



T-Mobile
Cullen Morgan
Site Acquisition Consultant
750 W Center Street
Suite 301
West Bridgewater, MA 02379
(941)549-7263
cmorgan@clinellc.com

December 30, 2024

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

RE: NOTICE OF EXEMPT MODIFICATION
63 Woodland Street, South Glastonbury, CT 06073
Latitude: 43.660792
Longitude: -72.574097
T-Mobile Site #: CTHA026A

Dear Members of the Siting Council:

T-Mobile currently maintains nine (9) antennas at the 145-foot level of the existing 150-foot monopole tower located at 63 Woodland Street, South Glastonbury, CT 06073. The 180-foot tower is owned by VB-S1 Assets, LLC d/b/a VerticalBridge, and the underlying property is currently owned by Mr. Paul J. Cavanna. T-Mobile now intends to modify their equipment located at the existing telecommunications facility as per the below. All tower-mounted equipment will be installed at the 145-foot level of the tower currently occupied by T-Mobile.

Planned Modifications:

<u>Existing to be Removed:</u>	<u>Install New:</u>	<u>Existing to Remain:</u>
(3) AIR32 B66A B2A Antennas	(3) APXVLL19P_43-C-A20 Antennas	(3) APXVAARR24_43-U- NA20 Antennas
(3) RRUS11 B4 RRUs	(3) Radio 4460 B25+B66 RRUs	(3) APX16DWV-16DWV-S-E-A20 Antennas
(1) Equipment Cabinet	(2) Equipment Cabinets	(3) Radio 4449 B71+B85 RRUs
(2) 1-5/8" Hybrid Cables	(1) T-Mobile Slack Box	(1) 1.99" Hybrid Cable
	(2) 1.99" Hybrid Cables	

This facility was approved by the CT Siting Council in Docket No. 478, dated March 29, 2018, with conditions. We used the information from the previous filing. Please see attached.

750 W Center St, Suite 301
West Bridgewater, MA 02379
781-713-4725

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-SOj-73, or construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-SOj-73, a copy of this letter is being sent to Glastonbury Town Council Chairman Thomas P. Gullotta, chief elected official, the Town of Glastonbury Building Official/Zoning Officer, Lincoln White, as well as the Property Owner and the Tower Owner.

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

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

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

Respectfully Submitted,
Cullen Morgan
Site Acquisition Consultant
Centerline Communications, LLC (Agent to T-Mobile)
Mobile: (941) 549-7263
cmorgan@clinellc.com

cc: Thomas P. Gullotta, Chairman of the Town Council – Town of Glastonbury Chief Elected Official
Lincoln White, Building Official/Zoning Officer – Town of Glastonbury Building Official
VB-S1 Assets LLC d/b/a VerticalBridge – Tower Owner
Mr. Paul J. Cavanna – Property Owner

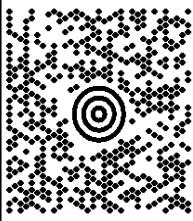
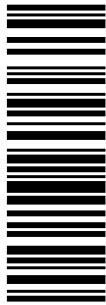
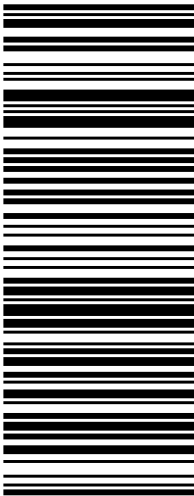
C/O CULLEN MORGAN 9415497263 CENTERLINE COMMUNICATIONS LLC 12579 SAGEWOOD DRIVE VENICE FL 34293		3 LBS	1 OF 1
SHIP TO: CONNECTICUT SITING COUNCIL 10 FRANKLIN SQUARE NEW BRITAIN CT 06051-2655			
	CT 067 9-06 		
UPS GROUND			
TRACKING #: 1Z 9Y4 503 03 0030 7996			
			
BILLING: P/P			
Reference # 1: CTHA026A EM			
CS 24.9 .00. MACNV50 53.0A 12/2024*  ™			

EXHIBIT A

Letter of Authorization

LETTER OF AUTHORIZATION FOR PERMITTING & ZONING

Tenant Name: T-Mobile Northeast LLC ("T-Mobile")

T-Mobile Site Name: CTHA026A

Site Address: 63 Woodland Street, South Glastonbury, CT 06073

Tax Map/Parcel ID #: G11/ 7800/ W2

I, tim tuck, on behalf of **VB-S1 Assets, LLC ("Vertical Bridge")**, tower owner of the property identified above or duly authorized agent thereof, do hereby authorize **T-Mobile Northeast LLC ("T-Mobile")**, **Centerline Communications LLC ("Centerline")**, their parents, subsidiaries, affiliates, successors, assigns, contractors, and agents, to act as the non-exclusive agent for the sole purpose of filing and consummating any land-use, building, zoning, or electrical permitting application(s) as may be required by the applicable permitting authorities for T-Mobile's proposed equipment per the scope of work as outlined below:

Signature: _____

Print Name: _____

Tim Tuck

(SEE REVERSE FOR NOTARY BLOCK)

NOTARY BLOCK

State of Florida)

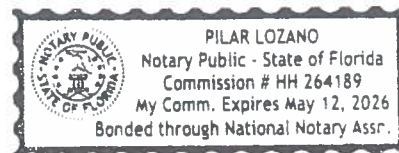
County of Palm Beach

On December 4, 2024 before me, Pilar Lozano
personally appeared tim tuck, who provide to me on the
basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to within instrument
and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies),
and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which
the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the state of Florida that the
foregoing paragraph is true and correct.

Witness my hand and official seal,

Signature: Pilar Lozano (Seal)



My commission expires: May 12/2026

EXHIBIT B

Original Facility Approval

DOCKET NO. 478 - Eco-Site, Inc. and T-Mobile Northeast, LLC	}	Connecticut
application for a Certificate of Environmental Compatibility and	}	
Public Need for the construction, maintenance, and operation of a	}	Siting
telecommunications facility located at 63 Woodland Street,	}	
Glastonbury, Connecticut.	}	Council

March 29, 2018

Decision and Order

Pursuant to Connecticut General Statutes §16-50p, and the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, maintenance, and operation of a telecommunications facility, including effects on the natural environment, ecological balance, public health and safety, scenic, historic, and recreational values, agriculture, forests and parks, air and water purity, and fish, aquaculture and wildlife are not disproportionate, either alone or cumulatively with other effects, when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Eco-Site, Inc., hereinafter referred to as the Certificate Holder, for a telecommunications facility at 63 Woodland Street, Glastonbury, Connecticut.

Unless otherwise approved by the Council, the facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed either as a monopine or monopole at a height of 150 feet above ground level (excluding faux monopine branches) to provide the proposed wireless services, sufficient to accommodate the antennas of T-Mobile Northeast, LLC, the Town of Glastonbury, and other entities, both public and private. The height of the tower may be extended after the date of this Decision and Order pursuant to regulations of the Federal Communications Commission. Prior to submission of the Development and Management Plan to the Council, the Certificate Holder shall consult with the Town of Glastonbury in regards to the Town's emergency communication equipment needs and the appropriateness of a monopine design based on those needs. The final tower design, either a monopole or monopine, shall be determined after this consultation.
2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Glastonbury for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
 - a) final site plan(s) for development of the facility that employ the governing standard in the State of Connecticut for tower design in accordance with the currently adopted International Building Code and include specifications for the tower, tower foundation, antennas, and equipment compound including, but not limited to, fencing, radio equipment, access road, utility line, and emergency backup power source;
 - b) construction plans for site clearing, grading, utility installation, water drainage and stormwater control, and erosion and sedimentation controls consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended;
 - c) schedule for deployment of T-Mobile Northeast LLC's, and the Town of Glastonbury's equipment; and
 - d) hours of construction.

3. Prior to the commencement of operation, the Certificate Holder shall provide the Council worst-case modeling of the electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of the electromagnetic radio frequency power density be submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.
4. Upon the establishment of any new federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
6. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed with at least one fully operational wireless telecommunications carrier providing wireless service within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The Certificate Holder shall provide written notice to the Executive Director of any schedule changes as soon as is practicable.
7. Any request for extension of the time period referred to in Condition 6 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of Glastonbury.
8. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council within 90 days from the one year period of cessation of service. The Certificate Holder may submit a written request to the Council for an extension of the 90 day period not later than 60 days prior to the expiration of the 90 day period.
9. Any nonfunctioning antenna, and associated antenna mounting equipment, on this facility shall be removed within 60 days of the date the antenna ceased to function.
10. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction, and the commencement of site operation.
11. The Certificate Holder shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v.

12. This Certificate may be transferred in accordance with Conn. Gen. Stat. §16-50k(b), provided both the Certificate Holder/transferor and the transferee are current with payments to the Council for their respective annual assessments and invoices under Conn. Gen. Stat. §16-50v. In addition, both the Certificate Holder/transferor and the transferee shall provide the Council a written agreement as to the entity responsible for any quarterly assessment charges under Conn. Gen. Stat. §16-50v(b)(2) that may be associated with this facility.
13. The Certificate Holder shall maintain the facility and associated equipment, including but not limited to, the tower, tower foundation, antennas, equipment compound, radio equipment, access road, and utility line in a reasonable physical and operational condition that is consistent with this Decision and Order and a Development and Management Plan to be approved by the Council.
14. If the Certificate Holder is a wholly-owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the Certificate Holder within 30 days of the sale and/or transfer.
15. This Certificate may be surrendered by the Certificate Holder upon written notification and approval by the Council.

We hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed in the Service List, dated October 26, 2017, and notice of issuance published in the Hartford Courant.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

EXHIBIT C

Property Card



Owner of Record

GIS ID: 78000063
Owner: CAVANNA PAUL J
Co-Owner:
Address: 80 WOODLAND ST
City, State ZIP: S GLASTONBURY, CT 06073-2715

Parcel Information

Map/Street/Lot G11 / 7800 / W2 **Property ID:** 1451
Developer Lot ID: **Water:** Well
Parcel Acreage: 174.42 **Sewer:** Septic
Zoning Code: RR **Census:** 5205.02

Valuation Summary

Item	Appraised Value	Assessed Value
Buildings	330900	231600
Land	4842000	1546900
Appurtenances	124000	86800
Total	5296900	1865300

Account Number: 78000063

Property Address: 63-65 WOODLAND ST



Property highlighted in blue

Owner of Record

CAVANNA PAUL J
CAVANNA GEORGE A ESTATE
CAVANNA GEORGE A

Deed / Page Sale Date Sale Price

0973/0350	1995-11-20	0
0894/0253	1994-08-25	0
0071/0372	1943-08-08	0





Town of Glastonbury GIS Parcel Report

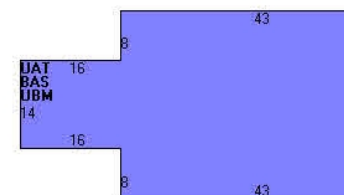
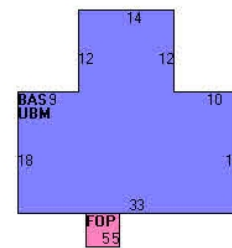
Report Generated 12/3/2024 2:03:31 PM

Building Information

Building ID

1451

Year Constructed :	1800	Number of Rooms :	7
Building Type :	Residential	Number of Bedrooms :	04
Style :	Century+	Number of Bathrooms :	1
Occupany :	Res on Comm	Number of Half-Baths :	0
Stories :	2	Exterior Wall :	Vinyl
Building Zone :	RR	Interior Wall :	Drywall
Roof Type :	Gable	Interior Floor :	Carpet
Roof Material :	Asphalt Shingl	Interior Floor #2 :	No entry
Est. Gross S.F. :	2614	Air Conditioning Type :	None
Est. Living S.F. :	1628	Heat Type :	Hot Water
		Fuel Type :	Oil



1C

Subarea Type	Est. Gross S.F.	Est. Living S.F.	Outbuilding Type	Est. Gross S.F.	Comments
First Floor	814	814	Barn 1story	375.00	
Porch, Enclosed	32	0	Barn 1story	960.00	
Porch, Open	140	0	Barn 1story	4000.00	
Upper Story, Finished	814	814	Barn w/Loft	1250.00	
Slab	264	0	Lean-to	864.00	
Basement	550	0	Patio-Concrete	66.00	
First Floor	762	762	Shed-Wood/Comp	117.00	

This data & map is a user generated static output from an Internet mapping site and is for reference only. Data that appears on this form may or may not be accurate, current, or otherwise reliable. Any questions on the data provided above should be directed to the Town of Glastonbury Property Assessment Office 860-652-7600.



Town of Glastonbury GIS Parcel Report

Report Generated 12/3/2024 2:03:31 PM

Porch, Open	25	0	Shed-Wood/Comp	48.00
Basement	762	0	Shed-Wood/Comp	176.00
First Floor	1514	1514	Shed-Wood/Comp	192.00
Attic, Unfinished	1514	0	Wood Deck	192.00
Basement	1514	0		

EXHIBIT D

Construction Drawings

SITE NAME: CTHA026A

63-80 WOODLAND ST
GLASTONBURY, CT 06073
HARTFORD COUNTY

SITE NUMBER: CTHA026A

SITE CLASS: MONOPOLE

RADIO UPGRADE_4460

RF DESIGN GUIDELINE: 67D998E MUAC

T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS
SECTOR A: ANTENNA/RADIO	ACCESS NOT PERMITTED
SECTOR B: ANTENNA/RADIO	ACCESS NOT PERMITTED
SECTOR C: ANTENNA/RADIO	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

GENERAL NOTES

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 PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

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.

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

TEP IS A FAMILY OF COMPANIES LICENSED TO PROVIDE DIFFERENT SERVICES IN DIFFERENT JURISDICTIONS. DEPENDING ON THE JURISDICTION, PROFESSIONAL ENGINEERING AND LAND SURVEYING SERVICES ARE PROVIDED BY TEP OPCO LLC, A DELAWARE LIMITED LIABILITY COMPANY, TEP ENGINEERING, PLLC, A NORTH CAROLINA PROFESSIONAL LIMITED LIABILITY COMPANY, OR M&H ENGINEERING, PLLC, A NEW YORK PROFESSIONAL LIMITED LIABILITY COMPANY. GENERAL CONTRACTOR SERVICES ARE PROVIDED BY TEPDB OPCO LLC, A DELAWARE LIMITED LIABILITY COMPANY. WE ACQUIRE THE REQUISITE LICENSES IN EACH STATE. ADDITIONAL INFORMATION CAN BE OBTAINED FROM THE COMPANY.

APPROVALS

PROJECT MANAGER	DATE
CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING / SITE ACQ.	DATE
OPERATIONS	DATE
TOWER OWNER	DATE



PROJECT SUMMARY

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT MODERNIZATION
ZONING JURISDICTION:	BASED ON INFORMATION PROVIDED BY T-MOBILE, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW).
SITE ADDRESS:	63-80 WOODLAND ST GLASTONBURY, CT 06073
LATITUDE:	41° 39' 38.85" N / 43.660792° N
LONGITUDE:	72° 34' 26.75" W / -72.574097° W
JURISDICTION:	TOWN OF GLASTONBURY, CT
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

PROJECT SCOPE OF WORK

- REMOVE (3) ANTENNAS	- INSTALL (3) NEW ANTENNAS
- REMOVE (3) RRUS	- INSTALL (3) NEW RADIOS
- REMOVE (1) 6102 CABINET	- INSTALL (3) NEW 6x24 HYBRID CABLE
- REMOVE (2) 6X12 HYBRID CABLES	- INSTALL (1) NEW 6160 V2 AC CABINET
	- INSTALL (1) NEW B160 CABINET
	- INSTALL (1) SLACK BOX

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	3
GN-1	GENERAL NOTES	3
A-1	COMPOUND & EQUIPMENT PLANS	3
A-2	ANTENNA PLANS & ELEVATION	3
A-3	TOWER EQUIPMENT DETAILS	3
A-4	EQUIPMENT DETAILS	3
SN-1	SPECIAL INSPECTIONS NOTES	3
E-1	ONE-LINE DIAGRAM & GROUNDING DETAILS	3

72 HOURS



CALL
BEFORE YOU DIG
CALL TOLL FREE 1-800-922-4455
OR CALL 811



UNDERGROUND SERVICE ALERT

T-MOBILE
NORTHEAST LLC

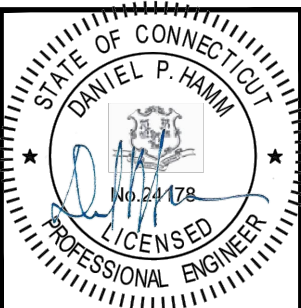
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116



750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379



TEP OPCO, LLC.
45 BEECHWOOD DR.
NORTH ANDOVER, MA 01845
OFFICE: (978) 557-5553



CHECKED BY: AT

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	10/23/24	REVISED FOR CONSTRUCTION	TR
2	10/11/24	ISSUED FOR CONSTRUCTION	TR
1	09/26/24	ISSUED FOR CONSTRUCTION	TR
0	08/12/24	ISSUED FOR REVIEW	ASD

SITE NUMBER:
CTHA026A

SITE NAME:
CTHA026A

SITE ADDRESS:
63-80 WOODLAND ST
GLASTONBURY, CT 06073
HARTFORD COUNTY

SHEET TITLE

TITLE SHEET
(RADIO UPGRADE)

SHEET NUMBER

T-1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81 STANDARDS) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS AND #2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

CONTRACTOR – CENTERLINE
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – T-MOBILE
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN

CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH T-MOBILE SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:

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

BUILDING CODE: 2021 IBC WITH 2022 CT STATE BUILDING CODE AMENDMENTS
ELECTRICAL CODE: NEC 2020, NFPA 70, 2020

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

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

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

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

EQUIPMENT 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	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

T-MOBILE
NORTHEAST LLC

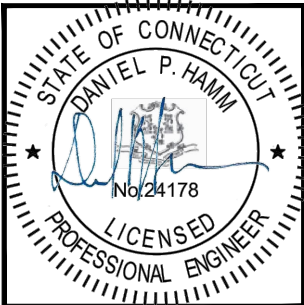
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116



750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379



TEP OPCO, LLC.
45 BEECHWOOD DR.
NORTH ANDOVER, MA 01845
OFFICE: (978) 557-5553



CHECKED BY: AT

APPROVED BY: DPH

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CTHA026A

SITE NAME:
CTHA026A

SITE ADDRESS:
63-80 WOODLAND ST
GLASTONBURY, CT 06073
HARTFORD COUNTY

SHEET TITLE

GENERAL NOTES

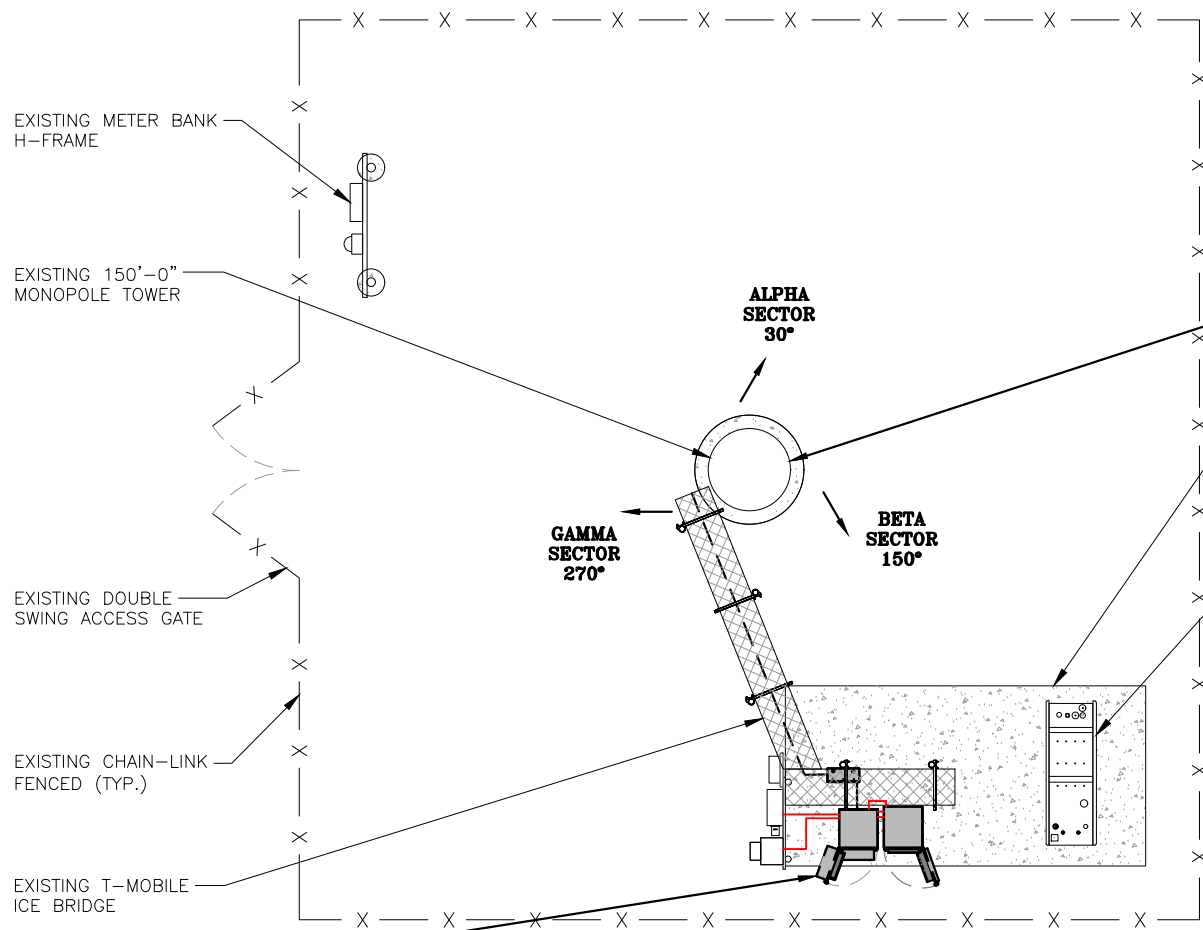
(RADIO UPGRADE)

SHEET NUMBER

GN-1

STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION,
GC SHALL REFER TO MOUNT ANALYSIS
PROVIDED BY TEP OPCO LLC, DATED:
AUGUST 30, 2024 TO DETERMINE IF THERE
ANY SUPPLEMENTAL OR SPECIAL
INSTALLATION REQUIREMENTS, OR
RELOCATION ARRANGEMENTS.

NOTE:
REFER TO THE FINAL RF DATA
SHEET FOR FINAL ANTENNA
SETTINGS.



PROPOSED T-MOBILE
EQUIPMENT MODIFICATIONS

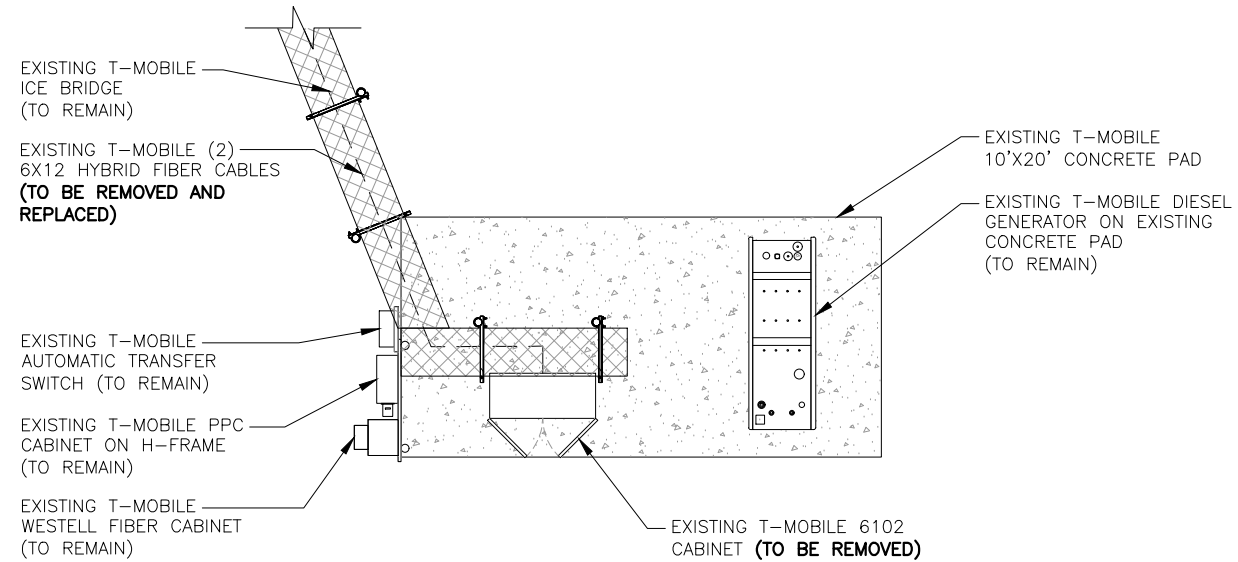
3
A-1

COMPOUND PLAN

22x34 SCALE: 3/16"=1'-0"
11x17 SCALE: 3/32"=1'-0"

1
A-1

0 2'-8" 5'-4" 10'-8" 16'-0"



EXISTING EQUIPMENT PLAN

22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"

2
A-1

0 2'-0" 4'-0" 8'-0" 12'-0"

EXISTING T-MOBILE ICE BRIDGE
(TO REMAIN)

PROPOSED T-MOBILE (3) 6X24
4AWG HYBRID FIBER CABLES

PROPOSED T-MOBILE (1) SLACK
BOX MOUNTED TO EXISTING ICE
BRIDGE POST

EXISTING T-MOBILE AUTOMATIC
TRANSFER SWITCH (TO REMAIN)

EXISTING T-MOBILE PPC CABINET
ON H-FRAME (TO REMAIN)

EXISTING T-MOBILE WESTELL
FIBER CABINET (TO REMAIN)

PROPOSED (1) 1" RGS
CONDUIT (FOR DC POWER)

PROPOSED (1) 2" RGS
CONDUIT (POWER)

PROPOSED (1) 2" RGS
CONDUIT (TELCO)

PROPOSED (1) 2" RGS CONDUIT
W/ (1) LB PER CABINET

PROPOSED (2) 2" RGS CONDUIT
(FOR ALARMS AND SPARE)

EXISTING T-MOBILE
10'X20' CONCRETE PAD

EXISTING T-MOBILE DIESEL
GENERATOR ON EXISTING
CONCRETE PAD (TO REMAIN)

PROPOSED T-MOBILE B160
BATTERY CABINET

PROPOSED T-MOBILE (1) CSR IXRE V2
INSTALLED INSIDE THE PROPOSED 6160 CABINET

EXISTING **RELOCATED** T-MOBILE
(2) BB 6630 AND (1) DUG20 INSTALLED
INSIDE THE PROPOSED 6160 CABINET

PROPOSED T-MOBILE
6160 EQUIPMENT CABINET

PROPOSED EQUIPMENT PLAN

22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"

3
A-1

0 2'-0" 4'-0" 8'-0" 12'-0"

**T-MOBILE
NORTHEAST LLC**

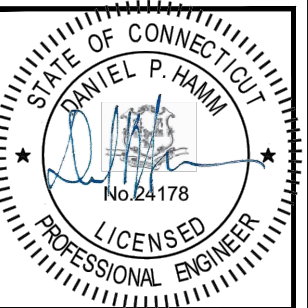
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116



750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379



TEP OPCO, LLC.
45 BEECHWOOD DR.
NORTH ANDOVER, MA 01845
OFFICE: (978) 557-5553



CHECKED BY: AT

APPROVED BY: DPH

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GLASTONBURY, CT 06073
HARTFORD COUNTY

SHEET TITLE

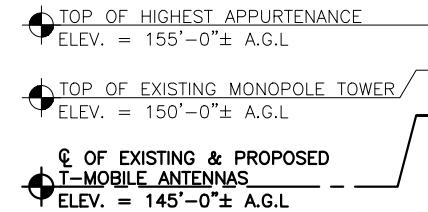
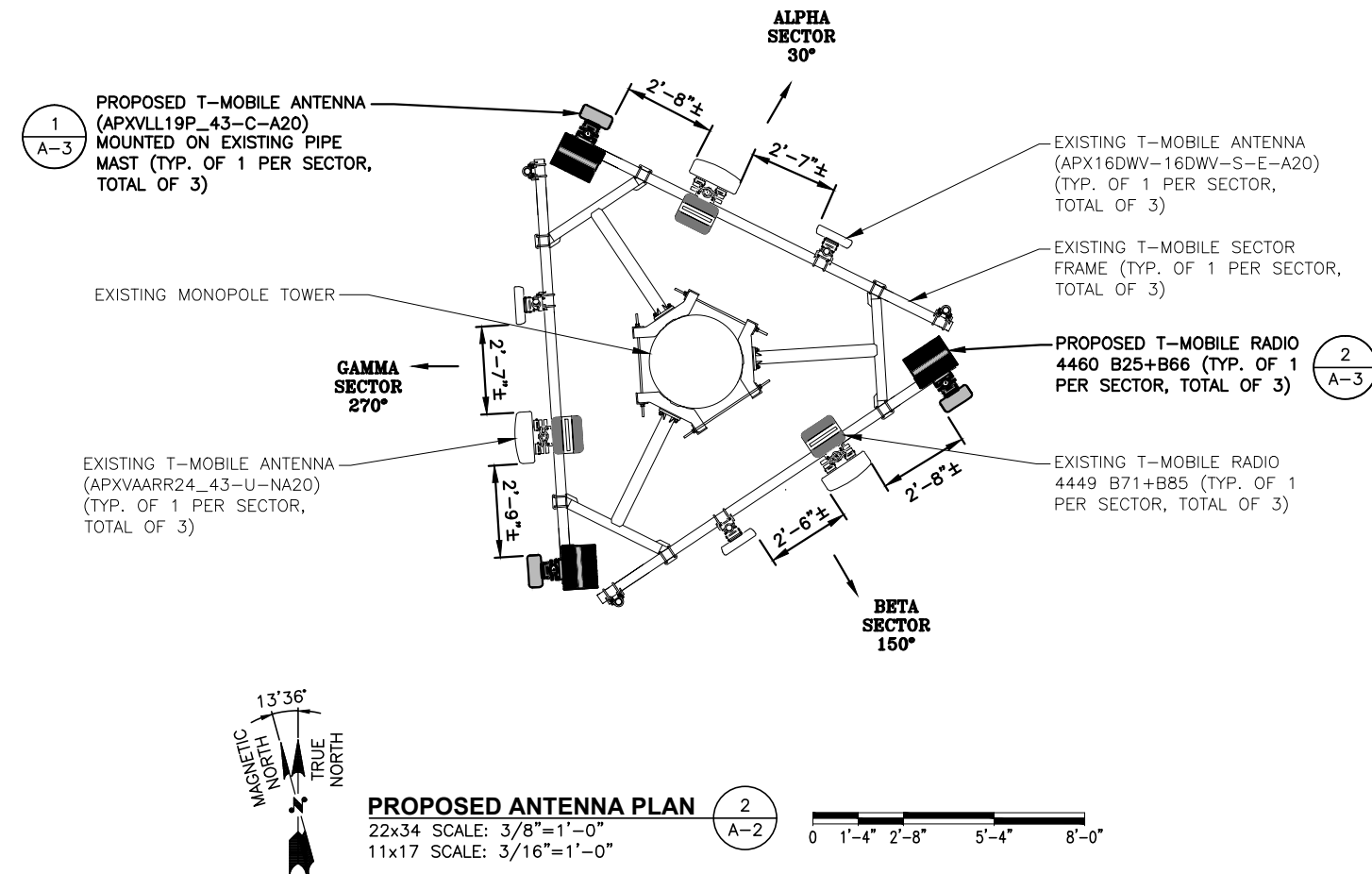
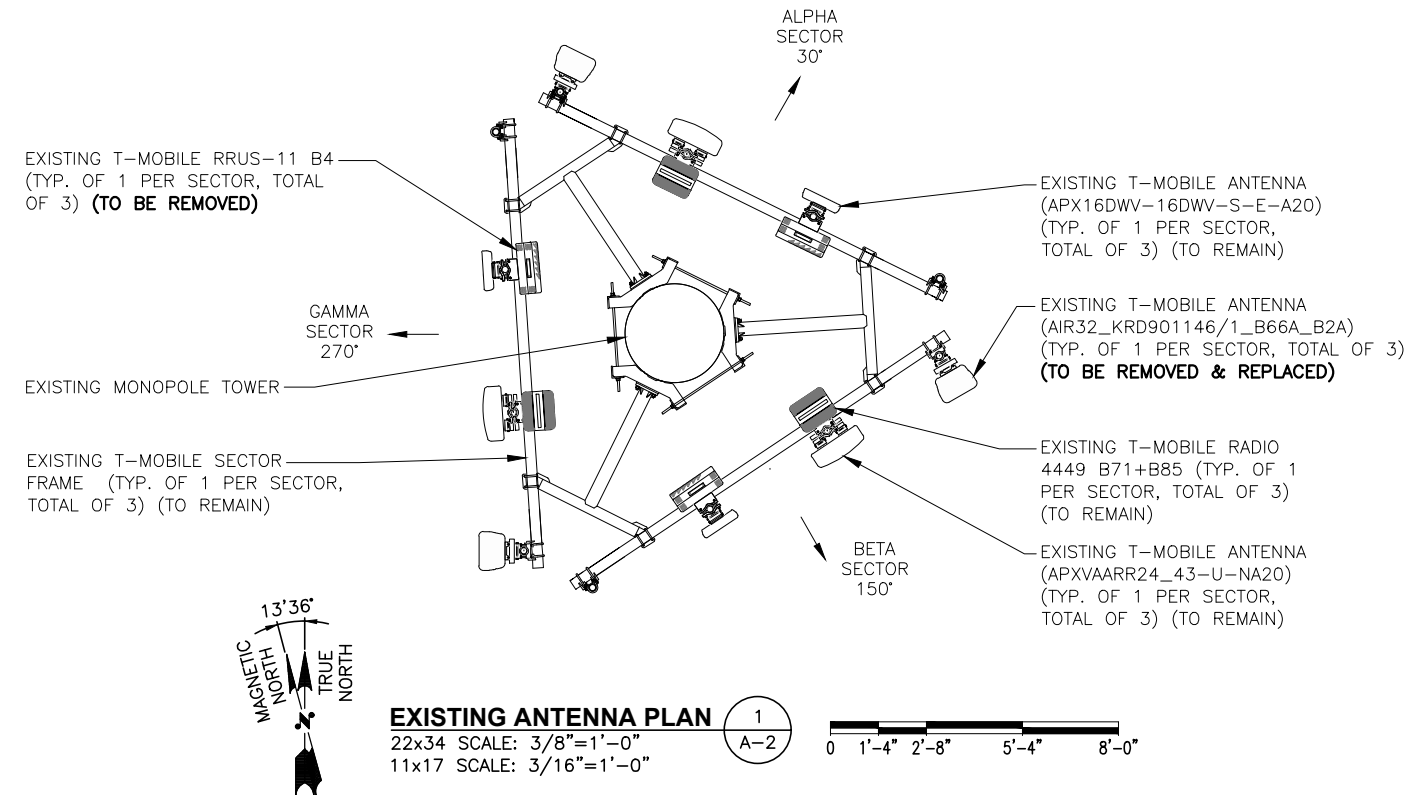
**COMPOUND &
EQUIPMENT PLANS**
(RADIO UPGRADE)

SHEET NUMBER

A-1

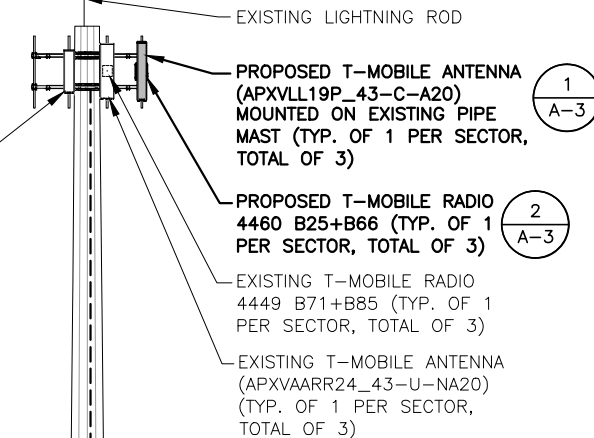
STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO MOUNT ANALYSIS PROVIDED BY TEP OPCO LLC, DATED: AUGUST 30, 2024 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



EXISTING T-MOBILE ANTENNA (APX16DWV-16DWV-S-E-A20) (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO REMAIN)

EXISTING MONOPOLE TOWER



GROUND LEVEL
ELEV. 0'-0"± (AGL)

ELEVATION

22x34 SCALE: 1/16"=1'-0"
11x17 SCALE: 1/32"=1'-0"

3 A-2

0 8'-0" 16'-0" 32'-0" 48'-0"

**T-MOBILE
NORTHEAST LLC**

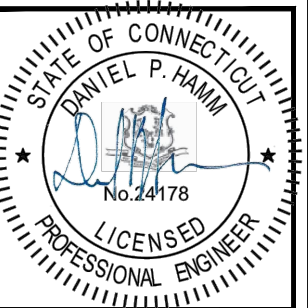
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116



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WEST BRIDGEWATER, MA 02379



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45 BEECHWOOD DR.
NORTH ANDOVER, MA 01845
OFFICE: (978) 557-5553



CHECKED BY: AT

APPROVED BY: DPH

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SITE ADDRESS:

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GLASTONBURY, CT 06073
HARTFORD COUNTY

SHEET TITLE

ANTENNA PLANS
& ELEVATION
(RADIO UPGRADE)

SHEET NUMBER

A-2

FINAL ANTENNA CONFIGURATION									
SECTOR MARK	ANTENNA MODEL	TECHNOLOGY	AZIMUTH	E-TILT	M-TILT	ANTENNA CENTERLINE	RADIO	CABLE FEED LINES	CABLE LENGTH
A-1	APXVLL19P_43-C-A20	L2100+N1900+L1900+G1900	30°	2/2	0	145'-0"±	(1) (P) RADIO 4460 B25+B66	(3) (P) 6X24 #4AWG HYBRID FIBER CABLE	220'±
A-2	APXVAARR24_43-U-NA20	N600+L700+L600	30°	2/2	0	145'-0"±	(1) (E) RADIO 4449 B71+B85		
A-3	APX16DWV-16DWV-S-E-A20	-	30°	2	0	145'-0"±	-		
A-4	-	-	-	-	-	-	-		
B-1	APXVLL19P_43-C-A20	L2100+N1900+L1900+G1900	150°	2/2	0	145'-0"±	(1) (P) RADIO 4460 B25+B66		
B-2	APXVAARR24_43-U-NA20	N600+L700+L600	150°	2/2	0	145'-0"±	(1) (E) RADIO 4449 B71+B85		
B-3	APX16DWV-16DWV-S-E-A20	-	150°	2	0	145'-0"±	-		
B-4	-	-	-	-	-	-	-		
C-1	APXVLL19P_43-C-A20	L2100+N1900+L1900+G1900	270°	2/2	0	145'-0"±	(1) (P) RADIO 4460 B25+B66		
C-2	APXVAARR24_43-U-NA20	N600+L700+L600	270°	2/2	0	145'-0"±	(1) (E) RADIO 4449 B71+B85		
C-3	APX16DWV-16DWV-S-E-A20	-	270°	2	0	145'-0"±	-		
C-4	-	-	-	-	-	-	-		

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

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T-MOBILE
NORTHEAST LLC

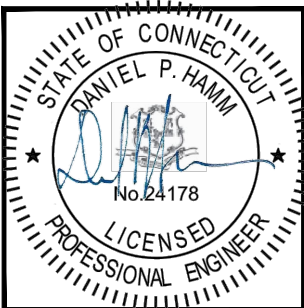
35 GRIFFIN ROAD SOUTH
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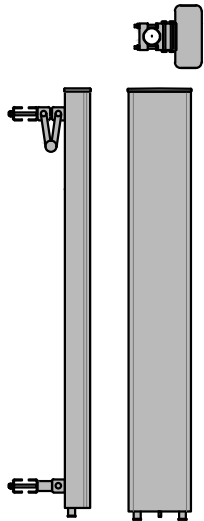
SITE ADDRESS:
63-80 WOODLAND ST
GLASTONBURY, CT 06073
HARTFORD COUNTY

SHEET TITLE
TOWER EQUIPMENT
DETAILS
(RADIO UPGRADE)

SHEET NUMBER

A-3

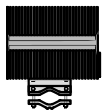
N1900+L2100+G1900+L1900 ANTENNA DIMENSIONS	
MODEL #	APXVLL19P_43-C-A20 (QUAD)
MANUF.	RFS
HEIGHT	75.8"
WIDTH	11.3"
DEPTH	4.6"
WEIGHT	40.9 LBS



N1900+L2100+G1900+L1900
ANTENNA DETAIL
SCALE: N.T.S.

1
A-3

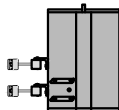
RADIO 4460 B25+B66 DIMENSIONS	
MODEL #	RADIO 4460 B25+B66
MANUF.	ERICSSON
HEIGHT	17.0"
WIDTH	15.1"
DEPTH	11.9"
WEIGHT	104 LBS



PLAN



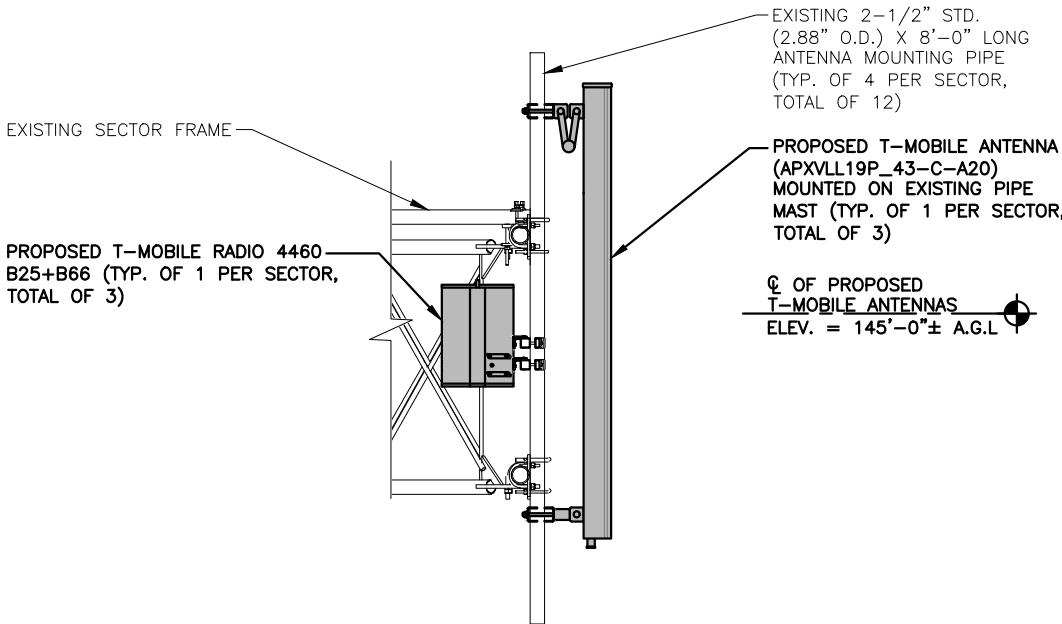
FRONT



SIDE

RADIO DETAIL
SCALE: N.T.S.

2
A-3



PROPOSED N1900+L2100+G1900+L1900
ANTENNA MOUNTING DETAIL
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

3
A-3



NOTE:
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**T-MOBILE
NORTHEAST LLC**

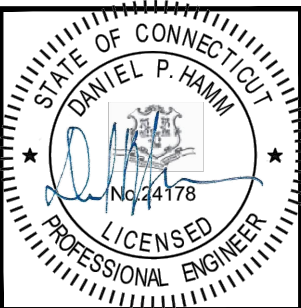
35 GRIFFIN ROAD SOUTH
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HARTFORD COUNTY

SHEET TITLE

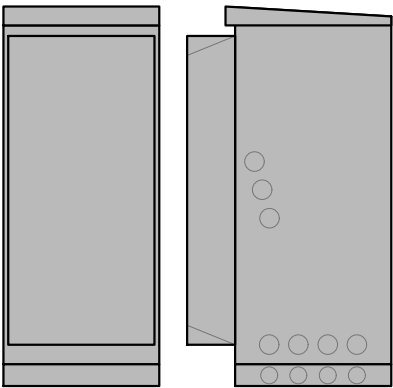
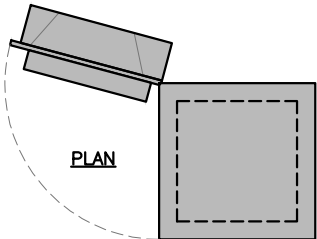
EQUIPMENT DETAILS

(RADIO UPGRADE)

SHEET NUMBER

A-4

CABINET DIMENSIONS	
MODEL #	B160 SITE SUPPORT CABINET
MANUF.	ERICSSON
HEIGHT	63"
WIDTH	25.6"
DEPTH (W/ DOOR)	33.5"
WEIGHT	1500 LBS MAX
(INSTALL PER MANUFACTURER'S INSTALLATION GUIDELINES)	



FRONT

SIDE

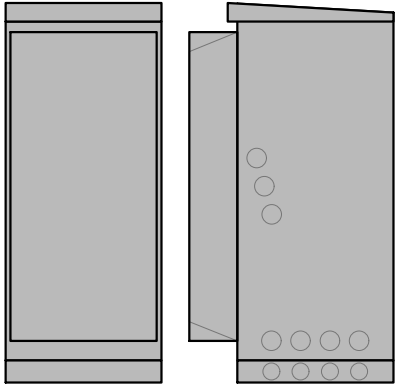
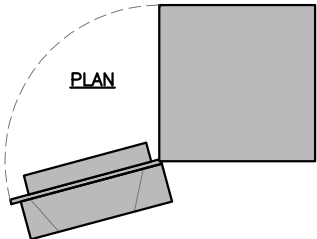
SITE SUPPORT CABINET DETAIL

SCALE: N.T.S

1

A-4

CABINET DIMENSIONS	
MODEL #	B160 BATTERY CABINET
MANUF.	ERICSSON
HEIGHT	63"
WIDTH	26"
DEPTH (W/ DOOR)	34"
WEIGHT	2000 LBS MAX
(INSTALL PER MANUFACTURER'S INSTALLATION GUIDELINES)	



FRONT

SIDE

BATTERY CABINET DETAIL

SCALE: N.T.S

2

A-4

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 D.I.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-70 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 KWI-K 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.

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.

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.

T-MOBILE
NORTHEAST LLC

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 **CENTERLINE**

750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379



TEP OPCO, LLC.
45 BEECHWOOD DR.
NORTH ANDOVER, MA 01845
OFFICE: (978) 557-5553

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: AT

APPROVED BY: DPH

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
3	10/23/24	REVISED FOR CONSTRUCTION	TR
2	10/11/24	ISSUED FOR CONSTRUCTION	TR
1	09/26/24	ISSUED FOR CONSTRUCTION	TR
0	08/12/24	ISSUED FOR REVIEW	ASD

SITE NUMBER:
CTHA026A

SITE NAME:
CTHA026A

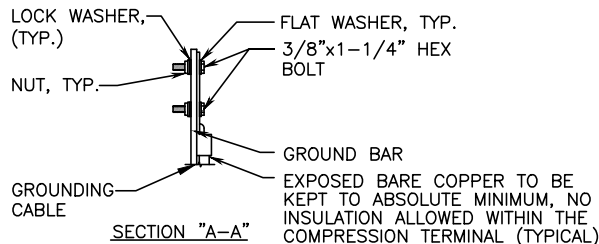
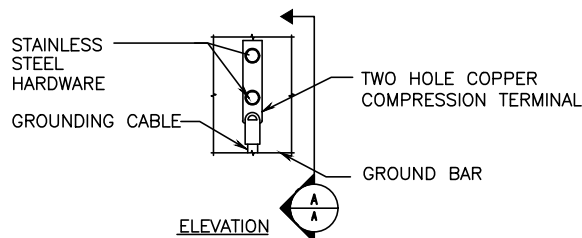
SITE ADDRESS:
63-80 WOODLAND ST
GLASTONBURY, CT 06073
HARTFORD COUNTY

SHEET TITLE

SPECIAL
INSPECTIONS NOTES
(RADIO UPGRADE)

SHEET NUMBER

SN-1

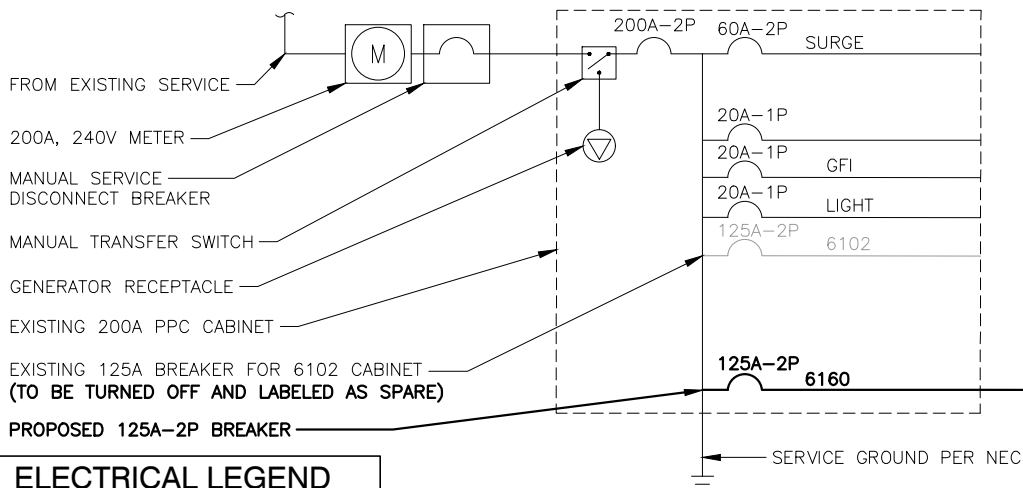


- NOTES:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
 2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
 3. CADWELD DOWNLEADS FROM UPPER AGB/EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL
SCALE: N.T.S

1
E-1

NOTE:
G.C. TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.



ELECTRICAL LEGEND

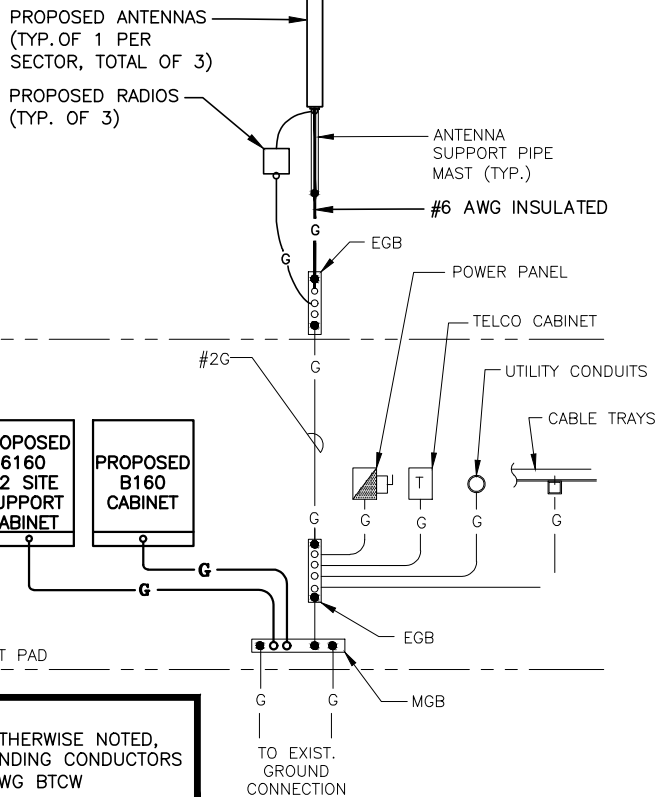
A	AMPERE
V	VOLT
KWH	KILOWATT - HOUR
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
BTBW	BARE TINNED (SOLID) COPPER WIRE (#2 AWG, UNLESS NOTES OTHERWISE)
G	GROUND
MGB	GROUND
AGB/EGB	MASTER GROUND BAR
MECHANICAL CONNECTION	MECHANICAL CONNECTION
CADWELD CONNECTION	CADWELD CONNECTION
EQUIPMENT GROUND BAR/ANTENNA GROUND BAR	EQUIPMENT GROUND BAR/ANTENNA GROUND BAR
GROUND COPPER WIRE, SIZE AS NOTED	GROUND COPPER WIRE, SIZE AS NOTED
EXPOSED WIRING	EXPOSED WIRING
INSULATED GROUNDING CONDUCTOR (#6 AWG STRANDED, UNLESS NOTED OTHERWISE)	INSULATED GROUNDING CONDUCTOR (#6 AWG STRANDED, UNLESS NOTED OTHERWISE)
5/8"x8" COPPER CLAD STAINLESS STEEL GROUND ROD	5/8"x8" COPPER CLAD STAINLESS STEEL GROUND ROD
EXOTHERMIC (CAD WELD) OR MECHANICAL (COMPRESSION TYPE) CONNECTION	EXOTHERMIC (CAD WELD) OR MECHANICAL (COMPRESSION TYPE) CONNECTION
PPC	POWER PROTECTION CABINET
OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

ONE LINE POWER DIAGRAM
SCALE: N.T.S

4
E-1

ELECTRICAL & GROUNDING NOTES

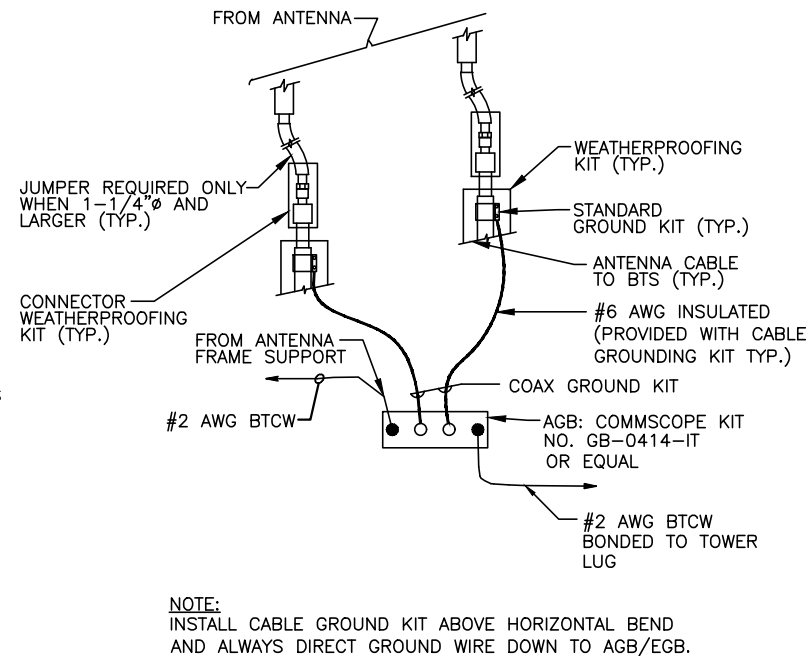
1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-1. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
12. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.



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

GROUNDING RISER DIAGRAM
SCALE: N.T.S

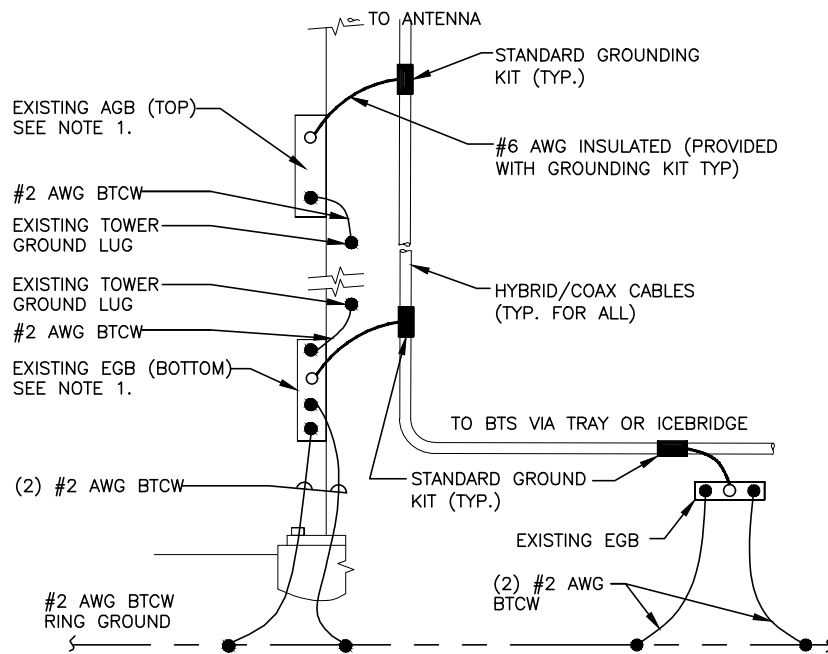
2
E-1



NOTE:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB.

TOWER TOP CABLE GROUNDING DETAIL
SCALE: N.T.S

3
E-1



- NOTES:
1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE ADDITIONAL AGB/EGB AS REQUIRED.
 2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

TOWER BOTTOM CABLE GROUNDING DETAIL
SCALE: N.T.S

5
E-1

13. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
14. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
15. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
16. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN BTS UNIT).
17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
20. BOND ANTENNA EGB'S AND MGB TO WATER MAIN.
21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
22. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
23. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

**T-MOBILE
NORTHEAST LLC**

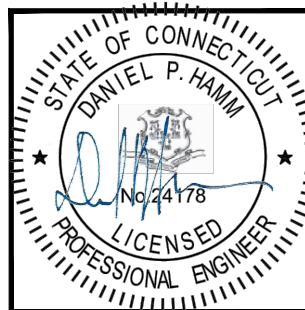
35 GRIFFIN ROAD SOUTH
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750 WEST CENTER STREET, SUITE #301
WEST BRIDGEWATER, MA 02379



TEP OPCO, LLC.
45 BEECHWOOD DR.
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OFFICE: (978) 557-5553



CHECKED BY: AT

APPROVED BY: DPH

SUBMITTALS

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2	10/11/24	ISSUED FOR CONSTRUCTION	TR
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0	08/12/24	ISSUED FOR REVIEW	ASD

SITE NUMBER:
CTHA026A

SITE NAME:
CTHA026A

SITE ADDRESS:
63-80 WOODLAND ST
GLASTONBURY, CT 06073
HARTFORD COUNTY

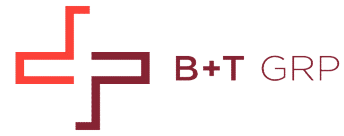
SHEET TITLE
**ONE-LINE DIAGRAM
& GROUNDING
DETAILS
(RADIO UPGRADE)**

SHEET NUMBER

E-1

EXHIBIT E

Structural Analysis Report



Date: **November 5, 2024**

John Bozzetto
Vertical Bridge
750 Park of Commerce Drive, Suite 200
Boca Raton, FL 33487

MTS Engineering, P.L.L.C.
1717 S. Boulder Ave, Suite 300
Tulsa, OK 74119
(918) 587-4630

Subject: **Structural Analysis Report**

Carrier Designation: **T-Mobile Co-Locate**
Site Number: CTHA026A
Site Name: CTHA026A

Vertical Bridge Designation: **Site Number:** US-CT-5018
Site Name: Hopewell

Engineering Firm Designation: **Project Number:** 173455.001.01.0001

Site Data: **63 Woodland St - Glastonbury, CT 06073, Hartford County**
Latitude 41.66079166°, Longitude -72.57409722°
150 Foot - Monopole

Dear John Bozzetto,

We are pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above-mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

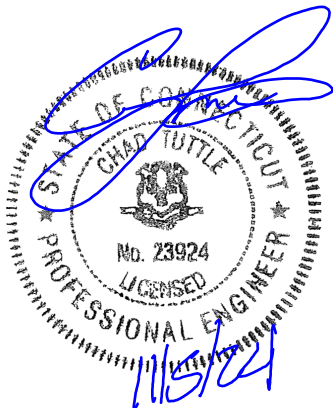
Proposed Equipment Configuration

Sufficient Capacity – 89.3%

This analysis utilizes an ultimate 3-second gust wind speed of 119 mph as required by the 2022 Connecticut State Building Code. Applicable standard references and design criteria are listed in Section 2 - Analysis Criteria

Structural analysis prepared by: Sheharyar Malik

Respectfully submitted by: MTS Engineering, P.L.L.C.
COA: BER: 2386985



Chad E. Tuttle, P.E.

tnxTower Report - version 8.2.4.3

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tnxTower Output

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1) INTRODUCTION

This is a 150 ft. Monopole designed by Ehresmann Engineering, Inc.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	119 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Seismic Ss:	0.202
Seismic S1:	0.056
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
145.0	145.0	3	RFS Celwave	APXVLL19P_43-C-A20	3	2" Hybrid
		3	Ericsson	Radio 4460 B25+B66		
		3	RFS Celwave	APX16DWV-16DWV-S-E-A20		
		3	RFS Celwave	APXVAARR24_43-U-NA20		
		3	Ericsson	Radio 4449 B71+B85		
		1	Site Pro 1	ULPD12-496 T-Arm Kit		

Note: Proposed Equipment shown in bold.

Note: Remaining Rights up to 25,000 sq. inches have been considered in the analysis results.

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
136.0	136.0	3	CCI Antennas	HPA65R-BU8A	6 2	5/8" DC 3/8"
		6	CCI Antennas	TPA65R-BU8D		
		3	Ericsson	E2-700		
		3	Ericsson	8843		
		3	Ericsson	RADIO 4415 B30		
		3	Ericsson	RADIO 4449		
		3	Ericsson	RRUS 4478 B14		
		3	Generic	Unknown DC		
		3	--	Sector Mount		
125.0	125.0	6	Fujitsu	TA08025-B605	1	1.6" Hybrid
		3	JMA Wireless	MX08FRO665-20_V0F		
		1	Raycap	RDIDC-9181-PF-48		
		1	--	Platform Mount w/ Handrails		
115.0	115.0	3	Commscope	BSAMNT-SBS-1-2	1	1-5/8" Hybrid
		1	Commscope	OVP12		
		3	Commscope	NHH-65B-R2B		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	Commscope	NHHSS-65B-R2BT4		
		3	Samsung Telecom.	MT6407-77A RRU		
		3	Samsung Telecom.	MT6407-77A_TIA		
		3	Samsung Telecom.	RF4439D-25A		
		3	Samsung Telecom.	RF4440D-13A		
		3	Samsung	CBRS RRH RT4401-48A		
		1	--	Platform Mount w/ Handrails		

Note: For 125' level, Remaining Rights up to 8,500 sq. inches have been considered in the analysis results.

Note: For 136' level, Remaining Rights considered as per B&P SA dated 04/08/2022.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Tower Data	Tower Manufacturer Drawing by EEI, Job No. 102800	Date: 12/17/2018	Vertical Bridge
Mount Data	Mount Analysis Report by TEP, Project No. 341846.981547	Date: 08/30/2024	Vertical Bridge
Foundation Data	Foundation Drawing by EEI, Job No. 102800	Date: 12/17/2018	Vertical Bridge
Soil Data	Geotechnical Report by FDH Velocitel, Project No. 18PGJC1600	Date: 04/10/2018	Vertical Bridge
Existing Loading	Structural Analysis Report by Bennett & Pless, Job No. 22.03.006.028	Date: 04/08/2022	Vertical Bridge
Proposed Loading	Collocation Application	Date: 10/17/2024	Vertical Bridge

3.1) Analysis Method

tnxTower (version 8.2.4.3), 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) The 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.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 100	Pole	TP39.688x26.375x0.25	1	-20.119	1762.700	51.9	Pass
L2	100 - 65.5	Pole	TP48.313x37.723x0.375	2	-28.450	3213.440	50.6	Pass
L3	65.5 - 32.25	Pole	TP56.375x45.776x0.438	3	-40.015	4377.230	51.7	Pass
L4	32.25 - 0	Pole	TP64x53.446x0.438	4	-56.960	5163.470	60.5	Pass
							Summary	
						Pole (L4)	60.5	Pass
						Rating =	60.5	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	54.2	Pass
1	Base Plate	Base	82.2	Pass
1,2	Base Foundation (Structure)	Base	89.3	Pass
1,2	Base Foundation (Soil Interaction)	Base	24.5	Pass

Structure Rating (max from all components) =	89.3%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) It is unknown whether the foundation is a drilled shaft or pier and pad. Both designs were analyzed and determined to be sufficient.

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	
Length (ft)	50.000	40.000	40.000	40.000	
Number of Sides	18	18	18	18	
Thickness (in)	0.250	0.375	0.438	0.438	
Socket Length (ft)	5.500	6.750	7.750		
Top Dia (in)	26.375	37.723	45.776	53.446	
Bot Dia (in)	39.688	48.312	56.375	64.000	
Grade		A572-65			
Weight (K)	4.4	6.9	9.6	11.0	31.9

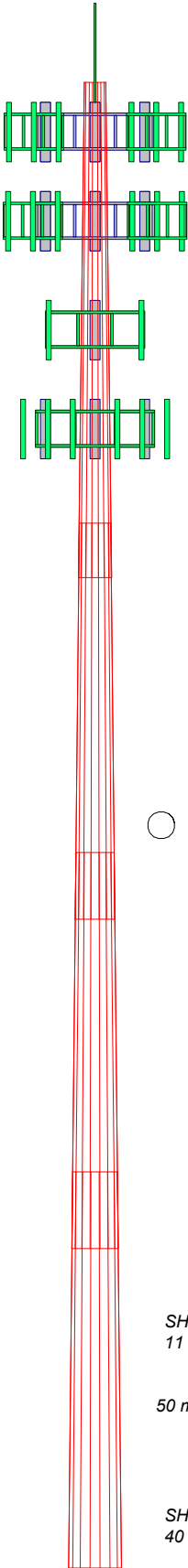
150.0 ft

100.0 ft

65.5 ft

32.2 ft

0.0 ft

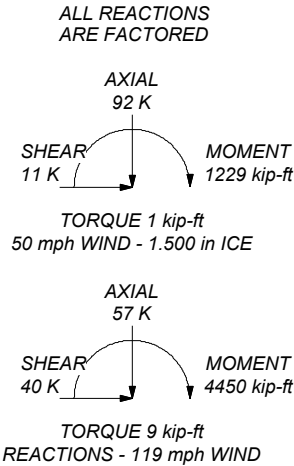


MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 119 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 0.000 ft
8. TOWER RATING: 60.5%



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Job: **173455.001.01.0001 - Hopewell, CT (Site# US-CT-501)**

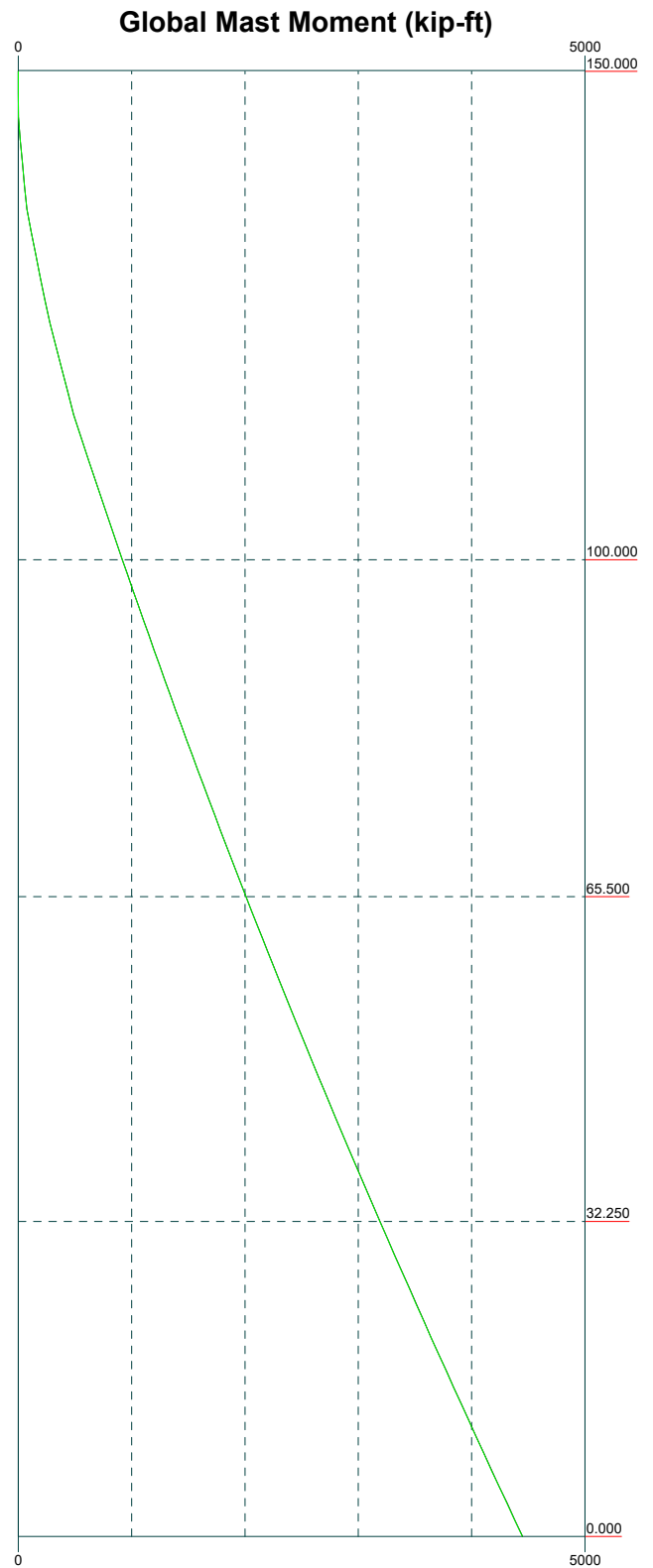
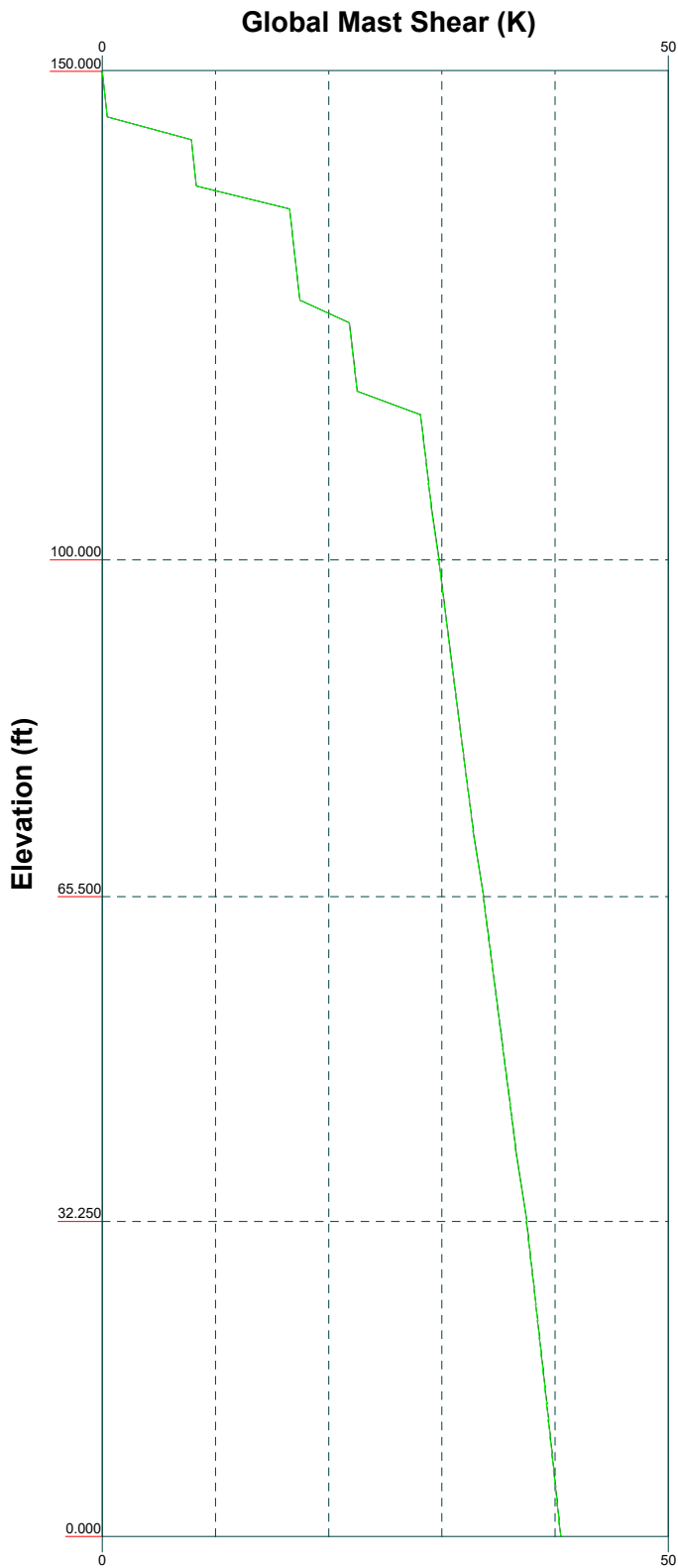
Project:	Client: Vertical Bridge	Drawn by: Akshay Kumar	App'd:
Code: TIA-222-H	Date: 10/28/24	Scale: NTS	
Path:		Dwg No. E-1	

Vx

Vz

Mx

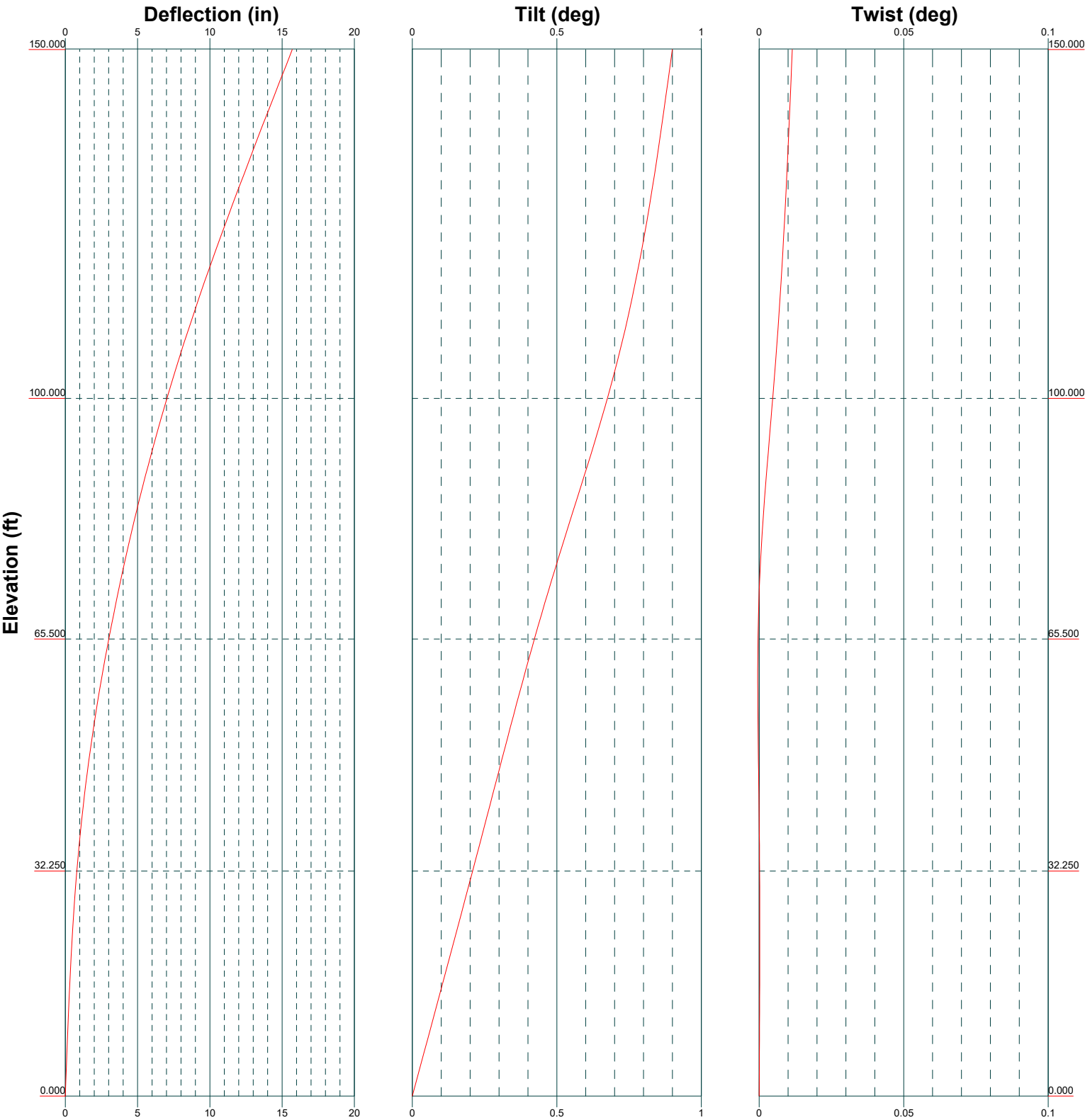
Mz



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Phone: (918) 587-4630
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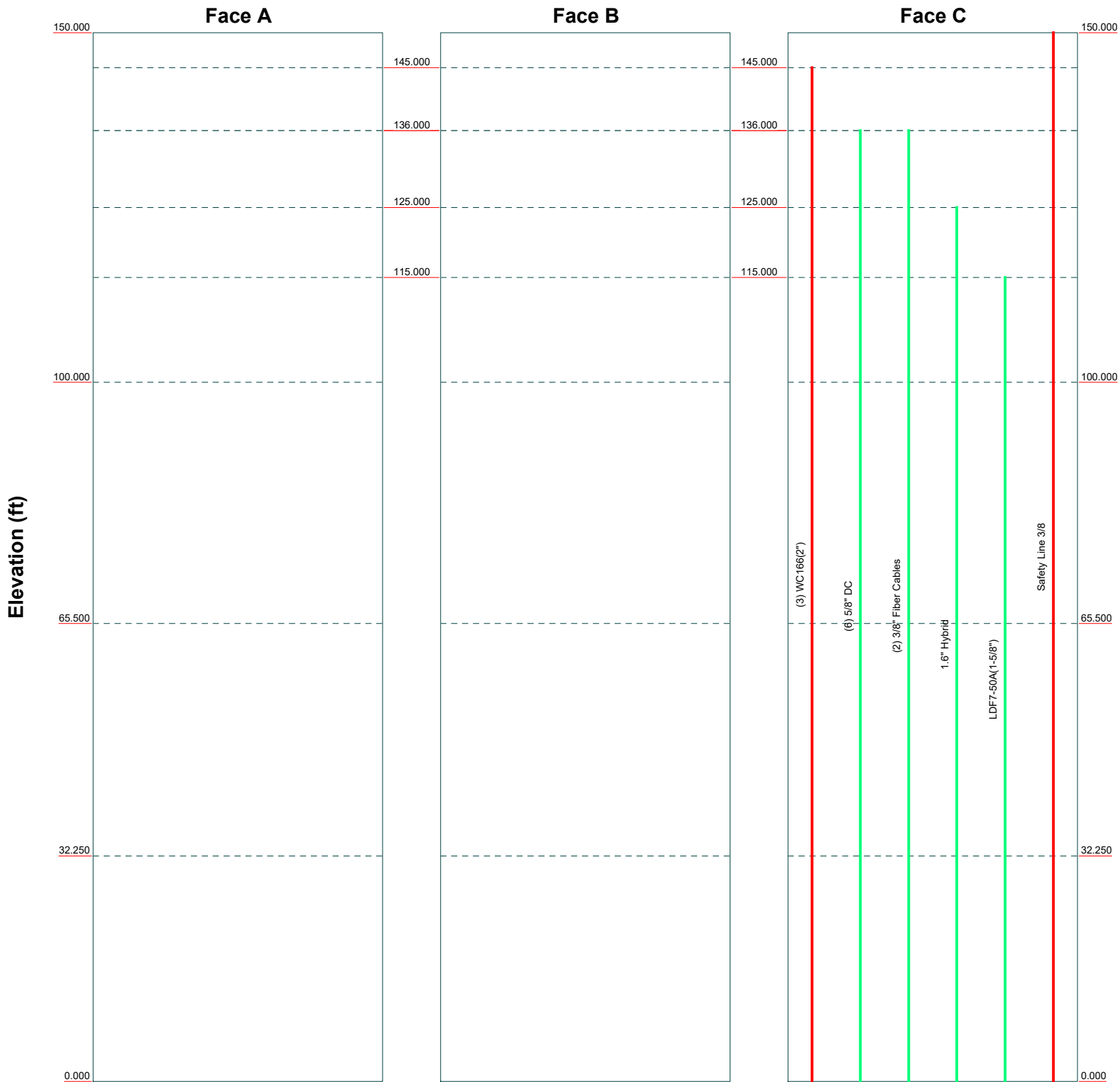
Job: **173455.001.01.0001 - Hopewell, CT (Site# US-CT-501)**

Project:	Client: Vertical Bridge	Drawn by: Akshay Kumar	App'd:
Code: TIA-222-H	Date: 10/28/24	Scale: NTS	
Path:		Dwg No. E-4	



Feed Line Distribution Chart
0' - 150'

Round Flat App In Face App Out Face Truss Leg



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	Client Vertical Bridge	Designed by Akshay Kumar

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower is located in Hartford County, Connecticut.

Tower base elevation above sea level: 308.000 ft.

Basic wind speed of 119 mph.

Risk Category II.

Exposure Category C.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.000 ft.

Nominal ice thickness of 1.500 in.

Ice thickness is considered to increase with height.

Ice density of 56.000 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50.000 °F.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Tower analysis based on target reliabilities in accordance with Annex S.

Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.

Maximum demand-capacity ratio is: 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

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Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.000-100.000	50.000	5.500	18	26.375	39.688	0.250	1.000	A572-65 (65 ksi)
L2	100.000-65.500	40.000	6.750	18	37.723	48.312	0.375	1.500	A572-65 (65 ksi)
L3	65.500-32.250	40.000	7.750	18	45.776	56.375	0.438	1.750	A572-65 (65 ksi)
L4	32.250-0.000	40.000		18	53.446	64.000	0.438	1.750	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	26.743	20.730	1787.530	9.274	13.399	133.413	3577.412	10.367	4.202	16.808
	40.261	31.294	6149.114	14.000	20.161	304.997	12306.318	15.650	6.545	26.18
L2	39.726	44.454	7833.973	13.259	19.163	408.800	15678.253	22.231	5.979	15.945
	49.000	57.058	16565.395	17.018	24.543	674.961	33152.586	28.534	7.843	20.915
L3	48.230	62.958	16349.736	16.095	23.254	703.094	32720.985	31.485	7.286	16.655
	57.177	77.676	30706.590	19.858	28.639	1072.214	61453.584	38.845	9.152	20.919
L4	56.280	73.609	26131.702	18.818	27.151	962.467	52297.789	36.812	8.637	19.741
	64.920	88.264	45053.169	22.565	32.512	1385.740	90165.619	44.141	10.494	23.986

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
L1 150.000-100.000				1	1	1			
L2 100.000-65.500				1	1	1			
L3 65.500-32.250				1	1	1			
L4 32.250-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
WC166(2")	C	No	Surface Ar (CaAa)	145.000 - 0.000	3	3	0.000 0.150	2.000		0.003
*										
Safety Line 3/8	C	No	Surface Ar (CaAa)	150.000 - 0.000	1	1	0.300 0.310	0.375		0.000

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	Vertical Bridge	Akshay Kumar

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
*										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		$C_A A_A$ ft ² /ft	Weight klf
*									
5/8" DC	C	No	No	Inside Pole	136.000 - 0.000	6	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
3/8" Fiber Cables	C	No	No	Inside Pole	136.000 - 0.000	2	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
*									
1.6" Hybrid	C	No	No	Inside Pole	125.000 - 0.000	1	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
*									
LDF7-50A(1-5/8")	C	No	No	Inside Pole	115.000 - 0.000	1	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
*									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
L1	150.000-100.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	28.875	0.000	0.541
L2	100.000-65.500	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	21.994	0.000	0.460
L3	65.500-32.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	21.197	0.000	0.444
L4	32.250-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	20.559	0.000	0.430

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Feed Line/Linear Appurtenances Section Areas - With Ice

<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A_R ft²</i>	<i>A_F ft²</i>	<i>C_AA_A In Face ft²</i>	<i>C_AA_A Out Face ft²</i>	<i>Weight K</i>
L1	150.000-100.000	A	1.455	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	66.543	0.000	1.213
L2	100.000-65.500	A	1.397	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	49.757	0.000	0.964
L3	65.500-32.250	A	1.326	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	47.088	0.000	0.904
L4	32.250-0.000	A	1.187	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	44.635	0.000	0.847

Feed Line Center of Pressure

<i>Section</i>	<i>Elevation ft</i>	<i>CP_X in</i>	<i>CP_Z in</i>	<i>CP_X Ice in</i>	<i>CP_Z Ice in</i>
L1	150.000-100.000	-0.719	3.832	-1.099	3.996
L2	100.000-65.500	-0.791	4.262	-1.227	4.575
L3	65.500-32.250	-0.811	4.366	-1.269	4.762
L4	32.250-0.000	-0.826	4.440	-1.288	4.875

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
L1	2	WC166(2")	100.00 - 145.00	1.0000	1.0000
L1	11	Safety Line 3/8	100.00 - 150.00	1.0000	1.0000
L2	2	WC166(2")	65.50 - 100.00	1.0000	1.0000
L2	11	Safety Line 3/8	65.50 - 100.00	1.0000	1.0000
L3	2	WC166(2")	32.25 - 65.50	1.0000	1.0000
L3	11	Safety Line 3/8	32.25 - 65.50	1.0000	1.0000
L4	2	WC166(2")	0.00 - 32.25	1.0000	1.0000
L4	11	Safety Line 3/8	0.00 - 32.25	1.0000	1.0000

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Discrete Tower Loads

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_AA_A Front ft²</i>	<i>C_AA_A Side ft²</i>	<i>Weight K</i>
Lightning Rod 5/8" x 6'	C	None		0.000	153.000	No Ice	0.375	0.375	0.006
						1/2" Ice	0.989	0.989	0.010
						1" Ice	1.619	1.619	0.019
						2" Ice	2.464	2.464	0.047
*									
APXVLL19P_43-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	145.000	No Ice	8.250	4.155	0.050
						1/2" Ice	8.724	4.616	0.094
						1" Ice	9.205	5.085	0.144
						2" Ice	10.187	6.045	0.263
APXVLL19P_43-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	145.000	No Ice	8.250	4.155	0.050
						1/2" Ice	8.724	4.616	0.094
						1" Ice	9.205	5.085	0.144
						2" Ice	10.187	6.045	0.263
APXVLL19P_43-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	145.000	No Ice	8.250	4.155	0.050
						1/2" Ice	8.724	4.616	0.094
						1" Ice	9.205	5.085	0.144
						2" Ice	10.187	6.045	0.263
Radio 4460 B25+B66	A	From Leg	4.000 0.000 0.000	0.000	145.000	No Ice	2.564	1.976	0.109
						1/2" Ice	2.764	2.156	0.134
						1" Ice	2.971	2.343	0.163
						2" Ice	3.408	2.740	0.231
Radio 4460 B25+B66	B	From Leg	4.000 0.000 0.000	0.000	145.000	No Ice	2.564	1.976	0.109
						1/2" Ice	2.764	2.156	0.134
						1" Ice	2.971	2.343	0.163
						2" Ice	3.408	2.740	0.231
Radio 4460 B25+B66	C	From Leg	4.000 0.000 0.000	0.000	145.000	No Ice	2.564	1.976	0.109
						1/2" Ice	2.764	2.156	0.134
						1" Ice	2.971	2.343	0.163
						2" Ice	3.408	2.740	0.231
APXVAARR24_43-U-NA20 _TIA w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	145.000	No Ice	20.480	11.024	0.161
						1/2" Ice	21.231	12.550	0.297
						1" Ice	21.990	14.099	0.444
						2" Ice	23.444	16.451	0.775
APXVAARR24_43-U-NA20 _TIA w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	145.000	No Ice	20.480	11.024	0.161
						1/2" Ice	21.231	12.550	0.297
						1" Ice	21.990	14.099	0.444
						2" Ice	23.444	16.451	0.775
APXVAARR24_43-U-NA20 _TIA w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	145.000	No Ice	20.480	11.024	0.161
						1/2" Ice	21.231	12.550	0.297
						1" Ice	21.990	14.099	0.444
						2" Ice	23.444	16.451	0.775
APX16DWV-16DWV-S-E-A 20_TIA w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	145.000	No Ice	6.824	3.494	0.061
						1/2" Ice	7.275	4.263	0.110
						1" Ice	7.719	4.960	0.165
						2" Ice	8.633	6.403	0.298
APX16DWV-16DWV-S-E-A 20_TIA w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	145.000	No Ice	6.824	3.494	0.061
						1/2" Ice	7.275	4.263	0.110
						1" Ice	7.719	4.960	0.165
						2" Ice	8.633	6.403	0.298
APX16DWV-16DWV-S-E-A 20_TIA w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	145.000	No Ice	6.824	3.494	0.061
						1/2" Ice	7.275	4.263	0.110
						1" Ice	7.719	4.960	0.165
						2" Ice	8.633	6.403	0.298
Radio 4449 B71+B85	A	From Leg	4.000	0.000	145.000	No Ice	1.969	1.587	0.075

<i>tnxTower</i> <i>MTS Engineering, P.L.L.C.</i> 1717 S. Boulder Ave, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 173455.001.01.0001 - Hopewell, CT (Site# US-CT-5018)	Page 6 of 16
	Project	Date 12:32:45 10/28/24
	Client Vertical Bridge	Designed by Akshay Kumar

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_AA_A Front ft²</i>	<i>C_AA_A Side ft²</i>	<i>Weight K</i>
			0.000			1/2" Ice	2.145	1.749	0.095
			0.000			1" Ice	2.329	1.918	0.117
						2" Ice	2.719	2.280	0.172
Radio 4449 B71+B85	B	From Leg	4.000	0.000	145.000	No Ice	1.969	1.587	0.075
			0.000			1/2" Ice	2.145	1.749	0.095
			0.000			1" Ice	2.329	1.918	0.117
						2" Ice	2.719	2.280	0.172
Radio 4449 B71+B85	C	From Leg	4.000	0.000	145.000	No Ice	1.969	1.587	0.075
			0.000			1/2" Ice	2.145	1.749	0.095
			0.000			1" Ice	2.329	1.918	0.117
						2" Ice	2.719	2.280	0.172
8' x 2" Mount Pipe	A	From Leg	4.000	0.000	145.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	B	From Leg	4.000	0.000	145.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	C	From Leg	4.000	0.000	145.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
Site Pro1 ULPD12-496	C	None		0.000	145.000	No Ice	17.040	17.040	2.060
						1/2" Ice	21.220	21.220	2.356
						1" Ice	25.500	25.500	2.780
						2" Ice	34.060	34.060	3.628
1/3 Remaining Reserved Rights	A	From Leg	4.000	0.000	145.000	No Ice	19.120	19.120	0.204
			0.000			1/2" Ice	22.430	22.430	0.306
			0.000			1" Ice	25.740	25.740	0.408
						2" Ice	32.360	32.360	0.612
1/3 Remaining Reserved Rights	B	From Leg	4.000	0.000	145.000	No Ice	19.120	19.120	0.204
			0.000			1/2" Ice	22.430	22.430	0.306
			0.000			1" Ice	25.740	25.740	0.408
						2" Ice	32.360	32.360	0.612
1/3 Remaining Reserved Rights	C	From Leg	4.000	0.000	145.000	No Ice	19.120	19.120	0.204
			0.000			1/2" Ice	22.430	22.430	0.306
			0.000			1" Ice	25.740	25.740	0.408
						2" Ice	32.360	32.360	0.612
*									
(2) TPA65R-BU8D w/ Mount Pipe	A	From Leg	4.000	0.000	136.000	No Ice	15.936	7.914	0.120
			0.000			1/2" Ice	16.868	8.763	0.235
			0.000			1" Ice	17.816	9.627	0.364
						2" Ice	19.760	11.404	0.667
(2) TPA65R-BU8D w/ Mount Pipe	B	From Leg	4.000	0.000	136.000	No Ice	15.936	7.914	0.120
			0.000			1/2" Ice	16.868	8.763	0.235
			0.000			1" Ice	17.816	9.627	0.364
						2" Ice	19.760	11.404	0.667
(2) TPA65R-BU8D w/ Mount Pipe	C	From Leg	4.000	0.000	136.000	No Ice	15.936	7.914	0.120
			0.000			1/2" Ice	16.868	8.763	0.235
			0.000			1" Ice	17.816	9.627	0.364
						2" Ice	19.760	11.404	0.667
HPA65R-BU8A w/Mount Pipe	A	From Leg	4.000	0.000	136.000	No Ice	18.564	10.575	0.094
			0.000			1/2" Ice	19.402	12.197	0.219
			0.000			1" Ice	20.251	13.843	0.355
						2" Ice	21.844	16.531	0.665
HPA65R-BU8A w/Mount	B	From Leg	4.000	0.000	136.000	No Ice	18.564	10.575	0.094

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	Project		Date
	Client		12:32:45 10/28/24
	Vertical Bridge		Designed by Akshay Kumar

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_AA_A Front ft²</i>	<i>C_AA_A Side ft²</i>	<i>Weight K</i>
Pipe			0.000 0.000			1/2" Ice 19.402 1" Ice 20.251 2" Ice 21.844	12.197 13.843 16.531	0.219 0.355 0.665
HPA65R-BU8A w/Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 18.564 1/2" Ice 19.402 1" Ice 20.251 2" Ice 21.844	10.575 12.197 13.843 16.531	0.094 0.219 0.355 0.665
RRUS 4478 B14	A	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 1.843 1/2" Ice 2.012 1" Ice 2.190 2" Ice 2.566	1.059 1.197 1.342 1.656	0.060 0.076 0.094 0.140
RRUS 4478 B14	B	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 1.843 1/2" Ice 2.012 1" Ice 2.190 2" Ice 2.566	1.059 1.197 1.342 1.656	0.060 0.076 0.094 0.140
RRUS 4478 B14	C	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 1.843 1/2" Ice 2.012 1" Ice 2.190 2" Ice 2.566	1.059 1.197 1.342 1.656	0.060 0.076 0.094 0.140
E2-700	A	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 3.083 1/2" Ice 3.301 1" Ice 3.526 2" Ice 3.998	1.243 1.392 1.553 1.901	0.052 0.075 0.101 0.163
E2-700	B	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 3.083 1/2" Ice 3.301 1" Ice 3.526 2" Ice 3.998	1.243 1.392 1.553 1.901	0.052 0.075 0.101 0.163
E2-700	C	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 3.083 1/2" Ice 3.301 1" Ice 3.526 2" Ice 3.998	1.243 1.392 1.553 1.901	0.052 0.075 0.101 0.163
RADIO 4415 B30	A	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 1.643 1/2" Ice 1.803 1" Ice 1.971 2" Ice 2.328	0.639 0.750 0.867 1.132	0.043 0.055 0.069 0.106
RADIO 4415 B30	B	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 1.643 1/2" Ice 1.803 1" Ice 1.971 2" Ice 2.328	0.639 0.750 0.867 1.132	0.043 0.055 0.069 0.106
RADIO 4415 B30	C	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 1.643 1/2" Ice 1.803 1" Ice 1.971 2" Ice 2.328	0.639 0.750 0.867 1.132	0.043 0.055 0.069 0.106
RADIO 4449	A	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 3.500 1/2" Ice 3.743 1" Ice 3.993 2" Ice 4.515	2.359 2.566 2.779 3.237	0.085 0.114 0.147 0.225
RADIO 4449	B	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 3.500 1/2" Ice 3.743 1" Ice 3.993 2" Ice 4.515	2.359 2.566 2.779 3.237	0.085 0.114 0.147 0.225
RADIO 4449	C	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice 3.500 1/2" Ice 3.743 1" Ice 3.993 2" Ice 4.515	2.359 2.566 2.779 3.237	0.085 0.114 0.147 0.225
8843	A	From Leg	4.000 0.000	0.000	136.000	No Ice 1.650 1/2" Ice 1.810	1.363 1.510	0.072 0.090

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	Project		Date
	Client		12:32:45 10/28/24
	Vertical Bridge		Designed by
			Akshay Kumar

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
			0.000			1" Ice	1.978	1.665	0.110
						2" Ice	2.336	1.997	0.160
8843	B	From Leg	4.000	0.000	136.000	No Ice	1.650	1.363	0.072
			0.000			1/2" Ice	1.810	1.510	0.090
			0.000			1" Ice	1.978	1.665	0.110
						2" Ice	2.336	1.997	0.160
8843	C	From Leg	4.000	0.000	136.000	No Ice	1.650	1.363	0.072
			0.000			1/2" Ice	1.810	1.510	0.090
			0.000			1" Ice	1.978	1.665	0.110
						2" Ice	2.336	1.997	0.160
Unknown DC	A	From Leg	4.000	0.000	136.000	No Ice	1.547	4.762	0.026
			0.000			1/2" Ice	1.708	5.042	0.063
			0.000			1" Ice	1.877	5.328	0.104
						2" Ice	2.237	5.924	0.199
Unknown DC	B	From Leg	4.000	0.000	136.000	No Ice	1.547	4.762	0.026
			0.000			1/2" Ice	1.708	5.042	0.063
			0.000			1" Ice	1.877	5.328	0.104
						2" Ice	2.237	5.924	0.199
Unknown DC	C	From Leg	4.000	0.000	136.000	No Ice	1.547	4.762	0.026
			0.000			1/2" Ice	1.708	5.042	0.063
			0.000			1" Ice	1.877	5.328	0.104
						2" Ice	2.237	5.924	0.199
8' x 2" Mount Pipe	A	From Leg	4.000	0.000	136.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	B	From Leg	4.000	0.000	136.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
8' x 2" Mount Pipe	C	From Leg	4.000	0.000	136.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
Sector Mount [SM 602-3]	C	None		0.000	136.000	No Ice	32.100	32.100	1.540
						1/2" Ice	39.560	39.560	2.122
						1" Ice	47.210	47.210	2.841
						2" Ice	63.520	63.520	4.686
1/3 Remaining Reserved Rights	A	From Leg	4.000	0.000	136.000	No Ice	1.149	1.149	0.012
			0.000			1/2" Ice	1.300	1.300	0.018
			0.000			1" Ice	1.451	1.451	0.024
						2" Ice	1.753	1.753	0.035
1/3 Remaining Reserved Rights	B	From Leg	4.000	0.000	136.000	No Ice	1.149	1.149	0.012
			0.000			1/2" Ice	1.300	1.300	0.018
			0.000			1" Ice	1.451	1.451	0.024
						2" Ice	1.753	1.753	0.035
1/3 Remaining Reserved Rights	C	From Leg	4.000	0.000	136.000	No Ice	1.149	1.149	0.012
			0.000			1/2" Ice	1.300	1.300	0.018
			0.000			1" Ice	1.451	1.451	0.024
						2" Ice	1.753	1.753	0.035
*									
MX08FRO665-20_V0F w/ Mount Pipe	A	From Leg	4.000	0.000	125.000	No Ice	12.964	7.767	0.083
			0.000			1/2" Ice	13.668	9.053	0.178
			0.000			1" Ice	14.340	10.191	0.282
						2" Ice	15.618	12.139	0.519
MX08FRO665-20_V0F w/ Mount Pipe	B	From Leg	4.000	0.000	125.000	No Ice	12.964	7.767	0.083
			0.000			1/2" Ice	13.668	9.053	0.178

<i>tnxTower</i> <i>MTS Engineering, P.L.L.C.</i> 1717 S. Boulder Ave, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job		Page
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	Project		Date
	Client		12:32:45 10/28/24
	Vertical Bridge		Designed by
			Akshay Kumar

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
			0.000			1" Ice	14.340	10.191	0.282
						2" Ice	15.618	12.139	0.519
MX08FRO665-20_V0F w/ Mount Pipe	C	From Leg	4.000	0.000	125.000	No Ice	12.964	7.767	0.083
			0.000			1/2" Ice	13.668	9.053	0.178
			0.000			1" Ice	14.340	10.191	0.282
(2) TA08025-B605	A	From Leg	4.000	0.000	125.000	2" Ice	15.618	12.139	0.519
			0.000			No Ice	1.964	1.129	0.075
			0.000			1/2" Ice	2.138	1.267	0.093
			0.000			1" Ice	2.320	1.411	0.114
(2) TA08025-B605	B	From Leg	4.000	0.000	125.000	2" Ice	2.705	1.723	0.164
			0.000			No Ice	1.964	1.129	0.075
			0.000			1/2" Ice	2.138	1.267	0.093
			0.000			1" Ice	2.320	1.411	0.114
(2) TA08025-B605	C	From Leg	4.000	0.000	125.000	2" Ice	2.705	1.723	0.164
			0.000			No Ice	1.964	1.129	0.075
			0.000			1/2" Ice	2.138	1.267	0.093
			0.000			1" Ice	2.320	1.411	0.114
RDIDC-9181-PF-48	C	From Leg	4.000	0.000	125.000	2" Ice	2.705	1.723	0.164
			0.000			No Ice	2.012	1.168	0.022
			0.000			1/2" Ice	2.189	1.311	0.040
			0.000			1" Ice	2.373	1.461	0.060
(2) 8' x 2" Mount Pipe	A	From Leg	4.000	0.000	125.000	2" Ice	2.763	1.784	0.110
			0.000			No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
(2) 8' x 2" Mount Pipe	B	From Leg	4.000	0.000	125.000	2" Ice	4.396	4.396	0.119
			0.000			No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
(2) 8' x 2" Mount Pipe	C	From Leg	4.000	0.000	125.000	2" Ice	4.396	4.396	0.119
			0.000			No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			0.000			1" Ice	3.401	3.401	0.063
Platform Mount [LP 716-1]	C	None		0.000	125.000	2" Ice	4.396	4.396	0.119
						No Ice	26.800	26.800	1.509
						1/2" Ice	32.200	32.200	1.811
						1" Ice	37.600	37.600	2.113
						2" Ice	48.400	48.400	2.717
1/3 Remaining Reserved Rights	A	From Leg	4.000	0.000	125.000	No Ice	5.880	5.880	0.063
			0.000			1/2" Ice	6.900	6.900	0.094
			0.000			1" Ice	7.920	7.920	0.125
						2" Ice	9.960	9.960	0.187
1/3 Remaining Reserved Rights	B	From Leg	4.000	0.000	125.000	No Ice	5.880	5.880	0.063
			0.000			1/2" Ice	6.900	6.900	0.094
			0.000			1" Ice	7.920	7.920	0.125
						2" Ice	9.960	9.960	0.187
1/3 Remaining Reserved Rights	C	From Leg	4.000	0.000	125.000	No Ice	5.880	5.880	0.063
			0.000			1/2" Ice	6.900	6.900	0.094
			0.000			1" Ice	7.920	7.920	0.125
						2" Ice	9.960	9.960	0.187
*									
NHH-65B-R2B_TIA w/ Mount Pipe	A	From Leg	4.000	0.000	115.000	No Ice	8.316	7.004	0.069
			0.000			1/2" Ice	8.876	8.185	0.138
			0.000			1" Ice	9.402	9.081	0.214
						2" Ice	10.475	10.904	0.395
NHH-65B-R2B_TIA w/ Mount Pipe	B	From Leg	4.000	0.000	115.000	No Ice	8.316	7.004	0.069
			0.000			1/2" Ice	8.876	8.185	0.138

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	Client Vertical Bridge	Designed by Akshay Kumar

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_AA_A Front ft²</i>	<i>C_AA_A Side ft²</i>	<i>Weight K</i>
			0.000			1" Ice 9.402	9.081	0.214
						2" Ice 10.475	10.904	0.395
NHH-65B-R2B_TIA w/ Mount Pipe	C	From Leg	4.000	0.000	115.000	No Ice 8.316	7.004	0.069
			0.000			1/2" Ice 8.876	8.185	0.138
			0.000			1" Ice 9.402	9.081	0.214
						2" Ice 10.475	10.904	0.395
NHHSS-65B-R2BT4_TIA w/ Mount Pipe	A	From Leg	4.000	0.000	115.000	No Ice 8.285	7.018	0.076
			0.000			1/2" Ice 8.845	8.199	0.145
			0.000			1" Ice 9.370	9.094	0.221
						2" Ice 10.442	10.918	0.402
NHHSS-65B-R2BT4_TIA w/ Mount Pipe	B	From Leg	4.000	0.000	115.000	No Ice 8.285	7.018	0.076
			0.000			1/2" Ice 8.845	8.199	0.145
			0.000			1" Ice 9.370	9.094	0.221
						2" Ice 10.442	10.918	0.402
NHHSS-65B-R2BT4_TIA w/ Mount Pipe	C	From Leg	4.000	0.000	115.000	No Ice 8.285	7.018	0.076
			0.000			1/2" Ice 8.845	8.199	0.145
			0.000			1" Ice 9.370	9.094	0.221
						2" Ice 10.442	10.918	0.402
MT6407-77A_TIA	A	From Leg	4.000	0.000	115.000	No Ice 4.700	1.844	0.087
			0.000			1/2" Ice 4.988	2.067	0.116
			0.000			1" Ice 5.284	2.297	0.150
						2" Ice 5.897	2.777	0.228
MT6407-77A_TIA	B	From Leg	4.000	0.000	115.000	No Ice 4.700	1.844	0.087
			0.000			1/2" Ice 4.988	2.067	0.116
			0.000			1" Ice 5.284	2.297	0.150
						2" Ice 5.897	2.777	0.228
MT6407-77A_TIA	C	From Leg	4.000	0.000	115.000	No Ice 4.700	1.844	0.087
			0.000			1/2" Ice 4.988	2.067	0.116
			0.000			1" Ice 5.284	2.297	0.150
						2" Ice 5.897	2.777	0.228
RF4439D-25A	A	From Leg	4.000	0.000	115.000	No Ice 1.865	1.252	0.075
			0.000			1/2" Ice 2.035	1.394	0.093
			0.000			1" Ice 2.212	1.544	0.114
						2" Ice 2.589	1.866	0.165
RF4439D-25A	B	From Leg	4.000	0.000	115.000	No Ice 1.865	1.252	0.075
			0.000			1/2" Ice 2.035	1.394	0.093
			0.000			1" Ice 2.212	1.544	0.114
						2" Ice 2.589	1.866	0.165
RF4439D-25A	C	From Leg	4.000	0.000	115.000	No Ice 1.865	1.252	0.075
			0.000			1/2" Ice 2.035	1.394	0.093
			0.000			1" Ice 2.212	1.544	0.114
						2" Ice 2.589	1.866	0.165
RF4440D-13A	A	From Leg	4.000	0.000	115.000	No Ice 1.865	1.129	0.073
			0.000			1/2" Ice 2.035	1.267	0.090
			0.000			1" Ice 2.212	1.411	0.110
						2" Ice 2.589	1.723	0.159
RF4440D-13A	B	From Leg	4.000	0.000	115.000	No Ice 1.865	1.129	0.073
			0.000			1/2" Ice 2.035	1.267	0.090
			0.000			1" Ice 2.212	1.411	0.110
						2" Ice 2.589	1.723	0.159
RF4440D-13A	C	From Leg	4.000	0.000	115.000	No Ice 1.865	1.129	0.073
			0.000			1/2" Ice 2.035	1.267	0.090
			0.000			1" Ice 2.212	1.411	0.110
						2" Ice 2.589	1.723	0.159
MT6407-77A RRU	A	From Leg	4.000	0.000	115.000	No Ice 4.291	1.653	0.079
			0.000			1/2" Ice 4.562	1.859	0.106
			0.000			1" Ice 4.840	2.072	0.137

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	Client	12:32:45 10/28/24
	Vertical Bridge	Designed by
		Akshay Kumar

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 90 deg - No Ice
5	0.9 Dead+1.0 Wind 90 deg - No Ice
6	1.2 Dead+1.0 Wind 180 deg - No Ice
7	0.9 Dead+1.0 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 100	Pole	Max Tension	2	0.000	-0.000	-0.000
			Max. Compression	8	-44.563	0.798	-2.079
			Max. Mx	4	-20.119	-755.815	-0.510
			Max. My	6	-20.120	0.231	-756.509
			Max. Vy	4	29.082	-755.815	-0.510
			Max. Vx	6	29.067	0.231	-756.509
			Max. Torque	5			-9.407
L2	100 - 65.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	8	-55.923	0.803	-3.601
			Max. Mx	4	-28.449	-1784.391	-1.330
			Max. My	6	-28.450	0.241	-1785.190
			Max. Vy	4	32.789	-1784.391	-1.330
			Max. Vx	6	32.774	0.241	-1785.190
			Max. Torque	5			-9.401
L3	65.5 - 32.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	8	-70.844	0.803	-5.301
			Max. Mx	4	-40.014	-2903.237	-2.144
			Max. My	6	-40.015	0.246	-2904.257
			Max. Vy	4	36.513	-2903.237	-2.144
			Max. Vx	6	36.498	0.246	-2904.257
			Max. Torque	5			-9.390
L4	32.25 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	8	-91.888	0.803	-7.646
			Max. Mx	4	-56.960	-4448.126	-3.191
			Max. My	6	-56.960	0.247	-4449.552
			Max. Vy	4	40.523	-4448.126	-3.191
			Max. Vx	6	40.507	0.247	-4449.552
			Max. Torque	5			-9.383

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Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	11	91.888	0.000	-11.127
	Max. H _x	8	91.888	0.000	-0.000
	Max. H _z	2	56.977	0.000	40.483
	Max. M _x	2	4443.101	0.000	40.483
	Max. M _z	4	4448.126	-40.499	0.000
	Max. Torsion	2	0.382	0.000	40.483
	Min. Vert	3	42.733	0.000	40.483
	Min. H _x	5	42.733	-40.499	-0.000
	Min. H _z	6	56.977	0.000	-40.483
	Min. M _x	6	-4449.552	0.000	-40.483
	Min. M _z	9	-0.845	0.000	11.127
	Min. Torsion	5	-9.380	-40.499	-0.000

Tower Mast Reaction Summary

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 Only	47.481	0.000	0.000	2.617	0.197	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	56.977	-0.000	-40.483	-4443.101	0.247	-0.382
0.9 Dead+1.0 Wind 0 deg - No Ice	42.733	0.000	-40.483	-4413.503	0.183	-0.382
1.2 Dead+1.0 Wind 90 deg - No Ice	56.977	40.499	0.000	3.190	-4448.126	9.379
0.9 Dead+1.0 Wind 90 deg - No Ice	42.733	40.499	0.000	2.375	-4417.750	9.380
1.2 Dead+1.0 Wind 180 deg - No Ice	56.977	-0.000	40.483	4449.552	0.247	0.382
0.9 Dead+1.0 Wind 180 deg - No Ice	42.733	0.000	40.483	4418.306	0.183	0.382
1.2 Dead+1.0 Ice+1.0 Temp	91.888	-0.000	0.000	7.646	0.803	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	91.888	-0.000	-11.127	-1212.736	0.845	-0.109
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	91.888	11.131	0.000	7.925	-1220.233	1.488
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	91.888	-0.000	11.127	1228.592	0.845	0.109
Dead+Wind 0 deg - Service	47.481	0.000	-9.693	-1057.674	0.206	-0.092
Dead+Wind 90 deg - Service	47.481	9.697	0.000	2.679	-1060.636	2.257
Dead+Wind 180 deg - Service	47.481	0.000	9.693	1063.035	0.206	0.092

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-47.481	0.000	0.000	47.481	0.000	0.000%
2	0.000	-56.977	-40.483	0.000	56.977	40.483	0.000%
3	0.000	-42.733	-40.483	0.000	42.733	40.483	0.000%
4	40.499	-56.977	0.000	-40.499	56.977	0.000	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
5	40.499	-42.733	0.000	-40.499	42.733	-0.000	0.000%
6	0.000	-56.977	40.483	0.000	56.977	-40.483	0.000%
7	0.000	-42.733	40.483	0.000	42.733	-40.483	0.000%
8	0.000	-91.888	0.000	0.000	91.888	-0.000	0.000%
9	0.000	-91.888	-11.127	0.000	91.888	11.127	0.000%
10	11.131	-91.888	0.000	-11.131	91.888	-0.000	0.000%
11	0.000	-91.888	11.127	0.000	91.888	-11.127	0.000%
12	0.000	-47.481	-9.693	0.000	47.481	9.693	0.000%
13	9.697	-47.481	0.000	-9.697	47.481	0.000	0.000%
14	0.000	-47.481	9.693	0.000	47.481	-9.693	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00015710
3	Yes	4	0.00000001	0.00007868
4	Yes	5	0.00000001	0.00004865
5	Yes	4	0.00000001	0.00093959
6	Yes	4	0.00000001	0.00015731
7	Yes	4	0.00000001	0.00007875
8	Yes	4	0.00000001	0.00002567
9	Yes	5	0.00000001	0.00017723
10	Yes	5	0.00000001	0.00017887
11	Yes	5	0.00000001	0.00017989
12	Yes	4	0.00000001	0.00003463
13	Yes	4	0.00000001	0.00010414
14	Yes	4	0.00000001	0.00003482

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 100	15.704	14	0.901	0.011
L2	105.5 - 65.5	7.837	14	0.709	0.004
L3	72.25 - 32.25	3.660	14	0.470	0.002
L4	40 - 0	1.150	14	0.256	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.000	Lightning Rod 5/8" x 6'	14	15.704	0.901	0.011	63283
145.000	APXVLL19P_43-C-A20 w/ Mount Pipe	14	14.758	0.884	0.010	63283
136.000	(2) TPA65R-BU8D w/ Mount Pipe	14	13.071	0.852	0.008	22601
125.000	MX08FRO665-20_V0F w/ Mount Pipe	14	11.070	0.809	0.007	12656

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Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
115.000	NHH-65B-R2B_TIA w/ Mount Pipe	14	9.350	0.762	0.005	9040

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	150 - 100	65.756	6	3.775	0.044
L2	105.5 - 65.5	32.823	6	2.969	0.018
L3	72.25 - 32.25	15.328	6	1.967	0.008
L4	40 - 0	4.816	6	1.072	0.004

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
153.000	Lightning Rod 5/8" x 6'	6	65.756	3.775	0.044	15226
145.000	APXVLL19P_43-C-A20 w/ Mount Pipe	6	61.798	3.703	0.041	15226
136.000	(2) TPA65R-BU8D w/ Mount Pipe	6	54.735	3.569	0.035	5437
125.000	MX08FRO665-20_V0F w/ Mount Pipe	6	46.359	3.387	0.028	3043
115.000	NHH-65B-R2B_TIA w/ Mount Pipe	6	39.155	3.192	0.023	2172

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	φP _n	Ratio P _u / φP _n
	ft		ft	ft		in ²	K	K	
L1	150 - 100 (1)	TP39.688x26.375x0.25	50.000	0.000	0.0	30.132	-20.119	1762.700	0.011
L2	100 - 65.5 (2)	TP48.313x37.723x0.375	40.000	0.000	0.0	54.931	-28.450	3213.440	0.009
L3	65.5 - 32.25 (3)	TP56.375x45.776x0.438	40.000	0.000	0.0	74.825	-40.015	4377.230	0.009
L4	32.25 - 0 (4)	TP64x53.446x0.438	40.000	0.000	0.0	88.265	-56.960	5163.470	0.011

Pole Bending Design Data

Section No.	Elevation	Size	M _{ux}	φM _{ux}	Ratio M _{ux} / φM _{ux}	M _{uy}	φM _{uy}	Ratio M _{uy} / φM _{uy}
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	150 - 100 (1)	TP39.688x26.375x0.25	755.815	1500.833	0.504	0.000	1500.833	0.000
L2	100 - 65.5 (2)	TP48.313x37.723x0.375	1785.192	3600.025	0.496	0.000	3600.025	0.000

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Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M_{uy} kip-ft	ϕM_{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L3	65.5 - 32.25 (3)	TP56.375x45.776x0.438	2904.258	5724.108	0.507	0.000	5724.108	0.000
L4	32.25 - 0 (4)	TP64x53.446x0.438	4449.550	7498.959	0.593	0.000	7498.959	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 100 (1)	TP39.688x26.375x0.25	29.082	528.811	0.055	9.403	1758.558	0.005
L2	100 - 65.5 (2)	TP48.313x37.723x0.375	32.774	964.034	0.034	0.383	3896.267	0.000
L3	65.5 - 32.25 (3)	TP56.375x45.776x0.438	36.498	1313.170	0.028	0.382	6196.683	0.000
L4	32.25 - 0 (4)	TP64x53.446x0.438	40.507	1549.040	0.026	0.382	8622.750	0.000

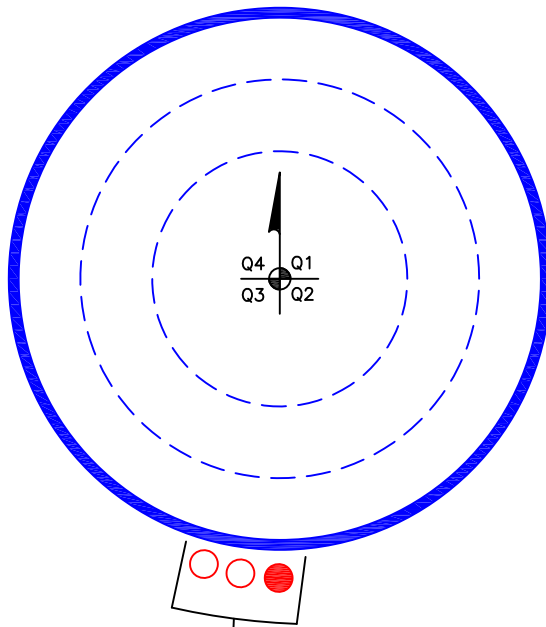
Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 100 (1)	0.011	0.504	0.000	0.055	0.005	0.519	1.000	✓
L2	100 - 65.5 (2)	0.009	0.496	0.000	0.034	0.000	0.506	1.000	✓
L3	65.5 - 32.25 (3)	0.009	0.507	0.000	0.028	0.000	0.517	1.000	✓
L4	32.25 - 0 (4)	0.011	0.593	0.000	0.026	0.000	0.605	1.000	✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 100	Pole	TP39.688x26.375x0.25	1	-20.119	1762.700	51.9	Pass
L2	100 - 65.5	Pole	TP48.313x37.723x0.375	2	-28.450	3213.440	50.6	Pass
L3	65.5 - 32.25	Pole	TP56.375x45.776x0.438	3	-40.015	4377.230	51.7	Pass
L4	32.25 - 0	Pole	TP64x53.446x0.438	4	-56.960	5163.470	60.5	Pass
Summary								
Pole (L4)							60.5	Pass
RATING =							60.5	Pass

APPENDIX B
BASE LEVEL DRAWING



(PROPOSED EQUIPMENT CONFIGURATION)
(3) 2" TO 145 FT LEVEL



PROJECT NUMBER: 173455.001.01.0001

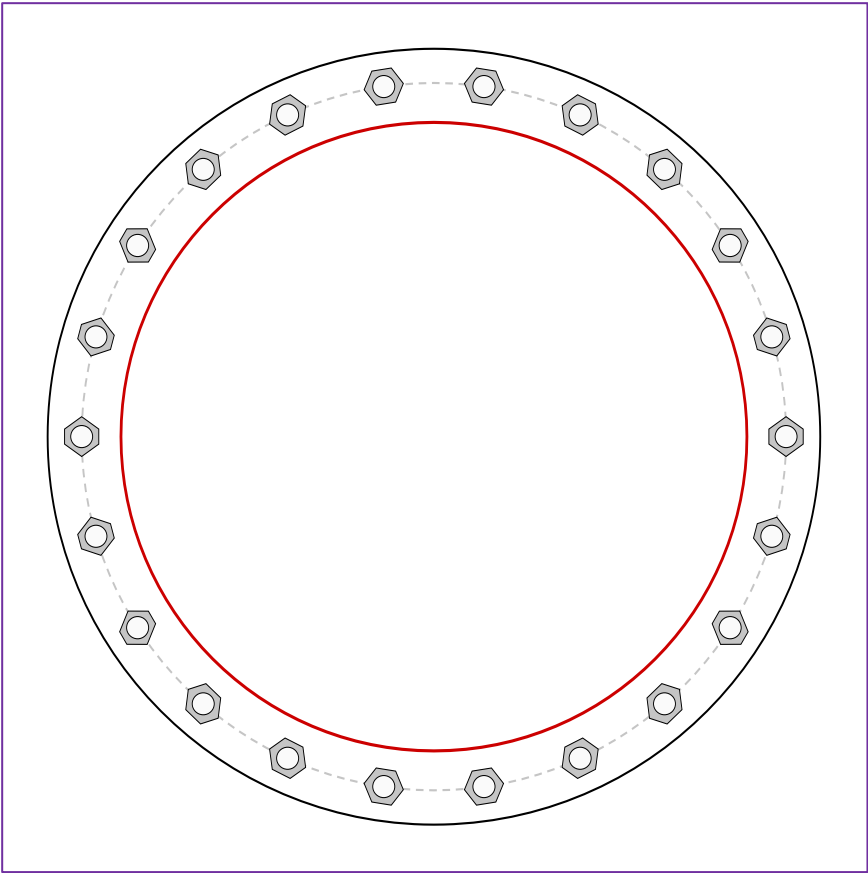
APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

Site Info	
BU #	US-CT-5018
Site Name	Hopewell, CT
Order #	173455.001.01.0001

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2.25

Applied Loads	
Moment (kip-ft)	4449.55
Axial Force (kips)	56.96
Shear Force (kips)	40.51



Connection Properties		Analysis Results	
Anchor Rod Data		Anchor Rod Summary <i>(units of kips, kip-in)</i>	
(22) 2-1/4" $\varnothing$ bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 72" BC		Pu_t = 132.19	ϕPn_t = 243.75 Stress Rating
Base Plate Data		Vu = 1.84	ϕVn = 149.1 54.2%
79" OD x 2" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)		Mu = n/a	ϕMn = n/a Pass
Stiffener Data		Base Plate Summary	
N/A		Max Stress (ksi):	36.99 (Flexural)
Pole Data		Allowable Stress (ksi):	45
64" x 0.4375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)		Stress Rating:	82.2% Pass

Drilled Pier Foundation

Site #	US-CT-5018
Site Name:	Hopewell, CT
Project #	173455.001.01.0001
TIA-222 Revision:	H
Tower Type:	Monopole

Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	4449.55	
Axial Force (kips)	56.98	
Shear Force (kips)	40.48	

Material Properties		
Concrete Strength, f'c:	4.5	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	40	ksi

Pier Design Data		
Depth	24	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 24' below grade		
Pier Diameter	8	ft
Rebar Quantity	38	
Rebar Size	10	
Clear Cover to Ties	3	in
Tie Size	5	
Tie Spacing	12	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check		
	Compression	Uplift
D _{v=0} (ft from TOC)	7.90	-
Soil Safety Factor	5.43	-
Max Moment (kip-ft)	4976.17	-
Rating	24.5%	-
Soil Vertical Check		
	Compression	Uplift
Skin Friction (kips)	933.05	-
End Bearing (kips)	2353.80	-
Weight of Concrete (kips)	168.97	-
Total Capacity (kips)	3286.85	-
Axial (kips)	225.95	-
Rating	6.9%	-
Reinforced Concrete Flexure		
	Compression	Uplift
Critical Depth (ft from TOC)	7.46	-
Critical Moment (kip-ft)	4974.61	-
Critical Moment Capacity	9142.62	-
Rating	54.4%	-
Reinforced Concrete Shear		
	Compression	Uplift
Critical Depth (ft from TOC)	19.49	-
Critical Shear (kip)	886.55	-
Critical Shear Capacity	993.16	-
Rating	89.3%	-

Structural Foundation Rating	89.3%
Soil Interaction Rating	24.5%

Check Limitation	
Apply TIA-222-H Section 15.5:	☐
N/A	☐
Design Options	
Input Effective Depths (else Actual):	☐
Consider non-tapered moment capacity:	☐
Check Shear along Depth of Pier:	☒
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

[Go to Soil Calculations](#)

Soil Profile															
Groundwater Depth		10	# of Layers		6										
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	Y _{soil} (pcf)	Y _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Net Bearing Capacity (ksf)	SPT Blow Count	Soil Type	
1	0	2	2	105	150	0	0	0.000	0.000	0.00	0.00			Cohesionless	
2	2	4	2	120	150	0	0	0.000	0.000	0.00	0.00			Cohesionless	
3	4	5	1	120	150	0	34	0.000	0.000	0.00	0.00			Cohesionless	
4	5	10	5	130	150	0	38	0.000	0.000	1.50	1.50			Cohesionless	
5	10	15	5	67.6	87.6	0	38	0.000	0.000	2.10	2.10			Cohesionless	
6	15	24	9	97.6	87.6	15	0	6.750	6.750	3.50	3.50	60		Cohesive	

Pier and Pad Foundation

Site # US-CT-5018
 Site Name: Hopewell, CT
 Project # 173455.001.01.000

TIA-222 Revision: H
 Tower Type: Monopole

Top & Bot. Pad Rein. Different?: ☐
 Block Foundation?: ☐
 Rectangular Pad?: ☐

Superstructure Analysis Reactions		
Compression, P_{comp} :	56.98	kips
Base Shear, Vu_{comp} :	40.48	kips
Moment, M_u :	4449.55	ft-kips
Tower Height, H :	150	ft
BP Dist. Above Fdn, bp_{dist} :		in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $dpier$:	8	ft
Ext. Above Grade, E :	0.5	ft
Pier Rebar Size, Sc :	10	
Pier Rebar Quantity, mc :	38	
Pier Tie/Spiral Size, St :	5	
Pier Tie/Spiral Quantity, mt :	8	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

Pad Properties		
Depth, D :	7	ft
Pad Width, W_1 :	28	ft
Pad Thickness, T :	3	ft
Pad Rebar Size (Bottom dir. 2), Sp_2 :	10	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	48	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, F_y :	60	ksi
Concrete Compressive Strength, F'_c :	4.5	ksi
Dry Concrete Density, δc :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	113	pcf
Ultimate Gross Bearing, Q_{ult} :	30.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	34	degrees
SPT Blow Count, N_{blows} :		
Base Friction, μ :	0.4	
Neglected Depth, N :	4.00	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	10	ft

Foundation Analysis Checks				
	Capacity	Demand	Rating	Check
Lateral (Sliding) (kips)	344.27	40.48	11.8%	Pass
Bearing Pressure (ksf)	22.50	2.12	9.4%	Pass
Overturning (kip*ft)	10025.81	4753.15	47.4%	Pass
Pier Flexure (Comp.) (kip*ft)	9017.46	4631.71	51.4%	Pass
Pier Compression (kip)	35992.10	97.70	0.3%	Pass
Pad Flexure (kip*ft)	8139.63	1593.23	19.6%	Pass
Pad Shear - 1-way (kips)	1051.30	227.72	21.7%	Pass
Pad Shear - 2-way (Comp) (ksi)	0.201	0.039	19.6%	Pass
Flexural 2-way (Comp) (kip*ft)	9891.57	2779.03	28.1%	Pass

Structural Rating:	51.4%
Soil Rating:	47.4%

<--Toggle between Gross and Net

Site# US-CT-501
Name: Hopewell, CT
Job# 173455.001.01.0001

Structure: A
Rev:

Location				
	Decimal Degrees	Deg	Min	Sec
Lat:	41.660792	+	41	39
Long:	-72.574097	-	72	34
				26.75
Code and Site Parameters				
Seismic Design Code:		TIA-222-H-1		
Site Soil:		D (Default) Default		
Risk Category:		II		
USGS Seismic Reference		S _s :	0.2020	g
		S ₁ :	0.0560	g
		T _L :	6	s
Seismic Design Category Determination				
Importance Factor, I _e :		1		
Acceleration-based site coefficient, F _a :		1.6000		
Velocity-based site coefficient, F _v :		2.4000		
Design spectral response acceleration short period, S _{DS} :		0.2155 g		
Design spectral response acceleration 1 s period, S _{D1} :		0.0896 g		
		T _s :	0.4158	
Seismic Design Category Based on S _{DS} :		B		
Seismic Design Category Based on S _{D1} :		B		
Seismic Design Category Based on S ₁ :		N/A		
Controlling Seismic Design Category:		B		

Site#US-CT-501

NameHopewell, CT

Job#173455.001.01.0001

Structure: A

Rev:

Tower Details

Tower Type: Tapered Monopole

Height, h: 150ft

Effective Seismic Weight, W: 47.48kips

Amplification Factor, A_s: 1.02.7.8.1

Seismic Base Shear

Response Modification Factor, R: 1.5

Discrete Appurtenance Weight in Top 1/3 of Structure, W_u: 13.684836kips

W_L: 33.79481772kips

E: 29000.0ksi

g: 386.088in/s²

Average Moment of Inertia, I_{avg}: 17545.62132in⁴

F_a: 0.343767774hz

Approximate Fundamental Period Monopole, T_a: 2.9089s2.7.7.1.3.3

Seismic Response Coefficient, C_s0.14362.7.7.1.1

Seismic Response Coefficient Max 1, C_{smax}0.02052.7.7.1.1

Seismic Response Coefficient Max 2, C_{smax}N/A2.7.7.1.1

Seismic Response Coefficient Min 1, C_{smin}0.03002.7.7.1.1

Seismic Response Coefficient Min 2, C_{smin}N/A2.7.7.1.1

Controlling Seismic Response Coefficient, C_{sc}0.0300

Seismic Base Shear, V1.424kips2.7.7.1.1

Vertical Distribution Factors

Period Related Exponent, k: 2.000

Sum of w_ih_i^k402185.65

Tower Section Loads								
Section Number	Length	Top Height	Mid Height, h_x	Section Weight, w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
1 - 1	10.00	150.00	145.00	0.7413	15586.27	0.0388	0.0552	0.0319
1 - 2	10.00	140.00	135.00	0.8132	14820.72	0.0369	0.0525	0.0350
1 - 3	10.00	130.00	125.00	0.8851	13829.63	0.0344	0.0490	0.0381
1 - 4	10.00	120.00	115.00	0.9570	12656.11	0.0315	0.0448	0.0412
1 - 5	10.00	110.00	105.00	1.0289	11343.31	0.0282	0.0402	0.0443
2 - 1	10.00	105.50	100.50	1.5662	15819.13	0.0393	0.0560	0.0675
2 - 2	10.00	95.50	90.50	1.6734	13705.81	0.0341	0.0485	0.0721
2 - 3	10.00	85.50	80.50	1.7806	11539.04	0.0287	0.0409	0.0767
2 - 4	10.00	75.50	70.50	1.8879	9383.16	0.0233	0.0332	0.0814
3 - 1	10.00	72.25	67.25	2.2048	9971.49	0.0248	0.0353	0.0950
3 - 2	10.00	62.25	57.25	2.3300	7636.84	0.0190	0.0270	0.1004
3 - 3	10.00	52.25	47.25	2.4552	5481.49	0.0136	0.0194	0.1058
3 - 4	10.00	42.25	37.25	2.5805	3580.54	0.0089	0.0127	0.1112
4 - 1	10.00	40.00	35.00	2.5670	3144.58	0.0078	0.0111	0.1106
4 - 2	10.00	30.00	25.00	2.6917	1682.30	0.0042	0.0060	0.1160
4 - 3	10.00	20.00	15.00	2.8163	633.68	0.0016	0.0022	0.1214
4 - 4	10.00	10.00	5.00	2.9410	73.53	0.0002	0.0003	0.1267
Sum				31.9202	150887.60			

Discrete Loads						
Name	h _x	w _x	w _x h _x ^k	C _{vx}	F _{xh}	F _{xv}
tower mounts Lightning Rod 5/8" x 6'	153.00	0.0060	140.45	0.0003	0.0005	0.0003
rfs celwave APXVLL19P_43-C-A20 w/ Mount Pipe	145.00	0.0500	1051.25	0.0026	0.0037	0.0022
rfs celwave APXVLL19P_43-C-A20 w/ Mount Pipe	145.00	0.0500	1051.25	0.0026	0.0037	0.0022
rfs celwave APXVLL19P_43-C-A20 w/ Mount Pipe	145.00	0.0500	1051.25	0.0026	0.0037	0.0022
ericsson Radio 4460 B25+B66	145.00	0.1090	2291.73	0.0057	0.0081	0.0047
ericsson Radio 4460 B25+B66	145.00	0.1090	2291.73	0.0057	0.0081	0.0047
ericsson Radio 4460 B25+B66	145.00	0.1090	2291.73	0.0057	0.0081	0.0047
rfs celwave APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	145.00	0.1610	3385.03	0.0084	0.0120	0.0069
rfs celwave APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	145.00	0.1610	3385.03	0.0084	0.0120	0.0069
rfs celwave APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	145.00	0.1610	3385.03	0.0084	0.0120	0.0069
rfs celwave APX16DWV-16DWV-S-E-A20_TIA w/ Mount Pipe	145.00	0.0610	1282.53	0.0032	0.0045	0.0026
rfs celwave APX16DWV-16DWV-S-E-A20_TIA w/ Mount Pipe	145.00	0.0610	1282.53	0.0032	0.0045	0.0026
rfs celwave APX16DWV-16DWV-S-E-A20_TIA w/ Mount Pipe	145.00	0.0610	1282.53	0.0032	0.0045	0.0026
ericsson Radio 4449 B71+B85	145.00	0.0750	1576.88	0.0039	0.0056	0.0032
ericsson Radio 4449 B71+B85	145.00	0.0750	1576.88	0.0039	0.0056	0.0032
ericsson Radio 4449 B71+B85	145.00	0.0750	1576.88	0.0039	0.0056	0.0032
tower mounts 8' x 2" Mount Pipe	145.00	0.0290	609.73	0.0015	0.0022	0.0012
tower mounts 8' x 2" Mount Pipe	145.00	0.0290	609.73	0.0015	0.0022	0.0012
tower mounts 8' x 2" Mount Pipe	145.00	0.0290	609.73	0.0015	0.0022	0.0012
Site Pro1 ULPD12-496	145.00	2.0600	43311.50	0.1077	0.1534	0.0888
1/3 Remaining Reserved Rights	145.00	0.2040	4289.10	0.0107	0.0152	0.0088
1/3 Remaining Reserved Rights	145.00	0.2040	4289.10	0.0107	0.0152	0.0088
1/3 Remaining Reserved Rights	145.00	0.2040	4289.10	0.0107	0.0152	0.0088
(2) cci antennas TPA65R-BU8D w/ Mount Pipe	136.00	0.2408	4454.13	0.0111	0.0158	0.0104
(2) cci antennas TPA65R-BU8D w/ Mount Pipe	136.00	0.2408	4454.13	0.0111	0.0158	0.0104
(2) cci antennas TPA65R-BU8D w/ Mount Pipe	136.00	0.2408	4454.13	0.0111	0.0158	0.0104
cci antennas HPA65R-BU8A w/Mount Pipe	136.00	0.0940	1738.62	0.0043	0.0062	0.0041
cci antennas HPA65R-BU8A w/Mount Pipe	136.00	0.0940	1738.62	0.0043	0.0062	0.0041
cci antennas HPA65R-BU8A w/Mount Pipe	136.00	0.0940	1738.62	0.0043	0.0062	0.0041
ericsson RRUS 4478 B14	136.00	0.0600	1109.76	0.0028	0.0039	0.0026
ericsson RRUS 4478 B14	136.00	0.0600	1109.76	0.0028	0.0039	0.0026
ericsson RRUS 4478 B14	136.00	0.0600	1109.76	0.0028	0.0039	0.0026
ericsson E2-700	136.00	0.0520	961.79	0.0024	0.0034	0.0022
ericsson E2-700	136.00	0.0520	961.79	0.0024	0.0034	0.0022
ericsson E2-700	136.00	0.0520	961.79	0.0024	0.0034	0.0022
ericsson RADIO 4415 B30	136.00	0.0430	795.33	0.0020	0.0028	0.0019
ericsson RADIO 4415 B30	136.00	0.0430	795.33	0.0020	0.0028	0.0019
ericsson RADIO 4415 B30	136.00	0.0430	795.33	0.0020	0.0028	0.0019
ericsson RADIO 4449	136.00	0.0850	1572.16	0.0039	0.0056	0.0037
ericsson RADIO 4449	136.00	0.0850	1572.16	0.0039	0.0056	0.0037
ericsson RADIO 4449	136.00	0.0850	1572.16	0.0039	0.0056	0.0037
ericsson 8843	136.00	0.0720	1331.71	0.0033	0.0047	0.0031
ericsson 8843	136.00	0.0720	1331.71	0.0033	0.0047	0.0031
ericsson 8843	136.00	0.0720	1331.71	0.0033	0.0047	0.0031
miscl Unknown DC	136.00	0.0260	480.90	0.0012	0.0017	0.0011
miscl Unknown DC	136.00	0.0260	480.90	0.0012	0.0017	0.0011
miscl Unknown DC	136.00	0.0260	480.90	0.0012	0.0017	0.0011
tower mounts 8' x 2" Mount Pipe	136.00	0.0290	536.38	0.0013	0.0019	0.0012
tower mounts 8' x 2" Mount Pipe	136.00	0.0290	536.38	0.0013	0.0019	0.0012
tower mounts 8' x 2" Mount Pipe	136.00	0.0290	536.38	0.0013	0.0019	0.0012
tower mounts Sector Mount [SM 602-3]	136.00	1.5405	28493.09	0.0708	0.1009	0.0664
1/3 Remaining Reserved Rights	136.00	0.0118	218.55	0.0005	0.0008	0.0005
1/3 Remaining Reserved Rights	136.00	0.0118	218.55	0.0005	0.0008	0.0005
1/3 Remaining Reserved Rights	136.00	0.0118	218.55	0.0005	0.0008	0.0005
jma wireless MX08FRO665-20_V0F w/ Mount Pipe	125.00	0.0830	1296.88	0.0032	0.0046	0.0036
jma wireless MX08FRO665-20_V0F w/ Mount Pipe	125.00	0.0830	1296.88	0.0032	0.0046	0.0036
jma wireless MX08FRO665-20_V0F w/ Mount Pipe	125.00	0.0830	1296.88	0.0032	0.0046	0.0036
(2) fujitsu TA08025-B605	125.00	0.1500	2343.75	0.0058	0.0083	0.0065
(2) fujitsu TA08025-B605	125.00	0.1500	2343.75	0.0058	0.0083	0.0065
(2) fujitsu TA08025-B605	125.00	0.1500	2343.75	0.0058	0.0083	0.0065
raycap RDIDC-9181-PF-48	125.00	0.0220	343.75	0.0009	0.0012	0.0009
(2) tower mounts 8' x 2" Mount Pipe	125.00	0.0580	906.25	0.0023	0.0032	0.0025
(2) tower mounts 8' x 2" Mount Pipe	125.00	0.0580	906.25	0.0023	0.0032	0.0025
(2) tower mounts 8' x 2" Mount Pipe	125.00	0.0580	906.25	0.0023	0.0032	0.0025
tower mounts Platform Mount [LP 716-1]	125.00	1.5094	23585.00	0.0586	0.0835	0.0650
1/3 Remaining Reserved Rights	125.00	0.0630	984.38	0.0024	0.0035	0.0027
1/3 Remaining Reserved Rights	125.00	0.0630	984.38	0.0024	0.0035	0.0027
1/3 Remaining Reserved Rights	125.00	0.0630	984.38	0.0024	0.0035	0.0027
commscope NHH-65B-R2B_TIA w/ Mount Pipe	115.00	0.0690	912.53	0.0023	0.0032	0.0030
commscope NHH-65B-R2B_TIA w/ Mount Pipe	115.00	0.0690	912.53	0.0023	0.0032	0.0030
commscope NHH-65B-R2B_TIA w/ Mount Pipe	115.00	0.0690	912.53	0.0023	0.0032	0.0030
commscope NHHSS-65B-R2BT4_TIA w/ Mount Pipe	115.00	0.0760	1005.10	0.0025	0.0036	0.0033
commscope NHHSS-65B-R2BT4_TIA w/ Mount Pipe	115.00	0.0760	1005.10	0.0025	0.0036	0.0033
commscope NHHSS-65B-R2BT4_TIA w/ Mount Pipe	115.00	0.0760	1005.10	0.0025	0.0036	0.0033
samsung telecommunications MT6407-77A_TIA	115.00	0.0870	1150.58	0.0029	0.0041	0.0037
samsung telecommunications MT6407-77A_TIA	115.00	0.0870	1150.58	0.0029	0.0041	0.0037
samsung telecommunications MT6407-77A_TIA	115.00	0.0870	1150.58	0.0029	0.0041	0.0037
samsung telecommunications RF4439D-25A	115.00	0.0750	991.88	0.0025	0.0035	0.0032
samsung telecommunications RF4439D-25A	115.00	0.0750	991.88	0.0025	0.0035	0.0032
samsung telecommunications RF4439D-25A	115.00	0.0750	991.88	0.0025	0.0035	0.0032
samsung telecommunications RF4440D-13A	115.00	0.0730	965.43	0.0024	0.0034	0.0031

samsung telecommunications RF4440D-13A	115.00	0.0730	965.43	0.0024	0.0034	0.0031
samsung telecommunications RF4440D-13A	115.00	0.0730	965.43	0.0024	0.0034	0.0031
samsung telecommunications MT6407-77A RRU	115.00	0.0790	1044.78	0.0026	0.0037	0.0034
samsung telecommunications MT6407-77A RRU	115.00	0.0790	1044.78	0.0026	0.0037	0.0034
samsung telecommunications MT6407-77A RRU	115.00	0.0790	1044.78	0.0026	0.0037	0.0034
Commscope OVP12	115.00	0.0200	264.50	0.0007	0.0009	0.0009
Samsung CBRS RRH RT4401-48A	115.00	0.0520	687.70	0.0017	0.0024	0.0022
Samsung CBRS RRH RT4401-48A	115.00	0.0520	687.70	0.0017	0.0024	0.0022
Samsung CBRS RRH RT4401-48A	115.00	0.0520	687.70	0.0017	0.0024	0.0022
Commscope BSAMNT-SBS-1-2	115.00	0.0700	925.75	0.0023	0.0033	0.0030
Commscope BSAMNT-SBS-1-2	115.00	0.0700	925.75	0.0023	0.0033	0.0030
Commscope BSAMNT-SBS-1-2	115.00	0.0700	925.75	0.0023	0.0033	0.0030
(2) tower mounts 8' x 2" Mount Pipe	115.00	0.0580	767.05	0.0019	0.0027	0.0025
(2) tower mounts 8' x 2" Mount Pipe	115.00	0.0580	767.05	0.0019	0.0027	0.0025
(2) tower mounts 8' x 2" Mount Pipe	115.00	0.0580	767.05	0.0019	0.0027	0.0025
Platform w/ Handrails	115.00	1.3400	17721.50	0.0441	0.0628	0.0577
Sum		13.6848	238862.55			

Linear Loads								
Name	Start Height	End Height	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
(3) andrew WC166(2") From 0 to 145	140.00	145.00	142.50	0.0420	852.86	0.0021	0.0030	0.0018
(3) andrew WC166(2") From 0 to 145	130.00	140.00	135.00	0.0840	1530.90	0.0038	0.0054	0.0036
(3) andrew WC166(2") From 0 to 145	120.00	130.00	125.00	0.0840	1312.50	0.0033	0.0046	0.0036
(3) andrew WC166(2") From 0 to 145	110.00	120.00	115.00	0.0840	1110.90	0.0028	0.0039	0.0036
(3) andrew WC166(2") From 0 to 145	100.00	110.00	105.00	0.0840	926.10	0.0023	0.0033	0.0036
(3) andrew WC166(2") From 0 to 145	90.00	100.00	95.00	0.0840	758.10	0.0019	0.0027	0.0036
(3) andrew WC166(2") From 0 to 145	80.00	90.00	85.00	0.0840	606.90	0.0015	0.0021	0.0036
(3) andrew WC166(2") From 0 to 145	70.00	80.00	75.00	0.0840	472.50	0.0012	0.0017	0.0036
(3) andrew WC166(2") From 0 to 145	60.00	70.00	65.00	0.0840	354.90	0.0009	0.0013	0.0036
(3) andrew WC166(2") From 0 to 145	50.00	60.00	55.00	0.0840	254.10	0.0006	0.0009	0.0036
(3) andrew WC166(2") From 0 to 145	40.00	50.00	45.00	0.0840	170.10	0.0004	0.0006	0.0036
(3) andrew WC166(2") From 0 to 145	30.00	40.00	35.00	0.0840	102.90	0.0003	0.0004	0.0036
(3) andrew WC166(2") From 0 to 145	20.00	30.00	25.00	0.0840	52.50	0.0001	0.0002	0.0036
(3) andrew WC166(2") From 0 to 145	10.00	20.00	15.00	0.0840	18.90	0.0000	0.0001	0.0036
(3) andrew WC166(2") From 0 to 145	0.00	10.00	5.00	0.0840	2.10	0.0000	0.0000	0.0036
(6) 5/8" DC From 0 to 136	130.00	136.00	133.00	0.0144	254.72	0.0006	0.0009	0.0006
(6) 5/8" DC From 0 to 136	120.00	130.00	125.00	0.0240	375.00	0.0009	0.0013	0.0010
(6) 5/8" DC From 0 to 136	110.00	120.00	115.00	0.0240	317.40	0.0008	0.0011	0.0010
(6) 5/8" DC From 0 to 136	100.00	110.00	105.00	0.0240	264.60	0.0007	0.0009	0.0010
(6) 5/8" DC From 0 to 136	90.00	100.00	95.00	0.0240	216.60	0.0005	0.0008	0.0010
(6) 5/8" DC From 0 to 136	80.00	90.00	85.00	0.0240	173.40	0.0004	0.0006	0.0010
(6) 5/8" DC From 0 to 136	70.00	80.00	75.00	0.0240	135.00	0.0003	0.0005	0.0010
(6) 5/8" DC From 0 to 136	60.00	70.00	65.00	0.0240	101.40	0.0003	0.0004	0.0010
(6) 5/8" DC From 0 to 136	50.00	60.00	55.00	0.0240	72.60	0.0002	0.0003	0.0010
(6) 5/8" DC From 0 to 136	40.00	50.00	45.00	0.0240	48.60	0.0001	0.0002	0.0010
(6) 5/8" DC From 0 to 136	30.00	40.00	35.00	0.0240	29.40	0.0001	0.0001	0.0010
(6) 5/8" DC From 0 to 136	20.00	30.00	25.00	0.0240	15.00	0.0000	0.0001	0.0010
(6) 5/8" DC From 0 to 136	10.00	20.00	15.00	0.0240	5.40	0.0000	0.0000	0.0010
(6) 5/8" DC From 0 to 136	0.00	10.00	5.00	0.0240	0.60	0.0000	0.0000	0.0010
(2) 3/8" Fiber Cables From 0 to 136	130.00	136.00	133.00	0.0084	148.59	0.0004	0.0005	0.0004
(2) 3/8" Fiber Cables From 0 to 136	120.00	130.00	125.00	0.0140	218.75	0.0005	0.0008	0.0006
(2) 3/8" Fiber Cables From 0 to 136	110.00	120.00	115.00	0.0140	185.15	0.0005	0.0007	0.0006
(2) 3/8" Fiber Cables From 0 to 136	100.00	110.00	105.00	0.0140	154.35	0.0004	0.0005	0.0006
(2) 3/8" Fiber Cables From 0 to 136	90.00	100.00	95.00	0.0140	126.35	0.0003	0.0004	0.0006
(2) 3/8" Fiber Cables From 0 to 136	80.00	90.00	85.00	0.0140	101.15	0.0003	0.0004	0.0006
(2) 3/8" Fiber Cables From 0 to 136	70.00	80.00	75.00	0.0140	78.75	0.0002	0.0003	0.0006
(2) 3/8" Fiber Cables From 0 to 136	60.00	70.00	65.00	0.0140	59.15	0.0001	0.0002	0.0006
(2) 3/8" Fiber Cables From 0 to 136	50.00	60.00	55.00	0.0140	42.35	0.0001	0.0001	0.0006
(2) 3/8" Fiber Cables From 0 to 136	40.00	50.00	45.00	0.0140	28.35	0.0001	0.0001	0.0006
(2) 3/8" Fiber Cables From 0 to 136	30.00	40.00	35.00	0.0140	17.15	0.0000	0.0001	0.0006
(2) 3/8" Fiber Cables From 0 to 136	20.00	30.00	25.00	0.0140	8.75	0.0000	0.0000	0.0006
(2) 3/8" Fiber Cables From 0 to 136	10.00	20.00	15.00	0.0140	3.15	0.0000	0.0000	0.0006
(2) 3/8" Fiber Cables From 0 to 136	0.00	10.00	5.00	0.0140	0.35	0.0000	0.0000	0.0006
1.6" Hybrid From 0 to 125	120.00	125.00	122.50	0.0005	7.50	0.0000	0.0000	0.0000
1.6" Hybrid From 0 to 125	110.00	120.00	115.00	0.0010	13.23	0.0000	0.0000	0.0000
1.6" Hybrid From 0 to 125	100.00	110.00	105.00	0.0010	11.03	0.0000	0.0000	0.0000
1.6" Hybrid From 0 to 125	90.00	100.00	95.00	0.0010	9.03	0.0000	0.0000	0.0000
1.6" Hybrid From 0 to 125	80.00	90.00	85.00	0.0010	7.23	0.0000	0.0000	0.0000
1.6" Hybrid From 0 to 125	70.00	80.00	75.00	0.0010	5.63	0.0000	0.0000	0.0000
1.6" Hybrid From 0 to 125	60.00	70.00	65.00	0.0010	4.23	0.0000	0.0000	0.0000
1.6" Hybrid From 0 to 125	50.00	60.00	55.00	0.0010	3.03	0.0000	0.0000	0.0000
1.6" Hybrid From 0 to 125	40.00	50.00	45.00	0.0010	2.03	0.0000	0.0000	0.0000
1.6" Hybrid From 0 to 125	30.00	40.00	35.00	0.0010	1.23	0.0000	0.0000	0.0000
1.6" Hybrid From 0 to 125	20.00	30.00	25.00	0.0010	0.63	0.0000	0.0000	0.0000
1.6" Hybrid From 0 to 125	10.00	20.00	15.00	0.0010	0.23	0.0000	0.0000	0.0000
1.6" Hybrid From 0 to 125	0.00	10.00	5.00	0.0010	0.03	0.0000	0.0000	0.0000
andrew LDF7-50A(1-5/8") From 0 to 115	110.00	115.00	112.50	0.0041	51.89	0.0001	0.0002	0.0002
andrew LDF7-50A(1-5/8") From 0 to 115	100.00	110.00	105.00	0.0082	90.41	0.0002	0.0003	0.0004
andrew LDF7-50A(1-5/8") From 0 to 115	90.00	100.00	95.00	0.0082	74.01	0.0002	0.0003	0.0004
andrew LDF7-50A(1-5/8") From 0 to 115	80.00	90.00	85.00	0.0082	59.25	0.0001	0.0002	0.0004
andrew LDF7-50A(1-5/8") From 0 to 115	70.00	80.00	75.00	0.0082	46.13	0.0001	0.0002	0.0004
andrew LDF7-50A(1-5/8") From 0 to 115	60.00	70.00	65.00	0.0082	34.65	0.0001	0.0001	0.0004
andrew LDF7-50A(1-5/8") From 0 to 115	50.00	60.00	55.00	0.0082	24.81	0.0001	0.0001	0.0004
andrew LDF7-50A(1-5/8") From 0 to 115	40.00	50.00	45.00	0.0082	16.61	0.0000	0.0001	0.0004
andrew LDF7-50A(1-5/8") From 0 to 115	30.00	40.00	35.00	0.0082	10.05	0.0000	0.0000	0.0004
andrew LDF7-50A(1-5/8") From 0 to 115	20.00	30.00	25.00	0.0082	5.13	0.0000	0.0000	0.0004
andrew LDF7-50A(1-5/8") From 0 to 115	10.00	20.00	15.00	0.0082	1.85	0.0000	0.0000	0.0004
andrew LDF7-50A(1-5/8") From 0 to 115	0.00	10.00	5.00	0.0082	0.21	0.0000	0.0000	0.0004
miscl Safety Line 3/8 From 0 to 150	140.00	150.00	145.00	0.0022	46.26	0.0001	0.0002	0.0001
miscl Safety Line 3/8 From 0 to 150	130.00	140.00	135.00	0.0022	40.10	0.0001	0.0001	0.0001
miscl Safety Line 3/8 From 0 to 150	120.00	130.00	125.00	0.0022	34.38	0.0001	0.0001	0.0001
miscl Safety Line 3/8 From 0 to 150	110.00	120.00	115.00	0.0022	29.10	0.0001	0.0001	0.0001
miscl Safety Line 3/8 From 0 to 150	100.00	110.00	105.00	0.0022	24.26	0.0001	0.0001	0.0001
miscl Safety Line 3/8 From 0 to 150	90.00	100.00	95.00	0.0022	19.86	0.0000	0.0001	0.0001
miscl Safety Line 3/8 From 0 to 150	80.00	90.00	85.00	0.0022	15.90	0.0000	0.0001	0.0001
miscl Safety Line 3/8 From 0 to 150	70.00	80.00	75.00	0.0022	12.38	0.0000	0.0000	0.0001
miscl Safety Line 3/8 From 0 to 150	60.00	70.00	65.00	0.0022	9.30	0.0000	0.0000	0.0001
miscl Safety Line 3/8 From 0 to 150	50.00	60.00	55.00	0.0022	6.66	0.0000	0.0000	0.0001
miscl Safety Line 3/8 From 0 to 150	40.00	50.00	45.00	0.0022	4.46	0.0000	0.0000	0.0001
miscl Safety Line 3/8 From 0 to 150	30.00	40.00	35.00	0.0022	2.70	0.0000	0.0000	0.0001
miscl Safety Line 3/8 From 0 to 150	20.00	30.00	25.00	0.0022	1.38	0.0000	0.0000	0.0001

misc1 Safety Line 3/8 From 0 to 150	10.00	20.00	15.00	0.0022	0.50	0.0000	0.0000	0.0001
misc1 Safety Line 3/8 From 0 to 150	0.00	10.00	5.00	0.0022	0.06	0.0000	0.0000	0.0001
Sum				1.8746	12435.50			

Section	1	2	3	4	
Length (ft)	50.000	40.000	40.000	40.000	
Number of Sides	18	18	18	18	
Thickness (in)	0.250	0.375	0.438	0.438	
Socket Length (ft)	5.500	6.750	7.750		
Top Dia (in)	26.375	37.723	45.776	53.446	
Bot Dia (in)	39.688	48.312	56.375	64.000	
Grade		A572-65			
Weight (K)	4.4	6.9	9.6	11.0	31.9

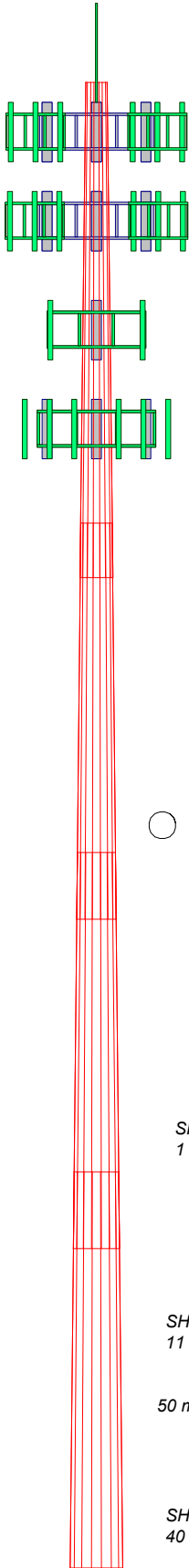
150.0 ft

100.0 ft

65.5 ft

32.2 ft

0.0 ft



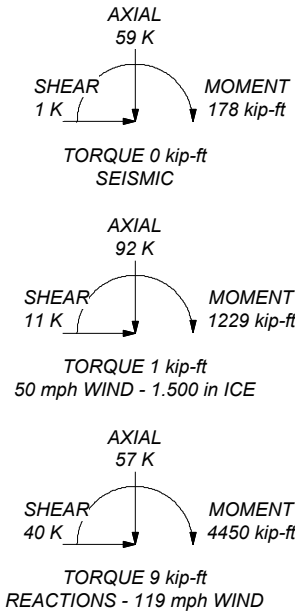
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 119 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 0.000 ft
8. CCISeismic Note: Seismic loads generated by Seismic 4.0.2
9. CCISeismic Note: Seismic calculations are in accordance with TIA-222-H-1
10. TOWER RATING: 60.5%

ALL REACTIONS
ARE FACTORED



MTS Engineering, P.L.L.C.
1717 S. Boulder Ave, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: **173455.001.01.0001 - Hopewell, CT (Site# US-CT-501)**

Project:	Client: Vertical Bridge	Drawn by: Akshay Kumar	App'd:
Code: TIA-222-H	Date: 10/28/24	Scale: NTS	
Path:		Dwg No. E-1	

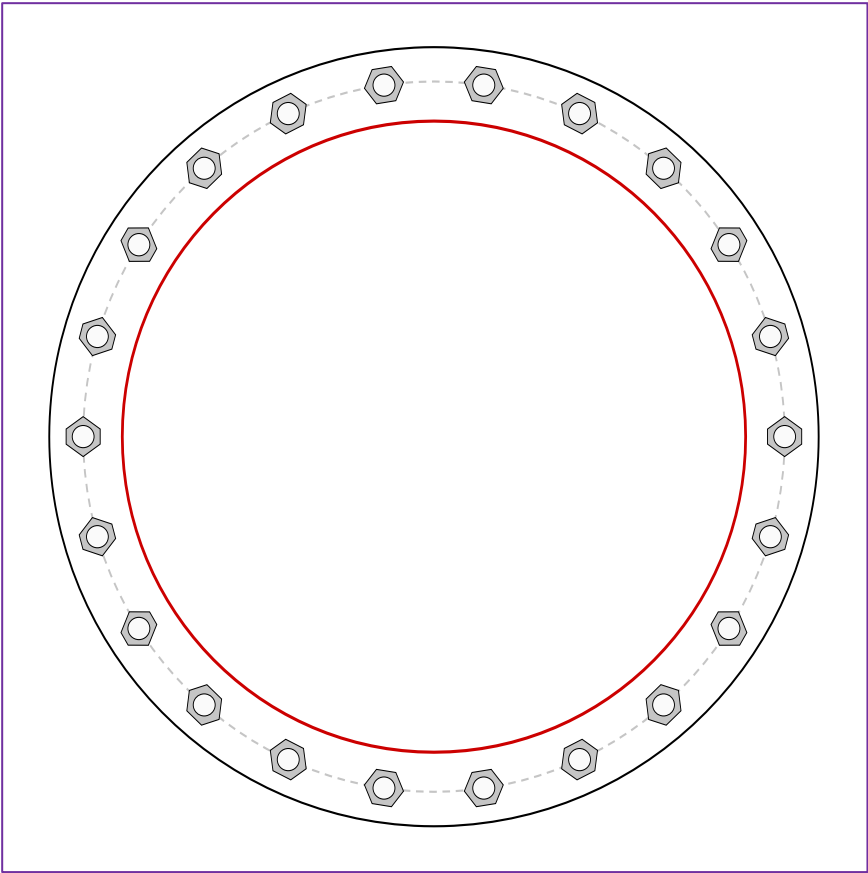
Monopole Base Plate Connection - Seismic

Site Info	
Site #	US-CT-5018
Site Name	Hopewell, CT
Project #	173455.001.01.0001

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2.25

Applied Loads	
Moment (kip-ft)	177.96
Axial Force (kips)	59.02
Shear Force (kips)	1.42

*1.5 Overstrength Factor Applied



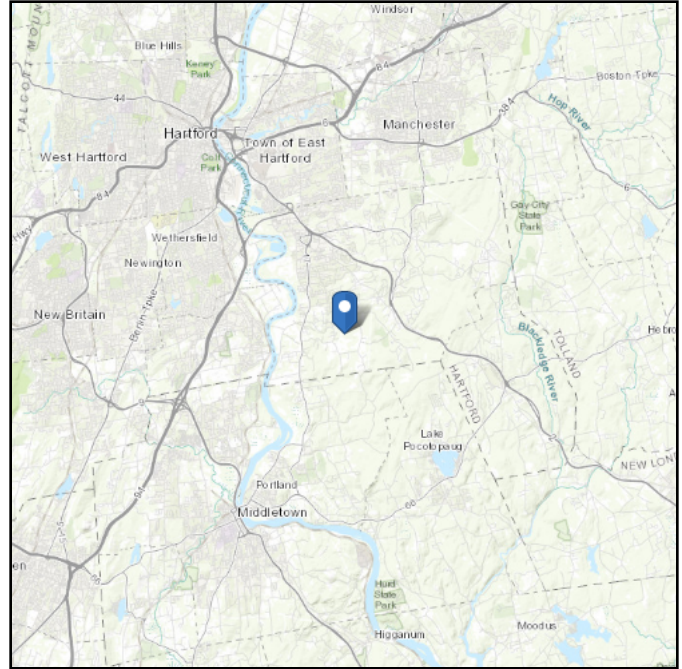
Connection Properties		Analysis Results	
Anchor Rod Data		Anchor Rod Summary <i>(units of kips, kip-in)</i>	
(22) 2-1/4" $\varnothing$ bolts (A615-75 N; F_y =75 ksi, F_u =100 ksi) on 72" BC		P_{u_c} = 10.77	ϕP_{n_c} = 268.39 Stress Rating
Base Plate Data		V_u = 0.1	ϕV_n = 120.77 4.0%
79" OD x 2" Plate (A572-50; F_y =50 ksi, F_u =65 ksi)		M_u = n/a	ϕM_n = n/a Pass
Stiffener Data		Base Plate Summary	
N/A		Max Stress (ksi):	2.19 (Flexural)
Pole Data		Allowable Stress (ksi):	45
64" x 0.4375" 18-sided pole (A572-65; F_y =65 ksi, F_u =80 ksi)		Stress Rating:	4.9% Pass

ASCE Hazards Report

Address:
No Address at This Location

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

Latitude: 41.6608
Longitude: -72.5741
Elevation: 308.0503307007861 ft
(NAVD 88)



Wind

Results:

Wind Speed	119 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Fri Oct 25 2024

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

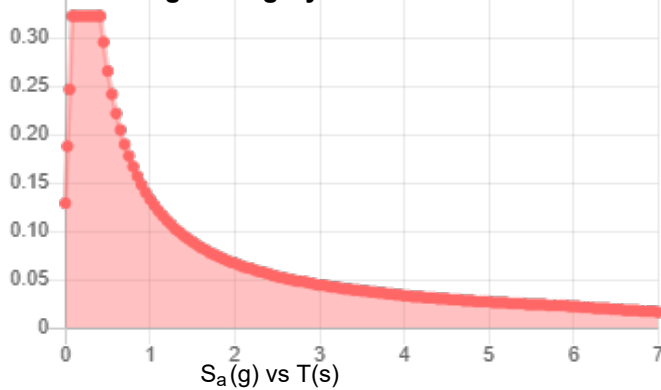
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

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

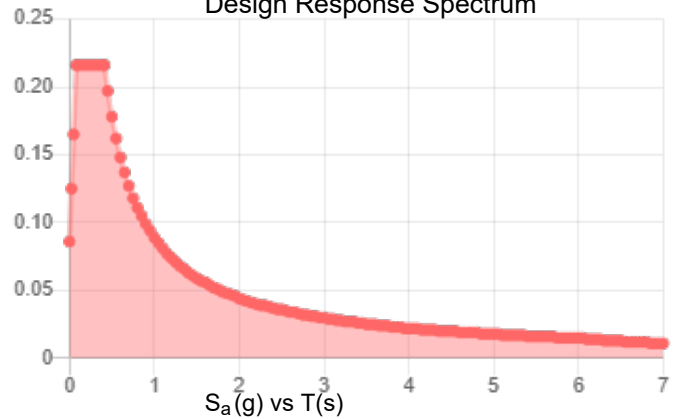
Results:

S_S :	0.202	S_{D1} :	0.089
S_1 :	0.056	T_L :	6
F_a :	1.6	PGA :	0.111
F_v :	2.4	PGA _M :	0.175
S_{MS} :	0.323	F_{PGA} :	1.578
S_{M1} :	0.133	I_e :	1
S_{DS} :	0.216	C_v :	0.704

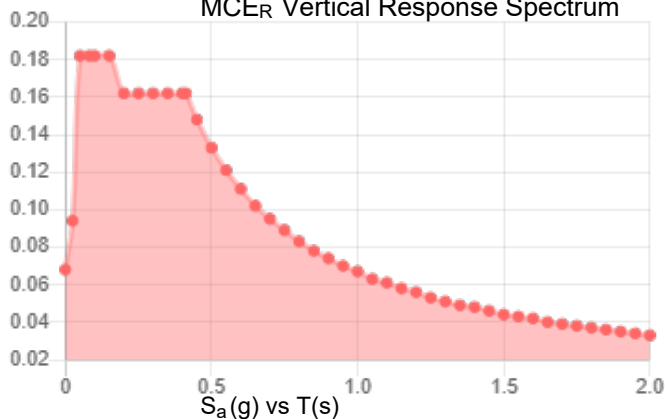
Seismic Design Category: B **MCE_R Response Spectrum**



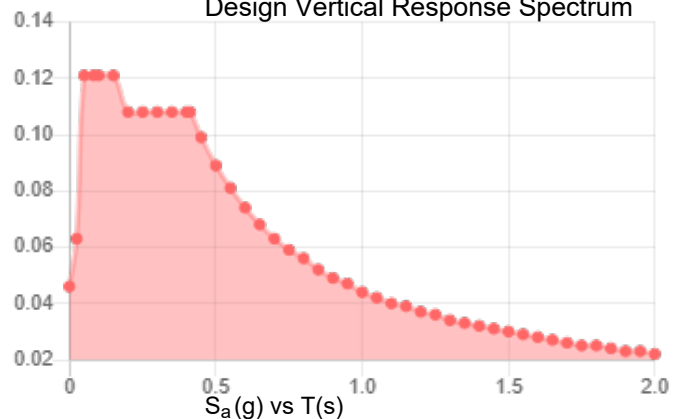
Design Response Spectrum



MCE_R Vertical Response Spectrum



Design Vertical Response Spectrum



Data Accessed: Fri Oct 25 2024

Date Source:

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

Results:

Ice Thickness: 1.50 in.
Concurrent Temperature: 15 F
Gust Speed 50 mph

Data Source: Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

Date Accessed: Fri Oct 25 2024

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

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

The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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COLOCATION APPLICATION - P-062006
US-CT-5018
Version 1
T-Mobile Northeast LLC

Vertical Bridge REIT, LLC.
750 Park of Commerce Dr, ste 200
Boca Raton, FL 33487

SUMMARY

PRIMARY INFO

Application #: P-062006
Application Version: 1 (Submitted: 10/17/2024 3:38:00 PM)
Application Type: Broadband
Application Name: TMO CTHA026A L600/Radio Upgrade
Lease Type: Amendment
ASR Number:
Description: -Swap (3) existing Antennas for (3) proposed Antennas, (3) existing RRUs for (3) proposed RRUs, (2) existing 6x12 hybrid cables for (2) proposed 6x24 hybrid Cables, and (1) existing Cabinet for (1) proposed Cabinet.
-Install (1) proposed Cabinet.

VERTICAL BRIDGE SITE INFO

VB Site #: US-CT-5018
VB Site Name: Hopewell
Latitude: 41.66079166
Longitude: -72.57409722
Structure Type: Monopole
Structure Height: 152.1600
Site Address: 63 Woodland St -
Glastonbury, CT 06073

VERTICAL BRIDGE DEAL TEAM

RLM: Floyd Jenkins Floyd.Jenkins@verticalbridge.com (301) 667-0069	LPM: Sam Bowden Sam.Bowden@verticalbridge.com	ROM: Joe Bascelli Joe.Bascelli@verticalbridge.com (484) 288-9586
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TENANT LEGAL INFO

Tenant Legal Name: T-Mobile Northeast LLC
State of Registration: Delaware
Type of Entity: LLC
Carrier NOC #: 8776115868
Tenant Site #: CTHA026A
Tenant Site Name: CTHA026A

APPLICANT

Name: Cullen Morgan
Address: 12579 Sagewood Drive
Venice, FL 34293
Phone Number: (941) 549-7263
Email Address: cmorgan@clinellc.com

FINAL LEASED RIGHTS CONFIGURATION TOTALS

This is a summary of your remaining existing equipment plus the new equipment.

FINAL EQUIPMENT

QTY	Equipment Type
6	RRU
9	Panel

FINAL LINES

QTY	Line Type
3	Hybrid

FREQUENCY & TECHNOLOGY INFO



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Type of Tehnology: Broadband Wireless
Is TX Frequency Licensed: Yes
TX Frequency: 617-632, 728-734, 1940-1965, 2130-2155 MHz
Is RX Frequency Licensed: Yes
RX Frequency: 663-678, 698-704, 1860-1885, 1730-1755 MHz

MOUNT & STRUCTURAL ANALYSIS

MOUNT ANALYSIS

Provided by Tenant: Yes
To Be Run by VB:
Include Mount Mapping:

STRUCTURAL HARD COPIES

Required: No
Number of Hard Copies:

CONTACTS

INVOICE CONTACT

Attention To	Name	Address	Phone Number 1	Phone Number 2	Email 1	Email 2
ATTN: Cullen Morgan	Centerline Communications LLC	350 W Center Street Suite 301 West Bridgewater, MA 02379	(941) 549-7263		cmorgan@clinellc.com	

PO CONTACT

Name	Phone	Email
Cullen Morgan	(941) 549-7263	cmorgan@clinellc.com

LEASING CONTACT

Name	Phone	Email
Mark Richard	(860) 648-1116	Mark.Richard64@t-mobile.com

NOTICE CONTACT

Notice To	Attention To	Name	Address
T-Mobile USA, Inc.	Lease Compliance / CTHA026A	T-Mobile USA Inc	12920 SE 38th Street Bellevue, WA 98006

RF CONTACT

Name	Phone	Email
Justin Darrow	(000) 000-0000	justin.darrow@t-mobile.com



COLOCATION APPLICATION - P-062006
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Boca Raton, FL 33487

TENANT CONSTRUCTION MANAGER CONTACT

Name	Phone	Email
Jeff York	(508) 821-6817	jyork@clinellc.com

EMERGENCY CONTACT

Name	Phone	Email
Cullen Morgan	(941) 549-7263	cmorgan@clinellc.com

LINE & EQUIPMENT

EXISTING LINE(S)

Qty	Line Type	Line Diameter(In.)	Line Location	Comments	Remain
2	Hybrid	1.25	Exterior		No
1	Hybrid	2	Exterior		Yes

NEW LINE(S)

Qty	Line Type	Line Diameter(In.)	Line Location	Comments
2	Hybrid	2	Exterior	

EXISTING EQUIPMENT

Qty	Equipment Type	Mount RAD Height	Equipment RAD Height (H')	Mount Type	Manufacturer	Model Number	Dimensions (H"xW"xD")	Weight (Lbs.)	Azimuth	Comments	Remain
3	Panel	145.00	145.00	Sector Frames	Ericsson	AIR32 KRD901146/1 B66A_B2A	56.60 x 12.90 x 8.70	132.20	30/150/270		No
3	Panel	145.00	145.00	Sector Frames	RFS	APXVAARR24 U- NA20	45.90 x 24.00 x 8.70	128.00	30/150/270		Yes
3	Panel	145.00	145.00	Sector Frames	RFS	APX16DWW-16DWW- S-E- A20	55.90 x 13.00 x 3.20	40.70	30/150/270		Yes
3	RRU	145.00	145.00	Sector Frames	Ericsson	Radio 4449 B71+B85	17.91 x 13.19 x 10.63	74.96	30/150/270		Yes
3	RRU	145.00	145.00	Sector Frames	T-Mobile	RRUS11 B4	20.00 x 17.00 x 7.00	51.00	30/150/270		No

NEW EQUIPMENT

Qty	Equipment Type	Mount RAD Height	Equipment RAD Height (H')	Mount Type	Manufacturer	Model Number	Dimensions (H"xW"xD")	Weight (Lbs.)	Azimuth	Comments
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3	Panel	145.00	145.00	Sector Frames	RFS	APXVLL19P_43- C- A20	75.80 x 11.30 x 4.60	42.00	30/ 150/ 270	
3	RRU	145.00	145.00	Sector Frames	Ericsson	Radio 4460 B25+B66	19.60 x 15.70 x 12.10	109.00	30/ 150/ 270	

EXISTING EQUIPMENT CABINET(S)

Qty of Cabinets	Cabinet Dimensions (H x W x D)	Manufacturer	Comments	Remain
1	57.01 x 51.20 x 27.60	Ericsson	N/A	No

NEW EQUIPMENT CABINET(S)

Qty of Cabinets	Cabinet Dimensions (H x W x D)	Manufacturer	Comments
1	63.00 x 25.60 x 25.60	Ericsson	N/A
1	63.00 x 26.00 x 26.00	Ericsson	N/A

ADDITIONAL SITE REQUIREMENTS

GROUND & INTERIOR SPACE REQUIREMENTS

Requirement Type	Total Lease Area (L x W)	Cabinet Required	Cabinet Area (L x W)	Shelter Required	Shelter Pad (L x W)	Comments
No Changes						

GENERATOR REQUIREMENTS

Requirement Type	Fuel Type	Kilowatt Size	Pad Dimensions (L x D)	Generator Manufacturer	Fuel Tank Manufacturer	Comments
Not Required						

AC POWER REQUIREMENTS

Meter Type	Additional Details	Comments
Existing Tenant Meter		

BACKHAUL REQUIREMENTS

Requirement Type	Cable Type	Number of Points of Entry	Riser Size (Inches)	Comments
Not Required				

EXHIBIT F

Mount Analysis Report

August 30, 2024



Centerline Communications
750 West Center Street, Suite #301
West Bridgewater, MA 02379

RE: T-Mobile Site Number: CTHA026A
TEP Project Number: 341846.981547
T-Mobile Site Name: CTHA026A
Site Address: 63-80 Woodland St
Glastonbury, CT 06073

To Whom It May Concern:

Tower Engineering Professionals (TEP) has been authorized by Centerline Communications to perform a mount analysis on the existing T-Mobile antenna/RRH mount to determine its capability of supporting the following additional loading:

- (3) APXVAARR24_43-U-NA20 Antennas (95.9"x24.0"x8.7" – Wt. = 128 lbs. /each)
- (3) APX16DWV-16DWV-S-E-A20 Antennas (55.9"x13.3"x3.2" – Wt. = 55 lbs. /each)
- (3) 4449 B71+B85 RRH's (17.9"x13.2"x9.5" – Wt. = 74 lbs. /each)
- **(3) APXVLL19P_43-C-A20 Antennas (75.8"x11.3"x4.6" – Wt. = 50 lbs. /each)**
- **(3) 4460 B25+B66 RRH's (17.0"x15.1"x11.9" – Wt. = 104 lbs. /each)**

**Proposed equipment shown in bold.*

Assembly drawings prepared by SitePro1 P/N ULPD12-496, dated January 31, 2014, were used to perform this analysis. TEP conducted a survey climb and mapping of the existing T-Mobile antenna mount on August 27, 2024.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, and the International Building Code 2021 with 2022 Connecticut State Building Code.
- TEP considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix P of the Connecticut State Building Code, the max basic wind speed for this site is equal to 120 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.5 in. An escalated ice thickness of 1.74 in was used for this analysis.
- TEP considers this site to be exposure category C; tower is located near large, flat, open, terrain/grasslands.
- TEP considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- TEP considers this site to have a spectral response acceleration parameter at short periods, S_s , of 0.200 and a spectral response acceleration parameter at a period of 1 second, S_1 , of 0.055.
- The mount has been analyzed with load combinations consisting of 500 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 2.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The existing mount is secured to the existing monopole with ring mounts and threaded rods. TEP considers the threaded rods to be the governing connection member.

Based on our evaluation, we have determined that the existing mount **IS CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	28	LC3	59%	PASS

Reference Documents:

- Assembly drawings prepared by SitePro1 P/N ULPD12-496, dated January 31, 2014.
- Mount Mapping Report prepared by TEP, dated August 30, 2024.

This determination was based on the following limitations and assumptions:

1. TEP is not responsible for any modifications completed prior to and hereafter in which TEP was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mount has been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to T-Mobile's mount must be tightened and re-plumbed prior to the installation of new appurtenances.
6. TEP performed a localized analysis on the mount itself and not on the supporting tower structure.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Tower Engineering Professionals



Michael Cabral
Director



Daniel P. Hamm, PE
Vice President

FIELD PHOTOS:



FIELD PHOTOS (Cont.):





Wind & Ice Load Calculations

Date: 8/29/2024
 Project Name: CTHA026A
 Project No.: CTHA026A
 Designed By: KSBM Checked By: MSC



2.6.5.2 Velocity Pressure Coeff:

$$K_z = 2.01 (z/z_g)^{2/\alpha}$$

$$K_z = 1.369$$

$$\begin{aligned} z &= 145 \text{ (ft)} \\ z_g &= 900 \text{ (ft)} \\ \alpha &= 9.5 \end{aligned}$$

$$K_{zmin} \leq K_z \leq 2.01$$

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_c
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.2 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$$K_{zt} = [1 + (K_c K_t / K_h)]^2$$

$$K_{zt} = 1$$

(If Category 1 then $K_{zt} = 1.0$)

$$\text{Category} = 1$$

$$K_h = e^{(f \cdot z/H)}$$

$$\begin{aligned} K_h &= 1 \\ K_c &= 1.0 \text{ (from Table 2-4)} \\ K_t &= 0 \text{ (from Table 2-5)} \\ f &= 0 \text{ (from Table 2-5)} \\ z &= 145 \\ z_s &= 310 \text{ (Mean elevation of base of structure above sea level)} \\ H &= 0 \text{ (Ht. of the crest above surrounding terrain)} \\ K_{zt} &= 1.00 \text{ (from 2.6.6.2.1)} \\ K_e &= 0.99 \text{ (from 2.6.8)} \end{aligned}$$

2.6.10 Design Ice Thickness

Max Ice Thickness =
 Importance Factor =

$$\begin{aligned} t_i &= 1.50 \text{ in} \\ I &= 1.00 \text{ (from Table 2-3)} \\ K_{iz} &= 1.16 \text{ (from Sec. 2.6.10)} \end{aligned}$$

$$t_{iz} = t_i \cdot I \cdot K_{iz} \cdot (K_{zt})^{0.35}$$

$$t_{iz} = 1.74 \text{ in}$$

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2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

$G_h = 1.0$ Latticed Structures > 600 ft

$G_h = 0.85$ Latticed Structures 450 ft or less

$$G_h = 0.85 + 0.15 [h/150 - 3.0]$$

$h =$ ht. of structure

$h =$ 150

$G_h =$ 0.85

2.6.9.2 Guyed Masts

$G_h =$ 0.85

2.6.9.3 Pole Structures

$G_h =$ 1.1

2.6.9 Appurtenances

$G_h =$ 1.0

2.6.9.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings ($ht. : width ratio > 5$))

$G_h =$ 1.35

$G_h =$ 1.00

2.6.11.2 Design Wind Force on Appurtenances

$$F = q_z * G_h * (EPA)_A$$

$$q_z = 0.00256 * K_z * K_{zt} * K_s * K_e * K_d * V_{max}^2$$

$$K_z = 1.369 \text{ (from 2.6.5.2)}$$

$$K_{zt} = 1.0 \text{ (from 2.6.6.2.1)}$$

$$K_s = 1.0 \text{ (from 2.6.7)}$$

$$K_e = 0.99 \text{ (from 2.6.8)}$$

$$K_d = 0.95 \text{ (from Table 2-2)}$$

$$V_{max} = 120 \text{ mph (Ultimate Wind Speed)}$$

$$V_{max(ice)} = 50 \text{ mph}$$

$$V_{30} = 30 \text{ mph}$$

$$q_z = 47.39$$

$$q_{z(ice)} = 8.23$$

$$q_{z(30)} = 2.96$$

Table 2-2

Structure Type	Wind Direction Probability Factor, K_d
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

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Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		$1.2 - 2.8(r_s) \geq 0.85$	$1.4 - 4.0(r_s) \geq 0.90$	$2.0 - 6.0(r_s) \geq 1.25$
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	$39 \leq C \leq 78$ (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
 (Aspect ratio is independent of the spacing between support points of a linear appurtenance.)

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = 1.74 in Angle = 0 (deg) Equivalent Angle = 180 (deg)

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
APXVLL19P_43-C-A20 Antenna	75.8	11.3	4.6	5.95	6.71	1.39	391	93	24
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	4.00	1.27	959	198	60
APX16DWV-16DWV-S-E-A20 Antenna	55.9	13.3	3.2	5.16	4.20	1.28	312	73	20
4460 B25+B66 RRH	17.0	15.1	11.9	1.78	1.13	1.20	101	26	6
4460 B25+B66 RRH (Shielded)	17.0	3.8	11.9	0.45	4.47	1.29	27	11	2
4449 B71+B85 RRH	17.9	13.2	9.5	1.64	1.36	1.20	93	24	6
4449 B71+B85 RRH (Shielded)	17.9	0.0	9.5	0.00	0.00	1.20	0	5	0
2" Pipe	2.4	12.0		0.20	0.20	1.20	11		
3" Pipe	3.5	12.0		0.29	0.29	1.20	17		
4" Pipe	4.5	12.0		0.38	0.38	1.20	21		

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Designed By: KSBM Checked By: MSC



WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.74	in.	Equivalent Angle =	210	(deg)
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WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
APXVLL19P_43-C-A20 Antenna	75.8	11.3	4.6	5.95	2.42	6.71	16.48	1.39	1.72	391	197	342
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	5.79	4.00	11.02	1.27	1.53	959	421	825
APX16DWV-16DWV-S-E-A20 Antenna	55.9	13.3	3.2	5.16	1.24	4.20	17.47	1.28	1.75	312	103	260
4460 B25+B66 RRH	17.0	15.1	11.9	1.78	1.40	1.13	1.43	1.20	1.20	101	80	96
4460 B25+B66 RRH (Shielded)	17.0	3.8	11.9	0.45	1.40	4.47	1.43	1.29	1.20	27	80	41
4449 B71+B85 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	93	67	87
4449 B71+B85 RRH (Shielded)	17.9	0.0	9.5	0.00	1.18	0.00	1.88	1.20	1.20	0	67	17

WIND LOADS WITH ICE:

APXVLL19P_43-C-A20 Antenna	79.3	14.8	8.1	8.14	4.45	5.36	9.81	1.33	1.49	89	55	80
APXVAARR24_43-U-NA20 Antenna	99.4	27.5	12.2	18.96	8.40	3.62	8.16	1.25	1.44	195	99	171
APX16DWV-16DWV-S-E-A20 Antenna	59.4	16.8	6.7	6.92	2.75	3.54	8.89	1.25	1.46	71	33	61
4460 B25+B66 RRH	20.5	18.6	15.4	2.64	2.19	1.10	1.33	1.20	1.20	26	22	25
4460 B25+B66 RRH (Shielded)	20.5	7.3	15.4	1.04	2.19	2.81	1.33	1.21	1.20	10	22	13
4449 B71+B85 RRH	21.4	16.7	13.0	2.48	1.93	1.28	1.65	1.20	1.20	24	19	23
4449 B71+B85 RRH (Shielded)	21.4	3.5	13.0	0.52	1.93	6.15	1.65	1.36	1.20	6	19	9

WIND LOADS AT 30 MPH:

APXVLL19P_43-C-A20 Antenna	75.8	11.3	4.6	5.95	2.42	6.71	16.48	1.39	1.72	24	12	21
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	5.79	4.00	11.02	1.27	1.53	60	26	52
APX16DWV-16DWV-S-E-A20 Antenna	55.9	13.3	3.2	5.16	1.24	4.20	17.47	1.28	1.75	20	6	16
4460 B25+B66 RRH	17.0	15.1	11.9	1.78	1.40	1.13	1.43	1.20	1.20	6	5	6
4460 B25+B66 RRH (Shielded)	17.0	3.8	11.9	0.45	1.40	4.47	1.43	1.29	1.20	2	5	3
4449 B71+B85 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	6	4	5
4449 B71+B85 RRH (Shielded)	17.9	0.0	9.5	0.00	1.18	0.00	1.88	1.20	1.20	0	4	1

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WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.74	in.	Equivalent Angle =	240	(deg)
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WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
APXVLL19P_43-C-A20 Antenna	75.8	11.3	4.6	5.95	2.42	6.71	16.48	1.39	1.72	391	197	245
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	5.79	4.00	11.02	1.27	1.53	959	421	556
APX16DWV-16DWV-S-E-A20 Antenna	55.9	13.3	3.2	5.16	1.24	4.20	17.47	1.28	1.75	312	103	155
4460 B25+B66 RRH	17.0	15.1	11.9	1.78	1.40	1.13	1.43	1.20	1.20	101	80	85
4460 B25+B66 RRH (Shielded)	17.0	3.8	11.9	0.45	1.40	4.47	1.43	1.29	1.20	27	80	67
4449 B71+B85 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	93	67	74
4449 B71+B85 RRH (Shielded)	17.9	0.0	9.5	0.00	1.18	0.00	1.88	1.20	1.20	0	67	50

WIND LOADS WITH ICE:

APXVLL19P_43-C-A20 Antenna	79.3	14.8	8.1	8.14	4.45	5.36	9.81	1.33	1.49	89	55	63
APXVAARR24_43-U-NA20 Antenna	99.4	27.5	12.2	18.96	8.40	3.62	8.16	1.25	1.44	195	99	123
APX16DWV-16DWV-S-E-A20 Antenna	59.4	16.8	6.7	6.92	2.75	3.54	8.89	1.25	1.46	71	33	43
4460 B25+B66 RRH	20.5	18.6	15.4	2.64	2.19	1.10	1.33	1.20	1.20	26	22	23
4460 B25+B66 RRH (Shielded)	20.5	7.3	15.4	1.04	2.19	2.81	1.33	1.21	1.20	10	22	19
4449 B71+B85 RRH	21.4	16.7	13.0	2.48	1.93	1.28	1.65	1.20	1.20	24	19	20
4449 B71+B85 RRH (Shielded)	21.4	3.5	13.0	0.52	1.93	6.15	1.65	1.36	1.20	6	19	16

WIND LOADS AT 30 MPH:

APXVLL19P_43-C-A20 Antenna	75.8	11.3	4.6	5.95	2.42	6.71	16.48	1.39	1.72	24	12	15
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	5.79	4.00	11.02	1.27	1.53	60	26	35
APX16DWV-16DWV-S-E-A20 Antenna	55.9	13.3	3.2	5.16	1.24	4.20	17.47	1.28	1.75	20	6	10
4460 B25+B66 RRH	17.0	15.1	11.9	1.78	1.40	1.13	1.43	1.20	1.20	6	5	5
4460 B25+B66 RRH (Shielded)	17.0	3.8	11.9	0.45	1.40	4.47	1.43	1.29	1.20	2	5	4
4449 B71+B85 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	6	4	5
4449 B71+B85 RRH (Shielded)	17.9	0.0	9.5	0.00	1.18	0.00	1.88	1.20	1.20	0	4	3

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Designed By: KSBM Checked By: MSC



WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.74	in.	Equivalent Angle =	270	(deg)
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WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
APXVLL19P_43-C-A20 Antenna	75.8	11.3	4.6	5.95	2.42	6.71	16.48	1.39	1.72	391	197	197
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	5.79	4.00	11.02	1.27	1.53	959	421	421
APX16DWV-16DWV-S-E-A20 Antenna	55.9	13.3	3.2	5.16	1.24	4.20	17.47	1.28	1.75	312	103	103
4460 B25+B66 RRH	17.0	15.1	11.9	1.78	1.40	1.13	1.43	1.20	1.20	101	80	80
4460 B25+B66 RRH (Shielded)	17.0	3.8	11.9	0.45	1.40	4.47	1.43	1.29	1.20	27	80	80
4449 B71+B85 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	93	67	67
4449 B71+B85 RRH (Shielded)	17.9	0.0	9.5	0.00	1.18	0.00	1.88	1.20	1.20	0	67	67

WIND LOADS WITH ICE:

APXVLL19P_43-C-A20 Antenna	79.3	14.8	8.1	8.14	4.45	5.36	9.81	1.33	1.49	89	55	55
APXVAARR24_43-U-NA20 Antenna	99.4	27.5	12.2	18.96	8.40	3.62	8.16	1.25	1.44	195	99	99
APX16DWV-16DWV-S-E-A20 Antenna	59.4	16.8	6.7	6.92	2.75	3.54	8.89	1.25	1.46	71	33	33
4460 B25+B66 RRH	20.5	18.6	15.4	2.64	2.19	1.10	1.33	1.20	1.20	26	22	22
4460 B25+B66 RRH (Shielded)	20.5	7.3	15.4	1.04	2.19	2.81	1.33	1.21	1.20	10	22	22
4449 B71+B85 RRH	21.4	16.7	13.0	2.48	1.93	1.28	1.65	1.20	1.20	24	19	19
4449 B71+B85 RRH (Shielded)	21.4	3.5	13.0	0.52	1.93	6.15	1.65	1.36	1.20	6	19	19

WIND LOADS AT 30 MPH:

APXVLL19P_43-C-A20 Antenna	75.8	11.3	4.6	5.95	2.42	6.71	16.48	1.39	1.72	24	12	12
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	5.79	4.00	11.02	1.27	1.53	60	26	26
APX16DWV-16DWV-S-E-A20 Antenna	55.9	13.3	3.2	5.16	1.24	4.20	17.47	1.28	1.75	20	6	6
4460 B25+B66 RRH	17.0	15.1	11.9	1.78	1.40	1.13	1.43	1.20	1.20	6	5	5
4460 B25+B66 RRH (Shielded)	17.0	3.8	11.9	0.45	1.40	4.47	1.43	1.29	1.20	2	5	5
4449 B71+B85 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	6	4	4
4449 B71+B85 RRH (Shielded)	17.9	0.0	9.5	0.00	1.18	0.00	1.88	1.20	1.20	0	4	4

Date: 8/29/2024
Project Name: CTHA026A
Project No.: CTHA026A
Designed By: KSBM Checked By: MSC



WIND LOADS

Angle = 120 (deg)

Ice Thickness = 1.74 in.

Equivalent Angle = 300 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
APXVLL19P_43-C-A20 Antenna	75.8	11.3	4.6	5.95	2.42	6.71	16.48	1.39	1.72	391	197	245
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	5.79	4.00	11.02	1.27	1.53	959	421	556
APX16DWV-16DWV-S-E-A20 Antenna	55.9	13.3	3.2	5.16	1.24	4.20	17.47	1.28	1.75	312	103	155
4460 B25+B66 RRH	17.0	15.1	11.9	1.78	1.40	1.13	1.43	1.20	1.20	101	80	85
4460 B25+B66 RRH (Shielded)	17.0	3.8	11.9	0.45	1.40	4.47	1.43	1.29	1.20	27	80	67
4449 B71+B85 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	93	67	74
4449 B71+B85 RRH (Shielded)	17.9	0.0	9.5	0.00	1.18	0.00	1.88	1.20	1.20	0	67	50

WIND LOADS WITH ICE:

APXVLL19P_43-C-A20 Antenna	79.3	14.8	8.1	8.14	4.45	5.36	9.81	1.33	1.49	89	55	63
APXVAARR24_43-U-NA20 Antenna	99.4	27.5	12.2	18.96	8.40	3.62	8.16	1.25	1.44	195	99	123
APX16DWV-16DWV-S-E-A20 Antenna	59.4	16.8	6.7	6.92	2.75	3.54	8.89	1.25	1.46	71	33	43
4460 B25+B66 RRH	20.5	18.6	15.4	2.64	2.19	1.10	1.33	1.20	1.20	26	22	23
4460 B25+B66 RRH (Shielded)	20.5	7.3	15.4	1.04	2.19	2.81	1.33	1.21	1.20	10	22	19
4449 B71+B85 RRH	21.4	16.7	13.0	2.48	1.93	1.28	1.65	1.20	1.20	24	19	20
4449 B71+B85 RRH (Shielded)	21.4	3.5	13.0	0.52	1.93	6.15	1.65	1.36	1.20	6	19	16

WIND LOADS AT 30 MPH:

APXVLL19P_43-C-A20 Antenna	75.8	11.3	4.6	5.95	2.42	6.71	16.48	1.39	1.72	24	12	15
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	5.79	4.00	11.02	1.27	1.53	60	26	35
APX16DWV-16DWV-S-E-A20 Antenna	55.9	13.3	3.2	5.16	1.24	4.20	17.47	1.28	1.75	20	6	10
4460 B25+B66 RRH	17.0	15.1	11.9	1.78	1.40	1.13	1.43	1.20	1.20	6	5	5
4460 B25+B66 RRH (Shielded)	17.0	3.8	11.9	0.45	1.40	4.47	1.43	1.29	1.20	2	5	4
4449 B71+B85 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	6	4	5
4449 B71+B85 RRH (Shielded)	17.9	0.0	9.5	0.00	1.18	0.00	1.88	1.20	1.20	0	4	3

Date: 8/29/2024
Project Name: CTHA026A
Project No.: CTHA026A
Designed By: KSBM Checked By: MSC



WIND LOADS

Angle = 150 (deg)

Ice Thickness = 1.74 in.

Equivalent Angle = 330 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
APXVLL19P_43-C-A20 Antenna	75.8	11.3	4.6	5.95	2.42	6.71	16.48	1.39	1.72	391	197	342
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	5.79	4.00	11.02	1.27	1.53	959	421	825
APX16DWV-16DWV-S-E-A20 Antenna	55.9	13.3	3.2	5.16	1.24	4.20	17.47	1.28	1.75	312	103	260
4460 B25+B66 RRH	17.0	15.1	11.9	1.78	1.40	1.13	1.43	1.20	1.20	101	80	96
4460 B25+B66 RRH (Shielded)	17.0	3.8	11.9	0.45	1.40	4.47	1.43	1.29	1.20	27	80	41
4449 B71+B85 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	93	67	87
4449 B71+B85 RRH (Shielded)	17.9	0.0	9.5	0.00	1.18	0.00	1.88	1.20	1.20	0	67	17

WIND LOADS WITH ICE:

APXVLL19P_43-C-A20 Antenna	79.3	14.8	8.1	8.14	4.45	5.36	9.81	1.33	1.49	89	55	80
APXVAARR24_43-U-NA20 Antenna	99.4	27.5	12.2	18.96	8.40	3.62	8.16	1.25	1.44	195	99	171
APX16DWV-16DWV-S-E-A20 Antenna	59.4	16.8	6.7	6.92	2.75	3.54	8.89	1.25	1.46	71	33	61
4460 B25+B66 RRH	20.5	18.6	15.4	2.64	2.19	1.10	1.33	1.20	1.20	26	22	25
4460 B25+B66 RRH (Shielded)	20.5	7.3	15.4	1.04	2.19	2.81	1.33	1.21	1.20	10	22	13
4449 B71+B85 RRH	21.4	16.7	13.0	2.48	1.93	1.28	1.65	1.20	1.20	24	19	23
4449 B71+B85 RRH (Shielded)	21.4	3.5	13.0	0.52	1.93	6.15	1.65	1.36	1.20	6	19	9

WIND LOADS AT 30 MPH:

APXVLL19P_43-C-A20 Antenna	75.8	11.3	4.6	5.95	2.42	6.71	16.48	1.39	1.72	24	12	21
APXVAARR24_43-U-NA20 Antenna	95.9	24.0	8.7	15.98	5.79	4.00	11.02	1.27	1.53	60	26	52
APX16DWV-16DWV-S-E-A20 Antenna	55.9	13.3	3.2	5.16	1.24	4.20	17.47	1.28	1.75	20	6	16
4460 B25+B66 RRH	17.0	15.1	11.9	1.78	1.40	1.13	1.43	1.20	1.20	6	5	6
4460 B25+B66 RRH (Shielded)	17.0	3.8	11.9	0.45	1.40	4.47	1.43	1.29	1.20	2	5	3
4449 B71+B85 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	6	4	5
4449 B71+B85 RRH (Shielded)	17.9	0.0	9.5	0.00	1.18	0.00	1.88	1.20	1.20	0	4	1

Date: 8/29/2024

Project Name: CTHA026A

Project No.: CTHA026A

Designed By: KSBM Checked By: MSC



ICE WEIGHT CALCULATIONS

Thickness of ice: 1.74 in.

Density of ice: 56 pcf

APXVLL19P_43-C-A20 Antenna

Weight of ice based on total radial SF area:

Height (in): 75.8

Width (in): 11.3

Depth (in): 4.6

Total weight of ice on object: 187 lbs

Weight of object: 50.0 lbs

Combined weight of ice and object: 237 lbs

APXVAARR24_43-U-NA20 Antenna

Weight of ice based on total radial SF area:

Height (in): 95.9

Width (in): 24.0

Depth (in): 8.7

Total weight of ice on object: 463 lbs

Weight of object: 128.0 lbs

Combined weight of ice and object: 591 lbs

APX16DWV-16DWV-S-E-A20 Antenna

Weight of ice based on total radial SF area:

Height (in): 55.9

Width (in): 13.3

Depth (in): 3.2

Total weight of ice on object: 153 lbs

Weight of object: 55.0 lbs

Combined weight of ice and object: 208 lbs

4460 B25+B66 RRH

Weight of ice based on total radial SF area:

Height (in): 17.0

Width (in): 15.1

Depth (in): 11.9

Total weight of ice on object: 63 lbs

Weight of object: 104.0 lbs

Combined weight of ice and object: 167 lbs

4449 B71+B85 RRH

Weight of ice based on total radial SF area:

Height (in): 17.9

Width (in): 13.2

Depth (in): 9.5

Total weight of ice on object: 57 lbs

Weight of object: 74.0 lbs

Combined weight of ice and object: 131 lbs

2" Pipe

Per foot weight of ice:

diameter (in): 2.38

Per foot weight of ice on object: 9 plf

3" Pipe

Per foot weight of ice:

diameter (in): 3.5

Per foot weight of ice on object: 11 plf

4" Pipe

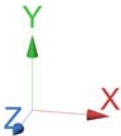
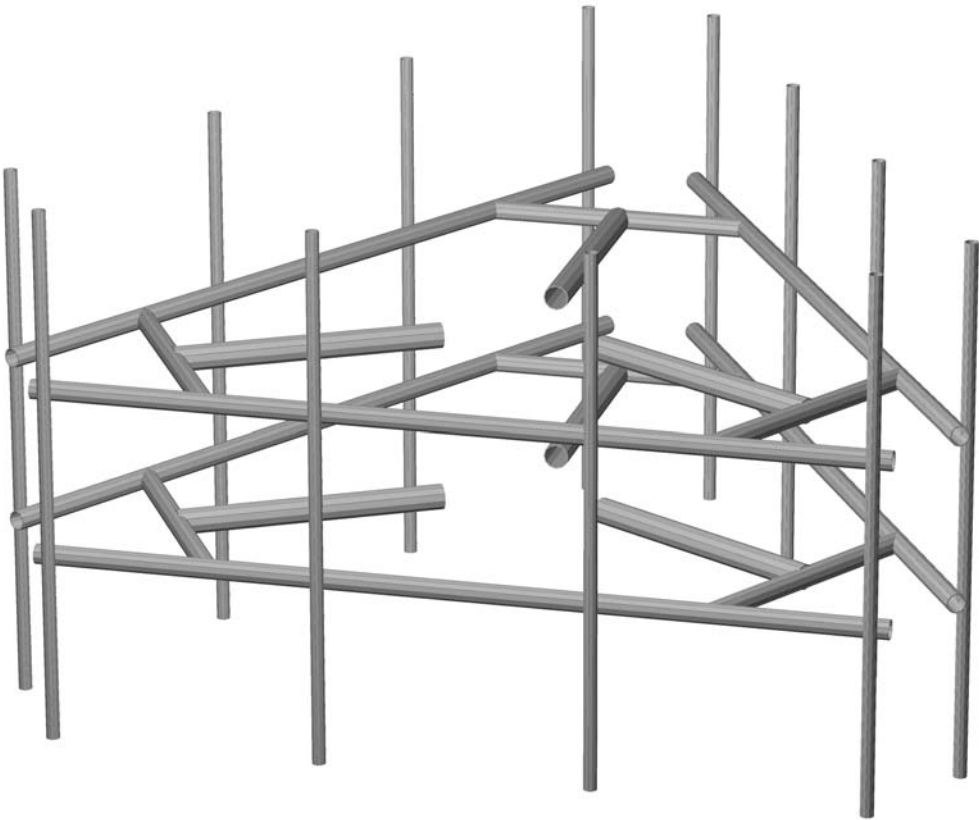
Per foot weight of ice:

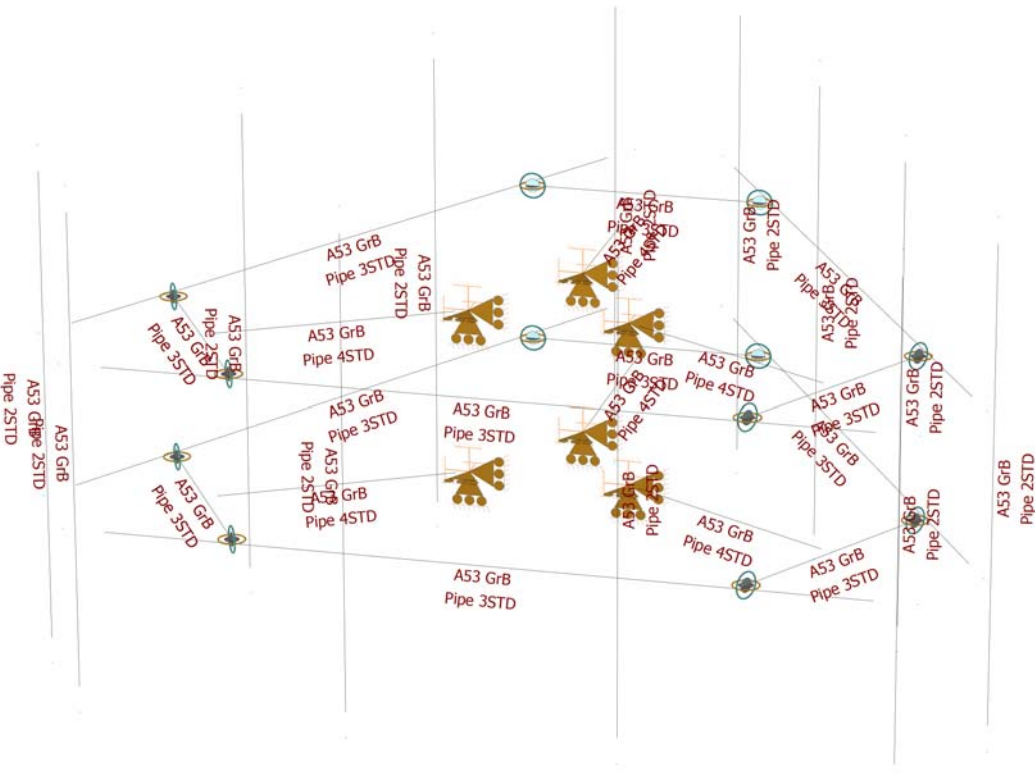
diameter (in): 4.5

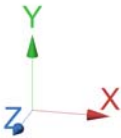
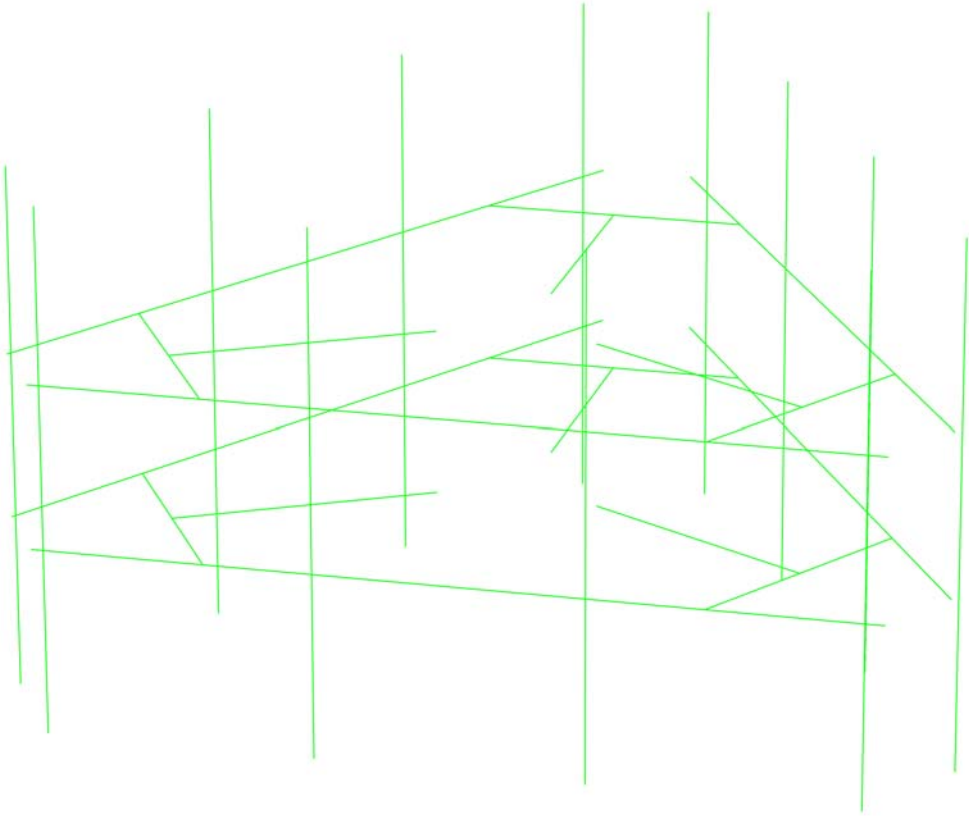
Per foot weight of ice on object: 13 plf

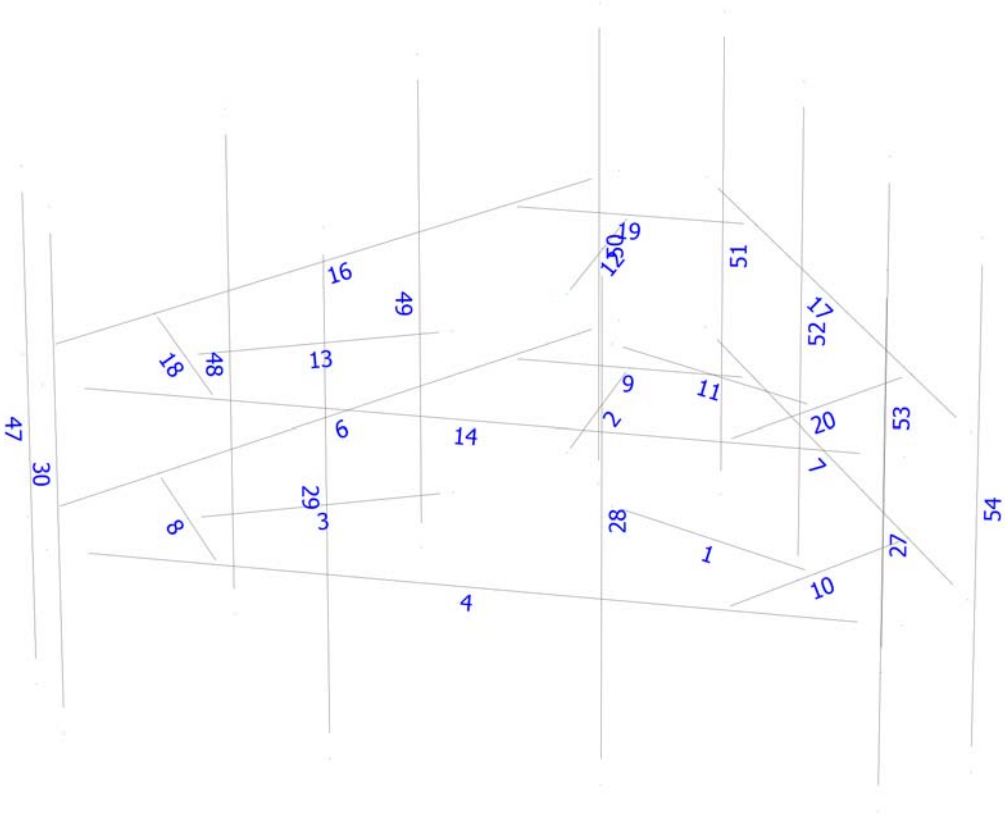


Mount Calculations (Existing Conditions)











Current Date: 8/29/2024 11:44 AM

Units system: English

Load data

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
W0	Wind Load 0/60/120 deg	No	WIND
W30	Wind Load 30/90/150 deg	No	WIND
Di	Ice Load	No	LL
Wi0	Ice Wind Load 0/60/120 deg	No	WIND
Wi30	Ice Wind Load 30/90/150 deg	No	WIND
WL0	WL 30 mph 0/60/120 deg	No	WIND
WL30	WL 30 mph 30/90/150 deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load End of Mount	No	LL
LLa1	500 lb Live Load Antenna 1	No	LL
LLa2	500 lb Live Load Antenna 2	No	LL
LLa3	500 lb Live Load Antenna 3	No	LL
LLa4	500 lb Live Load Antenna 4	No	LL

Distributed force on members

Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
W0	1	z	-0.021	0.00	0.00	No	0.00	No
	2	z	-0.021	0.00	0.00	No	0.00	No
	3	z	-0.021	0.00	0.00	No	0.00	No
	4	z	-0.017	0.00	0.00	No	0.00	No
	6	z	-0.017	0.00	0.00	No	0.00	No
	7	z	-0.017	0.00	0.00	No	0.00	No
	8	z	-0.017	0.00	0.00	No	0.00	No
	9	z	-0.017	0.00	0.00	No	0.00	No
	10	z	-0.017	0.00	0.00	No	0.00	No
	11	z	-0.021	0.00	0.00	No	0.00	No
	12	z	-0.021	0.00	0.00	No	0.00	No
	13	z	-0.021	0.00	0.00	No	0.00	No
	14	z	-0.017	0.00	0.00	No	0.00	No
	16	z	-0.017	0.00	0.00	No	0.00	No
	17	z	-0.017	0.00	0.00	No	0.00	No
	18	z	-0.017	0.00	0.00	No	0.00	No
	19	z	-0.017	0.00	0.00	No	0.00	No
	20	z	-0.017	0.00	0.00	No	0.00	No
	27	z	-0.017	-0.017	0.00	No	1.00	No
		z	-0.017	-0.017	7.25	No	100.00	Yes
	29	z	-0.017	-0.017	0.00	No	1.50	No
		z	-0.017	-0.017	6.50	No	100.00	Yes
	30	z	-0.017	0.00	0.00	No	0.00	No
	47	z	-0.017	0.00	0.00	No	0.00	No
	48	z	-0.017	0.00	0.00	No	0.00	No
	49	z	-0.017	0.00	0.00	No	0.00	No
	50	z	-0.017	0.00	0.00	No	0.00	No
	51	z	-0.017	0.00	0.00	No	0.00	No

W30	52	z	-0.017	0.00	0.00	No	0.00	No
	53	z	-0.017	0.00	0.00	No	0.00	No
	54	z	-0.017	0.00	0.00	No	0.00	No
	1	x	-0.021	0.00	0.00	No	0.00	No
	2	x	-0.021	0.00	0.00	No	0.00	No
	3	x	-0.021	0.00	0.00	No	0.00	No
	6	x	-0.017	0.00	0.00	No	0.00	No
	7	x	-0.017	0.00	0.00	No	0.00	No
	8	x	-0.017	0.00	0.00	No	0.00	No
	9	x	-0.017	0.00	0.00	No	0.00	No
	10	x	-0.017	0.00	0.00	No	0.00	No
	11	x	-0.021	0.00	0.00	No	0.00	No
	12	x	-0.021	0.00	0.00	No	0.00	No
	13	x	-0.021	0.00	0.00	No	0.00	No
	16	x	-0.017	0.00	0.00	No	0.00	No
	17	x	-0.017	0.00	0.00	No	0.00	No
	18	x	-0.017	0.00	0.00	No	0.00	No
	19	x	-0.017	0.00	0.00	No	0.00	No
	20	x	-0.017	0.00	0.00	No	0.00	No
	27	x	-0.017	0.00	0.00	No	0.00	No
	28	x	-0.017	0.00	0.00	No	0.00	No
	29	x	-0.017	0.00	0.00	No	0.00	No
	30	x	-0.017	0.00	0.00	No	0.00	No
	47	x	-0.017	0.00	0.00	No	0.00	No
	48	x	-0.017	0.00	0.00	No	0.00	No
	49	x	-0.017	0.00	0.00	No	0.00	No
	50	x	-0.017	0.00	0.00	No	0.00	No
	51	x	-0.017	0.00	0.00	No	0.00	No
	52	x	-0.017	0.00	0.00	No	0.00	No
	53	x	-0.017	0.00	0.00	No	0.00	No
	54	x	-0.017	0.00	0.00	No	0.00	No
Di	1	y	-0.013	0.00	0.00	No	0.00	No
	2	y	-0.013	0.00	0.00	No	0.00	No
	3	y	-0.013	0.00	0.00	No	0.00	No
	4	y	-0.011	0.00	0.00	No	0.00	No
	6	y	-0.011	0.00	0.00	No	0.00	No
	7	y	-0.011	0.00	0.00	No	0.00	No
	8	y	-0.011	0.00	0.00	No	0.00	No
	9	y	-0.011	0.00	0.00	No	0.00	No
	10	y	-0.011	0.00	0.00	No	0.00	No
	11	y	-0.013	0.00	0.00	No	0.00	No
	12	y	-0.013	0.00	0.00	No	0.00	No
	13	y	-0.013	0.00	0.00	No	0.00	No
	14	y	-0.011	0.00	0.00	No	0.00	No
	16	y	-0.011	0.00	0.00	No	0.00	No
	17	y	-0.011	0.00	0.00	No	0.00	No
	18	y	-0.011	0.00	0.00	No	0.00	No
	19	y	-0.011	0.00	0.00	No	0.00	No
	20	y	-0.011	0.00	0.00	No	0.00	No
	27	y	-0.009	0.00	0.00	No	0.00	No
	28	y	-0.009	0.00	0.00	No	0.00	No
	29	y	-0.009	0.00	0.00	No	0.00	No
	30	y	-0.009	0.00	0.00	No	0.00	No
	47	y	-0.009	0.00	0.00	No	0.00	No
	48	y	-0.009	0.00	0.00	No	0.00	No
	49	y	-0.009	0.00	0.00	No	0.00	No
	50	y	-0.009	0.00	0.00	No	0.00	No
	51	y	-0.009	0.00	0.00	No	0.00	No
	52	y	-0.009	0.00	0.00	No	0.00	No
	53	y	-0.009	0.00	0.00	No	0.00	No
	54	y	-0.009	0.00	0.00	No	0.00	No

Concentrated forces on members

Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	27	y	-0.025	1.50	No
		y	-0.025	6.75	No
		y	-0.104	50.00	Yes
	28	y	-0.064	0.50	No
		y	-0.064	7.50	No
		y	-0.074	1.75	No
	29	y	-0.028	2.00	No
		y	-0.028	6.00	No
	47	y	-0.025	1.50	No
		y	-0.025	6.75	No
		y	-0.104	50.00	Yes
	48	y	-0.064	0.50	No
		y	-0.064	7.50	No
		y	-0.074	1.75	No
	49	y	-0.028	2.00	No
		y	-0.028	6.00	No
	51	y	-0.025	1.50	No
		y	-0.025	6.75	No
		y	-0.104	50.00	Yes
	52	y	-0.064	0.50	No
		y	-0.064	7.50	No
		y	-0.074	1.75	No
	53	y	-0.028	2.00	No
		y	-0.028	6.00	No
W0	27	z	-0.196	1.50	No
		z	-0.196	6.75	No
		z	-0.027	50.00	Yes
	28	z	-0.48	0.50	No
		z	-0.48	7.50	No
	29	z	-0.157	2.00	No
		z	-0.157	6.00	No
	47	z	-0.123	1.50	No
		z	-0.123	6.75	No
		z	-0.067	50.00	Yes
	48	z	-0.278	0.50	No
		z	-0.278	7.50	No
		z	-0.05	1.75	No
	49	z	-0.078	2.00	No
		z	-0.078	6.00	No
	51	z	-0.123	1.50	No
		z	-0.123	6.75	No
		z	-0.067	50.00	Yes
	52	z	-0.278	0.50	No
		z	-0.278	7.50	No
		z	-0.05	1.75	No
	53	z	-0.078	2.00	No
		z	-0.078	6.00	No
W30	27	x	-0.099	1.50	No
		x	-0.099	6.75	No
		x	-0.08	50.00	Yes
	28	x	-0.211	0.50	No
		x	-0.211	7.50	No
		x	-0.067	1.75	No
	29	x	-0.052	2.00	No
		x	-0.052	6.00	No
	47	x	-0.172	1.50	No
		x	-0.172	6.75	No
	48	x	-0.413	0.50	No
		x	-0.413	7.50	No

Di	49	x	-0.13	2.00	No
		x	-0.13	6.00	No
	51	x	-0.172	1.50	No
		x	-0.172	6.75	No
	52	x	-0.413	0.50	No
		x	-0.413	7.50	No
	53	x	-0.13	2.00	No
		x	-0.13	6.00	No
	27	y	-0.094	1.50	No
		y	-0.094	6.75	No
		y	-0.063	50.00	Yes
	28	y	-0.232	0.50	No
		y	-0.232	7.50	No
		y	-0.057	1.75	No
	29	y	-0.077	2.00	No
		y	-0.077	6.00	No
	47	y	-0.094	1.50	No
		y	-0.094	6.75	No
		y	-0.063	50.00	Yes
	48	y	-0.232	0.50	No
Wi0		y	-0.232	7.50	No
		y	-0.057	1.75	No
	49	y	-0.077	2.00	No
		y	-0.077	6.00	No
	51	y	-0.094	1.50	No
		y	-0.094	6.75	No
		y	-0.063	50.00	Yes
	52	y	-0.232	0.50	No
		y	-0.232	7.50	No
		y	-0.057	1.75	No
	53	y	-0.077	2.00	No
		y	-0.077	6.00	No
	27	z	-0.047	1.50	No
		z	-0.047	6.75	No
		z	-0.011	50.00	Yes
	28	z	-0.099	0.50	No
		z	-0.099	7.50	No
		z	-0.005	1.75	No
	29	z	-0.037	2.00	No
		z	-0.037	6.00	No
Wi30	47	z	-0.032	1.50	No
		z	-0.032	6.75	No
		z	-0.019	50.00	Yes
	48	z	-0.062	0.50	No
		z	-0.062	7.50	No
		z	-0.016	1.75	No
	49	z	-0.022	2.00	No
		z	-0.022	6.00	No
	51	z	-0.032	1.50	No
		z	-0.032	6.75	No
		z	-0.019	50.00	Yes
	52	z	-0.062	0.50	No
		z	-0.062	7.50	No
		z	-0.016	1.75	No
	53	z	-0.022	2.00	No
		z	-0.022	6.00	No
	27	x	-0.028	1.50	No
		x	-0.028	6.75	No
		x	-0.022	50.00	Yes
	28	x	-0.05	0.50	No
		x	-0.05	7.50	No
		x	-0.019	1.75	No

WL0	29	x	-0.017	2.00	No
		x	-0.017	6.00	No
	47	x	-0.041	1.50	No
		x	-0.041	6.75	No
		x	-0.013	50.00	Yes
	48	x	-0.086	0.50	No
		x	-0.086	7.50	No
		x	-0.009	1.75	No
	49	x	-0.031	2.00	No
		x	-0.031	6.00	No
	51	x	-0.041	1.50	No
		x	-0.041	6.75	No
		x	-0.013	50.00	Yes
	52	x	-0.086	0.50	No
		x	-0.086	7.50	No
		x	-0.009	1.75	No
	53	x	-0.031	2.00	No
		x	-0.031	6.00	No
	27	z	-0.013	1.50	No
		z	-0.013	6.75	No
		z	-0.002	50.00	Yes
	28	z	-0.03	0.50	No
		z	-0.03	7.50	No
	29	z	-0.01	2.00	No
		z	-0.01	6.00	No
	47	z	-0.008	1.50	No
		z	-0.008	6.75	No
		z	-0.004	50.00	Yes
	48	z	-0.018	0.50	No
		z	-0.018	7.50	No
		z	-0.003	1.75	No
	49	z	-0.005	2.00	No
		z	-0.005	6.00	No
	51	z	-0.008	1.50	No
		z	-0.008	6.75	No
		z	-0.004	50.00	Yes
	52	z	-0.018	0.50	No
		z	-0.018	7.50	No
		z	-0.003	1.75	No
	53	z	-0.005	2.00	No
		z	-0.005	6.00	No
	27	x	-0.007	1.50	No
		x	-0.007	6.75	No
		x	-0.005	50.00	Yes
	28	x	-0.014	0.50	No
		x	-0.014	7.50	No
		x	-0.004	1.75	No
	29	x	-0.004	2.00	No
		x	-0.004	6.00	No
	47	x	-0.011	1.50	No
		x	-0.011	6.75	No
		x	-0.003	50.00	Yes
	48	x	-0.026	0.50	No
		x	-0.026	7.50	No
		x	-0.001	1.75	No
	49	x	-0.009	2.00	No
		x	-0.009	6.00	No
	51	x	-0.011	1.50	No
		x	-0.011	6.75	No
		x	-0.003	50.00	Yes
	52	x	-0.026	0.50	No
		x	-0.026	7.50	No

WL30

		x	-0.001	1.75	No
	53	x	-0.009	2.00	No
		x	-0.009	6.00	No
LL1	14	y	-0.25	50.00	Yes
LL2	14	y	-0.25	100.00	Yes
LLa1	27	y	-0.50	50.00	Yes
LLa2	28	y	-0.50	50.00	Yes
LLa3	29	y	-0.50	50.00	Yes
LLa4	30	y	-0.50	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
W0	Wind Load 0/60/120 deg	No	0.00	0.00	0.00
W30	Wind Load 30/90/150 deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi0	Ice Wind Load 0/60/120 deg	No	0.00	0.00	0.00
Wi30	Ice Wind Load 30/90/150 deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0/60/120 deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30/90/150 deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load End of Mount	No	0.00	0.00	0.00
LLa1	500 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	500 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	500 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	500 lb Live Load Antenna 4	No	0.00	0.00	0.00

Glossary

Comb : Indicates if load condition is a load combination



Steel Code Check

Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+W0
 LC2=1.2DL+W30
 LC3=1.2DL-W0
 LC4=1.2DL-W30
 LC5=0.9DL+W0
 LC6=0.9DL+W30
 LC7=0.9DL-W0
 LC8=0.9DL-W30
 LC9=1.2DL+Di+W0
 LC10=1.2DL+Di+W30
 LC11=1.2DL+Di-W0
 LC12=1.2DL+Di-W30
 LC13=1.4DL
 LC14=1.2DL+1.6LL1
 LC15=1.2DL+1.6LL2
 LC16=1.2DL+WL0+1.6LLa1
 LC17=1.2DL+WL30+1.6LLa1
 LC18=1.2DL-WL0+1.6LLa1
 LC19=1.2DL-WL30+1.6LLa1
 LC20=1.2DL+WL0+1.6LLa2
 LC21=1.2DL+WL30+1.6LLa2
 LC22=1.2DL-WL0+1.6LLa2
 LC23=1.2DL-WL30+1.6LLa2
 LC24=1.2DL+WL0+1.6LLa3
 LC25=1.2DL+WL30+1.6LLa3
 LC26=1.2DL-WL0+1.6LLa3
 LC27=1.2DL-WL30+1.6LLa3
 LC28=1.2DL+WL0+1.6LLa4
 LC29=1.2DL+WL30+1.6LLa4
 LC30=1.2DL-WL0+1.6LLa4
 LC31=1.2DL-WL30+1.6LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
<i>Pipe 2STD</i>		27	LC16 at 65.62%	0.30	OK	
		28	LC3 at 34.37%	0.59	OK	
		29	LC1 at 65.62%	0.17	OK	
		30	LC28 at 65.62%	0.27	OK	
		47	LC4 at 65.62%	0.22	OK	
		48	LC2 at 34.37%	0.54	OK	
		49	LC4 at 65.62%	0.19	OK	
		50	LC4 at 65.62%	0.13	OK	
		51	LC2 at 65.62%	0.27	OK	
		52	LC4 at 34.37%	0.54	OK	
		53	LC2 at 65.62%	0.18	OK	
		54	LC19 at 34.38%	0.11	OK	
<i>Pipe 3STD</i>		4	LC1 at 79.35%	0.18	OK	
		6	LC2 at 79.35%	0.16	OK	
		7	LC2 at 79.35%	0.18	OK	
		8	LC2 at 50.00%	0.44	OK	

9	LC1 at 50.00%	0.36	OK
10	LC3 at 50.00%	0.37	OK
14	LC3 at 79.35%	0.17	OK
16	LC9 at 79.35%	0.16	OK
17	LC4 at 79.35%	0.18	OK
18	LC4 at 50.00%	0.44	OK
19	LC3 at 50.00%	0.36	OK
20	LC1 at 50.00%	0.38	OK

Pipe 4STD

1	LC11 at 0.00%	0.41	OK
2	LC12 at 0.00%	0.41	OK
3	LC9 at 0.00%	0.39	OK
11	LC9 at 0.00%	0.41	OK
12	LC10 at 0.00%	0.41	OK
13	LC11 at 0.00%	0.39	OK



Geometry data

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
2	1.2051	0.00	0.6958	0
3	4.6692	0.00	2.6958	0
4	-1.2051	0.00	0.6958	0
5	0.00	0.00	-1.3915	0
6	-4.6692	0.00	2.6958	0
7	0.00	0.00	-5.3915	0
8	-6.25	0.00	4.4219	0
9	6.25	0.00	4.4219	0
12	-0.7045	0.00	-7.6236	0
13	6.9545	0.00	3.2017	0
14	-6.9545	0.00	3.2017	0
15	0.7045	0.00	-7.6236	0
16	-3.6692	0.00	4.4278	0
17	3.6692	0.00	4.4278	0
18	-2.00	0.00	-5.3915	0
19	5.6692	0.00	0.9637	0
20	-5.6692	0.00	0.9637	0
21	2.00	0.00	-5.3915	0
22	1.2051	2.50	0.6958	0
23	4.6692	2.50	2.6958	0
24	-1.2051	2.50	0.6958	0
25	0.00	2.50	-1.3915	0
26	-4.6692	2.50	2.6958	0
27	0.00	2.50	-5.3915	0
28	-6.25	2.50	4.4219	0
29	6.25	2.50	4.4219	0
32	-0.7045	2.50	-7.6236	0
33	6.9545	2.50	3.2017	0
34	-6.9545	2.50	3.2017	0
35	0.7045	2.50	-7.6236	0
36	-3.6692	2.50	4.4278	0
37	3.6692	2.50	4.4278	0
38	-2.00	2.50	-5.3915	0
39	5.6692	2.50	0.9637	0
40	-5.6692	2.50	0.9637	0
41	2.00	2.50	-5.3915	0
43	6.00	5.25	4.6219	0
44	6.00	-2.75	4.6219	0
57	2.00	5.25	4.6219	0
58	2.00	-2.75	4.6219	0
59	-2.00	5.25	4.6219	0
60	-2.00	-2.75	4.6219	0
61	-6.00	5.25	4.6219	0
62	-6.00	-2.75	4.6219	0
95	-7.0027	5.25	2.8852	0
96	-7.0027	-2.75	2.8852	0
97	-5.0027	5.25	-0.5789	0
98	-5.0027	-2.75	-0.5789	0
99	-3.0027	5.25	-4.043	0
100	-3.0027	-2.75	-4.043	0

101	-1.0027	5.25	-7.5071	0
102	-1.0027	-2.75	-7.5071	0
103	1.0027	5.25	-7.5071	0
104	1.0027	-2.75	-7.5071	0
105	3.0027	5.25	-4.043	0
106	3.0027	-2.75	-4.043	0
107	5.0027	5.25	-0.5789	0
108	5.0027	-2.75	-0.5789	0
109	7.0027	5.25	2.8852	0
110	7.0027	-2.75	2.8852	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
2	1	1	1	1	1	1
4	1	1	1	1	1	1
5	1	1	1	1	1	1
22	1	1	1	1	1	1
24	1	1	1	1	1	1
25	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	2	3		Pipe 4STD	A53 GrB	0.00	0.00	0.00
2	5	7		Pipe 4STD	A53 GrB	0.00	0.00	0.00
3	4	6		Pipe 4STD	A53 GrB	0.00	0.00	0.00
4	8	9		Pipe 3STD	A53 GrB	0.00	0.00	0.00
6	12	14		Pipe 3STD	A53 GrB	0.00	0.00	0.00
7	13	15		Pipe 3STD	A53 GrB	0.00	0.00	0.00
8	16	20		Pipe 3STD	A53 GrB	0.00	0.00	0.00
9	18	21		Pipe 3STD	A53 GrB	0.00	0.00	0.00
10	17	19		Pipe 3STD	A53 GrB	0.00	0.00	0.00
11	22	23		Pipe 4STD	A53 GrB	0.00	0.00	0.00
12	25	27		Pipe 4STD	A53 GrB	0.00	0.00	0.00
13	24	26		Pipe 4STD	A53 GrB	0.00	0.00	0.00
14	28	29		Pipe 3STD	A53 GrB	0.00	0.00	0.00
16	32	34		Pipe 3STD	A53 GrB	0.00	0.00	0.00
17	33	35		Pipe 3STD	A53 GrB	0.00	0.00	0.00
18	36	40		Pipe 3STD	A53 GrB	0.00	0.00	0.00
19	38	41		Pipe 3STD	A53 GrB	0.00	0.00	0.00
20	37	39		Pipe 3STD	A53 GrB	0.00	0.00	0.00
27	43	44		Pipe 2STD	A53 GrB	0.00	0.00	0.00
28	57	58		Pipe 2STD	A53 GrB	0.00	0.00	0.00
29	59	60		Pipe 2STD	A53 GrB	0.00	0.00	0.00
30	61	62		Pipe 2STD	A53 GrB	0.00	0.00	0.00
47	95	96		Pipe 2STD	A53 GrB	0.00	0.00	0.00
48	97	98		Pipe 2STD	A53 GrB	0.00	0.00	0.00
49	99	100		Pipe 2STD	A53 GrB	0.00	0.00	0.00
50	101	102		Pipe 2STD	A53 GrB	0.00	0.00	0.00
51	103	104		Pipe 2STD	A53 GrB	0.00	0.00	0.00
52	105	106		Pipe 2STD	A53 GrB	0.00	0.00	0.00
53	107	108		Pipe 2STD	A53 GrB	0.00	0.00	0.00

Hinges

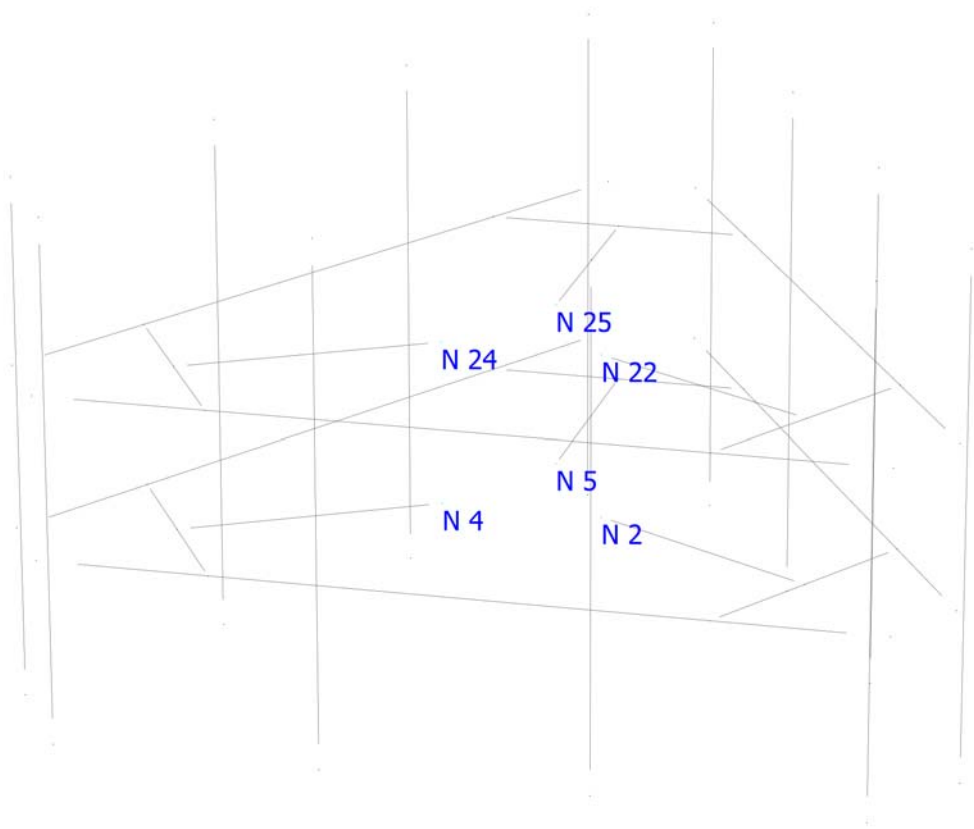
Member	Node-J				Node-K				TOR	AXL	Axial rigidity
	M33	M22	V3	V2	M33	M22	V3	V2			
8	1	1	0	0	1	1	0	0	0	0	Full
9	1	1	0	0	1	1	0	0	0	0	Full
10	1	1	0	0	1	1	0	0	0	0	Full
18	1	1	0	0	1	1	0	0	0	0	Full
19	1	1	0	0	1	1	0	0	0	0	Full
20	1	1	0	0	1	1	0	0	0	0	Full

Glossary

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z



Connection Check



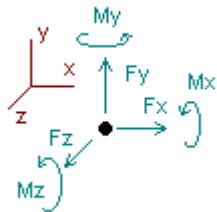


Analysis result

Nodes

Envelope for nodal reactions

Note.- I_c is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

LC1=1.2DL+W0
LC2=1.2DL+W30
LC3=1.2DL-W0
LC4=1.2DL-W30
LC5=0.9DL+W0
LC6=0.9DL+W30
LC7=0.9DL-W0
LC8=0.9DL-W30
LC9=1.2DL+Di+W0
LC10=1.2DL+Di+W30
LC11=1.2DL+Di-W0
LC12=1.2DL+Di-W30
LC13=1.4DL
LC14=1.2DL+1.6LL1
LC15=1.2DL+1.6LL2
LC16=1.2DL+W0+1.6LLa1
LC17=1.2DL+W30+1.6LLa1
LC18=1.2DL-W0+1.6LLa1
LC19=1.2DL-W30+1.6LLa1
LC20=1.2DL+W0+1.6LLa2
LC21=1.2DL+W30+1.6LLa2
LC22=1.2DL-W0+1.6LLa2
LC23=1.2DL-W30+1.6LLa2
LC24=1.2DL+W0+1.6LLa3
LC25=1.2DL+W30+1.6LLa3
LC26=1.2DL-W0+1.6LLa3
LC27=1.2DL-W30+1.6LLa3
LC28=1.2DL+W0+1.6LLa4
LC29=1.2DL+W30+1.6LLa4
LC30=1.2DL-W0+1.6LLa4
LC31=1.2DL-W30+1.6LLa4

Node		Forces						Moments					
		Fx	lc	Fy	lc	Fz	lc	Mx	lc	My	lc	Mz	lc
		[Kip]		[Kip]		[Kip]		[Kip*ft]		[Kip*ft]		[Kip*ft]	
2	Max	1.062	LC2	1.225	LC11	1.091	LC5	-0.63725	LC5	1.81771	LC3	2.86304	LC11
	Min	-1.043	LC8	0.271	LC5	-1.107	LC3	-2.58593	LC18	-1.61849	LC5	0.79448	LC5
4	Max	1.331	LC2	1.221	LC10	0.833	LC1	-0.35462	LC8	1.46611	LC1	-0.99297	LC8
	Min	-1.326	LC8	0.283	LC8	-0.809	LC7	-2.08283	LC29	-1.26150	LC7	-3.59884	LC10
5	Max	0.937	LC6	1.216	LC12	1.323	LC5	3.72362	LC12	2.53404	LC4	0.74659	LC12
	Min	-0.960	LC4	0.317	LC6	-1.331	LC3	1.06421	LC6	-2.33130	LC6	0.13996	LC6
22	Max	1.067	LC6	1.224	LC9	1.114	LC1	-0.63661	LC7	1.61225	LC7	2.85942	LC9
	Min	-1.085	LC4	0.276	LC7	-1.098	LC7	-2.58675	LC16	-1.81716	LC1	0.80357	LC7
24	Max	1.335	LC6	1.219	LC12	0.834	LC5	-0.35923	LC7	1.30274	LC5	-0.98511	LC6
	Min	-1.340	LC4	0.288	LC6	-0.857	LC3	-2.08229	LC28	-1.50224	LC3	-3.59668	LC12
25	Max	0.946	LC2	1.215	LC10	1.373	LC1	3.72417	LC10	2.28659	LC8	0.74823	LC10
	Min	-0.923	LC8	0.318	LC8	-1.365	LC7	1.06473	LC8	-2.48803	LC2	0.15225	LC8

Date: 8/29/2024
 Project Name: CTHA026A
 Project No.: CTHA026A
 Designed By: KSBM Checked By: MSC



CHECK EXISTING CONNECTION CAPACITY (Worst Case)

Reference: AISC Steel Construction Manual 14th Edition (ASD)

Anchor Type = A325 5/8" Bolt

Allowable Tensile Load =

$F_{Tall} = 13806$ lbs.

Allowable Shear Load =

$F_{vall} = 8283$ lbs.

CONNECTION PLATE CONFIGURATION (4-BOLT)

$N_{BOLT\ ROWS} = 2$ rows $d_y = 6$ in
 $N_{BOLT} = 2$ Bolts/row $d_x = 6$ in

TENSILE FORCES

Moment in X axis: 3724 lb-ft. (See Bentley Output)
Couple Reaction from M_x : 7448 lbs.
Moment in Y axis: 2488 lb-ft. (See Bentley Output)
Couple Reaction from M_y : 4976 lbs.
Reaction in Z direction: 1373 lbs. (See Bentley Output)

Resultant per Bolt: 6555 lbs.

SHEAR FORCES

Moment in Z axis: 748 lb-ft. (See Bentley Output)
Couple Reaction from M_z : 1496 lbs.
Reaction in X direction: 946 lbs. (See Bentley Output)
Reaction in Y direction: 1215 lbs. (See Bentley Output)

Resultant per Bolt: 759 lbs.

Tension Design Load / Bolts =

$f_t = 6555.25$ lbs. < 13806 lbs. Therefore, OK !

Shear Design Load / Bolts =

$f_v = 758.96$ lbs. < 8283.5 lbs. Therefore, OK !

CHECK COMBINED TENSION AND SHEAR

$f_t / F_T + f_v / F_v \leq 1.0$
 $0.475 + 0.092 = 0.566 < 1.0$ Therefore, OK !

EXHIBIT G

Power Density/RF Emissions Report



CENTERLINE

Radio Frequency Exposure Analysis Report

December 2, 2024

T-Mobile

Site Name: CTHA026A

Site ID: CTHA026A

Site Address: 63-80 Woodland St, Glastonbury, CT 06073



Michael Fischer, P.E.

Registered Professional Engineer (Electrical)

Connecticut License Number 33928

Expires January 31, 2025

Signed 02 December 2024

Site Compliance Summary

T-Mobile Compliance Status:	Compliant
Cumulative Calculated Power Density (Ground Level):	1.65631 $\mu\text{W}/\text{cm}^2$
Cumulative General Population % MPE (Ground Level):	0.24582%



December 2, 2024

Centerline

Attn: Peter Fales, Vice President – Site Acquisition

750 W Center St, Suite 301

West Bridgewater, MA 02379

RF Exposure Analysis for Site: **CTHA026A**

Centerline was contracted to analyze the proposed T-Mobile facility at **63-80 Woodland St, Glastonbury, CT 06073** 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 ($\mu\text{W}/\text{cm}^2$). 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 ($f_{\text{MHz}}/1500$). Frequencies between 1500 and 100,000 MHz have a General Population/Uncontrolled MPE limit of $1 \text{ mW}/\text{cm}^2$ ($1000 \mu\text{W}/\text{cm}^2$). 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 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 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(s) below. The cumulative power density and cumulative % MPE are displayed at the bottom of the table(s) below.



Maximum Calculated Cumulative Power Density (Location: approximately 20; 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 ($\mu\text{W}/\text{cm}^2$)	General Population MPE Limit ($\mu\text{W}/\text{cm}^2$)	General Population % MPE
T-Mobile A 1	RFS APXVLL19P_43-C-A20	1900	16.24	145	4.00	40.00	6731.63	0.00020	1000.00	0.00002
T-Mobile A 1	RFS APXVLL19P_43-C-A20	1900	16.24	145	4.00	40.00	6731.63	0.00020	1000.00	0.00002
T-Mobile A 1	RFS APXVLL19P_43-C-A20	2100	17.33	145	4.00	60.00	12978.10	0.00021	1000.00	0.00002
T-Mobile A 2	RFS APXVAARR24 43-U-NA20	600	13.14	145	4.00	40.00	3297.01	0.00022	400.00	0.00005
T-Mobile A 2	RFS APXVAARR24 43-U-NA20	700	13.20	145	4.00	40.00	3342.87	0.00063	466.67	0.00014
T-Mobile A 3	RFS APX16DWV-16DWVS-E-A20	Spare	16.25	145	0.00	0.00	0.00	0.00000	1000.00	0.00000
T-Mobile B 4	RFS APXVLL19P_43-C-A20	1900	16.24	145	4.00	40.00	6731.63	0.08455	1000.00	0.00846
T-Mobile B 4	RFS APXVLL19P_43-C-A20	1900	16.24	145	4.00	40.00	6731.63	0.08455	1000.00	0.00846
T-Mobile B 4	RFS APXVLL19P_43-C-A20	2100	17.33	145	4.00	60.00	12978.10	0.12617	1000.00	0.01262
T-Mobile B 5	RFS APXVAARR24 43-U-NA20	600	13.14	145	4.00	40.00	3297.01	0.06484	400.00	0.01621
T-Mobile B 5	RFS APXVAARR24 43-U-NA20	700	13.20	145	4.00	40.00	3342.87	0.07207	466.67	0.01544
T-Mobile B 6	RFS APX16DWV-16DWVS-E-A20	Spare	16.25	145	0.00	0.00	0.00	0.00000	1000.00	0.00000
T-Mobile C 7	RFS APXVLL19P_43-C-A20	1900	16.24	145	4.00	40.00	6731.63	0.00023	1000.00	0.00002
T-Mobile C 7	RFS APXVLL19P_43-C-A20	1900	16.24	145	4.00	40.00	6731.63	0.00023	1000.00	0.00002
T-Mobile C 7	RFS APXVLL19P_43-C-A20	2100	17.33	145	4.00	60.00	12978.10	0.00014	1000.00	0.00001
T-Mobile C 8	RFS APXVAARR24 43-U-NA20	600	13.14	145	4.00	40.00	3297.01	0.00014	400.00	0.00004
T-Mobile C 8	RFS APXVAARR24 43-U-NA20	700	13.20	145	4.00	40.00	3342.87	0.00009	466.67	0.00002
T-Mobile C 9	RFS APX16DWV-16DWVS-E-A20	Spare	16.25	145	0.00	0.00	0.00	0.00000	1000.00	0.00000
AT&T A 10	CCI HPA65R-BU8A	700	15.30	136	2.00	40.00	2710.75	0.00005	466.67	0.00001
AT&T A 11	CCI TPA65R-BU8D	700	13.05	136	4.00	40.00	3229.39	0.00021	466.67	0.00004
AT&T A 11	CCI TPA65R-BU8D	2300	14.05	136	4.00	25.00	2540.97	0.00002	1000.00	0.00000
AT&T A 12	CCI TPA65R-BU8D	700	13.05	136	4.00	40.00	3229.39	0.00021	466.67	0.00004
AT&T A 12	CCI TPA65R-BU8D	850	13.15	136	4.00	40.00	3304.61	0.00002	566.67	0.00000
AT&T A 12	CCI TPA65R-BU8D	1900	14.35	136	4.00	40.00	4356.32	0.00006	1000.00	0.00001
AT&T A 12	CCI TPA65R-BU8D	2100	15.25	136	4.00	40.00	5359.45	0.00003	1000.00	0.00000
AT&T B 13	CCI HPA65R-BU8A	700	15.30	136	2.00	40.00	2710.75	0.03821	466.67	0.00819
AT&T B 14	CCI TPA65R-BU8D	700	13.05	136	4.00	40.00	3229.39	0.08262	466.67	0.01770
AT&T B 14	CCI TPA65R-BU8D	2300	14.05	136	4.00	25.00	2540.97	0.05987	1000.00	0.00599
AT&T B 15	CCI TPA65R-BU8D	700	13.05	136	4.00	40.00	3229.39	0.08262	466.67	0.01770
AT&T B 15	CCI TPA65R-BU8D	850	13.15	136	4.00	40.00	3304.61	0.07455	566.67	0.01316
AT&T B 15	CCI TPA65R-BU8D	1900	14.35	136	4.00	40.00	4356.32	0.07952	1000.00	0.00795
AT&T B 15	CCI TPA65R-BU8D	2100	15.25	136	4.00	40.00	5359.45	0.07934	1000.00	0.00793
AT&T C 16	CCI HPA65R-BU8A	700	15.30	136	2.00	40.00	2710.75	0.00010	466.67	0.00002
AT&T C 17	CCI TPA65R-BU8D	700	13.05	136	4.00	40.00	3229.39	0.00014	466.67	0.00003
AT&T C 17	CCI TPA65R-BU8D	2300	14.05	136	4.00	25.00	2540.97	0.00004	1000.00	0.00000
AT&T C 18	CCI TPA65R-BU8D	700	13.05	136	4.00	40.00	3229.39	0.00014	466.67	0.00003
AT&T C 18	CCI TPA65R-BU8D	850	13.15	136	4.00	40.00	3304.61	0.00002	566.67	0.00000
AT&T C 18	CCI TPA65R-BU8D	1900	14.35	136	4.00	40.00	4356.32	0.00006	1000.00	0.00001
AT&T C 18	CCI TPA65R-BU8D	2100	15.25	136	4.00	40.00	5359.45	0.00013	1000.00	0.00001
Dish A 19	JMA MX08FRO665-20	600	11.35	125	4.00	40.00	2183.33	0.00002	400.00	0.00001
Dish A 19	JMA MX08FRO665-20	1900	15.75	125	4.00	40.00	6013.40	0.00013	1000.00	0.00001
Dish B 20	JMA MX08FRO665-20	600	11.35	125	4.00	40.00	2183.33	0.12430	400.00	0.03107
Dish B 20	JMA MX08FRO665-20	1900	15.75	125	4.00	40.00	6013.40	0.12591	1000.00	0.01259
Dish C 21	JMA MX08FRO665-20	600	11.35	125	4.00	40.00	2183.33	0.00020	400.00	0.00005
Dish C 21	JMA MX08FRO665-20	1900	15.75	125	4.00	40.00	6013.40	0.00030	1000.00	0.00003
Verizon A 22	COMMSCOPE NHH-65B-R2B	700	12.29	115	2.00	40.00	1355.47	0.00038	466.67	0.00008
Verizon A 22	COMMSCOPE NHH-65B-R2B	850	12.70	115	2.00	40.00	1489.67	0.00004	566.67	0.00001
Verizon A 22	COMMSCOPE NHH-65B-R2B	1900	15.65	115	4.00	40.00	5876.52	0.00023	1000.00	0.00002
Verizon A 22	COMMSCOPE NHH-65B-R2B	2100	16.22	115	4.00	40.00	6700.70	0.00014	1000.00	0.00001
Verizon A 23	COMMSCOPE NHHSS-65B-R2BT4	3600	14.74	115	4.00	5.00	595.70	0.00007	1000.00	0.00001
Verizon B 24	COMMSCOPE NHH-65B-R2B	700	12.29	115	2.00	40.00	1355.47	0.07254	466.67	0.01555
Verizon B 24	COMMSCOPE NHH-65B-R2B	850	12.70	115	2.00	40.00	1489.67	0.07864	566.67	0.01388
Verizon B 24	COMMSCOPE NHH-65B-R2B	1900	15.65	115	4.00	40.00	5876.52	0.13987	1000.00	0.01399
Verizon B 24	COMMSCOPE NHH-65B-R2B	2100	16.22	115	4.00	40.00	6700.70	0.15080	1000.00	0.01508
Verizon B 25	COMMSCOPE NHHSS-65B-R2BT4	3600	14.74	115	4.00	5.00	595.70	0.02995	1000.00	0.00300
Verizon C 26	COMMSCOPE NHH-65B-R2B	700	12.29	115	2.00	40.00	1355.47	0.00018	466.67	0.00004
Verizon C 26	COMMSCOPE NHH-65B-R2B	850	12.70	115	2.00	40.00	1489.67	0.00001	566.67	0.00000



Antenna ID	Make / Model	Frequency Band (MHz)	Antenna Gain (dBd)	Antenna Centerline (ft)	Channel Count	TX Power/ Channel (watts)	ERP (watts)	Calculated Power Density ($\mu\text{W}/\text{cm}^2$)	General Population MPE Limit ($\mu\text{W}/\text{cm}^2$)	General Population % MPE
Verizon C 26	COMMSCOPE NHH-65B-R2B	1900	15.65	115	4.00	40.00	5876.52	0.00007	1000.00	0.00001
Verizon C 26	COMMSCOPE NHH-65B-R2B	2100	16.22	115	4.00	40.00	6700.70	0.00007	1000.00	0.00001
Verizon C 27	COMMSCOPE NHHSS-65B-R2BT4	3600	14.74	115	4.00	5.00	595.70	0.00003	1000.00	0.00000
							Cumulative Power Density:	1.65631 $\mu\text{W}/\text{cm}^2$	Cumulative % MPE:	0.24582%



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.

Samuel Cosgrove
RF EME Technical Writer III
Centerline

EXHIBIT H

Mailing Receipts/Proof of Notice

Subject: UPS Delivery Notification, Tracking Number 1Z9Y45030330280806
Date: Thursday, December 19, 2024 at 2:41:41 PM Eastern Standard Time
From: UPS <pkginfo@ups.com>
To: Cullen Morgan <CMORGAN@CLINELLC.COM>

CAUTION: this email is from an external sender. Avoid opening attachments or links unless the sender is trusted.



Hello, your package has been delivered.

Delivery Date: Thursday, 12/19/2024

Delivery Time: 2:40 PM

Left At: FRONT DOOR

Experience UPS My Choice® Premium Today

Be in total control of how, when and where
your packages are delivered.

[Upgrade to Premium Now](#)



[Set Delivery Instructions](#)

[Manage Preferences](#)

[View My Packages](#)

CENTERLINE SITE ACQUISITION

Tracking Number:

[1Z9Y45030330280806](#)

Ship To:

PAUL J. CAVANNA
80 WOODLAND STREET
SOUTH GLASTONBURY, CT 060732715
US

Number of Packages:

1

UPS Service:

UPS Ground

Package Weight:

1.5 LBS

Reference Number:

CTHA026A PROP OWNER CC

Subject: UPS Delivery Notification, Tracking Number 1Z9Y45030302131672
Date: Tuesday, December 17, 2024 at 12:15:02 PM Eastern Standard Time
From: UPS <pkginfo@ups.com>
To: Cullen Morgan <CMORGAN@CLINELLC.COM>

CAUTION: this email is from an external sender. Avoid opening attachments or links unless the sender is trusted.



Hello, your package has been delivered.

Delivery Date: Tuesday, 12/17/2024

Delivery Time: 12:11 PM

Signed by: ZANE

CENTERLINE SITE ACQUISITION

Tracking Number:

[1Z9Y45030302131672](#)

Ship To:

VB-S1 ASSETS LLC DBA VERTICALBRIDGE
750 PARK OF COMMERCE DRIVE
SUITE 200
BOCA RATON, FL 334873650
US

Number of Packages:

1

UPS Service:

UPS Ground

Package Weight:

1.5 LBS

Reference Number:

CTHA026A TOWER OWNER CC

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Subject: UPS Delivery Notification, Tracking Number 1Z9Y45030335340410
Date: Thursday, December 19, 2024 at 11:20:46 AM Eastern Standard Time
From: UPS <pkginfo@ups.com>
To: Cullen Morgan <CMORGAN@CLINELLC.COM>

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Hello, your package has been delivered.

Delivery Date: Thursday, 12/19/2024

Delivery Time: 11:19 AM

Signed by: TOWN HALL

CENTERLINE SITE ACQUISITION

Tracking Number:	<u>1Z9Y45030335340410</u>
Ship To:	TOWN OF GLASTONBURY 2155 MAIN STREET GLASTONBURY, CT 060332282 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.5 LBS
Reference Number:	CTHA026A TOWN CC

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