_2.0	.704	42	15	.044	42		15	1785...	32130	1871...	1871.....	H1-1b
2	M2	PIPE_3.0	.411	30	7	.140	30		7	5703...	65205	5748...	5748.....	H1-1b
3	MP2	PIPE_2.0	.320	36	7	.100	36		14	2086...	32130	1871...	1871.....	H1-1b
4	M1	HSS4X4X4	.210	25	21	.141	25	y	16	1370...	139518	1618...	1618...	H1-1b
5	M5	PIPE_2.0	.038	0	13	.004	63.5...		19	2296...	32130	1871...	1871.....	H1-...

Exhibit E

Power Density/RF Emissions Report

Radio Frequency Exposure Analysis Report

September 26, 2022

Centerline on behalf of T-Mobile
Centerline Communications Project Number: N/A

T-Mobile Site Name: Harwinton SNET_1
Site Number: CT11358A

Site Address: 125 Wildcat Hill Rd, Harwinton, CT 06791

Site Compliance Summary

T-Mobile Compliance Status:	Compliant
Cumulative Calculated Power Density (Ground Level):	85.06633 µW/cm^2
Cumulative General Population % MPE (Ground Level):	8.5067599999999999%

750 West Center Street | Suite 301 | West Bridgewater | MA | 02379

September 26, 2022

Centerline
Attn: Jessica Meyer, Project Coordinator
750 W Center St, Suite 301
West Bridgewater, MA 02379

RF Exposure Analysis for Site: **Harwinton SNET_1**

Centerline Communications, LLC ("Centerline") was contracted to analyze the proposed T-Mobile facility at **125 Wildcat Hill Rd, Harwinton, CT 06791** for the purpose of determining whether the predictive exposure from the proposed facility is within specified federal limits.

All information used in this report was analyzed as a percentage of the Maximum Permissible Exposure (% MPE) limits as detailed in 47 CFR § 1.1310 as well as Federal Communications Commission (FCC) OET Bulletin 65 Edition 97-01. The FCC MPE limits are typically expressed in units of milliwatts per square centimeter (mW/cm^2) or microwatts per square centimeter ($\mu W/cm^2$). The exposure limits vary depending upon the frequencies being utilized. The General Population/Uncontrolled MPE limit (in mW/cm^2) for frequencies between 300 and 1500 is defined as frequency (in MHz) divided by 1500 ($f_{MHz}/1500$). Frequencies between 1500 and 100,000 MHz have a General Population/Uncontrolled MPE limit of 1 mW/cm^2 (1000 $\mu W/cm^2$). The calculated power density at each sample point divided by the limit at each calculated frequency provides a result in % MPE. Summing the calculated % MPE from all contributors provides a cumulative % MPE at a particular sample point. Wireless carriers use different frequency bands with varying MPE limits; therefore, it is useful to report results in terms of % MPE as opposed to power density.

All results were compared to the FCC radio frequency exposure rules as detailed in 47 CFR § 1.1307(b) to determine compliance with the 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.

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, 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.

Calculation Methodology

Centerline Communications, LLC has performed theoretical modeling of the site using a software tool, RoofMaster®, which incorporates calculation methodologies detailed in FCC OET 65. RoofMaster® uses a cylindrical model for conservative power density predictions within the near field of the antenna where the antenna pattern has not truly formed yet. Within this area power density values tend to decrease based upon an inverse distance function. At the point where it is appropriate for modeling to change from near-field calculations to far-field calculations, the power decreases inversely with the square of the distance. The modeling is based on worst-case assumptions in terms of transmitter power and duty cycle. No losses were included in the power calculations unless they were specifically provided for the project.

In OET 65, a far field model is presented to calculate the spatial peak power density. The RoofMaster® implementation of this model incorporates antenna manufacturer's horizontal and vertical pattern data to determine the power density in all directions. This model yields the power density at a single point in space. In order to determine the spatial power density for comparison to the FCC limits, the average of several points calculated within the human profile (0-6') must be conducted. RoofMaster® calculates seven power density values between 0-6' above the specified study plane and performs a linear spatial average.

Data & Results

The following table details the antennas and operating parameters for the T-Mobile antenna system as well as any other antenna systems at the site. This is based on antenna information provided by the client and data compiled from other sources where necessary. The data below was input into Roofmaster® to perform the theoretical exposure calculations at the ground level.

The theoretical calculations performed in Roofmaster® determine the cumulative exposure at all sample points at ground level (0-6' spatial average). The results from highest cumulative sample point at ground level surrounding the site are displayed in the table below. The contribution from directional antennas to the maximum cumulative totals varies greatly depending on location; therefore, the contribution from one antenna sector at the highest calculated exposure point may be greater or less than other sectors since sectorized directional antennas are pointed in different directions and there is not much overlapping exposure.

The contribution to the cumulative power density and % MPE for each antenna/frequency band is listed in the table. The cumulative power density and cumulative % MPE are displayed at the bottom of the table.

Maximum Calculated Cumulative Power Density (Location: approximately 282' northwest of site)

Antenna ID	Make / Model	Frequency Band (MHz)	Antenna Gain (dBd)	Antenna Centerline (ft)	Channel Count	TX Power/ Channel (watts)	ERP (watts)	Calculated Power Density ($\mu W/cm^2$)	General Population MPE Limit ($\mu W/cm^2$)	General Population % MPE
T-Mobile A 1	RFS APXVAALL24 43-U-NA20	700	13.65	96.00	4.00	40.00	3707.83	0.00000	466.67	0.00000
T-Mobile A 1	RFS APXVAALL24 43-U-NA20	600	12.95	96.00	2.00	40.00	1577.94	0.00000	400.00	0.00000
T-Mobile A 1	RFS APXVAALL24 43-U-NA20	600	12.95	96.00	2.00	30.00	1183.45	0.00000	400.00	0.00000
T-Mobile A 1	RFS APXVAALL24 43-U-NA20	1900	15.45	96.00	2.00	140.00	9821.05	0.00000	1000.00	0.00000
T-Mobile A 1	RFS APXVAALL24 43-U-NA20	2100	16.45	96.00	2.00	140.00	12363.97	0.00001	1000.00	0.00000
T-Mobile A 1	RFS APXVAALL24 43-U-NA20	1900	15.45	96.00	1.00	15.00	526.13	0.00000	1000.00	0.00000
T-Mobile A 2	ERICSSON AIR6419	2500	22.05	96.00	2.00	80.00	25651.93	0.73685	1000.00	0.07369
T-Mobile A 2	ERICSSON AIR6419	2500	22.05	96.00	2.00	80.00	25651.93	0.73685	1000.00	0.07369
T-Mobile B 3	RFS APXVAALL24 43-U-NA20	700	13.65	96.00	4.00	40.00	3707.83	0.00000	466.67	0.00000
T-Mobile B 3	RFS APXVAALL24 43-U-NA20	600	12.95	96.00	2.00	40.00	1577.94	0.00000	400.00	0.00000
T-Mobile B 3	RFS APXVAALL24 43-U-NA20	600	12.95	96.00	2.00	30.00	1183.45	0.00000	400.00	0.00000
T-Mobile B 3	RFS APXVAALL24 43-U-NA20	1900	15.45	96.00	2.00	140.00	9821.05	0.00000	1000.00	0.00000
T-Mobile B 3	RFS APXVAALL24 43-U-NA20	2100	16.45	96.00	2.00	140.00	12363.97	0.00000	1000.00	0.00000
T-Mobile B 3	RFS APXVAALL24 43-U-NA20	1900	15.45	96.00	1.00	15.00	526.13	0.00000	1000.00	0.00000
T-Mobile B 4	ERICSSON AIR6419	2500	22.05	96.00	2.00	80.00	25651.93	0.15902	1000.00	0.01590
T-Mobile B 4	ERICSSON AIR6419	2500	22.05	96.00	2.00	80.00	25651.93	0.15902	1000.00	0.01590
T-Mobile C 5	RFS APXVAALL24 43-U-NA20	700	13.65	96.00	4.00	40.00	3707.83	0.00055	466.67	0.00012
T-Mobile C 5	RFS APXVAALL24 43-U-NA20	600	12.95	96.00	2.00	40.00	1577.94	0.00022	400.00	0.00006
T-Mobile C 5	RFS APXVAALL24 43-U-NA20	600	12.95	96.00	2.00	30.00	1183.45	0.00017	400.00	0.00004
T-Mobile C 5	RFS APXVAALL24 43-U-NA20	1900	15.45	96.00	2.00	140.00	9821.05	0.00099	1000.00	0.00010
T-Mobile C 5	RFS APXVAALL24 43-U-NA20	2100	16.45	96.00	2.00	140.00	12363.97	0.00087	1000.00	0.00009
T-Mobile C 5	RFS APXVAALL24 43-U-NA20	1900	15.45	96.00	1.00	15.00	526.13	0.00005	1000.00	0.00001
T-Mobile C 6	ERICSSON AIR6419	2500	22.05	96.00	2.00	80.00	25651.93	41.63586	1000.00	4.16359
T-Mobile C 6	ERICSSON AIR6419	2500	22.05	96.00	2.00	80.00	25651.93	41.63586	1000.00	4.16359
Unknown 7	GENERIC OMNI 12FT	850	8.96	114.60	1.00	12.70	99.95	0.00001	566.67	0.00000
Unknown 8	GENERIC OMNI 9.5FT	450	5.96	105.30	1.00	25.00	98.61	0.00001	300.00	0.00000
							Cumulative Power Density:	**85.06633 $\mu W/cm^2$**	**Cumulative % MPE:**	**8.50676%**

Summary

The theoretical calculations performed for this analysis yielded cumulative power density totals in all areas at ground level that are within the allowable federal limits for public exposure to RF energy. Therefore, the site is **Compliant** with FCC rules and regulations.

Katrina Styx
RF EME Technical Writer
Centerline Communications, LLC

Exhibit F

Mailing Receipts/ Proof Postage

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.

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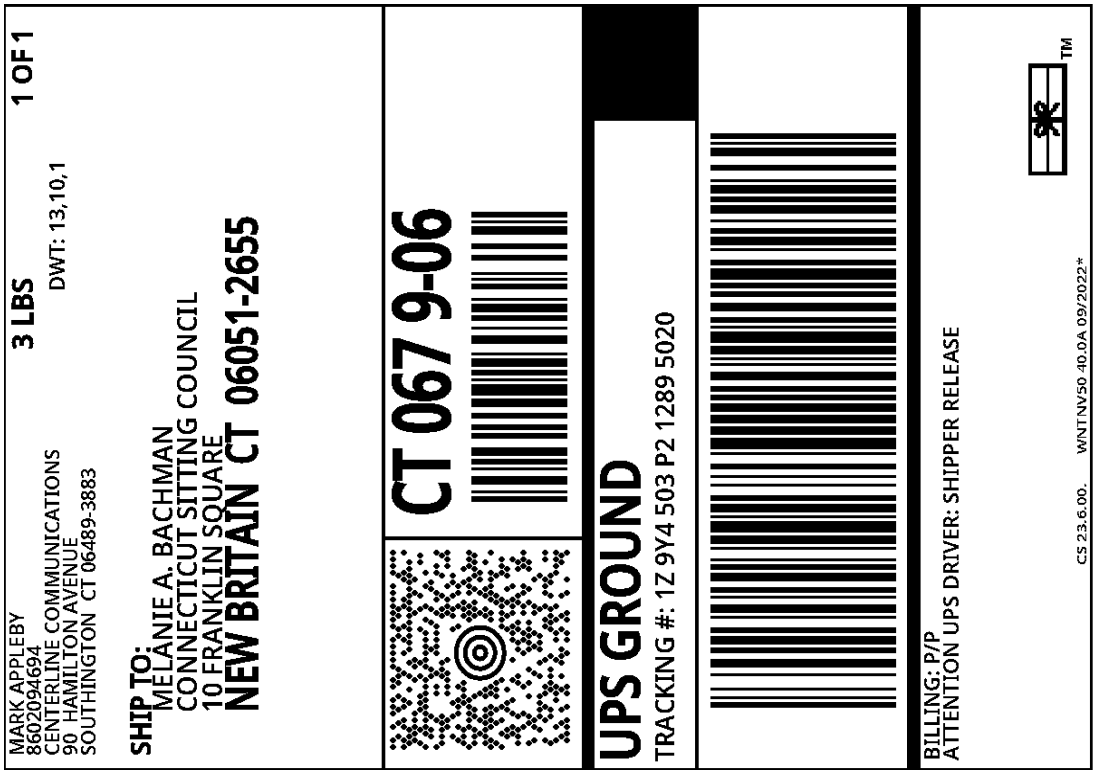

Shipment Receipt

Transaction Date: 27 Sep 2022 **Tracking Number:** 1Z9Y4503P212895020

1 Address Information

Ship To:
Connecticut Sitting Council
Melanie A. Bachman
10 Franklin Square
NEW BRITAIN CT 060512655

Ship From:
Centerline Communications
Mark Appleby
90 Hamilton Avenue
SOUTHINGTON CT 064893883
Telephone:8602094694
email:mappleby@clinellc.com
Residential

Return Address:
Centerline Communications
Mark Appleby
90 Hamilton Avenue
SOUTHINGTON CT 064893883
Telephone:8602094694 email:mappleby@clinellc.com
Residential

2 Package Information

	Weight	Dimensions / Packaging	Declared Value	Reference Numbers
1.	3.0 lbs (3.0 lbs billable)	13 x 10 x 1in. Other Packaging		

3 UPS Shipping Service and Shipping Options

Service: UPS Ground Service

Delivered By: End of Day Wednesday, Sep 28, 2022

Shipping Fees Subtotal: 12.40 USD

Transportation 10.64 USD

Fuel Surcharge 1.76 USD

Additional Shipping Options

Deliver Without Signature

Package1: Deliver Without Signature 0.00 USD

Quantum View Notify E-mail Notifications: No Charge

1 mappleby@clinellc.com: Delivery

4 Payment Information

Bill Shipping Charges to: Shipper's Account 9Y4503

Shipping Charges:	**12.40 USD**
Subtotal Shipping Charges:	**12.40 USD**
Total Charged:	**12.40 USD**

Note: This document is not an invoice. Your final invoice may vary from the displayed reference rates.

* For delivery and guarantee information, see the UPS Service Guide ({0}). To speak to a customer service representative, call 1-800-PICK-UPS for domest services and 1-800-782-7892 for international services.

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   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.
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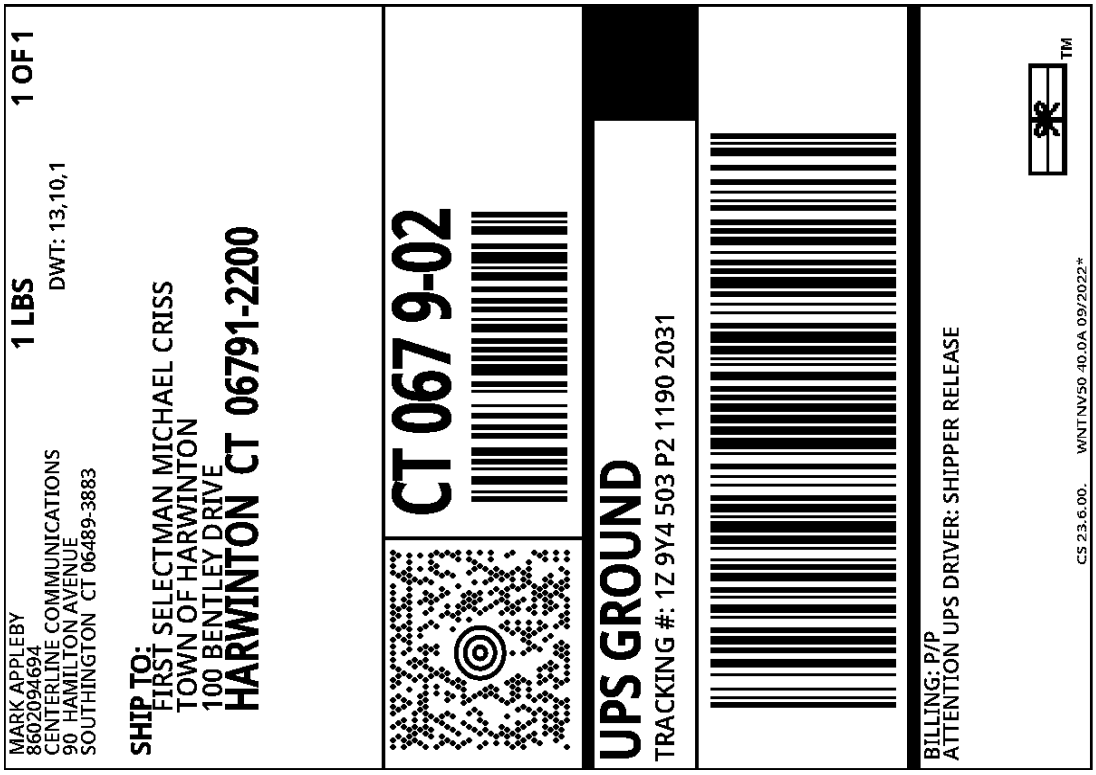

Shipment Receipt

Transaction Date: 27 Sep 2022 **Tracking Number:** 1Z9Y4503P211902031

1 Address Information

Ship To:
Town of Harwinton
First Selectman Michael Criss
100 Bentley Drive
HARWINTON CT 067912200

Ship From:
Centerline Communications
Mark Appleby
90 Hamilton Avenue
SOUTHINGTON CT 064893883
Telephone:8602094694
email:mappleby@clinellc.com
Residential

Return Address:
Centerline Communications
Mark Appleby
90 Hamilton Avenue
SOUTHINGTON CT 064893883
Telephone:8602094694 email:mappleby@clinellc.com
Residential

2 Package Information

	Weight	Dimensions / Packaging	Declared Value	Reference Numbers	
1.	1.0 lbs (1.0 lbs billable)	13 x 10 x 1in. Other Packaging			

3 UPS Shipping Service and Shipping Options

Service: UPS Ground Service

Delivered By: End of Day Wednesday, Sep 28, 2022

Shipping Fees Subtotal: 14.87 USD

Transportation 9.36 USD

Fuel Surcharge 2.11 USD

Delivery Area Surcharge 3.40 USD

Package 1

Additional Shipping Options

Deliver Without Signature

Package1: Deliver Without Signature 0.00 USD

4 Payment Information

Bill Shipping Charges to: Shipper's Account 9Y4503

Shipping Charges:	**14.87 USD**
Subtotal Shipping Charges:	**14.87 USD**
Total Charged:	**14.87 USD**

Note: This document is not an invoice. Your final invoice may vary from the displayed reference rates.

* For delivery and guarantee information, see the UPS Service Guide ({0}). To speak to a customer service representative, call 1-800-PICK-UPS for domest services and 1-800-782-7892 for international services.

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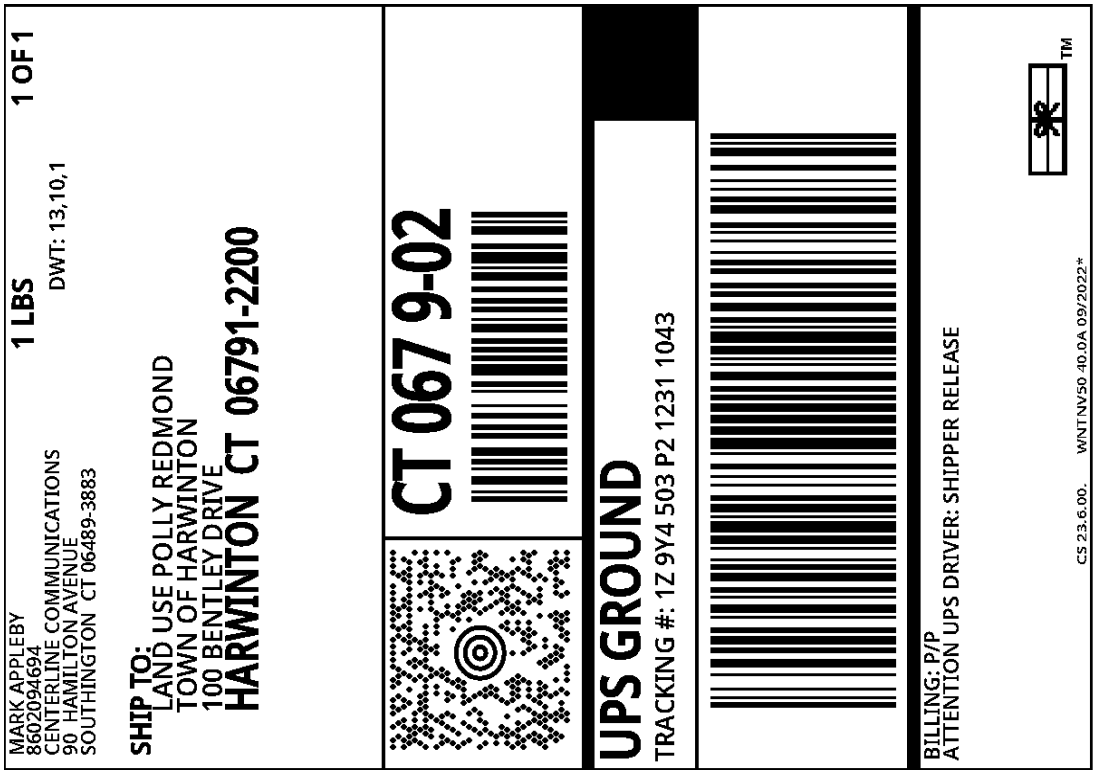

Shipment Receipt

Transaction Date: 27 Sep 2022 **Tracking Number:** 1Z9Y4503P212311043

1 Address Information

Ship To:
Town of Harwinton
Land use Polly Redmond
100 Bentley Drive
HARWINTON CT 067912200

Ship From:
Centerline Communications
Mark Appleby
90 Hamilton Avenue
SOUTHINGTON CT 064893883
Telephone:8602094694
email:mappleby@clinellc.com
Residential

Return Address:
Centerline Communications
Mark Appleby
90 Hamilton Avenue
SOUTHINGTON CT 064893883
Telephone:8602094694 email:mappleby@clinellc.com
Residential

2 Package Information

	Weight	Dimensions / Packaging	Declared Value	Reference Numbers	
1.	1.0 lbs (1.0 lbs billable)	13 x 10 x 1in. Other Packaging			

3 UPS Shipping Service and Shipping Options

Service: UPS Ground Service

Delivered By: End of Day Wednesday, Sep 28, 2022

Shipping Fees Subtotal: 14.87 USD

Transportation 9.36 USD

Fuel Surcharge 2.11 USD

Delivery Area Surcharge 3.40 USD

Package 1

Additional Shipping Options

Deliver Without Signature

Package1: Deliver Without Signature 0.00 USD

4 Payment Information

Bill Shipping Charges to: Shipper's Account 9Y4503

Shipping Charges:	**14.87 USD**
Subtotal Shipping Charges:	**14.87 USD**
Total Charged:	**14.87 USD**

Note: This document is not an invoice. Your final invoice may vary from the displayed reference rates.

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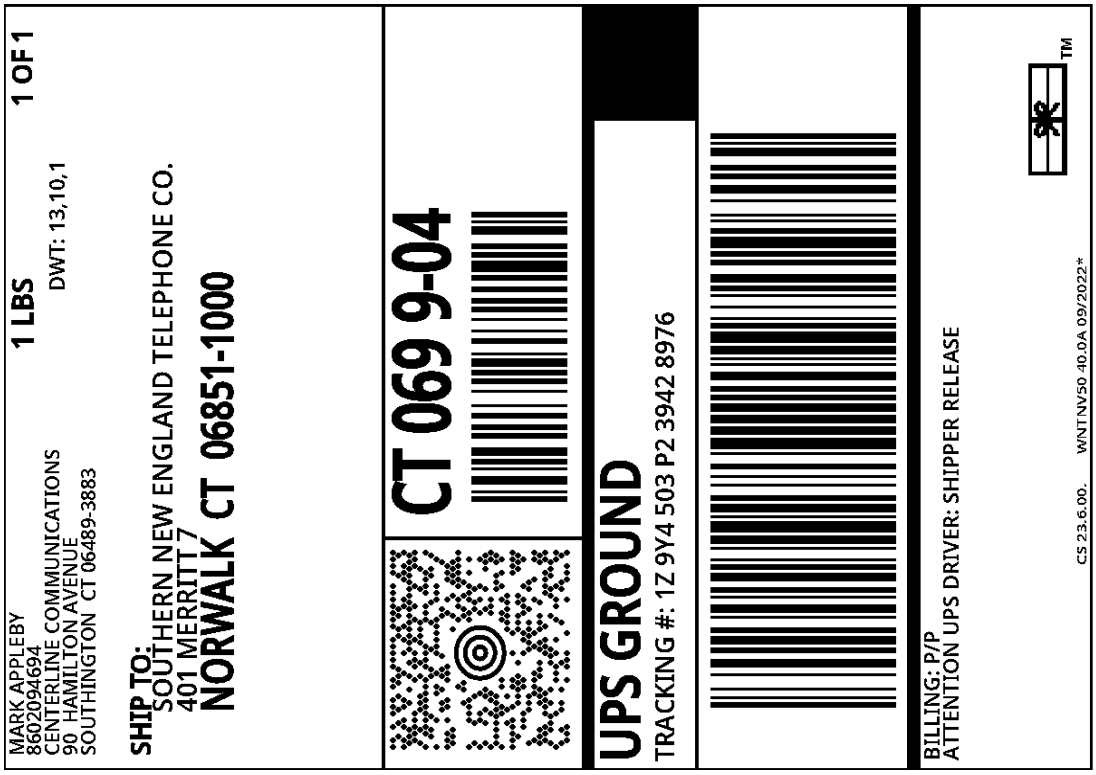

Shipment Receipt

Transaction Date: 27 Sep 2022 **Tracking Number:** 1Z9Y4503P239428976

1 Address Information

Ship To:
Southern New England
Telephone Co.
401 Merritt 7
NORWALK CT 068511000

Ship From:
Centerline Communications
Mark Appleby
90 Hamilton Avenue
SOUTHINGTON CT 064893883
Telephone:8602094694
email:mappleby@clinellc.com
Residential

Return Address:
Centerline Communications
Mark Appleby
90 Hamilton Avenue
SOUTHINGTON CT 064893883
Telephone:8602094694 email:mappleby@clinellc.com
Residential

2 Package Information

	Weight	Dimensions / Packaging	Declared Value	Reference Numbers
1.	1.0 lbs (1.0 lbs billable)	13 x 10 x 1in. Other Packaging		

3 UPS Shipping Service and Shipping Options

Service: UPS Ground Service

Delivered By: End of Day Wednesday, Sep 28, 2022

Shipping Fees Subtotal: 10.90 USD

Transportation 9.36 USD

Fuel Surcharge 1.54 USD

Additional Shipping Options

Deliver Without Signature

Package1: Deliver Without Signature 0.00 USD

4 Payment Information

Bill Shipping Charges to: Shipper's Account 9Y4503

Shipping Charges:	**10.90 USD**
Subtotal Shipping Charges:	**10.90 USD**
Total Charged:	**10.90 USD**

Note: This document is not an invoice. Your final invoice may vary from the displayed reference rates.

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   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.
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SOUTHINGTON ,CT 06489

UPS Access Point™
ADVANCE AUTO PARTS STORE 8525
151 QUEEN ST
SOUTHINGTON ,CT 06489

FOLD HERE

Shipment Receipt

Transaction Date: 27 Sep 2022 **Tracking Number:** 1Z9Y4503P237109583

1 Address Information

Ship To:
Everest Infrastructure Partners
Rommell Hadley
Two Allegheny Center
Nova Tower 2, Suite 703
PITTSBURGH PA 152125401
Telephone:781.820.9120

Ship From:
Centerline Communications
Mark Appleby
90 Hamilton Avenue
SOUTHINGTON CT 064893883
Telephone:8602094694
email:mappleby@clinellc.com
Residential

Return Address:
Centerline Communications
Mark Appleby
90 Hamilton Avenue
SOUTHINGTON CT 064893883
Telephone:8602094694 email:mappleby@clinellc.com
Residential

2 Package Information

	Weight	Dimensions / Packaging	Declared Value	Reference Numbers	
1.	1.0 lbs (1.0 lbs billable)	13 x 10 x 1in. Other Packaging			

3 UPS Shipping Service and Shipping Options

Service: UPS Ground Service

Delivered By: End of Day Thursday, Sep 29, 2022

Shipping Fees Subtotal: 12.41 USD

Transportation 10.65 USD

Fuel Surcharge 1.76 USD

Additional Shipping Options

Deliver Without Signature

Package1: Deliver Without Signature 0.00 USD

4 Payment Information

Bill Shipping Charges to: Shipper's Account 9Y4503

Shipping Charges:	**12.41 USD**
Subtotal Shipping Charges:	**12.41 USD**
Total Charged:	**12.41 USD**

Note: This document is not an invoice. Your final invoice may vary from the displayed reference rates.

* For delivery and guarantee information, see the UPS Service Guide ({0}). To speak to a customer service representative, call 1-800-PICK-UPS for domest services and 1-800-782-7892 for international services.