



1 Cityplace Dr, Suite 490
Creve Coeur, MO 63141

Phone: (314) 513-0147
www.crowncastle.com

April 15, 2021

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

**RE: Notice of Exempt Modification for T-Mobile
Crown Site ID# 876366; T-Mobile Site ID# CTNL841A
101 Pierce Rd. Preston, CT 06365
Latitude: 41.53819 / Longitude: -71.951667**

Dear Ms. Bachman

T-Mobile currently maintains six (6) antennas at the 157-foot mount on the existing 155-foot Monopole Tower located at 101 Pierce Rd. in Preston. The property is owned by Panus Farm LLC and the Tower by Crown Castle. T-Mobile now intends to replace six (6) existing antennas and add three (3) new antennas. This modification/proposal includes hardware that is both 4G(LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

**Planned Modifications:
Tower:**

Remove and Replace:

(3) RFS/CELWAVE – APXVTM14-ALU-120 Antennas (**REMOVE**) – (3) RFS APX16DWV-16DWV-S-E-A20 Antennas – (**REPLACE**)

(3) Commscope – NNVV-65B-R4 Antennas (**REMOVE**) - (3) Ericsson AIR6449 B41 Antennas (**REPLACE**)

(3) Alcatel Lucent – PCS 1900MHZ 4x45W-65MHZ Radios (**REMOVE**) – (3) Ericsson 4415 B66A Radios (**REPLACE**)

(3) Nokia – FZHNZ Radio (**REMOVE**) - (3) Ericsson 4449 B71+B85 Radio (**REPLACE**)

(3) Alcatel Lucent – RRH2X50-800 Radio (**REMOVE**) – (3) Ericsson 4424 B25 Radio (**REPLACE**)

Install New:

(3) RFS APXVAALL24_43-U-NA20 Antennas
(4) 1 5/8” Hybrid Cable



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- (3) Site Pro 1 HRK12 Handrail Kit
- (1) 8' Long 2.0 STD Mount Pipe

Remove:

- (3) Alcatel Lucent – RRH2X50-800 Radio

Ground:

Remove and Replace:

- (1) Sprint Cabinet (**REMOVE**) - (1) 6160 Site Support Cabinet (SSC) (**REPLACE**)
- (1) Sprint Cabinet (**REMOVE**) – (1) B160 Cabinet (**REPLACE**)

Install New:

Upgrade BTS Cabinet Breaker

- (1) RBS 6601 in 6160 SSC
- (3) BB 6630 in 6160 SSC
- (1) BB 6648 in 6160 SSC
- (1) DUG20 in 6160 SSC
- (1) PSU 4813 in 6160 SSC
- (1) CSR IXRE V2 (GEN2) Transport System in 6160 SSC

The facility was approved by the Town of Preston Planning and Zoning Commission by way of a Site Plan Application #2-99 and Special Exception Application #4-99 on August 3rd, 1999.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72(b)(2). In accordance with R.C.S.A. §16-50j-73, a copy of this letter is being sent to Sandra L. Allyn-Gauthier, First Selectwoman for the Town of Preston as well as Tom Weber, Building Official for the Town of Preston. A copy will also be sent to the property owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification 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 Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.



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

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

Sincerely,

Colin Robinson

Colin Robinson
Project Manager
NETWORK BUILDING + CONSULTING
100 Apollo Drive Suite 303
Chelmsford, MA 01824
crobison@nbcllc.com
(360) 561-3311

cc:

Sandra L. Allyn-Gauthier, First Selectwoman (via email only to allyngauthier@preston-ct.org)
Preston Town Hall
389 Route 2
Preston, CT 06365
860-887-5581, Ext. 101

Tom Weber, Building Official (via email only to building@preston-ct.org)
Preston Town Hall
389 Route 2
Preston, CT 06365
860-887-5581, ext. 130

Panus Farm LLC
60 Pierce Rd
Preston, CT 06365

Colin Robinson

From: Colin Robinson
Sent: Thursday, April 15, 2021 4:41 PM
To: allyngauthier@preston-ct.org
Cc: Zajac, Richard; Colin Robinson
Subject: CSC Exempt Modification Application 101 Pierce Rd. Preston CT 876366
Attachments: CSC Exempt Modification Application 101 Pierce Rd. Preston CT 876366 041521.pdf

Good Afternoon First Selectwoman Allyn-Gauthier ,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 101 Pierce Rd. in Preston CT.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,

Colin

Colin Robinson

Project Manager

NETWORK BUILDING + CONSULTING

100 Apollo Drive | Suite 303 | Chelmsford, MA | 01824
M 360.561.3311



Colin Robinson

From: Colin Robinson
Sent: Thursday, April 15, 2021 4:40 PM
To: building@preston-ct.org
Cc: Zajac, Richard; Colin Robinson
Subject: CSC Exempt Modification Application 101 Pierce Rd. Preston CT 876366
Attachments: CSC Exempt Modification Application 101 Pierce Rd. Preston CT 876366 041521.pdf

Good Afternoon Mr. Weber,

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Thank you,

Colin

Colin Robinson

Project Manager

NETWORK BUILDING + CONSULTING

100 Apollo Drive | Suite 303 | Chelmsford, MA | 01824
M 360.561.3311



Colin Robinson

From: Colin Robinson
Sent: Thursday, April 15, 2021 4:34 PM
To: dceccarelli@sbcglobal.net
Cc: Zajac, Richard; Colin Robinson
Subject: CSC Exempt Modification Application 101 Pierce Rd. Preston CT 876366
Attachments: CSC Exempt Modification Application 101 Pierce Rd. Preston CT 876366 041521.pdf

Good afternoon,

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Thank you,

Colin

Colin Robinson

Project Manager

NETWORK BUILDING + CONSULTING

100 Apollo Drive | Suite 303 | Chelmsford, MA | 01824
M 360.561.3311



Exhibit A

Original Facility Approval



TOWN OF PRESTON
TOWN OFFICES
389 ROUTE 2
PRESTON, CONNECTICUT 06365-8830

*To Dan
for signature
9/1/99*

FILE COPY

Date: August 10, 1999

Certified Mail

Sprint Spectrum, L.P.
One International Blvd
Suite 800 Mahwah New, Jersey 07495

Dear Attorney Regan:

At the regular meeting of the Preston Planning and Zoning Commission held on August 3, 1999, the Commission reviewed application Site Plan # 2-99 and Special Exception 4-99 for the installation of a monopole and other associated work at 101 Peirce Road. The Commission voted unanimously to approve the subject application with the following modifications:

1. Note sight distance for the driveway on the plan.
2. Gravel drive shall have 6" of gravel rather than 4". The driveway shall have a paved apron. A driveway permit is required for its installation.
3. An As-built plan must be provided for the project after the construction is completed. The as-built must be provided prior to the release of the bond.
4. A bond for the site work in the amount of \$28,000.00 must be submitted on forms as provided by the town with the final format to be approved by the town attorney.
5. A bond in the amount \$29,500.00 must be posted for the tower dismantling. This bond is to be renewed every two years and must be renewed by August 3, 2001. In the event the bond is not renewed it will be a violation of this permit.
6. The Commission requested that a company representative contact the First Selectmen to afford the town due consideration to address the town's emergency communication needs.

Please provide one mylar copy of the plan revised in accordance with the above noted and produced or reproduced in compliance with section 7-31 of the Connecticut General Statutes regarding requirements for the filing of a map. In addition, provide two (2) paper copies. After endorsement of the plan by the Chairman, the mylar copy of the plan must be filed with the Town Clerk's office.

BONDING: Prior to the endorsement of the plan the two bonds in the amount of \$28,000 and 29,500 must be filed with the Commission using the format as approved by the Commission (see attached forms). The Town will hold the bonds until such time the Commission approves their reduction or

release. Any plan filed without the appropriate bond will be considered to be in violation with the approved plan and zoning regulations. In order for the Commission to consider a bond release or reduction, a letter requesting a release or reduction must be submitted to the Planning and Zoning Office two (2) weeks prior to the regularly scheduled meeting. This will allow adequate time to conduct a site inspection of the completed work. Unauthorized work could result in delays with the bond release or reduction by the Commission.

OTHER PERMITS REQUIRED: Prior to the commencement of any work, a zoning permit and other subsequent town and state permits must be obtained.

SITE INSPECTIONS: During the construction of the project, inspections will be conducted of the progress by the town staff. A forty-eight hour notice is required for the inspections. In the event that there is concern with the location of the structure, parking etc, the Zoning Enforcement Officer may require that a land surveyor licensed in the State of Connecticut locate the structure prior to construction. Failure to provide notice to the town of the work and failure to construct the project as shown on the plan without prior approval of the changes could result in problems with the issuance of Certificate of Occupancy and the release or reduction of the bond. Please contact the Planning and Zoning Office at 889-2529 to schedule an appointment to inspect the project at the following times:

1. After the installation of the erosion and sediment control.
2. After the structure has been staked out and the footings are to be placed.
3. After the parking and sidewalks have been staked out.
4. Completion of the project.

If there are any questions regarding this application or if the staff can be of any assistance at any time during the project construction, please do not hesitate to contact the office.

Congratulations on the success completion of the application.

Very truly yours,



Daniel Kulesza
Town Planner

- cc: ZEO
 First Selectman
 Inland Wetland Officer
 Building Inspector
 Walter and Ruth Panus

Exhibit B

Property Card

101 PIERCE RD

Location 101 PIERCE RD

Mblu 8-0/ PIE1/ 101/ /

Acct# 00059300

Owner PANUS FARM LLC

Assessment \$257,750

Appraisal \$1,137,200

PID 602

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2017	\$92,400	\$1,044,800	\$1,137,200

Assessment			
Valuation Year	Improvements	Land	Total
2017	\$64,700	\$193,050	\$257,750

Owner of Record

Owner PANUS FARM LLC
Co-Owner
Address 60 PIERCE RD
PRESTON, CT 06365

Sale Price \$0
Certificate
Book & Page 0196/0038
Sale Date 12/03/2015
Instrument 01

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
PANUS FARM LLC	\$0		0196/0038	01	12/03/2015
SHEA JOAN	\$0		0193/0185	01	11/19/2014
SHEA JOAN - TRUSTEE	\$0		0193/0180	01	11/19/2014
PANUS RUTH L ESTATE OF	\$0		0190/0842		11/26/2013
PANUS RUTH L TRUSTEE	\$0		0188/0206		03/26/2013

Building Information

Building 1 : Section 1

Year Built: 1950

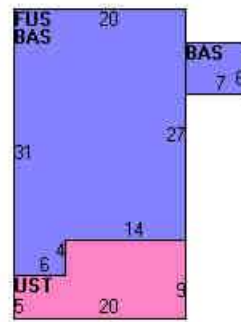
Building Photo

Living Area: 1,170
Replacement Cost: \$89,164
Building Percent Good: 65
Replacement Cost Less Depreciation: \$58,000



(<http://images.vgsi.com/photos/PrestonCTPhotos/\00\00\34\36.jpg>)

Building Layout



(http://images.vgsi.com/photos/PrestonCTPhotos//Sketches/602_602.jpg)

Building Attributes	
Field	Description
Style	Conventional
Model	Residential
Grade:	Below Average
Stories:	2 Stories
Occupancy	1
Exterior Wall 1	Wood Shingle
Exterior Wall 2	
Roof Structure:	Gable/Hip
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Plastered
Interior Wall 2	Panel
Interior Flr 1	Carpet
Interior Flr 2	Vinyl/Asphalt
Heat Fuel	Gas
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	4 Bedrooms
Total Bthrms:	1
Total Half Baths:	1
Total Xtra Fixtrs:	
Total Rooms:	6 Rooms
Bath Style:	Average
Kitchen Style:	Average
Num Kitchens	01
Cndtn	
Usrflid 103	
Usrflid 104	
Usrflid 105	
Usrflid 106	
Usrflid 107	
Num Park	
Fireplaces	
Usrflid 108	
Usrflid 101	
Usrflid 102	

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	606	606
FUS	Upper Story, Finished	564	564
UST	Utility, Storage, Unfinished	156	0
		1,326	1,170

Usrflid 100	
Usrflid 300	
Usrflid 301	

Extra Features

Extra Features	<u>Legend</u>
No Data for Extra Features	

Land

Land Use

Use Code	1010
Description	Single Fam MDL-01
Zone	R-80
Neighborhood	0050
Alt Land Appr Category	No

Land Line Valuation

Size (Acres)	198.45
Frontage	0
Depth	0
Assessed Value	\$193,050
Appraised Value	\$1,044,800

Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FGR1	GARAGE-AVE			492.00 S.F.	\$2,400	1
FGR1	GARAGE-AVE			2088.00 S.F.	\$16,700	1
SLO1	SILO-WD OR CNC			3432.00 DIAxHT	\$4,800	1
BRN3	1 STORY W/LOFT			1744.00 S.F.	\$2,300	1
BRN8	POLE BARN			5124.00 S.F.	\$3,600	1
SHD1	SHED FRAME			270.00 S.F.	\$600	1
LNT	LEAN-TO			930.00 S.F.	\$300	1
SHD2	W/LIGHTS ETC			4090.00 S.F.	\$3,700	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2011	\$119,800	\$976,600	\$1,096,400
2006	\$101,600	\$493,500	\$595,100
2001	\$102,200	\$466,700	\$568,900

Assessment			
Valuation Year	Improvements	Land	Total
2011	\$83,900	\$91,600	\$175,500
2006	\$71,100	\$58,900	\$130,000

2001		\$71,500	\$46,900	\$118,400
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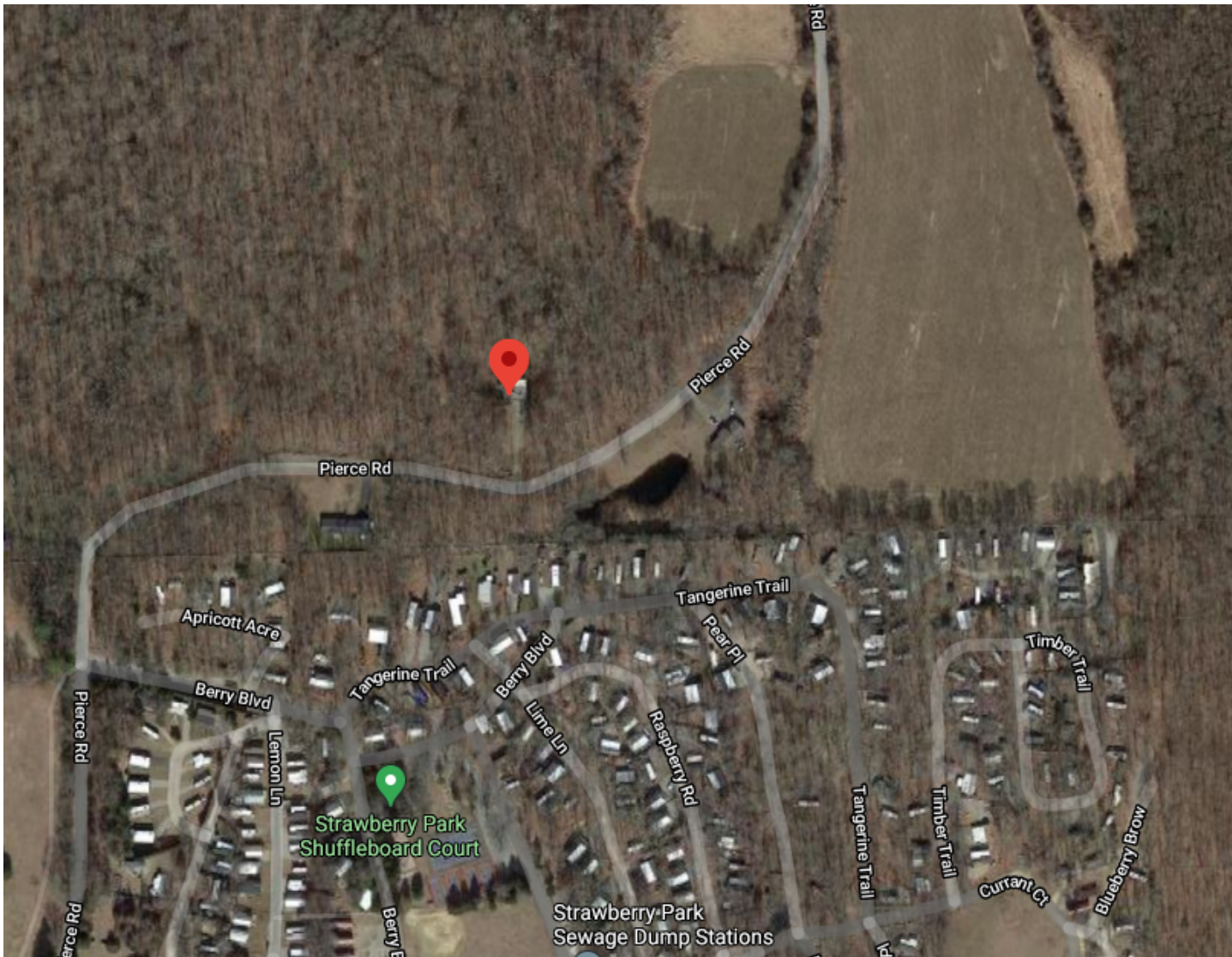


Exhibit C

Construction Drawings

T-Mobile

T-MOBILE SITE NUMBER: CTNL841A

T-MOBILE SITE NAME: CTNL841A

SITE TYPE: MONOPOLE

TOWER HEIGHT: 155'-0"

BUSINESS UNIT #: 876366

**SITE ADDRESS: 101 PIERCE ROAD
PRESTON, CT 06365**

COUNTY: NEW LONDON

JURISDICTION: TOWN OF PRESTON

T-MOBILE SPRINT RETAIN SITE CONFIGURATION: 67D5A998C 6160 (GSM only)

T-Mobile

4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE

3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

B+T GRP

1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

T-MOBILE SITE NUMBER:
CTNL841A

BU #: 876366
**WAPPINGERS FALLS /
PRESTON CIT**

101 PIERCE ROAD
PRESTON, CT 06365

EXISTING
155'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/23/21	JJR	CONSTRUCTION	GEH

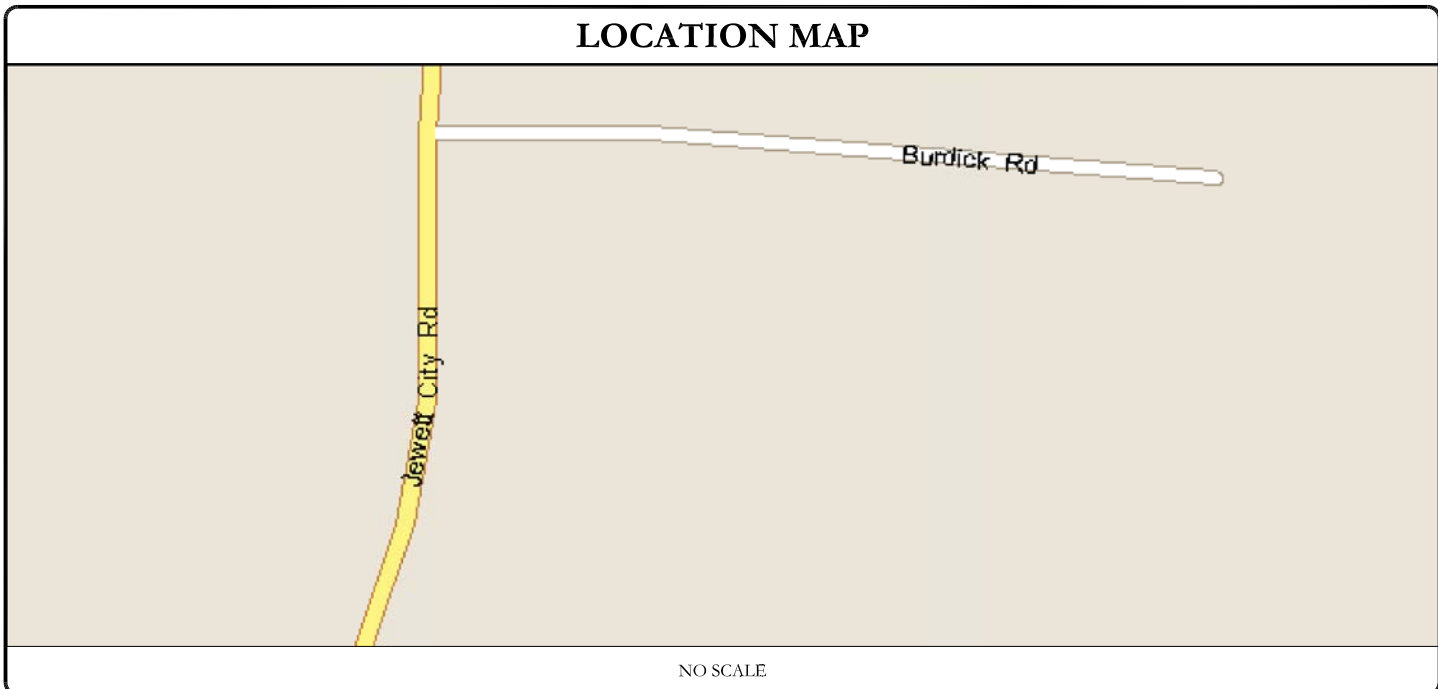
SITE INFORMATION	
CROWN CASTLE USA INC. SITE NAME:	WAPPINGERS FALLS / PRESTON CIT
SITE ADDRESS:	101 PIERCE ROAD PRESTON, CT 06365
COUNTY:	NEW LONDON
MAP/PARCEL #:	114-8-0-PIE1-101
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41.53819
LONGITUDE:	-71.951667
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	290 FT
CURRENT ZONING:	R-80
JURISDICTION:	TOWN OF PRESTON
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	PANUS FARM LLC 60 PIERCE RD PRESTON, CT 06365
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 4 SYLVAN WAY PARSIPPANY, NJ 07054
ELECTRIC PROVIDER:	NOT PROVIDED
TELCO PROVIDER:	NOT PROVIDED

PROJECT TEAM	
A&E FIRM:	CROWN CASTLE USA INC. 2000 CORPORATE DRIVE CANONSBURG, PA 15317 CROWN.AE.APPROVAL@CROWNCastle.COM
CROWN CASTLE USA INC. DISTRICT CONTACTS:	1500 CORPORATE DRIVE CANONSBURG, PA 15317

DRAWING INDEX	
SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	CODE SUMMARY
T-3	CODE SUMMARY
T-4	GENERAL NOTES
C-1.1	OVERALL SITE PLAN
C-1.2	SITE PLAN & ENLARGED SITE PLAN
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 24X36. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

PROJECT DESCRIPTION	
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.	
TOWER SCOPE OF WORK:	<ul style="list-style-type: none"> REMOVE (6) ANTENNAS REMOVE (12) RRHs INSTALL (9) ANTENNAS INSTALL (9) RRHs INSTALL (4) 1-5/8" HYBRID CABLE INSTALL (3) SITE PRO 1 HRK12 HANDRAIL KIT INSTALL (1) 8' LONG 2.0 STD MOUNT PIPE
GROUND SCOPE OF WORK:	<ul style="list-style-type: none"> UPGRADE BTS CABINET BREAKER REMOVE (2) EQUIPMENT CABINET INSTALL (1) 6160 SITE SUPPORT CABINET INSTALL (1) B160 BATTERY CABINET INSTALL (1) RBS 6601 IN SSC INSTALL (3) BB 6630 IN 6160 SSC INSTALL (1) BB 6648 IN 6160 SSC INSTALL (1) DUG20 IN SSI INSTALL (1) PSU 4813 INSTALL (1) CSR IXRE V2 (GEN2) TRANSPORT SYSTEM
NOTE:	PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER.



APPLICABLE CODES/REFERENCE DOCUMENTS	
ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:	
CODE TYPE	CODE
BUILDING	IBC 2015 / 2018
MECHANICAL	IMC 2015 / 2018
ELECTRICAL	NEC2017 / 2018
REFERENCE DOCUMENTS:	
STRUCTURAL ANALYSIS:	B+T GROUP
DATED:	2/19/21
MOUNT ANALYSIS:	INFINIGY ENGINEERING, PLLC
DATED:	1/31/21
RFDS REVISION:	1
DATED:	1/15/21
ORDER ID:	538782
REVISION:	1

APPROVALS		
APPROVAL	SIGNATURE	DATE
PROPERTY OWNER OR REP.	_____	_____
LAND USE PLANNER	_____	_____
T-MOBILE	_____	_____
OPERATIONS	_____	_____
RF	_____	_____
NETWORK	_____	_____
BACKHAUL	_____	_____
CONSTRUCTION MANAGER	_____	_____

THE PARTIES ABOVE HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES AND MODIFICATIONS THEY MAY IMPOSE.

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER: T-1	REVISION: 0
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SITE PLAN DISCLAIMER:
 PROPERTY LINES AND STRUCTURES HAVE BEEN DIGITIZED FROM JURISDICTIONAL GIS. CROWN CASTLE USA INC. HAS NOT COMPLETED A SITE SURVEY AND THEREFORE MAKES NO CLAIMS AS TO THE ACCURACY OF INFORMATION DEPICTED ON THIS SHEET.



T-Mobile
 4 SYLVAN WAY
 PARSIPPANY, NJ 07054

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300
 CHARLOTTE, NC 28277

B+T GRP
 1717 S. BOULDER
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WAPPINGERS FALLS / PRESTON CIT

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B&T ENGINEERING, INC.
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SHEET NUMBER: C-1.1 **REVISION:** 0

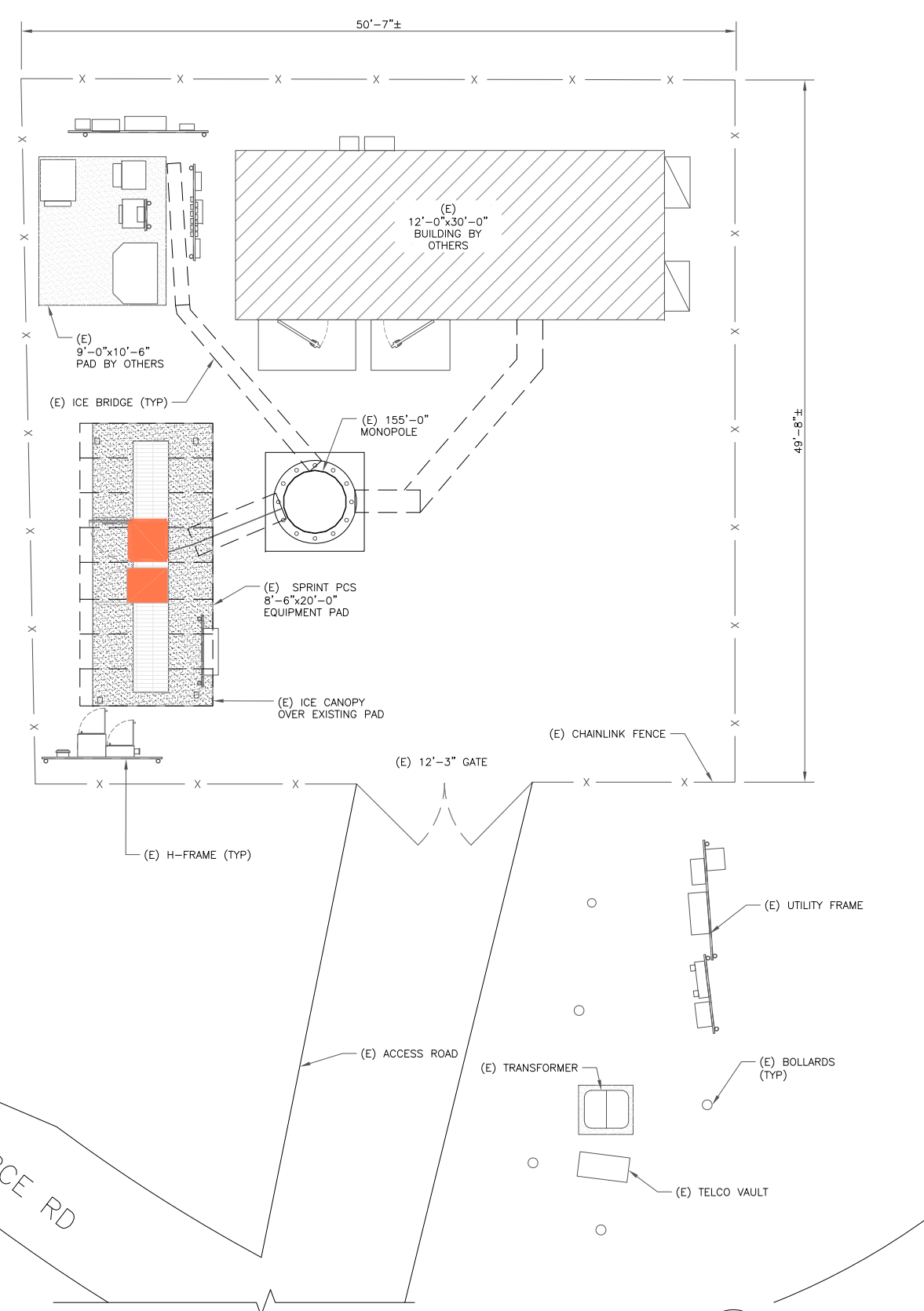
147460.003.01_WAPPINGERS FALLS-PRESTON CIT.dwg - Sheet:C-1.1 - User: ghayes - Mar 23, 2021 - 8:45am

1 OVERALL SITE PLAN
 SCALE: 1"=20'-0" (FULL SIZE)
 1"=40'-0" (11x17)

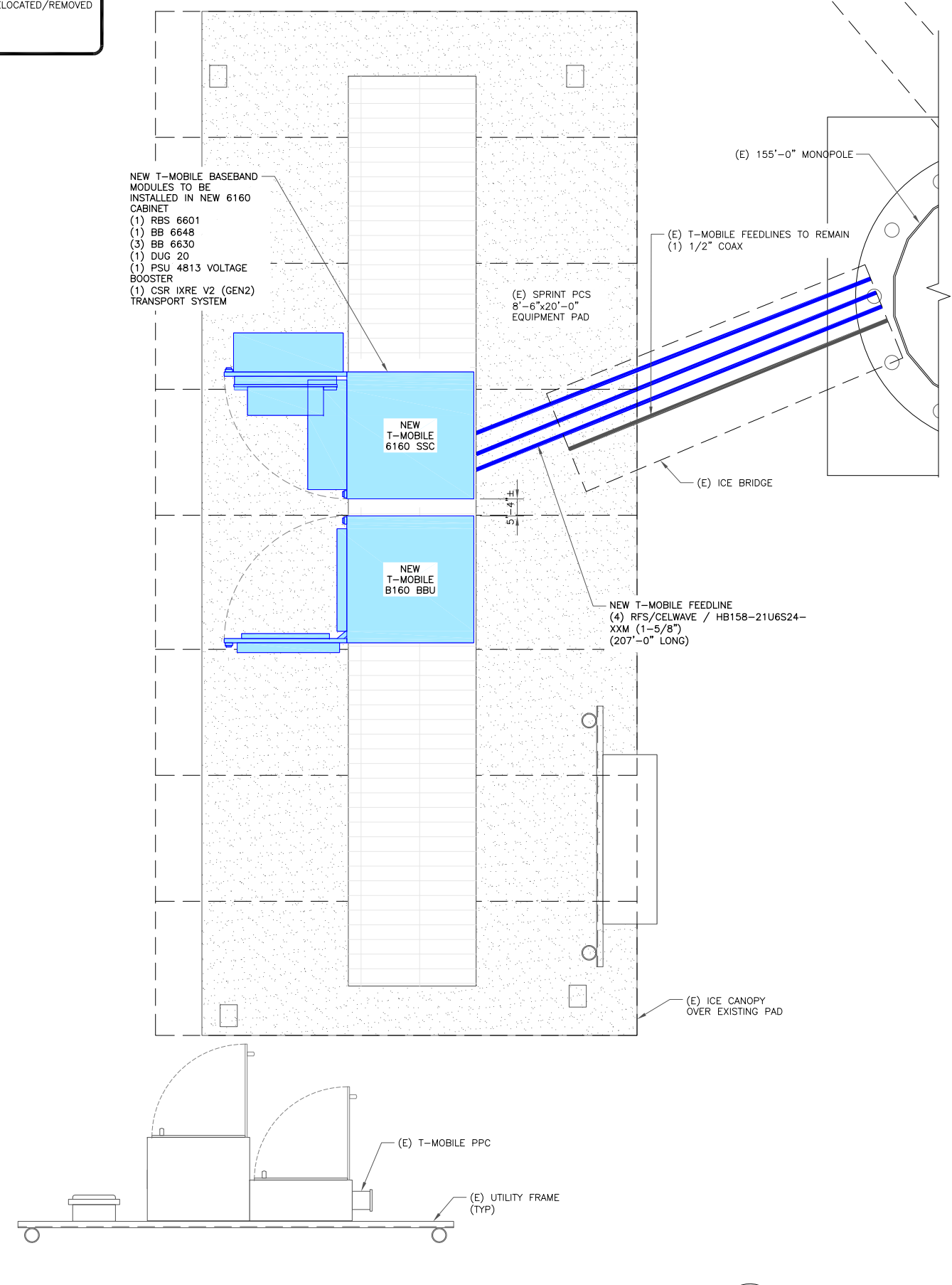
147460.003.01_WAPPINGERS FALLS--PRESTON_CIT.dwg - Sheet: C-1.2 - User: ghoyes - Mar 23, 2021 - 8:45am

EQUIPMENT LEGEND:

- EXISTING
- TO BE RELOCATED/REMOVED
- NEW



1 SITE PLAN
 SCALE: 3/16"=1'-0" (FULL SIZE)
 3/32"=1'-0" (11x17)



2 ENLARGED SITE PLAN
 SCALE: 3/4"=1'-0" (FULL SIZE)
 3/8"=1'-0" (11x17)



T-Mobile
 4 SYLVAN WAY
 PARSIPPANY, NJ 07054

CROWN CASTLE
 3530 TORINGDON WAY, SUITE 300
 CHARLOTTE, NC 28277

B+T GRP
 1717 S. BOULDER
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T-MOBILE SITE NUMBER:
CTNL841A

BU #: 876366
WAPPINGERS FALLS /
PRESTON CIT

101 PIERCE ROAD
 PRESTON, CT 06365

EXISTING
 155'-0" MONOPOLE

ISSUED FOR:

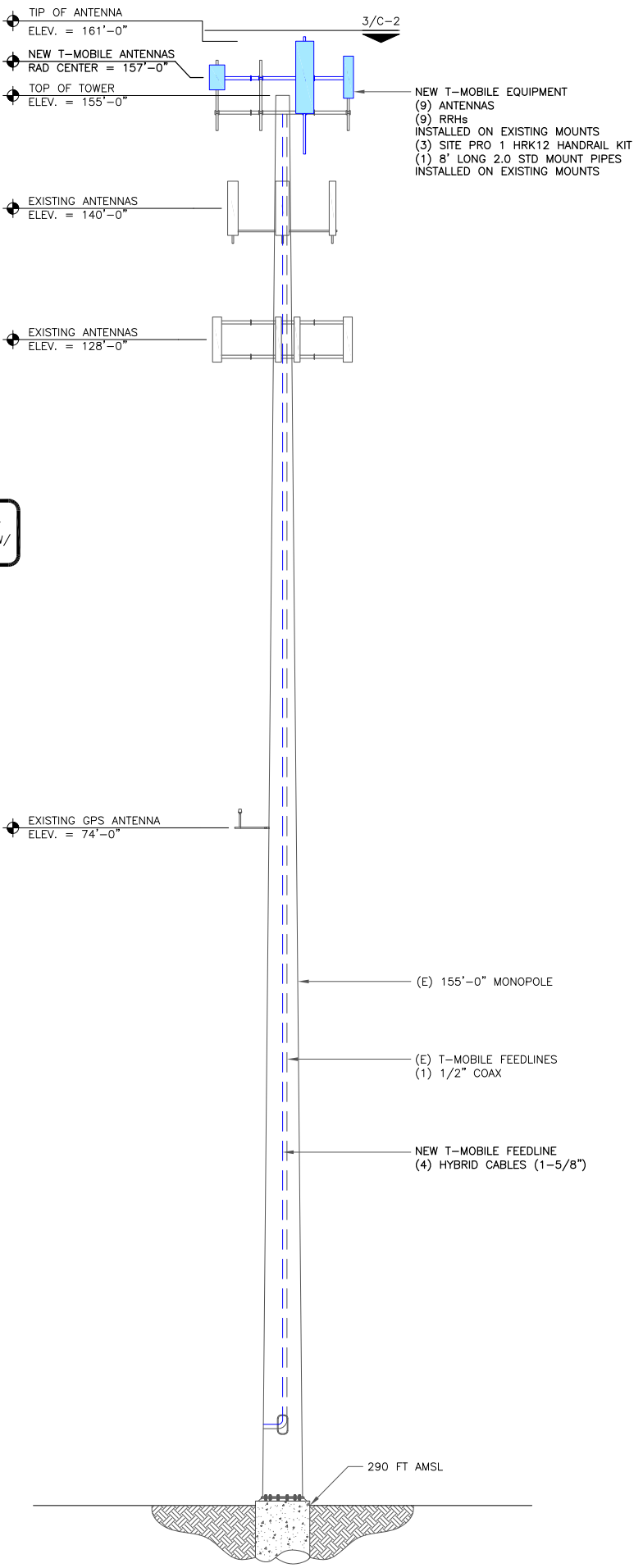
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/23/21	JJR	CONSTRUCTION	GEH

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 PEC.0001564
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SHEET NUMBER:
C-1.2

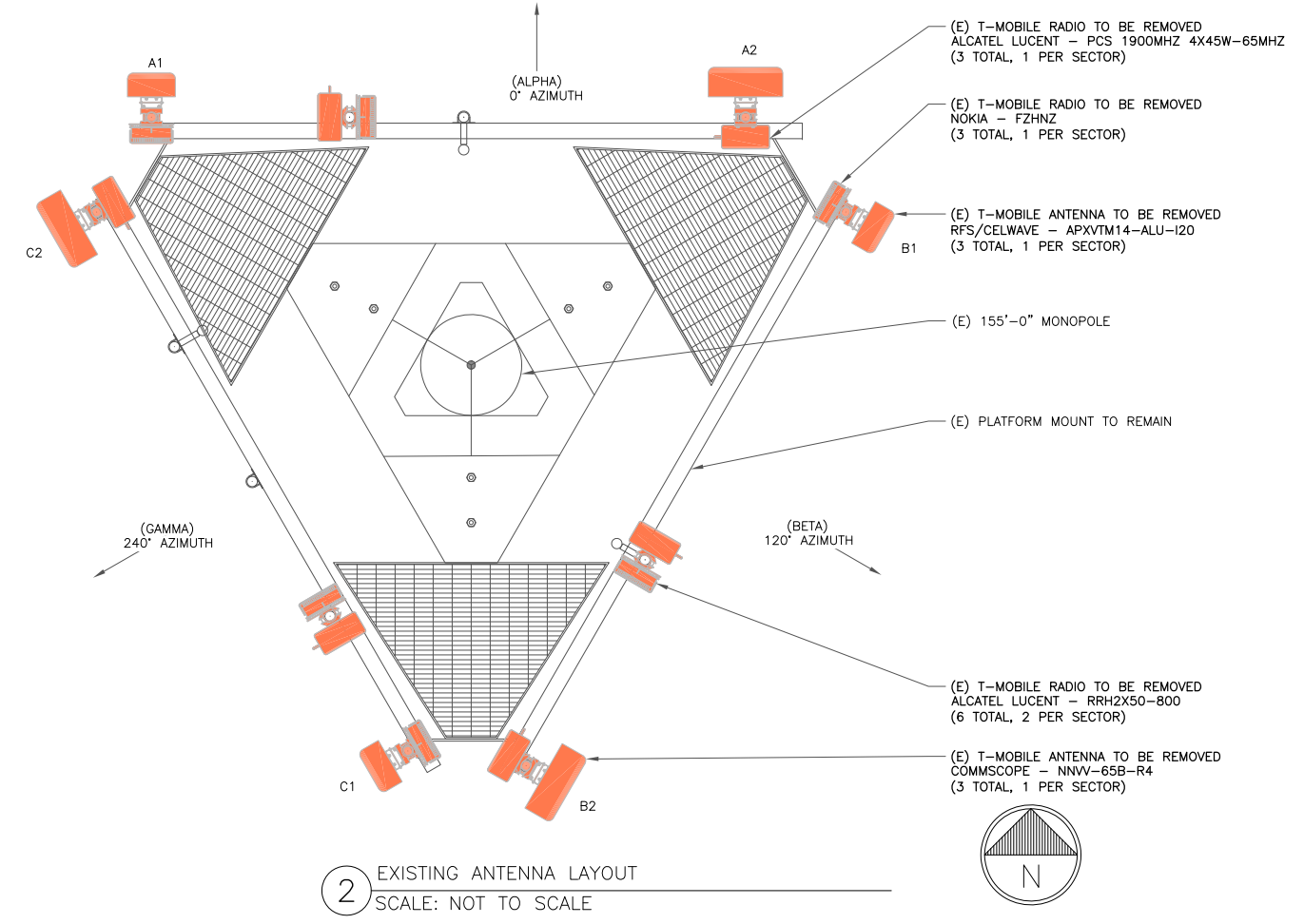
REVISION:
0



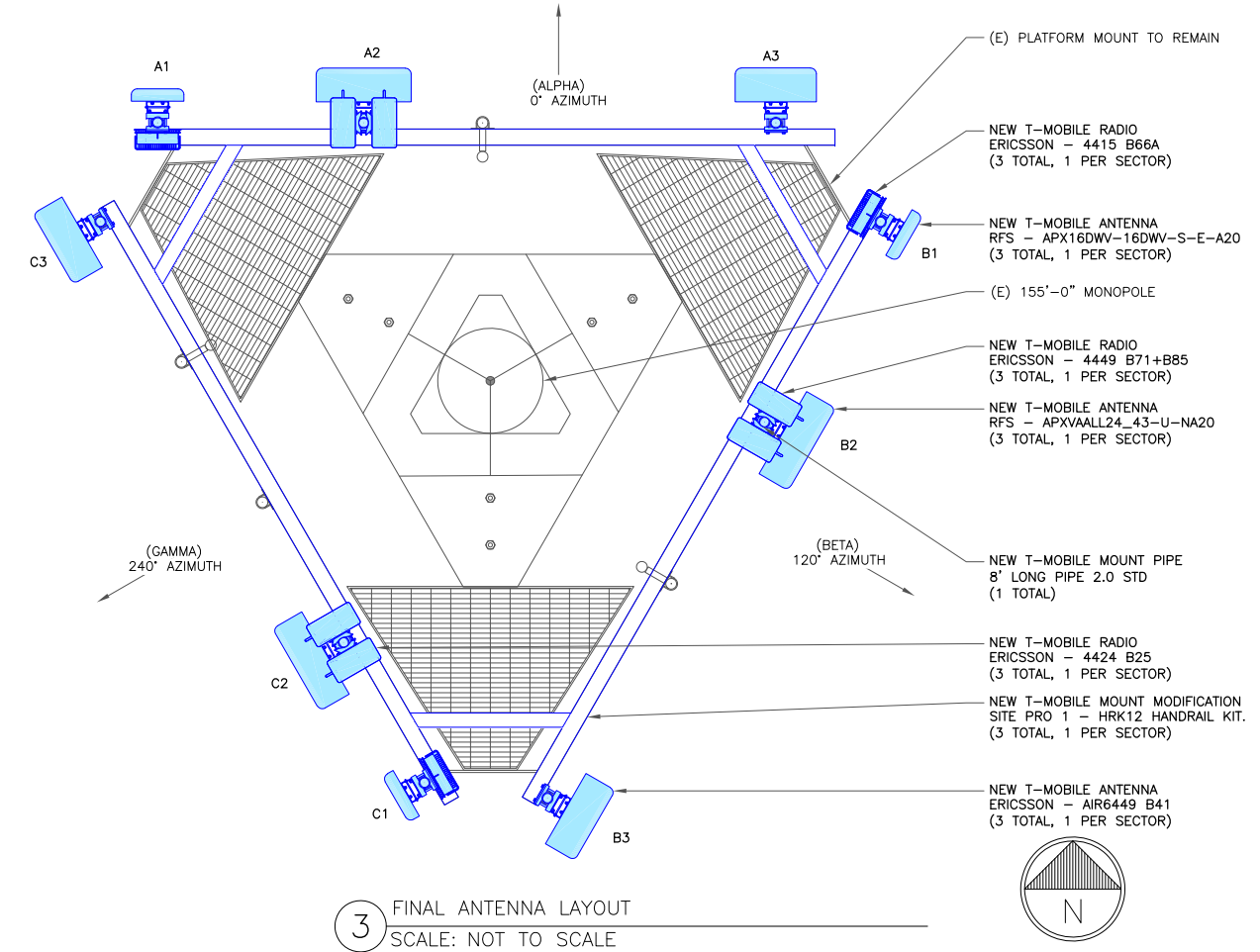
T-MOBILE EQUIPMENT
ANTENNA CL: 157'-0"
MOUNT CL: 155'-0"

ANY AND ALL TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ EXISTING SAFETY CLIMB

1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

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SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

T-MOBILE SITE NUMBER:
CTNL841A

BU #: **876366**
WAPPINGERS FALLS / PRESTON CIT

101 PIERCE ROAD
PRESTON, CT 06365

EXISTING
155'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/23/21	JJR	CONSTRUCTION	GEH

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SHEET NUMBER: **C-2** REVISION: **0**

147460.003.01_WAPPINGERS FALLS-PRESTON CIT.dwg - Sheet: C-2 - User: ghoyes - Mar 23, 2021 - 8:45am

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**T-MOBILE SITE NUMBER:
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**BU #: 876366
WAPPERS FALLS /
PRESTON CIT**

101 PIERCE ROAD
PRESTON, CT 06365

EXISTING
155'-0" MONOPOLE

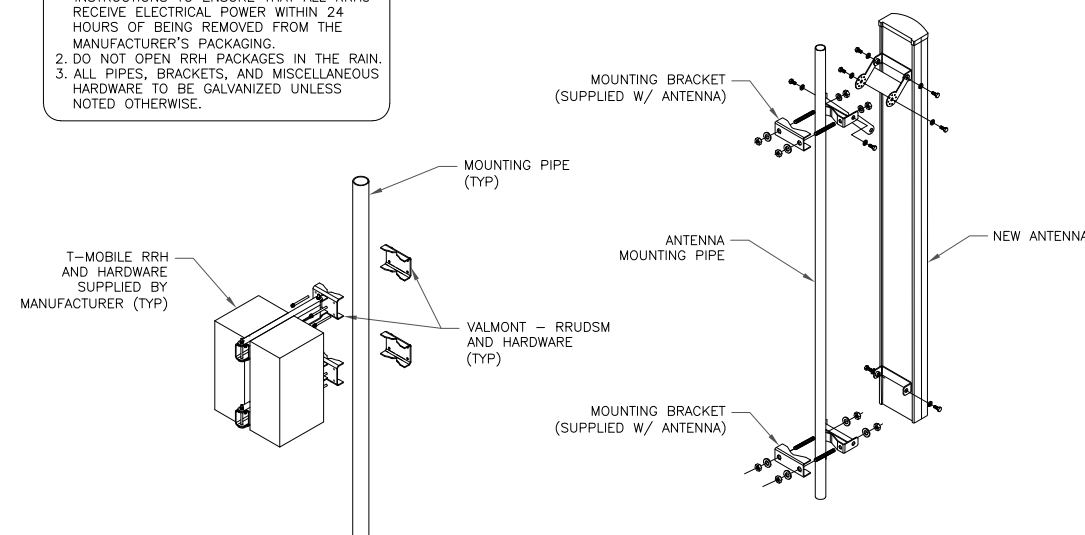
RF SYSTEM SCHEDULE										
SECTOR	ANTENNA	TECH	MANUFACTURER	ANTENNA MODEL	AZIMUTH	M-TILT	E-TILT	RAD CENTER	TMA/RRU	FEEDLINE TYPE
ALPHA	A-1	L2100	RFS	APX16DWV-16DWV-S-E-A20	0°	0°	2°	157'-0"	(1) 4415B66A	-
	A-2	L700/L600/N600/ L1900/G1900	RFS	APXVAARR24_43-U-NA20	0°	0°	2°/2'	157'-0"	(1) 4449 B71+B85 (1) 4424 B25	(2) 1 5/8" HYBRID
	A-3	L2500/N2500	ERICSSON	AIR6449 B41	0°	0°	2°	157'-0"	-	-
BETA	B-1	L2100	RFS	APX16DWV-16DWV-S-E-A20	120°	0°	2°	157'-0"	(1) 4415B66A	-
	B-2	L700/L600/N600/ L1900/G1900	RFS	APXVAARR24_43-U-NA20	120°	0°	2°/2'	157'-0"	(1) 4449 B71+B85 (1) 4424 B25	(1) 1 5/8" HYBRID
	B-3	L2500/N2500	ERICSSON	AIR6449 B41	120°	0°	2°	157'-0"	-	-
GAMMA	C-1	L2100	RFS	APX16DWV-16DWV-S-E-A20	240°	0°	2°	157'-0"	(1) 4415B66A	-
	C-2	L700/L600/N600/ L1900/G1900	RFS	APXVAARR24_43-U-NA20	240°	0°	2°/2'	157'-0"	(1) 4449 B71+B85 (1) 4424 B25	(1) 1 5/8" HYBRID
	C-3	L2500/N2500	ERICSSON	AIR6449 B41	240°	0°	2°	157'-0"	-	-

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE

ISSUED FOR:

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0	3/23/21	JJR	CONSTRUCTION	GEH

INSTALLER NOTES:
1. COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRHs RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING.
2. DO NOT OPEN RRH PACKAGES IN THE RAIN.
3. ALL PIPES, BRACKETS, AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE.



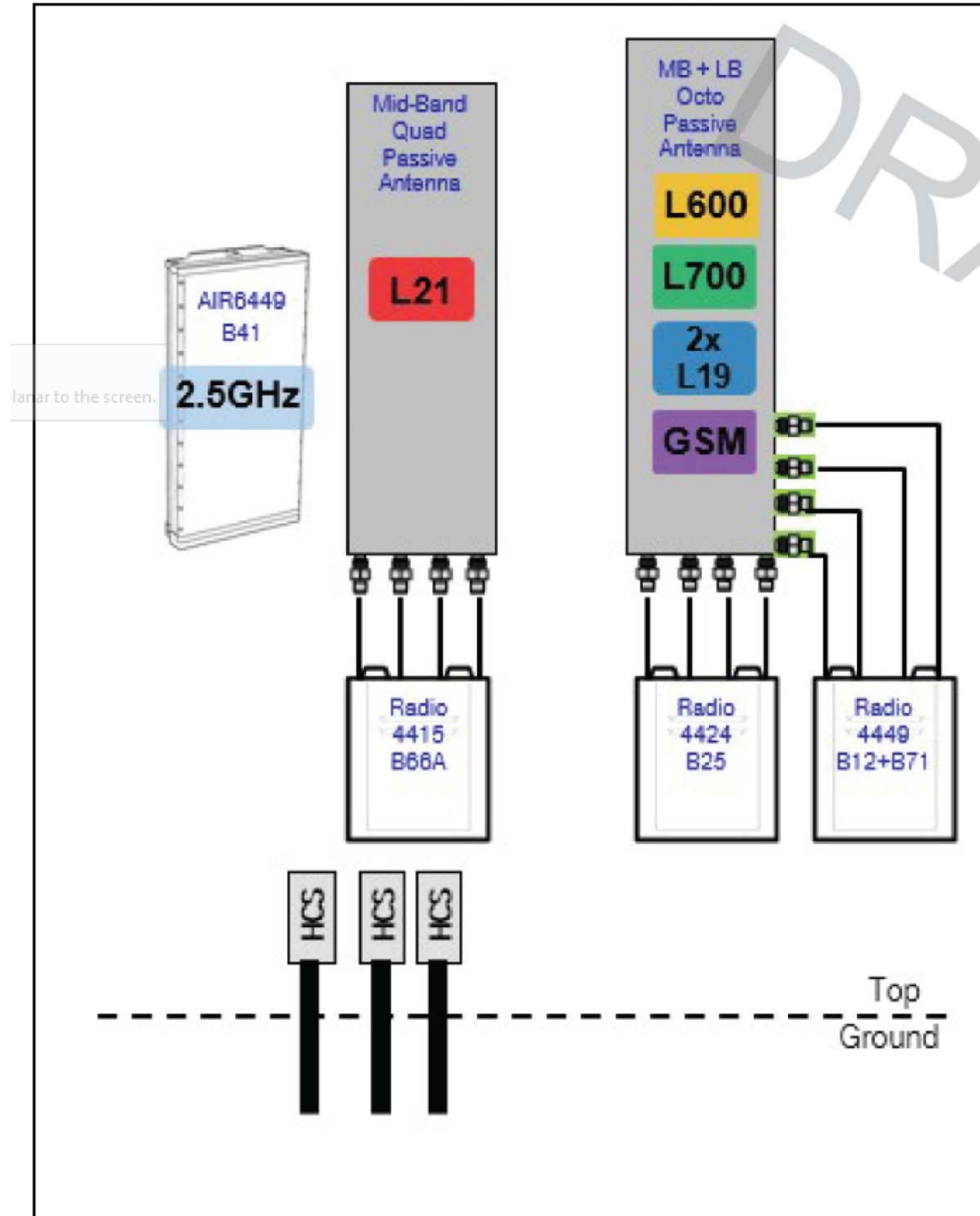
2 ANTENNA WITH RRHs MOUNTING DETAIL
SCALE: NOT TO SCALE



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SHEET NUMBER: C-3 **REVISION: 0**



laminar to the screen.



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
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BU #: 876366
WAPPINGERS FALLS / PRESTON CIT

101 PIERCE ROAD
PRESTON, CT 06365

EXISTING
155'-0" MONOPOLE

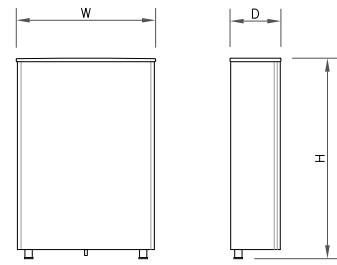
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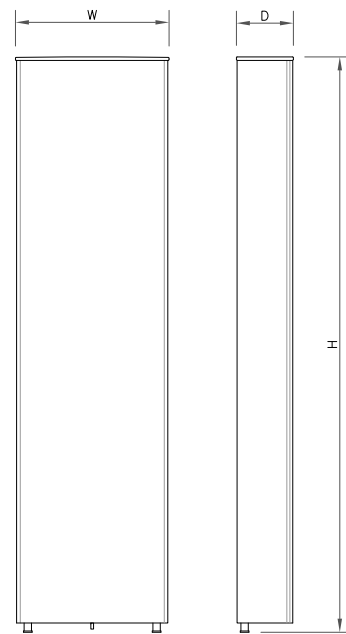
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SHEET NUMBER: **C-4** REVISION: **0**



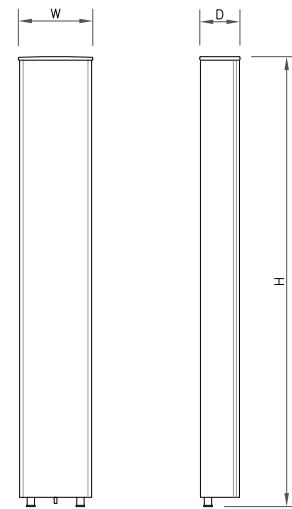
ANTENNA SPECS	
MANUFACTURER	ERICSSON
MODEL #	AIR6449 B41
WIDTH	20.51"
DEPTH	8.54"
HEIGHT	33.11"
WEIGHT	114.63 LBS

1 ANTENNA SPECS
SCALE: NOT TO SCALE



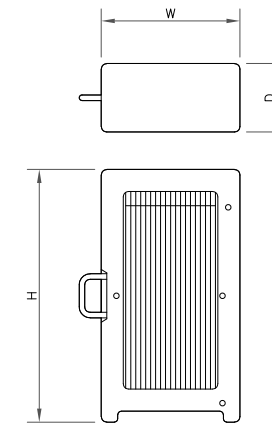
ANTENNA SPECS	
MANUFACTURER	RFS/CELWAVE
MODEL #	APXVAALL24_43-UNA20
WIDTH	24.00"
DEPTH	8.50"
HEIGHT	95.90"
WEIGHT	149.90 LBS

2 ANTENNA SPECS
SCALE: NOT TO SCALE



ANTENNA SPECS	
MANUFACTURER	RFS/CELWAVE
MODEL #	APX16DWV-16DWVS-E-A20
WIDTH	13.30"
DEPTH	3.15"
HEIGHT	55.90"
WEIGHT	40.70 LBS

3 ANTENNA SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4415 B66A
WIDTH	13.50"
DEPTH	6.30"
HEIGHT	16.50"
WEIGHT	49.60 LBS

4 RRU SPECS
SCALE: NOT TO SCALE

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T-MOBILE SITE NUMBER:
CTNL841A

BU #: **876366**
WAPPINGERS FALLS /
PRESTON CIT

101 PIERCE ROAD
PRESTON, CT 06365

EXISTING
155'-0" MONOPOLE

ISSUED FOR:

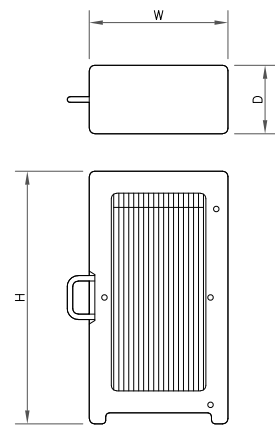
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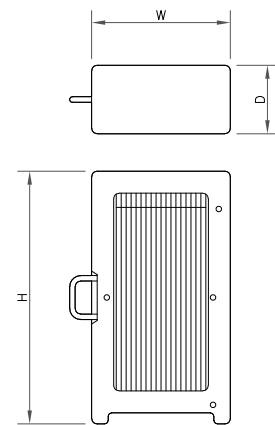
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RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4424 B25
WIDTH	14.40"
DEPTH	11.30"
HEIGHT	17.10"
WEIGHT	86.0 LBS

5 RRU SPECS
SCALE: NOT TO SCALE



RRU SPECIFICATIONS	
MANUFACTURER	ERICSSON
MODEL #	RADIO 4449 B71 B85A
WIDTH	13.20"
DEPTH	10.63"
HEIGHT	17.91"
WEIGHT	73.21 LBS

6 RRU SPECS
SCALE: NOT TO SCALE



BATTERY CABINET SPECIFICATIONS	
MODEL #	B160
MANUF.	ERICSSON
HEIGHT	63"
WIDTH	28"
DEPTH	26"
WEIGHT	

7 ERICSSON B160 BATTERY CABINET
SCALE: NOT TO SCALE



ERICSSON 6160 SSC
WEIGHT: 60.0 LBS
SIZE (HxWxD): 63"x25.6"x33.5" IN.

8 ERICSSON 6160 SSC
SCALE: NOT TO SCALE

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SHEET NUMBER:

E-1

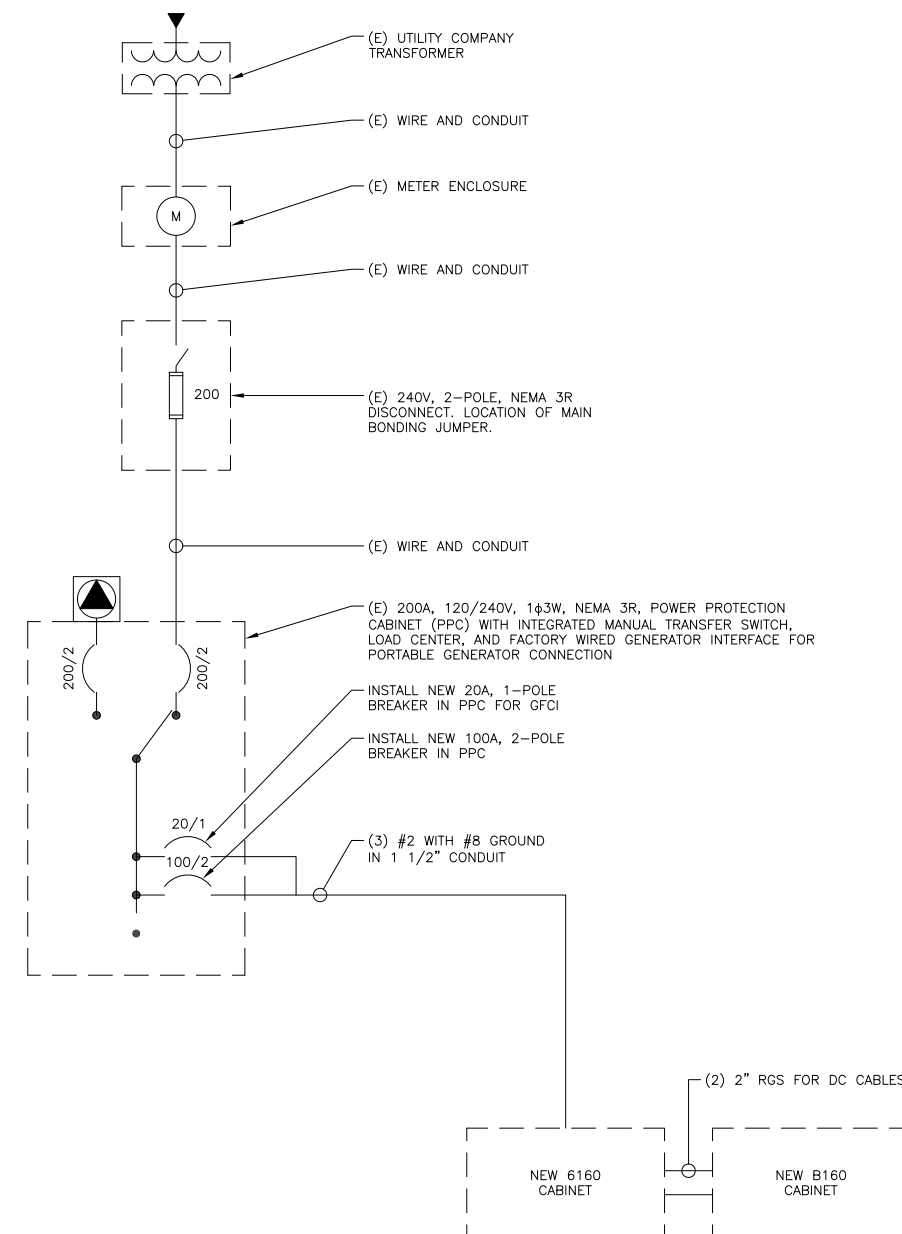
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FINAL PANEL SCHEDULE									
LOAD	POLES	AMPS	BUS		AMPS	POLES	LOAD	CIRCUIT BREAKER	
			L1	L2				TYPE	RATING
NEW BTS	2	XXA	1	2	XXA	2	SURGE ARRESTOR		
BACK BOARD CPI + LIGHT	1	20A	3	4	100A	2	6160		
OUTSIDE LIGHT	1	20A	7	8		1	TELCO OUTLETS		
FAN	1	XXA	11	12	20A	1	B160		

RATED VOLTAGE: 120/240 1 PHASE, 3 WIRE
 RATED AMPS: 100 200 400
 MAIN LUGS ONLY MAIN 200 AMPS BREAKER FUSED SWITCH HINGED DOOR KEYPED DOOR LATCH
 FUSED CIRCUIT BREAKER BRANCH DEVICES TO BE GFCI BREAKERS FULL NEUTRAL BUS GROUND BAR
 ALL BREAKERS MUST BE RATED TO INTERRUPT A SHORT CIRCUIT ISC OF 10,000 AMPS SYMMETRICAL

REPLACE EXISTING BREAKER IN POSITION 6 AND 8 WITH A NEW 2P 100A BREAKER
 REPLACE EXISTING WIRES FOR EXISTING CABINET WITH (3) 1/0 AWG THWN (COPPER) AND (1) #2G AWG. MINIMUM CONDUIT SIZE TO BE 2".
 IF 100A BREAKER WILL NOT PROPERLY FIT IN EXISTING PANEL, REPLACE (E) PANEL WITH SQUARE D PANEL Q012040M200RB (OR APPROVED EQUAL).
 UPGRADE FEEDER WIRES TO MEET AMPACITY IF NEW PANEL IS REQUIRED.
 FINAL PANEL DESIGN AND CALCULATIONS FOR WIRE SIZE WERE BASED OFF OF EXISTING DOCUMENTS AND PHOTOS



NOTES:

- ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL CONDUCTORS SHALL BE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 UNLESS NOTED OTHERWISE.
- CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- ALL GROUNDING AND BONDING PER THE NEC.

1 AC PANEL SCHEDULE
SCALE: NOT TO SCALE

2 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

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**WAPPINGERS FALLS /
PRESTON CIT**

101 PIERCE ROAD
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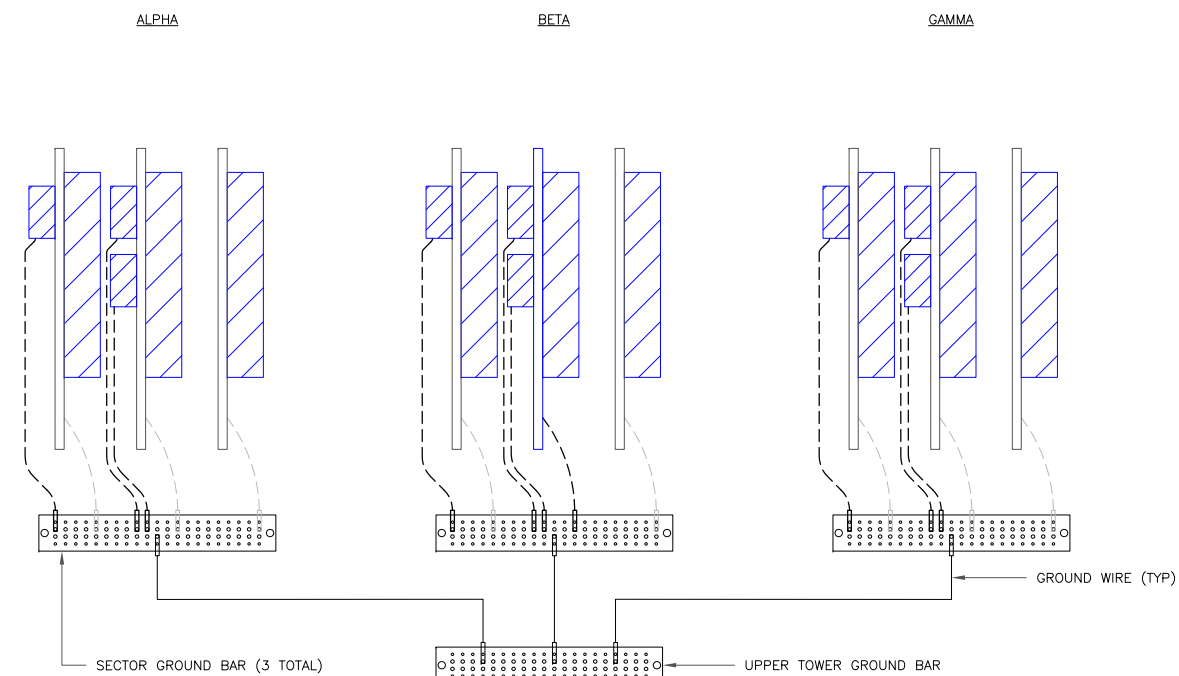
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G-1

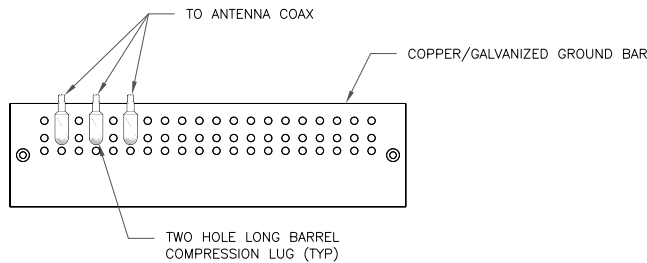
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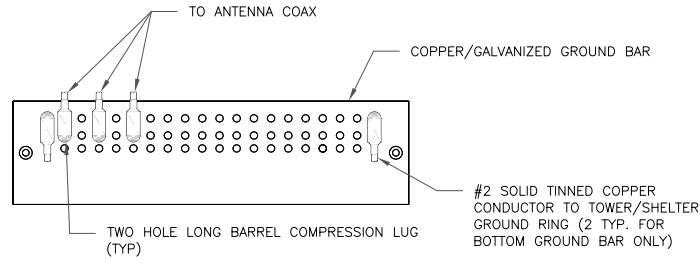
NOTE:
ALL NEW GROUNDS TO BE #6 STRANDED
COPPER WITH GREEN INSULATION UNLESS
NOTED OTHERWISE.

1 ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE



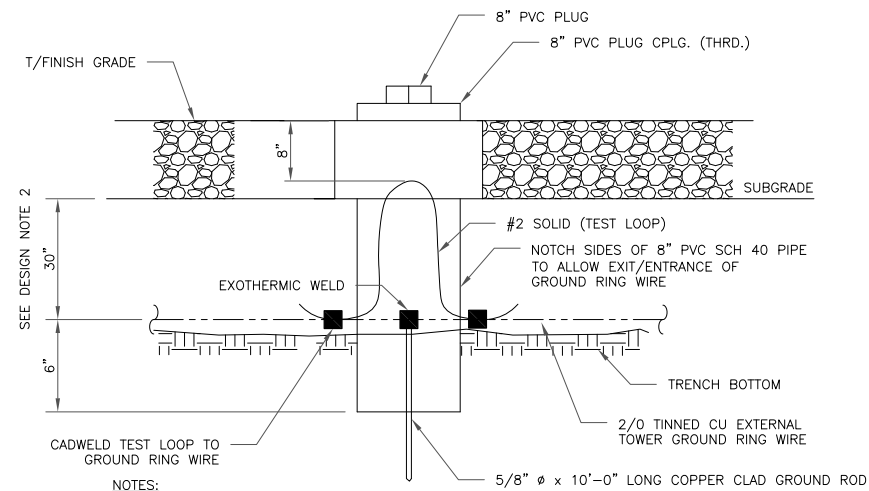
- NOTES:**
1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
 2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
 3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO ANTENNA MOUNT STEEL.

1 ANTENNA SECTOR GROUND BAR DETAIL
SCALE: NOT TO SCALE



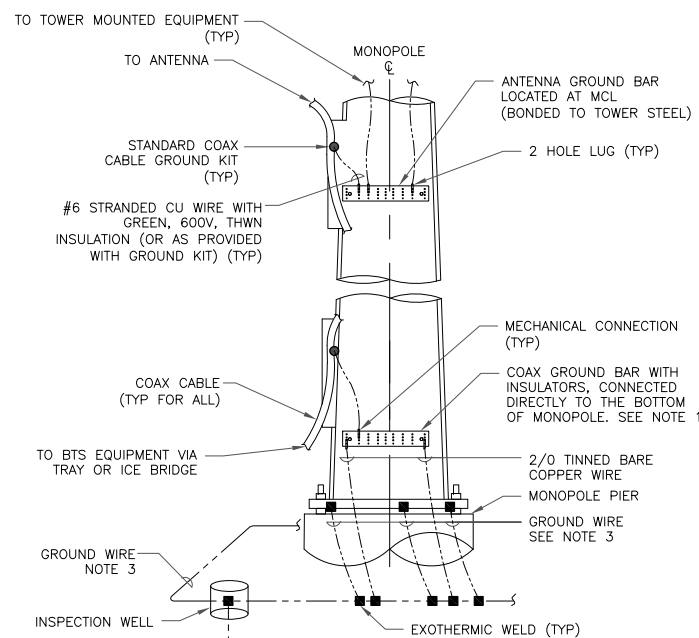
- NOTES:**
1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
 2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
 3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



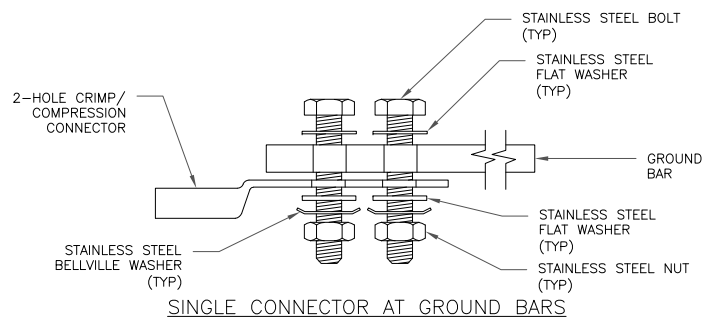
- NOTES:**
1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.
 2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D).

3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE

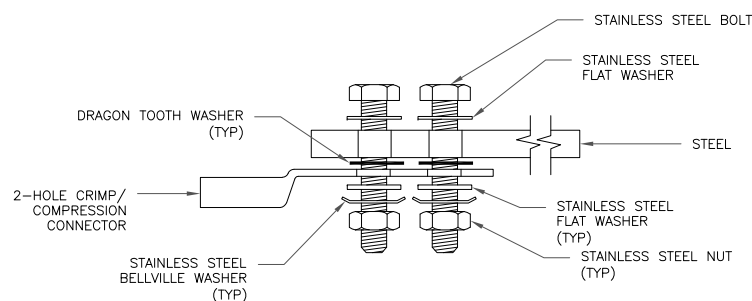


- NOTES:**
1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
 2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE USA INC. TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
 3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

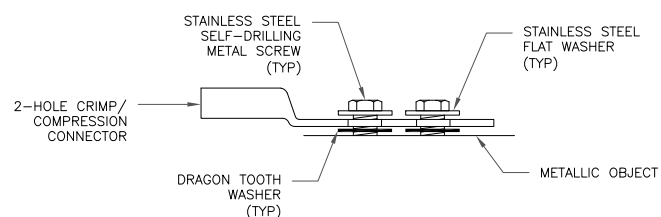
4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

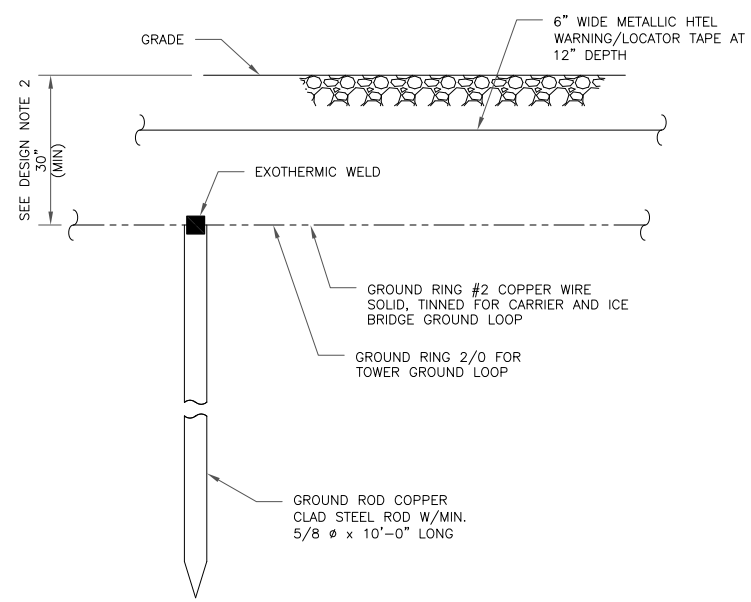


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



- NOTES:**
1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.
 2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D).

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

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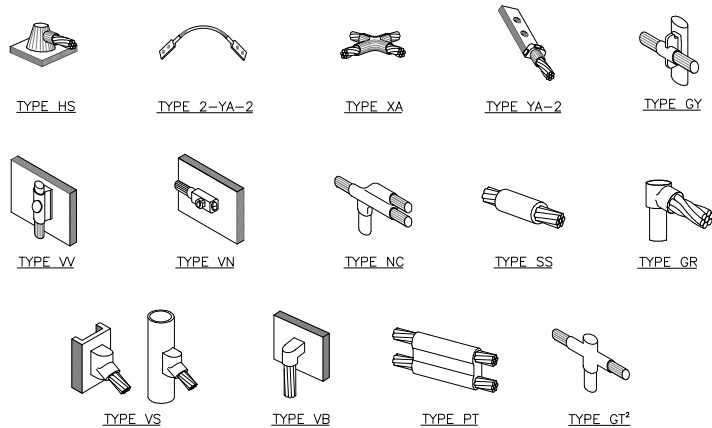
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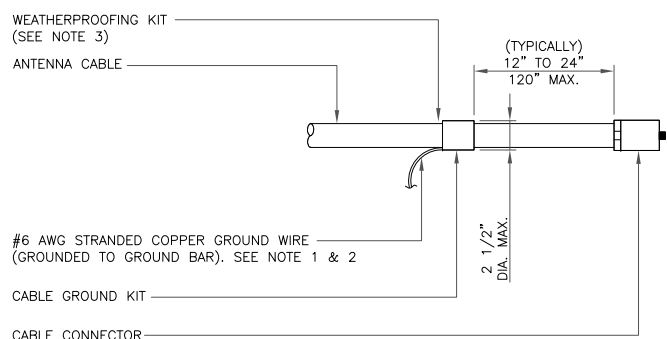
SHEET NUMBER: **G-2** REVISION: **0**



NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

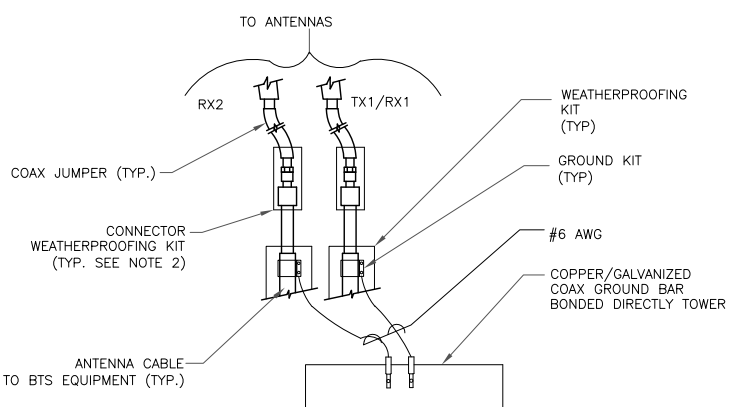
1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

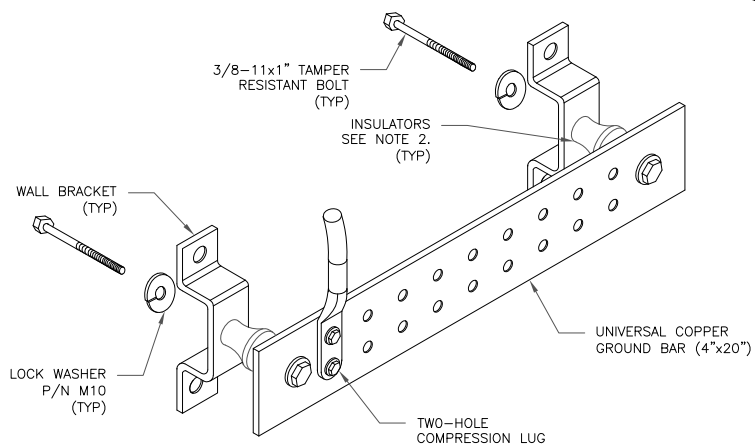
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

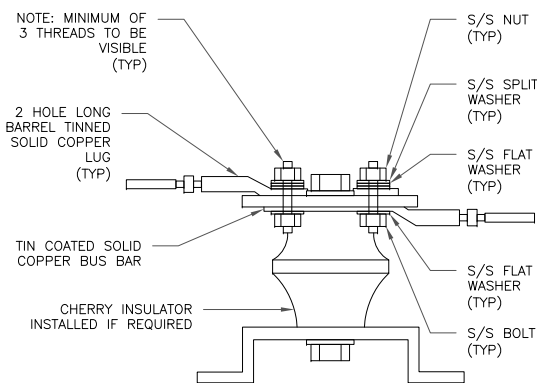
4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



NOTES:

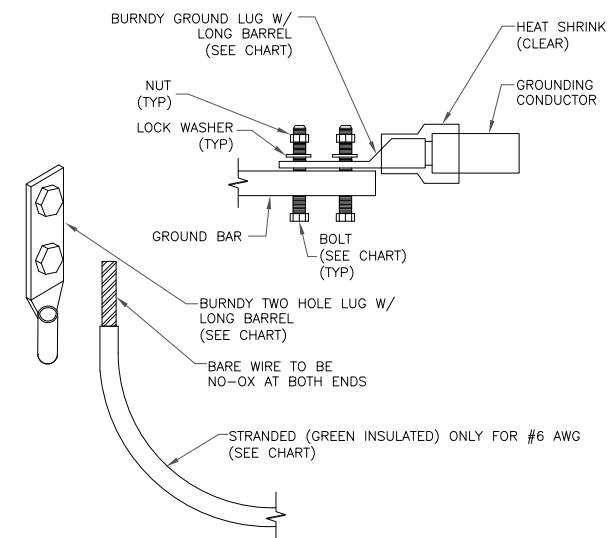
1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE

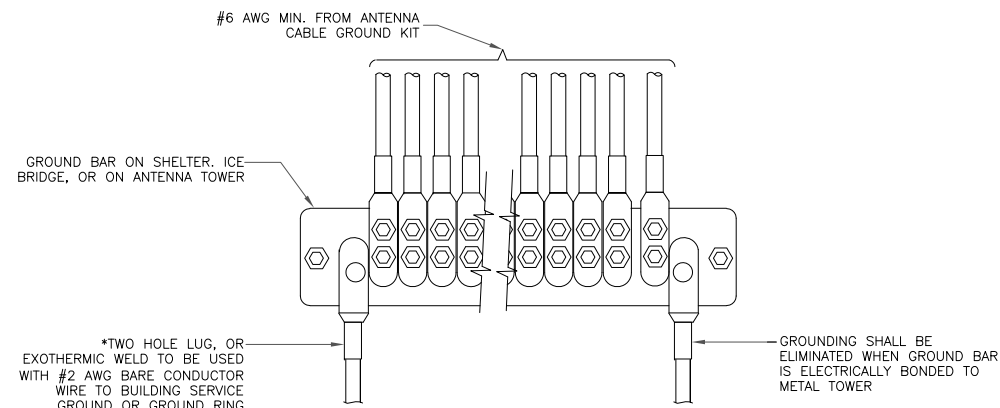
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



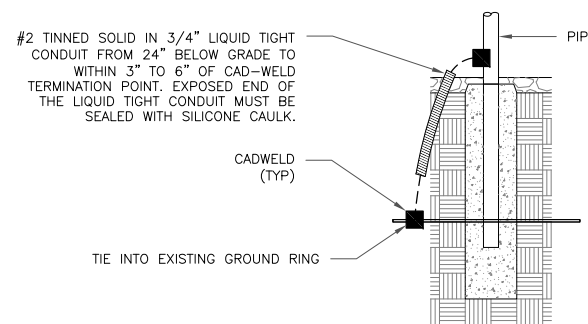
NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER, GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-Mobile
4 SYLVAN WAY
PARSIPPANY, NJ 07054

CROWN CASTLE
3530 TORINGDON WAY, SUITE 300
CHARLOTTE, NC 28277

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

T-MOBILE SITE NUMBER:
CTNL841A

BU #: **876366**
WAPPINGERS FALLS /
PRESTON CIT

101 PIERCE ROAD
PRESTON, CT 06365

EXISTING
155'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	3/23/21	JJR	CONSTRUCTION	GEH



B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

IT IS A VIOLATION OF LAW FOR ANY PERSON,
UNLESS THEY ARE ACTING UNDER THE DIRECTION
OF A LICENSED PROFESSIONAL ENGINEER,
TO ALTER THIS DOCUMENT.

SHEET NUMBER:

G-3

REVISION:

0

Exhibit D

Structural Analysis Report



Date: February 19, 2021

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Subject: Structural Analysis Report

Carrier Designation: Sprint PCS Co-Locate
Site Number: CTNL841A
Site Name: CTNL841A

Crown Castle Designation: BU Number: 876366
Site Name: Wappingers Falls / Preston CIT
JDE Job Number: 628847
Work Order Number: 1919049
Order Number: 538782 Rev. 0

Engineering Firm Designation: B+T Group Project Number: 147460.002.01a

Site Data: 101 Pierce Road, Preston, New London County, CT
Latitude 41° 32' 17.46", Longitude -71° 57' 6"
155 Foot - Monopole Tower

B+T Group is pleased to submit this “Structural Analysis Report” to determine the structural integrity of the above-mentioned tower.

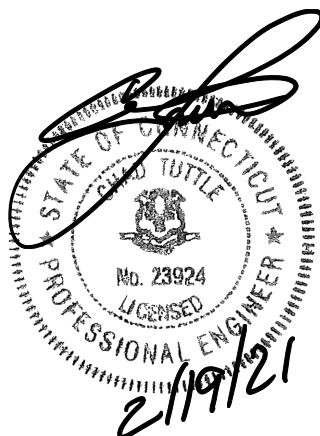
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Proposed Equipment Configuration **Sufficient Capacity – 100.0%**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 135 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Xavier Jones

Respectfully submitted by: B+T Engineering, Inc.
COA: PEC.0001564 Expires: 02/10/2022



Chad E. Tuttle, P.E.

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1) INTRODUCTION

This is a 155 ft. Monopole tower designed by Engineered Endeavors, Inc., in September of 1999 and mapped by TEP in December of 2007.

The tower has been modified as per drawing prepared by PSG in June of 2008. The reinforcement consists of adding base plate stiffeners. Later the tower was modified by Black & Veatch in November of 2015. The reinforcement consists of adding flat plate reinforcement from 45' to 70', 84' to 99' and adding new anchor rods and brackets.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	135 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
155.0	159.0	1	Site Pro 1	HRK-12 Handrail Kit	4	1-5/8
	157.0	3	Ericsson	AIR6449 B41_T-MOBILE		
		3	Ericsson	RADIO 4415 B66A		
		3	Ericsson	RADIO 4424 B25_TMO		
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	RFS Celwave	APX16DWV-16DWV-S-E-A20		
		3	RFS Celwave	APXVAALL24_43-U-NA20_TMO		
	3	--	8' Long Pipe 2.0 STD			
155.0	1	--	Platform Mount [LP 712-1]			
74.0	74.0	1	Lucent	KS24019-L112A	1	1/2
		1	--	Side Arm Mount [SO 701-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
140.0	140.0	3	CCI Antennas	HPA-65R-BUU-H8	12 4 2	1-1/4 7/16 3/8
		3	Ericsson	RRUS 11		
		3	Ericsson	RRUS 32 B2		
		3	Ericsson	RRUS 4478 B14		
		3	Kathrein	80010966		
		6	Powerwave Tech.	7770.00		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		6	Powerwave Tech.	LGP21401		
		6	Powerwave Tech.	LGP21901		
		2	Raycap	DC6-48-60-18-8F		
		1	--	Platform Mount [LP 303-1]		
128.0	131.0	3	Alcatel Lucent	B66A RRH4X45-4R	14	1-5/8
		3	Alcatel Lucent	RRH2X60-700		
		6	Antel	LPA-80063/6CF		
		6	Commscope	JAHH-65B-R3B		
		3	Nokia	B5 4T4R RRH4X40 AIRSCALE		
		6	Powerwave Tech.	LGP21401		
		6	Powerwave Tech.	LGP21901		
		1	Raycap	DC6-48-60-18-8F		
	1	Raycap	RVZDC-6627-PF-48			
	128.0	1	--	Side Arm Mount [SO 102-3]		
		1	--	T-Arm Mount [TA 602-3]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
TOWER MANUFACTURER DRAWING / MAPPING	2174297	CCI Sites
MOUNT ANALYSIS REPORT	9546045	CCI Sites
TOWER MODIFICATION DRAWING	2271037	CCI Sites
POST MODIFICATION INSPECTION	2391519	CCI Sites
TOWER MODIFICATION DRAWING	5971889	CCI Sites
POST MODIFICATION INSPECTION	6133027	CCI Sites
FOUNDATION DRAWING	2208798	CCI Sites
GEOTECH REPORT	2194336	CCI Sites
CROWN CAD PACKAGE	Date: 02/03/2021	CCI Sites

3.1) Analysis Method

tnxTower (version 8.0.7.5), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are presented in Appendix C.

3.2) Assumptions

- 1) The tower and structures were maintained in accordance with the - TIA-222 standard.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	155 - 150	Pole	TP19.036x18x0.188	1	-3.711	--	14.1%	Pass
L2	150 - 145	Pole	TP20.073x19.036x0.188	2	-3.958	--	22.9%	Pass
L3	145 - 140	Pole	TP21.109x20.073x0.188	3	-4.225	--	30.7%	Pass
L4	140 - 135	Pole	TP22.146x21.109x0.188	4	-7.342	--	44.8%	Pass
L5	135 - 130	Pole	TP23.182x22.146x0.188	5	-7.777	--	56.8%	Pass
L6	130 - 126.79	Pole	TP24.59x23.182x0.188	6	-10.440	--	68.7%	Pass
L7	126.79 - 121.79	Pole	TP24.671x23.473x0.25	7	-11.248	--	59.2%	Pass
L8	121.79 - 116.79	Pole	TP25.87x24.671x0.25	8	-11.958	--	67.8%	Pass
L9	116.79 - 111.79	Pole	TP27.068x25.87x0.25	9	-12.695	--	75.2%	Pass
L10	111.79 - 106.79	Pole	TP28.267x27.068x0.25	10	-13.464	--	81.6%	Pass
L11	106.79 - 101.79	Pole	TP29.465x28.267x0.25	11	-14.263	--	87.2%	Pass
L12	101.79 - 97.5	Pole	TP30.494x29.465x0.25	12	-14.968	--	91.5%	Pass
L13	97.5 - 97.25	Pole	TP30.554x30.494x0.25	13	-15.027	--	91.7%	Pass
L14	97.25 - 92.25	Pole	TP31.752x30.554x0.25	14	-15.861	--	96.2%	Pass
L15	92.25 - 87.41	Pole	TP34.07x31.752x0.25	15	-16.702	--	100.0%	Pass
L16	87.41 - 81.58	Pole	TP33.825x32.412x0.313	16	-18.301	--	79.8%	Pass
L17	81.58 - 76.58	Pole	TP35.037x33.825x0.313	17	-19.319	--	81.8%	Pass
L18	76.58 - 71.58	Pole	TP36.249x35.037x0.313	18	-20.442	--	83.7%	Pass
L19	71.58 - 68	Pole	TP37.117x36.249x0.313	19	-21.203	--	84.9%	Pass
L20	68 - 67.75	Pole + Reinf.	TP37.178x37.117x0.488	20	-21.291	--	82.8%	Pass
L21	67.75 - 62.75	Pole + Reinf.	TP38.39x37.178x0.475	21	-22.676	--	84.4%	Pass
L22	62.75 - 57.75	Pole + Reinf.	TP39.602x38.39x0.475	22	-24.097	--	85.8%	Pass
L23	57.75 - 52.75	Pole + Reinf.	TP40.814x39.602x0.463	23	-25.546	--	87.1%	Pass
L24	52.75 - 48.96	Pole + Reinf.	TP43.17x40.814x0.463	24	-26.660	--	88.0%	Pass
L25	48.96 - 42.03	Pole	TP42.791x41.108x0.375	25	-29.850	--	74.3%	Pass
L26	42.03 - 37.03	Pole	TP44.005x42.791x0.375	26	-31.210	--	74.9%	Pass
L27	37.03 - 32.03	Pole	TP45.22x44.005x0.375	27	-32.600	--	75.6%	Pass
L28	32.03 - 27.03	Pole	TP46.434x45.22x0.375	28	-34.019	--	76.1%	Pass
L29	27.03 - 22.03	Pole	TP47.649x46.434x0.375	29	-35.468	--	76.7%	Pass
L30	22.03 - 17.03	Pole	TP48.863x47.649x0.375	30	-36.946	--	77.2%	Pass
L31	17.03 - 12.03	Pole	TP50.078x48.863x0.375	31	-38.453	--	77.7%	Pass
L32	12.03 - 7.03	Pole	TP51.292x50.078x0.375	32	-39.990	--	78.1%	Pass
L33	7.03 - 2.03	Pole	TP52.507x51.292x0.375	33	-41.557	--	78.6%	Pass
L34	2.03 - 0	Pole	TP53x52.507x0.375	34	-42.201	--	78.7%	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
							Summary	
						Pole (L15)	100.0	Pass
						Reinforcement	88.0	Pass
						Rating =	100.0	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rod Bracket	Base	51.0	Pass
1,2	Anchor Rods	Base	73.9	Pass
1,2	Base Plate	Base	99.0	Pass
1,2	Base Foundation (Structure)	Base	90.1	Pass
1,2	Base Foundation (Soil Interaction)	Base	90.8	Pass

Structure Rating (max from all components) =	100.0%
---	---------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Rating per TIA-222-H Section 15.5.

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

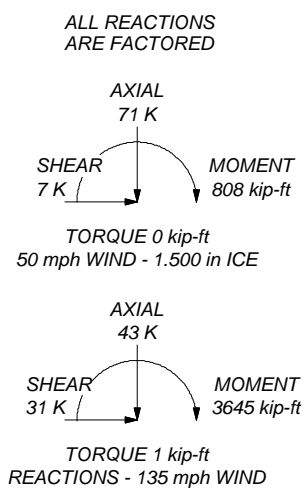
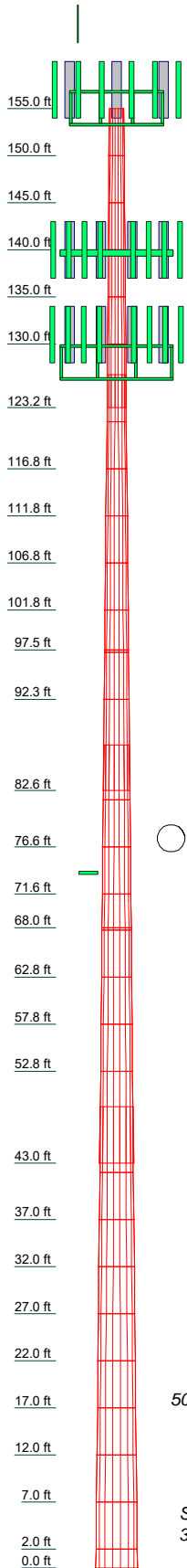
MATERIAL STRENGTH


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

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 135 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 100.0%

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.000	18	0.188	3.580	22.146	21.109	0.2	18.000
2	5.000	18	0.188	3.580	22.146	21.109	0.2	19.036
3	5.000	18	0.188	3.580	22.146	21.109	0.2	20.073
4	5.000	18	0.188	3.580	22.146	21.109	0.2	21.109
5	5.000	18	0.188	3.580	22.146	21.109	0.2	22.146
6	5.000	18	0.188	3.580	22.146	21.109	0.2	23.182
7	5.000	18	0.188	3.580	22.146	21.109	0.2	24.218
8	5.000	18	0.188	3.580	22.146	21.109	0.2	25.254
9	5.000	18	0.188	3.580	22.146	21.109	0.2	26.290
10	5.000	18	0.188	3.580	22.146	21.109	0.2	27.326
11	5.000	18	0.188	3.580	22.146	21.109	0.2	28.362
12	5.000	18	0.188	3.580	22.146	21.109	0.2	29.398
13	5.000	18	0.188	3.580	22.146	21.109	0.2	30.434
14	5.000	18	0.188	3.580	22.146	21.109	0.2	31.470
15	5.830	18	0.250	4.830	31.752	30.070	0.9	34.070
16	5.830	18	0.250	4.830	31.752	30.070	0.9	35.106
17	5.830	18	0.250	4.830	31.752	30.070	0.9	36.142
18	5.830	18	0.250	4.830	31.752	30.070	0.9	37.178
19	5.830	18	0.250	4.830	31.752	30.070	0.9	38.214
20	5.830	18	0.250	4.830	31.752	30.070	0.9	39.250
21	5.830	18	0.250	4.830	31.752	30.070	0.9	40.286
22	5.830	18	0.250	4.830	31.752	30.070	0.9	41.322
23	5.830	18	0.250	4.830	31.752	30.070	0.9	42.358
24	5.830	18	0.250	4.830	31.752	30.070	0.9	43.394
25	5.830	18	0.250	4.830	31.752	30.070	0.9	44.430
26	5.830	18	0.250	4.830	31.752	30.070	0.9	45.466
27	5.830	18	0.250	4.830	31.752	30.070	0.9	46.502
28	5.830	18	0.250	4.830	31.752	30.070	0.9	47.538
29	5.830	18	0.250	4.830	31.752	30.070	0.9	48.574
30	5.830	18	0.250	4.830	31.752	30.070	0.9	49.610
31	5.830	18	0.250	4.830	31.752	30.070	0.9	50.646
32	5.830	18	0.250	4.830	31.752	30.070	0.9	51.682
33	5.830	18	0.250	4.830	31.752	30.070	0.9	52.718
34	5.830	18	0.250	4.830	31.752	30.070	0.9	53.754



 <p>B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<p>Job: 147460.002.01 - WAPPINGERS FALLS/ PRESTON CIT, CT(BU# 87636)</p>		
	Project:	Drawn by: xjones	App'd:
	Client: Crown Castle	Date: 02/19/21	Scale: NTS
	Code: TIA-222-H	Path:	Dwg No: E-1

Vx

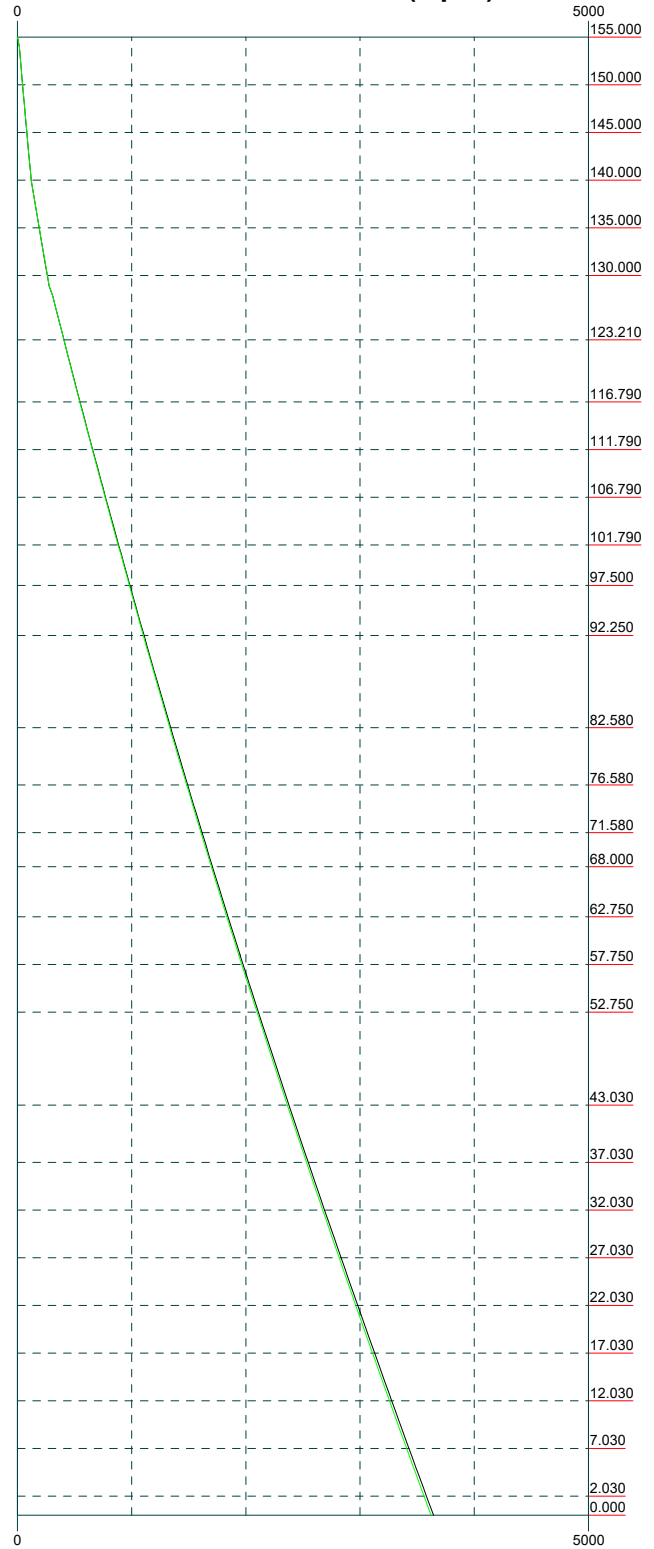
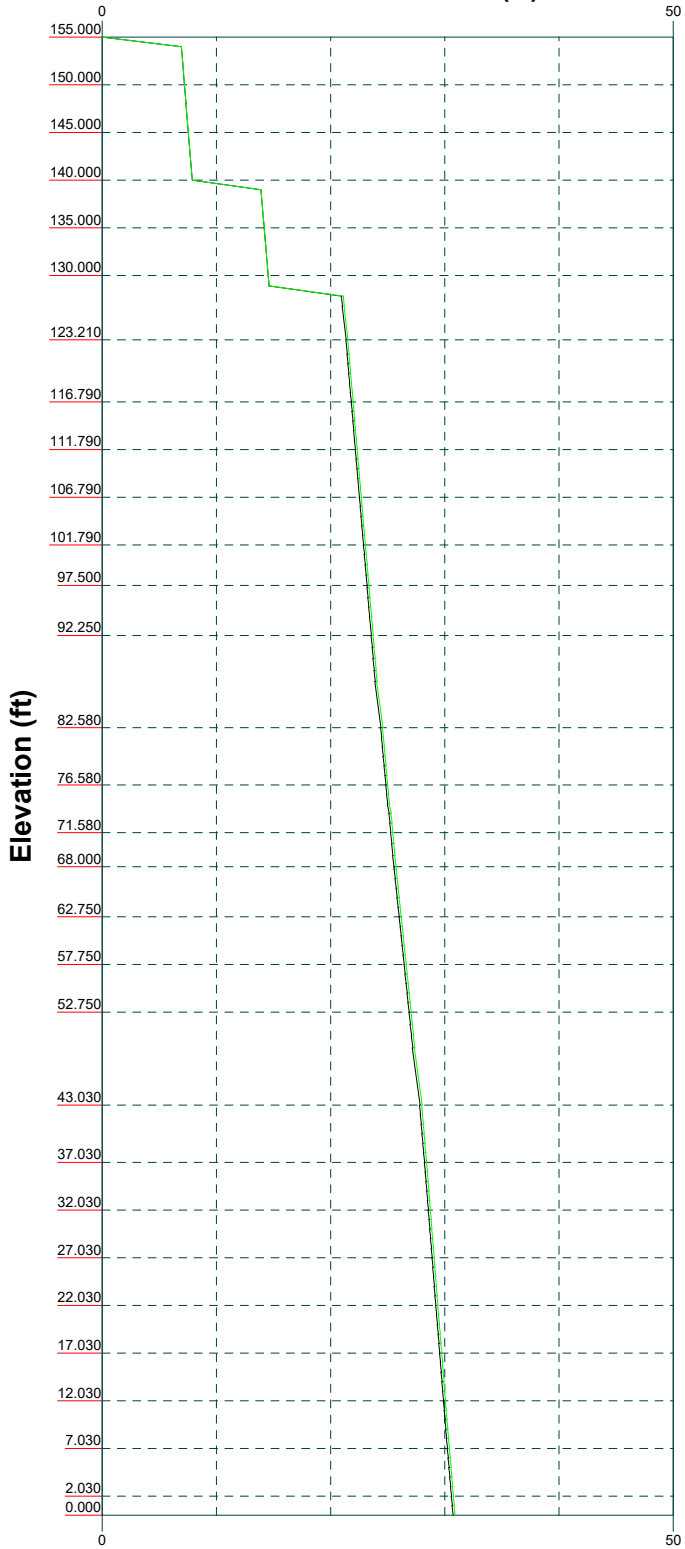
Vz

Mx

Mz

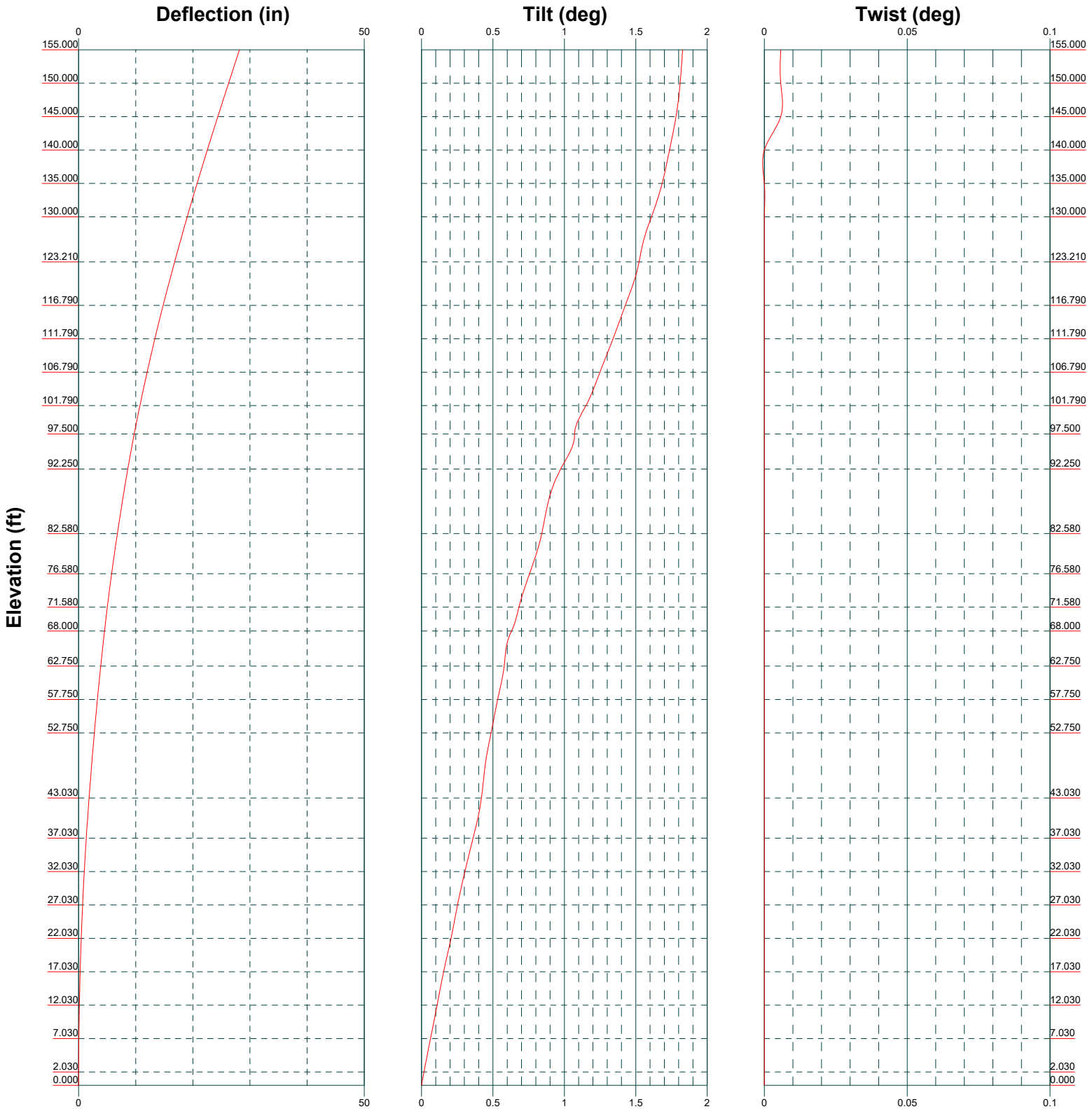
Global Mast Shear (K)

Global Mast Moment (kip-ft)



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 1717 S. Boulder, Suite 300
 Tulsa, OK 74119
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 FAX: (918) 295-0265

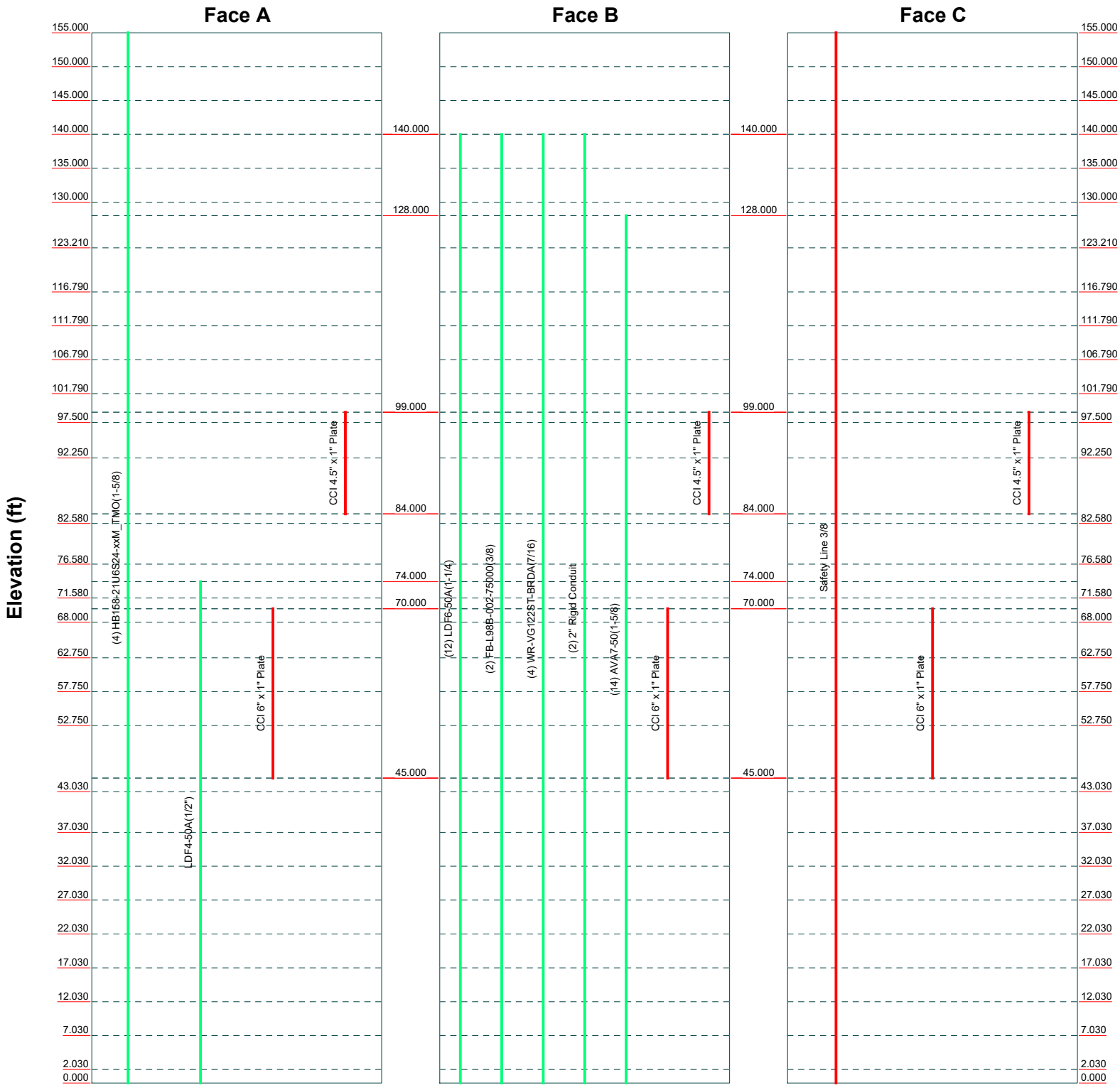
Job:	147460.002.01 - WAPPINGERS FALLS/ PRESTON CIT, CT(BU# 87636)		
Project:			
Client:	Crown Castle	Drawn by: xjones	App'd:
Code:	TIA-222-H	Date: 02/19/21	Scale: NTS
Path:			
			Dwg No: E-4



Feed Line Distribution Chart

0' - 155'

— Round
 — Flat
 — App In Face
 — App Out Face
 — Truss Leg



<p>B+T GRP</p>	B+T Group		Job: 147460.002.01 - WAPPINGERS FALLS/ PRESTON CIT, CT(BU# 87636)		
	1717 S. Boulder, Suite 300		Project:		
	Tulsa, OK 74119		Client: Crown Castle	Drawn by: xjones	App'd:
	Phone: (918) 587-4630		Code: TIA-222-H	Date: 02/19/21	Scale: NTS
	FAX: (918) 295-0265		Path:		Dwg No. E-7

<p>tnxTower</p> <p>B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<p>Job 147460.002.01 - WAPPINGERS FALLS/ PRESTON CIT, CT(BU# 876366)</p>	<p>Page 1 of 36</p>
	<p>Project</p>	<p>Date 08:00:18 02/19/21</p>
	<p>Client Crown Castle</p>	<p>Designed by xjones</p>

Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

Tower is located in New London County, Connecticut.

Tower base elevation above sea level: 290.000 ft.

Basic wind speed of 135 mph.

Risk Category II.

Exposure Category B.

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

Topographic Category: 1.

Crest Height: 0.000 ft.

Nominal ice thickness of 1.500 in.

Ice thickness is considered to increase with height.

Ice density of 56.000 pcf.

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

Temperature drop of 50.000 °F.

Deflections calculated using a wind speed of 60 mph.

TIA-222-H Annex S.

TOWER RATING: 99.9%.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.05.

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

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

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

Options

<ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric 	<ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs 	<ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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tnxTower

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 Tulsa, OK 74119
 Phone: (918) 587-4630
 FAX: (918) 295-0265

Job
 147460.002.01 - WAPPINGERS FALLS/ PRESTON CIT,
 CT(BU# 876366)

Page
 2 of 36

Project
Date
 08:00:18 02/19/21

Client
 Crown Castle
Designed by
 xjones

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	155.000-150.000	5.000	0.000	18	18.000	19.036	0.188	0.750	A572-65 (65 ksi)
L2	150.000-145.000	5.000	0.000	18	19.036	20.073	0.188	0.750	A572-65 (65 ksi)
L3	145.000-140.000	5.000	0.000	18	20.073	21.109	0.188	0.750	A572-65 (65 ksi)
L4	140.000-135.000	5.000	0.000	18	21.109	22.146	0.188	0.750	A572-65 (65 ksi)
L5	135.000-130.000	5.000	0.000	18	22.146	23.182	0.188	0.750	A572-65 (65 ksi)
L6	130.000-123.210	6.790	3.580	18	23.182	24.590	0.188	0.750	A572-65 (65 ksi)
L7	123.210-121.790	5.000	0.000	18	23.473	24.671	0.250	1.000	A572-65 (65 ksi)
L8	121.790-116.790	5.000	0.000	18	24.671	25.870	0.250	1.000	A572-65 (65 ksi)
L9	116.790-111.790	5.000	0.000	18	25.870	27.068	0.250	1.000	A572-65 (65 ksi)
L10	111.790-106.790	5.000	0.000	18	27.068	28.267	0.250	1.000	A572-65 (65 ksi)
L11	106.790-101.790	5.000	0.000	18	28.267	29.465	0.250	1.000	A572-65 (65 ksi)
L12	101.790-97.500	4.290	0.000	18	29.465	30.494	0.250	1.000	A572-65 (65 ksi)
L13	97.500-97.250	0.250	0.000	18	30.494	30.554	0.250	1.000	A572-65 (65 ksi)
L14	97.250-92.250	5.000	0.000	18	30.554	31.752	0.250	1.000	A572-65 (65 ksi)
L15	92.250-82.580	9.670	4.830	18	31.752	34.070	0.250	1.000	A572-65 (65 ksi)
L16	82.580-81.580	5.830	0.000	18	32.412	33.825	0.313	1.250	A572-65 (65 ksi)
L17	81.580-76.580	5.000	0.000	18	33.825	35.037	0.313	1.250	A572-65 (65 ksi)
L18	76.580-71.580	5.000	0.000	18	35.037	36.249	0.313	1.250	A572-65 (65 ksi)
L19	71.580-68.000	3.580	0.000	18	36.249	37.117	0.313	1.250	A572-65 (65 ksi)
L20	68.000-67.750	0.250	0.000	18	37.117	37.178	0.487	1.950	A572-65 (65 ksi)
L21	67.750-62.750	5.000	0.000	18	37.178	38.390	0.475	1.900	A572-65 (65 ksi)
L22	62.750-57.750	5.000	0.000	18	38.390	39.602	0.475	1.900	A572-65 (65 ksi)
L23	57.750-52.750	5.000	0.000	18	39.602	40.814	0.463	1.850	A572-65 (65 ksi)
L24	52.750-43.030	9.720	5.930	18	40.814	43.170	0.463	1.850	A572-65 (65 ksi)
L25	43.030-42.030	6.930	0.000	18	41.108	42.791	0.375	1.500	A572-65 (65 ksi)
L26	42.030-37.030	5.000	0.000	18	42.791	44.005	0.375	1.500	A572-65 (65 ksi)
L27	37.030-32.030	5.000	0.000	18	44.005	45.220	0.375	1.500	A572-65 (65 ksi)
L28	32.030-27.030	5.000	0.000	18	45.220	46.434	0.375	1.500	A572-65 (65 ksi)
L29	27.030-22.030	5.000	0.000	18	46.434	47.649	0.375	1.500	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
L30	22.030-17.030	5.000	0.000	18	47.649	48.863	0.375	1.500	A572-65 (65 ksi)
L31	17.030-12.030	5.000	0.000	18	48.863	50.078	0.375	1.500	A572-65 (65 ksi)
L32	12.030-7.030	5.000	0.000	18	50.078	51.292	0.375	1.500	A572-65 (65 ksi)
L33	7.030-2.030	5.000	0.000	18	51.292	52.507	0.375	1.500	A572-65 (65 ksi)
L34	2.030-0.000	2.030		18	52.507	53.000	0.375	1.500	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	18.249	10.601	424.933	6.323	9.144	46.471	850.425	5.301	2.838	15.136
	19.301	11.218	503.512	6.691	9.671	52.067	1007.687	5.610	3.020	16.109
L2	19.301	11.218	503.512	6.691	9.671	52.067	1007.687	5.610	3.020	16.109
	20.354	11.834	591.226	7.059	10.197	57.980	1183.231	5.918	3.203	17.082
L3	20.354	11.834	591.226	7.059	10.197	57.980	1183.231	5.918	3.203	17.082
	21.406	12.451	688.578	7.427	10.724	64.211	1378.062	6.227	3.385	18.055
L4	21.406	12.451	688.578	7.427	10.724	64.211	1378.062	6.227	3.385	18.055
	22.459	13.068	796.070	7.795	11.250	70.761	1593.187	6.535	3.568	19.028
L5	22.459	13.068	796.070	7.795	11.250	70.761	1593.187	6.535	3.568	19.028
	23.511	13.685	914.204	8.163	11.777	77.628	1829.610	6.844	3.750	20.001
L6	23.511	13.685	914.204	8.163	11.777	77.628	1829.610	6.844	3.750	20.001
	24.940	14.523	1092.568	8.663	12.492	87.463	2186.574	7.263	3.998	21.322
L7	24.668	18.427	1255.545	8.244	11.924	105.294	2512.742	9.215	3.691	14.765
	25.013	19.378	1460.140	8.670	12.533	116.503	2922.202	9.691	3.902	15.609
L8	25.013	19.378	1460.140	8.670	12.533	116.503	2922.202	9.691	3.902	15.609
	26.230	20.329	1685.836	9.095	13.142	128.279	3373.889	10.167	4.113	16.452
L9	26.230	20.329	1685.836	9.095	13.142	128.279	3373.889	10.167	4.113	16.452
	27.447	21.280	1933.666	9.521	13.751	140.623	3869.877	10.642	4.324	17.296
L10	27.447	21.280	1933.666	9.521	13.751	140.623	3869.877	10.642	4.324	17.296
	28.664	22.231	2204.668	9.946	14.360	153.533	4412.237	11.118	4.535	18.14
L11	28.664	22.231	2204.668	9.946	14.360	153.533	4412.237	11.118	4.535	18.14
	29.881	23.182	2499.876	10.371	14.968	167.010	5003.041	11.593	4.746	18.984
L12	29.881	23.182	2499.876	10.371	14.968	167.010	5003.041	11.593	4.746	18.984
	30.926	23.998	2773.245	10.737	15.491	179.025	5550.140	12.001	4.927	19.708
L13	30.926	23.998	2773.245	10.737	15.491	179.025	5550.140	12.001	4.927	19.708
	30.986	24.046	2789.762	10.758	15.521	179.738	5583.196	12.025	4.937	19.75
L14	30.986	24.046	2789.762	10.758	15.521	179.738	5583.196	12.025	4.937	19.75
	32.203	24.997	3134.029	11.183	16.130	194.297	6272.182	12.501	5.148	20.593
L15	32.203	24.997	3134.029	11.183	16.130	194.297	6272.182	12.501	5.148	20.593
	34.557	26.836	3877.977	12.006	17.308	224.063	7761.056	13.421	5.556	22.225
L16	34.053	31.839	4144.760	11.395	16.465	251.725	8294.973	15.922	5.155	16.495
	34.299	33.241	4716.635	11.897	17.183	274.489	9439.476	16.623	5.403	17.29
L17	34.299	33.241	4716.635	11.897	17.183	274.489	9439.476	16.623	5.403	17.29
	35.530	34.443	5247.100	12.327	17.799	294.797	10501.104	17.225	5.617	17.973
L18	35.530	34.443	5247.100	12.327	17.799	294.797	10501.104	17.225	5.617	17.973
	36.760	35.645	5815.918	12.758	18.415	315.830	11639.488	17.826	5.830	18.656
L19	36.760	35.645	5815.918	12.758	18.415	315.830	11639.488	17.826	5.830	18.656
	37.642	36.506	6247.497	13.066	18.856	331.334	12503.214	18.256	5.983	19.144
L20	37.615	56.678	9607.732	13.004	18.856	509.544	19228.107	28.344	5.675	11.64
	37.676	56.772	9655.496	13.025	18.886	511.242	19323.697	28.391	5.685	11.662
L21	37.678	55.335	9417.538	13.030	18.886	498.643	18847.468	27.673	5.707	12.015

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<p>Job</p> <p style="text-align: center;">147460.002.01 - WAPPINGERS FALLS/ PRESTON CIT, CT(BU# 876366)</p>	<p>Page</p> <p style="text-align: center;">4 of 36</p>
	<p>Project</p>	<p>Date</p> <p style="text-align: center;">08:00:18 02/19/21</p>
	<p>Client</p> <p style="text-align: center;">Crown Castle</p>	<p>Designed by</p> <p style="text-align: center;">xjones</p>

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
L22	38.909	57.162	10381.645	13.460	19.502	532.336	20776.951	28.587	5.921	12.464
	38.909	57.162	10381.645	13.460	19.502	532.336	20776.951	28.587	5.921	12.464
	40.140	58.990	11409.403	13.890	20.118	567.131	22833.820	29.500	6.134	12.914
L23	40.141	57.456	11119.807	13.894	20.118	552.736	22254.245	28.733	6.156	13.31
	41.372	59.235	12185.147	14.325	20.733	587.705	24386.327	29.623	6.369	13.771
L24	41.372	59.235	12185.147	14.325	20.733	587.705	24386.327	29.623	6.369	13.771
	43.765	62.694	14446.697	15.161	21.930	658.753	28912.403	31.353	6.784	14.668
L25	43.146	48.482	10162.507	14.460	20.883	486.649	20338.386	24.246	6.575	17.533
	43.393	50.485	11475.211	15.058	21.738	527.893	22965.522	25.248	6.871	18.323
L26	43.393	50.485	11475.211	15.058	21.738	527.893	22965.522	25.248	6.871	18.323
	44.626	51.931	12489.424	15.489	22.355	558.693	24995.282	25.970	7.085	18.893
L27	44.626	51.931	12489.424	15.489	22.355	558.693	24995.282	25.970	7.085	18.893
	45.860	53.377	13561.701	15.920	22.972	590.366	27141.248	26.693	7.299	19.463
L28	45.860	53.377	13561.701	15.920	22.972	590.366	27141.248	26.693	7.299	19.463
	47.093	54.822	14693.661	16.351	23.589	622.912	29406.656	27.416	7.512	20.033
L29	47.093	54.822	14693.661	16.351	23.589	622.912	29406.656	27.416	7.512	20.033
	48.326	56.268	15886.917	16.782	24.206	656.331	31794.739	28.139	7.726	20.603
L30	48.326	56.268	15886.917	16.782	24.206	656.331	31794.739	28.139	7.726	20.603
	49.559	57.713	17143.087	17.213	24.823	690.624	34308.732	28.862	7.940	21.173
L31	49.559	57.713	17143.087	17.213	24.823	690.624	34308.732	28.862	7.940	21.173
	50.793	59.159	18463.789	17.645	25.440	725.790	36951.873	29.585	8.154	21.743
L32	50.793	59.159	18463.789	17.645	25.440	725.790	36951.873	29.585	8.154	21.743
	52.026	60.604	19850.636	18.076	26.057	761.829	39727.392	30.308	8.367	22.313
L33	52.026	60.604	19850.636	18.076	26.057	761.829	39727.392	30.308	8.367	22.313
	53.259	62.050	21305.247	18.507	26.674	798.742	42638.528	31.031	8.581	22.883
L34	53.259	62.050	21305.247	18.507	26.674	798.742	42638.528	31.031	8.581	22.883
	53.760	62.637	21915.529	18.682	26.924	813.977	43859.896	31.324	8.668	23.115

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L1				1	1	1			
155.000-150.000									
L2				1	1	1			
150.000-145.000									
L3				1	1	1			
145.000-140.000									
L4				1	1	1			
140.000-135.000									
L5				1	1	1			
135.000-130.000									
L6				1	1	1			
130.000-123.210									
L7				1	1	1			
123.210-121.790									
L8				1	1	1			
121.790-116.790									
L9				1	1	1			
116.790-111.790									
L10				1	1	1			

<p>tnxTower</p> <p>B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<p>Job 147460.002.01 - WAPPINGERS FALLS/ PRESTON CIT, CT(BU# 876366)</p>	<p>Page 5 of 36</p>
	<p>Project</p>	<p>Date 08:00:18 02/19/21</p>
	<p>Client Crown Castle</p>	<p>Designed by xjones</p>

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
111.790-106.790									
L11				1	1	1			
106.790-101.790									
L12				1	1	1			
101.790-97.500									
L13				1	1	1			
97.500-97.250									
L14				1	1	1			
97.250-92.250									
L15				1	1	1			
92.250-82.580									
L16				1	1	1			
82.580-81.580									
L17				1	1	1			
81.580-76.580									
L18				1	1	1			
76.580-71.580									
L19				1	1	1			
71.580-68.000									
L20				1	1	0.961153			
68.000-67.750									
L21				1	1	0.975618			
67.750-62.750									
L22				1	1	0.965777			
62.750-57.750									
L23				1	1	0.982074			
57.750-52.750									
L24				1	1	0.975253			
52.750-43.030									
L25				1	1	1			
43.030-42.030									
L26				1	1	1			
42.030-37.030									
L27				1	1	1			
37.030-32.030									
L28				1	1	1			
32.030-27.030									
L29				1	1	1			
27.030-22.030									
L30				1	1	1			
22.030-17.030									
L31				1	1	1			
17.030-12.030									
L32				1	1	1			
12.030-7.030									
L33				1	1	1			
7.030-2.030									
L34				1	1	1			
2.030-0.000									

Feed Line/Linear Appurtenances - Entered As Round Or Flat

tnxTower B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 147460.002.01 - WAPPINGERS FALLS/ PRESTON CIT, CT(BU# 876366)	Page 7 of 36
	Project	Date 08:00:18 02/19/21
	Client Crown Castle	Designed by xjones

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	155.000-150.000	A	0.000	0.000	0.000	0.000	0.050
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.188	0.000	0.001
L2	150.000-145.000	A	0.000	0.000	0.000	0.000	0.050
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.188	0.000	0.001
L3	145.000-140.000	A	0.000	0.000	0.000	0.000	0.050
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.188	0.000	0.001
L4	140.000-135.000	A	0.000	0.000	0.000	0.000	0.050
		B	0.000	0.000	0.000	0.000	0.067
		C	0.000	0.000	0.188	0.000	0.001
L5	135.000-130.000	A	0.000	0.000	0.000	0.000	0.050
		B	0.000	0.000	0.000	0.000	0.067
		C	0.000	0.000	0.188	0.000	0.001
L6	130.000-123.210	A	0.000	0.000	0.000	0.000	0.068
		B	0.000	0.000	0.000	0.000	0.138
		C	0.000	0.000	0.255	0.000	0.001
L7	123.210-121.790	A	0.000	0.000	0.000	0.000	0.014
		B	0.000	0.000	0.000	0.000	0.033
		C	0.000	0.000	0.053	0.000	0.000
L8	121.790-116.790	A	0.000	0.000	0.000	0.000	0.050
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L9	116.790-111.790	A	0.000	0.000	0.000	0.000	0.050
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L10	111.790-106.790	A	0.000	0.000	0.000	0.000	0.050
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L11	106.790-101.790	A	0.000	0.000	0.000	0.000	0.050
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L12	101.790-97.500	A	0.000	0.000	1.125	0.000	0.043
		B	0.000	0.000	1.125	0.000	0.100
		C	0.000	0.000	1.286	0.000	0.001
L13	97.500-97.250	A	0.000	0.000	0.188	0.000	0.003
		B	0.000	0.000	0.188	0.000	0.006
		C	0.000	0.000	0.197	0.000	0.000
L14	97.250-92.250	A	0.000	0.000	3.750	0.000	0.050
		B	0.000	0.000	3.750	0.000	0.116
		C	0.000	0.000	3.938	0.000	0.001
L15	92.250-82.580	A	0.000	0.000	6.188	0.000	0.097
		B	0.000	0.000	6.188	0.000	0.225
		C	0.000	0.000	6.550	0.000	0.002
L16	82.580-81.580	A	0.000	0.000	0.000	0.000	0.010
		B	0.000	0.000	0.000	0.000	0.023
		C	0.000	0.000	0.037	0.000	0.000
L17	81.580-76.580	A	0.000	0.000	0.000	0.000	0.050
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L18	76.580-71.580	A	0.000	0.000	0.000	0.000	0.050

tnxTower B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 147460.002.01 - WAPPINGERS FALLS/ PRESTON CIT, CT(BU# 876366)	Page 8 of 36
	Project	Date 08:00:18 02/19/21
	Client Crown Castle	Designed by xjones

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L19	71.580-68.000	A	0.000	0.000	2.000	0.000	0.036
		B	0.000	0.000	2.000	0.000	0.083
		C	0.000	0.000	2.134	0.000	0.001
L20	68.000-67.750	A	0.000	0.000	0.250	0.000	0.003
		B	0.000	0.000	0.250	0.000	0.006
		C	0.000	0.000	0.259	0.000	0.000
L21	67.750-62.750	A	0.000	0.000	5.000	0.000	0.051
		B	0.000	0.000	5.000	0.000	0.116
		C	0.000	0.000	5.188	0.000	0.001
L22	62.750-57.750	A	0.000	0.000	5.000	0.000	0.051
		B	0.000	0.000	5.000	0.000	0.116
		C	0.000	0.000	5.188	0.000	0.001
L23	57.750-52.750	A	0.000	0.000	5.000	0.000	0.051
		B	0.000	0.000	5.000	0.000	0.116
		C	0.000	0.000	5.188	0.000	0.001
L24	52.750-43.030	A	0.000	0.000	7.750	0.000	0.099
		B	0.000	0.000	7.750	0.000	0.226
		C	0.000	0.000	8.114	0.000	0.002
L25	43.030-42.030	A	0.000	0.000	0.000	0.000	0.010
		B	0.000	0.000	0.000	0.000	0.023
		C	0.000	0.000	0.037	0.000	0.000
L26	42.030-37.030	A	0.000	0.000	0.000	0.000	0.051
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L27	37.030-32.030	A	0.000	0.000	0.000	0.000	0.051
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L28	32.030-27.030	A	0.000	0.000	0.000	0.000	0.051
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L29	27.030-22.030	A	0.000	0.000	0.000	0.000	0.051
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L30	22.030-17.030	A	0.000	0.000	0.000	0.000	0.051
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L31	17.030-12.030	A	0.000	0.000	0.000	0.000	0.051
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L32	12.030-7.030	A	0.000	0.000	0.000	0.000	0.051
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L33	7.030-2.030	A	0.000	0.000	0.000	0.000	0.051
		B	0.000	0.000	0.000	0.000	0.116
		C	0.000	0.000	0.188	0.000	0.001
L34	2.030-0.000	A	0.000	0.000	0.000	0.000	0.021
		B	0.000	0.000	0.000	0.000	0.047
		C	0.000	0.000	0.076	0.000	0.000

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} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	155.000-150.000	A	1.486	0.000	0.000	0.000	0.000	0.050
		B		0.000	0.000	0.000	0.000	0.000

tnxTower

B+T Group
 1717 S. Boulder, Suite 300
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Date
 08:00:18 02/19/21

Client
 Crown Castle

Designed by
 xjones

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L2	150.000-145.000	C	1.481	0.000	0.000	1.673	0.000	0.018
		A		0.000	0.000	0.000	0.000	0.050
		B		0.000	0.000	0.000	0.000	0.000
L3	145.000-140.000	C	1.476	0.000	0.000	1.668	0.000	0.018
		A		0.000	0.000	0.000	0.000	0.050
		B		0.000	0.000	0.000	0.000	0.000
L4	140.000-135.000	C	1.471	0.000	0.000	1.663	0.000	0.018
		A		0.000	0.000	0.000	0.000	0.050
		B		0.000	0.000	0.000	0.000	0.067
L5	135.000-130.000	C	1.465	0.000	0.000	1.658	0.000	0.018
		A		0.000	0.000	0.000	0.000	0.050
		B		0.000	0.000	0.000	0.000	0.067
L6	130.000-123.210	C	1.458	0.000	0.000	1.653	0.000	0.018
		A		0.000	0.000	0.000	0.000	0.068
		B		0.000	0.000	0.000	0.000	0.138
L7	123.210-121.790	C	1.454	0.000	0.000	2.235	0.000	0.024
		A		0.000	0.000	0.000	0.000	0.014
		B		0.000	0.000	0.000	0.000	0.033
L8	121.790-116.790	C	1.450	0.000	0.000	0.467	0.000	0.005
		A		0.000	0.000	0.000	0.000	0.050
		B		0.000	0.000	0.000	0.000	0.116
L9	116.790-111.790	C	1.444	0.000	0.000	1.637	0.000	0.017
		A		0.000	0.000	0.000	0.000	0.050
		B		0.000	0.000	0.000	0.000	0.116
L10	111.790-106.790	C	1.437	0.000	0.000	1.631	0.000	0.017
		A		0.000	0.000	0.000	0.000	0.050
		B		0.000	0.000	0.000	0.000	0.116
L11	106.790-101.790	C	1.430	0.000	0.000	1.625	0.000	0.017
		A		0.000	0.000	0.000	0.000	0.050
		B		0.000	0.000	0.000	0.000	0.116
L12	101.790-97.500	C	1.424	0.000	0.000	1.618	0.000	0.017
		A		0.000	0.000	1.548	0.000	0.057
		B		0.000	0.000	1.548	0.000	0.113
L13	97.500-97.250	C	1.421	0.000	0.000	2.931	0.000	0.028
		A		0.000	0.000	0.258	0.000	0.005
		B		0.000	0.000	0.258	0.000	0.008
L14	97.250-92.250	C	1.417	0.000	0.000	0.338	0.000	0.003
		A		0.000	0.000	5.155	0.000	0.095
		B		0.000	0.000	5.155	0.000	0.161
L15	92.250-82.580	C	1.405	0.000	0.000	6.760	0.000	0.062
		A		0.000	0.000	8.491	0.000	0.170
		B		0.000	0.000	8.491	0.000	0.299
L16	82.580-81.580	C	1.397	0.000	0.000	11.571	0.000	0.105
		A		0.000	0.000	0.000	0.000	0.010
		B		0.000	0.000	0.000	0.000	0.023
L17	81.580-76.580	C	1.391	0.000	0.000	0.319	0.000	0.003
		A		0.000	0.000	0.000	0.000	0.050
		B		0.000	0.000	0.000	0.000	0.116
L18	76.580-71.580	C	1.382	0.000	0.000	1.579	0.000	0.016
		A		0.000	0.000	0.000	0.000	0.050
		B		0.000	0.000	0.000	0.000	0.116
L19	71.580-68.000	C	1.374	0.000	0.000	1.570	0.000	0.016
		A		0.000	0.000	2.550	0.000	0.057
		B		0.000	0.000	2.550	0.000	0.104
L20	68.000-67.750	C	1.370	0.000	0.000	3.668	0.000	0.032
		A		0.000	0.000	0.319	0.000	0.005
		B		0.000	0.000	0.319	0.000	0.008
L21	67.750-62.750	C	1.365	0.000	0.000	0.396	0.000	0.003
		A		0.000	0.000	6.365	0.000	0.102
		B		0.000	0.000	6.365	0.000	0.167
		C		0.000	0.000	7.917	0.000	0.066

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	<p>Project</p>	<p>Date 08:00:18 02/19/21</p>
	<p>Client Crown Castle</p>	<p>Designed by xjones</p>

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L22	62.750-57.750	A	1.354	0.000	0.000	6.354	0.000	0.101
		B		0.000	0.000	6.354	0.000	0.167
		C		0.000	0.000	7.896	0.000	0.066
L23	57.750-52.750	A	1.342	0.000	0.000	6.342	0.000	0.101
		B		0.000	0.000	6.342	0.000	0.166
		C		0.000	0.000	7.872	0.000	0.065
L24	52.750-43.030	A	1.323	0.000	0.000	9.801	0.000	0.174
		B		0.000	0.000	9.801	0.000	0.302
		C		0.000	0.000	12.738	0.000	0.105
L25	43.030-42.030	A	1.308	0.000	0.000	0.000	0.000	0.010
		B		0.000	0.000	0.000	0.000	0.023
		C		0.000	0.000	0.302	0.000	0.003
L26	42.030-37.030	A	1.298	0.000	0.000	0.000	0.000	0.051
		B		0.000	0.000	0.000	0.000	0.116
		C		0.000	0.000	1.486	0.000	0.014
L27	37.030-32.030	A	1.281	0.000	0.000	0.000	0.000	0.051
		B		0.000	0.000	0.000	0.000	0.116
		C		0.000	0.000	1.468	0.000	0.014
L28	32.030-27.030	A	1.261	0.000	0.000	0.000	0.000	0.051
		B		0.000	0.000	0.000	0.000	0.116
		C		0.000	0.000	1.448	0.000	0.014
L29	27.030-22.030	A	1.238	0.000	0.000	0.000	0.000	0.051
		B		0.000	0.000	0.000	0.000	0.116
		C		0.000	0.000	1.425	0.000	0.013
L30	22.030-17.030	A	1.210	0.000	0.000	0.000	0.000	0.051
		B		0.000	0.000	0.000	0.000	0.116
		C		0.000	0.000	1.397	0.000	0.013
L31	17.030-12.030	A	1.175	0.000	0.000	0.000	0.000	0.051
		B		0.000	0.000	0.000	0.000	0.116
		C		0.000	0.000	1.362	0.000	0.012
L32	12.030-7.030	A	1.126	0.000	0.000	0.000	0.000	0.051
		B		0.000	0.000	0.000	0.000	0.116
		C		0.000	0.000	1.313	0.000	0.011
L33	7.030-2.030	A	1.045	0.000	0.000	0.000	0.000	0.051
		B		0.000	0.000	0.000	0.000	0.116
		C		0.000	0.000	1.233	0.000	0.010
L34	2.030-0.000	A	0.900	0.000	0.000	0.000	0.000	0.021
		B		0.000	0.000	0.000	0.000	0.047
		C		0.000	0.000	0.442	0.000	0.003

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	155.000-150.000	0.003	0.300	0.013	1.260
L2	150.000-145.000	0.003	0.300	0.013	1.273
L3	145.000-140.000	0.003	0.301	0.013	1.284
L4	140.000-135.000	0.003	0.301	0.014	1.294
L5	135.000-130.000	0.003	0.301	0.014	1.303
L6	130.000-123.210	0.003	0.301	0.014	1.312
L7	123.210-121.790	0.003	0.301	0.014	1.319
L8	121.790-116.790	0.003	0.301	0.014	1.321
L9	116.790-111.790	0.003	0.301	0.014	1.327
L10	111.790-106.790	0.003	0.301	0.014	1.333
L11	106.790-101.790	0.003	0.302	0.014	1.338
L12	101.790-97.500	0.002	0.213	0.011	1.034

tnxTower B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 147460.002.01 - WAPPINGERS FALLS/ PRESTON CIT, CT(BU# 876366)	Page 11 of 36
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Section	Elevation ft	CP _x	CP _z	CP _x	CP _z
		in	in	Ice in	Ice in
L13	97.500-97.250	0.001	0.139	0.008	0.731
L14	97.250-92.250	0.001	0.140	0.008	0.738
L15	92.250-82.580	0.002	0.157	0.008	0.807
L16	82.580-81.580	0.003	0.302	0.014	1.352
L17	81.580-76.580	0.003	0.302	0.014	1.345
L18	76.580-71.580	0.003	0.302	0.014	1.345
L19	71.580-68.000	0.002	0.175	0.009	0.898
L20	68.000-67.750	0.001	0.132	0.007	0.715
L21	67.750-62.750	0.001	0.133	0.008	0.720
L22	62.750-57.750	0.001	0.136	0.008	0.727
L23	57.750-52.750	0.001	0.138	0.008	0.734
L24	52.750-43.030	0.002	0.158	0.009	0.815
L25	43.030-42.030	0.003	0.302	0.014	1.330
L26	42.030-37.030	0.003	0.302	0.014	1.312
L27	37.030-32.030	0.003	0.302	0.014	1.302
L28	32.030-27.030	0.003	0.302	0.014	1.289
L29	27.030-22.030	0.003	0.302	0.013	1.274
L30	22.030-17.030	0.003	0.302	0.013	1.255
L31	17.030-12.030	0.003	0.302	0.013	1.229
L32	12.030-7.030	0.003	0.302	0.012	1.191
L33	7.030-2.030	0.003	0.303	0.012	1.126
L34	2.030-0.000	0.003	0.303	0.011	1.005

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	1	Safety Line 3/8	150.00 - 155.00	1.0000	1.0000
L2	1	Safety Line 3/8	145.00 - 150.00	1.0000	1.0000
L3	1	Safety Line 3/8	140.00 - 145.00	1.0000	1.0000
L4	1	Safety Line 3/8	135.00 - 140.00	1.0000	1.0000
L5	1	Safety Line 3/8	130.00 - 135.00	1.0000	1.0000
L6	1	Safety Line 3/8	123.21 - 130.00	1.0000	1.0000
L7	1	Safety Line 3/8	121.79 - 123.21	1.0000	1.0000
L8	1	Safety Line 3/8	116.79 - 121.79	1.0000	1.0000
L9	1	Safety Line 3/8	111.79 - 116.79	1.0000	1.0000
L10	1	Safety Line 3/8	106.79 - 111.79	1.0000	1.0000
L11	1	Safety Line 3/8	101.79 - 106.79	1.0000	1.0000
L12	1	Safety Line 3/8	97.50 - 101.79	1.0000	1.0000
L12	18	CCI 4.5" x 1" Plate	97.50 - 99.00	1.0000	1.0000
L12	19	CCI 4.5" x 1" Plate	97.50 - 99.00	1.0000	1.0000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L12	20	CCI 4.5" x 1" Plate	97.50 - 99.00	1.0000	1.0000
L13	1	Safety Line 3/8	97.25 - 97.50	1.0000	1.0000
L13	18	CCI 4.5" x 1" Plate	97.25 - 97.50	1.0000	1.0000
L13	19	CCI 4.5" x 1" Plate	97.25 - 97.50	1.0000	1.0000
L13	20	CCI 4.5" x 1" Plate	97.25 - 97.50	1.0000	1.0000
L14	1	Safety Line 3/8	92.25 - 97.25	1.0000	1.0000
L14	18	CCI 4.5" x 1" Plate	92.25 - 97.25	1.0000	1.0000
L14	19	CCI 4.5" x 1" Plate	92.25 - 97.25	1.0000	1.0000
L14	20	CCI 4.5" x 1" Plate	92.25 - 97.25	1.0000	1.0000
L15	1	Safety Line 3/8	82.58 - 92.25	1.0000	1.0000
L15	18	CCI 4.5" x 1" Plate	84.00 - 92.25	1.0000	1.0000
L15	19	CCI 4.5" x 1" Plate	84.00 - 92.25	1.0000	1.0000
L15	20	CCI 4.5" x 1" Plate	84.00 - 92.25	1.0000	1.0000
L16	1	Safety Line 3/8	81.58 - 82.58	1.0000	1.0000
L17	1	Safety Line 3/8	76.58 - 81.58	1.0000	1.0000
L18	1	Safety Line 3/8	71.58 - 76.58	1.0000	1.0000
L19	1	Safety Line 3/8	68.00 - 71.58	1.0000	1.0000
L19	15	CCI 6" x 1" Plate	68.00 - 70.00	1.0000	1.0000
L19	16	CCI 6" x 1" Plate	68.00 - 70.00	1.0000	1.0000
L19	17	CCI 6" x 1" Plate	68.00 - 70.00	1.0000	1.0000
L20	1	Safety Line 3/8	67.75 - 68.00	1.0000	1.0000
L20	15	CCI 6" x 1" Plate	67.75 - 68.00	1.0000	1.0000
L20	16	CCI 6" x 1" Plate	67.75 - 68.00	1.0000	1.0000
L20	17	CCI 6" x 1" Plate	67.75 - 68.00	1.0000	1.0000
L21	1	Safety Line 3/8	62.75 - 67.75	1.0000	1.0000
L21	15	CCI 6" x 1" Plate	62.75 - 67.75	1.0000	1.0000
L21	16	CCI 6" x 1" Plate	62.75 - 67.75	1.0000	1.0000
L21	17	CCI 6" x 1" Plate	62.75 - 67.75	1.0000	1.0000
L22	1	Safety Line 3/8	57.75 - 62.75	1.0000	1.0000
L22	15	CCI 6" x 1" Plate	57.75 - 62.75	1.0000	1.0000
L22	16	CCI 6" x 1" Plate	57.75 - 62.75	1.0000	1.0000
L22	17	CCI 6" x 1" Plate	57.75 - 62.75	1.0000	1.0000
L23	1	Safety Line 3/8	52.75 - 57.75	1.0000	1.0000
L23	15	CCI 6" x 1" Plate	52.75 - 57.75	1.0000	1.0000
L23	16	CCI 6" x 1" Plate	52.75 - 57.75	1.0000	1.0000
L23	17	CCI 6" x 1" Plate	52.75 - 57.75	1.0000	1.0000
L24	1	Safety Line 3/8	43.03 - 52.75	1.0000	1.0000
L24	15	CCI 6" x 1" Plate	45.00 - 52.75	1.0000	1.0000
L24	16	CCI 6" x 1" Plate	45.00 - 52.75	1.0000	1.0000
L24	17	CCI 6" x 1" Plate	45.00 - 52.75	1.0000	1.0000
L25	1	Safety Line 3/8	42.03 - 43.03	1.0000	1.0000
L26	1	Safety Line 3/8	37.03 - 42.03	1.0000	1.0000
L27	1	Safety Line 3/8	32.03 - 37.03	1.0000	1.0000
L28	1	Safety Line 3/8	27.03 - 32.03	1.0000	1.0000
L29	1	Safety Line 3/8	22.03 - 27.03	1.0000	1.0000
L30	1	Safety Line 3/8	17.03 - 22.03	1.0000	1.0000
L31	1	Safety Line 3/8	12.03 - 17.03	1.0000	1.0000
L32	1	Safety Line 3/8	7.03 - 12.03	1.0000	1.0000
L33	1	Safety Line 3/8	2.03 - 7.03	1.0000	1.0000
L34	1	Safety Line 3/8	0.00 - 2.03	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

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Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L12	18	CCI 4.5" x 1" Plate	97.50 - 99.00	Auto	0.0000
L12	19	CCI 4.5" x 1" Plate	97.50 - 99.00	Auto	0.0000
L12	20	CCI 4.5" x 1" Plate	97.50 - 99.00	Auto	0.0000
L13	18	CCI 4.5" x 1" Plate	97.25 - 97.50	Auto	0.0000
L13	19	CCI 4.5" x 1" Plate	97.25 - 97.50	Auto	0.0000
L13	20	CCI 4.5" x 1" Plate	97.25 - 97.50	Auto	0.0000
L14	18	CCI 4.5" x 1" Plate	92.25 - 97.25	Auto	0.0000
L14	19	CCI 4.5" x 1" Plate	92.25 - 97.25	Auto	0.0000
L14	20	CCI 4.5" x 1" Plate	92.25 - 97.25	Auto	0.0000
L15	18	CCI 4.5" x 1" Plate	84.00 - 92.25	Auto	0.0000
L15	19	CCI 4.5" x 1" Plate	84.00 - 92.25	Auto	0.0000
L15	20	CCI 4.5" x 1" Plate	84.00 - 92.25	Auto	0.0000
L19	15	CCI 6" x 1" Plate	68.00 - 70.00	Auto	0.0100
L19	16	CCI 6" x 1" Plate	68.00 - 70.00	Auto	0.0100
L19	17	CCI 6" x 1" Plate	68.00 - 70.00	Auto	0.0100
L20	15	CCI 6" x 1" Plate	67.75 - 68.00	Auto	0.0533
L20	16	CCI 6" x 1" Plate	67.75 - 68.00	Auto	0.0533
L20	17	CCI 6" x 1" Plate	67.75 - 68.00	Auto	0.0533
L21	15	CCI 6" x 1" Plate	62.75 - 67.75	Auto	0.0310
L21	16	CCI 6" x 1" Plate	62.75 - 67.75	Auto	0.0310
L21	17	CCI 6" x 1" Plate	62.75 - 67.75	Auto	0.0310
L22	15	CCI 6" x 1" Plate	57.75 - 62.75	Auto	0.0025
L22	16	CCI 6" x 1" Plate	57.75 - 62.75	Auto	0.0025
L22	17	CCI 6" x 1" Plate	57.75 - 62.75	Auto	0.0025
L23	15	CCI 6" x 1" Plate	52.75 - 57.75	Auto	0.0000
L23	16	CCI 6" x 1" Plate	52.75 - 57.75	Auto	0.0000
L23	17	CCI 6" x 1" Plate	52.75 - 57.75	Auto	0.0000
L24	15	CCI 6" x 1" Plate	45.00 - 52.75	Auto	0.0000
L24	16	CCI 6" x 1" Plate	45.00 - 52.75	Auto	0.0000
L24	17	CCI 6" x 1" Plate	45.00 - 52.75	Auto	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _{Front} ft ²	C _A A _{Side} ft ²	Weight K	
Lighting Rod 1/2" x 2'	C	From Leg	4.000	0.000	164.000	No Ice	0.100	0.100	0.020
			0.000			1/2" Ice	0.264	0.264	0.021
			0.000			1" Ice	0.395	0.395	0.024
						2" Ice	0.685	0.685	0.034
* AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.000	0.000	155.000	No Ice	5.870	3.270	0.128
			0.000			1/2" Ice	6.233	3.728	0.177
			2.000			1" Ice	6.606	4.203	0.232
						2" Ice	7.382	5.200	0.359
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.000	0.000	155.000	No Ice	5.870	3.270	0.128
			0.000			1/2" Ice	6.233	3.728	0.177
			2.000			1" Ice	6.606	4.203	0.232
						2" Ice	7.382	5.200	0.359
AIR6449 B41_T-MOBILE	C	From Leg	4.000	0.000	155.000	No Ice	5.870	3.270	0.128

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			Horz ft	Lateral Vert ft					
w/ Mount Pipe			0.000			1/2" Ice	6.233	3.728	0.177
			2.000			1" Ice	6.606	4.203	0.232
						2" Ice	7.382	5.200	0.359
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	A	From Leg	4.000	0.000	155.000	No Ice	6.290	2.760	0.061
			0.000			1/2" Ice	6.860	3.270	0.105
			2.000			1" Ice	7.450	3.790	0.157
						2" Ice	8.680	4.900	0.290
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	B	From Leg	4.000	0.000	155.000	No Ice	6.290	2.760	0.061
			0.000			1/2" Ice	6.860	3.270	0.105
			2.000			1" Ice	7.450	3.790	0.157
						2" Ice	8.680	4.900	0.290
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	C	From Leg	4.000	0.000	155.000	No Ice	6.290	2.760	0.061
			0.000			1/2" Ice	6.860	3.270	0.105
			2.000			1" Ice	7.450	3.790	0.157
						2" Ice	8.680	4.900	0.290
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	A	From Leg	4.000	0.000	155.000	No Ice	14.690	6.870	0.183
			0.000			1/2" Ice	15.460	7.550	0.311
			2.000			1" Ice	16.230	8.250	0.453
						2" Ice	17.820	9.670	0.782
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	B	From Leg	4.000	0.000	155.000	No Ice	14.690	6.870	0.183
			0.000			1/2" Ice	15.460	7.550	0.311
			2.000			1" Ice	16.230	8.250	0.453
						2" Ice	17.820	9.670	0.782
APXVAALL24_43-U-NA20 _TMO w/ Mount Pipe	C	From Leg	4.000	0.000	155.000	No Ice	14.690	6.870	0.183
			0.000			1/2" Ice	15.460	7.550	0.311
			2.000			1" Ice	16.230	8.250	0.453
						2" Ice	17.820	9.670	0.782
RADIO 4415 B66A	A	From Leg	4.000	0.000	155.000	No Ice	1.856	0.870	0.050
			0.000			1/2" Ice	2.027	0.997	0.064
			2.000			1" Ice	2.204	1.134	0.081
						2" Ice	2.582	1.432	0.124
RADIO 4415 B66A	B	From Leg	4.000	0.000	155.000	No Ice	1.856	0.870	0.050
			0.000			1/2" Ice	2.027	0.997	0.064
			2.000			1" Ice	2.204	1.134	0.081
						2" Ice	2.582	1.432	0.124
RADIO 4415 B66A	C	From Leg	4.000	0.000	155.000	No Ice	1.856	0.870	0.050
			0.000			1/2" Ice	2.027	0.997	0.064
			2.000			1" Ice	2.204	1.134	0.081
						2" Ice	2.582	1.432	0.124
RADIO 4424 B25_TMO	A	From Leg	4.000	0.000	155.000	No Ice	2.052	1.610	0.086
			0.000			1/2" Ice	2.231	1.772	0.107
			2.000			1" Ice	2.417	1.941	0.131
						2" Ice	2.811	2.301	0.188
RADIO 4424 B25_TMO	B	From Leg	4.000	0.000	155.000	No Ice	2.052	1.610	0.086
			0.000			1/2" Ice	2.231	1.772	0.107
			2.000			1" Ice	2.417	1.941	0.131
						2" Ice	2.811	2.301	0.188
RADIO 4424 B25_TMO	C	From Leg	4.000	0.000	155.000	No Ice	2.052	1.610	0.086
			0.000			1/2" Ice	2.231	1.772	0.107
			2.000			1" Ice	2.417	1.941	0.131
						2" Ice	2.811	2.301	0.188
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.000	0.000	155.000	No Ice	1.970	1.587	0.073
			0.000			1/2" Ice	2.147	1.749	0.093
			2.000			1" Ice	2.331	1.918	0.116
						2" Ice	2.721	2.280	0.170
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.000	0.000	155.000	No Ice	1.970	1.587	0.073
			0.000			1/2" Ice	2.147	1.749	0.093

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			Horz Lateral ft	Vert ft					
			2.000						
						1" Ice	2.331	1.918	0.116
						2" Ice	2.721	2.280	0.170
RADIO 4449 B71	C	From Leg	4.000	0.000	155.000	No Ice	1.970	1.587	0.073
B85A_T-MOBILE			0.000			1/2" Ice	2.147	1.749	0.093
			2.000			1" Ice	2.331	1.918	0.116
						2" Ice	2.721	2.280	0.170
9' x 2" Pipe Mount	C	From Leg	4.000	0.000	155.000	No Ice	2.138	2.138	0.065
			0.000			1/2" Ice	3.066	3.066	0.081
			4.000			1" Ice	4.010	4.010	0.103
						2" Ice	5.131	5.131	0.165
8' x 2.375" Mount Pipe	A	From Leg	4.000	0.000	155.000	No Ice	1.900	1.900	0.061
			0.000			1/2" Ice	2.728	2.728	0.075
			2.000			1" Ice	3.401	3.401	0.095
						2" Ice	4.396	4.396	0.150
8' x 2.375" Mount Pipe	B	From Leg	4.000	0.000	155.000	No Ice	1.900	1.900	0.061
			0.000			1/2" Ice	2.728	2.728	0.075
			2.000			1" Ice	3.401	3.401	0.095
						2" Ice	4.396	4.396	0.150
8' x 2.375" Mount Pipe	C	From Leg	4.000	0.000	155.000	No Ice	1.900	1.900	0.061
			0.000			1/2" Ice	2.728	2.728	0.075
			2.000			1" Ice	3.401	3.401	0.095
						2" Ice	4.396	4.396	0.150
4' x 2" Pipe Mount	A	From Leg	4.000	0.000	155.000	No Ice	0.785	0.785	0.029
			0.000			1/2" Ice	1.028	1.028	0.035
			2.000			1" Ice	1.281	1.281	0.044
						2" Ice	1.814	1.814	0.072
4' x 2" Pipe Mount	B	From Leg	4.000	0.000	155.000	No Ice	0.785	0.785	0.029
			0.000			1/2" Ice	1.028	1.028	0.035
			2.000			1" Ice	1.281	1.281	0.044
						2" Ice	1.814	1.814	0.072
4' x 2" Pipe Mount	C	From Leg	4.000	0.000	155.000	No Ice	0.785	0.785	0.029
			0.000			1/2" Ice	1.028	1.028	0.035
			2.000			1" Ice	1.281	1.281	0.044
						2" Ice	1.814	1.814	0.072
Platform Mount [LP 712-1]	C	None		0.000	155.000	No Ice	24.560	24.560	1.335
						1/2" Ice	27.920	27.920	1.915
						1" Ice	31.270	31.270	2.548
						2" Ice	37.980	37.980	3.971
Miscellaneous [NA 507-1]	C	None		0.000	159.000	No Ice	4.560	4.560	0.245
						1/2" Ice	6.390	6.390	0.311
						1" Ice	8.180	8.180	0.402
						2" Ice	11.660	11.660	0.657
Transition Ladder	C	From Leg	2.000	0.000	155.000	No Ice	6.000	6.000	0.160
			0.000			1/2" Ice	8.000	8.000	0.240
			-2.000			1" Ice	10.000	10.000	0.320
						2" Ice	14.000	14.000	0.480
*									
HPA-65R-BUU-H8 w/ Mount Pipe	A	From Leg	4.000	0.000	140.000	No Ice	12.250	8.330	0.105
			0.000			1/2" Ice	13.190	9.230	0.194
			0.000			1" Ice	14.160	10.150	0.297
						2" Ice	16.140	12.050	0.543
HPA-65R-BUU-H8 w/ Mount Pipe	B	From Leg	4.000	0.000	140.000	No Ice	12.250	8.330	0.105
			0.000			1/2" Ice	13.190	9.230	0.194
			0.000			1" Ice	14.160	10.150	0.297
						2" Ice	16.140	12.050	0.543
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	4.000	0.000	140.000	No Ice	12.250	8.330	0.105
			0.000			1/2" Ice	13.190	9.230	0.194

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			Horz Lateral ft	Vert ft					
			0.000						
						1" Ice	14.160	10.150	0.297
						2" Ice	16.140	12.050	0.543
80010966 w/ Mount Pipe	A	From Leg	4.000	0.000	140.000	No Ice	14.610	6.840	0.159
			0.000			1/2" Ice	15.470	7.630	0.267
			0.000			1" Ice	16.350	8.420	0.389
						2" Ice	18.140	10.060	0.677
80010966 w/ Mount Pipe	B	From Leg	4.000	0.000	140.000	No Ice	14.610	6.840	0.159
			0.000			1/2" Ice	15.470	7.630	0.267
			0.000			1" Ice	16.350	8.420	0.389
						2" Ice	18.140	10.060	0.677
80010966 w/ Mount Pipe	C	From Leg	4.000	0.000	140.000	No Ice	14.610	6.840	0.159
			0.000			1/2" Ice	15.470	7.630	0.267
			0.000			1" Ice	16.350	8.420	0.389
						2" Ice	18.140	10.060	0.677
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	140.000	No Ice	5.746	4.254	0.055
			0.000			1/2" Ice	6.179	5.014	0.103
			0.000			1" Ice	6.607	5.711	0.157
						2" Ice	7.488	7.155	0.287
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	140.000	No Ice	5.746	4.254	0.055
			0.000			1/2" Ice	6.179	5.014	0.103
			0.000			1" Ice	6.607	5.711	0.157
						2" Ice	7.488	7.155	0.287
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	140.000	No Ice	5.746	4.254	0.055
			0.000			1/2" Ice	6.179	5.014	0.103
			0.000			1" Ice	6.607	5.711	0.157
						2" Ice	7.488	7.155	0.287
RRUS 11	A	From Leg	4.000	0.000	140.000	No Ice	2.784	1.187	0.048
			0.000			1/2" Ice	2.992	1.334	0.068
			0.000			1" Ice	3.207	1.490	0.092
						2" Ice	3.658	1.833	0.150
RRUS 11	B	From Leg	4.000	0.000	140.000	No Ice	2.784	1.187	0.048
			0.000			1/2" Ice	2.992	1.334	0.068
			0.000			1" Ice	3.207	1.490	0.092
						2" Ice	3.658	1.833	0.150
RRUS 11	C	From Leg	4.000	0.000	140.000	No Ice	2.784	1.187	0.048
			0.000			1/2" Ice	2.992	1.334	0.068
			0.000			1" Ice	3.207	1.490	0.092
						2" Ice	3.658	1.833	0.150
RRUS 32 B2	A	From Leg	4.000	0.000	140.000	No Ice	2.731	1.668	0.053
			0.000			1/2" Ice	2.953	1.855	0.074
			0.000			1" Ice	3.182	2.049	0.098
						2" Ice	3.663	2.458	0.157
RRUS 32 B2	B	From Leg	4.000	0.000	140.000	No Ice	2.731	1.668	0.053
			0.000			1/2" Ice	2.953	1.855	0.074
			0.000			1" Ice	3.182	2.049	0.098
						2" Ice	3.663	2.458	0.157
RRUS 32 B2	C	From Leg	4.000	0.000	140.000	No Ice	2.731	1.668	0.053
			0.000			1/2" Ice	2.953	1.855	0.074
			0.000			1" Ice	3.182	2.049	0.098
						2" Ice	3.663	2.458	0.157
RRUS 4478 B14	A	From Leg	4.000	0.000	140.000	No Ice	1.843	1.059	0.060
			0.000			1/2" Ice	2.012	1.197	0.076
			0.000			1" Ice	2.190	1.342	0.094
						2" Ice	2.566	1.656	0.140
RRUS 4478 B14	B	From Leg	4.000	0.000	140.000	No Ice	1.843	1.059	0.060
			0.000			1/2" Ice	2.012	1.197	0.076
			0.000			1" Ice	2.190	1.342	0.094

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight K
			Horz ft	Lateral Vert ft					
RRUS 4478 B14	C	From Leg	4.000 0.000 0.000	0.000	140.000	2" Ice	2.566	1.656	0.140
						No Ice	1.843	1.059	0.060
						1/2" Ice	2.012	1.197	0.076
						1" Ice	2.190	1.342	0.094
(2) LGP21401	A	From Leg	4.000 0.000 0.000	0.000	140.000	2" Ice	2.566	1.656	0.140
						No Ice	1.104	0.207	0.014
						1/2" Ice	1.239	0.274	0.021
						1" Ice	1.381	0.348	0.030
(2) LGP21401	B	From Leg	4.000 0.000 0.000	0.000	140.000	2" Ice	1.688	0.521	0.055
						No Ice	1.104	0.207	0.014
						1/2" Ice	1.239	0.274	0.021
						1" Ice	1.381	0.348	0.030
(2) LGP21401	C	From Leg	4.000 0.000 0.000	0.000	140.000	2" Ice	1.688	0.521	0.055
						No Ice	1.104	0.207	0.014
						1/2" Ice	1.239	0.274	0.021
						1" Ice	1.381	0.348	0.030
(2) DC6-48-60-18-8F	A	From Leg	4.000 0.000 0.000	0.000	140.000	2" Ice	1.688	0.521	0.055
						No Ice	1.212	1.212	0.033
						1/2" Ice	1.892	1.892	0.055
						1" Ice	2.105	2.105	0.080
(2) LGP21901	A	From Leg	4.000 0.000 0.000	0.000	140.000	2" Ice	2.570	2.570	0.138
						No Ice	0.231	0.158	0.006
						1/2" Ice	0.294	0.213	0.008
						1" Ice	0.365	0.276	0.011
(2) LGP21901	B	From Leg	4.000 0.000 0.000	0.000	140.000	2" Ice	0.528	0.423	0.022
						No Ice	0.231	0.158	0.006
						1/2" Ice	0.294	0.213	0.008
						1" Ice	0.365	0.276	0.011
(2) LGP21901	C	From Leg	4.000 0.000 0.000	0.000	140.000	2" Ice	0.528	0.423	0.022
						No Ice	0.231	0.158	0.006
						1/2" Ice	0.294	0.213	0.008
						1" Ice	0.365	0.276	0.011
Platform Mount [LP 303-1]	C	None		0.000	140.000	2" Ice	0.528	0.423	0.022
						No Ice	14.690	14.690	1.250
						1/2" Ice	18.010	18.010	1.569
						1" Ice	21.340	21.340	1.942
* (2) LPA-80063/6CF w/ Mount Pipe	A	From Leg	4.000 0.000 3.000	0.000	128.000	2" Ice	28.080	28.080	2.852
						No Ice	9.831	10.215	0.052
						1/2" Ice	10.400	11.384	0.145
						1" Ice	10.933	12.269	0.246
(2) LPA-80063/6CF w/ Mount Pipe	B	From Leg	4.000 0.000 3.000	0.000	128.000	2" Ice	12.026	14.086	0.476
						No Ice	9.831	10.215	0.052
						1/2" Ice	10.400	11.384	0.145
						1" Ice	10.933	12.269	0.246
(2) LPA-80063/6CF w/ Mount Pipe	C	From Leg	4.000 0.000 3.000	0.000	128.000	2" Ice	12.026	14.086	0.476
						No Ice	9.831	10.215	0.052
						1/2" Ice	10.400	11.384	0.145
						1" Ice	10.933	12.269	0.246
(2) JAHH-65B-R3B w/ Mount Pipe	A	From Leg	4.000 0.000 3.000	0.000	128.000	2" Ice	12.026	14.086	0.476
						No Ice	5.500	4.380	0.096
						1/2" Ice	5.970	4.840	0.169
						1" Ice	6.450	5.300	0.254
(2) JAHH-65B-R3B w/ Mount Pipe	B	From Leg	4.000 0.000 3.000	0.000	128.000	2" Ice	7.440	6.260	0.457
						No Ice	5.500	4.380	0.096
						1/2" Ice	5.970	4.840	0.169
						1" Ice	6.450	5.300	0.254

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			Horz Lateral ft	Vert ft						
(2) JAHH-65B-R3B w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	128.000	2" Ice	7.440	6.260	0.457
			0.000				No Ice	5.500	4.380	0.096
			3.000				1/2" Ice	5.970	4.840	0.169
							1" Ice	6.450	5.300	0.254
(4) LGP21401	A	From Leg	4.000	0.000	0.000	128.000	2" Ice	7.440	6.260	0.457
			0.000				No Ice	1.104	0.207	0.014
			3.000				1/2" Ice	1.239	0.274	0.021
							1" Ice	1.381	0.348	0.030
(2) LGP21401	B	From Leg	4.000	0.000	0.000	128.000	2" Ice	1.688	0.521	0.055
			0.000				No Ice	1.104	0.207	0.014
			3.000				1/2" Ice	1.239	0.274	0.021
							1" Ice	1.381	0.348	0.030
RRH2X60-700	A	From Leg	4.000	0.000	0.000	128.000	2" Ice	1.688	0.521	0.055
			0.000				No Ice	3.500	1.816	0.060
			3.000				1/2" Ice	3.761	2.052	0.083
							1" Ice	4.029	2.289	0.109
RRH2X60-700	B	From Leg	4.000	0.000	0.000	128.000	2" Ice	4.585	2.785	0.173
			0.000				No Ice	3.500	1.816	0.060
			3.000				1/2" Ice	3.761	2.052	0.083
							1" Ice	4.029	2.289	0.109
RRH2X60-700	C	From Leg	4.000	0.000	0.000	128.000	2" Ice	4.585	2.785	0.173
			0.000				No Ice	3.500	1.816	0.060
			3.000				1/2" Ice	3.761	2.052	0.083
							1" Ice	4.029	2.289	0.109
B66A RRH4X45-4R	A	From Leg	4.000	0.000	0.000	128.000	2" Ice	4.585	2.785	0.173
			0.000				No Ice	2.537	1.610	0.057
			3.000				1/2" Ice	2.750	1.791	0.077
							1" Ice	2.970	1.978	0.100
(2) B66A RRH4X45-4R	B	From Leg	4.000	0.000	0.000	128.000	2" Ice	3.432	2.374	0.157
			0.000				No Ice	2.537	1.610	0.057
			3.000				1/2" Ice	2.750	1.791	0.077
							1" Ice	2.970	1.978	0.100
(2) LGP21901	A	From Leg	4.000	0.000	0.000	128.000	2" Ice	3.432	2.374	0.157
			0.000				No Ice	0.231	0.158	0.006
			3.000				1/2" Ice	0.294	0.213	0.008
							1" Ice	0.365	0.276	0.011
(2) LGP21901	B	From Leg	4.000	0.000	0.000	128.000	2" Ice	0.528	0.423	0.022
			0.000				No Ice	0.231	0.158	0.006
			3.000				1/2" Ice	0.294	0.213	0.008
							1" Ice	0.365	0.276	0.011
(2) LGP21901	C	From Leg	4.000	0.000	0.000	128.000	2" Ice	0.528	0.423	0.022
			0.000				No Ice	0.231	0.158	0.006
			3.000				1/2" Ice	0.294	0.213	0.008
							1" Ice	0.365	0.276	0.011
B5 4T4R RRH4X40 AIRSCALE	A	From Leg	4.000	0.000	0.000	128.000	2" Ice	0.528	0.423	0.022
			0.000				No Ice	1.322	0.748	0.049
			3.000				1/2" Ice	1.465	0.862	0.060
							1" Ice	1.616	0.983	0.074
(2) B5 4T4R RRH4X40 AIRSCALE	C	From Leg	4.000	0.000	0.000	128.000	2" Ice	1.941	1.249	0.110
			0.000				No Ice	1.322	0.748	0.049
			3.000				1/2" Ice	1.465	0.862	0.060
							1" Ice	1.616	0.983	0.074
RVZDC-6627-PF-48	A	From Leg	4.000	0.000	0.000	128.000	2" Ice	1.941	1.249	0.110
			0.000				No Ice	3.792	2.514	0.032
			3.000				1/2" Ice	4.044	2.727	0.063
							1" Ice	4.303	2.947	0.099
						2" Ice	4.844	3.417	0.181	

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			Horz Lateral ft	Vert ft					
DC6-48-60-18-8F	B	From Leg	4.000	0.000	0.000	128.000	No Ice 1.212	1.212	0.033
			0.000				1/2" Ice 1.892	1.892	0.055
			3.000				1" Ice 2.105	2.105	0.080
							2" Ice 2.570	2.570	0.138
12' Horizontal Handrail	A	From Leg	4.000	0.000	0.000	128.000	No Ice 2.280	0.010	0.033
			0.000				1/2" Ice 3.500	0.040	0.050
			2.500				1" Ice 4.750	0.090	0.076
							2" Ice 7.280	0.210	0.150
12' Horizontal Handrail	B	From Leg	4.000	0.000	0.000	128.000	No Ice 2.280	0.010	0.033
			0.000				1/2" Ice 3.500	0.040	0.050
			2.500				1" Ice 4.750	0.090	0.076
							2" Ice 7.280	0.210	0.150
12' Horizontal Handrail	C	From Leg	4.000	0.000	0.000	128.000	No Ice 2.280	0.010	0.033
			0.000				1/2" Ice 3.500	0.040	0.050
			2.500				1" Ice 4.750	0.090	0.076
							2" Ice 7.280	0.210	0.150
(2) 6' x 2.5" Schedule 40 Pipe	A	From Leg	2.000	0.000	0.000	128.000	No Ice 1.728	1.728	0.035
			0.000				1/2" Ice 2.090	2.090	0.048
			2.500				1" Ice 2.461	2.461	0.065
							2" Ice 3.231	3.231	0.112
(2) 6' x 2.5" Schedule 40 Pipe	B	From Leg	2.000	0.000	0.000	128.000	No Ice 1.728	1.728	0.035
			0.000				1/2" Ice 2.090	2.090	0.048
			2.500				1" Ice 2.461	2.461	0.065
							2" Ice 3.231	3.231	0.112
(2) 6' x 2.5" Schedule 40 Pipe	C	From Leg	2.000	0.000	0.000	128.000	No Ice 1.728	1.728	0.035
			0.000				1/2" Ice 2.090	2.090	0.048
			2.500				1" Ice 2.461	2.461	0.065
							2" Ice 3.231	3.231	0.112
T-Arm Mount [TA 602-3]	C	None		0.000	0.000	128.000	No Ice 13.400	13.400	0.774
							1/2" Ice 16.440	16.440	1.004
							1" Ice 19.700	19.700	1.292
							2" Ice 25.860	25.860	2.053
Side Arm Mount [SO 102-3]	C	None		0.000	0.000	128.000	No Ice 3.600	3.600	0.075
							1/2" Ice 4.180	4.180	0.105
							1" Ice 4.750	4.750	0.135
							2" Ice 5.900	5.900	0.195
* KS24019-L112A	C	From Leg	3.000	0.000	0.000	74.000	No Ice 0.141	0.141	0.005
			0.000				1/2" Ice 0.198	0.198	0.007
			0.000				1" Ice 0.262	0.262	0.009
							2" Ice 0.415	0.415	0.018
Side Arm Mount [SO 701-1]	C	From Leg	2.000	0.000	0.000	74.000	No Ice 0.850	1.670	0.065
			0.000				1/2" Ice 1.140	2.340	0.079
			0.000				1" Ice 1.430	3.010	0.093
							2" Ice 2.010	4.350	0.121

Load Combinations

Comb. No.	Description
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Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	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	155 - 150	Pole	Max Tension	45	0.000	-0.000	0.000
			Max. Compression	26	-10.724	1.787	-1.031
			Max. Mx	20	-3.725	45.379	-0.380

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	150 - 145	Pole	Max. My	14	-3.720	0.675	-45.021
			Max. Vy	20	-7.202	45.379	-0.380
			Max. Vx	14	7.204	0.675	-45.021
			Max. Torque	24			1.547
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-11.230	1.806	-1.042
			Max. Mx	20	-3.986	82.227	-0.376
			Max. My	14	-3.981	0.684	-81.883
			Max. Vy	20	-7.542	82.227	-0.376
			Max. Vx	14	7.544	0.684	-81.883
L3	145 - 140	Pole	Max. Torque	24			1.547
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-11.757	1.822	-1.051
			Max. Mx	20	-4.268	120.795	-0.370
			Max. My	14	-4.263	0.690	-120.466
			Max. Vy	20	-7.891	120.795	-0.370
			Max. Vx	2	-7.894	0.725	119.446
			Max. Torque	24			1.547
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-21.141	1.844	0.060
L4	140 - 135	Pole	Max. Mx	20	-7.400	190.818	-0.054
			Max. My	14	-7.390	0.697	-190.129
			Max. Vy	20	-14.186	190.818	-0.054
			Max. Vx	2	-14.192	0.753	189.881
			Max. Torque	24			1.546
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-21.791	1.860	0.058
			Max. Mx	20	-7.850	262.607	-0.041
			Max. My	14	-7.839	0.699	-261.948
			Max. Vy	20	-14.540	262.607	-0.041
L5	135 - 130	Pole	Max. Vx	2	-14.546	0.777	261.698
			Max. Torque	14			-1.338
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-31.311	0.678	1.155
			Max. Mx	20	-10.562	331.514	0.417
			Max. My	2	-10.522	0.659	332.011
			Max. Vy	20	-21.037	331.514	0.417
			Max. Vx	2	-21.199	0.659	332.011
			Max. Torque	14			-1.337
			Max Tension	1	0.000	0.000	0.000
L6	130 - 123.21	Pole	Max. Compression	26	-32.507	0.694	1.156
			Max. Mx	20	-11.384	437.739	0.647
			Max. My	2	-11.345	0.902	439.046
			Max. Vy	20	-21.458	437.739	0.647
			Max. Vx	2	-21.620	0.902	439.046
			Max. Torque	4			0.789
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-33.369	0.709	1.155
			Max. Mx	20	-12.107	545.865	0.876
			Max. My	2	-12.069	1.142	547.985
L7	123.21 - 121.79	Pole	Max. Vy	20	-21.815	545.865	0.876
			Max. Vx	2	-21.978	1.142	547.985
			Max. Torque	4			0.789
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-34.259	0.722	1.151
			Max. Mx	20	-12.858	655.787	1.105
			Max. My	2	-12.822	1.382	658.722
			Max. Vy	20	-22.175	655.787	1.105
			Max. Vx	2	-22.175	655.787	1.105
			Max. Vy	20	-22.175	655.787	1.105

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L10	111.79 - 106.79	Pole	Max. Vx	2	-22.338	1.382	658.722
			Max. Torque	4			0.788
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-35.178	0.729	1.138
			Max. Mx	20	-13.640	767.501	1.333
			Max. My	2	-13.607	1.619	771.252
			Max. Vy	20	-22.534	767.501	1.333
L11	106.79 - 101.79	Pole	Max. Vx	2	-22.698	1.619	771.252
			Max. Torque	4			0.786
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-36.126	0.729	1.117
			Max. Mx	20	-14.452	881.006	1.561
			Max. My	2	-14.420	1.856	885.573
			Max. Vy	20	-22.893	881.006	1.561
L12	101.79 - 97.5	Pole	Max. Vx	2	-23.057	1.856	885.573
			Max. Torque	4			0.785
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-37.003	0.729	1.099
			Max. Mx	20	-15.168	979.819	1.755
			Max. My	2	-15.139	2.057	985.086
			Max. Vy	20	-23.201	979.819	1.755
L13	97.5 - 97.25	Pole	Max. Vx	2	-23.365	2.057	985.086
			Max. Torque	4			0.784
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-37.059	0.731	1.099
			Max. Mx	20	-15.228	985.618	1.767
			Max. My	2	-15.198	2.070	990.926
			Max. Vy	20	-23.212	985.618	1.767
L14	97.25 - 92.25	Pole	Max. Vx	2	-23.376	2.070	990.926
			Max. Torque	4			0.783
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-38.196	0.729	1.076
			Max. Mx	20	-16.074	1102.531	1.992
			Max. My	2	-16.047	2.302	1108.655
			Max. Vy	20	-23.576	1102.531	1.992
L15	92.25 - 82.58	Pole	Max. Vx	2	-23.739	2.302	1108.655
			Max. Torque	4			0.783
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-39.307	0.729	1.053
			Max. Mx	20	-16.928	1217.392	2.210
			Max. My	2	-16.902	2.527	1224.305
			Max. Vy	20	-23.920	1217.392	2.210
L16	82.58 - 81.58	Pole	Max. Vx	2	-24.084	2.527	1224.305
			Max. Torque	4			0.781
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-41.605	0.729	1.027
			Max. Mx	20	-18.544	1358.411	2.472
			Max. My	2	-18.520	2.798	1366.273
			Max. Vy	20	-24.469	1358.411	2.472
L17	81.58 - 76.58	Pole	Max. Vx	2	-24.632	2.798	1366.273
			Max. Torque	4			0.780
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-42.820	0.729	1.003
			Max. Mx	20	-19.574	1481.633	2.696
			Max. My	2	-19.552	3.029	1490.311
			Max. Vy	20	-24.849	1481.633	2.696
L18	76.58 - 71.58	Pole	Max. Vx	2	-25.012	3.029	1490.311
			Max. Torque	4			0.780
			Max Tension	1	0.000	0.000	0.000

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	Client Crown Castle	Designed by xjones

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L19	71.58 - 68	Pole	Max. Compression	26	-44.197	1.134	0.745
			Max. Mx	20	-20.713	1607.142	2.814
			Max. My	2	-20.692	3.537	1616.268
			Max. Vy	20	-25.283	1607.142	2.814
			Max. Vx	2	-25.463	3.537	1616.268
			Max. Torque	2			0.970
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-45.173	1.134	0.727
			Max. Mx	20	-21.483	1698.082	3.027
			Max. My	2	-21.464	3.754	1707.850
			Max. Vy	20	-25.555	1698.082	3.027
			Max. Vx	2	-25.734	3.754	1707.850
			Max. Torque	2			0.970
			Max Tension	1	0.000	0.000	0.000
L20	68 - 67.75	Pole	Max. Compression	26	-45.263	1.136	0.727
			Max. Mx	20	-21.571	1704.470	3.042
			Max. My	2	-21.552	3.770	1714.283
			Max. Vy	20	-25.566	1704.470	3.042
			Max. Vx	14	25.746	-2.209	-1714.175
			Max. Torque	2			0.969
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-47.082	1.134	0.701
			Max. Mx	20	-22.971	1833.369	3.338
			Max. My	2	-22.953	4.071	1844.078
			Max. Vy	20	-26.012	1833.369	3.338
			Max. Vx	2	-26.192	4.071	1844.078
			Max. Torque	2			0.969
			Max Tension	1	0.000	0.000	0.000
L22	62.75 - 57.75	Pole	Max. Compression	26	-48.932	1.134	0.675
			Max. Mx	20	-24.405	1964.469	3.634
			Max. My	2	-24.388	4.372	1976.075
			Max. Vy	20	-26.451	1964.469	3.634
			Max. Vx	2	-26.630	4.372	1976.075
			Max. Torque	2			0.969
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-50.811	1.134	0.649
			Max. Mx	20	-25.868	2097.742	3.929
			Max. My	2	-25.852	4.673	2110.242
			Max. Vy	20	-26.881	2097.742	3.929
			Max. Vx	2	-27.061	4.673	2110.242
			Max. Torque	2			0.968
			Max Tension	1	0.000	0.000	0.000
L24	52.75 - 43.03	Pole	Max. Compression	26	-52.236	1.134	0.629
			Max. Mx	20	-26.992	2200.176	4.153
			Max. My	2	-26.977	4.900	2213.355
			Max. Vy	20	-27.200	2200.176	4.153
			Max. Vx	2	-27.379	4.900	2213.355
			Max. Torque	2			0.968
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-56.441	1.134	0.592
			Max. Mx	20	-30.202	2391.029	4.561
			Max. My	2	-30.189	5.316	2405.448
			Max. Vy	20	-27.883	2391.029	4.561
			Max. Vx	2	-28.063	5.316	2405.448
			Max. Torque	2			0.967
			Max Tension	1	0.000	0.000	0.000
L26	42.03 - 37.03	Pole	Max. Compression	26	-58.060	1.134	0.565
			Max. Mx	20	-31.575	2531.245	4.856
			Max. My	2	-31.564	5.615	2546.556
			Max. Vy	20	-28.236	2531.245	4.856
			Max. Vx	2	-28.415	5.615	2546.556
			Max. Torque	2			0.967
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-58.060	1.134	0.565
			Max. Mx	20	-31.575	2531.245	4.856
			Max. My	2	-31.564	5.615	2546.556
			Max. Vy	20	-28.236	2531.245	4.856
			Max. Vx	2	-28.415	5.615	2546.556
			Max. Torque	2			0.967
			Max Tension	1	0.000	0.000	0.000

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L27	37.03 - 32.03	Pole	Max. Torque	2			0.967
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-59.712	1.134	0.539
			Max. Mx	20	-32.978	2673.189	5.149
			Max. My	2	-32.968	5.912	2689.390
			Max. Vy	20	-28.575	2673.189	5.149
			Max. Vx	2	-28.754	5.912	2689.390
L28	32.03 - 27.03	Pole	Max. Torque	2			0.967
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-61.398	1.134	0.512
			Max. Mx	20	-34.411	2816.795	5.440
			Max. My	2	-34.403	6.207	2833.882
			Max. Vy	20	-28.901	2816.795	5.440
			Max. Vx	2	-29.078	6.207	2833.882
L29	27.03 - 22.03	Pole	Max. Torque	2			0.966
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-63.115	1.134	0.485
			Max. Mx	20	-35.874	2962.036	5.731
			Max. My	2	-35.867	6.501	2980.006
			Max. Vy	20	-29.230	2962.036	5.731
			Max. Vx	2	-29.407	6.501	2980.006
L30	22.03 - 17.03	Pole	Max. Torque	2			0.966
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-64.861	1.134	0.459
			Max. Mx	20	-37.365	3108.935	6.020
			Max. My	2	-37.360	6.793	3127.782
			Max. Vy	20	-29.564	3108.935	6.020
			Max. Vx	2	-29.740	6.793	3127.782
L31	17.03 - 12.03	Pole	Max. Torque	2			0.966
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-66.634	1.134	0.433
			Max. Mx	20	-38.886	3257.511	6.307
			Max. My	2	-38.882	7.083	3277.231
			Max. Vy	20	-29.901	3257.511	6.307
			Max. Vx	2	-30.076	7.083	3277.231
L32	12.03 - 7.03	Pole	Max. Torque	2			0.966
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-68.429	1.134	0.408
			Max. Mx	20	-40.437	3407.785	6.593
			Max. My	2	-40.434	7.371	3428.374
			Max. Vy	20	-30.243	3407.785	6.593
			Max. Vx	2	-30.417	7.371	3428.374
L33	7.03 - 2.03	Pole	Max. Torque	2			0.966
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-70.234	1.134	0.385
			Max. Mx	20	-42.017	3559.777	6.877
			Max. My	2	-42.016	7.658	3581.231
			Max. Vy	20	-30.589	3559.777	6.877
			Max. Vx	2	-30.762	7.658	3581.231
L34	2.03 - 0	Pole	Max. Torque	2			0.965
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-70.956	1.134	0.378
			Max. Mx	20	-42.666	3621.982	6.992
			Max. My	2	-42.666	7.773	3643.785
			Max. Vy	20	-30.731	3621.982	6.992
			Max. Vx	2	-30.904	7.773	3643.785
			Max. Torque	2			0.965

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Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	70.956	0.000	0.000
	Max. H _x	20	42.679	30.713	0.057
	Max. H _z	2	42.679	0.057	30.886
	Max. M _x	2	3643.785	0.057	30.886
	Max. M _z	8	3620.358	-30.713	-0.057
	Max. Torsion	2	0.965	0.057	30.886
	Min. Vert	23	32.009	26.627	15.492
	Min. H _x	8	42.679	-30.713	-0.057
	Min. H _z	14	42.679	-0.057	-30.886
	Min. M _x	14	-3643.743	-0.057	-30.886
	Min. M _z	20	-3621.982	30.713	0.057
	Min. Torsion	14	-0.960	-0.057	-30.886

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	35.566	0.000	0.000	-0.011	0.627	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	42.679	-0.057	-30.886	-3643.785	7.773	-0.965
0.9 Dead+1.0 Wind 0 deg - No Ice	32.009	-0.057	-30.886	-3592.176	7.466	-0.935
1.2 Dead+1.0 Wind 30 deg - No Ice	42.679	15.307	-26.719	-3152.191	-1803.707	-0.903
0.9 Dead+1.0 Wind 30 deg - No Ice	32.009	15.307	-26.719	-3107.536	-1778.355	-0.877
1.2 Dead+1.0 Wind 60 deg - No Ice	42.679	26.570	-15.393	-1815.937	-3131.733	-0.595
0.9 Dead+1.0 Wind 60 deg - No Ice	32.009	26.570	-15.393	-1790.203	-3087.569	-0.581
1.2 Dead+1.0 Wind 90 deg - No Ice	42.679	30.713	0.057	6.952	-3620.358	-0.125
0.9 Dead+1.0 Wind 90 deg - No Ice	32.009	30.713	0.057	6.868	-3569.279	-0.126
1.2 Dead+1.0 Wind 120 deg - No Ice	42.679	26.627	15.492	1827.935	-3138.639	0.377
0.9 Dead+1.0 Wind 120 deg - No Ice	32.009	26.627	15.492	1802.060	-3094.388	0.361
1.2 Dead+1.0 Wind 150 deg - No Ice	42.679	15.406	26.776	3159.056	-1815.744	0.773
0.9 Dead+1.0 Wind 150 deg - No Ice	32.009	15.406	26.776	3114.329	-1790.237	0.747
1.2 Dead+1.0 Wind 180 deg - No Ice	42.679	0.057	30.886	3643.743	-6.170	0.960
0.9 Dead+1.0 Wind 180 deg - No Ice	32.009	0.057	30.886	3592.149	-6.296	0.930
1.2 Dead+1.0 Wind 210 deg - No Ice	42.679	-15.307	26.719	3152.158	1805.314	0.892
0.9 Dead+1.0 Wind 210 deg - No Ice	32.009	-15.307	26.719	3107.515	1779.528	0.866
1.2 Dead+1.0 Wind 240 deg - No Ice	42.679	-26.570	15.393	1815.906	3133.351	0.589
0.9 Dead+1.0 Wind 240 deg - No Ice	32.009	-26.570	15.393	1790.184	3088.749	0.574

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	<p>Client</p> <p style="text-align: center;">Crown Castle</p>	<p>Designed by</p> <p style="text-align: center;">xjones</p>

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						
1.2 Dead+1.0 Wind 270 deg - No Ice	42.679	-30.713	-0.057	-6.992	3621.982	0.130
0.9 Dead+1.0 Wind 270 deg - No Ice	32.009	-30.713	-0.057	-6.894	3570.464	0.131
1.2 Dead+1.0 Wind 300 deg - No Ice	42.679	-26.627	-15.492	-1827.984	3140.258	-0.366
0.9 Dead+1.0 Wind 300 deg - No Ice	32.009	-26.627	-15.492	-1802.092	3095.570	-0.350
1.2 Dead+1.0 Wind 330 deg - No Ice	42.679	-15.406	-26.776	-3159.106	1817.353	-0.767
0.9 Dead+1.0 Wind 330 deg - No Ice	32.009	-15.406	-26.776	-3114.362	1791.411	-0.741
1.2 Dead+1.0 Ice+1.0 Temp	70.956	-0.000	-0.000	-0.378	1.134	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	70.956	-0.011	-6.602	-806.925	2.625	-0.346
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	70.956	3.276	-5.712	-698.196	-398.722	-0.293
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	70.956	5.686	-3.291	-402.511	-692.894	-0.161
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	70.956	6.572	0.011	0.902	-801.069	0.013
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	70.956	5.697	3.311	403.949	-694.260	0.185
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	70.956	3.296	5.724	698.635	-401.088	0.306
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	70.956	0.011	6.602	806.000	-0.106	0.345
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	70.956	-3.276	5.712	697.273	401.244	0.292
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	70.956	-5.686	3.291	401.587	695.420	0.161
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	70.956	-6.572	-0.011	-1.830	803.595	-0.014
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	70.956	-5.697	-3.311	-404.879	696.784	-0.184
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	70.956	-3.296	-5.724	-699.564	403.608	-0.306
Dead+Wind 0 deg - Service	35.566	-0.011	-5.746	-673.737	1.962	-0.181
Dead+Wind 30 deg - Service	35.566	2.848	-4.971	-582.831	-332.967	-0.169
Dead+Wind 60 deg - Service	35.566	4.943	-2.864	-335.762	-578.498	-0.112
Dead+Wind 90 deg - Service	35.566	5.714	0.011	1.270	-668.833	-0.024
Dead+Wind 120 deg - Service	35.566	4.954	2.882	337.956	-579.787	0.069
Dead+Wind 150 deg - Service	35.566	2.866	4.981	584.082	-335.200	0.145
Dead+Wind 180 deg - Service	35.566	0.011	5.746	673.692	-0.616	0.181
Dead+Wind 210 deg - Service	35.566	-2.848	4.971	582.794	334.313	0.169
Dead+Wind 240 deg - Service	35.566	-4.943	2.864	335.724	579.844	0.112
Dead+Wind 270 deg - Service	35.566	-5.714	-0.011	-1.308	670.180	0.025
Dead+Wind 300 deg - Service	35.566	-4.954	-2.882	-337.995	581.133	-0.069
Dead+Wind 330 deg - Service	35.566	-2.866	-4.981	-584.120	336.546	-0.144

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-35.566	0.000	0.000	35.566	0.000	0.000%
2	-0.057	-42.679	-30.886	0.057	42.679	30.886	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
3	-0.057	-32.009	-30.886	0.057	32.009	30.886	0.000%
4	15.307	-42.679	-26.719	-15.307	42.679	26.719	0.000%
5	15.307	-32.009	-26.719	-15.307	32.009	26.719	0.000%
6	26.570	-42.679	-15.393	-26.570	42.679	15.393	0.000%
7	26.570	-32.009	-15.393	-26.570	32.009	15.393	0.000%
8	30.713	-42.679	0.057	-30.713	42.679	-0.057	0.000%
9	30.713	-32.009	0.057	-30.713	32.009	-0.057	0.000%
10	26.627	-42.679	15.492	-26.627	42.679	-15.492	0.000%
11	26.627	-32.009	15.492	-26.627	32.009	-15.492	0.000%
12	15.406	-42.679	26.776	-15.406	42.679	-26.776	0.000%
13	15.406	-32.009	26.776	-15.406	32.009	-26.776	0.000%
14	0.057	-42.679	30.886	-0.057	42.679	-30.886	0.000%
15	0.057	-32.009	30.886	-0.057	32.009	-30.886	0.000%
16	-15.307	-42.679	26.719	15.307	42.679	-26.719	0.000%
17	-15.307	-32.009	26.719	15.307	32.009	-26.719	0.000%
18	-26.570	-42.679	15.393	26.570	42.679	-15.393	0.000%
19	-26.570	-32.009	15.393	26.570	32.009	-15.393	0.000%
20	-30.713	-42.679	-0.057	30.713	42.679	0.057	0.000%
21	-30.713	-32.009	-0.057	30.713	32.009	0.057	0.000%
22	-26.627	-42.679	-15.492	26.627	42.679	15.492	0.000%
23	-26.627	-32.009	-15.492	26.627	32.009	15.492	0.000%
24	-15.406	-42.679	-26.776	15.406	42.679	26.776	0.000%
25	-15.406	-32.009	-26.776	15.406	32.009	26.776	0.000%
26	0.000	-70.956	0.000	0.000	70.956	0.000	0.000%
27	-0.011	-70.956	-6.602	0.011	70.956	6.602	0.000%
28	3.276	-70.956	-5.712	-3.276	70.956	5.712	0.000%
29	5.686	-70.956	-3.291	-5.686	70.956	3.291	0.000%
30	6.572	-70.956	0.011	-6.572	70.956	-0.011	0.000%
31	5.697	-70.956	3.311	-5.697	70.956	-3.311	0.000%
32	3.296	-70.956	5.724	-3.296	70.956	-5.724	0.000%
33	0.011	-70.956	6.602	-0.011	70.956	-6.602	0.000%
34	-3.276	-70.956	5.712	3.276	70.956	-5.712	0.000%
35	-5.686	-70.956	3.291	5.686	70.956	-3.291	0.000%
36	-6.572	-70.956	-0.011	6.572	70.956	0.011	0.000%
37	-5.697	-70.956	-3.311	5.697	70.956	3.311	0.000%
38	-3.296	-70.956	-5.724	3.296	70.956	5.724	0.000%
39	-0.011	-35.566	-5.746	0.011	35.566	5.746	0.000%
40	2.848	-35.566	-4.971	-2.848	35.566	4.971	0.000%
41	4.943	-35.566	-2.864	-4.943	35.566	2.864	0.000%
42	5.714	-35.566	0.011	-5.714	35.566	-0.011	0.000%
43	4.954	-35.566	2.882	-4.954	35.566	-2.882	0.000%
44	2.866	-35.566	4.981	-2.866	35.566	-4.981	0.000%
45	0.011	-35.566	5.746	-0.011	35.566	-5.746	0.000%
46	-2.848	-35.566	4.971	2.848	35.566	-4.971	0.000%
47	-4.943	-35.566	2.864	4.943	35.566	-2.864	0.000%
48	-5.714	-35.566	-0.011	5.714	35.566	0.011	0.000%
49	-4.954	-35.566	-2.882	4.954	35.566	2.882	0.000%
50	-2.866	-35.566	-4.981	2.866	35.566	4.981	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	0.00092026
3	Yes	5	0.00000001	0.00037668

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4	Yes	7	0.00000001	0.00012895
5	Yes	6	0.00000001	0.00059019
6	Yes	7	0.00000001	0.00013215
7	Yes	6	0.00000001	0.00060571
8	Yes	5	0.00000001	0.00025884
9	Yes	5	0.00000001	0.00008491
10	Yes	7	0.00000001	0.00013194
11	Yes	6	0.00000001	0.00060410
12	Yes	7	0.00000001	0.00012965
13	Yes	6	0.00000001	0.00059310
14	Yes	5	0.00000001	0.00058918
15	Yes	5	0.00000001	0.00023486
16	Yes	7	0.00000001	0.00013295
17	Yes	6	0.00000001	0.00060892
18	Yes	7	0.00000001	0.00012977
19	Yes	6	0.00000001	0.00059412
20	Yes	5	0.00000001	0.00039138
21	Yes	5	0.00000001	0.00015171
22	Yes	7	0.00000001	0.00013066
23	Yes	6	0.00000001	0.00059800
24	Yes	7	0.00000001	0.00013293
25	Yes	6	0.00000001	0.00060831
26	Yes	4	0.00000001	0.00018805
27	Yes	7	0.00000001	0.00029107
28	Yes	7	0.00000001	0.00037458
29	Yes	7	0.00000001	0.00037639
30	Yes	7	0.00000001	0.00028746
31	Yes	7	0.00000001	0.00037611
32	Yes	7	0.00000001	0.00037429
33	Yes	7	0.00000001	0.00028948
34	Yes	7	0.00000001	0.00037868
35	Yes	7	0.00000001	0.00037553
36	Yes	7	0.00000001	0.00028978
37	Yes	7	0.00000001	0.00037917
38	Yes	7	0.00000001	0.00038238
39	Yes	5	0.00000001	0.00006486
40	Yes	5	0.00000001	0.00037870
41	Yes	5	0.00000001	0.00039960
42	Yes	4	0.00000001	0.00085976
43	Yes	5	0.00000001	0.00039879
44	Yes	5	0.00000001	0.00038455
45	Yes	4	0.00000001	0.00099159
46	Yes	5	0.00000001	0.00040803
47	Yes	5	0.00000001	0.00038461
48	Yes	4	0.00000001	0.00086871
49	Yes	5	0.00000001	0.00039302
50	Yes	5	0.00000001	0.00040982

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155 - 150	28.155	50	1.825	0.005
L2	150 - 145	26.252	50	1.809	0.004
L3	145 - 140	24.373	50	1.779	0.003
L4	140 - 135	22.531	50	1.738	0.003
L5	135 - 130	20.739	50	1.683	0.002
L6	130 - 123.21	19.013	50	1.613	0.002
L7	126.79 - 121.79	17.946	50	1.561	0.001

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L8	121.79 - 116.79	16.335	50	1.509	0.001
L9	116.79 - 111.79	14.798	50	1.426	0.001
L10	111.79 - 106.79	13.350	50	1.338	0.001
L11	106.79 - 101.79	11.996	50	1.247	0.001
L12	101.79 - 97.5	10.739	50	1.154	0.001
L13	97.5 - 97.25	9.737	50	1.074	0.001
L14	97.25 - 92.25	9.681	50	1.070	0.001
L15	92.25 - 82.58	8.610	50	0.976	0.001
L16	87.41 - 81.58	7.666	50	0.887	0.000
L17	81.58 - 76.58	6.614	50	0.831	0.000
L18	76.58 - 71.58	5.783	50	0.755	0.000
L19	71.58 - 68	5.031	50	0.682	0.000
L20	68 - 67.75	4.540	50	0.630	0.000
L21	67.75 - 62.75	4.507	50	0.627	0.000
L22	62.75 - 57.75	3.875	50	0.580	0.000
L23	57.75 - 52.75	3.291	50	0.534	0.000
L24	52.75 - 43.03	2.756	50	0.488	0.000
L25	48.96 - 42.03	2.383	50	0.454	0.000
L26	42.03 - 37.03	1.749	50	0.413	0.000
L27	37.03 - 32.03	1.345	50	0.359	0.000
L28	32.03 - 27.03	0.997	50	0.306	0.000
L29	27.03 - 22.03	0.703	50	0.255	0.000
L30	22.03 - 17.03	0.463	50	0.205	0.000
L31	17.03 - 12.03	0.274	50	0.156	0.000
L32	12.03 - 7.03	0.136	50	0.109	0.000
L33	7.03 - 2.03	0.046	50	0.063	0.000
L34	2.03 - 0	0.004	50	0.018	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
164.000	Lighting Rod 1/2" x 2'	50	28.155	1.825	0.005	11354
159.000	Miscellaneous [NA 507-1]	50	28.155	1.825	0.005	11354
155.000	AIR6449 B41_T-MOBILE w/ Mount Pipe	50	28.155	1.825	0.005	11354
140.000	HPA-65R-BUU-H8 w/ Mount Pipe	50	22.531	1.738	0.003	5864
128.000	(2) LPA-80063/6CF w/ Mount Pipe	50	18.345	1.579	0.001	4368
74.000	KS24019-L112A	50	5.385	0.718	0.000	3825

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	155 - 150	151.826	2	9.857	0.027
L2	150 - 145	141.596	2	9.776	0.022
L3	145 - 140	131.492	2	9.613	0.018
L4	140 - 135	121.587	2	9.390	0.014
L5	135 - 130	111.946	2	9.094	0.011
L6	130 - 123.21	102.654	2	8.718	0.008

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L7	126.79 - 121.79	96.907	2	8.438	0.007
L8	121.79 - 116.79	88.226	2	8.159	0.007
L9	116.79 - 111.79	79.940	2	7.713	0.006
L10	111.79 - 106.79	72.134	2	7.238	0.005
L11	106.79 - 101.79	64.829	2	6.746	0.004
L12	101.79 - 97.5	58.042	2	6.245	0.004
L13	97.5 - 97.25	52.636	2	5.812	0.003
L14	97.25 - 92.25	52.333	2	5.787	0.003
L15	92.25 - 82.58	46.548	2	5.282	0.003
L16	87.41 - 81.58	41.447	2	4.797	0.003
L17	81.58 - 76.58	35.760	2	4.496	0.002
L18	76.58 - 71.58	31.271	2	4.088	0.002
L19	71.58 - 68	27.205	2	3.688	0.002
L20	68 - 67.75	24.547	2	3.407	0.002
L21	67.75 - 62.75	24.369	2	3.395	0.002
L22	62.75 - 57.75	20.952	24	3.139	0.001
L23	57.75 - 52.75	17.798	24	2.889	0.001
L24	52.75 - 43.03	14.906	24	2.640	0.001
L25	48.96 - 42.03	12.886	24	2.455	0.001
L26	42.03 - 37.03	9.461	24	2.237	0.001
L27	37.03 - 32.03	7.275	24	1.942	0.001
L28	32.03 - 27.03	5.392	24	1.656	0.001
L29	27.03 - 22.03	3.804	24	1.378	0.001
L30	22.03 - 17.03	2.503	24	1.107	0.000
L31	17.03 - 12.03	1.482	24	0.844	0.000
L32	12.03 - 7.03	0.733	24	0.588	0.000
L33	7.03 - 2.03	0.248	24	0.339	0.000
L34	2.03 - 0	0.021	24	0.097	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
164.000	Lighting Rod 1/2" x 2"	2	151.826	9.857	0.028	2403
159.000	Miscellaneous [NA 507-1]	2	151.826	9.857	0.028	2403
155.000	AIR6449 B41_T-MOBILE w/ Mount Pipe	2	151.826	9.857	0.028	2403
140.000	HPA-65R-BUU-H8 w/ Mount Pipe	2	121.587	9.390	0.015	1170
128.000	(2) LPA-80063/6CF w/ Mount Pipe	2	99.056	8.536	0.008	850
74.000	KS24019-L112A	2	29.120	3.883	0.002	713

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	155 - 150 (1)	TP19.036x18x0.188	5.000	0.000	0.0	11.217	-3.725	656.224	0.006

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L2	150 - 145 (2)	TP20.073x19.036x0.188	5.000	0.000	0.0	11.834	-3.986	692.309	0.006
L3	145 - 140 (3)	TP21.109x20.073x0.188	5.000	0.000	0.0	12.451	-4.269	728.394	0.006
L4	140 - 135 (4)	TP22.146x21.109x0.188	5.000	0.000	0.0	13.068	-7.400	764.480	0.010
L5	135 - 130 (5)	TP23.182x22.146x0.188	5.000	0.000	0.0	13.685	-7.850	800.565	0.010
L6	130 - 123.21 (6)	TP24.59x23.182x0.188	6.790	0.000	0.0	14.081	-10.522	823.731	0.013
L7	123.21 - 121.79 (7)	TP24.671x23.473x0.25	5.000	0.000	0.0	19.378	-11.345	1133.630	0.010
L8	121.79 - 116.79 (8)	TP25.87x24.671x0.25	5.000	0.000	0.0	20.329	-12.069	1189.270	0.010
L9	116.79 - 111.79 (9)	TP27.068x25.87x0.25	5.000	0.000	0.0	21.280	-12.822	1244.900	0.010
L10	111.79 - 106.79 (10)	TP28.267x27.068x0.25	5.000	0.000	0.0	22.231	-13.606	1300.540	0.010
L11	106.79 - 101.79 (11)	TP29.465x28.267x0.25	5.000	0.000	0.0	23.182	-14.420	1356.170	0.011
L12	101.79 - 97.5 (12)	TP30.494x29.465x0.25	4.290	0.000	0.0	23.998	-15.138	1403.900	0.011
L13	97.5 - 97.25 (13)	TP30.554x30.494x0.25	0.250	0.000	0.0	24.046	-15.198	1406.690	0.011
L14	97.25 - 92.25 (14)	TP31.752x30.554x0.25	5.000	0.000	0.0	24.997	-16.047	1462.320	0.011
L15	92.25 - 82.58 (15)	TP34.07x31.752x0.25	9.670	0.000	0.0	25.917	-16.902	1516.170	0.011
L16	82.58 - 81.58 (16)	4.8.2 (1.05 CR) - 15 TP33.825x32.412x0.313	5.830	0.000	0.0	33.241	-18.520	1944.580	0.010
L17	81.58 - 76.58 (17)	TP35.037x33.825x0.313	5.000	0.000	0.0	34.443	-19.552	2014.900	0.010
L18	76.58 - 71.58 (18)	TP36.249x35.037x0.313	5.000	0.000	0.0	35.645	-20.691	2085.230	0.010
L19	71.58 - 68 (19)	TP37.117x36.249x0.313	3.580	0.000	0.0	36.506	-21.463	2135.580	0.010
L20	68 - 67.75 (20)	TP37.178x37.117x0.488	0.250	0.000	0.0	56.772	-21.551	3321.160	0.006
L21	67.75 - 62.75 (21)	TP38.39x37.178x0.475	5.000	0.000	0.0	57.162	-22.952	3344.000	0.007
L22	62.75 - 57.75 (22)	TP39.602x38.39x0.475	5.000	0.000	0.0	58.990	-24.387	3450.890	0.007
L23	57.75 - 52.75 (23)	TP40.814x39.602x0.463	5.000	0.000	0.0	59.235	-25.852	3465.240	0.007
L24	52.75 - 43.03 (24)	TP43.17x40.814x0.463	9.720	0.000	0.0	60.583	-26.977	3544.130	0.008
L25	43.03 - 42.03 (25)	TP42.791x41.108x0.375	6.930	0.000	0.0	50.486	-30.188	2953.400	0.010
L26	42.03 - 37.03 (26)	TP44.005x42.791x0.375	5.000	0.000	0.0	51.931	-31.563	3037.970	0.010
L27	37.03 - 32.03 (27)	TP45.22x44.005x0.375	5.000	0.000	0.0	53.377	-32.968	3122.530	0.011
L28	32.03 - 27.03 (28)	TP46.434x45.22x0.375	5.000	0.000	0.0	54.822	-34.403	3207.100	0.011
L29	27.03 - 22.03 (29)	TP47.649x46.434x0.375	5.000	0.000	0.0	56.268	-35.866	3291.660	0.011
L30	22.03 - 17.03 (30)	TP48.863x47.649x0.375	5.000	0.000	0.0	57.713	-37.359	3376.230	0.011
L31	17.03 - 12.03 (31)	TP50.078x48.863x0.375	5.000	0.000	0.0	59.159	-38.882	3460.790	0.011
L32	12.03 - 7.03 (32)	TP51.292x50.078x0.375	5.000	0.000	0.0	60.604	-40.434	3545.360	0.011
L33	7.03 - 2.03 (33)	TP52.507x51.292x0.375	5.000	0.000	0.0	62.050	-42.016	3629.930	0.012
L34	2.03 - 0 (34)	TP53x52.507x0.375	2.030	0.000	0.0	62.637	-42.666	3664.260	0.012

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Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux}	ϕM_{ux}	Ratio	M_{uy}	ϕM_{uy}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{ux}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{uy}}$
L1	155 - 150 (1)	TP19.036x18x0.188	45.516	317.939	0.143	0.000	317.939	0.000
L2	150 - 145 (2)	TP20.073x19.036x0.188	82.364	349.072	0.236	0.000	349.072	0.000
L3	145 - 140 (3)	TP21.109x20.073x0.188	120.932	381.078	0.317	0.000	381.078	0.000
L4	140 - 135 (4)	TP22.146x21.109x0.188	190.818	413.875	0.461	0.000	413.875	0.000
L5	135 - 130 (5)	TP23.182x22.146x0.188	262.608	447.380	0.587	0.000	447.380	0.000
L6	130 - 123.21 (6)	TP24.59x23.182x0.188	332.224	469.225	0.708	0.000	469.225	0.000
L7	123.21 - 121.79 (7)	TP24.671x23.473x0.25	439.251	716.555	0.613	0.000	716.555	0.000
L8	121.79 - 116.79 (8)	TP25.87x24.671x0.25	548.182	779.438	0.703	0.000	779.438	0.000
L9	116.79 - 111.79 (9)	TP27.068x25.87x0.25	658.909	843.967	0.781	0.000	843.967	0.000
L10	111.79 - 106.79 (10)	TP28.267x27.068x0.25	771.431	910.025	0.848	0.000	910.025	0.000
L11	106.79 - 101.79 (11)	TP29.465x28.267x0.25	885.742	977.475	0.906	0.000	977.475	0.000
L12	101.79 - 97.5 (12)	TP30.494x29.465x0.25	985.250	1036.367	0.951	0.000	1036.367	0.000
L13	97.5 - 97.25 (13)	TP30.554x30.494x0.25	991.092	1039.825	0.953	0.000	1039.825	0.000
L14	97.25 - 92.25 (14)	TP31.752x30.554x0.25	1108.808	1109.592	0.999	0.000	1109.592	0.000
L15	92.25 - 82.58 (15)	TP34.07x31.752x0.25	1224.450	1178.108	1.039	0.000	1178.108	0.000
L16	82.58 - 81.58 (16)	TP33.825x32.412x0.313	1366.408	1647.525	0.829	0.000	1647.525	0.000
L17	81.58 - 76.58 (17)	TP35.037x33.825x0.313	1490.433	1751.667	0.851	0.000	1751.667	0.000
L18	76.58 - 71.58 (18)	TP36.249x35.037x0.313	1616.550	1857.625	0.870	0.000	1857.625	0.000
L19	71.58 - 68 (19)	TP37.117x36.249x0.313	1708.158	1934.533	0.883	0.000	1934.533	0.000
L20	68 - 67.75 (20)	TP37.178x37.117x0.488	1714.592	3165.225	0.542	0.000	3165.225	0.000
L21	67.75 - 62.75 (21)	TP38.39x37.178x0.475	1844.425	3295.825	0.560	0.000	3295.825	0.000
L22	62.75 - 57.75 (22)	TP39.602x38.39x0.475	1976.450	3511.250	0.563	0.000	3511.250	0.000
L23	57.75 - 52.75 (23)	TP40.814x39.602x0.463	2110.658	3638.625	0.580	0.000	3638.625	0.000
L24	52.75 - 43.03 (24)	TP43.17x40.814x0.463	2213.792	3807.158	0.581	0.000	3807.158	0.000
L25	43.03 - 42.03 (25)	TP42.791x41.108x0.375	2405.933	3120.408	0.771	0.000	3120.408	0.000
L26	42.03 - 37.03 (26)	TP44.005x42.791x0.375	2547.075	3274.375	0.778	0.000	3274.375	0.000
L27	37.03 - 32.03 (27)	TP45.22x44.005x0.375	2689.942	3430.325	0.784	0.000	3430.325	0.000
L28	32.03 - 27.03 (28)	TP46.434x45.22x0.375	2834.467	3588.108	0.790	0.000	3588.108	0.000
L29	27.03 - 22.03 (29)	TP47.649x46.434x0.375	2980.625	3747.617	0.795	0.000	3747.617	0.000
L30	22.03 - 17.03 (30)	TP48.863x47.649x0.375	3128.433	3908.700	0.800	0.000	3908.700	0.000
L31	17.03 - 12.03 (31)	TP50.078x48.863x0.375	3277.917	4071.233	0.805	0.000	4071.233	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{rx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	M_{uy} kip-ft	ϕM_{ry} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
L32	12.03 - 7.03 (32)	TP51.292x50.078x0.375	3429.092	4235.083	0.810	0.000	4235.083	0.000
L33	7.03 - 2.03 (33)	TP52.507x51.292x0.375	3581.983	4400.125	0.814	0.000	4400.125	0.000
L34	2.03 - 0 (34)	TP53x52.507x0.375	3644.550	4467.442	0.816	0.000	4467.442	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	155 - 150 (1)	TP19.036x18x0.188	7.202	196.867	0.037	0.002	324.968	0.000
L2	150 - 145 (2)	TP20.073x19.036x0.188	7.542	207.693	0.036	0.002	361.691	0.000
L3	145 - 140 (3)	TP21.109x20.073x0.188	7.891	218.518	0.036	0.002	400.378	0.000
L4	140 - 135 (4)	TP22.146x21.109x0.188	14.186	229.344	0.062	0.246	441.031	0.001
L5	135 - 130 (5)	TP23.182x22.146x0.188	14.540	240.169	0.061	0.246	483.649	0.001
L6	130 - 123.21 (6)	TP24.59x23.182x0.188	21.198	247.119	0.086	0.521	512.046	0.001
L7	123.21 - 121.79 (7)	TP24.671x23.473x0.25	21.619	340.090	0.064	0.520	727.352	0.001
L8	121.79 - 116.79 (8)	TP25.87x24.671x0.25	21.977	356.780	0.062	0.519	800.494	0.001
L9	116.79 - 111.79 (9)	TP27.068x25.87x0.25	22.337	373.471	0.060	0.519	877.142	0.001
L10	111.79 - 106.79 (10)	TP28.267x27.068x0.25	22.696	390.161	0.058	0.518	957.292	0.001
L11	106.79 - 101.79 (11)	TP29.465x28.267x0.25	23.055	406.851	0.057	0.517	1040.942	0.000
L12	101.79 - 97.5 (12)	TP30.494x29.465x0.25	23.363	421.171	0.055	0.516	1115.508	0.000
L13	97.5 - 97.25 (13)	TP30.554x30.494x0.25	23.372	422.006	0.055	0.516	1119.933	0.000
L14	97.25 - 92.25 (14)	TP31.752x30.554x0.25	23.737	438.696	0.054	0.515	1210.275	0.000
L15	92.25 - 82.58 (15)	TP34.07x31.752x0.25	24.082	454.852	0.053	0.514	1301.058	0.000
L16	82.58 - 81.58 (16)	TP33.825x32.412x0.313	24.630	583.374	0.042	0.514	1712.142	0.000
L17	81.58 - 76.58 (17)	TP35.037x33.825x0.313	25.010	604.471	0.041	0.513	1838.217	0.000
L18	76.58 - 71.58 (18)	TP36.249x35.037x0.313	25.469	625.569	0.041	0.771	1968.775	0.000
L19	71.58 - 68 (19)	TP37.117x36.249x0.313	25.741	640.675	0.040	0.770	2065.008	0.000
L20	68 - 67.75 (20)	TP37.178x37.117x0.488	25.749	996.347	0.026	0.770	3201.417	0.000
L21	67.75 - 62.75 (21)	TP38.39x37.178x0.475	26.198	1003.200	0.026	0.770	3331.017	0.000
L22	62.75 - 57.75 (22)	TP39.602x38.39x0.475	26.637	1035.270	0.026	0.769	3547.383	0.000
L23	57.75 - 52.75 (23)	TP40.814x39.602x0.463	27.067	1039.570	0.026	0.769	3673.600	0.000
L24	52.75 - 43.03 (24)	TP43.17x40.814x0.463	27.386	1063.240	0.026	0.769	3842.783	0.000
L25	43.03 - 42.03 (25)	TP42.791x41.108x0.375	28.069	886.020	0.032	0.769	3291.183	0.000
L26	42.03 - 37.03 (26)	TP44.005x42.791x0.375	28.421	911.390	0.031	0.768	3482.358	0.000
L27	37.03 - 32.03	TP45.22x44.005x0.375	28.760	936.760	0.031	0.768	3678.925	0.000

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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 $\frac{T_u}{\phi T_n}$
L28	(27) 32.03 - 27.03	TP46.434x45.22x0.375	29.084	962.129	0.030	0.768	3880.892	0.000
L29	(28) 27.03 - 22.03	TP47.649x46.434x0.375	29.413	987.499	0.030	0.768	4088.258	0.000
L30	(29) 22.03 - 17.03	TP48.863x47.649x0.375	29.746	1012.870	0.029	0.767	4301.017	0.000
L31	(30) 17.03 - 12.03	TP50.078x48.863x0.375	30.083	1038.240	0.029	0.767	4519.175	0.000
L32	(31) 12.03 - 7.03	TP51.292x50.078x0.375	30.424	1063.610	0.029	0.767	4742.725	0.000
L33	(32) 7.03 - 2.03 (33)	TP52.507x51.292x0.375	30.769	1088.980	0.028	0.767	4971.675	0.000
L34	(34) 2.03 - 0 (34)	TP53x52.507x0.375	30.910	1099.280	0.028	0.767	5066.167	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	155 - 150 (1)	0.006	0.143	0.000	0.037	0.000	0.150	1.050	4.8.2 ✓
L2	150 - 145 (2)	0.006	0.236	0.000	0.036	0.000	0.243	1.050	4.8.2 ✓
L3	145 - 140 (3)	0.006	0.317	0.000	0.036	0.000	0.325	1.050	4.8.2 ✓
L4	140 - 135 (4)	0.010	0.461	0.000	0.062	0.001	0.475	1.050	4.8.2 ✓
L5	135 - 130 (5)	0.010	0.587	0.000	0.061	0.001	0.601	1.050	4.8.2 ✓
L6	130 - 123.21 (6)	0.013	0.708	0.000	0.086	0.001	0.728	1.050	4.8.2 ✓
L7	123.21 - 121.79 (7)	0.010	0.613	0.000	0.064	0.001	0.627	1.050	4.8.2 ✓
L8	121.79 - 116.79 (8)	0.010	0.703	0.000	0.062	0.001	0.717	1.050	4.8.2 ✓
L9	116.79 - 111.79 (9)	0.010	0.781	0.000	0.060	0.001	0.795	1.050	4.8.2 ✓
L10	111.79 - 106.79 (10)	0.010	0.848	0.000	0.058	0.001	0.862	1.050	4.8.2 ✓
L11	106.79 - 101.79 (11)	0.011	0.906	0.000	0.057	0.000	0.920	1.050	4.8.2 ✓
L12	101.79 - 97.5 (12)	0.011	0.951	0.000	0.055	0.000	0.965	1.050	4.8.2 ✓
L13	97.5 - 97.25 (13)	0.011	0.953	0.000	0.055	0.000	0.967	1.050	4.8.2 ✓
L14	97.25 - 92.25 (14)	0.011	0.999	0.000	0.054	0.000	1.013	1.050	4.8.2 ✓
L15	92.25 - 82.58 (15)	0.011	1.039	0.000	0.053	0.000	1.053	1.050	4.8.2 ✗
L16	82.58 - 81.58 (16)	0.010	0.829	0.000	0.042	0.000	0.841	1.050	4.8.2 ✓

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Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u ϕP_n	M_{ux} ϕM_{nx}	M_{uy} ϕM_{ny}	V_u ϕV_n	T_u ϕT_n			
L17	81.58 - 76.58 (17)	0.010	0.851	0.000	0.041	0.000	0.862	1.050	4.8.2 ✓
L18	76.58 - 71.58 (18)	0.010	0.870	0.000	0.041	0.000	0.882	1.050	4.8.2 ✓
L19	71.58 - 68 (19)	0.010	0.883	0.000	0.040	0.000	0.895	1.050	4.8.2 ✓
L20	68 - 67.75 (20)	0.006	0.542	0.000	0.026	0.000	0.549	1.050	4.8.2 ✓
L21	67.75 - 62.75 (21)	0.007	0.560	0.000	0.026	0.000	0.567	1.050	4.8.2 ✓
L22	62.75 - 57.75 (22)	0.007	0.563	0.000	0.026	0.000	0.571	1.050	4.8.2 ✓
L23	57.75 - 52.75 (23)	0.007	0.580	0.000	0.026	0.000	0.588	1.050	4.8.2 ✓
L24	52.75 - 43.03 (24)	0.008	0.581	0.000	0.026	0.000	0.590	1.050	4.8.2 ✓
L25	43.03 - 42.03 (25)	0.010	0.771	0.000	0.032	0.000	0.782	1.050	4.8.2 ✓
L26	42.03 - 37.03 (26)	0.010	0.778	0.000	0.031	0.000	0.789	1.050	4.8.2 ✓
L27	37.03 - 32.03 (27)	0.011	0.784	0.000	0.031	0.000	0.796	1.050	4.8.2 ✓
L28	32.03 - 27.03 (28)	0.011	0.790	0.000	0.030	0.000	0.802	1.050	4.8.2 ✓
L29	27.03 - 22.03 (29)	0.011	0.795	0.000	0.030	0.000	0.807	1.050	4.8.2 ✓
L30	22.03 - 17.03 (30)	0.011	0.800	0.000	0.029	0.000	0.812	1.050	4.8.2 ✓
L31	17.03 - 12.03 (31)	0.011	0.805	0.000	0.029	0.000	0.817	1.050	4.8.2 ✓
L32	12.03 - 7.03 (32)	0.011	0.810	0.000	0.029	0.000	0.822	1.050	4.8.2 ✓
L33	7.03 - 2.03 (33)	0.012	0.814	0.000	0.028	0.000	0.826	1.050	4.8.2 ✓
L34	2.03 - 0 (34)	0.012	0.816	0.000	0.028	0.000	0.828	1.050	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	155 - 150	Pole	TP19.036x18x0.188	1	-3.725	689.035	**	**
L2	150 - 145	Pole	TP20.073x19.036x0.188	2	-3.986	726.924	**	**
L3	145 - 140	Pole	TP21.109x20.073x0.188	3	-4.269	764.814	**	**
L4	140 - 135	Pole	TP22.146x21.109x0.188	4	-7.400	802.704	**	**
L5	135 - 130	Pole	TP23.182x22.146x0.188	5	-7.850	840.593	**	**
L6	130 - 123.21	Pole	TP24.59x23.182x0.188	6	-10.522	864.918	**	**

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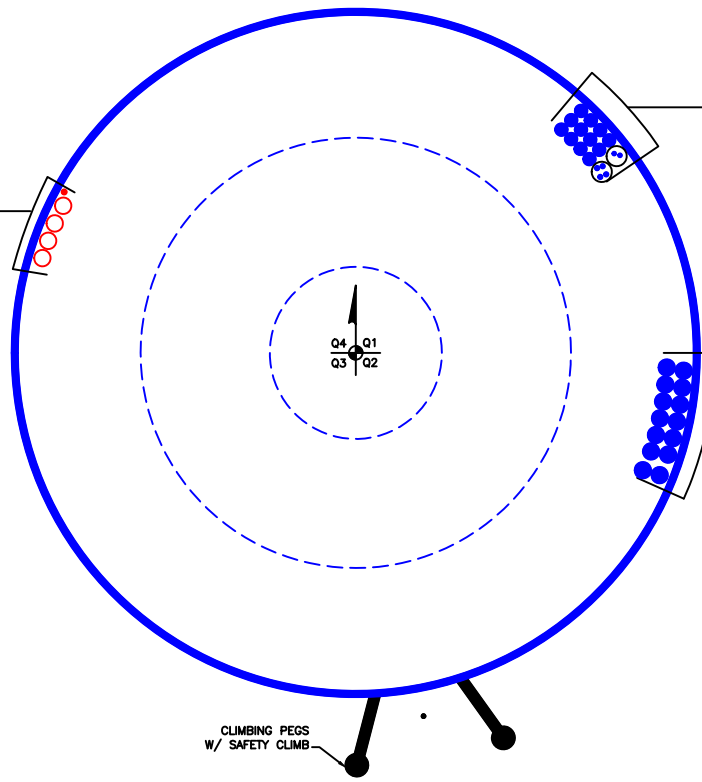
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L7	123.21 - 121.79	Pole	TP24.671x23.473x0.25	7	-11.345	1190.311	**	**
L8	121.79 - 116.79	Pole	TP25.87x24.671x0.25	8	-12.069	1248.733	**	**
L9	116.79 - 111.79	Pole	TP27.068x25.87x0.25	9	-12.822	1307.145	**	**
L10	111.79 - 106.79	Pole	TP28.267x27.068x0.25	10	-13.606	1365.567	**	**
L11	106.79 - 101.79	Pole	TP29.465x28.267x0.25	11	-14.420	1423.978	**	**
L12	101.79 - 97.5	Pole	TP30.494x29.465x0.25	12	-15.138	1474.095	**	**
L13	97.5 - 97.25	Pole	TP30.554x30.494x0.25	13	-15.198	1477.024	**	**
L14	97.25 - 92.25	Pole	TP31.752x30.554x0.25	14	-16.047	1535.436	**	**
L15	92.25 - 82.58	Pole	TP34.07x31.752x0.25	15	-16.902	1591.978	**	**
L16	82.58 - 81.58	Pole	TP33.825x32.412x0.313	16	-18.520	2041.809	**	**
L17	81.58 - 76.58	Pole	TP35.037x33.825x0.313	17	-19.552	2115.645	**	**
L18	76.58 - 71.58	Pole	TP36.249x35.037x0.313	18	-20.691	2189.491	**	**
L19	71.58 - 68	Pole	TP37.117x36.249x0.313	19	-21.463	2242.359	**	**
L20	68 - 67.75	Pole	TP37.178x37.117x0.488	20	-21.551	3487.218	**	**
L21	67.75 - 62.75	Pole	TP38.39x37.178x0.475	21	-22.952	3511.200	**	**
L22	62.75 - 57.75	Pole	TP39.602x38.39x0.475	22	-24.387	3623.434	**	**
L23	57.75 - 52.75	Pole	TP40.814x39.602x0.463	23	-25.852	3638.502	**	**
L24	52.75 - 43.03	Pole	TP43.17x40.814x0.463	24	-26.977	3721.336	**	**
L25	43.03 - 42.03	Pole	TP42.791x41.108x0.375	25	-30.188	3101.070	**	**
L26	42.03 - 37.03	Pole	TP44.005x42.791x0.375	26	-31.563	3189.868	**	**
L27	37.03 - 32.03	Pole	TP45.22x44.005x0.375	27	-32.968	3278.656	**	**
L28	32.03 - 27.03	Pole	TP46.434x45.22x0.375	28	-34.403	3367.455	**	**
L29	27.03 - 22.03	Pole	TP47.649x46.434x0.375	29	-35.866	3456.243	**	**
L30	22.03 - 17.03	Pole	TP48.863x47.649x0.375	30	-37.359	3545.041	**	**
L31	17.03 - 12.03	Pole	TP50.078x48.863x0.375	31	-38.882	3633.829	**	**
L32	12.03 - 7.03	Pole	TP51.292x50.078x0.375	32	-40.434	3722.628	**	**
L33	7.03 - 2.03	Pole	TP52.507x51.292x0.375	33	-42.016	3811.426	**	**
L34	2.03 - 0	Pole	TP53x52.507x0.375	34	-42.666	3847.473	**	**
							Summary	
							Pole (L15)	**
							RATING =	**

** See Additional Calculations in Appendix C.

APPENDIX B
BASE LEVEL DRAWING



(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1/2" TO 74 FT LEVEL
(4) 1-5/8" TO 155 FT LEVEL



(OTHER CONSIDERED EQUIPMENT)
(2) 3/8" TO 140 FT LEVEL IN CONDUIT
(4) 7/16" TO 140 FT LEVEL IN CONDUIT
(12) 1-1/4" TO 140 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)
(14) 1-5/8" TO 128 FT LEVEL

CLIMBING PEGS
W/ SAFETY CLIMB

BUSINESS UNIT: 876366

APPENDIX C
ADDITIONAL CALCULATIONS

Site BU: 876366
Work Order: 1919049



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Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	155	31.79	3.58	18	18	24.59	0.1875	Auto	A572-65
2	126.79	44.21	4.83	18	23.47	34.07	0.25	Auto	A572-65
3	87.41	44.38	5.93	18	32.41	43.17	0.3125	Auto	A572-65
4	48.96	48.96	0	18	41.11	53	0.375	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	47	68	plate	CCI-SFP-060100	3	E						E						E					
2	85.5	97.5	plate	CCI-SFP-045100	3	E						E						E					
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in ²)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in ²)	Bolt Hole Size (in)	Reinforcement Material
1	6	1	6	0.5	PC 8.8 - M20 (100)	24	PC 8.8 - M20 (100)	24.000	16.000	4.750	1.1875	A572-65
2	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	18	PC 8.8 - M20 (100)	18.000	20.000	3.250	1.1875	A572-65

TNX Geometry Input

Increment (ft): [Export to TNX](#)

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	155 - 150	5		18	18.000	19.036	0.1875	A572-65	1.000
2	150 - 145	5		18	19.036	20.073	0.1875	A572-65	1.000
3	145 - 140	5		18	20.073	21.109	0.1875	A572-65	1.000
4	140 - 135	5		18	21.109	22.146	0.1875	A572-65	1.000
5	135 - 130	5		18	22.146	23.182	0.1875	A572-65	1.000
6	130 - 126.79	6.79	3.58	18	23.182	24.590	0.1875	A572-65	1.000
7	126.79 - 121.79	5		18	23.473	24.671	0.25	A572-65	1.000
8	121.79 - 116.79	5		18	24.671	25.870	0.25	A572-65	1.000
9	116.79 - 111.79	5		18	25.870	27.068	0.25	A572-65	1.000
10	111.79 - 106.79	5		18	27.068	28.267	0.25	A572-65	1.000
11	106.79 - 101.79	5		18	28.267	29.465	0.25	A572-65	1.000
12	101.79 - 97.5	4.29		18	29.465	30.494	0.25	A572-65	1.000
13	97.5 - 97.25	0.25		18	30.494	30.554	0.25	A572-65	1.000
14	97.25 - 92.25	5		18	30.554	31.752	0.25	A572-65	1.000
15	92.25 - 87.41	9.67	4.83	18	31.752	34.070	0.25	A572-65	1.000
16	87.41 - 81.58	5.83		18	32.412	33.825	0.3125	A572-65	1.000
17	81.58 - 76.58	5		18	33.825	35.037	0.3125	A572-65	1.000
18	76.58 - 71.58	5		18	35.037	36.249	0.3125	A572-65	1.000
19	71.58 - 68	3.58		18	36.249	37.117	0.3125	A572-65	1.000
20	68 - 67.75	0.25		18	37.117	37.178	0.4875	A572-65	0.961
21	67.75 - 62.75	5		18	37.178	38.390	0.475	A572-65	0.976
22	62.75 - 57.75	5		18	38.390	39.602	0.475	A572-65	0.966
23	57.75 - 52.75	5		18	39.602	40.814	0.4625	A572-65	0.982
24	52.75 - 48.96	9.72	5.93	18	40.814	43.170	0.4625	A572-65	0.975
25	48.96 - 42.03	6.93		18	41.108	42.791	0.375	A572-65	1.000
26	42.03 - 37.03	5		18	42.791	44.005	0.375	A572-65	1.000
27	37.03 - 32.03	5		18	44.005	45.220	0.375	A572-65	1.000
28	32.03 - 27.03	5		18	45.220	46.434	0.375	A572-65	1.000
29	27.03 - 22.03	5		18	46.434	47.649	0.375	A572-65	1.000
30	22.03 - 17.03	5		18	47.649	48.863	0.375	A572-65	1.000
31	17.03 - 12.03	5		18	48.863	50.078	0.375	A572-65	1.000
32	12.03 - 7.03	5		18	50.078	51.292	0.375	A572-65	1.000
33	7.03 - 2.03	5		18	51.292	52.507	0.375	A572-65	1.000
34	2.03 - 0	2.03		18	52.507	53.000	0.375	A572-65	1.000

TNX Section Forces

Increment (ft):		TNX Output			
	5	Section Height (ft)	P _u (K)	M _{ux} (kip-ft)	V _u (K)
1	155 - 150		3.72	45.52	7.20
2	150 - 145		3.99	82.36	7.54
3	145 - 140		4.27	120.93	7.89
4	140 - 135		7.40	190.82	14.19
5	135 - 130		7.85	262.61	14.54
6	130 - 126.79		10.52	332.22	21.20
7	126.79 - 121.79		11.34	439.25	21.62
8	121.79 - 116.79		12.07	548.18	21.98
9	116.79 - 111.79		12.82	658.91	22.34
10	111.79 - 106.79		13.61	771.43	22.70
11	106.79 - 101.79		14.42	885.74	23.05
12	101.79 - 97.5		15.14	985.25	23.36
13	97.5 - 97.25		15.20	991.09	23.37
14	97.25 - 92.25		16.05	1108.81	23.74
15	92.25 - 87.41		16.90	1224.45	24.08
16	87.41 - 81.58		18.52	1366.41	24.63
17	81.58 - 76.58		19.55	1490.44	25.01
18	76.58 - 71.58		20.69	1616.55	25.47
19	71.58 - 68		21.46	1708.16	25.74
20	68 - 67.75		21.55	1714.59	25.75
21	67.75 - 62.75		22.95	1844.42	26.20
22	62.75 - 57.75		24.39	1976.45	26.64
23	57.75 - 52.75		25.85	2110.65	27.07
24	52.75 - 48.96		26.98	2213.79	27.39
25	48.96 - 42.03		30.19	2405.93	28.07
26	42.03 - 37.03		31.56	2547.07	28.42
27	37.03 - 32.03		32.97	2689.94	28.76
28	32.03 - 27.03		34.40	2834.47	29.08
29	27.03 - 22.03		35.87	2980.62	29.41
30	22.03 - 17.03		37.36	3128.43	29.75
31	17.03 - 12.03		38.88	3277.92	30.08
32	12.03 - 7.03		40.43	3429.09	30.42
33	7.03 - 2.03		42.02	3581.98	30.77
34	2.03 - 0		42.67	3644.55	30.91

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
155 - 150	Pole	TP19.036x18x0.1875	Pole	14.1%	Pass
150 - 145	Pole	TP20.073x19.036x0.1875	Pole	22.9%	Pass
145 - 140	Pole	TP21.109x20.073x0.1875	Pole	30.7%	Pass
140 - 135	Pole	TP22.146x21.109x0.1875	Pole	44.8%	Pass
135 - 130	Pole	TP23.182x22.146x0.1875	Pole	56.8%	Pass
130 - 126.79	Pole	TP24.59x23.182x0.1875	Pole	68.7%	Pass
126.79 - 121.79	Pole	TP24.671x23.473x0.25	Pole	59.2%	Pass
121.79 - 116.79	Pole	TP25.87x24.671x0.25	Pole	67.8%	Pass
116.79 - 111.79	Pole	TP27.068x25.87x0.25	Pole	75.2%	Pass
111.79 - 106.79	Pole	TP28.267x27.068x0.25	Pole	81.6%	Pass
106.79 - 101.79	Pole	TP29.465x28.267x0.25	Pole	87.2%	Pass
101.79 - 97.5	Pole	TP30.494x29.465x0.25	Pole	91.5%	Pass
97.5 - 97.25	Pole	TP30.554x30.494x0.25	Pole	91.7%	Pass
97.25 - 92.25	Pole	TP31.752x30.554x0.25	Pole	96.2%	Pass
92.25 - 87.41	Pole	TP34.07x31.752x0.25	Pole	100.0%	Pass
87.41 - 81.58	Pole	TP33.825x32.412x0.3125	Pole	79.8%	Pass
81.58 - 76.58	Pole	TP35.037x33.825x0.3125	Pole	81.8%	Pass
76.58 - 71.58	Pole	TP36.249x35.037x0.3125	Pole	83.7%	Pass
71.58 - 68	Pole	TP37.117x36.249x0.3125	Pole	84.9%	Pass
68 - 67.75	Pole + Reinf.	TP37.178x37.117x0.4875	Reinf. 1 Tension Rupture	82.8%	Pass
67.75 - 62.75	Pole + Reinf.	TP38.39x37.178x0.475	Reinf. 1 Tension Rupture	84.4%	Pass
62.75 - 57.75	Pole + Reinf.	TP39.602x38.39x0.475	Reinf. 1 Tension Rupture	85.8%	Pass
57.75 - 52.75	Pole + Reinf.	TP40.814x39.602x0.4625	Reinf. 1 Tension Rupture	87.1%	Pass
52.75 - 48.96	Pole + Reinf.	TP43.17x40.814x0.4625	Reinf. 1 Tension Rupture	88.0%	Pass
48.96 - 42.03	Pole	TP42.791x41.108x0.375	Pole	74.3%	Pass
42.03 - 37.03	Pole	TP44.005x42.791x0.375	Pole	74.9%	Pass
37.03 - 32.03	Pole	TP45.22x44.005x0.375	Pole	75.6%	Pass
32.03 - 27.03	Pole	TP46.434x45.22x0.375	Pole	76.1%	Pass
27.03 - 22.03	Pole	TP47.649x46.434x0.375	Pole	76.7%	Pass
22.03 - 17.03	Pole	TP48.863x47.649x0.375	Pole	77.2%	Pass
17.03 - 12.03	Pole	TP50.078x48.863x0.375	Pole	77.7%	Pass
12.03 - 7.03	Pole	TP51.292x50.078x0.375	Pole	78.1%	Pass
7.03 - 2.03	Pole	TP52.507x51.292x0.375	Pole	78.6%	Pass
2.03 - 0	Pole	TP53x52.507x0.375	Pole	78.7%	Pass
				Summary	
			Pole	100.0%	Pass
			Reinforcement	88.0%	Pass
			Overall	100.0%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity*		
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2
155 - 150	503	n/a	503	11.22	n/a	11.22	14.1%		
150 - 145	591	n/a	591	11.83	n/a	11.83	22.9%		
145 - 140	688	n/a	688	12.45	n/a	12.45	30.7%		
140 - 135	796	n/a	796	13.07	n/a	13.07	44.8%		
135 - 130	914	n/a	914	13.68	n/a	13.68	56.8%		
130 - 126.79	996	n/a	996	14.08	n/a	14.08	68.7%		
126.79 - 121.79	1460	n/a	1460	19.38	n/a	19.38	59.2%		
121.79 - 116.79	1685	n/a	1685	20.33	n/a	20.33	67.8%		
116.79 - 111.79	1933	n/a	1933	21.28	n/a	21.28	75.2%		
111.79 - 106.79	2204	n/a	2204	22.23	n/a	22.23	81.6%		
106.79 - 101.79	2499	n/a	2499	23.18	n/a	23.18	87.2%		
101.79 - 97.5	2772	n/a	2772	24.00	n/a	24.00	91.5%		
97.5 - 97.25	2789	n/a	2789	24.05	n/a	24.05	91.7%		
97.25 - 92.25	3133	n/a	3133	25.00	n/a	25.00	96.2%		
92.25 - 87.41	3492	n/a	3492	25.92	n/a	25.92	100.0%		
87.41 - 81.58	4715	n/a	4715	33.24	n/a	33.24	79.8%		
81.58 - 76.58	5245	n/a	5245	34.44	n/a	34.44	81.8%		
76.58 - 71.58	5814	n/a	5814	35.64	n/a	35.64	83.7%		
71.58 - 68	6245	n/a	6245	36.50	n/a	36.50	84.9%		
68 - 67.75	6276	3307	9583	36.56	18.00	54.56	54.9%	82.8%	
67.75 - 62.75	6916	3519	10435	37.77	18.00	55.77	56.6%	84.4%	
62.75 - 57.75	7597	3737	11334	38.97	18.00	56.97	58.2%	85.8%	
57.75 - 52.75	8322	3962	12284	40.17	18.00	58.17	59.8%	87.1%	
52.75 - 48.96	8902	4136	13038	41.08	18.00	59.08	60.9%	88.0%	
48.96 - 42.03	11471	n/a	11471	50.48	n/a	50.48	74.3%		
42.03 - 37.03	12485	n/a	12485	51.93	n/a	51.93	74.9%		
37.03 - 32.03	13557	n/a	13557	53.37	n/a	53.37	75.6%		
32.03 - 27.03	14688	n/a	14688	54.82	n/a	54.82	76.1%		
27.03 - 22.03	15881	n/a	15881	56.27	n/a	56.27	76.7%		
22.03 - 17.03	17137	n/a	17137	57.71	n/a	57.71	77.2%		
17.03 - 12.03	18457	n/a	18457	59.16	n/a	59.16	77.7%		
12.03 - 7.03	19843	n/a	19843	60.60	n/a	60.60	78.1%		
7.03 - 2.03	21298	n/a	21298	62.05	n/a	62.05	78.6%		
2.03 - 0	21908	n/a	21908	62.63	n/a	62.63	78.7%		

Note: Section capacity checked using 5 degree increments.

Rating per TIA-222-H Section 15.5.

Monopole Base Plate Connection

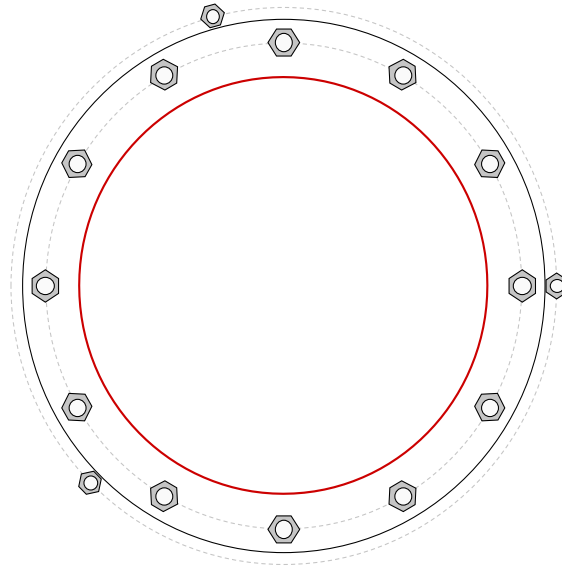


Site Info	
BU #	876366
Site Name	PINGERS FALLS /FALLS
Order #	538782, Rev.0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
I_{ar} (in)	See Custom Sheet

Applied Loads	
Moment (kip-ft)	3644.55
Axial Force (kips)	42.67
Shear Force (kips)	30.91

*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
-----------------------	------------------

Anchor Rod Data
GROUP 1: (12) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 62" BC
GROUP 2: (3) 1-3/4" ϕ bolts (A193 Gr. B7 N; $F_y=105$ ksi, $F_u=125$ ksi) on 71.09" BC

Base Plate Data
68" OD x 1.75" Plate (A871-60; $F_y=60$ ksi, $F_u=75$ ksi)

Stiffener Data
N/A

Pole Data
53" x 0.375" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary	<i>(units of kips, kip-in)</i>	
GROUP 1:		
$P_{u,c} = 208.22$	$\phi P_{n,c} = 268.39$	Stress Rating
$V_u = 2.58$	$\phi V_n = 120.77$	73.9%
$M_u = n/a$	$\phi M_n = n/a$	Pass
GROUP 2:		
$P_{u,c} = 133.45$	$\phi P_{n,c} = 227.3$	Stress Rating
$V_u = 0$	$\phi V_n = 102.28$	55.9%
$M_u = n/a$	$\phi M_n = n/a$	Pass
Base Plate Summary		
Max Stress (ksi):	56.15	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	99.0%	Pass

CCIplate

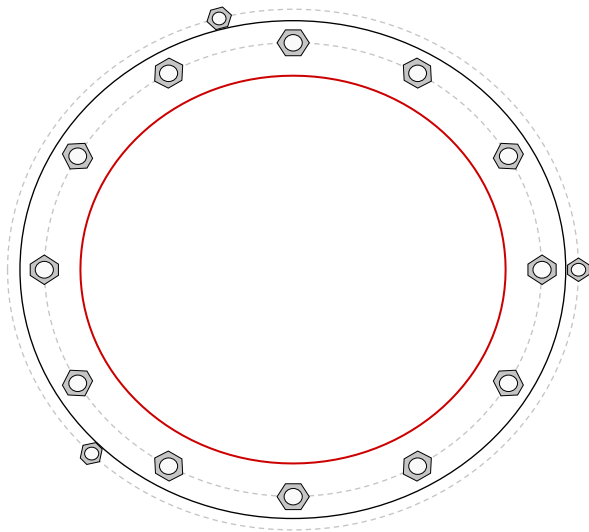
Elevation (ft) | 0 | (Base)

note: Bending interaction not considered when Grout Considered = "Yes"

Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending	Grout Considered	Apply at BARB Elevation	BARB CL Elevation (ft)
1	Yes	Yes	Yes	No	No	
2	No	No	No	No	No	

Custom Bolt Connection										
Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, n:	I_{br} (in):	Thread Type	Area Override, in ²	Tension Only
1	1	0	2.25	A615-75	62	0.5	1	N-Included		No
2	1	30	2.25	A615-75	62	0.5	1	N-Included		No
3	1	60	2.25	A615-75	62	0.5	1	N-Included		No
4	1	90	2.25	A615-75	62	0.5	1	N-Included		No
5	1	120	2.25	A615-75	62	0.5	1	N-Included		No
6	1	150	2.25	A615-75	62	0.5	1	N-Included		No
7	1	180	2.25	A615-75	62	0.5	1	N-Included		No
8	1	210	2.25	A615-75	62	0.5	1	N-Included		No
9	1	240	2.25	A615-75	62	0.5	1	N-Included		No
10	1	270	2.25	A615-75	62	0.5	1	N-Included		No
11	1	300	2.25	A615-75	62	0.5	1	N-Included		No
12	1	330	2.25	A615-75	62	0.5	1	N-Included		No
13	2	0	1.75	A193 Gr. B7	71.09	0.5	1	N-Included		No
14	2	105	1.75	A193 Gr. B7	71.09	0.5	1	N-Included		No
15	2	225	1.75	A193 Gr. B7	71.09	0.5	1	N-Included		No

Plot Graphic



PROJECT **147460.002.01 - WAPPINGERS FALLS/ PRESTON CIT, CT**

SUBJECT **Anchor Rod Bracket Analysis**

DATE **02/19/21**

TIA-222 Rev.

H

v4.6.1

Apply TIA-222-H Section 15.5?

Yes



B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Analysis Criteria	
Design/Analysis	Analysis
Load Type	Current Load
Current load	133.45 kips
AR Capacity	227.3 kips

Tower Type	Monopole
------------	----------

Manufacturers Tower Prop.	
Pole Thickness	0.375 in
Pole Grade	A572-65
Fy	65 ksi
Fu	80 ksi
Base Plate Gr.	A572-60
Fy	60 ksi
Fu	75 ksi

Post-Installed Adhesive AR Mod.	
ARB Type	Welded
Size	1.75 in
Grade	A193 Gr B7
Fy	105 ksi
Fu	125 ksi

Anchor Rod Bracket Analysis Checks		
Tube Bearing	34.0%	-
Tube Compression	51.0%	-
Gusset Shear	18.1%	-
Gusset Flexure	N/A	-
Welds	Gusset to Tower and BP	34.2% -
	Gusset to Tube	38.1% -
	Geometry	N/A
Tower Punching	26.7%	-
Tube Punching	10.1%	-
Utilization		51.0%

Bracket Properties		
Gusset	Pipe/Tube	Weld - Gusset to Pipe/Tube
Thickness	1 in	FEXX
Width at Tube	6.5 in	70 ksi
Height at Pole	30 in	Weld Type
Height at Tube	24 in	Double Fillet
Grade	A572-50	Fillet Size
Fy	50 ksi	5/16 in
Fu	65 ksi	
Weld - Gusset to Tower		Weld - Gusset to Base Plate
FEXX	70	FEXX
Weld Type	Double Fillet	70 ksi
Fillet Size	5/16	Weld Type
		CJP - Double Bevel
		Fillet Size
		1/4 in
		Bevel Depth
		1/4 in
		Gap
		0 in
		Notch (horiz)
		0.75 in
		Notch (vert)
		0.75 in
		Pipe/Tube Welded to Base/Footpad?
		Yes
		Fillet Size
		1/4 in

Pier and Pad Foundation



BU # :	876366
Site Name:	WAPPINGERS
App. Number:	538782, Rev.0

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	<input checked="" type="checkbox"/>
Block Foundation?:	<input type="checkbox"/>
Rectangular Pad?:	<input type="checkbox"/>

Superstructure Analysis Reactions		
Compression, P_{comp} :	42.68	kips
Base Shear, V_{u_comp} :	30.89	kips
Moment, M_u :	3644.55	ft-kips
Tower Height, H :	155	ft
BP Dist. Above Fdn, bp_{dist} :	3.25	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	283.76	30.89	10.4%	Pass
<i>Bearing Pressure (ksf)</i>	4.31	3.45	80.1%	Pass
<i>Overturning (kip*ft)</i>	4259.81	3869.15	90.8%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	3998.39	3783.56	90.1%	Pass
<i>Pier Compression (kip)</i>	31187.52	82.37	0.3%	Pass
<i>Pad Flexure (kip*ft)</i>	3732.05	1828.34	46.7%	Pass
<i>Pad Shear - 1-way (kips)</i>	667.68	311.07	44.4%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.190	0.000	0.0%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	3450.28	2270.13	62.7%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	7	ft
Ext. Above Grade, E :	1	ft
Pier Rebar Size, Sc :	8	
Pier Rebar Quantity, mc :	30	
Pier Tie/Spiral Size, St :	4	
Pier Tie/Spiral Quantity, mt :	5	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

*Rating per TIA-222-H Section 15.5

Soil Rating*:	90.8%
Structural Rating*:	90.1%

Pad Properties		
Depth, D :	6	ft
Pad Width, W_1 :	23	ft
Pad Thickness, T :	2.5	ft
Pad Rebar Size (Top dir.2), Sp_{top2} :	8	
Pad Rebar Quantity (Top dir. 2), mp_{top2} :	20	
Pad Rebar Size (Bottom dir. 2), Sp_2 :	8	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	43	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, F_y :	60	ksi
Concrete Compressive Strength, F'_c :	4	ksi
Dry Concrete Density, δ_c :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	125	pcf
Ultimate Net Bearing, Q_{net} :	5.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	34	degrees
SPT Blow Count, N_{blows} :		
Base Friction, μ :	0.6	
Neglected Depth, N :	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	6	ft

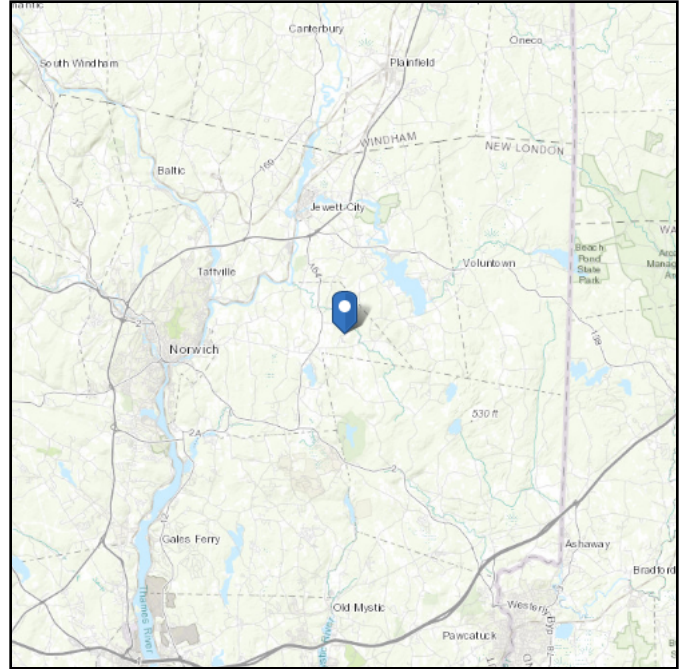
<--Toggle between Gross and Net

ASCE 7 Hazards Report

Address:
No Address at This
Location

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

Elevation: 290.25 ft (NAVD 88)
Latitude: 41.538183
Longitude: -71.951667

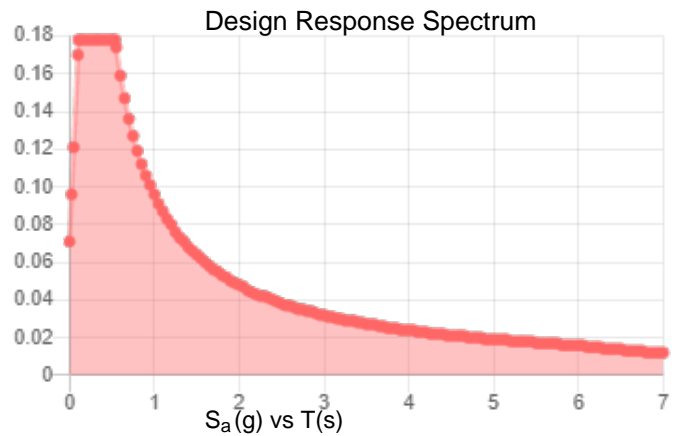
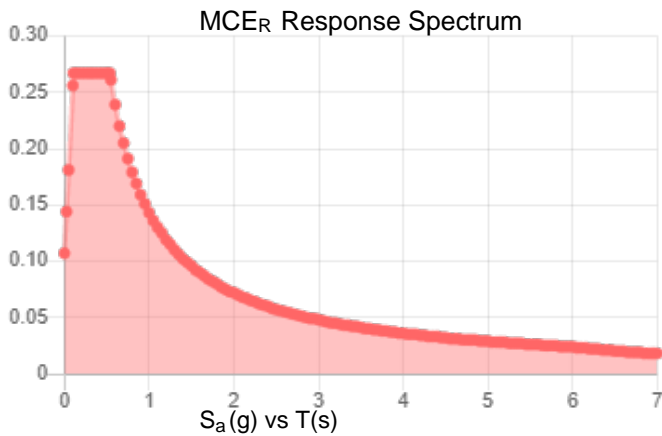


Site Soil Class: D - Stiff Soil

Results:

S_S :	0.167	S_{DS} :	0.178
S_1 :	0.06	S_{D1} :	0.096
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.084
S_{MS} :	0.267	PGA _M :	0.134
S_{M1} :	0.143	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Thu Feb 04 2021

Date Source:

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

Ice

Results:

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

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

Date Accessed: Thu Feb 04 2021

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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Exhibit E

Mount Analysis

Date: **January 31, 2021**

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
Infinigy Engineering, PLLC
1033 Watervliet Shaker Road
Albany, NY 12205
518-690-0790
structural@infinigy.com

Darcy Tarr
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6589

Subject: **Mount Analysis Report**

Carrier Designation: **Sprint PCS Retain**
Carrier Site Number: CTNL841A
Carrier Site Name: CTNL841A

Crown Castle Designation: **Crown Castle BU Number:** 876366
Crown Castle Site Name: WAPPINGERS FALLS / PRESTON CIT
Crown Castle JDE Job Number: 628847
Crown Castle Order Number: 538782 Rev. 0

Engineering Firm Designation: **Infinigy Engineering, PLLC Report Designation:** 1039-Z0001-B

Site Data: **101 Pierce Road, Preston, New London County, CT, 06365**
Latitude 41°32'17.46", Longitude -71°57'6.00"

Structure Information: **Tower Height & Type:** **155.0 ft Monopole**
Mount Elevation: **155.0 ft**
Mount Type: **10.0 ft Platform**

Dear Darcy Tarr,

Infinigy Engineering, PLLC is pleased to submit this "**Mount Analysis Report**" to determine the structural integrity of Sprint PCS's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

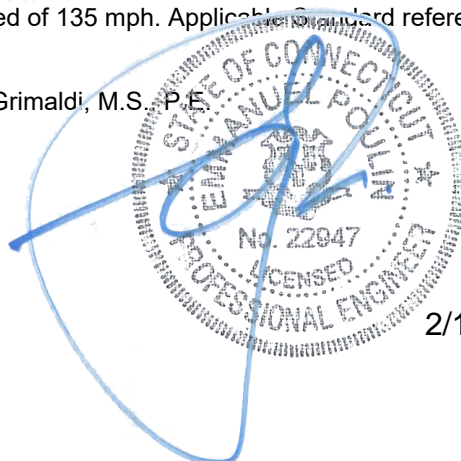
The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Platform **Sufficient - 92.1%**
***Sufficient upon completion of the changes listed in the 'Recommendations' section of this report.**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code and Appendix N based upon an ultimate 3-second gust wind speed of 135 mph. Applicant's standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Jacques S. Grimaldi, M.S., P.E.

Respectfully Submitted by:
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518-690-0790
structural@infinigy.com
CT PE License No. 22947



2/1/21

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1) INTRODUCTION

This is an existing 3 sector 10.0 ft Platform, designed by Engineered Endeavors Incorporated.

2) ANALYSIS CRITERIA

Building Code: 2015 IBC / 2018 Connecticut State Building Code and Appendix N
TIA-222 Revision: TIA-222-H
Risk Category: II
Ultimate Wind Speed: 135 mph
Exposure Category: C
Topographic Factor at Base: 1.0
Topographic Factor at Mount: 1.0
Ice Thickness: 1.5 in
Wind Speed with Ice: 50 mph
Seismic S_s: 0.167
Seismic S₁: 0.060
Live Loading Wind Speed: 30 mph
Man Live Load at Mid/End-Points: 250 lb
Man Live Load at Mount Pipes: 500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
155.0	157.0	3	Ericsson	AIR6449 B41 T-MOBILE	10.0 ft Platform
		3	RFS/Celwave	APX16DWV-16DWV-S-E-A20	
		3	RFS/Celwave	APXVAALL24 43-U-NA20 TMO	
		3	Ericsson	RADIO 4415 B66A	
		3	Ericsson	RADIO 4424 B25 TMO	
		3	Ericsson	RADIO 4449 B71 B85A_ T-MOBILE	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	Sprint PCS Application	538782 Rev. 0	CCI Sites
Loading Document	Sprint PCS	RFDS Version: 1	TSA
Tower Manufacturer Drawings	Engineered Endeavors Incorporated	2174297	CCI Sites

3.1) Analysis Method

RISA-3D (Version 19.0.1), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

Infinigy Mount Analysis Tool V2.1.4, a tool internally developed by Infinigy, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B "Software Input Calculations".

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision B).

3.2) Assumptions

- 1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
- 3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
- 4) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
- 5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
- 6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Infinigy Engineering, PLLC should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Platform, All Sectors)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2	Mount Pipe(s)	MP5	155.0	67.9	Pass
	Horizontal(s)	M1		90.2	Pass
	Handrail(s)	M62		78.2	Pass
	Support Channel(s)	M9		55.6	Pass
	Mount Connection(s)	-		3.6	Pass

Structure Rating (max from all components) =	90.2%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) See additional documentation in "Appendix D - Additional Calculations" for detailed mount connection calculations.

4.1) Recommendations

The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the structural modifications listed below must be completed.

1. Installation of proposed Site Pro 1 HRK12 handrail kit.
2. Installation of (1) 8' long pipe 2.0 STD per sector for proposed antennas.

No structural modifications are required at this time, provided that the above-listed changes are implemented.

APPENDIX A
WIRE FRAME AND RENDERED MODELS



Infinigy Engineering, PLLC

876366

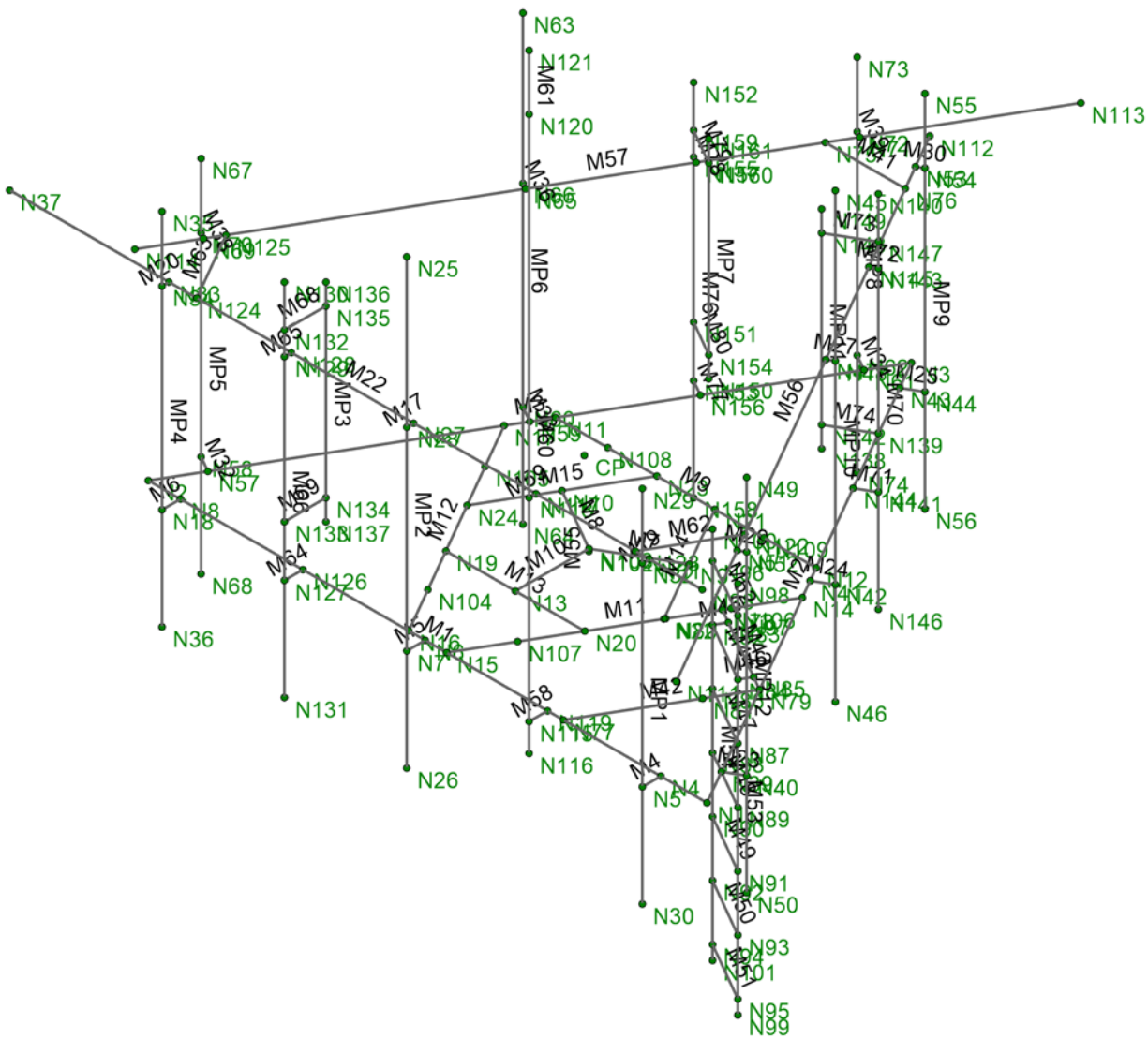
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JG

Jan 31, 2021

1039-Z0001-B

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Wireframe

JG

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APPENDIX B
SOFTWARE INPUT CALCULATIONS

Program Inputs

PROJECT INFORMATION		
Client:	Crown Castle	
Carrier:	Sprint PCS	
Engineer:	Jacques Grimaldi	

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	C	
Topo Factor Procedure:	Method 1, Category 1	
Site Class:	D - Stiff Soil	
Ground Elevation:	290.25	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Platform	
Num Sectors:	3	
Centerline AGL:	155.0	ft
Tower Height AGL:	155.0	ft

TOPOGRAPHIC DATA		
Topo Feature:	N/A	
Slope Distance:	N/A	ft
Crest Distance:	N/A	ft
Crest Height:	N/A	ft

FACTORS		
Directionality Fact. (K_d):	0.95	
Ground Ele. Factor (K_e):	0.99	*Rev H Only
Rooftop Speed-Up (K_s):	1.00	*Rev H Only
Topographic Factor (K_{zt}):	1.00	
Gust Effect Factor (G_h):	1.0	

CODE STANDARDS		
Building Code:	2015 IBC	
TIA Standard:	TIA-222-H	
ASCE Standard:	ASCE 7-10	

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	135	mph
Design Wind (V):	N/A	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	1.5	in
Flat Pressure:	121.75	psf
Round Pressure:	73.05	psf
Ice Wind Pressure:	10.02	psf

SEISMIC DATA		
Short-Period Accel. (S_s):	0.167	g
1-Second Accel. (S_1):	0.060	g
Short-Period Design (S_{DS}):	0.18	
1-Second Design (S_{D1}):	0.10	
Short-Period Coeff. (F_a):	1.60	
1-Second Coeff. (F_v):	2.40	
Amplification Factor (a_p):	1.00	
Response Mod. (R_p):	2.50	
Overstrength (Ω_o):	1.00	



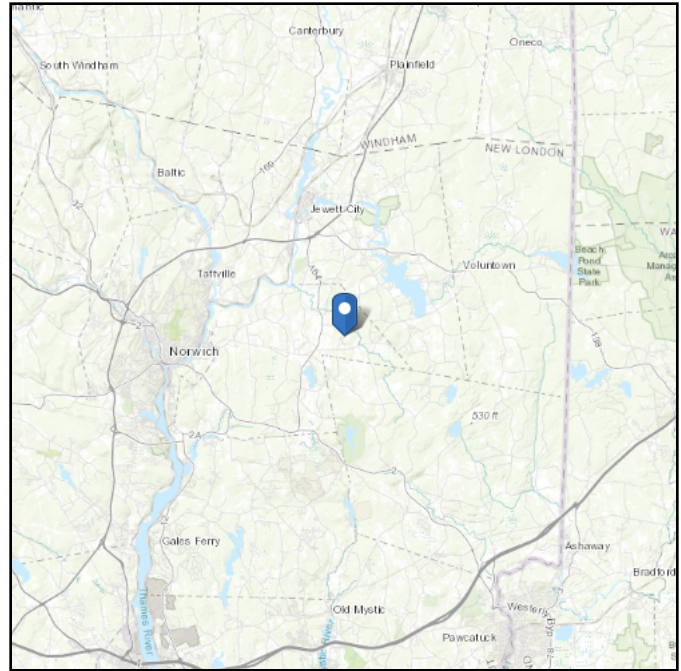
Infinigy Load Calculator V2.1.4

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 290.25 ft (NAVD 88)
Latitude: 41.538183
Longitude: -71.951667



Wind

Results:

Wind Speed:
10-year MRI
25-year MRI
50-year MRI
100-year MRI

135 Vmph per 2018 Connecticut State Building Code and Appendix N

79 Vmph
89 Vmph
98 Vmph
108 Vmph

Data Source:

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

Date Accessed:

Sun Jan 31 2021

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

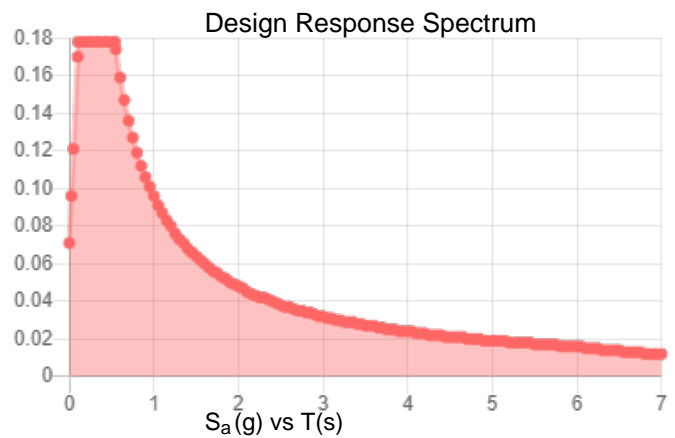
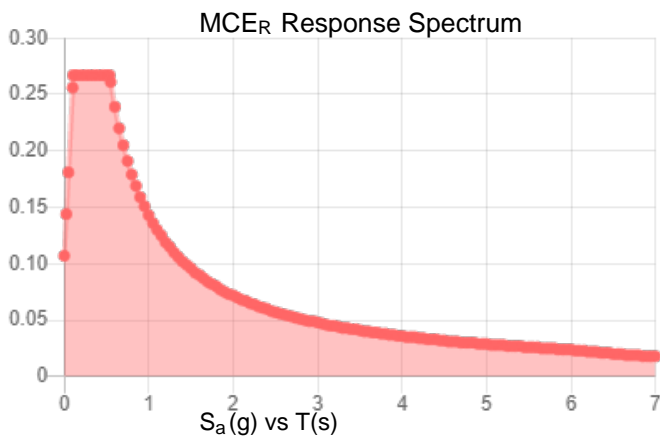
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Site Soil Class: D - Stiff Soil

Results:

S_S :	0.167	S_{DS} :	0.178
S_1 :	0.06	S_{D1} :	0.096
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.084
S_{MS} :	0.267	PGA _M :	0.134
S_{M1} :	0.143	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Sun Jan 31 2021

Date Source:

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

Ice

Results:

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

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

Date Accessed: Sun Jan 31 2021

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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APPENDIX C
SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M1	N2	N1	180	Horizontal Channel	Beam	Channel	A36 Gr.36	Typical
2	M2	N1	N3	180	Horizontal Channel	Beam	Channel	A36 Gr.36	Typical
3	M3	N2	N3		Horizontal Channel	Beam	Channel	A36 Gr.36	Typical
4	M4	N4	N5		RIGID	None	None	RIGID	Typical
5	M5	N6	N7		RIGID	None	None	RIGID	Typical
6	M6	N8	N18		RIGID	None	None	RIGID	Typical
7	M7	N103	N9		RIGID	None	None	RIGID	Typical
8	M8	N103	N10		RIGID	None	None	RIGID	Typical
9	M9	N11	N12		Channel Bracing	Beam	Channel	A36 Gr.36	Typical
10	M10	N103	N13		RIGID	None	None	RIGID	Typical
11	M11	N14	N15		Channel Bracing	Beam	Channel	A36 Gr.36	Typical
12	M12	N16	N17		Channel Bracing	Beam	Channel	A36 Gr.36	Typical
13	M13	N19	N20		RIGID	None	None	RIGID	Typical
14	M14	N21	N22		RIGID	None	None	RIGID	Typical
15	M15	N23	N24		RIGID	None	None	RIGID	Typical
16	MP2	N25	N26		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
17	M17	N27	N28		RIGID	None	None	RIGID	Typical
18	MP1	N29	N30		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
19	M19	N31	N32		RIGID	None	None	RIGID	Typical
20	M20	N33	N34		RIGID	None	None	RIGID	Typical
21	MP4	N35	N36		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
22	M22	N37	N38		Handrail	Beam	Pipe	A53 Gr.B	Typical
23	M23	N39	N40		RIGID	None	None	RIGID	Typical
24	M24	N41	N42		RIGID	None	None	RIGID	Typical
25	M25	N43	N44		RIGID	None	None	RIGID	Typical
26	MP10	N45	N46		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
27	M27	N47	N48		RIGID	None	None	RIGID	Typical
28	MP12	N49	N50		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
29	M29	N51	N52		RIGID	None	None	RIGID	Typical
30	M30	N53	N54		RIGID	None	None	RIGID	Typical
31	MP9	N55	N56		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
32	M32	N57	N58		RIGID	None	None	RIGID	Typical
33	M33	N59	N60		RIGID	None	None	RIGID	Typical
34	M34	N61	N62		RIGID	None	None	RIGID	Typical
35	MP6	N63	N64		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
36	M36	N65	N66		RIGID	None	None	RIGID	Typical
37	MP5	N67	N68		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
38	M38	N69	N70		RIGID	None	None	RIGID	Typical
39	M39	N71	N72		RIGID	None	None	RIGID	Typical
40	MP8	N73	N74		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
41	M41	N75	N76	180	Handrail Corner Angle	Beam	Single Angle	A36 Gr.36	Typical
42	M42	N77	N79		Channel Bracing	Beam	Channel	A36 Gr.36	Typical
43	M43	N78	N79	180	Channel Bracing	Beam	Channel	A36 Gr.36	Typical
44	M44	N82	N84		Ladder Rung	Beam	BAR	A992	Typical
45	M45	N82	N83		RIGID	None	None	RIGID	Typical
46	M46	N84	N85		RIGID	None	None	RIGID	Typical
47	M47	N86	N87		Ladder Rung	Beam	BAR	A992	Typical
48	M48	N88	N89		Ladder Rung	Beam	BAR	A992	Typical
49	M49	N90	N91		Ladder Rung	Beam	BAR	A992	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
50	M50	N92	N93		Ladder Rung	Beam	BAR	A992	Typical
51	M51	N94	N95		Ladder Rung	Beam	BAR	A992	Typical
52	M52	N96	N97		Ladder Rung	Beam	BAR	A992	Typical
53	M53	N98	N99	210	Ladder Rail	Column	Single Angle	A992	Typical
54	M54	N100	N101	30	Ladder Rail	Column	Single Angle	A992	Typical
55	M55	N102	N103		RIGID	None	None	RIGID	Typical
56	M56	N111	N112		Handrail	Beam	Pipe	A53 Gr.B	Typical
57	M57	N113	N114		Handrail	Beam	Pipe	A53 Gr.B	Typical
58	M58	N119	N115		RIGID	None	None	RIGID	Typical
59	M59	N117	N118		RIGID	None	None	RIGID	Typical
60	M60	N120	N116		LR Extension	Column	HSS Pipe	A53 Gr.B	Typical
61	M61	N121	N120		LR	Column	BAR	A36 Gr.36	Typical
62	M62	N122	N123	180	Handrail Corner Angle	Beam	Single Angle	A36 Gr.36	Typical
63	M63	N124	N125	180	Handrail Corner Angle	Beam	Single Angle	A36 Gr.36	Typical
64	M64	N126	N127		RIGID	None	None	RIGID	Typical
65	M65	N128	N129		RIGID	None	None	RIGID	Typical
66	M66	N130	N131		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
67	MP3	N136	N137		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
68	M68	N135	N132		RIGID	None	None	RIGID	Typical
69	M69	N134	N133		RIGID	None	None	RIGID	Typical
70	M70	N140	N146		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
71	M71	N144	N141		RIGID	None	None	RIGID	Typical
72	M72	N145	N143		RIGID	None	None	RIGID	Typical
73	M73	N148	N147		RIGID	None	None	RIGID	Typical
74	M74	N142	N139		RIGID	None	None	RIGID	Typical
75	MP11	N149	N138		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
76	M76	N152	N158		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
77	M77	N156	N153		RIGID	None	None	RIGID	Typical
78	M78	N157	N155		RIGID	None	None	RIGID	Typical
79	M79	N160	N159		RIGID	None	None	RIGID	Typical
80	M80	N154	N151		RIGID	None	None	RIGID	Typical
81	MP7	N161	N150		Mount Pipe	Column	Pipe	A53 Gr.B	Typical

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General Members				
2	RIGID		41	269.1	0
3	Total General		41	269.1	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	0.625 SR	1	12	1.044
7	A36 Gr.36	C5X9	8	585.3	438.147
8	A36 Gr.36	L2.5x2.5x3	3	52	13.276
9	A53 Gr.B	PIPE 2.0	18	1575	455.547
10	A53 Gr.B	PIPE 2.5	1	120	54.785
11	A992	0.75 SR	7	105	13.154
12	A992	1.75x1.75x3	2	162	28.603
13	Total HR Steel		40	2611.2	1004.555

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)
1	Self Weight	DL		-1			36		8
2	Wind Load AZI 0	WLZ					72		
3	Wind Load AZI 30	None					72		
4	Wind Load AZI 60	None					72		
5	Wind Load AZI 90	WLX					72		
6	Wind Load AZI 120	None					72		
7	Wind Load AZI 150	None					72		
8	Wind Load AZI 180	None					72		
9	Wind Load AZI 210	None					72		
10	Wind Load AZI 240	None					72		
11	Wind Load AZI 270	None					72		
12	Wind Load AZI 300	None					72		
13	Wind Load AZI 330	None					72		
14	Distr. Wind Load Z	WLZ						81	
15	Distr. Wind Load X	WLX						81	
16	Ice Weight	OL1					36	81	8
17	Ice Wind Load AZI 0	OL2					72		
18	Ice Wind Load AZI 30	None					72		
19	Ice Wind Load AZI 60	None					72		
20	Ice Wind Load AZI 90	OL3					72		
21	Ice Wind Load AZI 120	None					72		
22	Ice Wind Load AZI 150	None					72		
23	Ice Wind Load AZI 180	None					72		
24	Ice Wind Load AZI 210	None					72		
25	Ice Wind Load AZI 240	None					72		
26	Ice Wind Load AZI 270	None					72		
27	Ice Wind Load AZI 300	None					72		
28	Ice Wind Load AZI 330	None					72		
29	Distr. Ice Wind Load Z	OL2						81	
30	Distr. Ice Wind Load X	OL3						81	
31	Seismic Load Z	ELZ			-0.089		36		
32	Seismic Load X	ELX	-0.089				36		
33	Service Live Loads	LL				1			
34	Maintenance Load 1	LL				1			
35	Maintenance Load 2	LL				1			
36	Maintenance Load 3	LL				1			
37	Maintenance Load 4	LL				1			
38	Maintenance Load 5	LL				1			
39	Maintenance Load 6	LL				1			
40	Maintenance Load 7	LL				1			
41	Maintenance Load 8	LL				1			
42	Maintenance Load 9	LL				1			
43	Maintenance Load 10	LL				1			
44	Maintenance Load 11	LL				1			
45	Maintenance Load 12	LL				1			
46	BLC 1 Transient Area Loads	None						64	
47	BLC 16 Transient Area Loads	None						64	



Company : Infinigy Engineering, PLLC
 Designer : JG
 Job Number : 1039-Z0001-B
 Model Name : 876366

1/31/2021
 8:05:04 PM
 Checked By : _____

Load Combinations

	Description	Solve	P	Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor
1	1.4DL	Yes	Y	1	1.4								
2	1.2DL + 1WL AZI 0	Yes	Y	1	1.2	2	1	14	1	15			
3	1.2DL + 1WL AZI 30	Yes	Y	1	1.2	3	1	14	0.866	15	0.5		
4	1.2DL + 1WL AZI 60	Yes	Y	1	1.2	4	1	14	0.5	15	0.866		
5	1.2DL + 1WL AZI 90	Yes	Y	1	1.2	5	1	14		15	1		
6	1.2DL + 1WL AZI 120	Yes	Y	1	1.2	6	1	14	-0.5	15	0.866		
7	1.2DL + 1WL AZI 150	Yes	Y	1	1.2	7	1	14	-0.866	15	0.5		
8	1.2DL + 1WL AZI 180	Yes	Y	1	1.2	8	1	14	-1	15			
9	1.2DL + 1WL AZI 210	Yes	Y	1	1.2	9	1	14	-0.866	15	-0.5		
10	1.2DL + 1WL AZI 240	Yes	Y	1	1.2	10	1	14	-0.5	15	-0.866		
11	1.2DL + 1WL AZI 270	Yes	Y	1	1.2	11	1	14		15	-1		
12	1.2DL + 1WL AZI 300	Yes	Y	1	1.2	12	1	14	0.5	15	-0.866		
13	1.2DL + 1WL AZI 330	Yes	Y	1	1.2	13	1	14	0.866	15	-0.5		
14	0.9DL + 1WL AZI 0	Yes	Y	1	0.9	2	1	14	1	15			
15	0.9DL + 1WL AZI 30	Yes	Y	1	0.9	3	1	14	0.866	15	0.5		
16	0.9DL + 1WL AZI 60	Yes	Y	1	0.9	4	1	14	0.5	15	0.866		
17	0.9DL + 1WL AZI 90	Yes	Y	1	0.9	5	1	14		15	1		
18	0.9DL + 1WL AZI 120	Yes	Y	1	0.9	6	1	14	-0.5	15	0.866		
19	0.9DL + 1WL AZI 150	Yes	Y	1	0.9	7	1	14	-0.866	15	0.5		
20	0.9DL + 1WL AZI 180	Yes	Y	1	0.9	8	1	14	-1	15			
21	0.9DL + 1WL AZI 210	Yes	Y	1	0.9	9	1	14	-0.866	15	-0.5		
22	0.9DL + 1WL AZI 240	Yes	Y	1	0.9	10	1	14	-0.5	15	-0.866		
23	0.9DL + 1WL AZI 270	Yes	Y	1	0.9	11	1	14		15	-1		
24	0.9DL + 1WL AZI 300	Yes	Y	1	0.9	12	1	14	0.5	15	-0.866		
25	0.9DL + 1WL AZI 330	Yes	Y	1	0.9	13	1	14	0.866	15	-0.5		
26	1.2D + 1.0Di	Yes	Y	1	1.2	16	1						
27	1.2D + 1.0Di + 1.0Wi AZI 0	Yes	Y	1	1.2	16	1	17	1	29	1	30	
28	1.2D + 1.0Di + 1.0Wi AZI 30	Yes	Y	1	1.2	16	1	18	1	29	0.866	30	0.5
29	1.2D + 1.0Di + 1.0Wi AZI 60	Yes	Y	1	1.2	16	1	19	1	29	0.5	30	0.866
30	1.2D + 1.0Di + 1.0Wi AZI 90	Yes	Y	1	1.2	16	1	20	1	29		30	1
31	1.2D + 1.0Di + 1.0Wi AZI 120	Yes	Y	1	1.2	16	1	21	1	29	-0.5	30	0.866
32	1.2D + 1.0Di + 1.0Wi AZI 150	Yes	Y	1	1.2	16	1	22	1	29	-0.866	30	0.5
33	1.2D + 1.0Di + 1.0Wi AZI 180	Yes	Y	1	1.2	16	1	23	1	29	-1	30	
34	1.2D + 1.0Di + 1.0Wi AZI 210	Yes	Y	1	1.2	16	1	24	1	29	-0.866	30	-0.5
35	1.2D + 1.0Di + 1.0Wi AZI 240	Yes	Y	1	1.2	16	1	25	1	29	-0.5	30	-0.866
36	1.2D + 1.0Di + 1.0Wi AZI 270	Yes	Y	1	1.2	16	1	26	1	29		30	-1
37	1.2D + 1.0Di + 1.0Wi AZI 300	Yes	Y	1	1.2	16	1	27	1	29	0.5	30	-0.866
38	1.2D + 1.0Di + 1.0Wi AZI 330	Yes	Y	1	1.2	16	1	28	1	29	0.866	30	-0.5
39	(1.2 + 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	1.236	31	1	32					
40	(1.2 + 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	1.236	31	0.866	32	0.5				
41	(1.2 + 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	1.236	31	0.5	32	0.866				
42	(1.2 + 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	1.236	31		32	1				
43	(1.2 + 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	1.236	31	-0.5	32	0.866				
44	(1.2 + 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	1.236	31	-0.866	32	0.5				
45	(1.2 + 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	1.236	31	-1	32					
46	(1.2 + 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	1.236	31	-0.866	32	-0.5				
47	(1.2 + 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	1.236	31	-0.5	32	-0.866				
48	(1.2 + 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	1.236	31		32	-1				
49	(1.2 + 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	1.236	31	0.5	32	-0.866				

Load Combinations (Continued)

Description	Solve	PD	Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
50 (1.2 + 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	1.236	31	0.866	32	-0.5							
51 (0.9 - 0.2Sds)DL + 1.0E AZI 0	Yes	Y	1	0.864	31	1	32								
52 (0.9 - 0.2Sds)DL + 1.0E AZI 30	Yes	Y	1	0.864	31	0.866	32	0.5							
53 (0.9 - 0.2Sds)DL + 1.0E AZI 60	Yes	Y	1	0.864	31	0.5	32	0.866							
54 (0.9 - 0.2Sds)DL + 1.0E AZI 90	Yes	Y	1	0.864	31		32	1							
55 (0.9 - 0.2Sds)DL + 1.0E AZI 120	Yes	Y	1	0.864	31	-0.5	32	0.866							
56 (0.9 - 0.2Sds)DL + 1.0E AZI 150	Yes	Y	1	0.864	31	-0.866	32	0.5							
57 (0.9 - 0.2Sds)DL + 1.0E AZI 180	Yes	Y	1	0.864	31	-1	32								
58 (0.9 - 0.2Sds)DL + 1.0E AZI 210	Yes	Y	1	0.864	31	-0.866	32	-0.5							
59 (0.9 - 0.2Sds)DL + 1.0E AZI 240	Yes	Y	1	0.864	31	-0.5	32	-0.866							
60 (0.9 - 0.2Sds)DL + 1.0E AZI 270	Yes	Y	1	0.864	31		32	-1							
61 (0.9 - 0.2Sds)DL + 1.0E AZI 300	Yes	Y	1	0.864	31	0.5	32	-0.866							
62 (0.9 - 0.2Sds)DL + 1.0E AZI 330	Yes	Y	1	0.864	31	0.866	32	-0.5							
63 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 0	Yes	Y	1	1	2	0.198	14	0.198	15			33	1.5		
64 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 30	Yes	Y	1	1	3	0.198	14	0.171	15	0.099		33	1.5		
65 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 60	Yes	Y	1	1	4	0.198	14	0.099	15	0.171		33	1.5		
66 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 90	Yes	Y	1	1	5	0.198	14		15	0.198		33	1.5		
67 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 120	Yes	Y	1	1	6	0.198	14	-0.099	15	0.171		33	1.5		
68 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 150	Yes	Y	1	1	7	0.198	14	-0.171	15	0.099		33	1.5		
69 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 180	Yes	Y	1	1	8	0.198	14	-0.198	15			33	1.5		
70 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 210	Yes	Y	1	1	9	0.198	14	-0.171	15	-0.099		33	1.5		
71 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 240	Yes	Y	1	1	10	0.198	14	-0.099	15	-0.171		33	1.5		
72 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 270	Yes	Y	1	1	11	0.198	14		15	-0.198		33	1.5		
73 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 300	Yes	Y	1	1	12	0.198	14	0.099	15	-0.171		33	1.5		
74 1.0DL + 1.5LL + 1.0SWL (60 mph) AZI 330	Yes	Y	1	1	13	0.198	14	0.171	15	-0.099		33	1.5		
75 1.2DL + 1.5LL	Yes	Y	1	1.2	33	1.5									
76 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	34	1.5	2	0.049	14	0.049	15				
77 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	34	1.5	3	0.049	14	0.043	15	0.025			
78 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	34	1.5	4	0.049	14	0.025	15	0.043			
79 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	34	1.5	5	0.049	14		15	0.049			
80 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	34	1.5	6	0.049	14	-0.025	15	0.043			
81 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	34	1.5	7	0.049	14	-0.043	15	0.025			
82 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	34	1.5	8	0.049	14	-0.049	15				
83 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	34	1.5	9	0.049	14	-0.043	15	-0.025			
84 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	34	1.5	10	0.049	14	-0.025	15	-0.043			
85 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	34	1.5	11	0.049	14		15	-0.049			
86 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	34	1.5	12	0.049	14	0.025	15	-0.043			
87 1.2DL + 1.5LM-MP1 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	34	1.5	13	0.049	14	0.043	15	-0.025			
88 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	35	1.5	2	0.049	14	0.049	15				
89 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	35	1.5	3	0.049	14	0.043	15	0.025			
90 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	35	1.5	4	0.049	14	0.025	15	0.043			
91 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	35	1.5	5	0.049	14		15	0.049			
92 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	35	1.5	6	0.049	14	-0.025	15	0.043			
93 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	35	1.5	7	0.049	14	-0.043	15	0.025			
94 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	35	1.5	8	0.049	14	-0.049	15				
95 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	35	1.5	9	0.049	14	-0.043	15	-0.025			
96 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	35	1.5	10	0.049	14	-0.025	15	-0.043			
97 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	35	1.5	11	0.049	14		15	-0.049			
98 1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	35	1.5	12	0.049	14	0.025	15	-0.043			

Load Combinations (Continued)

	Description	Solve	PD	Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor
99	1.2DL + 1.5LM-MP2 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	35	1.5	13	0.049	14	0.043	15	-0.025
100	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	36	1.5	2	0.049	14	0.049	15	
101	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	36	1.5	3	0.049	14	0.043	15	0.025
102	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	36	1.5	4	0.049	14	0.025	15	0.043
103	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	36	1.5	5	0.049	14		15	0.049
104	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	36	1.5	6	0.049	14	-0.025	15	0.043
105	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	36	1.5	7	0.049	14	-0.043	15	0.025
106	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	36	1.5	8	0.049	14	-0.049	15	
107	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	36	1.5	9	0.049	14	-0.043	15	-0.025
108	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	36	1.5	10	0.049	14	-0.025	15	-0.043
109	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	36	1.5	11	0.049	14		15	-0.049
110	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	36	1.5	12	0.049	14	0.025	15	-0.043
111	1.2DL + 1.5LM-MP3 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	36	1.5	13	0.049	14	0.043	15	-0.025
112	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	37	1.5	2	0.049	14	0.049	15	
113	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	37	1.5	3	0.049	14	0.043	15	0.025
114	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	37	1.5	4	0.049	14	0.025	15	0.043
115	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	37	1.5	5	0.049	14		15	0.049
116	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	37	1.5	6	0.049	14	-0.025	15	0.043
117	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	37	1.5	7	0.049	14	-0.043	15	0.025
118	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	37	1.5	8	0.049	14	-0.049	15	
119	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	37	1.5	9	0.049	14	-0.043	15	-0.025
120	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	37	1.5	10	0.049	14	-0.025	15	-0.043
121	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	37	1.5	11	0.049	14		15	-0.049
122	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	37	1.5	12	0.049	14	0.025	15	-0.043
123	1.2DL + 1.5LM-MP4 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	37	1.5	13	0.049	14	0.043	15	-0.025
124	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	38	1.5	2	0.049	14	0.049	15	
125	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	38	1.5	3	0.049	14	0.043	15	0.025
126	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	38	1.5	4	0.049	14	0.025	15	0.043
127	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	38	1.5	5	0.049	14		15	0.049
128	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	38	1.5	6	0.049	14	-0.025	15	0.043
129	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	38	1.5	7	0.049	14	-0.043	15	0.025
130	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	38	1.5	8	0.049	14	-0.049	15	
131	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	38	1.5	9	0.049	14	-0.043	15	-0.025
132	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	38	1.5	10	0.049	14	-0.025	15	-0.043
133	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	38	1.5	11	0.049	14		15	-0.049
134	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	38	1.5	12	0.049	14	0.025	15	-0.043
135	1.2DL + 1.5LM-MP5 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	38	1.5	13	0.049	14	0.043	15	-0.025
136	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	39	1.5	2	0.049	14	0.049	15	
137	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	39	1.5	3	0.049	14	0.043	15	0.025
138	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	39	1.5	4	0.049	14	0.025	15	0.043
139	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	39	1.5	5	0.049	14		15	0.049
140	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	39	1.5	6	0.049	14	-0.025	15	0.043
141	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	39	1.5	7	0.049	14	-0.043	15	0.025
142	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	39	1.5	8	0.049	14	-0.049	15	
143	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	39	1.5	9	0.049	14	-0.043	15	-0.025
144	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	39	1.5	10	0.049	14	-0.025	15	-0.043
145	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	39	1.5	11	0.049	14		15	-0.049
146	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	39	1.5	12	0.049	14	0.025	15	-0.043
147	1.2DL + 1.5LM-MP6 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	39	1.5	13	0.049	14	0.043	15	-0.025



Load Combinations (Continued)

Description		Solve	PDelta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor
148	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	40	1.5	2	0.049	14	0.049	15	
149	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	40	1.5	3	0.049	14	0.043	15	0.025
150	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	40	1.5	4	0.049	14	0.025	15	0.043
151	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	40	1.5	5	0.049	14		15	0.049
152	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	40	1.5	6	0.049	14	-0.025	15	0.043
153	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	40	1.5	7	0.049	14	-0.043	15	0.025
154	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	40	1.5	8	0.049	14	-0.049	15	
155	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	40	1.5	9	0.049	14	-0.043	15	-0.025
156	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	40	1.5	10	0.049	14	-0.025	15	-0.043
157	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	40	1.5	11	0.049	14		15	-0.049
158	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	40	1.5	12	0.049	14	0.025	15	-0.043
159	1.2DL + 1.5LM-MP7 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	40	1.5	13	0.049	14	0.043	15	-0.025
160	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	41	1.5	2	0.049	14	0.049	15	
161	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	41	1.5	3	0.049	14	0.043	15	0.025
162	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	41	1.5	4	0.049	14	0.025	15	0.043
163	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	41	1.5	5	0.049	14		15	0.049
164	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	41	1.5	6	0.049	14	-0.025	15	0.043
165	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	41	1.5	7	0.049	14	-0.043	15	0.025
166	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	41	1.5	8	0.049	14	-0.049	15	
167	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	41	1.5	9	0.049	14	-0.043	15	-0.025
168	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	41	1.5	10	0.049	14	-0.025	15	-0.043
169	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	41	1.5	11	0.049	14		15	-0.049
170	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	41	1.5	12	0.049	14	0.025	15	-0.043
171	1.2DL + 1.5LM-MP8 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	41	1.5	13	0.049	14	0.043	15	-0.025
172	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	42	1.5	2	0.049	14	0.049	15	
173	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	42	1.5	3	0.049	14	0.043	15	0.025
174	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	42	1.5	4	0.049	14	0.025	15	0.043
175	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	42	1.5	5	0.049	14		15	0.049
176	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	42	1.5	6	0.049	14	-0.025	15	0.043
177	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	42	1.5	7	0.049	14	-0.043	15	0.025
178	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	42	1.5	8	0.049	14	-0.049	15	
179	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	42	1.5	9	0.049	14	-0.043	15	-0.025
180	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	42	1.5	10	0.049	14	-0.025	15	-0.043
181	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	42	1.5	11	0.049	14		15	-0.049
182	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	42	1.5	12	0.049	14	0.025	15	-0.043
183	1.2DL + 1.5LM-MP9 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	42	1.5	13	0.049	14	0.043	15	-0.025
184	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	43	1.5	2	0.049	14	0.049	15	
185	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	43	1.5	3	0.049	14	0.043	15	0.025
186	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	43	1.5	4	0.049	14	0.025	15	0.043
187	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	43	1.5	5	0.049	14		15	0.049
188	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	43	1.5	6	0.049	14	-0.025	15	0.043
189	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	43	1.5	7	0.049	14	-0.043	15	0.025
190	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	43	1.5	8	0.049	14	-0.049	15	
191	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	43	1.5	9	0.049	14	-0.043	15	-0.025
192	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	43	1.5	10	0.049	14	-0.025	15	-0.043
193	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	43	1.5	11	0.049	14		15	-0.049
194	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	43	1.5	12	0.049	14	0.025	15	-0.043
195	1.2DL + 1.5LM-MP10 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	43	1.5	13	0.049	14	0.043	15	-0.025
196	1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	44	1.5	2	0.049	14	0.049	15	



Company : Infinigy Engineering, PLLC
 Designer : JG
 Job Number : 1039-Z0001-B
 Model Name : 876366

1/31/2021
 8:05:04 PM
 Checked By : _____

Load Combinations (Continued)

Description	Solve	PD	Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
197 1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	44	1.5	3	0.049	14	0.043	15	0.025	
198 1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	44	1.5	4	0.049	14	0.025	15	0.043	
199 1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	44	1.5	5	0.049	14		15	0.049	
200 1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	44	1.5	6	0.049	14	-0.025	15	0.043	
201 1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	44	1.5	7	0.049	14	-0.043	15	0.025	
202 1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	44	1.5	8	0.049	14	-0.049	15		
203 1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	44	1.5	9	0.049	14	-0.043	15	-0.025	
204 1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	44	1.5	10	0.049	14	-0.025	15	-0.043	
205 1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	44	1.5	11	0.049	14		15	-0.049	
206 1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	44	1.5	12	0.049	14	0.025	15	-0.043	
207 1.2DL + 1.5LM-MP11 + 1SWL (30 mph) AZI 330	Yes	Y	1	1.2	44	1.5	13	0.049	14	0.043	15	-0.025	
208 1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 0	Yes	Y	1	1.2	45	1.5	2	0.049	14	0.049	15		
209 1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 30	Yes	Y	1	1.2	45	1.5	3	0.049	14	0.043	15	0.025	
210 1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 60	Yes	Y	1	1.2	45	1.5	4	0.049	14	0.025	15	0.043	
211 1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 90	Yes	Y	1	1.2	45	1.5	5	0.049	14		15	0.049	
212 1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 120	Yes	Y	1	1.2	45	1.5	6	0.049	14	-0.025	15	0.043	
213 1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 150	Yes	Y	1	1.2	45	1.5	7	0.049	14	-0.043	15	0.025	
214 1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 180	Yes	Y	1	1.2	45	1.5	8	0.049	14	-0.049	15		
215 1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 210	Yes	Y	1	1.2	45	1.5	9	0.049	14	-0.043	15	-0.025	
216 1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 240	Yes	Y	1	1.2	45	1.5	10	0.049	14	-0.025	15	-0.043	
217 1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 270	Yes	Y	1	1.2	45	1.5	11	0.049	14		15	-0.049	
218 1.2DL + 1.5LM-MP12 + 1SWL (30 mph) AZI 300	Yes	Y	1	1.2	45	1.5	12	0.049	14	0.025	15	-0.043	

Envelope Node Reactions

Node Label	X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1 N102 max	7099.318	17	8758.411	36	7352.883	14	14017.093	2	4656.959	23	13057.349	23
2 min	-7099.326	11	2367.79	54	-7352.885	8	-12936.563	20	-4657.429	17	-13370.512	5
3 Totals: max	7099.318	17	8758.411	36	7352.883	14						
4 min	-7099.326	11	2367.79	54	-7352.885	8						

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1 M62	L2.5x2.5x3	0.782	17.321	13	0.145	0	y	13	27133.879	29192.4	872.574	1971.83	1.5	H2-1
2 M63	L2.5x2.5x3	0.739	0	3	0.149	17.321	y	3	27133.879	29192.4	872.574	1971.83	1.5	H2-1
3 MP5	PIPE 2.0	0.679	55.25	2	0.182	55.25	3	19360.206	32130	1871.625	1871.625	2.633	H1-1b	
4 M41	L2.5x2.5x3	0.659	17.321	5	0.152	0	y	5	27133.879	29192.4	872.574	1971.83	1.5	H2-1
5 MP12	PIPE 2.0	0.628	55.25	2	0.171	55.25	13	19360.206	32130	1871.625	1871.625	2.638	H1-1b	
6 M76	PIPE 2.0	0.621	55.25	6	0.272	55.25	5	19360.206	32130	1871.625	1871.625	2.339	H1-1b	
7 M70	PIPE 2.0	0.612	55.25	10	0.261	55.25	11	19360.206	32130	1871.625	1871.625	2.405	H1-1b	
8 MP6	PIPE 2.0	0.589	74	8	0.137	74	13	14916.096	32130	1871.625	1871.625	2.506	H1-1b	
9 M2	C5X9	0.581	56.719	13	0.68	64.281	z	5	9628.39	85536	1909.122	11853	1.554	H1-1b
10 MP10	PIPE 2.0	0.578	74	8	0.126	74	4	14916.096	32130	1871.625	1871.625	2.439	H1-1b	
11 M57	PIPE 2.0	0.577	135.938	3	0.329	60.938	5	6295.422	32130	1871.625	1871.625	3	H1-1b	
12 M9	C5X9	0.556	34.674	2	0.166	34.674	y	2	42098.084	85536	1909.122	11853	1.97	H1-1b
13 M11	C5X9	0.542	21.744	10	0.265	21.744	y	10	42098.084	85536	1909.122	11853	1.993	H1-1b
14 M3	C5X9	0.534	56.719	3	0.656	56.719	z	3	9628.39	85536	1909.122	11853	1.603	H1-1b
15 M1	C5X9	0.534	0	2	0.921	86.969	y	2	9628.39	85536	1909.122	11459.875	1.37	H1-1b
16 MP2	PIPE 2.0	0.53	32	8	0.095	74	4	14916.096	32130	1871.625	1871.625	2.032	H1-1b	

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

Member	Shape	Code Check	LOC[in]	LC	Shear Check	LOC[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
17	M56	PIPE 2.0	0.523	114.063	11	0.312	134.375	5	6295.422	32130	1871.625	1871.625	2.578	H3-6
18	M12	C5X9	0.506	34.674	6	0.139	21.744	y	642098.084	85536	1909.122	11853	1.955	H1-1b
19	M22	PIPE 2.0	0.504	87.5	8	0.328	134.375	8	6295.422	32130	1871.625	1871.625	1.797	H3-6
20	M66	PIPE 2.0	0.499	55.25	10	0.256	55.25	9	19360.206	32130	1871.625	1871.625	2.708	H1-1b
21	MP8	PIPE 2.0	0.499	55.25	6	0.17	55.25	5	19360.206	32130	1871.625	1871.625	2.399	H1-1b
22	MP9	PIPE 2.0	0.474	55.25	10	0.163	55.25	11	19360.206	32130	1871.625	1871.625	2.252	H1-1b
23	MP4	PIPE 2.0	0.407	55.25	9	0.145	55.25	9	19360.206	32130	1871.625	1871.625	2.458	H1-1b
24	M60	PIPE 2.5	0.385	113.75	7	0.161	113.75	8	22373.407	50715	3596.25	3596.25	3	H1-1b
25	MP1	PIPE 2.0	0.356	55.25	7	0.163	55.25	7	19360.206	32130	1871.625	1871.625	2.297	H1-1b
26	MP7	PIPE 2.0	0.213	4.688	5	0.087	4.688	10	27144.736	32130	1871.625	1871.625	1.502	H1-1b
27	MP11	PIPE 2.0	0.211	4.688	11	0.081	4.688	6	27144.736	32130	1871.625	1871.625	1.509	H1-1b
28	MP3	PIPE 2.0	0.194	4.688	9	0.081	4.688	8	27144.736	32130	1871.625	1871.625	1.812	H1-1b
29	M43	C5X9	0.171	0	11	0.048	3.427	z	1276847.709	85536	1909.122	11853	2.276	H1-1b
30	M42	C5X9	0.122	0	13	0.008	19.435	y	1268963.215	85536	1909.122	11853	1.453	H1-1b
31	M54	1.75x1.75x3	0.074	18.563	14	0.006	29.531	y	112528.639	28019.52	576.505	937.667	1.395	H2-1
32	M53	1.75x1.75x3	0.067	18.563	20	0.004	17.719	z	122528.639	28019.52	576.505	963.55	1.5	H2-1
33	M44	0.75 SR	0.029	0	4	0.012	0	11	12450.781	19880.391	248.505	248.505	2.535	H1-1b*
34	M48	0.75 SR	0.027	0	9	0.005	0	11	12450.781	19880.391	248.505	248.505	2.273	H1-1b
35	M47	0.75 SR	0.025	0	9	0.008	0	11	12450.781	19880.391	248.505	248.505	2.334	H1-1b
36	M49	0.75 SR	0.024	0	9	0.004	0	11	12450.781	19880.391	248.505	248.505	2.288	H1-1b
37	M61	0.625 SR	0.019	12	2	0	12	2	7286.892	9940.196	103.544	103.544	1.667	H1-1b
38	M50	0.75 SR	0.018	0	9	0.003	0	11	12450.781	19880.391	248.505	248.505	2.291	H1-1b
39	M51	0.75 SR	0.013	0	9	0.003	0	11	12450.781	19880.391	248.505	248.505	2.288	H1-1b
40	M52	0.75 SR	0.009	0	27	0.009	0	11	12450.781	19880.391	248.505	248.505	2.366	H1-1b

APPENDIX D
ADDITIONAL CALCUATIONS

Bolt Calculation Tool, V1.4

PROJECT DATA	
Site Name:	WAPPINGERS FALLS / PRESTON C
Site Number:	876366
Job Code:	1039-Z0001-B
Connection Description:	Platform to Tower

APPLIED LOADS		
Bolt Tension:	1944.17	lbs
Bolt Shear:	636.01	lbs

BOLT PROPERTIES		
Bolt Type:	Bolt	-
Bolt Diameter:	1	in
Bolt Grade:	A325	-
# of Bolts:	12	-
Threads Excluded?	No	-

BOLT CHECK		
Tensile Strength	54516.96	
Shear Strength	31808.63	
Tensile Usage	3.6%	
Shear Usage	2.0%	
Interaction Check	0.00	≤1.05
Result	Pass	

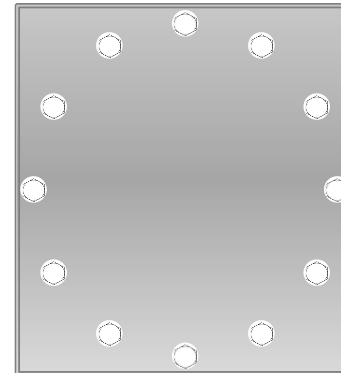


Exhibit F

Power Density/RF Emissions Report

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

T-Mobile Existing Facility

Site ID: CTNL841A

101 Pierce Road
Preston, Connecticut 06365

March 24, 2021

EBI Project Number: 6221001371

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	18.07%

March 24, 2021

T-Mobile

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

Emissions Analysis for Site: CTNL841A

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **101 Pierce Road in Preston, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is $1000 \mu\text{W}/\text{cm}^2$. 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 101 Pierce Road in Preston, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower. For power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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

- 1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.
- 3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

- 6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 7) 1 LTE channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.
- 8) 1 NR channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.
- 9) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 10) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 11) The antennas used in this modeling are the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

- 12) The antenna mounting height centerline of the proposed antennas is 157 feet above ground level (AGL).
- 13) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 14) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	157 feet	Height (AGL):	157 feet	Height (AGL):	157 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna AI MPE %:	0.74%	Antenna BI MPE %:	0.74%	Antenna CI MPE %:	0.74%
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd
Height (AGL):	157 feet	Height (AGL):	157 feet	Height (AGL):	157 feet
Channel Count:	11	Channel Count:	11	Channel Count:	11
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	12,569.87	ERP (W):	12,569.87	ERP (W):	12,569.87
Antenna A2 MPE %:	2.89%	Antenna B2 MPE %:	2.89%	Antenna C2 MPE %:	2.89%
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd
Height (AGL):	157 feet	Height (AGL):	157 feet	Height (AGL):	157 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	12,888.76	ERP (W):	12,888.76	ERP (W):	12,888.76
Antenna A3 MPE %:	2.03%	Antenna B3 MPE %:	2.03%	Antenna C3 MPE %:	2.03%

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	5.65%
AT&T	3.54%
Verizon	6.22%
Sprint	2.66%
Site Total MPE % :	18.07%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	5.65%
T-Mobile Sector B Total:	5.65%
T-Mobile Sector C Total:	5.65%
Site Total MPE % :	18.07%

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 ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 2100 MHz LTE	2	2334.27	157.0	7.36	2100 MHz LTE	1000	0.74%
T-Mobile 600 MHz LTE	2	591.73	157.0	1.87	600 MHz LTE	400	0.47%
T-Mobile 600 MHz NR	1	1577.94	157.0	2.49	600 MHz NR	400	0.62%
T-Mobile 700 MHz LTE	2	695.22	157.0	2.19	700 MHz LTE	467	0.47%
T-Mobile 1900 MHz GSM	4	1052.26	157.0	6.64	1900 MHz GSM	1000	0.66%
T-Mobile 1900 MHz LTE	2	2104.51	157.0	6.64	1900 MHz LTE	1000	0.66%
T-Mobile 2500 MHz LTE	1	6444.38	157.0	10.16	2500 MHz LTE	1000	1.02%
T-Mobile 2500 MHz NR	1	6444.38	157.0	10.16	2500 MHz NR	1000	1.02%
						Total:	5.65%

• 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:	5.65%
Sector B:	5.65%
Sector C:	5.65%
T-Mobile Maximum MPE % (Sector A):	5.65%
Site Total:	18.07%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **18.07%** 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.