10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

August 16, 2021

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

RE: Notice of Exempt Modification
498 Bushy Hill Road, Simsbury, CT 06070
Also Known As: 530 Bushy Hill Road, Simsbury, CT 06070
Latitude: 41.816781
Longitude: -72.8651357
T-Mobile/Sprint Site#: CT11975A-CT43XC825

Dear Ms. Bachman:

T-Mobile/Sprint currently maintains three (3) antennas at the 113-foot level of the existing 118-foot flagpole at 498 Bushy Hill Road, Simsbury, CT. The 118-foot flagpole is owned and operated by Simsbury Commons LLC. The property is owned by Simsbury Common LLC. T-Mobile/Sprint now intends to remove the three (3) existing antennas and add three (3) new 600/700/1900/2100/2500 MHz antennas. The new antennas will be installed at the same 113-foot level of the tower and will support 5G services.

Planned Modifications:
Tower:
Remove
(6) 1-1/4" coax cables

Remove:
(3) Commscope DHHTT6565B-3XR Antennas

Install New:
(3) RFS APXVAALL24_43-U-NA20 antennas
(6) 7/8" Coax Cables
(3) 6/24" 4 AWG Hybrid Cables
(6) SITEPRO1: DCP12K Pipe Clamps

Ground:
Existing To Remain:
(1) Sprint SPD
(1) Meter Bank
(1) Corning Fiber Termination Cabinet

(1) Telco Cabinet
(1) 200A PPC Cabinet

Remove
(1) Sprint Battery Cabinet
(1) Sprint BTS Cabinet
(1) Fiber Junction Box
(3) RFS Diplexer/Cross Band Coupler #KIT-FD9R6004/1C-DL
(3) CCI Outdoor Diplexer DPO-7126Y-0x1
(3) Sprint 1900 MHz RRH
(3) Samsung RRH-B8-2500 MHz RRH
(3) ALU #800 MHz 2x50W RRH

Install New:
(3) Ericsson Radio 4460 B25+B66
(3) Ericsson Radio 4480 B71+B85
(3) CBC426T-DS-43 Diplexers
(1) T-Mobile 6160 Cabinet
(1) T-Mobile B160 Cabinet

This site was first approved by the Connecticut Siting Council in Docket No. 279 on June 30, 2004. T-Mobile/Sprint has been approved for subsequent modifications at their facility.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to First Selectman Eric Wellman, Elected Official, and Christine Campasano, Acting Zoning Enforcement Official, as well as the tower and property 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/Sprint respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Dave DePinto
Transcend Wireless
Cell: 973-907-3243
Email: ddepinto@transcendwireless.com

Attachments
cc: Eric Wellman – First Selectman of the Town of Simsbury
Christine Campasano– Acting Zoning Official
Simsbury Commons LLC c/o Lincoln Property Company – Tower & Property Owner

Transcend Wireless

DePinto, Dave <ddepinto@transcendwireless.com>

UPS Delivery Notification, Tracking Number 1ZV257423591998070

UPS <pkginfo@ups.com>
To: DDEPINTO@transcendwireless.com

Wed, Aug 18, 2021 at 12:44 PM

Hello, your package has been delivered.

Delivery Date: Wednesday, 08/18/2021
Delivery Time: 12:44 PM
Left At: FRONT DESK
Signed by: AL

TRANSCEND WIRELESS

Tracking Number:	1ZV257423591998070
Ship To:	SIMSBURY COMMONS LLC 75 HOLLY HILL LANE SUITE 303, LINCOLN PROPERTY COMPANY GREENWICH, CT 06830 US
Number of Packages:	1
UPS Service:	UPS 2nd Day Air®
Package Weight:	1.8 LBS
Reference Number:	CT11975A-CT43XC825

Download the UPS mobile app

Transcend Wireless

DePinto, Dave <ddepinto@transcendwireless.com>

UPS Delivery Notification, Tracking Number 1ZV257423592942056

UPS <pkginfo@ups.com>
To: DDEPINTO@transcendwireless.com

Wed, Aug 18, 2021 at 11:15 AM

Hello, your package has been delivered.

Delivery Date: Wednesday, 08/18/2021
Delivery Time: 11:14 AM
Left At: FRONT DESK
Signed by: TC

TRANSCEND WIRELESS

Tracking Number:	1ZV257423592942056
Ship To:	TOWN OF SIMSBURY, CT 933 HOPMEADOW STREET SIMSBURY, CT 06070 US
Number of Packages:	1
UPS Service:	UPS 2nd Day Air®
Package Weight:	1.8 LBS
Reference Number:	CT11975A-CT43XC825

Download the UPS mobile app

Transcend Wireless

DePinto, Dave <ddepinto@transcendwireless.com>

UPS Delivery Notification, Tracking Number 1ZV257423594768063

UPS <pkginfo@ups.com>
To: DDEPINTO@transcendwireless.com

Wed, Aug 18, 2021 at 11:15 AM

Hello, your package has been delivered.

Delivery Date: Wednesday, 08/18/2021
Delivery Time: 11:14 AM
Left At: FRONT DESK
Signed by: TC

TRANSCEND WIRELESS

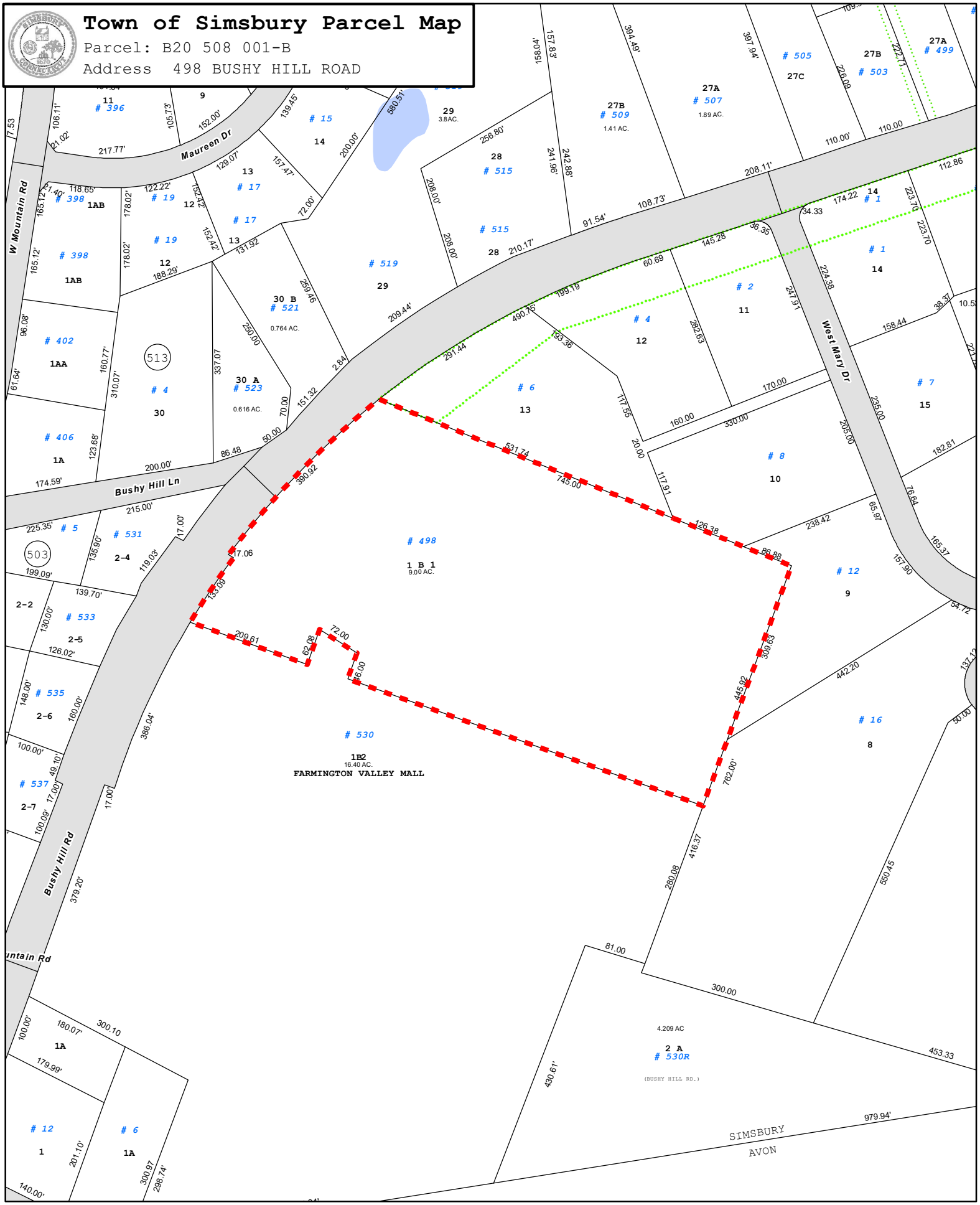
Tracking Number:	1ZV257423594768063
Ship To:	SIMSBURY, CT PLANNING/LAND USE DEPT 933 HOPMEADOW STREET SIMSBURY, CT 06070 US
Number of Packages:	1
UPS Service:	UPS 2nd Day Air®
Package Weight:	1.8 LBS
Reference Number:	CT11975A-CT43XC825

Download the UPS mobile app

Town of Simsbury Parcel Map

Parcel: B20 508 001-B

Address 498 BUSHY HILL ROAD



Map Produced: February 2021

Town of Simsbury, CT

Property Listing Report

Map Block Lot **B20 508 001-B** | Building # **1** | Unique Identifier **31116210**

Property Information

Property Location	498 BUSHY HILL ROAD
Mailing Address	7 HANA LANE MONSEY NY 10952
Land Use	Retail Store
Zoning Code	B-3
Neighborhood	0238

Owner	SIMSBURY COMMONS LLC
Co-Owner	
Book / Page	0950/0685
Land Class	Commercial
Census Tract	4661020
Acreage	9

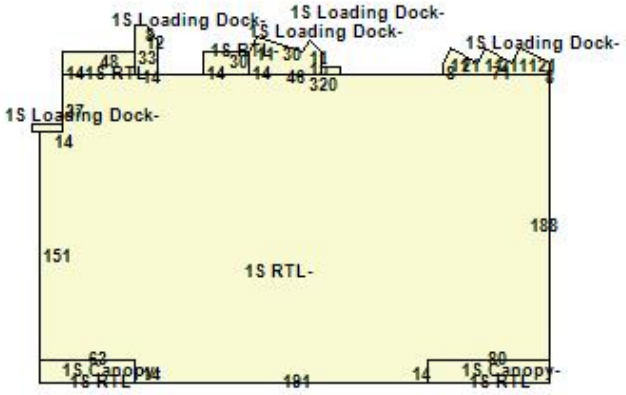
Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	7753780	5427650
Outbuildings	506220	354350
Land	4590000	3213000
Total	12850000	8995000

Utility Information

Electric	No
Gas	No
Sewer	No
Public Water	No
Well	No



Primary Construction Details

Year Built	1993
Building Desc.	Commercial
Building Style	
Stories	1
Exterior Walls	B. V. Solid
Exterior Walls 2	Concrete Block
Interior Walls	Dry Wall
Interior Walls 2	
Interior Floors 1	Tile
Interior Floors 2	

Heating Fuel	Gas
Heating Type	FHA
AC Type	Central
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	21
Total Rooms	0
Bath Style	NA
Kitchen Style	
Occupancy	0

Livable Area (ft)	64948
Building Use	Retail Store
Building Condition	Average
Frame Type	Good
Building Grade	0
Fireplaces	0
Wood Stoves	0
Attic Access	
Roof Style	
Roof Cover	Compo_Built

Bsmt Area	0
Fin Bsmt Area	0
Fin Bsmt Quality	
Bsmt Access	
Bsmt Gar	0
Bsmt Sump Pump	No

Report Created On **8/5/2021**

Town of Simsbury, CT

Property Listing Report | Map Block Lot **B20 508 001-B** | Building # **1** | Unique Identifier **31116210**

Detached Outbuildings

Type	Description	Area (sq ft)	Condition	Year Built
Paving	Paving	230100	Average	1993

Attached Extra Features

Type	Description	Area (sq ft)	Condition	Year Built
Canopy	Canopy	1120	Average	1993
Canopy	Canopy	882	Average	1993
Loading Dock	UnCovered Loading Dock	879	Average	1993
Loading Dock	UnCovered Loading Dock	70	Average	1993
Loading Dock	UnCovered Loading Dock	95	Average	1993
Loading Dock	UnCovered Loading Dock	886	Average	1993
Loading Dock	UnCovered Loading Dock	432	Average	1993
Paving	Paving	1120	Average	1993
Mezzanine	Finished Mezzanine	1455	VG	1993
Paving	Paving	882	Average	1993

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
SIMSBURY COMMONS LLC	0950_0685	11/27/2019	41850000
E & A/I & G SIMSBURY COMMONS LP	0676_0595	11/10/2004	14588160
SIMSBURY COMMONS NORTH E&A LLC	0595_0533	11/21/2002	10232845

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.ct.gov/csc

JUL - 1 2004
431825

June 30, 2004

Thomas J. Regan, Esquire
Brown Rudnick Berlack Isreals LLP
CityPlace I, 38th Floor
185 Asylum Street
Hartford, CT 06103-3402

RE: **DOCKET NO. 279** - Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 530 Bushy Hill Road, Simsbury, Connecticut.

Dear Attorney Regan:

By its Decision and Order dated June 23, 2004, the Connecticut Siting Council (Council) granted a Certificate of Environmental Compatibility and Public Need (Certificate) for the construction, maintenance and operation of a wireless telecommunications facility at 530 Bushy Hill Road, Simsbury, Connecticut.

Enclosed are the Council's Certificate, Findings of Fact, Opinion, and Decision and Order.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/laf

Enclosures (4)

CSC
CONNECTICUT SITING COUNCIL

DOCKET NO. 279 – Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 530 Bushy Hill Road, Simsbury, Connecticut.	}	Connecticut
	}	Siting
	}	Council

June 23, 2004

Opinion

On December 4, 2003, Sprint Spectrum L.P. (Sprint) applied to the Connecticut Siting Council (Council) for a Certificate of Environmental Compatibility and Public Need (Certificate) for the construction, operation and maintenance of a wireless telecommunications facility proposed to be located at 530 Bushy Hill Road (the Simsbury Common Mall) in Simsbury, Connecticut. Sprint had been searching for a tower site in this vicinity to provide Sprint service to existing coverage gaps in the area surrounding the intersection of Route 167 and Route 44 on the Simsbury-Canton border.

Sprint's facility would consist of a 120-foot flagpole tower designed to accommodate a total of three wireless carriers. AT&T Wireless PCS, an intervenor in this proceeding, seeks to place its antennas within the flagpole at a centerline of 108 feet above ground level (agl). Sprint's antennas would be located within the flagpole at the top of the tower. Sprint has offered the Town of Simsbury space on the tower for Town antennas.

The flagpole would be placed behind commercial buildings at the edge of a parking lot. No clearing of vegetation or access road construction would be required. The tower compound would be enclosed by a fence.

The flagpole would be fully visible along commercially-developed Route 44. Four homes along Joyce Lane would have some visibility of the flagpole above the trees. A visual analysis of the proposed tower indicates it would be visible to only approximately one percent of a two-mile radius study area.

The tower would have no effect on any rare, threatened or species of special concern in the area. The facility would have no effect on historic, architectural or archaeological resources listed on as eligible for the National Register of Historic Places. The closest wetland is approximately 50 feet east of the parking lot on which the facility would be built; however, this wetland is protected by an existing stockade fence.

The radio frequency power density levels at the base of the proposed tower would be well below federal and State standards for the frequencies used by wireless companies. If federal or state standards change, the Council will require that the tower be brought into compliance with such standards. The Council will require that the power densities be remodeled in the event other carriers add antennas to the tower.

Based on the record of this proceeding, the Council concludes that the proposed facility would be well sited to provide coverage to a heavily traveled area where several carriers currently have limited or unreliable service.

Therefore, the Council finds that the effects associated with the construction, operation, and maintenance of the proposed telecommunications facility, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with policies of the State concerning such effects, and are not sufficient reason to deny this application. Therefore, the Council will issue a Certificate for the construction, operation, and maintenance of a 120-foot flagpole tower and associated ground equipment at 530 Bushy Hill Road (the Simsbury Commons Mall), Simsbury, Connecticut.

DOCKET NO. 279 – Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 530 Bushy Hill Road, Simsbury, Connecticut.	}	Connecticut
	}	Siting
	}	Council

June 23, 2004

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish 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 Sprint Spectrum, L.P. for the construction, maintenance and operation of a wireless telecommunications facility at 530 Bushy Hill Road, Simsbury, Connecticut.

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 designed as a flagpole and shall be constructed no taller than 120 feet above ground level to provide the proposed telecommunications services to both public and private entities.

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 Simsbury 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) a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment building, access, utility line, and landscaping; and
   b) construction plans for site preparation, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of 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 electromagnetic radio frequency power density is 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 State or 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. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

7. If the facility does not initially provide wireless services within one year of completion of construction or 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 before any such use is made.

8. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.

9. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved. Any request for extensions of the period shall be filed with the Council not later than sixty days prior to expiration date of the Certificate and shall be served on all parties and intervenors, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the Hartford Courant, Valley News, and The Farmington Valley Post.

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.

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
Sprint Spectrum L.P. d/b/a Sprint PCS	Thomas J. Regan Brown, Rudnick, Berlack, Israels, LLP City Place I 185 Asylum Avenue Hartford, CT 06103-3402 (860) 509-6500
Intervenor	**Its Representative**
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Christopher B. Fisher, Esq. Cuddy & Feder, LLP 90 Maple Avenue White Plains, NY 10601

CERTIFICATION

The undersigned members of the Connecticut Siting Council (Council) hereby certify that they have heard this case, or read the record thereof, in **DOCKET NO. 279** - Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 530 Bushy Hill Road, Simsbury, Connecticut, and voted as follows to approve the proposed site:

Council Members	Vote Cast
Pamela B. Katz, P.E., Chairman	Yes
Commissioner Donald W. Downes Designee: Gerald J. Heffernan	Yes
Commissioner Arthur J. Rocque, Jr. Designee: Brian J. Emerick	Abstained
Philip T. Ashton	Yes
Daniel P. Lynch, Jr.	Yes
James J. Murphy, Jr.	Abstained
Brian F. O'Neill	Yes
Colin C. Tait	Yes
Edward S. Wilensky	Yes

Dated at New Britain, Connecticut June 23, 2004.

STATE OF CONNECTICUT)

ss. New Britain, Connecticut :

COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the Findings of Fact, Opinion, and Decision and Order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

S. Derek Phelps
Executive Director
Connecticut Siting Council

I certify that a copy of the Findings of Fact, Opinion, and Decision and Order in Docket No. 279 has been forwarded by Certified First Class Return Receipt Requested mail on June 30, 2004, to all parties and intervenors of record as listed on the attached service list, dated December 22, 2003.

ATTEST:

Lisa A. Fontaine
Administrative Assistant
Connecticut Siting Council

Sprint Now part of T-Mobile™

SPRINT ID: CT43XC825
SITE ID: CT11975A
498 BUSHY HILL RD.
SIMSBURY, CT 06070

RAN TEMPLATE (PROVIDED BY RFDS)
67E5A998E 6160

T-MOBILE A&L TEMPLATE (PROVIDED BY RFDS)
67E5998E_1xAIR+1OP+1QP

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

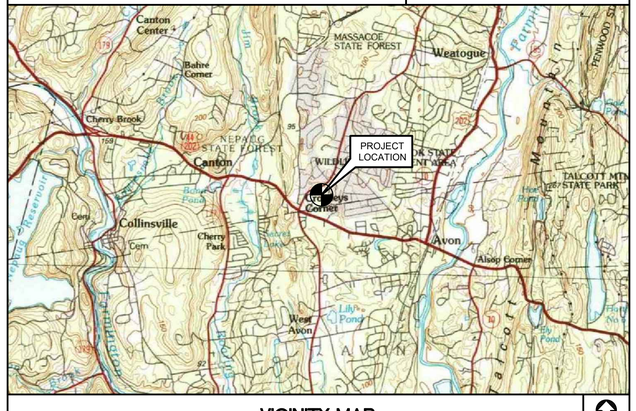
FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

TO: 498 BUSHY HILL RD.
SIMSBURY, CT 06070

1.	START OUT GOING NORTH ON GRIFFIN RD TOWARD HARTMAN RD.	
2.	TURN LEFT ONTO DAY HILL RD.	0.30 MI.
3.	TURN LEFT ONTO TUNXIS AVE/CT-189.	0.61 MI.
4.	TURN SLIGHT RIGHT ONTO BROWN ST.	2.45 MI.
5.	TURN RIGHT ONTO MOUNTAIN AVE/CT-178. CONTINUE TO FOLLOW CT-178.	0.93 MI.
6.	TURN RIGHT ONTO SIMSBURY RD/CT-185. CONTINUE TO FOLLOW CT-185.	1.12 MI.
7.	TURN RIGHT ONTO HOPMEADOW ST/US-202 E/CT-10.	2.76 MI.
8.	TURN LEFT ONTO CANAL ST.	0.19 MI.
9.	CANAL ST BECOMES DEER PARK RD.	0.17 MI.
10.	TURN SLIGHT LEFT ONTO BUSHY HILL RD/CT-167.	1.25 MI.
11.	TURN LEFT AT LIGHT INTO STOP & SHOP PARKING LOT.	0.47 MI.
12.	STOP & SHOP, 498 BUSHY HILL ROAD, SIMSBURY, CT, 498 BUSHY HILL ROAD.SITE BEHIND BUILDING	0.01 MI.

SITE COORDINATES: LATITUDE: 41°-49'-5.268" N
LONGITUDE: 72°-51'-46.9476" W
GROUND ELEVATION: 279'± AMSL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH



VICINITY MAP — NORTH

PROJECT SUMMARY

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

1. REMOVE ALL EXISTING SPRINT EQUIPMENT
2. REMOVE ALL EXISTING COAX CABLES.
3. INSTALL (1) APXVAALL24_43-U-NA20 ANTENNA PER SECTOR, TOTAL OF (3).
4. INSTALL (1) RADIO 4480 B71+B85 PER SECTOR, TOTAL OF (3).
5. INSTALL (1) RADIO 4460 B25+B66 PER SECTOR, TOTAL OF (3).
6. INSTALL (1) CBC426T-DS-43 DIPLEXER PER SECTOR, TOTAL OF (3).
7. INSTALL (2) 7/8" COAX CABLES PER SECTOR, TOTAL OF (6).
8. INSTALL (3) 6/24 4AWG HYBRID CABLES.
9. INSTALL (1) NEW ENCLOSURE CABINET 6160.
10. INSTALL (1) NEW BATTERY CABINET B160.
11. INSTALL NEW ANTENNA MOUNTS TYPICAL FOR ALL SECTORS.
12. INSTALL (6) PIPE CLAMPS, TYP. (2) PER SECTOR.
13. INSTALL 10' x 4' DIAMETER ANTENNA STEALTHING ENCLOSURE (CONTRACTOR TO VERIFY FINAL MAKE/MODEL OF ENCLOSURE)

PROJECT INFORMATION

SITE NAME:	CT43XC825
SITE ID:	CT11975A
SITE ADDRESS:	498 BUSHY HILL RD. SIMSBURY, CT 06070
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	KYLE RICHERS TRANSCEND WIRELESS, (908) 447-4716
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
PROJECT COORDINATES:	LATITUDE: 41°-49'-5.268" N LONGITUDE: 72°-51'-46.9476" W GROUND ELEVATION: 279'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/03/21	BSP	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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T-MOBILE NORTHEAST LLC

SPRINT ID: CT43XC825
SITE ID: CT11975A
498 BUSHY HILL RD.
SIMSBURY, CT 06070

DATE:	06/29/21
SCALE:	AS NOTED
JOB NO.	21005.34

TITLE SHEET

T-1

Sheet No. 1 of 10

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 93 MPH (Vasd) (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND IT'S COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS, ARE TO BE BROUGHT TO THE ATTENTION OF THE SITE OWNER'S CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
18. CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
19. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
20. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325-N
   G. U-BOLTS---ASTM A36
   H. ANCHOR RODS----ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

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

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498 BUSHY HILL RD.
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SCALE: AS NOTED
JOB NO. 21005.34

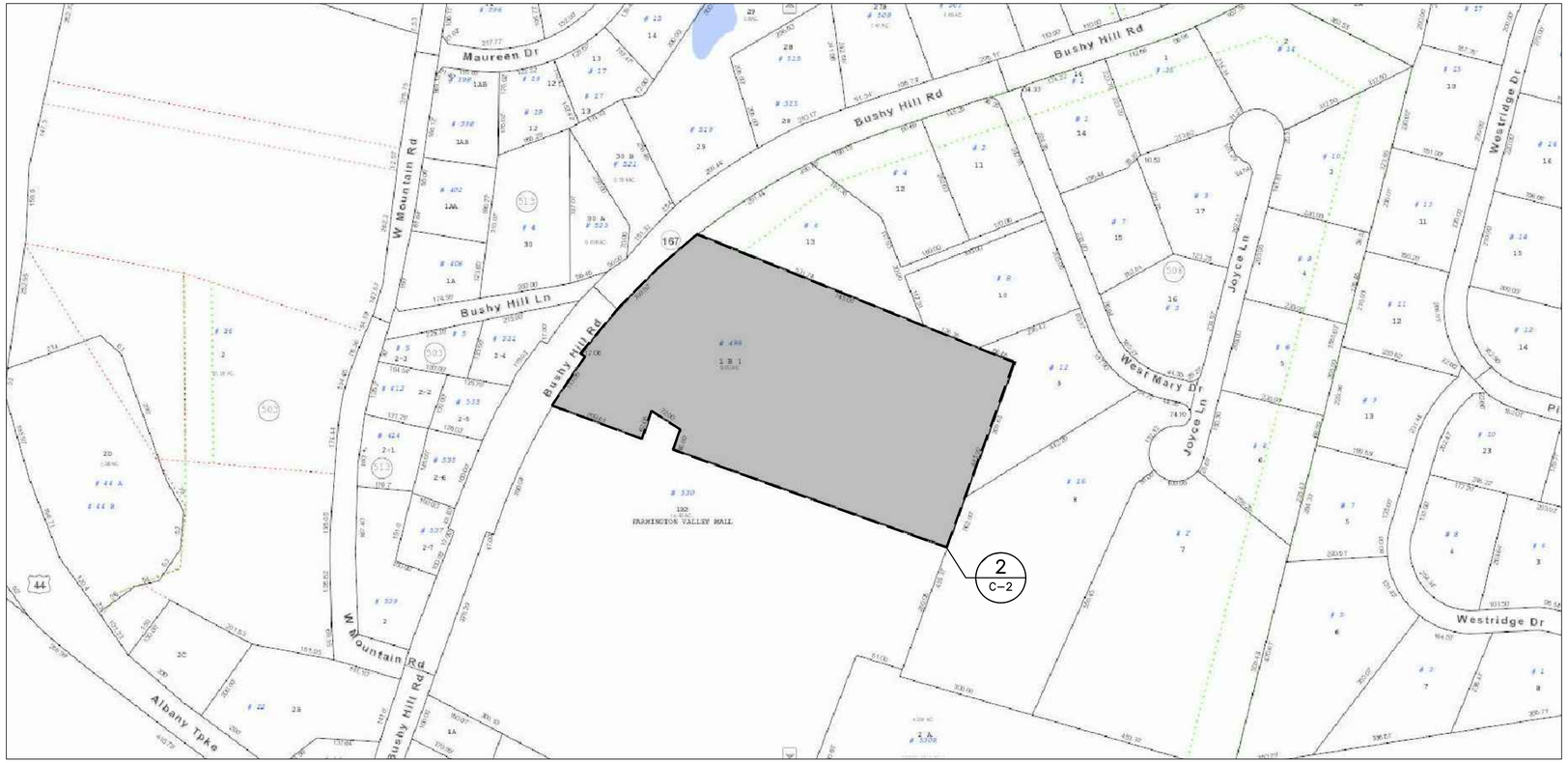
GENERAL NOTES AND SPECIFICATIONS

N-1

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

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) DIPLEXER (QTY)	(QTY) PROPOSED COAX (LENGTH)
A1	PROPOSED	RFS–APXVAALL24_43–U–NA20	33.1 x 20.6 x 8.6	111'–6"	20°	(P) RADIO 4460 B25+B66A (1), (P) RADIO 4480 B71+B85 (1)	(P) TWIN LB/MIDBAND CBC426T–DS–43 (1)	(1) 6/24 4AWG HYBRID CABLE (±328')
B1	PROPOSED	RFS–APXVAALL24_43–U–NA20	33.1 x 20.6 x 8.6	111'–6"	140°	(P) RADIO 4460 B25+B66A (1), (P) RADIO 4480 B71+B85 (1)	(P) TWIN LB/MIDBAND CBC426T–DS–43 (1)	(1) 6/24 4AWG HYBRID CABLE (±328')
C1	PROPOSED	RFS–APXVAALL24_43–U–NA20	33.1 x 20.6 x 8.6	111'–6"	260°	(P) RADIO 4460 B25+B66A (1), (P) RADIO 4480 B71+B85 (1)	(P) TWIN LB/MIDBAND CBC426T–DS–43 (1)	(1) 6/24 4AWG HYBRID CABLE (±328')



1 / C–1 SITE LOCATION PLAN
SCALE: NOT TO SCALE

TRUE NORTH

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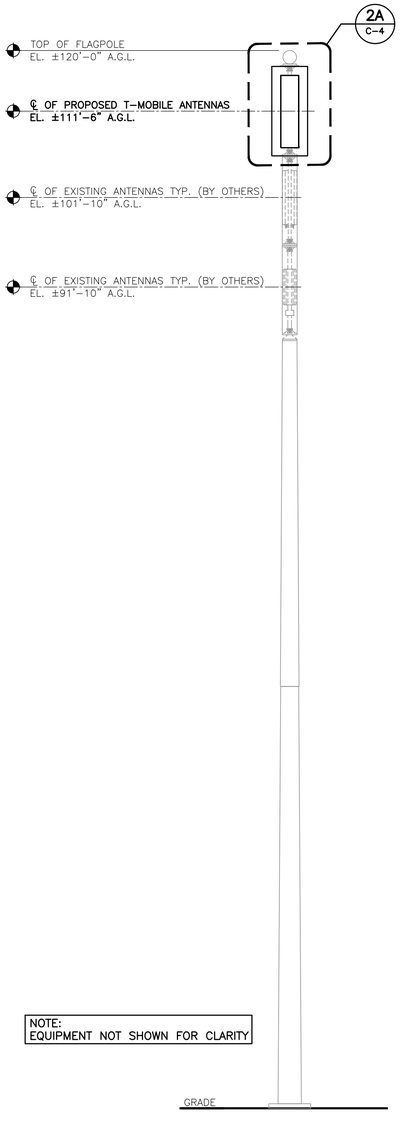
SITE LOCATION PLAN

C–1

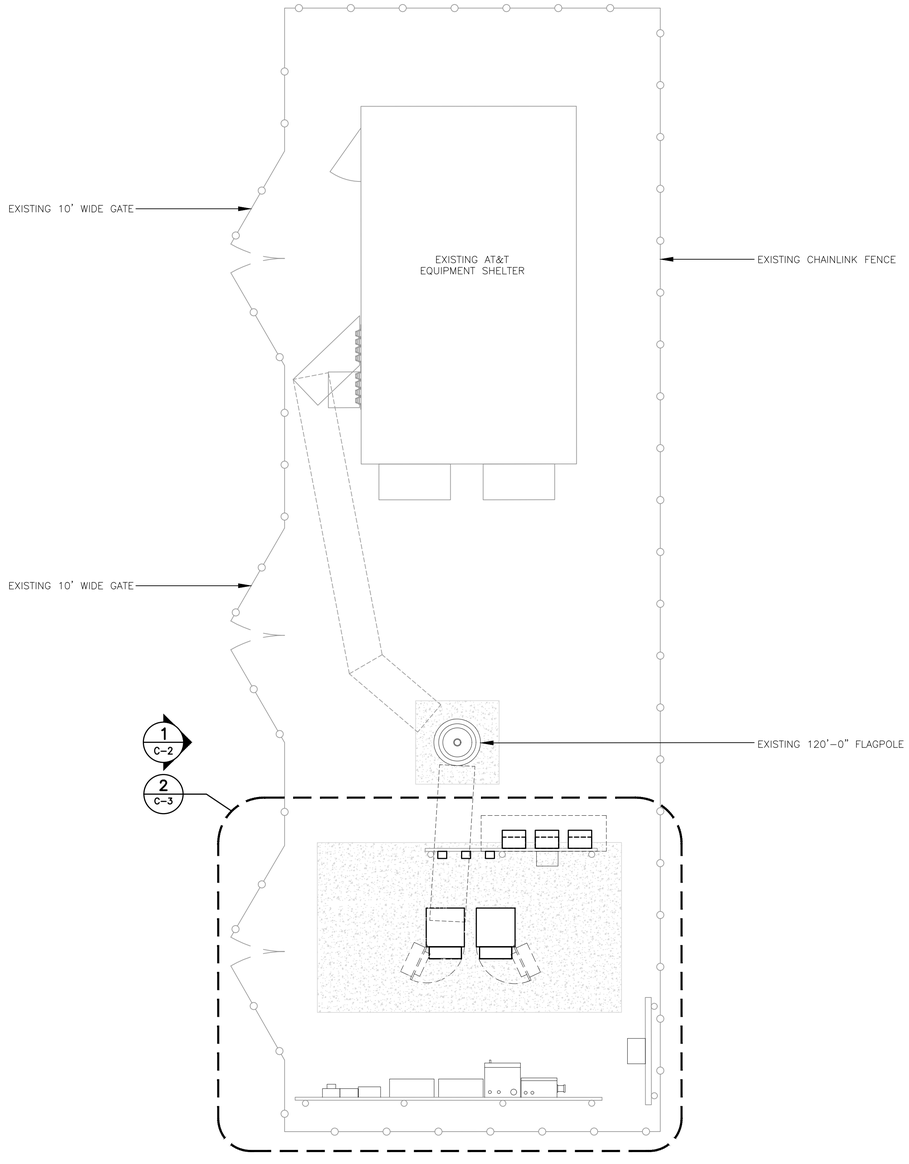
Sheet No. 3 of 10

STRUCTURAL COMPLIANCE
TOWER A STRUCTURAL ANALYSIS OF THE TOWER WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING. REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21005.34) DATED 07/15/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.



NOTE:
EQUIPMENT NOT SHOWN FOR CLARITY

1 C-2 **WEST ELEVATION - PROPOSED**
SCALE: 1/8" = 1'



2 C-2 **PARTIAL COMPOUND PLAN - PROPOSED**
SCALE: 1/4" = 1'

TRUE NORTH

NOTE:
ANTENNAS NOT SHOWN FOR CLARITY

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COMPOUND PLAN AND ELEVATION

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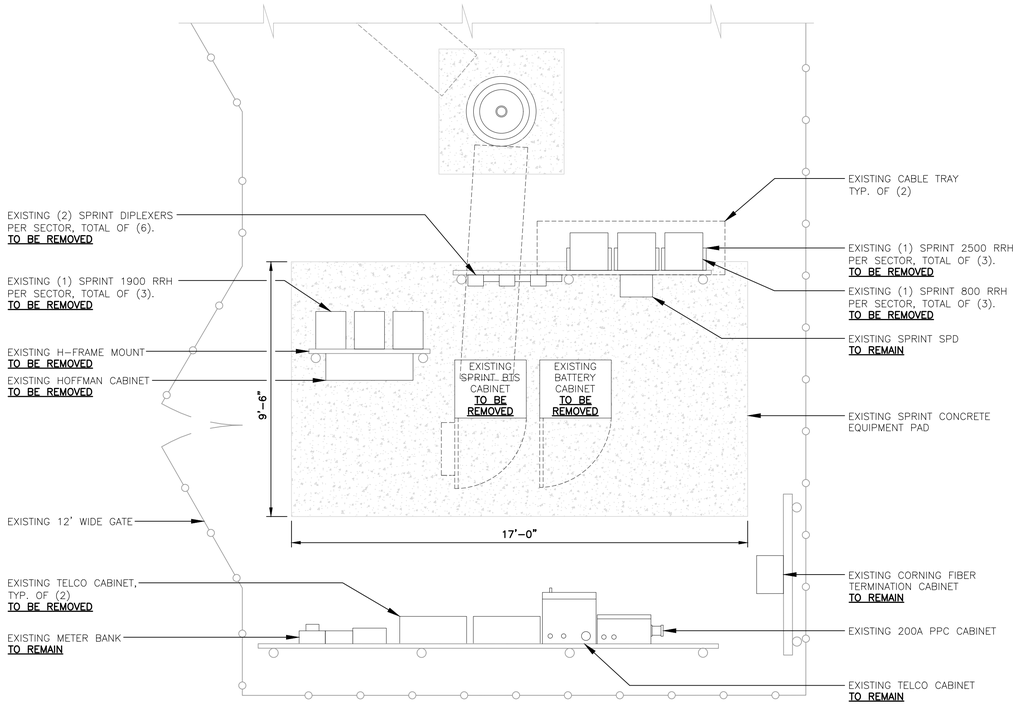
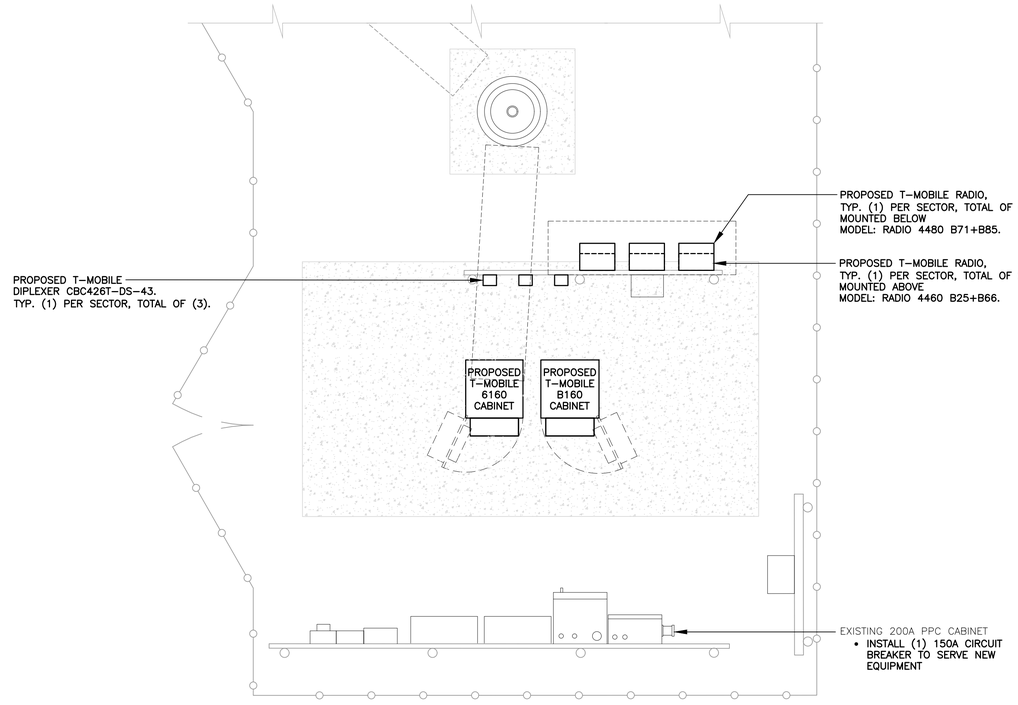


1 / C-3 **EXISTING EQUIPMENT PLAN**
SCALE: 3/8" = 1'
TRUE NORTH



2 / C-3 **PROPOSED EQUIPMENT PLAN**
SCALE: 3/8" = 1'
TRUE NORTH

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EQUIPMENT PLANS

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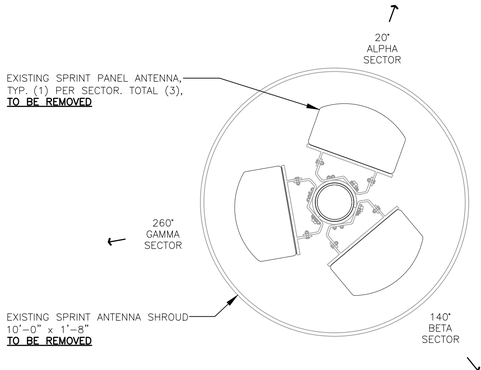
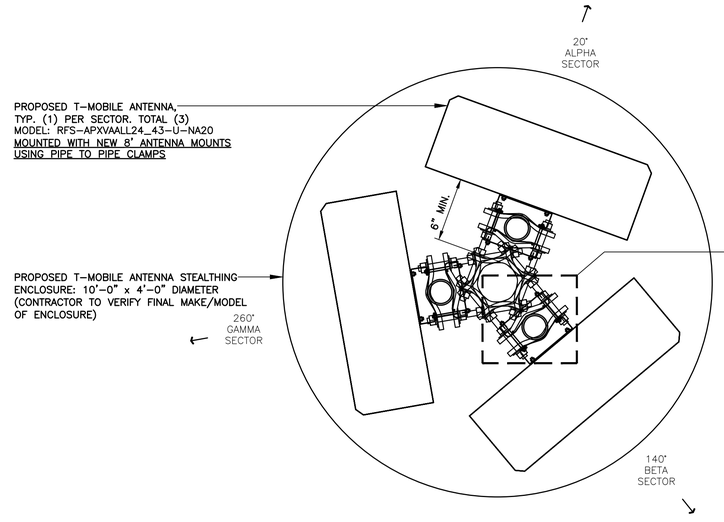


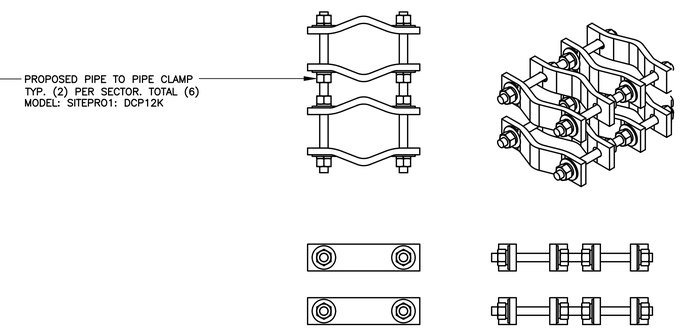
1 C-4 **EXISTING ANTENNA PLAN**
SCALE: 1-1/2" = 1'-0"

TRUE NORTH

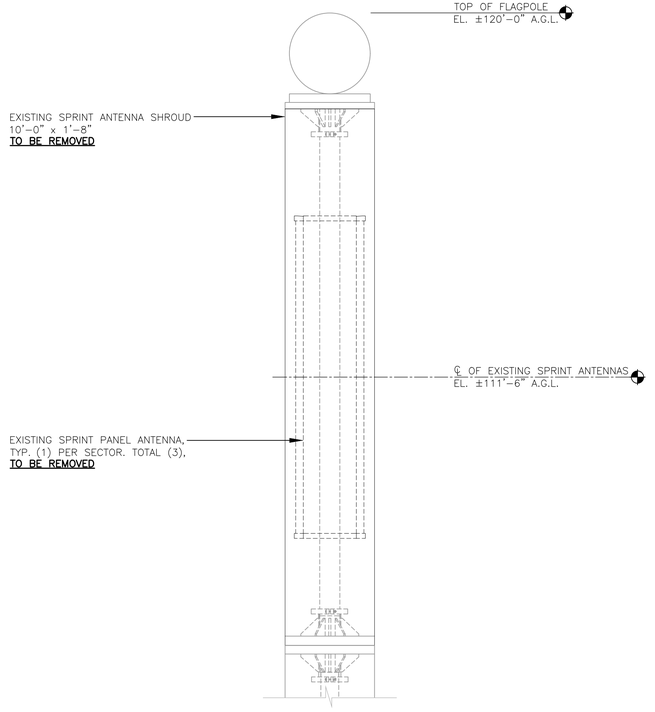


1A C-4 **PROPOSED ANTENNA PLAN**
SCALE: 1-1/2" = 1'-0"

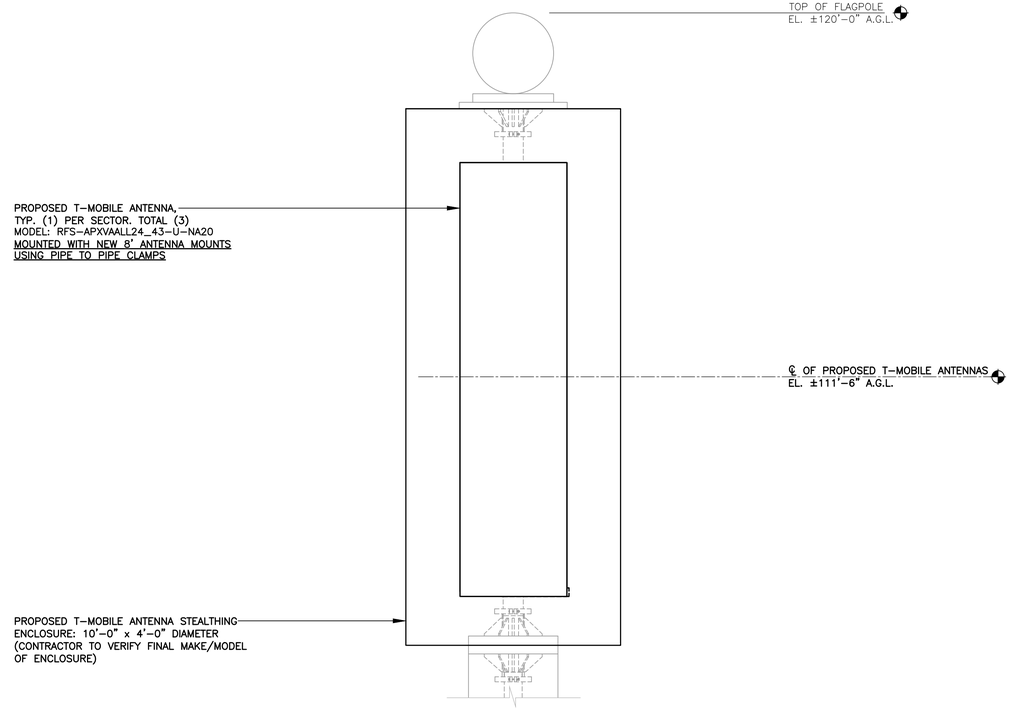
TRUE NORTH



3 C-4 **PROPOSED PIPE TO PIPE CLAMP DETAIL**
SITEPRO1 – P/N: DCP12K



2 C-4 **EXISTING ANTENNA ELEVATION**
SCALE: 3/4" = 1'-0"



2A C-4 **PROPOSED ANTENNA ELEVATION**
SCALE: 3/4" = 1'-0"

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ANTENNA PLANS AND ELEVATIONS

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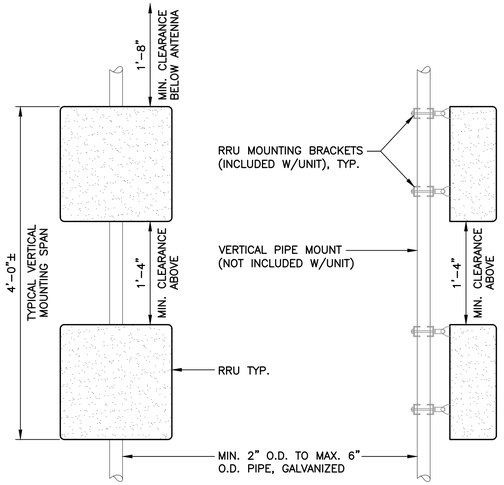


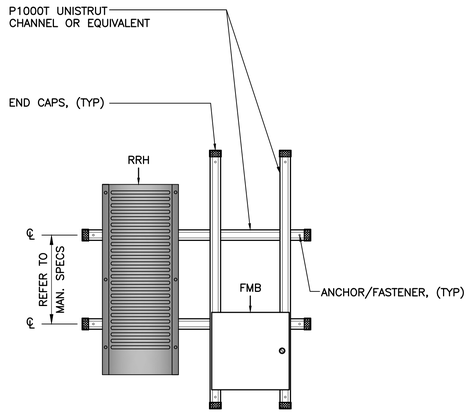
FRONT ELEVATION SIDE ELEVATION

NOTES: (PIPE MOUNTING)

1. T–MOBILE SHALL SUPPLY RRU, AND RRU POLE–MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE–MOUNTING BRACKET.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

1 C–5 TYPICAL RRU MOUNTING DETAIL

SCALE: NOT TO SCALE



FRONT ELEVATION

NOTES: (UNISTRUT MOUNTING)

1. INSTALL A MINIMUM OF (2) ANCHORS PER UNISTRUT (± 16"o/c MIN).
2. MOUNT RRU TO UNISTRUT WITH 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET.
3. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

APXVAALL24_43-U-NA20

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXVAALL24_43–U–NA20	95.9"L x 24.0"W x 8.5"D	±150 LBS.

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

2 C–5 PROPOSED ANTENNA DETAIL

SCALE: NOT TO SCALE

RADIO 4460 B25+B66

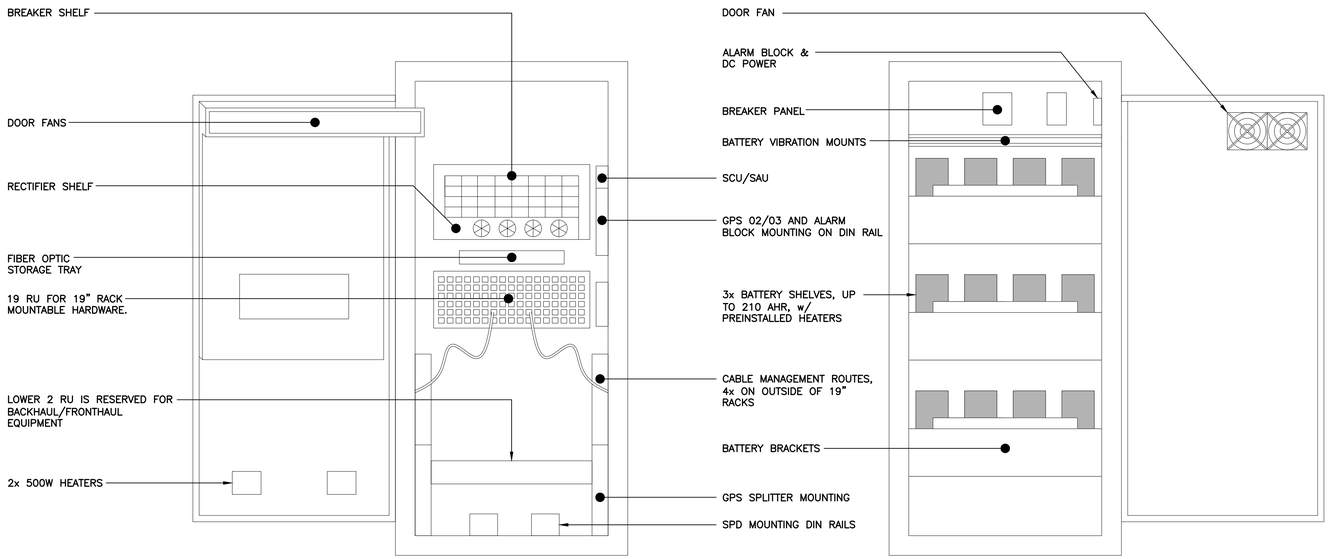
RADIO 4480 B71+B85

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4460 B25+B66	19.6"L x 15.7"W x 12.1"D	±109 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4480 B71+B85	21.8"L x 15.7"W x 7.5"D	±84 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.

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

3 C–5 PROPOSED RRU DETAIL

SCALE: NOT TO SCALE



EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: ENCLOSURE 6160 CABINET	62.0"H x 26.0"W x 26.0"D	±1200 LBS

4 C–5 ENCLOSURE 6160 CABINET DETAIL

SCALE: NOT TO SCALE

EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: BATTERY B160 CABINET	62.0"H x 26.0"W x 26.0"D	±1883 LBS

5 C–5 BATTERY B160 CABINET DETAIL

SCALE: NOT TO SCALE

DIPLEXER		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: CBC426T–DS–43	6"L x 4.8"W x 3.4"D	–

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

6 C–5 PROPOSED DIPLEXER DETAIL

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TYPICAL EQUIPMENT DETAILS

C-5

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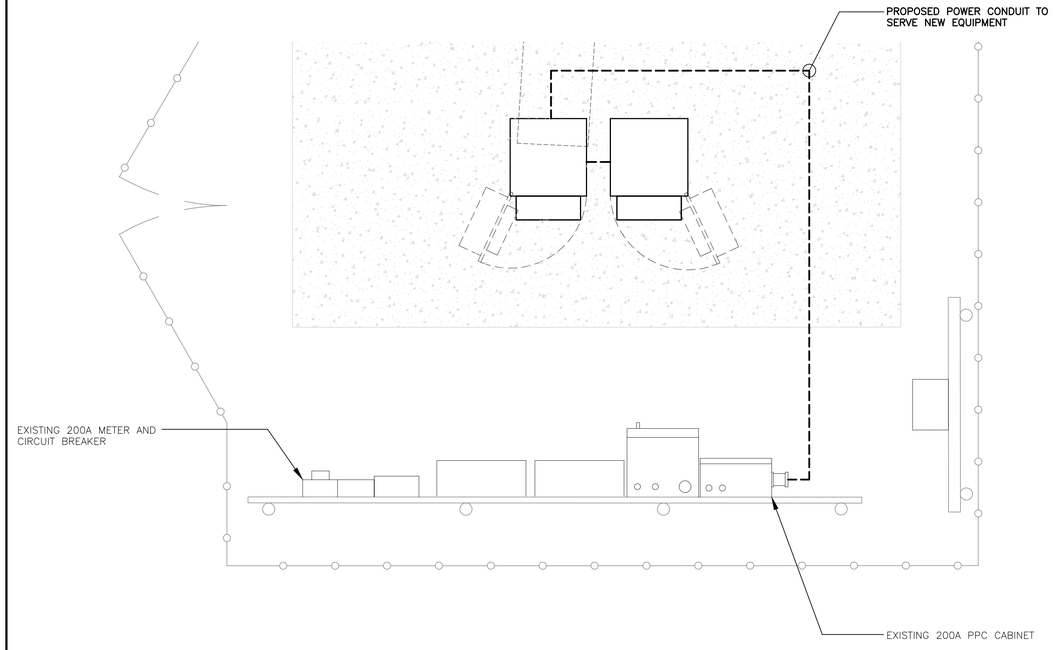
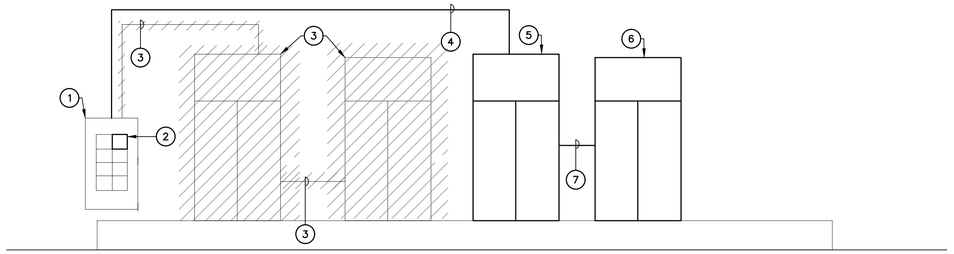


1 E-1 **ELECTRICAL CONDUIT ROUTING PLAN**

SCALE: 1/4" = 1'

RISER DIAGRAM NOTES

1. EXISTING 200A, PPC CABINET TO REMAIN.
2. NEW 150A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.
3. EXISTING CABINETS AND ASSOCIATED CONDUITS AND CONDUCTORS TO BE REMOVED.
4. (3) 1/0 AWG, (1) #6 AWG GROUND, 1-1/2" CONDUIT.
5. NEW T-MOBILE EQUIPMENT CABINET
6. NEW T-MOBILE BATTERY CABINET
7. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.



2 E-1 **ELECTRICAL POWER RISER DIAGRAM**

SCALE: NOT TO SCALE

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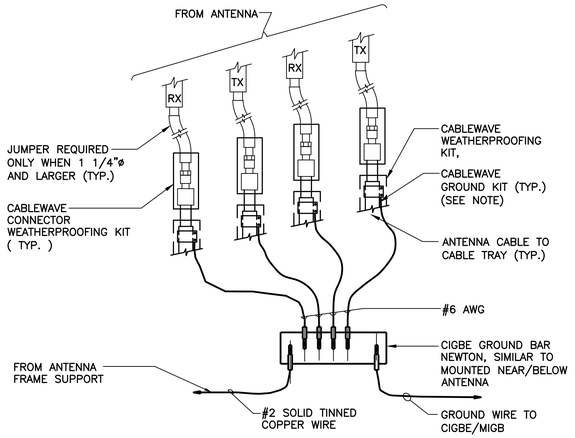
ELECTRICAL RISER DIAGRAM AND CONDUIT ROUTING

E-1

Sheet No. 8 of 10

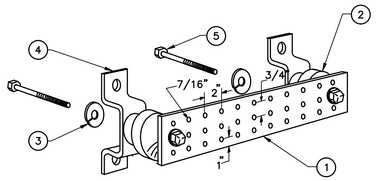


NOTES:

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

1 E-2 CONNECTION OF GROUND WIRES TO GROUND BAR

SCALE: NOT TO SCALE

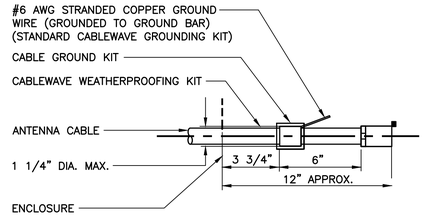


NOTES

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

2 E-2 GROUND BAR DETAIL

SCALE: NOT TO SCALE

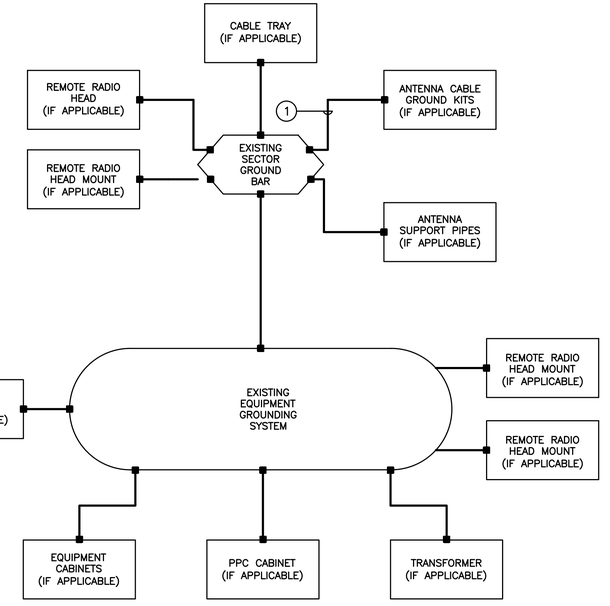


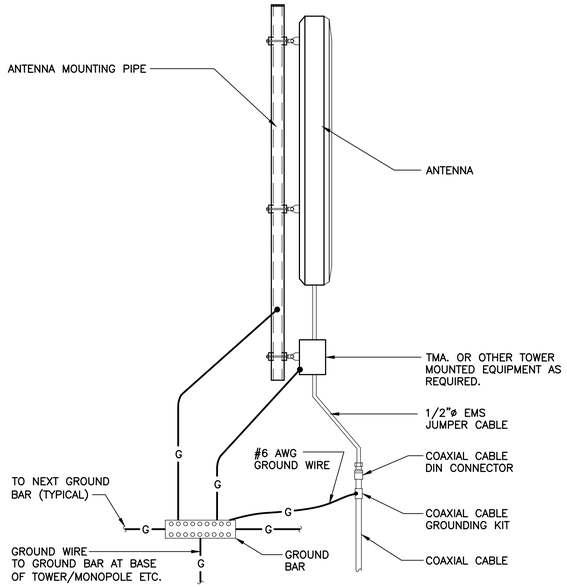
NOTES:

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

3 E-2 ANTENNA CABLE GROUNDING DETAIL

SCALE: NOT TO SCALE

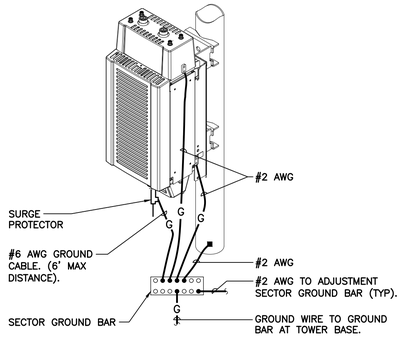




4 E-2 TYPICAL ANTENNA GROUNDING DETAIL

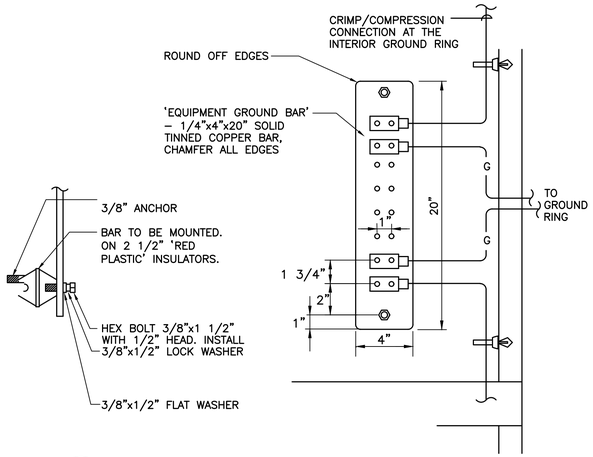
SCALE: NOT TO SCALE

EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:
1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



5 E-2 RRH POLE MOUNT GROUNDING

SCALE: NOT TO SCALE



6 E-2 EQUIPMENT GROUND BAR DETAIL

SCALE: NOT TO SCALE

GROUNDING SCHEMATIC NOTES

(1) #6 AWG

GENERAL NOTES:

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

7 E-2 ELECTRICAL SCHEMATIC DIAGRAM

SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E-2

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ELECTRICAL SPECIFICATIONS

SECTION 16010

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR THE SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

F. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

G. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

H. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

I. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

J. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

K. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

L. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

M. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.

2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

N. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUIT

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.

B. THE INTERIOR OF RACEWAYS/ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION, INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

C. CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.

D. PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS

E. ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

CONDUIT SCHEDULE SECTION 16111

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

[1] PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

[2] UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, DRIVEWAYS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".

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

SECTION 16123

1.01. CONDUCTORS

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

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

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

SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH – INTERMATIC #FF15M (INTERIOR LIGHTS)

2. DUPLEX RECEPTACLE – P&S #2095 (GFCI) SPECIFICATION GRADE

3. SINGLE POLE SWITCH – P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE

4. DUPLEX RECEPTACLE – P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES – ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16170

1.01. DISCONNECT SWITCHES

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

SECTION 16190

1.01. SEISMIC RESTRAINT

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

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

SECTION 16450

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.

2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.

2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.

3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

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

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

1. GROUND BARS

2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).

3. ANTENNA GROUND CONNECTIONS AND PLATES.

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

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

SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16477

1.01. FUSES

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

SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.

2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.

3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/03/21	BSP	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

Sprint New part of T-Mobile

Transcend Wireless

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC

SPRINT ID: CT43XC825
SITE ID: CT11975A
498 BUSHY HILL RD.
SIMSBURY, CT 06070

DATE: 06/29/21
SCALE: AS NOTED
JOB NO. 21005.34

ELECTRICAL SPECIFICATIONS

E-3

Sheet No. 10 of 10

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

118-ft Existing Flagpole

Proposed T-Mobile
Antenna Upgrade

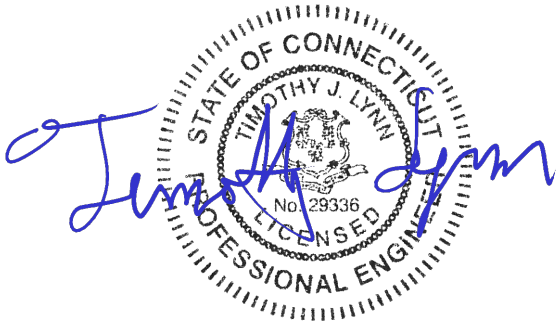
T-Mobile Site Ref: CT11975A

530 Bushy Hill Road
Simsbury, CT

Centek Project No. 21005.34

Date: July 15, 2021

Max Stress Ratio = 79%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by T-Mobile on the existing flagpole (tower) located in Simsbury, Connecticut.

The host tower consists of three (3) 10-ft concealment canister sections supported on a 86.5-ft tall, two-section, eighteen sided, tapered monopole original designed by EEI jo no. 12826-E01 dated 8/12/04. The tower geometry and structure member sizes were obtained the original design documents.

Antenna and appurtenance information were obtained from a previous structural analysis report prepared by Hudson Design Group; dated January 16, 2020 and a T-Mobile RF data sheet.

The tower is made up of two (2) tapered vertical sections consisting of A572-65 pole sections. The vertical tower sections are slip joint connected. The diameter of the pole (flat-flat) is 19.50-in at the top and 31.25-in at the base.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- AT&T (EXISTING):
  Antennas: Three (3) Commscope SBNH-1D6565B panel antennas and three (3) CCI DTMABP7819VG12A TMAs mounted within a concealment canister with a rad center elevation of ±104.5-ft above grade level.
  Cables: Nine (9) 1-1/4" ∅ coax cables running inside the monopole.
- AT&T (EXISTING):
  Antennas: Three (3) CCI DMP65R-BU4D panel antennas and six (6) CCI TMABPDB7823VG12A TMAs mounted within a concealment canister with a rad center elevation of ±94-ft above grade level.
  Cables: Nine (9) 1-1/4" ∅ coax cables running inside the monopole.
- **T-MOBILE (SPRINT) (EXISTING TO REMOVE):**
  Antennas: Three (3) panel antennas and three (3) TMAs mounted within a concealment canister with a rad center elevation of ±113-ft above grade level.
  Cables: Six (6) 1-1/4" ∅ coax cables running inside the monopole.
- **T-MOBILE (Proposed):**
  Antennas: Three (3) RFS APXVAALL24_43 panel antennas and three (3) Commscope CBC426T-DS-43 TMAs mounted within a proposed replacement concealment canister with a rad center elevation of ±113-ft above grade level.
  Existing concealment canister to re replaced with a 10-ft x 4'-0" ∅ canister.
  Cables: Six (6) 7/8" ∅ coax cables running inside the monopole.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents or reinforcement drawings.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables to be installed as indicated in this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 1.00" radial ice on the tower structure and its components.

Basic Wind Speed:	Simsbury; v = 93 mph (Vasd – Risk Cat II)	*[Appendix N of the 2018 CT Building Code]*
Load Cases:	Load Case 1; 93 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2018 CT Building Code]*
	Load Case 2; 40 mph wind speed w/ 1.00" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2015 International Building Code as amended by the 2018 Connecticut State Building Code (CSBC).

Tower Capacity

- Calculated stresses were found to be within allowable limits.

Tower Section	Elevation (AGL)	Stress Ratio (percentage of capacity)	Result
Canister Section (L3)	88.0' - 98.0'	79.0%	**PASS**
Pole Shaft (L2)	1.5' - 48.68'	64.4%	**PASS**

Foundation and Anchors

The existing foundation consists of a one (1) 5-ft square x 4.5-ft tall pier on a 12.5-ft square x 3.0-ft thick reinforced concrete mat. The existing foundation properties were obtained from the aforementioned design documents. The base of the tower is connected to the foundation by means of (4) 2.25"∅, ASTM A615-75 anchor bolts embedded approximately 7-ft into the concrete foundation structure.

- The tower base reactions developed from the governing Load Case were used in the verification of the foundation and its anchors:

Location	Vector	Proposed Reactions
Base	Shear	7 kips
	Compression	10 kips
	Moment	458 kip-ft

- The foundation was found to be within allowable limits.

Foundation	Design Limit	TIA-222-G Section 9.4 FS[(1)]	Proposed Loading (FS)[(1)]	Result
Reinforced Concrete Pad and Pier	OTM[(2)]	1.0	2.08	**PASS**

Note 1: FS denotes Factor of Safety.
Note 2: OTM denotes Overturning Moment

- The anchor bolts and base plate were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Combined Axial and Bending	56.5%	**PASS**
Base Plate	Bending	69.6%	**PASS**

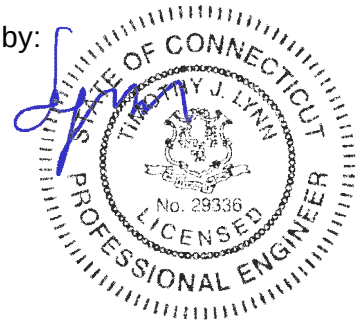
C o n c l u s i o n

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by T-Mobile. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Section	Size	Length (ft)	Grade	Weight (K)
1	P4x.237	10.00	A53-B-35	0.1
2	4" Solid Round	10.00	A572-50	0.4
3	5" Solid Round	10.00		0.7
				1.2

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVAALL24-43 (T-Mobile - Porposed)	113	DTMABP7819VG12A TMA (AT⌶ Existing)	104.5
APXVAALL24-43 (T-Mobile - Porposed)	113	DTMABP7819VG12A TMA (AT⌶ Existing)	104.5
APXVAALL24-43 (T-Mobile - Porposed)	113	SBNH-1D6565B (AT⌶ Existing)	104.5
CBC426T-DS-43 (T-Mobile - Porposed)	113	10'x30" Canister	103
CBC426T-DS-43 (T-Mobile - Porposed)	113	DMP65R-BU4D (AT⌶ Existing)	94
CBC426T-DS-43 (T-Mobile - Porposed)	113	TMABPDB7823VG12A (AT⌶ Existing)	94
10'x48" Canister	113	TMABPDB7823VG12A (AT⌶ Existing)	94
SBNH-1D6565B (AT⌶ Existing)	104.5	TMABPDB7823VG12A (AT⌶ Existing)	94
SBNH-1D6565B (AT⌶ Existing)	104.5	TMABPDB7823VG12A (AT⌶ Existing)	94
DTMABP7819VG12A TMA (AT⌶ Existing)	104.5	TMABPDB7823VG12A (AT⌶ Existing)	94
		TMABPDB7823VG12A (AT⌶ Existing)	94
		DMP65R-BU4D (AT⌶ Existing)	94
		DMP65R-BU4D (AT⌶ Existing)	94
		10'x 42" Canister	93

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A572-50	50 ksi	65 ksi

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 79%

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job:	***21005.34 - CT11975A***		
Project:	***118' Flagpole - 498 Bushy Hill Rd Simsbury, CT***		
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 07/14/21	Scale: NTS	
Path: J:\Jobs\2100\00\W\34_CT11975A_CT43XC825\05_Structural\Tower\Backup Documentation\Calcs\ERI Files\118-ft Flagpole Tower.eri		Dwg No. E-1	

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 93 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50 °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.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	118.00-108.00	10.00	P4x.237	A53-B-35 (35 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L2	108.00-98.00	10.00	4" Solid Round	A572-50 (50 ksi)	
L3	98.00-88.00	10.00	5" Soild Round	A572-50 (50 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 118.00-108.00				1	1	1			
L2 108.00-98.00				1	1	1			
L3 98.00-88.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
7/8 (T-Mobile)	C	No	No	Inside Pole	174.50 - 88.00	6	No Ice	0.00	0.54
							1/2" Ice	0.00	0.54
							1" Ice	0.00	0.54
1 1/4 (AT&T)	C	No	No	Inside Pole	174.50 - 88.00	9	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
1 1/4 (AT&T)	C	No	No	Inside Pole	174.50 - 88.00	9	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	118.00-108.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.15
L2	108.00-98.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.15
L3	98.00-88.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.15

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	*Tower Elevation* *ft*	*Face or Leg*	*Ice Thickness* *in*	A_R *ft^2*	A_F *ft^2*	C_AA_A *In Face* *ft^2*	C_AA_A *Out Face* *ft^2*	*Weight* *K*
L1	118.00-108.00	A	2.262	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.15
L2	108.00-98.00	A	2.241	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.15
L3	98.00-88.00	A	2.218	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.15

Feed Line Center of Pressure

Section	*Elevation* *ft*	CP_X *in*	CP_Z *in*	CP_X *Ice* *in*	CP_Z *Ice* *in*
L1	118.00-108.00	0.0000	0.0000	0.0000	0.0000
L2	108.00-98.00	0.0000	0.0000	0.0000	0.0000
L3	98.00-88.00	0.0000	0.0000	0.0000	0.0000

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

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft ft ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* *ft^2*	C_AA_A *Side* *ft^2*	*Weight* *K*
APXVAALL24-43	A	From Face	0.50	0.0000	113.00	No Ice	0.00	0.00	0.15
(T-Mobile - Porposed)			0.00			1/2" Ice	0.00	0.00	0.27
			0.00			1" Ice	0.00	0.00	0.39
APXVAALL24-43	B	From Face	0.50	0.0000	113.00	No Ice	0.00	0.00	0.15
(T-Mobile - Porposed)			0.00			1/2" Ice	0.00	0.00	0.27
			0.00			1" Ice	0.00	0.00	0.39
APXVAALL24-43	C	From Face	0.50	0.0000	113.00	No Ice	0.00	0.00	0.15
(T-Mobile - Porposed)			0.00			1/2" Ice	0.00	0.00	0.27
			0.00			1" Ice	0.00	0.00	0.39
CBC426T-DS-43	A	From Face	0.50	0.0000	113.00	No Ice	0.00	0.00	0.01
(T-Mobile - Porposed)			0.00			1/2" Ice	0.00	0.00	0.01
			0.00			1" Ice	0.00	0.00	0.02
CBC426T-DS-43	A	From Face	0.50	0.0000	113.00	No Ice	0.00	0.00	0.01
(T-Mobile - Porposed)			0.00			1/2" Ice	0.00	0.00	0.01
			0.00			1" Ice	0.00	0.00	0.02
CBC426T-DS-43	A	From Face	0.50	0.0000	113.00	No Ice	0.00	0.00	0.01
(T-Mobile - Porposed)			0.00			1/2" Ice	0.00	0.00	0.01
			0.00			1" Ice	0.00	0.00	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
SBNH-1D6565B	A	From Face	0.50	0.0000	104.50	No Ice	0.00	0.00	0.05
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.10
			0.00			1" Ice	0.00	0.00	0.16
SBNH-1D6565B	B	From Face	0.50	0.0000	104.50	No Ice	0.00	0.00	0.05
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.10
			0.00			1" Ice	0.00	0.00	0.16
SBNH-1D6565B	C	From Face	0.50	0.0000	104.50	No Ice	0.00	0.00	0.05
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.10
			0.00			1" Ice	0.00	0.00	0.16
DTMABP7819VG12A TMA	A	From Face	0.50	0.0000	104.50	No Ice	0.00	0.00	0.02
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.04
DTMABP7819VG12A TMA	B	From Face	0.50	0.0000	104.50	No Ice	0.00	0.00	0.02
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.04
DTMABP7819VG12A TMA	C	From Face	0.50	0.0000	104.50	No Ice	0.00	0.00	0.02
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.04
DMP65R-BU4D	A	From Face	0.50	0.0000	94.00	No Ice	0.00	0.00	0.07
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.12
			0.00			1" Ice	0.00	0.00	0.17
DMP65R-BU4D	B	From Face	0.50	0.0000	94.00	No Ice	0.00	0.00	0.07
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.12
			0.00			1" Ice	0.00	0.00	0.17
DMP65R-BU4D	C	From Face	0.50	0.0000	94.00	No Ice	0.00	0.00	0.07
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.12
			0.00			1" Ice	0.00	0.00	0.17
TMABPDB7823VG12A	A	From Face	0.00	0.0000	94.00	No Ice	0.00	0.00	0.03
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.05
TMABPDB7823VG12A	B	From Face	0.00	0.0000	94.00	No Ice	0.00	0.00	0.03
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.05
TMABPDB7823VG12A	C	From Face	0.00	0.0000	94.00	No Ice	0.00	0.00	0.03
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.05
TMABPDB7823VG12A	A	From Face	0.00	0.0000	94.00	No Ice	0.00	0.00	0.03
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.05
TMABPDB7823VG12A	B	From Face	0.00	0.0000	94.00	No Ice	0.00	0.00	0.03
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.05
TMABPDB7823VG12A	C	From Face	0.00	0.0000	94.00	No Ice	0.00	0.00	0.03
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.05
10'x48" Canister	C	None		0.0000	113.00	No Ice	20.00	20.00	0.40
						1/2" Ice	28.82	28.82	0.76
						1" Ice	29.65	29.65	1.13
10'x30" Canister	C	None		0.0000	103.00	No Ice	13.33	13.33	0.20
						1/2" Ice	19.05	19.05	0.41
						1" Ice	19.77	19.77	0.63
10'x 42" Canister	C	None		0.0000	93.00	No Ice	17.78	17.78	0.35
						1/2" Ice	25.54	25.54	0.66
						1" Ice	26.32	26.32	0.97

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	113.00	1.299	27	3.750	A	0.000	3.750	3.750	100.00	0.000	0.000
118.00-108.00					B	0.000	3.750		100.00	0.000	0.000
					C	0.000	3.750		100.00	0.000	0.000
L2	103.00	1.274	27	3.333	A	0.000	3.333	3.333	100.00	0.000	0.000
108.00-98.00					B	0.000	3.333		100.00	0.000	0.000
					C	0.000	3.333		100.00	0.000	0.000
L3 98.00-88.00	93.00	1.246	26	4.167	A	0.000	4.167	4.167	100.00	0.000	0.000
					B	0.000	4.167		100.00	0.000	0.000
					C	0.000	4.167		100.00	0.000	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	113.00	1.299	5	2.2620	7.520	A	0.000	7.520	7.520	100.00	0.000	0.000
118.00-108.00						B	0.000	7.520		100.00	0.000	0.000
						C	0.000	7.520		100.00	0.000	0.000
L2 108.00-98.00	103.00	1.274	5	2.2411	7.069	A	0.000	7.069	7.069	100.00	0.000	0.000
						B	0.000	7.069		100.00	0.000	0.000
						C	0.000	7.069		100.00	0.000	0.000
L3 98.00-88.00	93.00	1.246	5	2.2183	7.864	A	0.000	7.864	7.864	100.00	0.000	0.000
						B	0.000	7.864		100.00	0.000	0.000
						C	0.000	7.864		100.00	0.000	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	113.00	1.299	10	3.750	A	0.000	3.750	3.750	100.00	0.000	0.000
118.00-108.00					B	0.000	3.750		100.00	0.000	0.000
					C	0.000	3.750		100.00	0.000	0.000
L2	103.00	1.274	10	3.333	A	0.000	3.333	3.333	100.00	0.000	0.000
108.00-98.00					B	0.000	3.333		100.00	0.000	0.000
					C	0.000	3.333		100.00	0.000	0.000
L3 98.00-88.00	93.00	1.246	10	4.167	A	0.000	4.167	4.167	100.00	0.000	0.000
					B	0.000	4.167		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	4.167		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.15	0.11	A	1	0.966	27	1	1	3.750	0.11	10.89	C
118.00-108.00			B	1	0.966		1	1	3.750			
			C	1	0.966		1	1	3.750			
L2	0.15	0.43	A	1	1.098	27	1	1	3.333	0.11	10.78	C
108.00-98.00			B	1	1.098		1	1	3.333			
			C	1	1.098		1	1	3.333			
L3	0.15	0.67	A	1	0.888	26	1	1	4.167	0.11	10.67	C
98.00-88.00			B	1	0.888		1	1	4.167			
			C	1	0.888		1	1	4.167			
Sum Weight:	0.45	1.20						OTM	4.87 kip-ft	0.32		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.15	0.11	A	1	0.966	27	1	1	3.750	0.11	10.89	C
118.00-108.00			B	1	0.966		1	1	3.750			
			C	1	0.966		1	1	3.750			
L2	0.15	0.43	A	1	1.098	27	1	1	3.333	0.11	10.78	C
108.00-98.00			B	1	1.098		1	1	3.333			
			C	1	1.098		1	1	3.333			
L3	0.15	0.67	A	1	0.888	26	1	1	4.167	0.11	10.67	C
98.00-88.00			B	1	0.888		1	1	4.167			
			C	1	0.888		1	1	4.167			
Sum Weight:	0.45	1.20						OTM	4.87 kip-ft	0.32		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.15	0.11	A	1	0.966	27	1	1	3.750	0.11	10.89	C
118.00-108.00			B	1	0.966		1	1	3.750			
			C	1	0.966		1	1	3.750			
L2	0.15	0.43	A	1	1.098	27	1	1	3.333	0.11	10.78	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
108.00-98.00			B	1	1.098		1	1	3.333			
			C	1	1.098		1	1	3.333			
L3	0.15	0.67	A	1	0.888	26	1	1	4.167	0.11	10.67	C
98.00-88.00			B	1	0.888		1	1	4.167			
			C	1	0.888		1	1	4.167			
Sum Weight:	0.45	1.20						OTM	4.87 kip-ft	0.32		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.15	0.11	A	1	0.966	27	1	1	3.750	0.11	10.89	C
118.00-108.00			B	1	0.966		1	1	3.750			
			C	1	0.966		1	1	3.750			
L2	0.15	0.43	A	1	1.098	27	1	1	3.333	0.11	10.78	C
108.00-98.00			B	1	1.098		1	1	3.333			
			C	1	1.098		1	1	3.333			
L3	0.15	0.67	A	1	0.888	26	1	1	4.167	0.11	10.67	C
98.00-88.00			B	1	0.888		1	1	4.167			
			C	1	0.888		1	1	4.167			
Sum Weight:	0.45	1.20						OTM	4.87 kip-ft	0.32		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.15	0.29	A	1	1.2	5	1	1	7.520	0.05	5.02	C
118.00-108.00			B	1	1.2		1	1	7.520			
			C	1	1.2		1	1	7.520			
L2	0.15	0.60	A	1	1.2	5	1	1	7.069	0.05	4.62	C
108.00-98.00			B	1	1.2		1	1	7.069			
			C	1	1.2		1	1	7.069			
L3	0.15	0.86	A	1	1.2	5	1	1	7.864	0.05	5.03	C
98.00-88.00			B	1	1.2		1	1	7.864			
			C	1	1.2		1	1	7.864			
Sum Weight:	0.45	1.76						OTM	2.20 kip-ft	0.15		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.15	0.29	A	1	1.2	5	1	1	7.520	0.05	5.02	C
118.00-108.00			B	1	1.2		1	1	7.520			
			C	1	1.2		1	1	7.520			
L2	0.15	0.60	A	1	1.2	5	1	1	7.069	0.05	4.62	C
108.00-98.00			B	1	1.2		1	1	7.069			
			C	1	1.2		1	1	7.069			
L3	0.15	0.86	A	1	1.2	5	1	1	7.864	0.05	5.03	C
98.00-88.00			B	1	1.2		1	1	7.864			
			C	1	1.2		1	1	7.864			
Sum Weight:	0.45	1.76						OTM	2.20 kip-ft	0.15		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.15	0.29	A	1	1.2	5	1	1	7.520	0.05	5.02	C
118.00-108.00			B	1	1.2		1	1	7.520			
			C	1	1.2		1	1	7.520			
L2	0.15	0.60	A	1	1.2	5	1	1	7.069	0.05	4.62	C
108.00-98.00			B	1	1.2		1	1	7.069			
			C	1	1.2		1	1	7.069			
L3	0.15	0.86	A	1	1.2	5	1	1	7.864	0.05	5.03	C
98.00-88.00			B	1	1.2		1	1	7.864			
			C	1	1.2		1	1	7.864			
Sum Weight:	0.45	1.76						OTM	2.20 kip-ft	0.15		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.15	0.29	A	1	1.2	5	1	1	7.520	0.05	5.02	C
118.00-108.00			B	1	1.2		1	1	7.520			
			C	1	1.2		1	1	7.520			
L2	0.15	0.60	A	1	1.2	5	1	1	7.069	0.05	4.62	C
108.00-98.00			B	1	1.2		1	1	7.069			
			C	1	1.2		1	1	7.069			
L3	0.15	0.86	A	1	1.2	5	1	1	7.864	0.05	5.03	C
98.00-88.00			B	1	1.2		1	1	7.864			
			C	1	1.2		1	1	7.864			
Sum Weight:	0.45	1.76						OTM	2.20 kip-ft	0.15		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.15	0.11	A	1	1.2	10	1	1	3.750	0.05	5.04	C
118.00-108.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
L2	0.15	0.43	A	1	1.2	10	1	1	3.333	0.04	4.39	C
108.00-98.00			B	1	1.2		1	1	3.333			
			C	1	1.2		1	1	3.333			
L3	0.15	0.67	A	1	1.2	10	1	1	4.167	0.05	5.37	C
98.00-88.00			B	1	1.2		1	1	4.167			
			C	1	1.2		1	1	4.167			
Sum Weight:	0.45	1.20						OTM	2.19 kip-ft	0.15		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.15	0.11	A	1	1.2	10	1	1	3.750	0.05	5.04	C
118.00-108.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
L2	0.15	0.43	A	1	1.2	10	1	1	3.333	0.04	4.39	C
108.00-98.00			B	1	1.2		1	1	3.333			
			C	1	1.2		1	1	3.333			
L3	0.15	0.67	A	1	1.2	10	1	1	4.167	0.05	5.37	C
98.00-88.00			B	1	1.2		1	1	4.167			
			C	1	1.2		1	1	4.167			
Sum Weight:	0.45	1.20						OTM	2.19 kip-ft	0.15		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.15	0.11	A	1	1.2	10	1	1	3.750	0.05	5.04	C
118.00-108.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
L2	0.15	0.43	A	1	1.2	10	1	1	3.333	0.04	4.39	C
108.00-98.00			B	1	1.2		1	1	3.333			
			C	1	1.2		1	1	3.333			
L3	0.15	0.67	A	1	1.2	10	1	1	4.167	0.05	5.37	C
98.00-88.00			B	1	1.2		1	1	4.167			
			C	1	1.2		1	1	4.167			
Sum Weight:	0.45	1.20						OTM	2.19 kip-ft	0.15		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.15	0.11	A	1	1.2	10	1	1	3.750	0.05	5.04	C
118.00-108.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
L2	0.15	0.43	A	1	1.2	10	1	1	3.333	0.04	4.39	C
108.00-98.00			B	1	1.2		1	1	3.333			
			C	1	1.2		1	1	3.333			
L3	0.15	0.67	A	1	1.2	10	1	1	4.167	0.05	5.37	C
98.00-88.00			B	1	1.2		1	1	4.167			
			C	1	1.2		1	1	4.167			
Sum Weight:	0.45	1.20						OTM	2.19 kip-ft	0.15		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	1.20					
Bracing Weight	0.00					
Total Member Self-Weight	1.20			-0.01	0.02	
Total Weight	3.68			-0.01	0.02	
Wind 0 deg - No Ice		0.00	-1.83	-28.36	0.02	0.00
Wind 30 deg - No Ice		0.91	-1.58	-24.56	-14.16	0.00
Wind 45 deg - No Ice		1.29	-1.29	-20.06	-20.03	0.00
Wind 60 deg - No Ice		1.58	-0.91	-14.19	-24.54	0.00
Wind 90 deg - No Ice		1.83	0.00	-0.01	-28.34	0.00
Wind 120 deg - No Ice		1.58	0.91	14.17	-24.54	0.00
Wind 135 deg - No Ice		1.29	1.29	20.04	-20.03	0.00
Wind 150 deg - No Ice		0.91	1.58	24.54	-14.16	0.00
Wind 180 deg - No Ice		0.00	1.83	28.34	0.02	0.00
Wind 210 deg - No Ice		-0.91	1.58	24.54	14.19	0.00
Wind 225 deg - No Ice		-1.29	1.29	20.04	20.06	0.00
Wind 240 deg - No Ice		-1.58	0.91	14.17	24.57	0.00
Wind 270 deg - No Ice		-1.83	0.00	-0.01	28.37	0.00
Wind 300 deg - No Ice		-1.58	-0.91	-14.19	24.57	0.00
Wind 315 deg - No Ice		-1.29	-1.29	-20.06	20.06	0.00
Wind 330 deg - No Ice		-0.91	-1.58	-24.56	14.19	0.00
Member Ice	0.55					
Total Weight Ice	12.46			-0.03	0.06	
Wind 0 deg - Ice		0.00	-0.59	-9.17	0.06	0.00
Wind 30 deg - Ice		0.30	-0.51	-7.95	-4.51	0.00
Wind 45 deg - Ice		0.42	-0.42	-6.50	-6.40	0.00
Wind 60 deg - Ice		0.51	-0.30	-4.60	-7.86	0.00
Wind 90 deg - Ice		0.59	0.00	-0.03	-9.08	0.00
Wind 120 deg - Ice		0.51	0.30	4.54	-7.86	0.00
Wind 135 deg - Ice		0.42	0.42	6.43	-6.40	0.00
Wind 150 deg - Ice		0.30	0.51	7.88	-4.51	0.00
Wind 180 deg - Ice		0.00	0.59	9.11	0.06	0.00

Load Case	*Vertical Forces* *K*	*Sum of Forces X* *K*	*Sum of Forces Z* *K*	*Sum of Overturning Moments, M_x* *kip-ft*	*Sum of Overturning Moments, M_z* *kip-ft*	*Sum of Torques* *kip-ft*
Wind 210 deg - Ice		-0.30	0.51	7.88	4.63	0.00
Wind 225 deg - Ice		-0.42	0.42	6.43	6.52	0.00
Wind 240 deg - Ice		-0.51	0.30	4.54	7.97	0.00
Wind 270 deg - Ice		-0.59	0.00	-0.03	9.20	0.00
Wind 300 deg - Ice		-0.51	-0.30	-4.60	7.97	0.00
Wind 315 deg - Ice		-0.42	-0.42	-6.50	6.52	0.00
Wind 330 deg - Ice		-0.30	-0.51	-7.95	4.63	0.00
Total Weight	3.68			-0.01	0.02	
Wind 0 deg - Service		0.00	-0.71	-10.94	0.02	0.00
Wind 30 deg - Service		0.35	-0.61	-9.48	-5.45	0.00
Wind 45 deg - Service		0.50	-0.50	-7.74	-7.71	0.00
Wind 60 deg - Service		0.61	-0.35	-5.47	-9.45	0.00
Wind 90 deg - Service		0.71	0.00	-0.01	-10.91	0.00
Wind 120 deg - Service		0.61	0.35	5.46	-9.45	0.00
Wind 135 deg - Service		0.50	0.50	7.72	-7.71	0.00
Wind 150 deg - Service		0.35	0.61	9.46	-5.45	0.00
Wind 180 deg - Service		0.00	0.71	10.92	0.02	0.00
Wind 210 deg - Service		-0.35	0.61	9.46	5.48	0.00
Wind 225 deg - Service		-0.50	0.50	7.72	7.74	0.00
Wind 240 deg - Service		-0.61	0.35	5.46	9.48	0.00
Wind 270 deg - Service		-0.71	0.00	-0.01	10.95	0.00
Wind 300 deg - Service		-0.61	-0.35	-5.47	9.48	0.00
Wind 315 deg - Service		-0.50	-0.50	-7.74	7.74	0.00
Wind 330 deg - Service		-0.35	-0.61	-9.48	5.48	0.00

Load Combinations

Comb. No.	*Description*
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice

Comb. No.	Description
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 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	118 - 108	Pole	Max Tension	47	0.00	-0.00	-0.00
			Max. Compression	34	-5.11	0.08	0.05
			Max. Mx	26	-1.22	6.47	0.01
			Max. My	2	-1.22	0.02	6.46
			Max. Vy	26	-1.28	6.47	0.01
			Max. Vx	2	-1.28	0.02	6.46
			Max. Torque	20			-0.00
L2	108 - 98	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	34	-8.53	0.10	0.06
			Max. Mx	26	-2.43	23.51	0.01
			Max. My	2	-2.43	0.02	23.50
			Max. Vy	26	-2.09	23.51	0.01
			Max. Vx	2	-2.09	0.02	23.50
			Max. Torque	20			-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	98 - 88	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	34	-13.19	0.11	0.06
			Max. Mx	26	-4.41	48.84	0.01
			Max. My	2	-4.41	0.02	48.83
			Max. Vy	26	-2.98	37.02	0.01
			Max. Vx	2	-2.98	0.02	37.01
			Max. Torque	20			-0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	49	13.19	0.42	0.42
	Max. H_x	27	3.32	2.93	0.00
	Max. H_z	3	3.32	0.00	2.93
	Max. M_x	2	48.83	0.00	2.93
	Max. M_z	10	48.79	-2.93	0.00
	Max. Torsion	4	0.00	-1.46	2.54
	Min. Vert	15	3.32	-2.07	-2.07
	Min. H_x	11	3.32	-2.93	0.00
	Min. H_z	19	3.32	0.00	-2.93
	Min. M_x	18	-48.80	0.00	-2.93
	Min. M_z	26	-48.84	2.93	0.00
	Min. Torsion	20	-0.00	1.46	-2.54

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	3.68	0.00	0.00	-0.01	0.02	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	4.42	0.00	-2.93	-48.83	0.02	-0.00
0.9 Dead+1.6 Wind 0 deg - No Ice	3.32	0.00	-2.93	-47.87	0.02	-0.00
1.2 Dead+1.6 Wind 30 deg - No Ice	4.42	1.46	-2.54	-42.29	-24.39	-0.00
0.9 Dead+1.6 Wind 30 deg - No Ice	3.32	1.46	-2.54	-41.46	-23.91	-0.00
1.2 Dead+1.6 Wind 45 deg - No Ice	4.42	2.07	-2.07	-34.53	-34.50	-0.00
0.9 Dead+1.6 Wind 45 deg - No Ice	3.32	2.07	-2.07	-33.85	-33.83	-0.00
1.2 Dead+1.6 Wind 60 deg - No Ice	4.42	2.54	-1.46	-24.42	-42.25	-0.00
0.9 Dead+1.6 Wind 60 deg - No Ice	3.32	2.54	-1.46	-23.94	-41.43	-0.00
1.2 Dead+1.6 Wind 90 deg - No Ice	4.42	2.93	0.00	-0.01	-48.79	-0.00
0.9 Dead+1.6 Wind 90 deg - No Ice	3.32	2.93	0.00	-0.01	-47.85	-0.00
1.2 Dead+1.6 Wind 120 deg -	4.42	2.54	1.46	24.40	-42.25	0.00

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
No Ice						
0.9 Dead+1.6 Wind 120 deg - No Ice	3.32	2.54	1.46	23.92	-41.43	0.00
1.2 Dead+1.6 Wind 135 deg - No Ice	4.42	2.07	2.07	34.51	-34.50	0.00
0.9 Dead+1.6 Wind 135 deg - No Ice	3.32	2.07	2.07	33.83	-33.83	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice	4.42	1.46	2.54	42.26	-24.39	0.00
0.9 Dead+1.6 Wind 150 deg - No Ice	3.32	1.46	2.54	41.44	-23.91	0.00
1.2 Dead+1.6 Wind 180 deg - No Ice	4.42	0.00	2.93	48.80	0.02	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	3.32	0.00	2.93	47.85	0.02	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice	4.42	-1.46	2.54	42.26	24.43	0.00
0.9 Dead+1.6 Wind 210 deg - No Ice	3.32	-1.46	2.54	41.44	23.95	0.00
1.2 Dead+1.6 Wind 225 deg - No Ice	4.42	-2.07	2.07	34.50	34.54	0.00
0.9 Dead+1.6 Wind 225 deg - No Ice	3.32	-2.07	2.07	33.83	33.86	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice	4.42	-2.54	1.46	24.39	42.30	0.00
0.9 Dead+1.6 Wind 240 deg - No Ice	3.32	-2.54	1.46	23.92	41.47	0.00
1.2 Dead+1.6 Wind 270 deg - No Ice	4.42	-2.93	0.00	-0.01	48.84	0.00
0.9 Dead+1.6 Wind 270 deg - No Ice	3.32	-2.93	0.00	-0.01	47.88	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice	4.42	-2.54	-1.46	-24.42	42.30	0.00
0.9 Dead+1.6 Wind 300 deg - No Ice	3.32	-2.54	-1.46	-23.94	41.47	0.00
1.2 Dead+1.6 Wind 315 deg - No Ice	4.42	-2.07	-2.07	-34.53	34.54	-0.00
0.9 Dead+1.6 Wind 315 deg - No Ice	3.32	-2.07	-2.07	-33.85	33.86	-0.00
1.2 Dead+1.6 Wind 330 deg - No Ice	4.42	-1.46	-2.54	-42.29	24.43	-0.00
0.9 Dead+1.6 Wind 330 deg - No Ice	3.32	-1.46	-2.54	-41.46	23.95	-0.00
1.2 Dead+1.0 Ice+1.0 Temp	13.19	-0.00	-0.00	-0.06	0.11	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	13.19	-0.00	-0.59	-12.67	0.11	-0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	13.19	0.30	-0.51	-10.98	-6.19	-0.00
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	13.19	0.42	-0.42	-8.98	-8.80	-0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	13.19	0.51	-0.30	-6.37	-10.80	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	13.19	0.59	-0.00	-0.06	-12.49	-0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	13.19	0.51	0.30	6.24	-10.80	0.00
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	13.19	0.42	0.42	8.85	-8.80	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	13.19	0.30	0.51	10.85	-6.19	0.00
1.2 Dead+1.0 Wind 180	13.19	-0.00	0.59	12.54	0.11	0.00

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
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	13.19	-0.30	0.51	10.85	6.41	0.00
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	13.19	-0.42	0.42	8.85	9.03	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	13.19	-0.51	0.30	6.24	11.03	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	13.19	-0.59	-0.00	-0.06	12.72	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	13.19	-0.51	-0.30	-6.37	11.03	0.00
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	13.19	-0.42	-0.42	-8.98	9.03	-0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	13.19	-0.30	-0.51	-10.98	6.41	-0.00
Dead+Wind 0 deg - Service	3.68	0.00	-0.71	-11.65	0.02	-0.00
Dead+Wind 30 deg - Service	3.68	0.35	-0.61	-10.09	-5.80	-0.00
Dead+Wind 45 deg - Service	3.68	0.50	-0.50	-8.24	-8.21	-0.00
Dead+Wind 60 deg - Service	3.68	0.61	-0.35	-5.83	-10.06	-0.00
Dead+Wind 90 deg - Service	3.68	0.71	0.00	-0.01	-11.62	-0.00
Dead+Wind 120 deg - Service	3.68	0.61	0.35	5.81	-10.06	0.00
Dead+Wind 135 deg - Service	3.68	0.50	0.50	8.22	-8.21	0.00
Dead+Wind 150 deg - Service	3.68	0.35	0.61	10.07	-5.80	0.00
Dead+Wind 180 deg - Service	3.68	0.00	0.71	11.63	0.02	0.00
Dead+Wind 210 deg - Service	3.68	-0.35	0.61	10.07	5.84	0.00
Dead+Wind 225 deg - Service	3.68	-0.50	0.50	8.22	8.25	0.00
Dead+Wind 240 deg - Service	3.68	-0.61	0.35	5.81	10.09	0.00
Dead+Wind 270 deg - Service	3.68	-0.71	0.00	-0.01	11.65	0.00
Dead+Wind 300 deg - Service	3.68	-0.61	-0.35	-5.83	10.09	0.00
Dead+Wind 315 deg - Service	3.68	-0.50	-0.50	-8.24	8.25	-0.00
Dead+Wind 330 deg - Service	3.68	-0.35	-0.61	-10.09	5.84	-0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-3.68	0.00	0.00	3.68	0.00	0.000%
2	0.00	-4.42	-2.93	0.00	4.42	2.93	0.000%
3	0.00	-3.32	-2.93	0.00	3.32	2.93	0.000%
4	1.46	-4.42	-2.54	-1.46	4.42	2.54	0.000%
5	1.46	-3.32	-2.54	-1.46	3.32	2.54	0.000%
6	2.07	-4.42	-2.07	-2.07	4.42	2.07	0.000%
7	2.07	-3.32	-2.07	-2.07	3.32	2.07	0.000%
8	2.54	-4.42	-1.46	-2.54	4.42	1.46	0.000%
9	2.54	-3.32	-1.46	-2.54	3.32	1.46	0.000%
10	2.93	-4.42	0.00	-2.93	4.42	0.00	0.000%
11	2.93	-3.32	0.00	-2.93	3.32	0.00	0.000%
12	2.54	-4.42	1.46	-2.54	4.42	-1.46	0.000%
13	2.54	-3.32	1.46	-2.54	3.32	-1.46	0.000%
14	2.07	-4.42	2.07	-2.07	4.42	-2.07	0.000%
15	2.07	-3.32	2.07	-2.07	3.32	-2.07	0.000%
16	1.46	-4.42	2.54	-1.46	4.42	-2.54	0.000%
17	1.46	-3.32	2.54	-1.46	3.32	-2.54	0.000%
18	0.00	-4.42	2.93	0.00	4.42	-2.93	0.000%
19	0.00	-3.32	2.93	0.00	3.32	-2.93	0.000%
20	-1.46	-4.42	2.54	1.46	4.42	-2.54	0.000%
21	-1.46	-3.32	2.54	1.46	3.32	-2.54	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
22	-2.07	-4.42	2.07	2.07	4.42	-2.07	0.000%
23	-2.07	-3.32	2.07	2.07	3.32	-2.07	0.000%
24	-2.54	-4.42	1.46	2.54	4.42	-1.46	0.000%
25	-2.54	-3.32	1.46	2.54	3.32	-1.46	0.000%
26	-2.93	-4.42	0.00	2.93	4.42	0.00	0.000%
27	-2.93	-3.32	0.00	2.93	3.32	0.00	0.000%
28	-2.54	-4.42	-1.46	2.54	4.42	1.46	0.000%
29	-2.54	-3.32	-1.46	2.54	3.32	1.46	0.000%
30	-2.07	-4.42	-2.07	2.07	4.42	2.07	0.000%
31	-2.07	-3.32	-2.07	2.07	3.32	2.07	0.000%
32	-1.46	-4.42	-2.54	1.46	4.42	2.54	0.000%
33	-1.46	-3.32	-2.54	1.46	3.32	2.54	0.000%
34	0.00	-13.19	0.00	0.00	13.19	0.00	0.000%
35	0.00	-13.19	-0.59	0.00	13.19	0.59	0.000%
36	0.30	-13.19	-0.51	-0.30	13.19	0.51	0.000%
37	0.42	-13.19	-0.42	-0.42	13.19	0.42	0.000%
38	0.51	-13.19	-0.30	-0.51	13.19	0.30	0.000%
39	0.59	-13.19	0.00	-0.59	13.19	0.00	0.000%
40	0.51	-13.19	0.30	-0.51	13.19	-0.30	0.000%
41	0.42	-13.19	0.42	-0.42	13.19	-0.42	0.000%
42	0.30	-13.19	0.51	-0.30	13.19	-0.51	0.000%
43	0.00	-13.19	0.59	0.00	13.19	-0.59	0.000%
44	-0.30	-13.19	0.51	0.30	13.19	-0.51	0.000%
45	-0.42	-13.19	0.42	0.42	13.19	-0.42	0.000%
46	-0.51	-13.19	0.30	0.51	13.19	-0.30	0.000%
47	-0.59	-13.19	0.00	0.59	13.19	0.00	0.000%
48	-0.51	-13.19	-0.30	0.51	13.19	0.30	0.000%
49	-0.42	-13.19	-0.42	0.42	13.19	0.42	0.000%
50	-0.30	-13.19	-0.51	0.30	13.19	0.51	0.000%
51	0.00	-3.68	-0.71	0.00	3.68	0.71	0.000%
52	0.35	-3.68	-0.61	-0.35	3.68	0.61	0.000%
53	0.50	-3.68	-0.50	-0.50	3.68	0.50	0.000%
54	0.61	-3.68	-0.35	-0.61	3.68	0.35	0.000%
55	0.71	-3.68	0.00	-0.71	3.68	0.00	0.000%
56	0.61	-3.68	0.35	-0.61	3.68	-0.35	0.000%
57	0.50	-3.68	0.50	-0.50	3.68	-0.50	0.000%
58	0.35	-3.68	0.61	-0.35	3.68	-0.61	0.000%
59	0.00	-3.68	0.71	0.00	3.68	-0.71	0.000%
60	-0.35	-3.68	0.61	0.35	3.68	-0.61	0.000%
61	-0.50	-3.68	0.50	0.50	3.68	-0.50	0.000%
62	-0.61	-3.68	0.35	0.61	3.68	-0.35	0.000%
63	-0.71	-3.68	0.00	0.71	3.68	0.00	0.000%
64	-0.61	-3.68	-0.35	0.61	3.68	0.35	0.000%
65	-0.50	-3.68	-0.50	0.50	3.68	0.50	0.000%
66	-0.35	-3.68	-0.61	0.35	3.68	0.61	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	5	0.00000001	0.00018996
3	Yes	5	0.00000001	0.00000001
4	Yes	6	0.00000001	0.00021418
5	Yes	6	0.00000001	0.00006926
6	Yes	6	0.00000001	0.00023916

7	Yes	6	0.00000001	0.00007573
8	Yes	6	0.00000001	0.00021508
9	Yes	6	0.00000001	0.00006949
10	Yes	5	0.00000001	0.00018913
11	Yes	5	0.00000001	0.00000001
12	Yes	6	0.00000001	0.00021414
13	Yes	6	0.00000001	0.00006926
14	Yes	6	0.00000001	0.00023862
15	Yes	6	0.00000001	0.00007562
16	Yes	6	0.00000001	0.00021390
17	Yes	6	0.00000001	0.00006920
18	Yes	5	0.00000001	0.00018960
19	Yes	5	0.00000001	0.00000001
20	Yes	6	0.00000001	0.00021553
21	Yes	6	0.00000001	0.00006960
22	Yes	6	0.00000001	0.00023956
23	Yes	6	0.00000001	0.00007582
24	Yes	6	0.00000001	0.00021462
25	Yes	6	0.00000001	0.00006936
26	Yes	5	0.00000001	0.00018976
27	Yes	5	0.00000001	0.00000001
28	Yes	6	0.00000001	0.00021557
29	Yes	6	0.00000001	0.00006959
30	Yes	6	0.00000001	0.00024010
31	Yes	6	0.00000001	0.00007594
32	Yes	6	0.00000001	0.00021581
33	Yes	6	0.00000001	0.00006965
34	Yes	4	0.00000001	0.00003867
35	Yes	7	0.00049607	0.00014767
36	Yes	7	0.00049455	0.00016659
37	Yes	7	0.00049395	0.00017353
38	Yes	7	0.00049434	0.00016638
39	Yes	7	0.00049574	0.00014048
40	Yes	7	0.00049429	0.00016149
41	Yes	7	0.00049383	0.00016838
42	Yes	7	0.00049435	0.00016156
43	Yes	7	0.00049584	0.00014246
44	Yes	7	0.00049442	0.00017010
45	Yes	7	0.00049403	0.00017737
46	Yes	7	0.00049463	0.00017027
47	Yes	7	0.00049616	0.00014949
48	Yes	7	0.00049465	0.00017533
49	Yes	7	0.00049413	0.00018273
50	Yes	7	0.00049460	0.00017530
51	Yes	5	0.00000001	0.00000001
52	Yes	5	0.00000001	0.00000001
53	Yes	5	0.00000001	0.00000001
54	Yes	5	0.00000001	0.00000001
55	Yes	5	0.00000001	0.00000001
56	Yes	5	0.00000001	0.00000001
57	Yes	5	0.00000001	0.00000001
58	Yes	5	0.00000001	0.00000001
59	Yes	5	0.00000001	0.00000001
60	Yes	5	0.00000001	0.00000001
61	Yes	5	0.00000001	0.00000001
62	Yes	5	0.00000001	0.00000001
63	Yes	5	0.00000001	0.00000001
64	Yes	5	0.00000001	0.00000001
65	Yes	5	0.00000001	0.00000001
66	Yes	5	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	118 - 108	6.976	64	1.6971	0.0002
L2	108 - 98	3.487	64	1.5330	0.0002
L3	98 - 88	0.910	64	0.7752	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
113.00	APXVAALL24-43	64	5.182	1.6740	0.0002	3030
104.50	SBNH-1D6565B	64	2.418	1.3160	0.0001	908
103.00	10'x30" Canister	64	2.005	1.1999	0.0001	776
94.00	DMP65R-BU4D	64	0.399	0.4517	0.0000	871
93.00	10'x 42" Canister	64	0.311	0.3745	0.0000	1043

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	118 - 108	29.221	26	7.1115	0.0011
L2	108 - 98	14.627	26	6.4366	0.0009
L3	98 - 88	3.819	26	3.2559	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
113.00	APXVAALL24-43	26	21.720	7.0227	0.0010	752
104.50	SBNH-1D6565B	26	10.145	5.5272	0.0007	221
103.00	10'x30" Canister	26	8.415	5.0398	0.0006	188
94.00	DMP65R-BU4D	30	1.673	1.8971	0.0002	208
93.00	10'x 42" Canister	30	1.306	1.5729	0.0001	249

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	118 - 108 (1)	P4x.237	10.00	30.00	238.5	3.1741	-1.22	12.61	0.097
L2	108 - 98 (2)	4" Solid Round	10.00	30.00	360.0	12.5664	-2.43	21.91	0.111
L3	98 - 88 (3)	5" Soild Round	10.00	30.00	288.0	19.6350	-4.41	53.48	0.082

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	118 - 108 (1)	P4x.237	6.48	11.32	0.572	0.00	11.32	0.000
L2	108 - 98 (2)	4" Solid Round	23.51	35.34	0.665	0.00	35.34	0.000
L3	98 - 88 (3)	5" Soild Round	48.84	69.03	0.708	0.00	69.03	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	118 - 108 (1)	P4x.237	1.28	49.99	0.026	0.00	16.88	0.000
L2	108 - 98 (2)	4" Solid Round	2.09	282.74	0.007	0.00	47.12	0.000
L3	98 - 88 (3)	5" Soild Round	2.94	441.79	0.007	0.00	92.04	0.000

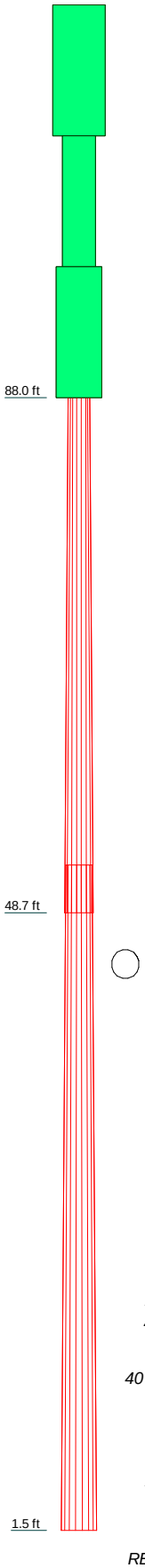
Pole Interaction Design Data

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	118 - 108 (1)	0.097	0.572	0.000	0.026	0.000	0.670 ✔	1.000	4.8.2 ✔
L2	108 - 98 (2)	0.111	0.665	0.000	0.007	0.000	0.776 ✔	1.000	4.8.2 ✔
L3	98 - 88 (3)	0.082	0.708	0.000	0.007	0.000	0.790 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	118 - 108	Pole	P4x.237	1	-1.22	12.61	67.0	Pass
L2	108 - 98	Pole	4" Solid Round	2	-2.43	21.91	77.6	Pass
L3	98 - 88	Pole	5" Soild Round	3	-4.41	53.48	79.0	Pass
							Summary	
						Pole (L3)	79.0	Pass
						RATING =	**79.0**	**Pass**



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	39.32	18	0.1875	3.64	19.5000	25.0700	A572-65	1.8
2	50.82	18	0.1875		24.1794	31.2500		2.8

ALL REACTIONS ARE FACTORED

AXIAL 24 K

SHEAR 2 K — *MOMENT 106 kip-ft*

TORQUE 0 kip-ft
40 mph WIND - 1.0000 in ICE

AXIAL 10 K

SHEAR 7 K — *MOMENT 458 kip-ft*

TORQUE 0 kip-ft
REACTIONS - 93 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVAALL24-43 (T-Mobile - Porposed)	113	DTMABP7819VG12A TMA (AT⌶ Existing)	104.5
APXVAALL24-43 (T-Mobile - Porposed)	113	DTMABP7819VG12A TMA (AT⌶ Existing)	104.5
APXVAALL24-43 (T-Mobile - Porposed)	113	SBNH-1D6565B (AT⌶ Existing)	104.5
CBC426T-DS-43 (T-Mobile - Porposed)	113	10'x30" Canister	103
CBC426T-DS-43 (T-Mobile - Porposed)	113	DMP65R-BU4D (AT⌶ Existing)	94
CBC426T-DS-43 (T-Mobile - Porposed)	113	TMABPDB7823VG12A (AT⌶ Existing)	94
10'x48" Canister	113	TMABPDB7823VG12A (AT⌶ Existing)	94
SBNH-1D6565B (AT⌶ Existing)	104.5	TMABPDB7823VG12A (AT⌶ Existing)	94
SBNH-1D6565B (AT⌶ Existing)	104.5	TMABPDB7823VG12A (AT⌶ Existing)	94
DTMABP7819VG12A TMA (AT⌶ Existing)	104.5	TMABPDB7823VG12A (AT⌶ Existing)	94
		TMABPDB7823VG12A (AT⌶ Existing)	94
		DMP65R-BU4D (AT⌶ Existing)	94
		DMP65R-BU4D (AT⌶ Existing)	94
		10'x 42" Canister	93

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 64.4%

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: ***21005.34 - CT11975A***			
Project: ***118' Flagpole - 498 Bushy Hill Rd Simsbury, CT***			
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 07/14/21	Scale: NTS	
Path: J:\Jobs\2100\600.W\34_CT11975A_CT43XC825\05_Structural\Tower\Backup Documentation\Calcs\ERI Rise\118-ft Flagpole.eri		Dwg No. E-1	

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 93 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50 °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.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

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	88.00-48.68	39.32	3.64	18	19.5000	25.0700	0.1875	0.7500	A572-65 (65 ksi)

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
L2	48.68-1.50	50.82		18	24.1794	31.2500	0.1875	0.7500	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	19.7719	11.4934	541.5782	6.8559	9.9060	54.6717	1083.8689	5.7478	3.1020	16.544
	25.4278	14.8082	1158.3177	8.8333	12.7356	90.9515	2318.1595	7.4055	4.0823	21.772
L2	25.0377	14.2782	1038.3353	8.5171	12.2831	84.5335	2078.0369	7.1404	3.9256	20.936
	31.7032	18.4861	2253.4860	11.0272	15.8750	141.9519	4509.9372	9.2448	5.1700	27.573

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 88.00-48.68				1	1	1			
L2 48.68-1.50				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
7/8 (T-Mobile)	C	No	No	Inside Pole	88.00 - 1.50	6	No Ice	0.00	0.54
							1/2" Ice	0.00	0.54
							1" Ice	0.00	0.54
1 1/4 (AT&T)	C	No	No	Inside Pole	88.00 - 1.50	9	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
1 1/4 (AT&T)	C	No	No	Inside Pole	88.00 - 1.50	9	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	88.00-48.68	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.59
L2	48.68-1.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	0.000	0.71

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	88.00-48.68	A	2.149	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.59
L2	48.68-1.50	A	1.947	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.71

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	88.00-48.68	0.0000	0.0000	0.0000	0.0000
L2	48.68-1.50	0.0000	0.0000	0.0000	0.0000

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVAALL24-43	A	From Face	0.50	0.0000	113.00	No Ice	0.00	0.00	0.15
(T-Mobile - Porposed)			0.00			1/2" Ice	0.00	0.00	0.27
			0.00			1" Ice	0.00	0.00	0.39
APXVAALL24-43	B	From Face	0.50	0.0000	113.00	No Ice	0.00	0.00	0.15
(T-Mobile - Porposed)			0.00			1/2" Ice	0.00	0.00	0.27
			0.00			1" Ice	0.00	0.00	0.39
APXVAALL24-43	C	From Face	0.50	0.0000	113.00	No Ice	0.00	0.00	0.15
(T-Mobile - Porposed)			0.00			1/2" Ice	0.00	0.00	0.27
			0.00			1" Ice	0.00	0.00	0.39
CBC426T-DS-43	A	From Face	0.50	0.0000	113.00	No Ice	0.00	0.00	0.01
(T-Mobile - Porposed)			0.00			1/2" Ice	0.00	0.00	0.01
			0.00			1" Ice	0.00	0.00	0.02
CBC426T-DS-43	A	From Face	0.50	0.0000	113.00	No Ice	0.00	0.00	0.01
(T-Mobile - Porposed)			0.00			1/2" Ice	0.00	0.00	0.01
			0.00			1" Ice	0.00	0.00	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
CBC426T-DS-43	A	From Face	0.50	0.0000	113.00	No Ice	0.00	0.00	0.01
(T-Mobile - Porposed)			0.00			1/2" Ice	0.00	0.00	0.01
			0.00			1" Ice	0.00	0.00	0.02
SBNH-1D6565B	A	From Face	0.50	0.0000	104.50	No Ice	0.00	0.00	0.05
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.10
			0.00			1" Ice	0.00	0.00	0.16
SBNH-1D6565B	B	From Face	0.50	0.0000	104.50	No Ice	0.00	0.00	0.05
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.10
			0.00			1" Ice	0.00	0.00	0.16
SBNH-1D6565B	C	From Face	0.50	0.0000	104.50	No Ice	0.00	0.00	0.05
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.10
			0.00			1" Ice	0.00	0.00	0.16
DTMABP7819VG12A TMA	A	From Face	0.50	0.0000	104.50	No Ice	0.00	0.00	0.02
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.04
DTMABP7819VG12A TMA	B	From Face	0.50	0.0000	104.50	No Ice	0.00	0.00	0.02
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.04
DTMABP7819VG12A TMA	C	From Face	0.50	0.0000	104.50	No Ice	0.00	0.00	0.02
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.04
DMP65R-BU4D	A	From Face	0.50	0.0000	94.00	No Ice	0.00	0.00	0.07
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.12
			0.00			1" Ice	0.00	0.00	0.17
DMP65R-BU4D	B	From Face	0.50	0.0000	94.00	No Ice	0.00	0.00	0.07
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.12
			0.00			1" Ice	0.00	0.00	0.17
DMP65R-BU4D	C	From Face	0.50	0.0000	94.00	No Ice	0.00	0.00	0.07
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.12
			0.00			1" Ice	0.00	0.00	0.17
TMABPDB7823VG12A	A	From Face	0.00	0.0000	94.00	No Ice	0.00	0.00	0.03
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.05
TMABPDB7823VG12A	B	From Face	0.00	0.0000	94.00	No Ice	0.00	0.00	0.03
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.05
TMABPDB7823VG12A	C	From Face	0.00	0.0000	94.00	No Ice	0.00	0.00	0.03
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.05
TMABPDB7823VG12A	A	From Face	0.00	0.0000	94.00	No Ice	0.00	0.00	0.03
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.05
TMABPDB7823VG12A	B	From Face	0.00	0.0000	94.00	No Ice	0.00	0.00	0.03
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.05
TMABPDB7823VG12A	C	From Face	0.00	0.0000	94.00	No Ice	0.00	0.00	0.03
(AT&T Existing)			0.00			1/2" Ice	0.00	0.00	0.03
			0.00			1" Ice	0.00	0.00	0.05
10'x48" Canister	C	None		0.0000	113.00	No Ice	20.00	20.00	0.40
						1/2" Ice	28.82	28.82	0.76
						1" Ice	29.65	29.65	1.13
10'x30" Canister	C	None		0.0000	103.00	No Ice	13.33	13.33	0.20
						1/2" Ice	19.05	19.05	0.41
						1" Ice	19.77	19.77	0.63
10'x 42" Canister	C	None		0.0000	93.00	No Ice	17.78	17.78	0.35
						1/2" Ice	25.54	25.54	0.66
						1" Ice	26.32	26.32	0.97

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 88.00-48.68	67.82	1.166	24	74.052	A	0.000	74.052	74.052	100.00	0.000	0.000
					B	0.000	74.052		100.00	0.000	0.000
					C	0.000	74.052		100.00	0.000	0.000
L2 48.68-1.50	25.27	0.947	20	111.543	A	0.000	111.543	111.543	100.00	0.000	0.000
					B	0.000	111.543		100.00	0.000	0.000
					C	0.000	111.543		100.00	0.000	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 88.00-48.68	67.82	1.166	5	2.1494	88.138	A	0.000	88.138	88.138	100.00	0.000	0.000
						B	0.000	88.138		100.00	0.000	0.000
						C	0.000	88.138		100.00	0.000	0.000
L2 48.68-1.50	25.27	0.947	4	1.9473	128.444	A	0.000	128.444	128.444	100.00	0.000	0.000
						B	0.000	128.444		100.00	0.000	0.000
						C	0.000	128.444		100.00	0.000	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 88.00-48.68	67.82	1.166	9	74.052	A	0.000	74.052	74.052	100.00	0.000	0.000
					B	0.000	74.052		100.00	0.000	0.000
					C	0.000	74.052		100.00	0.000	0.000
L2 48.68-1.50	25.27	0.947	7	111.543	A	0.000	111.543	111.543	100.00	0.000	0.000
					B	0.000	111.543		100.00	0.000	0.000
					C	0.000	111.543		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.59	1.76	A	1	0.65	24	1	1	74.052	1.30	32.95	C
88.00-48.68			B	1	0.65		1	1	74.052			
			C	1	0.65		1	1	74.052			
L2 48.68-1.50	0.71	2.83	A	1	0.65	20	1	1	111.543	1.56	33.14	C
			B	1	0.65		1	1	111.543			
			C	1	0.65		1	1	111.543			
Sum Weight:	1.31	4.59						OTM	123.07 kip-ft	2.86		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.59	1.76	A	1	0.65	24	1	1	74.052	1.30	32.95	C
88.00-48.68			B	1	0.65		1	1	74.052			
			C	1	0.65		1	1	74.052			
L2 48.68-1.50	0.71	2.83	A	1	0.65	20	1	1	111.543	1.56	33.14	C
			B	1	0.65		1	1	111.543			
			C	1	0.65		1	1	111.543			
Sum Weight:	1.31	4.59						OTM	123.07 kip-ft	2.86		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.59	1.76	A	1	0.65	24	1	1	74.052	1.30	32.95	C
88.00-48.68			B	1	0.65		1	1	74.052			
			C	1	0.65		1	1	74.052			
L2 48.68-1.50	0.71	2.83	A	1	0.65	20	1	1	111.543	1.56	33.14	C
			B	1	0.65		1	1	111.543			
			C	1	0.65		1	1	111.543			
Sum Weight:	1.31	4.59						OTM	123.07 kip-ft	2.86		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.59	1.76	A	1	0.65	24	1	1	74.052	1.30	32.95	C
88.00-48.68			B	1	0.65		1	1	74.052			
			C	1	0.65		1	1	74.052			
L2 48.68-1.50	0.71	2.83	A	1	0.65	20	1	1	111.543	1.56	33.14	C
			B	1	0.65		1	1	111.543			
			C	1	0.65		1	1	111.543			
Sum Weight:	1.31	4.59						OTM	123.07 kip-ft	2.86		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.59	4.31	A	1	1.2	5	1	1	88.138	0.53	13.39	C
88.00-48.68			B	1	1.2		1	1	88.138			
			C	1	1.2		1	1	88.138			
L2 48.68-1.50	0.71	6.23	A	1	1.2	4	1	1	126.855	0.61	12.87	C
			B	1	1.2		1	1	126.855			
			C	1	1.2		1	1	126.855			
Sum Weight:	1.31	10.53						OTM	49.36 kip-ft	1.13		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.59	4.31	A	1	1.2	5	1	1	88.138	0.53	13.39	C
88.00-48.68			B	1	1.2		1	1	88.138			
			C	1	1.2		1	1	88.138			
L2 48.68-1.50	0.71	6.23	A	1	1.2	4	1	1	126.855	0.61	12.87	C
			B	1	1.2		1	1	126.855			
			C	1	1.2		1	1	126.855			
Sum Weight:	1.31	10.53						OTM	49.36 kip-ft	1.13		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.59	4.31	A	1	1.2	5	1	1	88.138	0.53	13.39	C
88.00-48.68			B	1	1.2		1	1	88.138			
			C	1	1.2		1	1	88.138			
L2 48.68-1.50	0.71	6.23	A	1	1.2	4	1	1	126.855	0.61	12.87	C
			B	1	1.2		1	1	126.855			
			C	1	1.2		1	1	126.855			
Sum Weight:	1.31	10.53						OTM	49.36 kip-ft	1.13		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.59	4.31	A	1	1.2	5	1	1	88.138	0.53	13.39	C
88.00-48.68			B	1	1.2		1	1	88.138			
			C	1	1.2		1	1	88.138			
L2 48.68-1.50	0.71	6.23	A	1	1.2	4	1	1	126.855	0.61	12.87	C
			B	1	1.2		1	1	126.855			
			C	1	1.2		1	1	126.855			
Sum Weight:	1.31	10.53						OTM	49.36 kip-ft	1.13		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.59	1.76	A	1	0.65	9	1	1	74.052	0.48	12.27	C
88.00-48.68			B	1	0.65		1	1	74.052			
			C	1	0.65		1	1	74.052			
L2 48.68-1.50	0.71	2.83	A	1	0.65	7	1	1	111.543	0.58	12.34	C
			B	1	0.65		1	1	111.543			
			C	1	0.65		1	1	111.543			
Sum Weight:	1.31	4.59						OTM	45.83 kip-ft	1.06		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.59	1.76	A	1	0.65	9	1	1	74.052	0.48	12.27	C
88.00-48.68			B	1	0.65		1	1	74.052			
			C	1	0.65		1	1	74.052			
L2 48.68-1.50	0.71	2.83	A	1	0.65	7	1	1	111.543	0.58	12.34	C
			B	1	0.65		1	1	111.543			
			C	1	0.65		1	1	111.543			
Sum Weight:	1.31	4.59						OTM	45.83 kip-ft	1.06		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.59	1.76	A	1	0.65	9	1	1	74.052	0.48	12.27	C
88.00-48.68			B	1	0.65		1	1	74.052			
			C	1	0.65		1	1	74.052			
L2 48.68-1.50	0.71	2.83	A	1	0.65	7	1	1	111.543	0.58	12.34	C
			B	1	0.65		1	1	111.543			
			C	1	0.65		1	1	111.543			
Sum Weight:	1.31	4.59						OTM	45.83 kip-ft	1.06		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.59	1.76	A	1	0.65	9	1	1	74.052	0.48	12.27	C
88.00-48.68			B	1	0.65		1	1	74.052			
			C	1	0.65		1	1	74.052			
L2 48.68-1.50	0.71	2.83	A	1	0.65	7	1	1	111.543	0.58	12.34	C
			B	1	0.65		1	1	111.543			
			C	1	0.65		1	1	111.543			
Sum Weight:	1.31	4.59						OTM	45.83 kip-ft	1.06		

Force Totals

Load Case	*Vertical Forces* *K*	*Sum of Forces X* *K*	*Sum of Forces Z* *K*	*Sum of Overturning Moments, M_x* *kip-ft*	*Sum of Overturning Moments, M_z* *kip-ft*	*Sum of Torques* *kip-ft*
Leg Weight	4.59					
Bracing Weight	0.00					
Total Member Self-Weight	4.59			-0.02	0.03	
Total Weight	7.93			-0.02	0.03	
Wind 0 deg - No Ice		0.00	-4.37	-276.88	0.03	0.00
Wind 30 deg - No Ice		2.18	-3.78	-239.79	-138.40	0.00
Wind 45 deg - No Ice		3.09	-3.09	-195.79	-195.74	0.00
Wind 60 deg - No Ice		3.78	-2.18	-138.45	-239.74	0.00
Wind 90 deg - No Ice		4.37	0.00	-0.02	-276.84	0.00
Wind 120 deg - No Ice		3.78	2.18	138.42	-239.74	0.00
Wind 135 deg - No Ice		3.09	3.09	195.76	-195.74	0.00
Wind 150 deg - No Ice		2.18	3.78	239.76	-138.40	0.00
Wind 180 deg - No Ice		0.00	4.37	276.85	0.03	0.00
Wind 210 deg - No Ice		-2.18	3.78	239.76	138.46	0.00
Wind 225 deg - No Ice		-3.09	3.09	195.76	195.81	0.00
Wind 240 deg - No Ice		-3.78	2.18	138.42	239.80	0.00
Wind 270 deg - No Ice		-4.37	0.00	-0.02	276.90	0.00
Wind 300 deg - No Ice		-3.78	-2.18	-138.45	239.80	0.00
Wind 315 deg - No Ice		-3.09	-3.09	-195.79	195.81	0.00
Wind 330 deg - No Ice		-2.18	-3.78	-239.79	138.46	0.00
Member Ice	5.94					
Total Weight Ice	22.09			-0.06	0.11	
Wind 0 deg - Ice		0.00	-1.58	-94.88	0.11	0.00
Wind 30 deg - Ice		0.79	-1.37	-82.18	-47.30	0.00
Wind 45 deg - Ice		1.12	-1.12	-67.11	-66.93	0.00
Wind 60 deg - Ice		1.37	-0.79	-47.47	-82.00	0.00
Wind 90 deg - Ice		1.58	0.00	-0.06	-94.70	0.00
Wind 120 deg - Ice		1.37	0.79	47.34	-82.00	0.00
Wind 135 deg - Ice		1.12	1.12	66.98	-66.93	0.00
Wind 150 deg - Ice		0.79	1.37	82.05	-47.30	0.00
Wind 180 deg - Ice		0.00	1.58	94.75	0.11	0.00
Wind 210 deg - Ice		-0.79	1.37	82.05	47.52	0.00
Wind 225 deg - Ice		-1.12	1.12	66.98	67.16	0.00
Wind 240 deg - Ice		-1.37	0.79	47.34	82.22	0.00
Wind 270 deg - Ice		-1.58	0.00	-0.06	94.93	0.00
Wind 300 deg - Ice		-1.37	-0.79	-47.47	82.22	0.00
Wind 315 deg - Ice		-1.12	-1.12	-67.11	67.16	0.00
Wind 330 deg - Ice		-0.79	-1.37	-82.18	47.52	0.00
Total Weight	7.93			-0.02	0.03	
Wind 0 deg - Service		0.00	-1.63	-103.13	0.03	0.00
Wind 30 deg - Service		0.81	-1.41	-89.31	-51.52	0.00
Wind 45 deg - Service		1.15	-1.15	-72.93	-72.88	0.00
Wind 60 deg - Service		1.41	-0.81	-51.57	-89.27	0.00
Wind 90 deg - Service		1.63	0.00	-0.02	-103.08	0.00
Wind 120 deg - Service		1.41	0.81	51.54	-89.27	0.00
Wind 135 deg - Service		1.15	1.15	72.89	-72.88	0.00
Wind 150 deg - Service		0.81	1.41	89.28	-51.52	0.00
Wind 180 deg - Service		0.00	1.63	103.09	0.03	0.00
Wind 210 deg - Service		-0.81	1.41	89.28	51.59	0.00
Wind 225 deg - Service		-1.15	1.15	72.89	72.94	0.00
Wind 240 deg - Service		-1.41	0.81	51.54	89.33	0.00
Wind 270 deg - Service		-1.63	0.00	-0.02	103.14	0.00
Wind 300 deg - Service		-1.41	-0.81	-51.57	89.33	0.00
Wind 315 deg - Service		-1.15	-1.15	-72.93	72.94	0.00
Wind 330 deg - Service		-0.81	-1.41	-89.31	51.59	0.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service

Comb. No.	Description
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 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	88 - 48.68	Pole	Max Tension	47	0.00	-0.00	-0.00
			Max. Compression	34	-15.50	0.12	0.07
			Max. Mx	26	-4.77	163.18	0.02
			Max. My	2	-4.77	0.04	163.16
			Max. Vy	26	-4.50	163.18	0.02
			Max. Vx	2	-4.50	0.04	163.16
			Max. Torque	4			0.00
L2	48.68 - 1.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	34	-23.93	0.12	0.07
			Max. Mx	26	-9.50	458.11	0.02
			Max. My	2	-9.50	0.04	458.09
			Max. Vy	26	-7.00	458.11	0.02
			Max. Vx	2	-7.00	0.04	458.09
			Max. Torque	20			-0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	47	23.93	1.58	0.00
	Max. H_x	26	9.51	6.98	0.00
	Max. H_z	2	9.51	0.00	6.98
	Max. M_x	2	458.09	0.00	6.98
	Max. M_z	10	458.03	-6.98	0.00
	Max. Torsion	4	0.00	-3.49	6.05
	Min. Vert	15	7.13	-4.94	-4.94
	Min. H_x	10	9.51	-6.98	0.00
	Min. H_z	18	9.51	0.00	-6.98
	Min. M_x	18	-458.05	0.00	-6.98
	Min. M_z	26	-458.11	6.98	0.00
	Min. Torsion	20	-0.00	3.49	-6.05

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

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	7.93	0.00	0.00	-0.02	0.03	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	9.51	0.00	-6.98	-458.09	0.04	-0.00
0.9 Dead+1.6 Wind 0 deg - No Ice	7.13	0.00	-6.98	-454.13	0.03	-0.00
1.2 Dead+1.6 Wind 30 deg - No Ice	9.51	3.49	-6.05	-396.72	-229.00	-0.00
0.9 Dead+1.6 Wind 30 deg - No Ice	7.13	3.49	-6.05	-393.29	-227.03	-0.00
1.2 Dead+1.6 Wind 45 deg - No Ice	9.51	4.94	-4.94	-323.93	-323.87	-0.00
0.9 Dead+1.6 Wind 45 deg - No Ice	7.13	4.94	-4.94	-321.13	-321.08	-0.00
1.2 Dead+1.6 Wind 60 deg - No Ice	9.51	6.05	-3.49	-229.06	-396.66	-0.00
0.9 Dead+1.6 Wind 60 deg - No Ice	7.13	6.05	-3.49	-227.07	-393.25	-0.00
1.2 Dead+1.6 Wind 90 deg - No Ice	9.51	6.98	0.00	-0.02	-458.03	-0.00
0.9 Dead+1.6 Wind 90 deg - No Ice	7.13	6.98	0.00	-0.02	-454.09	-0.00
1.2 Dead+1.6 Wind 120 deg - No Ice	9.51	6.05	3.49	229.01	-396.66	0.00
0.9 Dead+1.6 Wind 120 deg - No Ice	7.13	6.05	3.49	227.04	-393.25	0.00
1.2 Dead+1.6 Wind 135 deg - No Ice	9.51	4.94	4.94	323.88	-323.87	0.00
0.9 Dead+1.6 Wind 135 deg - No Ice	7.13	4.94	4.94	321.09	-321.08	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice	9.51	3.49	6.05	396.68	-229.00	0.00
0.9 Dead+1.6 Wind 150 deg - No Ice	7.13	3.49	6.05	393.26	-227.03	0.00
1.2 Dead+1.6 Wind 180 deg - No Ice	9.51	0.00	6.98	458.05	0.04	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	7.13	0.00	6.98	454.10	0.03	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice	9.51	-3.49	6.05	396.68	229.08	0.00
0.9 Dead+1.6 Wind 210 deg - No Ice	7.13	-3.49	6.05	393.26	227.09	0.00
1.2 Dead+1.6 Wind 225 deg - No Ice	9.51	-4.94	4.94	323.88	323.94	0.00
0.9 Dead+1.6 Wind 225 deg - No Ice	7.13	-4.94	4.94	321.09	321.14	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice	9.51	-6.05	3.49	229.01	396.74	0.00
0.9 Dead+1.6 Wind 240 deg - No Ice	7.13	-6.05	3.49	227.04	393.30	0.00
1.2 Dead+1.6 Wind 270 deg - No Ice	9.51	-6.98	0.00	-0.02	458.11	0.00
0.9 Dead+1.6 Wind 270 deg - No Ice	7.13	-6.98	0.00	-0.02	454.14	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice	9.51	-6.05	-3.49	-229.06	396.74	0.00
0.9 Dead+1.6 Wind 300 deg - No Ice	7.13	-6.05	-3.49	-227.07	393.30	0.00
1.2 Dead+1.6 Wind 315 deg - No Ice	9.51	-4.94	-4.94	-323.93	323.94	-0.00
0.9 Dead+1.6 Wind 315 deg - No Ice	7.13	-4.94	-4.94	-321.12	321.14	-0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.6 Wind 330 deg - No Ice	9.51	-3.49	-6.05	-396.72	229.07	-0.00
0.9 Dead+1.6 Wind 330 deg - No Ice	7.13	-3.49	-6.05	-393.29	227.09	-0.00
1.2 Dead+1.0 Ice+1.0 Temp	23.93	0.00	0.00	-0.07	0.12	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	23.93	-0.00	-1.58	-106.20	0.14	-0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	23.93	0.79	-1.37	-91.98	-52.91	-0.00
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	23.93	1.12	-1.12	-75.12	-74.89	-0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	23.93	1.37	-0.79	-53.14	-91.75	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	23.93	1.58	-0.00	-0.08	-105.97	-0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	23.93	1.37	0.79	52.97	-91.75	0.00
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	23.93	1.12	1.12	74.95	-74.89	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	23.93	0.79	1.37	91.81	-52.91	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	23.93	-0.00	1.58	106.03	0.14	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	23.93	-0.79	1.37	91.81	53.20	0.00
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	23.93	-1.12	1.12	74.95	75.18	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	23.93	-1.37	0.79	52.97	92.04	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	23.93	-1.58	-0.00	-0.08	106.26	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	23.93	-1.37	-0.79	-53.14	92.04	0.00
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	23.93	-1.12	-1.12	-75.12	75.18	-0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	23.93	-0.79	-1.37	-91.98	53.20	-0.00
Dead+Wind 0 deg - Service	7.93	0.00	-1.63	-106.09	0.03	-0.00
Dead+Wind 30 deg - Service	7.93	0.81	-1.41	-91.88	-53.00	-0.00
Dead+Wind 45 deg - Service	7.93	1.15	-1.15	-75.02	-74.97	-0.00
Dead+Wind 60 deg - Service	7.93	1.41	-0.81	-53.05	-91.83	-0.00
Dead+Wind 90 deg - Service	7.93	1.63	0.00	-0.02	-106.04	-0.00
Dead+Wind 120 deg - Service	7.93	1.41	0.81	53.02	-91.83	0.00
Dead+Wind 135 deg - Service	7.93	1.15	1.15	74.98	-74.97	0.00
Dead+Wind 150 deg - Service	7.93	0.81	1.41	91.84	-53.00	0.00
Dead+Wind 180 deg - Service	7.93	0.00	1.63	106.05	0.03	0.00
Dead+Wind 210 deg - Service	7.93	-0.81	1.41	91.84	53.07	0.00
Dead+Wind 225 deg - Service	7.93	-1.15	1.15	74.98	75.04	0.00
Dead+Wind 240 deg - Service	7.93	-1.41	0.81	53.02	91.89	0.00
Dead+Wind 270 deg - Service	7.93	-1.63	0.00	-0.02	106.10	0.00
Dead+Wind 300 deg - Service	7.93	-1.41	-0.81	-53.05	91.89	0.00
Dead+Wind 315 deg - Service	7.93	-1.15	-1.15	-75.02	75.04	-0.00
Dead+Wind 330 deg - Service	7.93	-0.81	-1.41	-91.88	53.07	-0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-7.93	0.00	0.00	7.93	0.00	0.000%
2	0.00	-9.51	-6.98	0.00	9.51	6.98	0.000%
3	0.00	-7.13	-6.98	0.00	7.13	6.98	0.000%
4	3.49	-9.51	-6.05	-3.49	9.51	6.05	0.000%
5	3.49	-7.13	-6.05	-3.49	7.13	6.05	0.000%
6	4.94	-9.51	-4.94	-4.94	9.51	4.94	0.000%
7	4.94	-7.13	-4.94	-4.94	7.13	4.94	0.000%
8	6.05	-9.51	-3.49	-6.05	9.51	3.49	0.000%
9	6.05	-7.13	-3.49	-6.05	7.13	3.49	0.000%
10	6.98	-9.51	0.00	-6.98	9.51	0.00	0.000%
11	6.98	-7.13	0.00	-6.98	7.13	0.00	0.000%
12	6.05	-9.51	3.49	-6.05	9.51	-3.49	0.000%
13	6.05	-7.13	3.49	-6.05	7.13	-3.49	0.000%
14	4.94	-9.51	4.94	-4.94	9.51	-4.94	0.000%
15	4.94	-7.13	4.94	-4.94	7.13	-4.94	0.000%
16	3.49	-9.51	6.05	-3.49	9.51	-6.05	0.000%
17	3.49	-7.13	6.05	-3.49	7.13	-6.05	0.000%
18	0.00	-9.51	6.98	0.00	9.51	-6.98	0.000%
19	0.00	-7.13	6.98	0.00	7.13	-6.98	0.000%
20	-3.49	-9.51	6.05	3.49	9.51	-6.05	0.000%
21	-3.49	-7.13	6.05	3.49	7.13	-6.05	0.000%
22	-4.94	-9.51	4.94	4.94	9.51	-4.94	0.000%
23	-4.94	-7.13	4.94	4.94	7.13	-4.94	0.000%
24	-6.05	-9.51	3.49	6.05	9.51	-3.49	0.000%
25	-6.05	-7.13	3.49	6.05	7.13	-3.49	0.000%
26	-6.98	-9.51	0.00	6.98	9.51	0.00	0.000%
27	-6.98	-7.13	0.00	6.98	7.13	0.00	0.000%
28	-6.05	-9.51	-3.49	6.05	9.51	3.49	0.000%
29	-6.05	-7.13	-3.49	6.05	7.13	3.49	0.000%
30	-4.94	-9.51	-4.94	4.94	9.51	4.94	0.000%
31	-4.94	-7.13	-4.94	4.94	7.13	4.94	0.000%
32	-3.49	-9.51	-6.05	3.49	9.51	6.05	0.000%
33	-3.49	-7.13	-6.05	3.49	7.13	6.05	0.000%
34	0.00	-23.93	0.00	0.00	23.93	0.00	0.000%
35	0.00	-23.93	-1.58	0.00	23.93	1.58	0.000%
36	0.79	-23.93	-1.37	-0.79	23.93	1.37	0.000%
37	1.12	-23.93	-1.12	-1.12	23.93	1.12	0.000%
38	1.37	-23.93	-0.79	-1.37	23.93	0.79	0.000%
39	1.58	-23.93	0.00	-1.58	23.93	0.00	0.000%
40	1.37	-23.93	0.79	-1.37	23.93	-0.79	0.000%
41	1.12	-23.93	1.12	-1.12	23.93	-1.12	0.000%
42	0.79	-23.93	1.37	-0.79	23.93	-1.37	0.000%
43	0.00	-23.93	1.58	0.00	23.93	-1.58	0.000%
44	-0.79	-23.93	1.37	0.79	23.93	-1.37	0.000%
45	-1.12	-23.93	1.12	1.12	23.93	-1.12	0.000%
46	-1.37	-23.93	0.79	1.37	23.93	-0.79	0.000%
47	-1.58	-23.93	0.00	1.58	23.93	0.00	0.000%
48	-1.37	-23.93	-0.79	1.37	23.93	0.79	0.000%
49	-1.12	-23.93	-1.12	1.12	23.93	1.12	0.000%
50	-0.79	-23.93	-1.37	0.79	23.93	1.37	0.000%
51	0.00	-7.93	-1.63	0.00	7.93	1.63	0.000%
52	0.81	-7.93	-1.41	-0.81	7.93	1.41	0.000%
53	1.15	-7.93	-1.15	-1.15	7.93	1.15	0.000%
54	1.41	-7.93	-0.81	-1.41	7.93	0.81	0.000%
55	1.63	-7.93	0.00	-1.63	7.93	0.00	0.000%
56	1.41	-7.93	0.81	-1.41	7.93	-0.81	0.000%
57	1.15	-7.93	1.15	-1.15	7.93	-1.15	0.000%
58	0.81	-7.93	1.41	-0.81	7.93	-1.41	0.000%
59	0.00	-7.93	1.63	0.00	7.93	-1.63	0.000%
60	-0.81	-7.93	1.41	0.81	7.93	-1.41	0.000%
61	-1.15	-7.93	1.15	1.15	7.93	-1.15	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
62	-1.41	-7.93	0.81	1.41	7.93	-0.81	0.000%
63	-1.63	-7.93	0.00	1.63	7.93	0.00	0.000%
64	-1.41	-7.93	-0.81	1.41	7.93	0.81	0.000%
65	-1.15	-7.93	-1.15	1.15	7.93	1.15	0.000%
66	-0.81	-7.93	-1.41	0.81	7.93	1.41	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	0.00011353
3	Yes	4	0.00000001	0.00003284
4	Yes	5	0.00000001	0.00021601
5	Yes	5	0.00000001	0.00010014
6	Yes	5	0.00000001	0.00024424
7	Yes	5	0.00000001	0.00011229
8	Yes	5	0.00000001	0.00021612
9	Yes	5	0.00000001	0.00010018
10	Yes	4	0.00000001	0.00011342
11	Yes	4	0.00000001	0.00003278
12	Yes	5	0.00000001	0.00021598
13	Yes	5	0.00000001	0.00010013
14	Yes	5	0.00000001	0.00024415
15	Yes	5	0.00000001	0.00011226
16	Yes	5	0.00000001	0.00021595
17	Yes	5	0.00000001	0.00010012
18	Yes	4	0.00000001	0.00011349
19	Yes	4	0.00000001	0.00003283
20	Yes	5	0.00000001	0.00021619
21	Yes	5	0.00000001	0.00010020
22	Yes	5	0.00000001	0.00024431
23	Yes	5	0.00000001	0.00011232
24	Yes	5	0.00000001	0.00021608
25	Yes	5	0.00000001	0.00010016
26	Yes	4	0.00000001	0.00011349
27	Yes	4	0.00000001	0.00003280
28	Yes	5	0.00000001	0.00021622
29	Yes	5	0.00000001	0.00010021
30	Yes	5	0.00000001	0.00024440
31	Yes	5	0.00000001	0.00011235
32	Yes	5	0.00000001	0.00021625
33	Yes	5	0.00000001	0.00010022
34	Yes	4	0.00000001	0.00000001
35	Yes	5	0.00000001	0.00020486
36	Yes	5	0.00000001	0.00023953
37	Yes	5	0.00000001	0.00025015
38	Yes	5	0.00000001	0.00023953
39	Yes	5	0.00000001	0.00020406
40	Yes	5	0.00000001	0.00023887
41	Yes	5	0.00000001	0.00024945
42	Yes	5	0.00000001	0.00023887
43	Yes	5	0.00000001	0.00020428
44	Yes	5	0.00000001	0.00024001
45	Yes	5	0.00000001	0.00025066
46	Yes	5	0.00000001	0.00024001

47	Yes	5	0.00000001	0.00020507
48	Yes	5	0.00000001	0.00024067
49	Yes	5	0.00000001	0.00025137
50	Yes	5	0.00000001	0.00024067
51	Yes	4	0.00000001	0.00000001
52	Yes	4	0.00000001	0.00008155
53	Yes	4	0.00000001	0.00009414
54	Yes	4	0.00000001	0.00008169
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00008150
57	Yes	4	0.00000001	0.00009400
58	Yes	4	0.00000001	0.00008146
59	Yes	4	0.00000001	0.00000001
60	Yes	4	0.00000001	0.00008179
61	Yes	4	0.00000001	0.00009423
62	Yes	4	0.00000001	0.00008165
63	Yes	4	0.00000001	0.00000001
64	Yes	4	0.00000001	0.00008183
65	Yes	4	0.00000001	0.00009437
66	Yes	4	0.00000001	0.00008187

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	88 - 48.68	9.045	64	0.8708	0.0000
L2	52.32 - 1.5	3.430	64	0.6008	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
113.00	APXVAALL24-43	64	9.045	0.8708	0.0000	27485
104.50	SBNH-1D6565B	64	9.045	0.8708	0.0000	27485
103.00	10'x30" Canister	64	9.045	0.8708	0.0000	27485
94.00	DMP65R-BU4D	64	9.045	0.8708	0.0000	27485
93.00	10'x 42" Canister	64	9.045	0.8708	0.0000	27485

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	88 - 48.68	39.066	26	3.7610	0.0000
L2	52.32 - 1.5	14.820	26	2.5967	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
113.00	APXVAALL24-43	26	39.066	3.7610	0.0000	6402
104.50	SBNH-1D6565B	26	39.066	3.7610	0.0000	6402
103.00	10'x30" Canister	26	39.066	3.7610	0.0000	6402
94.00	DMP65R-BU4D	26	39.066	3.7610	0.0000	6402
93.00	10'x 42" Canister	26	39.066	3.7610	0.0000	6402

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	88 - 48.68 (1)	TP25.07x19.5x0.1875	39.32	86.50	120.0	14.5013	-4.77	227.51	0.021
L2	48.68 - 1.5 (2)	TP31.25x24.1794x0.1875	50.82	86.50	94.1	18.4861	-9.50	469.50	0.020

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	88 - 48.68 (1)	TP25.07x19.5x0.1875	163.18	499.45	0.327	0.00	499.45	0.000
L2	48.68 - 1.5 (2)	TP31.25x24.1794x0.1875	458.12	734.28	0.624	0.00	734.28	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	88 - 48.68 (1)	TP25.07x19.5x0.1875	4.50	498.31	0.009	0.00	1001.28	0.000
L2	48.68 - 1.5 (2)	TP31.25x24.1794x0.1875	7.00	573.74	0.012	0.00	1471.69	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

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	88 - 48.68 (1)	0.021	0.327	0.000	0.009	0.000	0.348 ✔	1.000	4.8.2 ✔
L2	48.68 - 1.5 (2)	0.020	0.624	0.000	0.012	0.000	0.644 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	88 - 48.68	Pole	TP25.07x19.5x0.1875	1	-4.77	227.51	34.8	Pass
L2	48.68 - 1.5	Pole	TP31.25x24.1794x0.1875	2	-9.50	469.50	64.4	Pass
							Summary	
						Pole (L2)	64.4	Pass
						RATING =	**64.4**	**Pass**

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Subject:	Anchor Bolt and Baseplate Analysis
Location:	118-FT Flagepole Simsbury, CT
Rev. 0: 7/14/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21005.34

Anchor Bolt and Base Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	$OM := 458 \cdot ft \cdot kips$	(Input From tnxTower)
Shear Force =	$Shear := 7 \cdot kips$	(Input From tnxTower)
Axial Force =	$Axial := 10 \cdot kips$	(Input From tnxTower)

Anchor Bolt Data:

ASTMA615 Grade 75

Number of Anchor Bolts =	$N := 4$	(User Input)
Bolt "Column" Distance =	$l := 3.0 \cdot in$	(User Input)
Bolt Ultimate Strength =	$F_u := 100 \cdot ksi$	(User Input)
Bolt Yield Strength =	$F_y := 75 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Anchor Bolts =	$D := 2.25 \cdot in$	(User Input)
Threads per Inch =	$n := 4.5$	(User Input)
Top of Concrete to Bot Leveling Nut =	$l_{ar} := 2 \cdot in$	(User Input)

Base Plate Data:

Use AST MA572 Grade 60

Plate Yield Strength =	$Fy_{bp} := 60 \cdot ksi$	(User Input)
Base Plate Thickness =	$t_{bp} := 1.5 \cdot in$	(User Input)
Base Plate Diameter =	$D_{bp} := 45 \cdot in$	(User Input)
Outer Pole Diameter =	$D_{pole} := 31.25 \cdot in$	(User Input)
	$\eta := 0.5$	per TIA-222-G Section 4.9.9

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

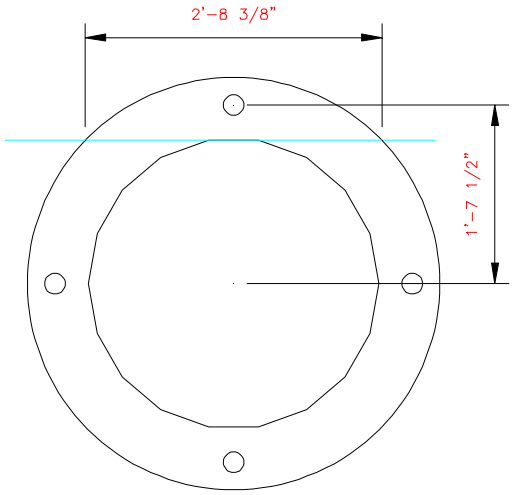
$d_1 := 19.5in$ $d_2 := 0in$ (User Input)

Critical Distances For Bending in Plate:

(User Input)

$ma_1 := 3.875in$

Effective Width of Baseplate for Bending = $B_{eff} := 0.8 \cdot 32.875in = 26.3 \cdot in$ (User Input)



Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Polar Moment of Inertia = $I_p := \left[\left(d_1\right)^2 \cdot 2 + \left(d_2\right)^2 \cdot 2 \right] = 760.5 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 3.976 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 = 3.248 \cdot in^2$

Net Diameter = $D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 2.033 \cdot in$

Radius of Gyration of Bolt = $r := \frac{D_n}{4} = 0.508 \cdot in$

Section Modulus of Bolt = $S_x := \frac{\pi \cdot D_n^3}{32} = 0.826 \cdot in^3$

Tensile Root Diameter = $d_{rt} := D - \frac{0.9743 \cdot in}{n} = 2.033 \cdot in$

Plastic Section Modulus = $Z := \frac{d_{rt}^3}{6} = 1.401 \cdot in^3$

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := OM \cdot \frac{d_1}{I_p} - \frac{Axial}{N} = 138.4 \cdot kips$

Maximum Compressive Force = $P_u := OM \cdot \frac{d_1}{I_p} + \frac{Axial}{N} = 143.4 \cdot kips$

Maximum Shear Force = $V_u := \frac{Shear}{N} = 1.8 \cdot kips$

Design Tensile Strength = $\Phi R_{nt} := 0.8 \cdot F_u \cdot A_n = 259.815 \cdot k$

Bolt % of Capacity = $\frac{\left(P_u + \frac{V_u}{\eta}\right)}{\Phi R_{nt}} \cdot 100 = 56.5$

Condition1 = $Condition1 := if\left[\frac{\left(P_u + \frac{V_u}{\eta}\right)}{\Phi R_{nt}} \le 1.00, "OK", "Overstressed"\right]$

Condition1 = "OK"

Base Plate Analysis:

Force from Bolts =

$$C_1 := \frac{OM \cdot d_1}{I_p} + \frac{Axial}{N} = 143.423 \cdot kips$$

Applied Bending Stress in Plate =

$$f_{bp} := \frac{4 \cdot \left(1 \cdot C_1 \cdot ma_1\right)}{B_{eff} \, t_{bp}^{\,2}} = 37.57 \cdot ksi$$

Allowable Bending Stress in Plate =

$$F_{bp} := 0.9 \cdot Fy_{bp} = 54 \cdot ksi$$

Plate Bending Stress % of Capacity =

$$\frac{f_{bp}}{F_{bp}} = 69.6 \cdot \%$$

Condition2= =

$$Condition2 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$$

Condition2 = "Ok"

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Subject: FOUNDATION ANALYSIS

Location: 118-ft Flagpole
Simsbury, CT

Rev. 0: 7/14/21

Prepared by: T.J.L Checked by: C.F.C.
Job no. 21005.34

Standard Monopole Foundation:

Input Data:

Tower Data

Overturning Moment =	$OM := 458 \cdot ft \cdot kips$	(User Input)	
Shear Force =	$Shear := 7 \cdot kip$	(User Input)	
Axial Force =	$Axial := 10 \cdot kip$	(User Input)	
Tower Height =	$H_t := 118 \cdot ft$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 6.5 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 4.5 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 1.0 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 5.0 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 3.0 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 12.5 \cdot ft$	(User Input)	

Anchor Bolt Data:

Length of Anchor Bolts=	$L_{st} := 96 \cdot in$	(User Input)	
Projection of Anchor Bolts Above Pier =	$A_{BP} := 12.0 \cdot in$	(User Input)	
Anchor Bolt Diameter =	$d_{anchor} := 2.25 \cdot in$	(User Input)	
Base Plate Bolt Circle =	$MP := 39 \cdot in$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 4000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Anchor Bolt Yield Strength =	$f_{ya} := 75000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Ultimate Soil Bearing Capacity =	$q_u := 4000 \cdot psf$	(User Input)	
Allowable Soil Bearing Capacity =	$q_a := \frac{q_u}{2} = 2000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 100 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Pier Reinforcement:

Bar Size =	$BS_{pier} := 8$	(User Input)	
Bar Diameter =	$d_{bpier} := 1.00 \cdot in$	(User Input)	
Number of Bars =	$NB_{pier} := 24$	(User Input)	
Clear Cover of Reinforcement =	$Cvr_{pier} := 3 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Diameter of Tie =	$d_{Tie} := 0.5 \cdot in$	(User Input)	

Pad Reinforcement:

Bar Size =	$BS_{top} := 8$	(User Input)	(Top of Pad)
Bar Diameter =	$d_{btop} := 1.00 \cdot in$	(User Input)	(Top of Pad)
Number of Bars =	$NB_{top} := 13$	(User Input)	(Top of Pad)
Bar Size =	$BS_{bot} := 8$	(User Input)	(Bottom of Pad)
Bar Diameter =	$d_{bbot} := 1.00 \cdot in$	(User Input)	(Bottom of Pad)
Number of Bars =	$NB_{bot} := 13$	(User Input)	(Bottom of Pad)
Clear Cover of Reinforcement =	$Cvr_{pad} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Pier Reinforcement Bar Area =

$$A_{bpier} := \frac{\pi \cdot d_{bpier}^{2}}{4} = 0.785 \cdot in^{2}$$

Pad Top Reinforcement Bar Area =

$$A_{btop} := \frac{\pi \cdot d_{btop}^{2}}{4} = 0.785 \cdot in^{2}$$

Pad Bottom Reinforcement Bar Area =

$$A_{bbot} := \frac{\pi \cdot d_{bbot}^{2}}{4} = 0.785 \cdot in^{2}$$

Coefficient of Lateral Soil Pressure =

$$K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$$

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 150 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 100 \cdot pcf$

Passive Pressure = $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p} = 0 \cdot ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 1.05 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 1.05 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 1.95 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.5 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 3$

$A_p := W_f \cdot T_p = 37.5$

Ultimate Shear = $S_u := P_{ave} \cdot A_p = 56.25 \cdot kip$

Weight of Concrete Pad = $WT_c := \left[\left(W_f^2 \cdot T_f\right) + d_p^2 L_p\right] \cdot \gamma_c = 87.188 \cdot kip$

Weight of Soil Above Footing = $WT_{s1} := \left[\left(W_f^2 - d_p^2\right) \cdot \left(\left|L_p - L_{pag} - n\right|\right)\right] \cdot \gamma_s = 45.94 \cdot kip$

Weight of Soil Wedge at Back Face = $WT_{s2} := \left(\frac{D_f^2 \cdot \tan(\Phi_s)}{2} \cdot W_f\right) \cdot \gamma_s = 15.246 \cdot kip$

Weight of Soil Wedge at back face Corners = $WT_{s3} := 2 \cdot \left[\left(D_f\right)^3 \cdot \frac{\tan(\Phi_s)}{3}\right] \cdot \gamma_s = 10.57 \cdot kips$

Total Weight = $WT_{tot} := WT_c + WT_{s1} + Axial = 143.125 \cdot kip$

Resisting Weight = $WT_R := 0.9 \cdot WT_c + 0.75 \cdot WT_{s1} + 0.75 \cdot Axial = 120.422 \cdot kip$

Resisting Moment = $M_r := \left(WT_R\right) \cdot \frac{W_f}{2} + 0.75 \cdot S_u \cdot \frac{T_f}{3} + 0.75 \cdot \left[\left(WT_{s2} + WT_{s3}\right) \cdot \left(W_f + \frac{D_f \cdot \tan(\Phi_s)}{3}\right)\right] = 1061 \cdot kip \cdot ft$

Overturning Moment = $M_{ot} := OM + Shear \cdot \left(L_p + T_f\right) = 511 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 2.08$

Factor of Safety Required = $FS_{req} := 1$

$OverTurning\_Moment\_Check := if(FS \geq FS_{req}, "Okay", "No Good")$

$OverTurning\_Moment\_Check = "Okay"$

Shear Capacity in Pier:

Shear Resistance of Pier = $S_p := \frac{P_{ave} \cdot A_p + \mu \cdot WT_{tot}}{FS_{req}} = 120.656 \cdot kips$

$Shear\_Check := if(S_p > Shear, "Okay", "No Good")$

Shear_Check = "Okay"

Bearing Pressure Caused by Footing:

Area of the Mat = $A_{mat} := W_f^{\,2} = 156.25$

Section Modulus of Mat = $S := \frac{W_f^{\,3}}{6} = 325.52 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{WT_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 2.484 \cdot ksf$

$Max\_Pressure\_Check := if(P_{max} < .75 \cdot q_u, "Okay", "No Good")$

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat = $P_{min} := \frac{WT_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.652 \cdot ksf$

$Min\_Pressure\_Check := if\left[(P_{min} \geq 0) \cdot (P_{min} < .75 \cdot q_u), "Okay", "No Good"\right]$

Min_Pressure_Check = "No Good"

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 3.3$

Distance to Kern = $X_k := \frac{W_f}{6} = 2.083$

Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity = $e := \frac{M_{ot}}{WT_{tot}} = 3.567$

Adjusted Soil Pressure = $P_a := \frac{2 \cdot WT_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} = 2.845 \cdot ksf$

$q_{adj} := if(P_{min} < 0, P_a, P_{max}) = 2.845 \cdot ksf$

$Pressure\_Check := if(q_{adj} < .75 \cdot q_u, "Okay", "No Good")$

Pressure_Check = "Okay"

Concrete Bearing Capacity:

Strength Reduction Factor = $\Phi_c := 0.65$ (ACI-2008 9.3.2.2)

Bearing Strength Between Pier and Pad = $P_b := \Phi_c \cdot 0.85 \cdot f_c \cdot \frac{\pi \cdot d_p^2}{4} = 6.249 \times 10^3 \cdot kips$ (ACI-2008 10.14)

$Bearing\_Check := if(P_b > Axial, "Okay", "No Good")$

Bearing_Check = "Okay"

Shear Strength of Concrete:

Beam Shear: (Critical section located at a distance d from the face of Pier) (ACI 11.3.1.1)

$\phi_c := 0.85$ (ACI 9.3.2.5)

$d := T_f - Cvr_{pad} - d_{bbot} = 2.667$

$d_1 := \frac{W_f}{2} - \frac{d_p}{2}$

$d_2 := d_1 - d$

$L := \left(\frac{W_f}{2} - e\right) \cdot 3$

$Slope := if\left(L > W_f, \frac{P_{max} - P_{min}}{W_f}, \frac{q_{adj}}{L}\right)$

$V_{req} := \left[\left(q_{adj} - Slope \cdot d_1\right) + \left(\frac{Slope \cdot d_1}{2}\right)\right] \cdot W_f \cdot d_1$

$V_{Avail} := \phi_c \cdot 2 \cdot \sqrt{f_c \cdot psi} \cdot W_f \cdot d$ (ACI-2008 11.2.1.1)

$Beam\_Shear\_Check := if(V_{req} < V_{Avail}, "Okay", "No Good")$

Beam_Shear_Check = "Okay"

Punching Shear: (Critical Section Located at a distance of d/2 from the face of pier) (ACI 11.11.1.2)

Critical Perimeter of Punching Shear = $b_o := (d_p + d) \cdot \pi = 24.1$

Area Included Inside Perimeter = $A_{bo} := \frac{\pi \cdot (d_p + d)^2}{4} = 46.2$

Area Outside of Perimeter = $A_{out} := A_{mat} - A_{bo} = 110.1$

Guess Value = $v_u := 1ksf$

(From "Foundation Analysis and design", By Joseph Bowles, Eq. 8-9)

Given $d^2 + d_p \cdot d = \frac{WT_{tot}}{\pi \cdot v_u}$

$v_u := \text{Find}(v_u) = 2.2 \cdot ksf$

$V_u := v_u \cdot d \cdot W_f = 74.3 \cdot kips$

Required Shear Strength = $V_{req} := V_u = 74.3 \cdot kips$

Available Shear Strength = $V_{Avail} := \phi_c \cdot 4 \cdot \sqrt{f_c \cdot psi} \cdot b_o \cdot d = 1988.8 \cdot kip$ (ACI-2008 11.11.2.1)

$Punching\_Shear\_Check := \text{if}(V_{req} < V_{Avail}, \text{"Okay"}, \text{"No Good"})$

Punching_Shear_Check = "Okay"

Steel Reinforcement in Pad:

Required Reinforcement for Bending:

Strength Reduction Factor = $\phi_m := .90$ (ACI-2008 9.3.2.1)

$q_b := q_{adj} - d_1 \cdot Slope = 1.52 \cdot ksf$

Maximum Bending at Face of Pier = $M_n := \frac{1}{\phi_m} \cdot \left[\left(q_{adj} - q_b \right) \cdot \frac{d_1^2}{3} + q_b \cdot \frac{d_1^2}{2} \right] \cdot W_f = 234.7 \cdot kip \cdot ft$

$$\beta := \begin{cases} 0.85 & \text{if } 2500 \cdot psi \le f_c \le 4000 \cdot psi \\ 0.65 & \text{if } f_c > 8000 \cdot psi \\ \left[\left[0.85 - \left[\frac{\left(\frac{f_c}{psi} - 4000 \right)}{1000} \right] \cdot 0.5 \right] \right] & \text{otherwise} \end{cases} = 0.85$$

(ACI-200810.2.7.3)

$R_n := \frac{M_n}{W_f \cdot d^2} = 18.3 \cdot psi$

$\rho := \frac{0.85 \cdot f_c}{f_y} \left(1 - \sqrt{1 - \frac{2 \cdot R_n}{0.85 \cdot f_c}} \right) = 0.0003$

$\rho_{min} := \rho = 0.00031$

Required Reinforcement for Temperature and Shrinkage:

$$\rho_{sh} := \begin{cases} .0018 & \text{if } f_y \geq 60000 \cdot psi \\ .0020 & \text{otherwise} \end{cases}$$ (ACI-2008 7.12.2.1)

Check Bottom Bars:

$$As := \begin{cases} \rho_{min} \cdot W_f \cdot d & \text{if } \rho_{min} > \frac{\rho_{sh}}{2} \\ \rho_{sh} \cdot W_f \cdot \frac{d}{2} & \text{otherwise} \end{cases} = 4.32 \cdot in^2$$

$As_{prov} := A_{bbot} \cdot NB_{bot} = 10.2 \cdot in^2$

$Pad\_Reinforcement\_Bot := if(As_{prov} > As, "Okay", "No Good")$

Pad_Reinforcement_Bot = "Okay"

Check top Bars:

$As := \rho_{sh} \cdot \left(W_f \cdot \frac{d}{2}\right) = 4.3 \cdot in^2$

$As_{prov} := A_{btop} \cdot NB_{top} = 10.2 \cdot in^2$

$Pad\_Reinforcement\_Top := if(As_{prov} > As, "Okay", "No Good")$

Pad_Reinforcement_Top = "Okay"

Developement Length Pad Reinforcement:

Bar Spacing =

$$B_{sPad} := \frac{W_f - 2 \cdot Cvr_{pad} - NB_{bot} \cdot d_{bbot}}{NB_{bot} - 1} = 10.92 \cdot in$$

Spacing or Cover Dimension =

$$c := if\left(Cvr_{pad} < \frac{B_{sPad}}{2}, Cvr_{pad}, \frac{B_{sPad}}{2}\right) = 3 \cdot in$$

Transverse Reinforcement Index =

$k_{tr} := 0$ (ACI-2008 12.2.3)

$$L_{dbt} := \frac{3 \cdot f_y \alpha_{pad} \cdot \beta_{pad} \cdot \gamma_{pad} \cdot \lambda_{pad}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \frac{c + k_{tr}}{d_{bbot}}} \cdot d_{bbot} = 23.7 \cdot in$$

Minimum Development Length =

$L_{dbmin} := 12 \cdot in$ (ACI-2008 12.2.1)

$L_{dbtCheck} := if(L_{dbt} \geq L_{dbmin}, "Use L.dbt", "Use L.dbmin")$

Available Length in Pad =

$$L_{Pad} := \frac{W_f}{2} - \frac{d_p}{2} - Cvr_{pad} = 42 \cdot in$$

$Lpad\_Check := if(L_{Pad} > L_{dbt}, "Okay", "No Good")$

Lpad_Check = "Okay"

Steel Reinforcement in Pier:

Area of Pier = $A_p := d_p^2 = 3600 \cdot in^2$

$A_{smin} := 0.01 \cdot 0.5 \cdot A_p = 18 \cdot in^2$ (ACI-2008 10.8.4 & 10.9.1)

$A_{sprov} := NB_{pier} \cdot A_{bpier} = 18.85 \cdot in^2$

$Steel\_Area\_Check := if\left(A_{sprov} > A_{smin}, "Okay", "No Good"\right)$

Steel_Area_Check = "Okay"

NOTE: Anchor Bolts are not accounted for in reinforcement calculation and will provide additional reinforcement to satisfy minimum requirement of steel.

Bar Spacing In Pier = $B_{sPier} := \frac{d_p \cdot \pi}{NB_{pier}} - d_{bpier} = 6.854 \cdot in$

Diameter of Reinforcement Cage = $Diam_{cage} := d_p - 2 \cdot Cvr_{pier} = 54 \cdot in$

Maximum Moment in Pier = $M_p := \left[OM + Shear \cdot \left(L_p + \frac{A_{BP}}{2}\right)\right] = 5916 \cdot in \cdot kips$

Pier Check evaluated from outside program and results are listed below;

$\left(D \;\; N \;\; n \;\; P_u \;\; M_{xu}\right) := \left(d_p \cdot 12 \;\; NB_{pier} \;\; BS_{pier} \;\; \frac{Axial \cdot 1.333}{kips} \;\; \frac{M_p}{in \cdot kips}\right)$

$\left(D \;\; N \;\; n \;\; P_u \;\; M_{xu}\right) = (60 \;\; 24 \;\; 8 \;\; 13.3 \;\; 5916)$

$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) := (0 \;\; 0 \;\; 0 \;\; 0)$

$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) := \phi P'_n\left(D, N, n, P_u, M_{xu}\right)^T$

$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) = (58.1 \;\; 25787.3 \;\; -60 \;\; 0)$

$Axial\_Load\_Check := if\left(\phi P_n \geq P_u, "Okay", "No Good"\right)$

Axial_Load_Check = "Okay"

$Bending\_Check := if\left(\phi M_{xn} \geq M_{xu}, "Okay", "No Good"\right)$

Bending_Check = "Okay"

Development Length Pier Reinforcement:

Available Length in Foundation:

$L_{pier} := L_p - Cvr_{pier} = 51 \cdot in$

$L_{pad} := T_f - Cvr_{pad} = 33 \cdot in$

Tension: (ACI-2008 12.2.3)

Spacing or Cover Dimension =

$c := if\left(Cvr_{pier} < \frac{B_{sPier}}{2}, Cvr_{pier}, \frac{B_{sPier}}{2}\right) = 3 \cdot in$

Transverse Reinforcement =

$k_{tr} := 0$ (ACI-2008 12.2.3)

$L_{dbt} := \frac{3 \cdot f_y \cdot \alpha_{pier} \cdot \beta_{pier} \cdot \gamma_{pier} \cdot \lambda_{pier}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \left(\frac{c + k_{tr}}{d_{bpier}}\right)} \cdot d_{bpier} = 23.72 \cdot in$

Minimum Development Length =

$L_{dh} := \frac{1200 \cdot d_{bpier}}{\sqrt{\frac{f_c}{psi}}} \cdot .7 = 13.282 \cdot in$ (ACI 12.2.1)

Pier reinforcement bars are standard 90 degree hooks and therefore developement in the pad is computed as follows:

$L_{db} := \max\left(L_{dbt}, L_{dbmin}\right)$

$L_{tension\_Check} := if\left(L_{pier} + L_{pad} > L_{dbt}, "Okay", "No Good"\right)$

$L_{tension\_Check} = "Okay"$

Compression: (ACI-2008 12.3.2)

$L_{dbc1} := \frac{.02 \cdot d_{bpier} \cdot f_y}{\sqrt{f_c \cdot psi}} = 18.974 \cdot in$

$L_{dbmin} := 0.0003 \cdot \frac{in^2}{lb} \cdot \left(d_{bpier} \cdot f_y\right) = 18 \cdot in$

$L_{dbc} := if\left(L_{dbc1} \geq L_{dbmin}, L_{dbc1}, L_{dbmin}\right) = 18.974 \cdot in$

$L_{compression\_Check} := if\left(L_{pier} + L_{pad} > L_{dbc}, "Okay", "No Good"\right)$

$L_{compression\_Check} = "Okay"$

RAN Template:	A&L Template:
67E5A998E 6160	67E5998E_1xAIR+1OP+1QP

CT11975A_Sprint Retain_1_draft

Print Name: Standard

Section 1 - Site Information

Site ID: CT11975A
Status: Draft
Version: 1
Project Type: Sprint Retain
Approved: Not Approved
Approved By: Not Approved
Last Modified: 6/15/2021 9:26:23 AM
Last Modified By: ANKIT.JAISWAL20@T-Mobile.com

Site Name: CT11975A
Site Class: Roof Top Mount
Site Type: Building
Plan Year: 2021
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Not Specified

Latitude: 41.81813060
Longitude: -72.86304170
Address: 498 Bushy Hill Rd
City, State: Simsbury, CT
Region: NORTHEAST

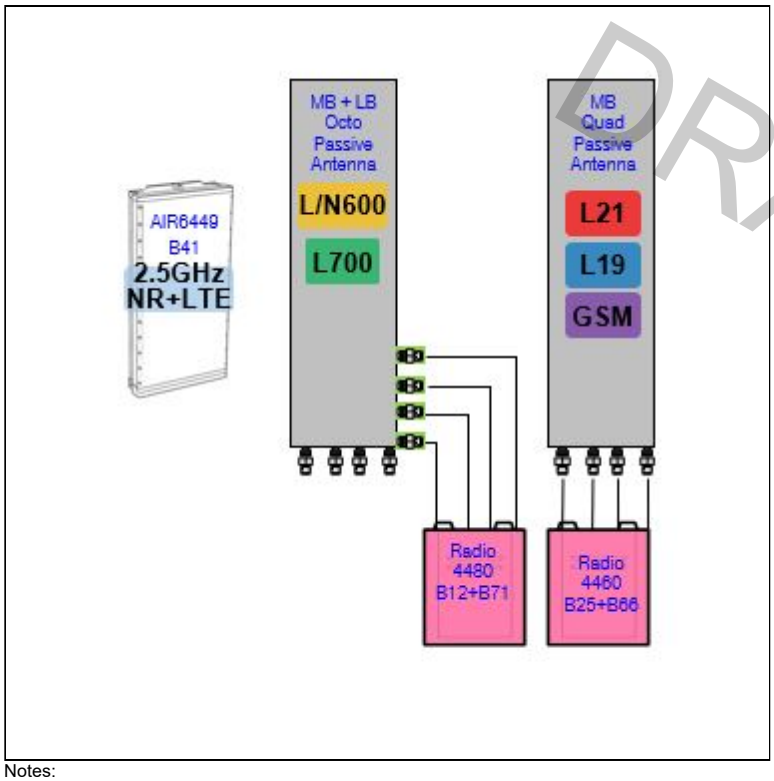
RAN Template: 67E5A998E 6160			**AL Template:** 67E5998E_1xAIR+1OP+1QP	
Sector Count: 3	**Antenna Count:** 3	**Coax Line Count:** 6	**TMA Count:** 0	**RRU Count:** 9

Section 2 - Existing Template Images

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

Section 3 - Proposed Template Images

67E5A998E.JPG



Notes:

Section 4 - Siteplan Images

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

RAN Template:	A&L Template:
67E5A998E 6160	67E5998E_1xAIR+1OP+1QP

CT11975A_Sprint Retain_1_draft

Print Name: Standard

Section 5 - RAN Equipment

Existing RAN Equipment

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

Proposed RAN Equipment

Template: 67E5A998E 6160

Enclosure	1	2	3
Enclosure Type	Enclosure 6160	RBS 6601	B160
Baseband	BB 6648 (L700, L600, N600); BB 6648; BB 6648 (L2100, L1900)	DUG20 (G1900)	
Hybrid Cable System	Ericsson Hybrid Trunk 6/24 4AWG 100m **(x 3)**		
Transport System	CSR IXRe V2 (Gen2)		

RAN Scope of Work:

Existing 200Amp
Crown.fiber

RAN Template:	A&L Template:
67E5A998E 6160	67E5998E_1xAIR+1OP+1QP

CT11975A_Sprint Retain_1_draft

Print Name: Standard

Section 6 - A&L Equipment

Existing Template: Custom
Proposed Template: 67E5998E_1xAIR+1OP+1QP

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro			
Antenna	1			
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)			
Azimuth	30			
M. Tilt				
Height	115			
Ports	**P1**	**P2**	**P3**	**P4**
Active Tech.	L700 L600 N600	L700 L600 N600	L2100 L1900 G1900	L2100 L1900 G1900
Dark Tech.				
Restricted Tech.				
Decomm. Tech.				
E. Tilt	2		2	
Cables	7/8In STANDARD COAX CABLE **(x2)**	SHARED 7/8In STANDARD COAX CABLE **(x2)**	SHARED 7/8In STANDARD COAX CABLE **(x2)**	SHARED 7/8In STANDARD COAX CABLE **(x2)**
TMAs				
Diplexers / Combiners	CommScope - Twin LB/Midband CBC426T-DS-43 (4.3-10) (AtAntenna)			
Radio	Radio 4480 B71+B85 (At Cabinet)	SHARED Radio 4480 B71+B85 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)	SHARED Radio 4460 B25+B66 (At Cabinet)
Sector Equipment				

Unconnected Equipment:

Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Sector Equipment: Radio 4460 B25+B66

Scope of Work:

We have to adjust diplexer later.
We are not using anchor here.

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

RAN Template:	A&L Template:
67E5A998E 6160	67E5998E_1xAIR+1OP+1QP

CT11975A_Sprint Retain_1_draft

Print Name: Standard

Sector 2 (Proposed) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1			
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)			
Azimuth	140			
M. Tilt				
Height	115			
Ports	**P1**	**P2**	**P3**	**P4**
Active Tech.	L700 L600 N600	L700 L600 N600	L2100 L1900 G1900	L2100 L1900 G1900
Dark Tech.				
Restricted Tech.				
Decomm. Tech.				
E. Tilt	2		2	
Cables	7/8In STANDARD COAX CABLE **(x2)**	SHARED 7/8In STANDARD COAX CABLE **(x2)**	SHARED 7/8In STANDARD COAX CABLE **(x2)**	SHARED 7/8In STANDARD COAX CABLE **(x2)**
TMAs				
Diplexers / Combiners	CommScope - Twin LB/Midband CBC426T-DS-43 (4.3-10) (AtAntenna)			
Radio	Radio 4480 B71+B85 (At Cabinet)	SHARED Radio 4480 B71+B85 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)	SHARED Radio 4460 B25+B66 (At Cabinet)
Sector Equipment				

Unconnected Equipment:

Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Sector Equipment: Radio 4460 B25+B66

Scope of Work:

We have to adjust diplexer later

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

RAN Template:	A&L Template:
67E5A998E 6160	67E5998E_1xAIR+1OP+1QP

CT11975A_Sprint Retain_1_draft

Print Name: Standard

Sector 3 (Proposed) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1			
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)			
Azimuth	260			
M. Tilt				
Height	115			
Ports	**P1**	**P2**	**P3**	**P4**
Active Tech.	L700 L600 N600	L700 L600 N600	L2100 L1900 G1900	L2100 L1900 G1900
Dark Tech.				
Restricted Tech.				
Decomm. Tech.				
E. Tilt	2		2	
Cables	7/8In STANDARD COAX CABLE **(x2)**	SHARED 7/8In STANDARD COAX CABLE **(x2)**	SHARED 7/8In STANDARD COAX CABLE **(x2)**	SHARED 7/8In STANDARD COAX CABLE **(x2)**
TMAs				
Diplexers / Combiners	CommScope - Twin LB/Midband CBC426T-DS-43 (4.3-10) (AtAntenna)			
Radio	Radio 4480 B71+B85 (At Cabinet)	SHARED Radio 4480 B71+B85 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)	SHARED Radio 4460 B25+B66 (At Cabinet)
Sector Equipment				

Unconnected Equipment:

Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Cable: Coax Jumper | Sector Equipment: Radio 4460 B25+B66

Scope of Work:

We have to adjust diplexer later

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

RAN Template:	A&L Template:
67E5A998E 6160	67E5998E_1xAIR+1OP+1QP

CT11975A_Sprint Retain_1_draft

Print Name: Standard

Section 7 - Power Systems Equipment

Existing Power Systems Equipment
----- This section is intentionally blank. -----

	Proposed Power Systems Equipment
Enclosure	1
Enclosure Type	Enclosure 6160

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11975A

CT43XC825
530 Bushy Hill Road
Simsbury, Connecticut 06070

August 12, 2021

EBI Project Number: 6221004436

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**16.73%**

August 12, 2021

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

Emissions Analysis for Site: CT11975A - CT43XC825

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **530 Bushy Hill Road** in **Simsbury, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 530 Bushy Hill Road in Simsbury, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

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

5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

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

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

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

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

10) The antenna mounting height centerline of the proposed antennas is 113 feet above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd
Height (AGL):	113 feet	Height (AGL):	113 feet	Height (AGL):	113 feet
Channel Count:	14	Channel Count:	14	Channel Count:	14
Total TX Power (W):	540 Watts	Total TX Power (W):	540 Watts	Total TX Power (W):	540 Watts
ERP (W):	17,474.23	ERP (W):	17,474.23	ERP (W):	17,474.23
Antenna A1 MPE %:	**7.10%**	Antenna B1 MPE %:	**7.10%**	Antenna C1 MPE %:	**7.10%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	7.10%
AT&T	9.63%
Site Total MPE % :	16.73%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	7.10%
T-Mobile Sector B Total:	7.10%
T-Mobile Sector C Total:	7.10%
Site Total MPE % :	16.73%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 600 MHz LTE	2	591.73	113.0	3.72	600 MHz LTE	400	0.93%
T-Mobile 600 MHz NR	2	591.73	113.0	3.72	600 MHz NR	400	0.93%
T-Mobile 700 MHz LTE	2	695.22	113.0	4.37	700 MHz LTE	467	0.93%
T-Mobile 1900 MHz GSM	4	1052.26	113.0	13.22	1900 MHz GSM	1000	1.32%
T-Mobile 1900 MHz LTE	2	2104.51	113.0	13.22	1900 MHz LTE	1000	1.32%
T-Mobile 2100 MHz LTE	2	2649.42	113.0	16.64	2100 MHz LTE	1000	1.66%
						Total:	**7.10%**

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

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	7.10%
Sector B:	7.10%
Sector C:	7.10%
T-Mobile Maximum MPE % (Sector A):	7.10%
Site Total:	16.73%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **16.73%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.