



Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

June 17, 2020

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

RE: **Notice of Exempt Modification for T-Mobile:
876319 - T-Mobile Site ID: CTNH312
280 Elm Street, Naugatuck, CT 06770
Latitude: 41° 28' 52.54" / Longitude: -73° 3' 11.67"**

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 120-foot mount on the existing 150-foot Monopole Tower, located at 280 Elm Street, Naugatuck, CT. The tower is owned by Crown Castle and the property is owned by Lanxess Solutions US Inc. T-Mobile now intends to replace three (3) existing antennas with three (3) new 1900/2100 MHz antennas and three (3) new 600/700 MHz antennas. The new antennas will be installed at the 120-ft level of the tower. T-Mobile is also proposing tower mount modifications, as shown on the enclosed mount analysis.

Planned Modifications:

Tower:

Remove:
(5) 1 5/8" Coax

Remove and Replace:
(3) LNX 6515DS-A1M Antenna (**REMOVE**) - (3) RFS-APXVAARR24_43-U-NA20 Antenna 600/700 MHz (**REPLACE**)

(3) RRUS11 B12 (**REMOVE**) – (3) Radio 4449 B71/B12 (**REPLACE**)

Existing to Remain:
(6) 1 5/8" Coax
(2) Fiber line
(3) AIR32 KRD901146-1_B66A_B2A Antenna 1900/2100 MHz
(3) AIR21 KRC118023-1_B2A_B4P Antenna 1900/2100 MHz
(3) TMA

The facility was approved by the Naugatuck Zoning Commission on September 17, 1997.

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 Mr. N. Warren Hess, Mayor for the Borough of Naugatuck, Lori Rotella, Town Planner, Crown Castle as the tower owner, and Lanxess Solutions US Inc., 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.
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). Please send approval/rejection letter to Attn: Anne Marie Zsamba.

Sincerely,

Anne Marie Zsamba
Site Acquisition Specialist
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
(201) 236-9224
AnneMarie.Zsamba@crowncastle.com

Attachments

cc:

N. Warren Hess III, Mayor (*via email only to nwhess@naugatuck-ct.gov*)
Borough of Naugatuck
229 Church Street, 4th Floor
Naugatuck, CT 06770
203.720.7009

Lori Rotella, Town Planner (*via email only to LRotella@naugatuck-ct.gov*)
Borough of Naugatuck
229 Church Street, 2nd Floor

Melanie A. Bachman

Page 3

Naugatuck, CT 06770
203.720.7009

Lanxess Solutions US Inc.
2 Armstrong Road
Shelton, CT 06484

From: [Zsamba, Anne Marie](#)
To: LRotella@naugatuck-ct.gov
Subject: 280 Elm Street - Notice of Exempt Modification Application
Date: Tuesday, May 26, 2020 11:15:00 AM
Attachments: [EM T Mobile 280 Elm Street Naugatuck 876319 CTNH312 notice copy.pdf](#)

Dear Ms. Rotella:

Attached please find T-Mobile's exempt modification application that is being submitted to the Connecticut Siting Council.

In light of the present circumstances with Covid-19, The Council has advised that electronic notification of this filing is acceptable. If you could kindly confirm receipt. Thank you.

Best,
Anne Marie Zsamba

ANNE MARIE ZSAMBA
Site Acquisition Specialist
T: (201) 236-9224
M: (518) 350-3639
F: (724) 416-6112

CROWN CASTLE
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
CrownCastle.com

From: [Zsamba, Anne Marie](#)
To: nwhess@naugatuck-ct.gov
Subject: 280 Elm Street - Notice of Exempt Modification Application
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Site Acquisition Specialist
T: (201) 236-9224
M: (518) 350-3639
F: (724) 416-6112

CROWN CASTLE
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
CrownCastle.com

ORIGIN ID: SCHA (518) 350-3639
ANNE MARIE ZSAMBA
CROWN CASTLE
21 HEATHER DRIVE
GANSEVOORT, NY 12831
UNITED STATES US

SHIP DATE: 26MAY20
ACTWGT: 1.50 LB
CAD: 104924194IN/ET4220

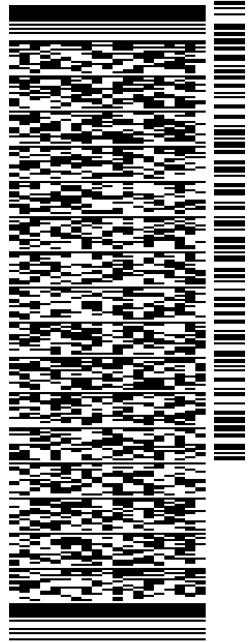
BILL SENDER

TO LANXESS SOLUTIONS US INC.

2 ARMSTRONG ROAD

SHELLTON CT 06484

(201) 236-9224 REF: 1734.7890
INV: DEPT:
PO:

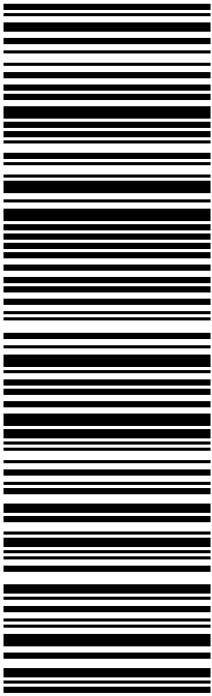


J201120042401uv

56BJ32925/FE4A

TRK# 7705 4350 6324 WED - 27 MAY 3:00P
#0201 STANDARD OVERNIGHT

EB CIVA 06484
CT-US BDL



After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Exhibit A

Original Facility Approval

**HARRIS
BEACH &
WILCOX**

A LIMITED LIABILITY PARTNERSHIP

ATTORNEYS AT LAW

147 NORTH BROAD STREET
P.O. BOX 112
MILFORD, CONNECTICUT 06460-0112
(203) 877-6000
(203) 878-9800 (Fax)

MEMORANDUM

DATE: September 18, 1997
TO: Christine Rosenthal
FROM: John W. Knuff, Esq.
RE: Naugatuck; Site No. 035
CC: Steve Paisner
Steve Kotfila
Scott Chasse
Steve Crotty

Pete Gardell and I appeared before the Naugatuck Zoning Commission to present Sprint's application for a Special Permit and Site Plan review. The commission closed the public hearing and voted 4-1 to approve the application.

I will record the Special Permit as soon as I receive it and a building application can be submitted.

COPENHAGEN
KERTHAMBOND
AFFILIATES
LIVORNO
LONDON

PARIS
OSLO

WASHINGTON DC
MILFORD, CT
NACHTENBACH NJ

ALBANY
BUFFALO

NEW YORK
ITHACA
NEW YORK CITY

ROCHESTER
SYRACUSE

Exhibit B

Property Card



Town of Naugatuck, CT

Property Listing Report

Map Block Lot

5.5-20W20

Building # 1

PID 128902

Account

068-7770

Property Information

Property Location	0 ELM ST
Owner	LANXESS SOLUTIONS US INC
Co-Owner	
Mailing Address	2 ARMSTRONG RD SHELTON CT 06484
Land Use	4400 VACANT IND
Land Class	I
Zoning Code	
Census Tract	

Neighborhood	J
Acreage	86.56
Utilities	
Lot Setting/Desc	
Book / Page	1017/0532
Additional Info	

Photo



Sketch



Primary Construction Details

Year Built	0
Building Desc.	VACANT IND
Building Style	UNKNOWN
Building Grade	
Stories	
Occupancy	
Exterior Walls	
Exterior Walls 2	NA
Roof Style	
Roof Cover	
Interior Walls	
Interior Walls 2	NA
Interior Floors 1	
Interior Floors 2	

Heating Fuel	
Heating Type	
AC Type	
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Total Rooms	0
Bath Style	NA
Kitchen Style	NA
Fin Bsmt Area	
Fin Bsmt Quality	
Bsmt Gar	0
Fireplaces	0

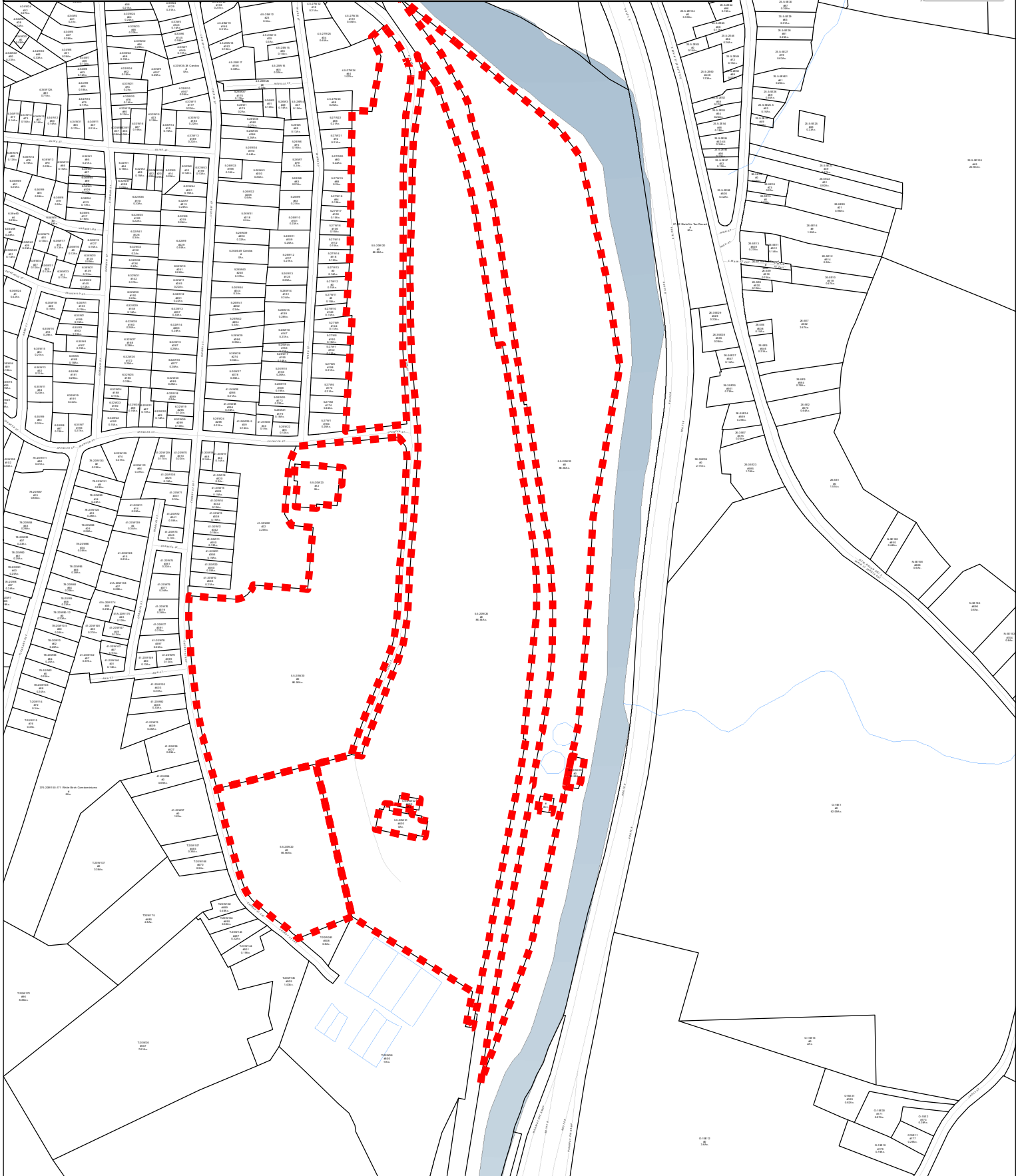
(*Industrial / Commercial Details)

Building Use	Vacant
Building Condition	
Sprinkler %	NA
Heat / AC	NA
Frame Type	NA
Baths / Plumbing	NA
Ceiling / Wall	NA
Rooms / Prtns	NA
Wall Height	NA
First Floor Use	NA
Foundation	NA

Borough of Naugatuck, Connecticut - Assessment Parcel Map

Parcel Account Number: 068-7770

Address: 0 ELM ST



0 130 260 390 520 Feet

Disclaimer: This map is for informational purposes only.
All information is subject to verification by any user.
The Borough of Naugatuck and its mapping contractors
assume no legal responsibility for the information contained herein.

Map Produced March 2019

Exhibit C

Construction Drawings



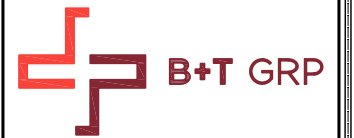
T-MOBILE SITE NAME:
NH312/CROWN-NAUGATUCK

T-MOBILE SITE NUMBER:
CTNH312A

CROWN BU: 876319 / APP#: 479854
67D92DB CONFIGURATION

280 ELM STREET
 NAUGATUCK, CT 06770

EXISTING 150'-0" MONOPOLE



CTNH312A
 BU #: 876319
 NH312/CROWN-
 NAUGATUCK
 280 ELM STREET
 NAUGATUCK, CT 06770
 EXISTING 150'-0" MONOPOLE

PROJECT NO: 137246.001.01
 CHECKED BY: RMC

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	8/1/19	DAC	CONSTRUCTION
1	5/20/20	GEH	CONSTRUCTION
2	5/29/20	GEH	CONSTRUCTION

B&T ENGINEERING, INC.
 PEC.0001564
 Expires 2/10/21



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: **2**

PROJECT SUMMARY

SITE TYPE: EXISTING EQUIPMENT UPGRADE
 SITE ADDRESS: 280 ELM STREET
 NAUGATUCK, CT 06770
 JURISDICTION: NEW HAVEN COUNTY

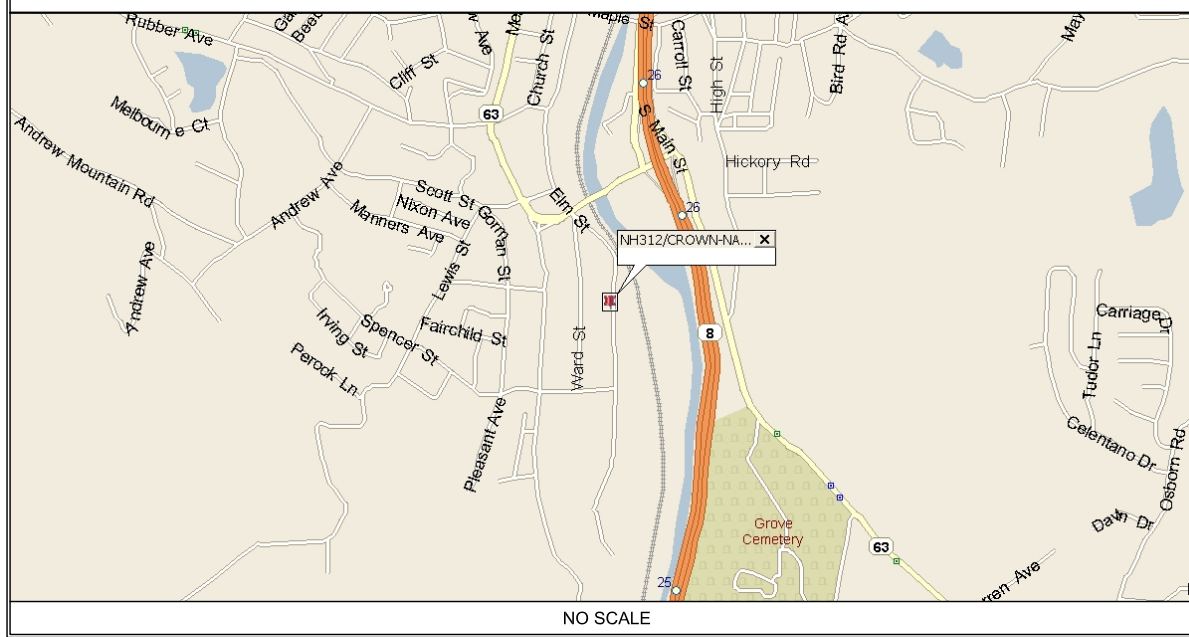
NAD83
 LATITUDE: 41.481250° N
 LONGITUDE: 73.053160° W

TOWER OWNER: CROWN CASTLE
 3200 HORIZON DRIVE, SUITE 150
 KING OF PRUSSIA, PA 19406
 JASON SMITH
 (610) 635-3225

CUSTOMER/APPLICANT: T-MOBILE
 4 SYLVAN WAY
 PARSIPPANY, NJ 07054
 (973) 397-4800

OCCUPANCY TYPE: UNMANNED
 A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION

LOCATION MAP



DRAWING INDEX

SHEET #	SHEET DESCRIPTION	REV. #
T-1	TITLE SHEET	2
A-1	OVERALL SITE PLAN	2
A-2	AZIMUTH PLANS	2
A-2.1	ANTENNA/CABLE SCHEDULES	2
A-3	TOWER ELEVATION	2
A-4	ANTENNA AND RRU DETAILS	2
E-1	PANEL SCHEDULE AND ONE-LINE DIAGRAM	2
-	MOUNT MODIFICATION SHEETS	-

CONTACT INFORMATION

A&E FIRM: B+T GROUP
 1717 S. BOULDER, STE. 300
 TULSA, OK 74119
 CONTACT: MIKE OAKES
 PHONE: (918) 587-4630

ELECTRIC PROVIDER: CONNECTICUT LIGHT & POWER
 PROVIDER: 860-947-2000

TELCO PROVIDER: AT&T
 PROVIDER: 888-265-8656

DRIVING DIRECTIONS

DEPART BRADLEY INTERNATIONAL AIRPORT ON TERMINAL RD. ROAD NAME CHANGES TO CT-20 [BRADLEY FIELD CONNECTOR]. TAKE RAMP (RIGHT) ONTO I-91 [RICHARD P HORAN MEMORIAL HWY]. AT EXIT 32A-32B, TURN RIGHT ONTO RAMP. TAKE RAMP (LEFT) ONTO I-84 [US-6]. AT EXIT 19, TAKE RAMP (LEFT) ONTO CT-8. AT EXIT 27, KEEP RIGHT ONTO RAMP. TURN RIGHT ONTO MAPLE ST. TURN LEFT ONTO OLD FIRE HOUSE RD. BEAR LEFT ONTO ELM ST. ARRIVE AT NH312/CROWN-NAUGATUCK.

A/E DOCUMENT REVIEW STATUS

TITLE	SIGNATURE	DATE
T-MOBILE PROP:		
T-MOBILE R.F. MGR.:		
T-MOBILE NetOps:		
T-MOBILE CONST. MGR.:		
INTERCONNECT:		
T-MOBILE SITE DEV. MGR.:		
PROPERTY OWNER:		
PLANNING:		

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

CODE COMPLIANCE

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/DWELLING	2018 CONNECTICUT STATE BUILDING CODE
STRUCTURAL	2018 CONNECTICUT STATE BUILDING CODE
MECHANICAL	2018 CONNECTICUT STATE BUILDING CODE
ELECTRICAL	NEC 2017

PROJECT DESCRIPTION

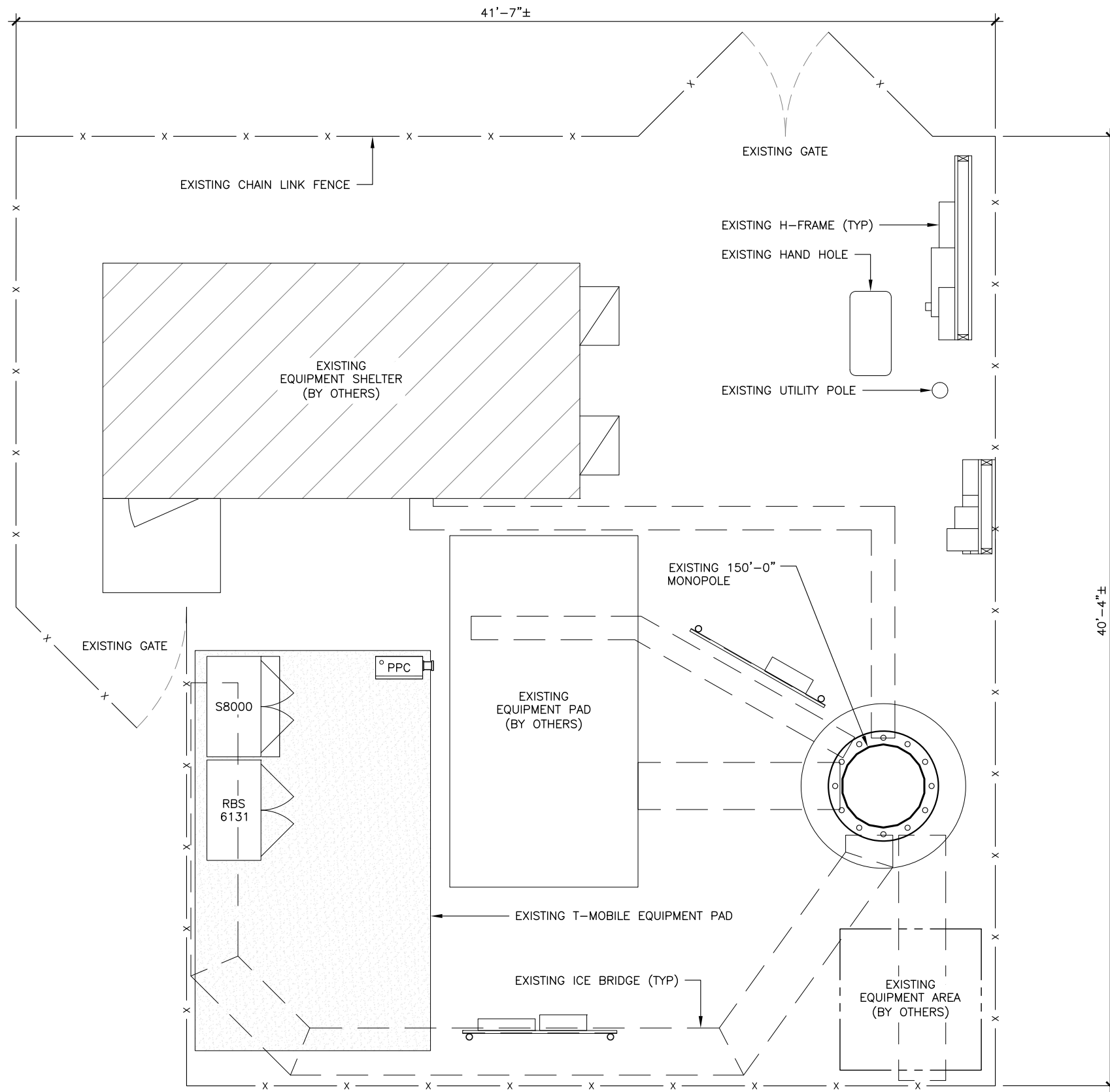
THE PROPOSED PROJECT INCLUDES:

- REMOVE & REPLACE (3) EXISTING ANTENNAS AT 120'-0"
- REMOVE & REPLACE (3) EXISTING RRUS AT 120'-0"
- REMOVE (5) EXISTING COAX LINES.
- INSTALL (2) NEW 6X12 HCS FIBER
- INSTALL (1) BB 6630
- MODIFY EXISTING MOUNTS PER MOUNT ANALYSIS REPORT BY CLS ENGINEERING PLLC DATED 5/29/19

DO NOT SCALE DRAWINGS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11X17. 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.

CALL CONNECTICUT ONE CALL
 (800) 922-4455
 CALL 3 WORKING DAYS BEFORE YOU DIG!



1 OVERALL SITE PLAN
 SCALE: 0' 1' 4' 8' 16'

GENERAL NOTES:

1. SUBJECT PROPERTY IS SITUATED AT 280 ELM STREET, NAUGATUCK, CT 06770.
2. APPLICANT: T-MOBILE
 A DELAWARE LIMITED LIABILITY COMPANY
 4 SYLVAN WAY
 PARSIPPANY, NEW JERSEY 07054
 (973) 397-4800
- TOWER OWNER: CROWN CASTLE INTERNATIONAL
- THE APPLICANT IS TO UPDATE THEIR NETWORK BY INSTALLING THREE (3) NEW PANEL ANTENNAS, (3) RRUS, AND TWO (2) ADDITIONAL CABLES MOUNTED ON AN EXISTING MONOPOLE.
3. THIS FACILITY SHALL BE VISITED ON THE AVERAGE OF ONCE A MONTH FOR MAINTENANCE AND SHALL BE MONITORED FROM A REMOTE FACILITY.
4. THE EXISTING SITE IS LOCATED AT LATITUDE OF 41.481250° N± AND LONGITUDE OF 73.053160° W±. THE HORIZONTAL DATUM ARE IN TERMS OF NORTH AMERICAN DATUM OF 1983 (NAD 83).
5. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND EACH OF THE DRAWINGS HAVE BEEN REVISED TO INDICATED "ISSUED FOR CONSTRUCTION"
6. ALL MATERIALS, WORKMANSHIP, AND CONSTRUCTION FOR THE SITE IMPROVEMENTS SHOWN HEREON SHALL BE IN ACCORDANCE WITH:
 - 6.A. CURRENT PREVAILING MUNICIPAL AND/OR COUNTY SPECIFICATIONS, STANDARDS, AND REQUIREMENTS.
 - 6.B. CURRENT PREVAILING UTILITY COMPANY AUTHORITY SPECIFICATIONS, STANDARDS AND REQUIREMENTS.
7. THE CONTRACTOR SHALL NOTIFY B+T GROUP, P.A. IMMEDIATELY IF ANY FIELD-CONDITIONS ENCOUNTERED DIFFER FROM THOSE REPRESENTED HEREON, AND/OR IF SUCH CONDITIONS WOULD OR COULD RENDER THE DESIGNS SHOWN HEREON INAPPROPRIATE AND/OR INEFFECTIVE.
8. THE CONTRACTOR IS RESPONSIBLE TO PROTECT, REPAIR AND/OR REPLACE ANY DAMAGED STRUCTURES, UTILITIES OR LANDSCAPED AREA WHICH MAY BE DISTURBED DURING THE CONSTRUCTION OF THIS FACILITY.
9. THE CONSTRUCTION CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL CONSTRUCTION MEANS AND METHODS. THE CONSTRUCTION CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.
10. SITE INFORMATION SHOWN TAKEN FROM CROWN SITE PLANS AND FROM CROWN INSPECTION PHOTOS.
11. NO GUARANTEE IS MADE NOR SHOULD BE ASSUMED AS TO THE COMPLETENESS OR ACCURACY OF THE HORIZONTAL OR VERTICAL LOCATIONS. ALL PARTIES UTILIZING THIS INFORMATION SHALL FIELD VERIFY THE ACCURACY AND COMPLETENESS OF THE INFORMATION SHOWN PRIOR TO CONSTRUCTION ACTIVITIES.
12. ALL IMPROVEMENTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE TOWNSHIP ENGINEER WHO WILL BE GIVEN PROPER NOTIFICATION PRIOR TO THE START OF ANY CONSTRUCTION.



CTNH312A
 BU #: 876319
 NH312/CROWN-
 NAUGATUCK
 280 ELM STREET
 NAUGATUCK, CT 06770
 EXISTING 150'-0" MONOPOLE

PROJECT NO: 137246.001.01
 CHECKED BY: RMC

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	8/1/19	DAC	CONSTRUCTION
1	5/20/20	GEH	CONSTRUCTION
2	5/29/20	GEH	CONSTRUCTION

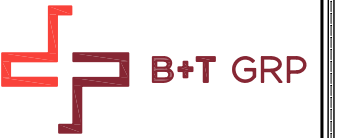
B&T ENGINEERING, INC.
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SHEET NUMBER: **A-1** REVISION: **2**

137246_876319_Naugatuck 2 Uniroyal.dwg - Sheet-A-1 - User: rcarson - May 29, 2020 - 1:48pm



CTNH312A
 BU #: 876319
 NH312/CROWN-
 NAUGATUCK
 280 ELM STREET
 NAUGATUCK, CT 06770
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B&T ENGINEERING, INC.
 PEC.0001564
 Expires 2/10/21



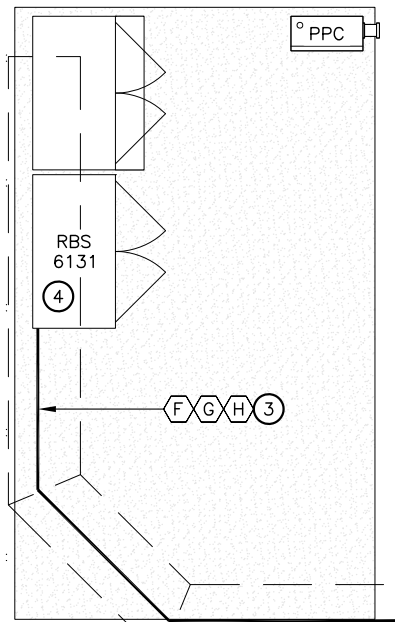
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SHEET NUMBER: A-2
 REVISION: 2

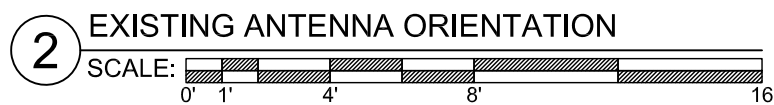
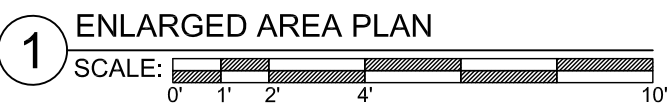
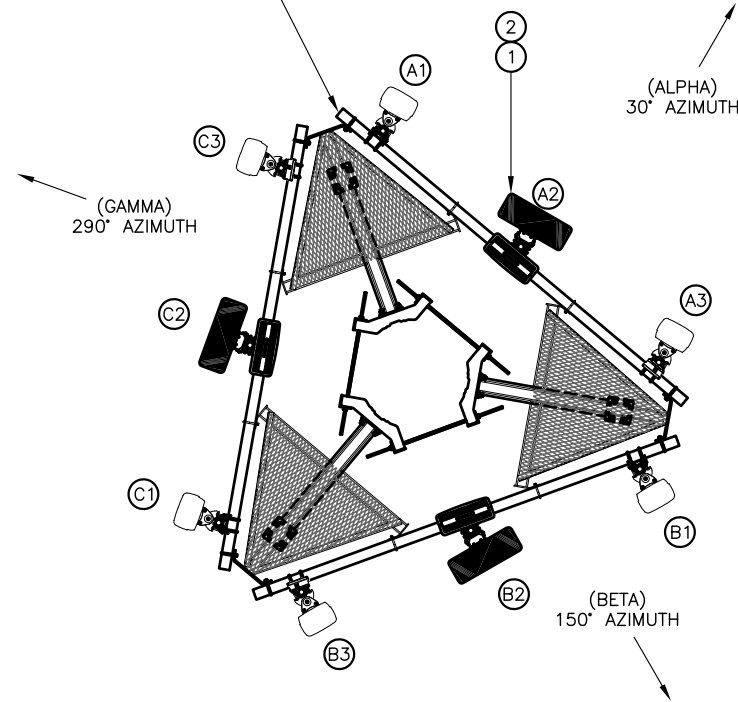
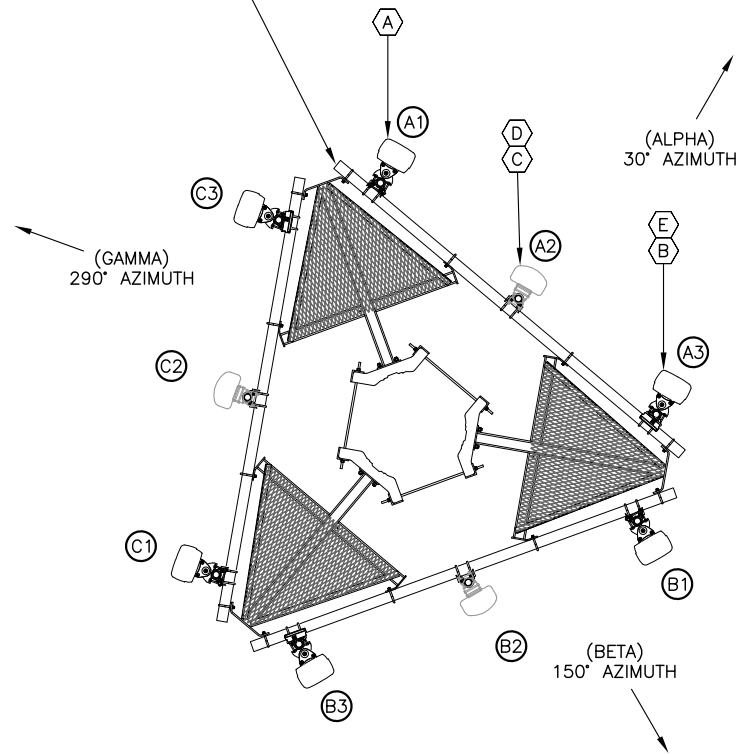
LEGEND	
EXISTING/DEMOLITION NOTES	INSTALLATION NOTES
(A) EXISTING ERICSSON AIR32 KRD901146-1_B66A_B2A ANTENNA TO REMAIN (TOTAL OF 3)	(1) INSTALL RFS APXVAARR24_43-U-NA20 ANTENNA ON EXISTING MOUNT IN POS. 2 (TYP OF 1 PER SECTOR, TOTAL OF 3)
(B) EXISTING ERICSSON AIR21 KRC118023-1_B2A_B4P ANTENNA TO REMAIN (TOTAL OF 3)	(2) INSTALL RADIO 4449 B12/B71 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
(C) EXISTING ANDREW LNX-6515DS-A1M ANTENNA TO BE REMOVED (TOTAL OF 3)	(3) INSTALL (2) 6x12 HCS FIBER. RUN FROM EQUIPMENT TO ANTENNAS FOLLOWING EXISTING ROUTING
(D) EXISTING RRUS11 B12 TO BE REMOVED (TOTAL OF 3)	(4) INSTALL (1) BB 6630
(E) EXISTING TMA TO REMAIN (TOTAL OF 3)	
(F) EXISTING 1 5/8" COAX CABLES (6 USED TO REMAIN, 5 UNUSED TO BE REMOVED)	
(G) EXISTING 9x18 HCS FIBER TO REMAIN (TOTAL OF 1)	
(H) EXISTING 6x12 HCS FIBER TO REMAIN (TOTAL OF 1)	

EXISTING MOUNT TO BE MODIFIED PER MOUNT ANALYSIS REPORT BY CLS ENGINEERING PLLC DATED 5/29/19

EXISTING MOUNT MODIFIED PER MOUNT ANALYSIS REPORT BY CLS ENGINEERING PLLC DATED 5/29/19



EXISTING T-MOBILE ICE BRIDGE





CTNH312A
 BU #: 876319
 NH312/CROWN-
 NAUGATUCK
 280 ELM STREET
 NAUGATUCK, CT 06770
 EXISTING 150'-0" MONOPOLE

EXISTING ANTENNA AND CABLE SCHEDULE											
SECTOR	POSITION	EXISTING ANTENNAS	PROPOSED ANTENNA CONFIGURATION		E-TILT	M-TILT	ANTENNA CENTERLINE	TMA/RRU	CABLES	JUMPER TYPE	CABLE LENGTH
30° - ALPHA	A1	ERICSSON AIR32 KRD901146-1_B66A_B2A	LTE	-	2'/2'	0°	120'-0"	0/0	(1) 6x12 HCS FIBER	DC/FIBER	170'-0"
	A2	ANDREW LNX-6515DS-A1M	LTE	B12	2'/2'	0°		0/1	SHARED FIBER	1/2" COAX DC/FIBER	170'-0"
	A3	ERICSSON AIR21 KRC118023-1_B2A_B4P	UMTS GSM	-	2'/2'/2'	0°		1/0	(2) 1 5/8" COAX (1) 9x18 HCS FIBER	1/2" COAX DC/FIBER	170'-0"
150° - BETA	B1	ERICSSON AIR32 KRD901146-1_B66A_B2A	LTE	-	2'/2'	0°	120'-0"	0/0	SHARED FIBER	DC/FIBER	170'-0"
	B2	ANDREW LNX-6515DS-A1M	LTE	B12	2'/2'	0°		0/1	SHARED FIBER	1/2" COAX DC/FIBER	170'-0"
	B3	ERICSSON AIR21 KRC118023-1_B2A_B4P	UMTS GSM	-	2'/2'/2'	0°		1/0	(2) 1 5/8" COAX SHARED FIBER	1/2" COAX	170'-0"
290° - GAMMA	C1	ERICSSON AIR32 KRD901146-1_B66A_B2A	LTE	-	2'/2'	0°	120'-0"	0/0	SHARED FIBER	DC/FIBER	170'-0"
	C2	ANDREW LNX-6515DS-A1M	LTE	B12	2'/2'	0°		0/1	SHARED FIBER	1/2" COAX DC/FIBER	170'-0"
	C3	ERICSSON AIR21 KRC118023-1_B2A_B4P	UMTS GSM	-	2'/2'/2'	0°		1/0	(2) 1 5/8" COAX SHARED FIBER	1/2" COAX	170'-0"

PROPOSED ANTENNA AND CABLE SCHEDULE											
SECTOR	POSITION	EXISTING ANTENNAS	PROPOSED ANTENNA CONFIGURATION		E-TILT	M-TILT	ANTENNA CENTERLINE	TMA/RRU	CABLES	JUMPER TYPE	CABLE LENGTH
30° - ALPHA	A1	ERICSSON AIR32 KRD901146-1_B66A_B2A	LTE	-	2'/2'	0°	120'-0"	0/0	(1) 6x12 HCS FIBER	DC/FIBER	170'-0"
	A2	RFS APXVAARR24_43-U-NA20	LTE	B71 B12	2'/2'	0°		0/1	(1) 6x12 HCS FIBER	1/2" COAX DC/FIBER	170'-0"
	A3	ERICSSON AIR21 KRC118023-1_B2A_B4P	UMTS GSM	-	2'/2'/2'	0°		1/0	(2) 1 5/8" COAX (1) 9x18 HCS FIBER	1/2" COAX DC/FIBER	170'-0"
150° - BETA	B1	ERICSSON AIR32 KRD901146-1_B66A_B2A	LTE	-	2'/2'	0°	120'-0"	0/0	(1) 6x12 HCS FIBER	DC/FIBER	170'-0"
	B2	RFS APXVAARR24_43-U-NA20	LTE	B71 B12	2'/2'	0°		0/1	SHARED FIBER	1/2" COAX DC/FIBER	170'-0"
	B3	ERICSSON AIR21 KRC118023-1_B2A_B4P	UMTS GSM	-	2'/2'/2'	0°		1/0	(2) 1 5/8" COAX SHARED FIBER	1/2" COAX	170'-0"
290° - GAMMA	C1	ERICSSON AIR32 KRD901146-1_B66A_B2A	LTE	-	2'/2'	0°	120'-0"	0/0	SHARED FIBER	DC/FIBER	170'-0"
	C2	RFS APXVAARR24_43-U-NA20	LTE	B71 B12	2'/2'	0°		0/1	SHARED FIBER	1/2" COAX DC/FIBER	170'-0"
	C3	ERICSSON AIR21 KRC118023-1_B2A_B4P	UMTS GSM	-	2'/2'/2'	0°		1/0	(2) 1 5/8" COAX SHARED FIBER	1/2" COAX	170'-0"

PROJECT NO: 137246.001.01
 CHECKED BY: RMC

ISSUED FOR:			
REV	DATE	DRWN	DESCRIPTION
0	8/1/19	DAC	CONSTRUCTION
1	5/20/20	GEH	CONSTRUCTION
2	5/29/20	GEH	CONSTRUCTION

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SHEET NUMBER: A-2.1 | REVISION: 2

1 ANTENNA SCHEDULES
 SCALE: N.T.S.

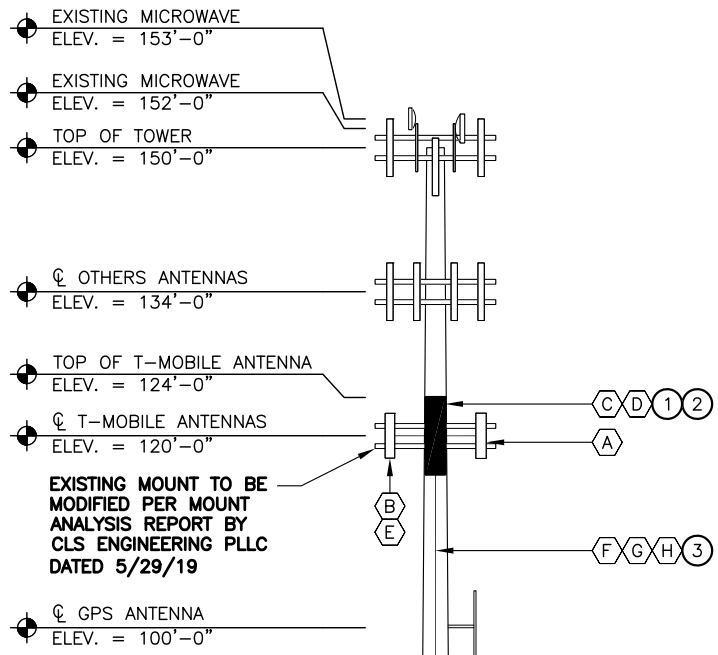
137246_876319_Naugatuck 2 - SheetA-3 - User: rcarson - May 29, 2020 - 1:48pm

LEGEND	
EXISTING/DEMOLITION NOTES	INSTALLATION NOTES
(A) EXISTING ERICSSON AIR32 KRD901146-1_B66A_B2A ANTENNA TO REMAIN (TOTAL OF 3)	(1) INSTALL RFS APXVAARR24_43-U-NA20 ANTENNA ON EXISTING MOUNT IN POS. 2 (TYP OF 1 PER SECTOR, TOTAL OF 3)
(B) EXISTING ERICSSON AIR21 KRC118023-1_B2A_B4P ANTENNA TO REMAIN (TOTAL OF 3)	(2) INSTALL RADIO 4449 B12/B71 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
(C) EXISTING ANDREW LNX-6515DS-A1M ANTENNA TO BE REMOVED (TOTAL OF 3)	(3) INSTALL (2) 6x12 HCS FIBER RUN FROM EQUIPMENT TO ANTENNAS FOLLOWING EXISTING ROUTING
(D) EXISTING RRUS11 B12 TO BE REMOVED (TOTAL OF 3)	
(E) EXISTING TMA TO REMAIN (TOTAL OF 3)	
(F) EXISTING 1 5/8" COAX CABLES (6 USED TO REMAIN, 5 UNUSED TO BE REMOVED)	
(G) EXISTING 9x18 HCS FIBER TO REMAIN (TOTAL OF 1)	
(H) EXISTING 6x12 HCS FIBER TO REMAIN (TOTAL OF 1)	

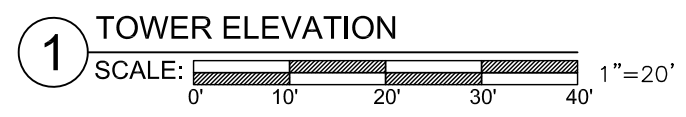
EXISTING TOWER IS SUFFICIENT PER STRUCTURAL ANALYSIS BY FDH INFRASTRUCTURE SERVICES, LLC DATED 6/19/19

EXISTING MOUNT TO BE MODIFIED PER MOUNT ANALYSIS REPORT BY CLS ENGINEERING PLLC DATED 5/29/19

LEGEND:
 NEW
 EXISTING



EXISTING 150'-0" MONOPOLE



CTNH312A
 BU #: 876319
 NH312/CROWN-
 NAUGATUCK
 280 ELM STREET
 NAUGATUCK, CT 06770
 EXISTING 150'-0" MONOPOLE

PROJECT NO: 137246.001.01
 CHECKED BY: RMC

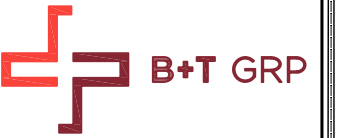
ISSUED FOR:			
REV	DATE	DRWN	DESCRIPTION
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1	5/20/20	GEH	CONSTRUCTION
2	5/29/20	GEH	CONSTRUCTION

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SHEET NUMBER: A-3
 REVISION: 2



CTNH312A
 BU #: 876319
 NH312/CROWN-
 NAUGATUCK
 280 ELM STREET
 NAUGATUCK, CT 06770
 EXISTING 150'-0" MONOPOLE

PROJECT NO: 137246.001.01

CHECKED BY: RMC

ISSUED FOR:

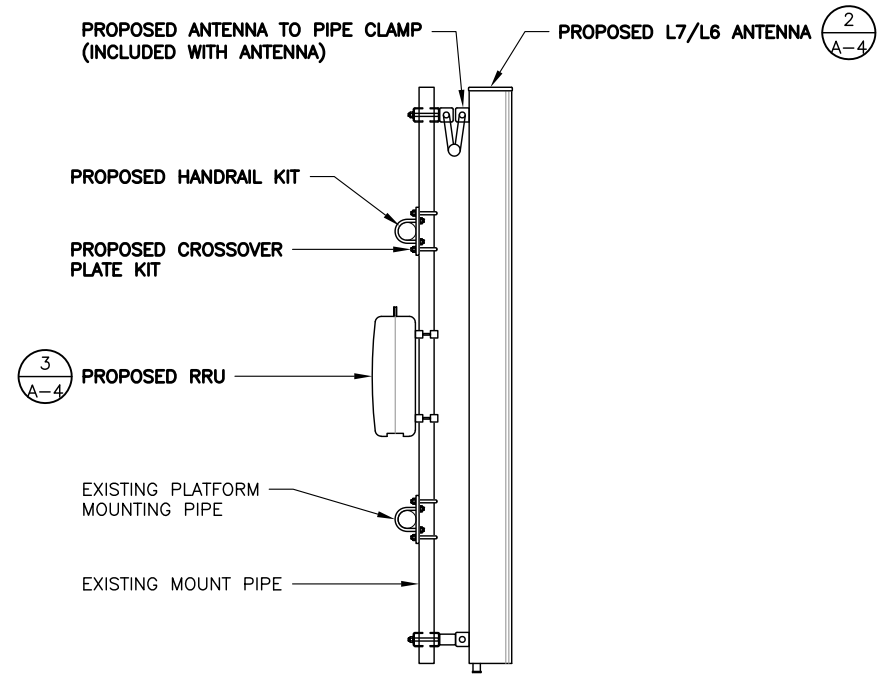
REV	DATE	DRWN	DESCRIPTION
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2	5/29/20	GEH	CONSTRUCTION

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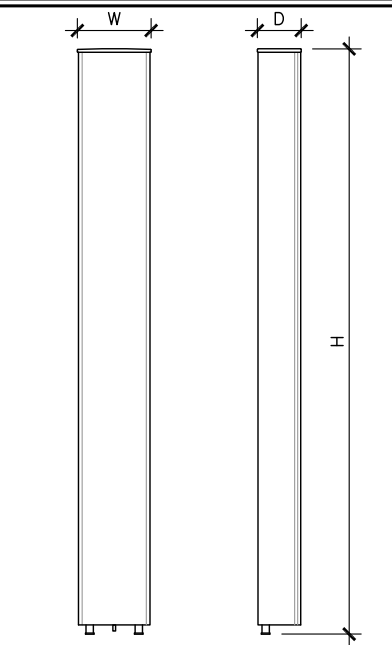
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SHEET NUMBER: **A-4** REVISION: **2**



1 PROPOSED L7/L6 ANTENNA & RRU MOUNTING DETAIL
 SCALE: 3/8" = 1'-0"

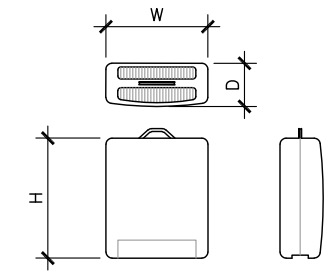
- NOTES:
- TAG ALL EXISTING AND PROPOSED CABLES/JUMPERS PER T-MOBILE SPECIFICATIONS.
 - SEE RF SCHEDULE FOR CABLE AND JUMPER LENGTHS.
 - REFER TO ANTENNA ORIENTATION ON SHEET A-2 FOR EXACT ANTENNA POSITIONING.



ANTENNA SPECS

MANUFACTURER	RFS
MODEL #	APXVAARR24_43-U-NA20
WIDTH	24.0"
DEPTH	8.7"
HEIGHT	95.9"
WEIGHT	128.0 LBS

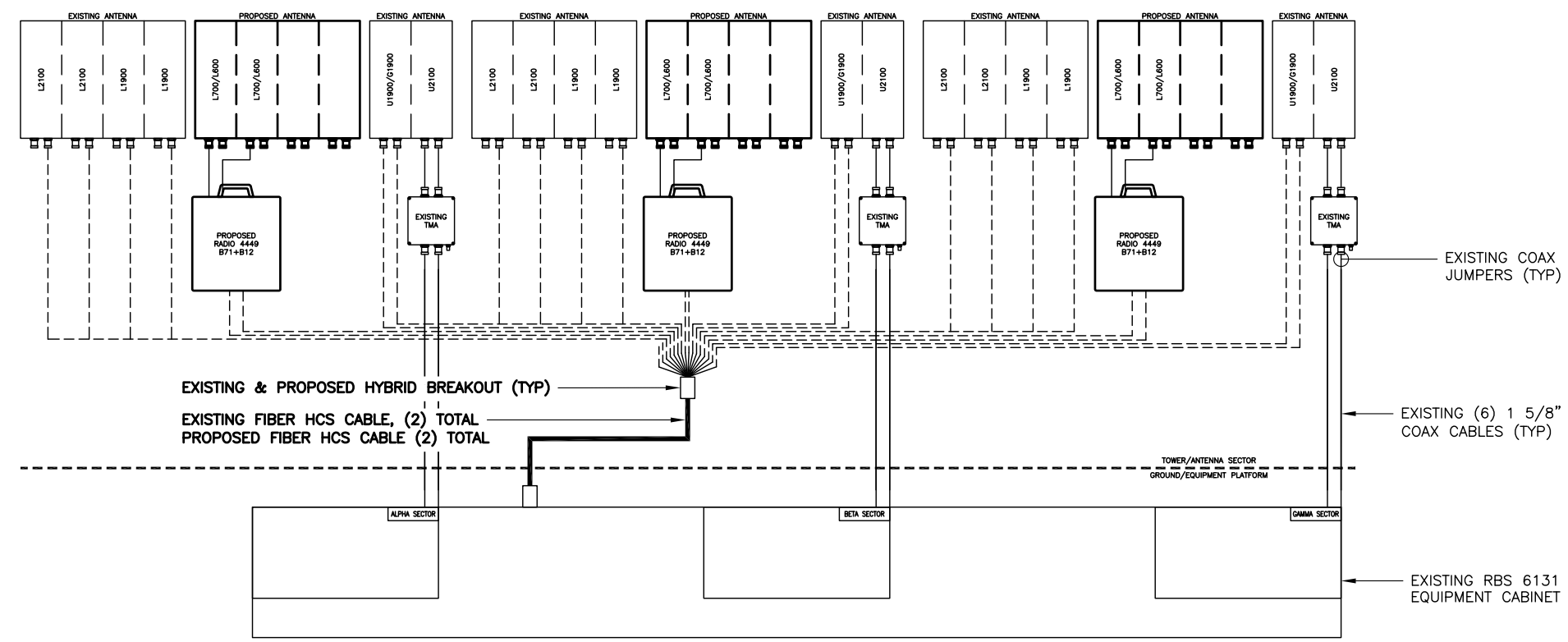
2 L7/L6 ANTENNA DETAIL
 SCALE: 3/8" = 1'-0"



RRU SPECIFICATIONS

MANUFACTURER	ERICSSON
MODEL #	4449
WIDTH	13.2"
DEPTH	10.4"
HEIGHT	14.9"
WEIGHT	74 LBS

3 REMOTE RADIO UNIT (RRU)
 SCALE: 3/8" = 1'-0"



4 ANTENNA & CABLING SCHEMATIC
 SCALE: N.T.S.

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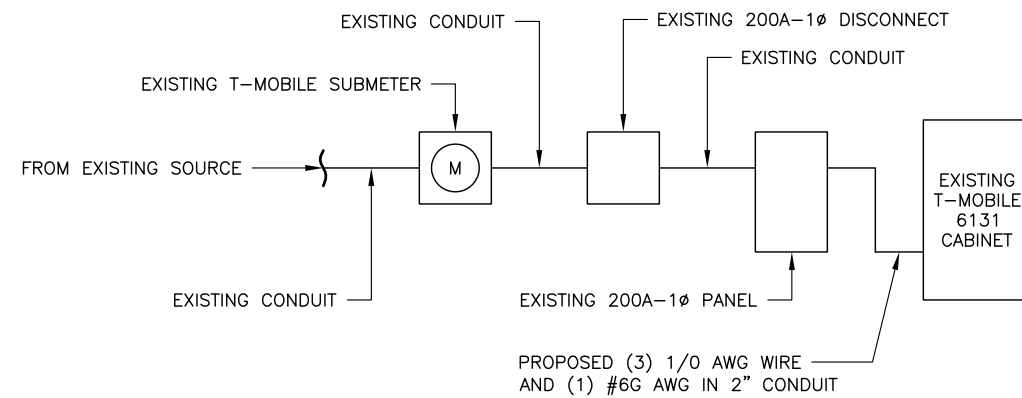
CTNH312A
 BU #: 876319
 NH312/CROWN-
 NAUGATUCK
 280 ELM STREET
 NAUGATUCK, CT 06770
 EXISTING 150'-0" MONOPOLE

FINAL PANEL SCHEDULE							
LOAD	POLES	AMPS	BUS		AMPS	POLES	LOAD
			L1	L2			
TVSS	2	60A	1	2	20A	1	GFCI
RBS 6131	2	125A	3	4	50A	2	BTS-1 (DARK)
			5	6			
			7	8	20A	1	SPOTLIGHT

RATED VOLTAGE: 120/240 _____ 1 PHASE, 3 WIRE
 BRANCH POLES: 12 24 30 42 APPROVED MF'RS
 RATED AMPS: 100 200 400 _____
 CABINET: SURFACE FLUSH NEMA 1 3R 4X
 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 5 AND 7 WITH A NEW 2P 125A BREAKER
 REPLACE EXISTING WIRES FOR EXISTING 6131 CABINET WITH (3) 1/0 AWG THWN (COPPER) AND (1) #6G AWG. MINIMUM CONDUIT SIZE TO BE 2".
 IF 125A 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 PHOTOS

1 FINAL T-MOBILE PANEL DETAIL
 SCALE: N.T.S.



2 ONE-LINE DIAGRAM
 SCALE: N.T.S.

PROJECT NO: 137246.001.01
 CHECKED BY: RMC

ISSUED FOR:

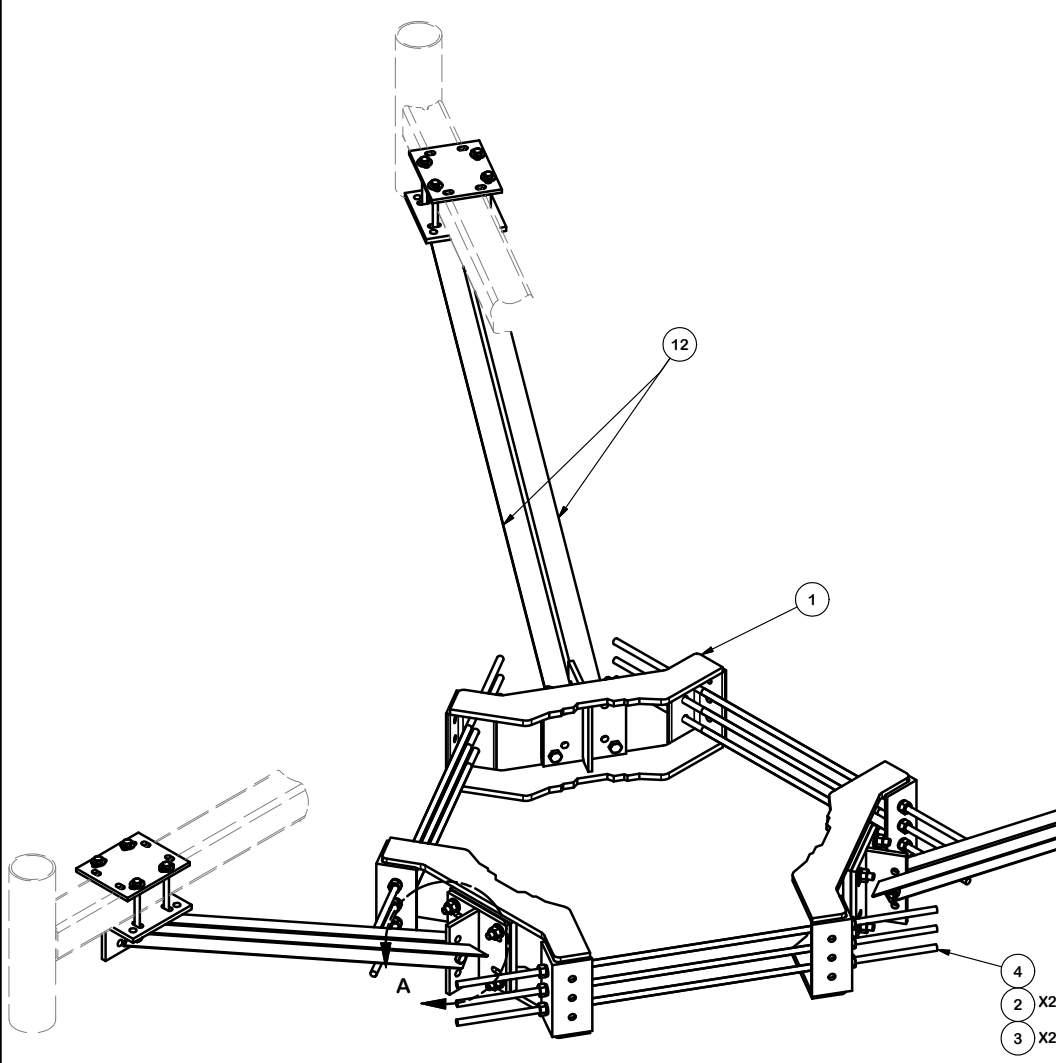
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0	8/1/19	DAC	CONSTRUCTION
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2	5/29/20	GEH	CONSTRUCTION

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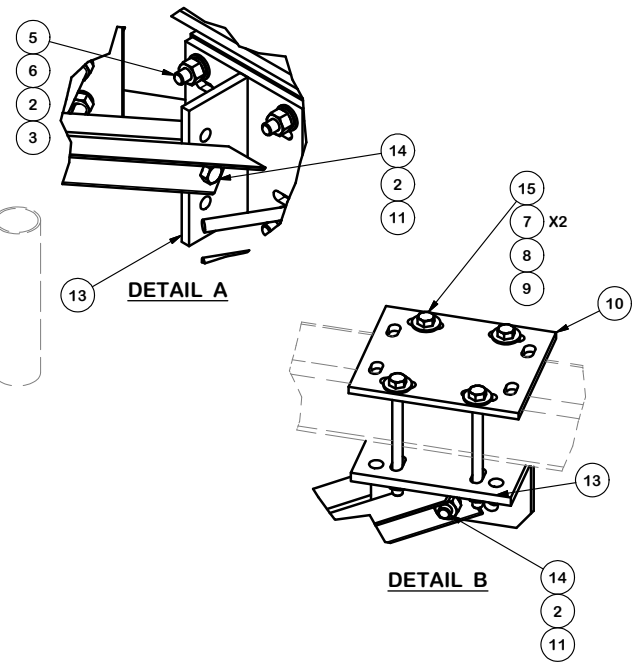


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SHEET NUMBER: **E-1** REVISION: **2**



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	36	G58LW	5/8" HDG LOCKWASHER		0.03	0.94
3	30	A58NUT	5/8" HDG A325 HEX NUT		0.13	3.90
4	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.55	4.94
4	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.55	4.94
5	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	4.27
6	12	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.41
7	24	G12FW	1/2" HDG USS FLATWASHER		0.03	0.82
8	12	G12LW	1/2" HDG LOCKWASHER		0.01	0.17
9	12	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	0.86
10	3	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	18.06
11	6	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	0.78
12	6	X-253993	PLATFORM REINFORCEMENT KIT ANGLE	52 25/32 in	14.33	85.99
13	6	X-253992	T-BRACKET FOR REINFORCEMENT KIT		13.55	81.27
14	6	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.62
15	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
TOTAL WT. #						464.91

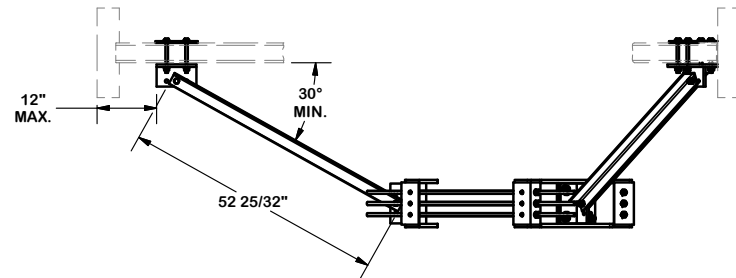
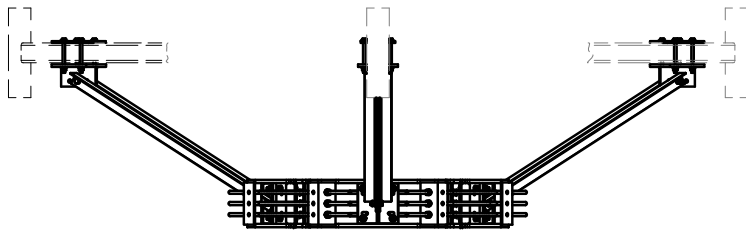
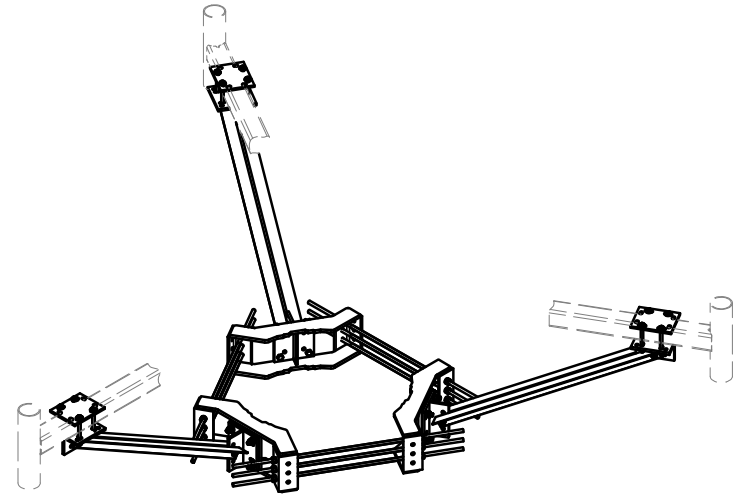
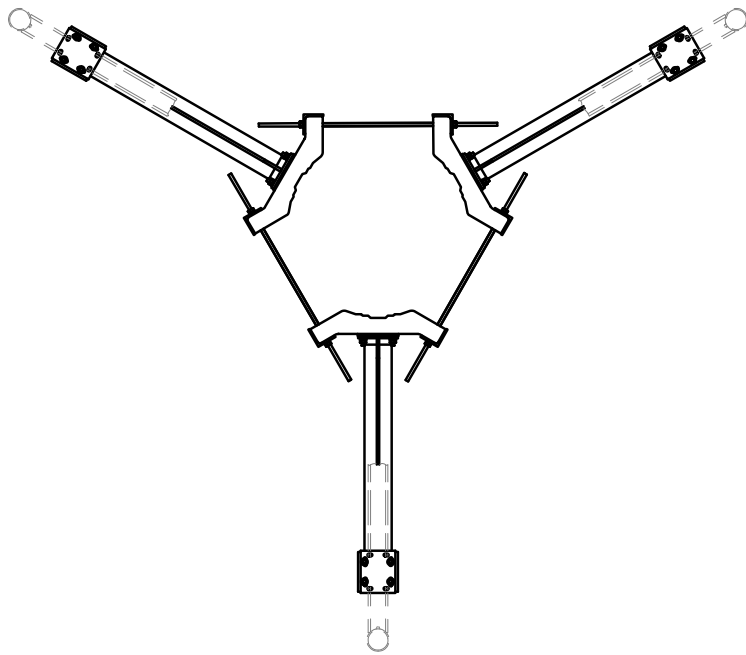


TOLERANCE NOTES
 TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
 SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.030"$)
 DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
 LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
 BENDS ARE $\pm 1/2$ DEGREE
 ALL OTHER MACHINING ($\pm 0.030"$)
 ALL OTHER ASSEMBLY ($\pm 0.060"$)

PROPRIETARY NOTE:
 THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION		PLATFORM REINFORCEMENT ON A 12" TO 45" POLE 4' 6" ANGLE	
CPD NO.	DRAWN BY	ENG. APPROVAL	
4488	CEK 4/10/2014		
CLASS	SUB	DRAWING USAGE	CHECKED BY
81	01	CUSTOMER	BMC 4/10/2014

 A valmont COMPANY	Locations: New York, NY Atlanta, GA Los Angeles, CA Plymouth, IN Salem, OR Dallas, TX
	Engineering Support Team: 1-888-753-7446
PART NO.	PRK-1245
DWG. NO.	PRK-1245



TOLERANCE NOTES

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 DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
 LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
 BENDS ARE $\pm 1/2$ DEGREE
 ALL OTHER MACHINING ($\pm 0.030"$)
 ALL OTHER ASSEMBLY ($\pm 0.060"$)

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DESCRIPTION

PLATFORM REINFORCEMENT
 ON A 12" TO 45" POLE
 4' 6" ANGLE

CPD NO. 4488	DRAWN BY CEK 4/10/2014	ENG. APPROVAL
CLASS 81	SUB 01	DRAWING USAGE CUSTOMER
		CHECKED BY BMC 4/10/2014

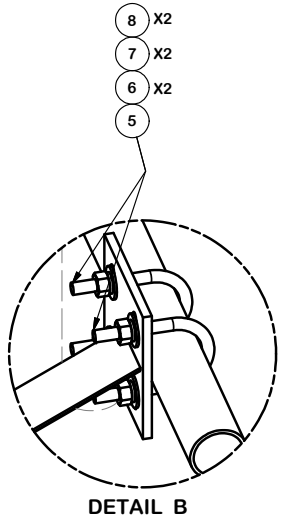
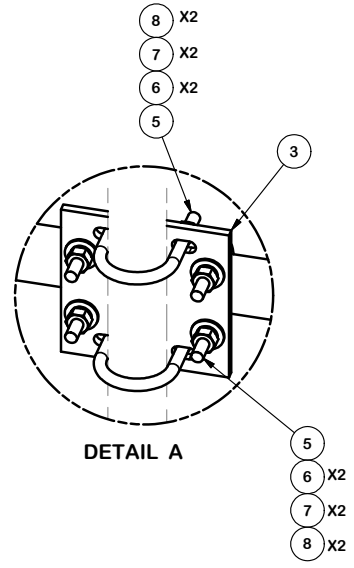
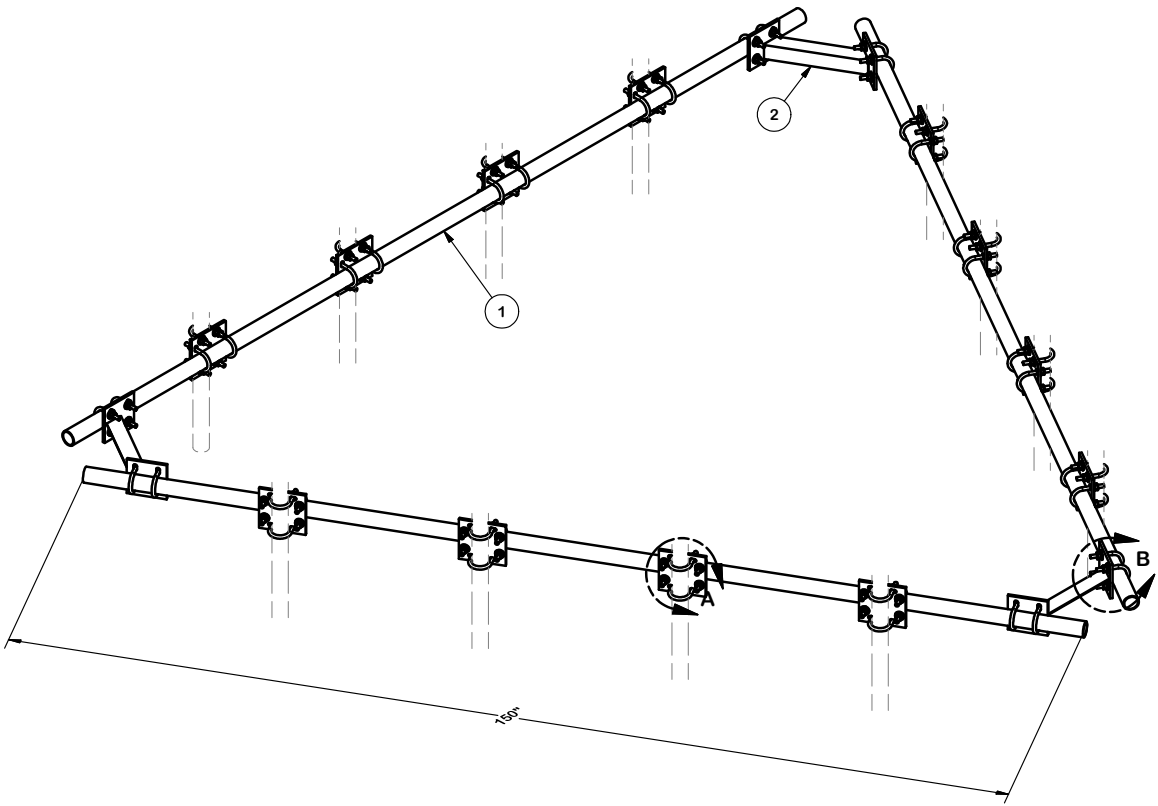


Engineering Support Team:
 1-888-753-7446

Locations:
 New York, NY
 Atlanta, GA
 Los Angeles, CA
 Plymouth, IN
 Salem, OR
 Dallas, TX

PART NO. PRK-1245	PAGE 2 OF 2
DWG. NO. PRK-1245	

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2150	2-3/8" OD X 150" SCH 40 GALVANIZED PIPE	150 in	45.77	137.31
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
4	24	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.73	17.56
5	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	43.90
6	120	G12FW	1/2" HDG USS FLATWASHER		0.03	4.09
7	120	G12LW	1/2" HDG LOCKWASHER		0.01	1.67
8	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.60
					TOTAL WT. #	302.21



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
 SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.030"$)
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 LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
 BENDS ARE $\pm 1/2$ DEGREE
 ALL OTHER MACHINING ($\pm 0.030"$)
 ALL OTHER ASSEMBLY ($\pm 0.060"$)

PROPRIETARY NOTE:
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DESCRIPTION
UNIVERSAL HANDRAIL KIT FOR 12' PLATFORM
 2-3/8" & 2-7/8" ANTENNA PIPES

SITE PRO 1
 Engineering Support Team:
 1-888-753-7446

Locations:
 New York, NY
 Atlanta, GA
 Los Angeles, CA
 Plymouth, IN
 Salem, OR
 Dallas, TX

CPD NO.	DRAWN BY CEK	3/9/2015	ENG. APPROVAL
CLASS 81	SUB 01	DRAWING USAGE CUSTOMER	CHECKED BY BMC 3/10/2015

PART NO.	HRK12-U	PAGE	1 OF 1
DWG. NO.	HRK12-U		

Exhibit D

Structural Analysis Report



ENGINEERING INNOVATION

FDH Infrastructure Services, LLC
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
919.755.1012

Date: June 19, 2019

Denice Nicholson
Crown Castle
3 Corporate Dr. Suite 101
Clifton Park, NY 12065

Subject: Structural Analysis Report

Carrier Designation: *T-Mobile Co-Locate*
Carrier Site Number: CTNH312
Carrier Site Name: NH312/Crown-Naugatuck

Crown Castle Designation:
Crown Castle BU Number: 876319
Crown Castle Site Name: Naugatuck 2 Uniroyal
Crown Castle JDE Job Number: 559322
Crown Castle Work Order Number: 1731700
Crown Castle Order Number: 479854 Rev. 0

Engineering Firm Designation: **FDH-IS Project Number:** 19BK1Y1400

Site Data: **280 Elm Street, Naugatuck, New Haven County, CT**
Latitude 41° 28' 52.54", Longitude -73° 3' 11.67"
150 Foot - Monopole Tower

Dear Denice Nicholson,

FDH Infrastructure Services, LLC 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:

LC7: Proposed Equipment Configuration

Sufficient Capacity – 52.4%

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Respectfully submitted by:

Reviewed by:

Ricardo Goncalves, EI
Project Engineer I

Krystyn M. Perez, PE
Vice President, Structural Engineering
CT PE License No. 32975



TABLE OF CONTENTS

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2) ANALYSIS CRITERIA

Table 1 - Proposed Equipment Configuration

Table 2 - Other Considered Equipment

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Table 3 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Table 5 – Tower Component Stresses vs. Capacity – LC7

4.1) Recommendations

5) APPENDIX A

tnxTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by Summit Manufacturing Inc.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 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)
119.0	120.0	3	ericsson	AIR -32 B2A/B66AA	10	1-5/8
		3	ericsson	ERICSSON AIR 21 B2A B4P		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20		
	119.0	1	-	Platform Mount [LP 303-1]		
		1	sitepro1	Handrail Kit [P/N: HRK12-U]		
		1	sitepro1	Platform Reinforcement Kit [P/N: PRK-1245]		

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)
150.0	153.0	1	dragonwave	A-ANT-23G-1-C	3 3 4 4 1	1/4 5/16 1/2 1-1/4 Conduit
	152.0	3	dragonwave	A-ANT-23G-2-C		
	150.0	1	commscope	Platform Mount [P/N: MC-PA 12L-B]		
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER		
		3	alcatel lucent	800MHZ RRH		
		3	alcatel lucent	TD-RRH8x20-25		
		3	alcatel lucent	1900MHz RRH (65MHz)		
		9	rfs celwave	ACU-A20-N		
		3	rfs celwave	APXVSPP18-C-A20		
	148.0	3	rfs celwave	APXVTM14-C-120		
		3	argus tech	LLPX310R		
		6	samsung telecom	FDD_R6_RRH		
	142.0	142.0	1	-		
3		rfs celwave	APXV18-206517S-C			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
134.0	135.0	12	decibel	844G90VTA-SX	12	1-1/4
	134.0	1	-	Platform Mount [LP 1201-1]		
99.0	100.0	1	lucent	KS24019-L112A	1	1/2
	99.0	1	-	Side Arm Mount [SO 702-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, PE, PC	1529732	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Paul J. Ford and Company	1447037	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Paul J. Ford and Company	1446973	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.5.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
- 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. FDH Infrastructure Services, LLC 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 ²	Pass / Fail
L1	150 - 108	Pole	TP30.401x22x0.25	1	-14.17	1341.96	38.4	Pass
L2	108 - 69.75	Pole	TP37.553x29.1509x0.3125	2	-20.99	2070.52	57.3	Pass
L3	69.75 - 32.5	Pole	TP44.379x35.9778x0.375	3	-30.42	3182.20	56.7	Pass
L4	32.5 - 0	Pole	TP50.13x42.5288x0.4375	4	-43.45	4300.01	55.4	Pass
							Summary	
						Pole (L2)	57.3	Pass
						RATING =	57.3	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1, 2	Anchor Rods	0	54.5	Pass
1, 2	Base Plate	0	53.2	Pass
1, 2	Base Foundation	0	35.4	Pass
1, 2	Base Foundation Soil Interaction	0	27.4	Pass

Structure Rating (max from all components) =	57.3%²
---	--------------------------

Notes:

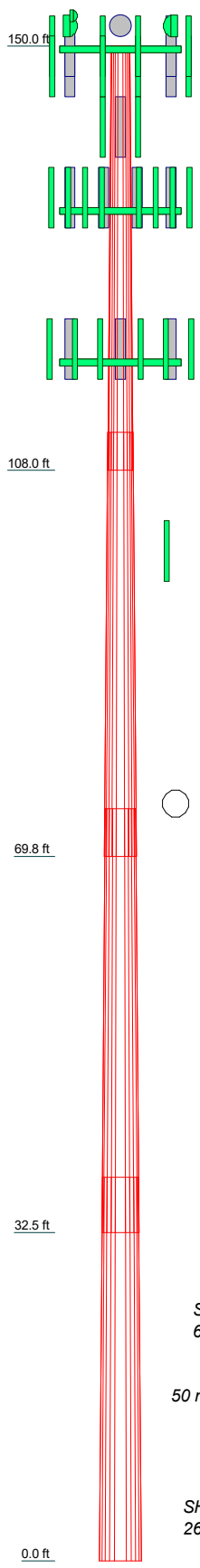
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Ratings per TIA-H-222 Section 15.5.

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

Section	1	2	3	4	
Length (ft)	42.00	42.00	42.00	38.00	
Number of Sides	12	12	12	12	
Thickness (in)	0.2500	0.3125	0.3750	0.4375	
Socket Length (ft)	3.75	4.75	5.50	42.5288	
Top Dia (in)	22.0000	29.1509	35.9778	50.1300	
Bot Dia (in)	30.4010	37.5530	44.3790		
Grade		A607-60	A607-65	A607-65	
Weight (K)	3.0	4.8	6.9	8.4	23.0



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 57.3%

150.0 ft

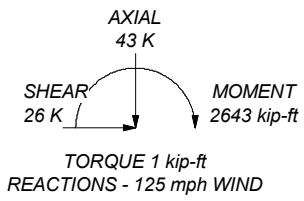
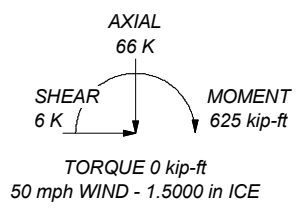
108.0 ft

69.8 ft

32.5 ft

0.0 ft

ALL REACTIONS
ARE FACTORED



FDH Infrastructure Services, LLC
 6521 Meridien Drive, Suite 107
 Raleigh, North Carolina 27616
 Phone: 919.755.1012
 FAX: 919.755.1031

Job: 876319 Naugatuck 2 Uniroyal		
Project: 19BK1Y1400	Drawn by: Ricardo.Goncalves	App'd:
Client: Crown Castle	Date: 06/18/19	Scale: NTS
Code: TIA-222-H	Path:	Dwg No. E-1

<p>tnxTower</p> <p>FDH Infrastructure Services, LLC</p> <p>6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 919.755.1012 FAX: 919.755.1031</p>	Job 876319 Naugatuck 2 Uniroyal	Page 1 of 29
	Project 19BK1Y1400	Date 09:00:00 06/19/19
	Client Crown Castle	Designed by Ricardo.Goncalves

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 Haven County, Connecticut.

Tower base elevation above sea level: 232.90 ft.

Basic wind speed of 125 mph.

Risk Category II.

Exposure Category B.

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

Topographic Category: 1.

Crest Height: 0.00 ft.

Nominal ice thickness of 1.5000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

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

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

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 <div style="background-color: #e0e0e0; text-align: center; padding: 2px; font-weight: bold;">Poles</div> <ul style="list-style-type: none"> √ 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
--	---	--

tnxTower FDH Infrastructure Services, LLC 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 919.755.1012 FAX: 919.755.1031	Job	876319 Naugatuck 2 Uniroyal	Page	3 of 29
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	Client	Crown Castle	Designed by	Ricardo.Goncalves

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
* * 150 * SPRINT & CLEARWIRE * [I] * * 150 * SPRINT & CLEARWIRE * [P] *] *									
LDF4-50A(1/2)	A	No	No	Inside Pole	150.00 - 0.00	4	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
9258(1/4)	A	No	No	Inside Pole	150.00 - 0.00	3	No Ice	0.00	0.04
							1/2" Ice	0.00	0.04
							1" Ice	0.00	0.04
							2" Ice	0.00	0.04
9207(5/16)	A	No	No	Inside Pole	150.00 - 0.00	3	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
2" Rigid Conduit	A	No	No	Inside Pole	150.00 - 0.00	1	No Ice	0.00	2.80
							1/2" Ice	0.00	2.80
							1" Ice	0.00	2.80
							2" Ice	0.00	2.80
HB114-1-0813U4-M 5J(1-1/4)	A	No	No	Inside Pole	150.00 - 0.00	4	No Ice	0.00	1.20
							1/2" Ice	0.00	1.20
							1" Ice	0.00	1.20
							2" Ice	0.00	1.20
* * 142 * METRO * [NOT INST] * * * 134 * SPRINT * [ABN]									
LDF6-50A(1-1/4)	B	No	No	Inside Pole	134.00 - 0.00	12	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
							2" Ice	0.00	0.60
* *** 119 * T-MOBILE * [I] *** *** 119 * T-MOBILE * [P] ***									
LDF7-50A(1-5/8)	C	No	No	Inside Pole	119.00 - 0.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
MLE Hybrid 9Power/18Fiber RL 2(1-5/8)	C	No	No	Inside Pole	119.00 - 0.00	1	No Ice	0.00	1.07
							1/2" Ice	0.00	1.07
							1" Ice	0.00	1.07
							2" Ice	0.00	1.07
HCS 6X12 4AWG(1-5/8)	C	No	No	Inside Pole	119.00 - 0.00	3	No Ice	0.00	2.40
							1/2" Ice	0.00	2.40

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	Project	19BK1Y1400	Date	09:00:00 06/19/19
	Client	Crown Castle	Designed by	Ricardo.Goncalves

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_{AA} ft ² /ft	Weight plf	
							1" Ice	2.40	
							2" Ice	2.40	
* 99 * SPRINT * [I]									
	1/2"	A	No	No	Inside Pole	99.00 - 0.00	1	No Ice	0.15
							1/2" Ice	0.15	
							1" Ice	0.15	
							2" Ice	0.15	

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	150.00-108.00	A	0.000	0.000	0.000	0.000	0.36
		B	0.000	0.000	0.000	0.000	0.19
		C	0.000	0.000	1.575	0.000	0.15
L2	108.00-69.75	A	0.000	0.000	0.000	0.000	0.33
		B	0.000	0.000	0.000	0.000	0.28
		C	0.000	0.000	1.434	0.000	0.51
L3	69.75-32.50	A	0.000	0.000	0.000	0.000	0.32
		B	0.000	0.000	0.000	0.000	0.27
		C	0.000	0.000	1.397	0.000	0.50
L4	32.50-0.00	A	0.000	0.000	0.000	0.000	0.28
		B	0.000	0.000	0.000	0.000	0.23
		C	0.000	0.000	1.031	0.000	0.43

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	150.00-108.00	A	1.460	0.000	0.000	0.000	0.000	0.36
		B		0.000	0.000	0.000	0.000	0.19
		C		0.000	0.000	13.841	0.000	0.29
L2	108.00-69.75	A	1.407	0.000	0.000	0.000	0.000	0.33
		B		0.000	0.000	0.000	0.000	0.28
		C		0.000	0.000	12.605	0.000	0.64
L3	69.75-32.50	A	1.332	0.000	0.000	0.000	0.000	0.32
		B		0.000	0.000	0.000	0.000	0.27
		C		0.000	0.000	11.880	0.000	0.61
L4	32.50-0.00	A	1.185	0.000	0.000	0.000	0.000	0.28
		B		0.000	0.000	0.000	0.000	0.23
		C		0.000	0.000	8.356	0.000	0.51

Feed Line Center of Pressure

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Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice in	Ice in
L1	150.00-108.00	0.0000	0.2288	0.0000	1.3169
L2	108.00-69.75	0.0000	0.2289	0.0000	1.3698
L3	69.75-32.50	0.0000	0.2290	0.0000	1.3642
L4	32.50-0.00	0.0000	0.1921	0.0000	1.1211

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	108.00 - 150.00	1.0000	1.0000
L2	1	Safety Line 3/8	69.75 - 108.00	1.0000	1.0000
L3	1	Safety Line 3/8	32.50 - 69.75	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
* 150 * SPRINT & CLEARWIRE * [1]									
LLPX310R w/ Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	4.54	2.98	0.05
			0.00			1/2" Ice	4.89		0.08
			-2.00			1" Ice	5.25		0.13
						2" Ice	6.01		0.23
LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	4.54	2.98	0.05
			0.00			1/2" Ice	4.89		0.08
			-2.00			1" Ice	5.25		0.13
						2" Ice	6.01		0.23
LLPX310R w/ Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	4.54	2.98	0.05
			0.00			1/2" Ice	4.89		0.08
			-2.00			1" Ice	5.25		0.13
						2" Ice	6.01		0.23
*									
(2) FDD_R6_RRH	A	From Leg	4.00	0.0000	150.00	No Ice	1.53	0.68	0.03
			0.00			1/2" Ice	1.69		0.04
			-2.00			1" Ice	1.85		0.06
						2" Ice	2.20		0.09
(2) FDD_R6_RRH	B	From Leg	4.00	0.0000	150.00	No Ice	1.53	0.68	0.03
			0.00			1/2" Ice	1.69		0.04

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	Project	19BK1Y1400	Date	09:00:00 06/19/19
	Client	Crown Castle	Designed by	Ricardo.Goncalves

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
			-2.00			1" Ice	1.85	0.92	0.06
						2" Ice	2.20	1.19	0.09
(2) FDD_R6_RRH	C	From Leg	4.00	0.0000	150.00	No Ice	1.53	0.68	0.03
			0.00			1/2" Ice	1.69	0.80	0.04
			-2.00			1" Ice	1.85	0.92	0.06
						2" Ice	2.20	1.19	0.09
* *									
* 150 * SPRINT * [P] *									
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	4.09	2.86	0.08
			0.00			1/2" Ice	4.48	3.23	0.13
			0.00			1" Ice	4.88	3.61	0.19
						2" Ice	5.71	4.40	0.33
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	4.09	2.86	0.08
			0.00			1/2" Ice	4.48	3.23	0.13
			0.00			1" Ice	4.88	3.61	0.19
						2" Ice	5.71	4.40	0.33
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	4.09	2.86	0.08
			0.00			1/2" Ice	4.48	3.23	0.13
			0.00			1" Ice	4.88	3.61	0.19
						2" Ice	5.71	4.40	0.33
APXVSP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	4.60	4.01	0.10
			0.00			1/2" Ice	5.05	4.45	0.16
			0.00			1" Ice	5.50	4.89	0.23
						2" Ice	6.44	5.82	0.42
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	4.60	4.01	0.10
			0.00			1/2" Ice	5.05	4.45	0.16
			0.00			1" Ice	5.50	4.89	0.23
						2" Ice	6.44	5.82	0.42
APXVSP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	4.60	4.01	0.10
			0.00			1/2" Ice	5.05	4.45	0.16
			0.00			1" Ice	5.50	4.89	0.23
						2" Ice	6.44	5.82	0.42
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00	0.0000	150.00	No Ice	0.66	0.32	0.01
			0.00			1/2" Ice	0.76	0.40	0.02
			0.00			1" Ice	0.87	0.48	0.02
						2" Ice	1.11	0.67	0.04
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00	0.0000	150.00	No Ice	0.66	0.32	0.01
			0.00			1/2" Ice	0.76	0.40	0.02
			0.00			1" Ice	0.87	0.48	0.02
						2" Ice	1.11	0.67	0.04
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00	0.0000	150.00	No Ice	0.66	0.32	0.01
			0.00			1/2" Ice	0.76	0.40	0.02
			0.00			1" Ice	0.87	0.48	0.02
						2" Ice	1.11	0.67	0.04
800MHZ RRH	A	From Leg	4.00	0.0000	150.00	No Ice	2.13	1.77	0.05
			0.00			1/2" Ice	2.32	1.95	0.07
			0.00			1" Ice	2.51	2.13	0.10
						2" Ice	2.92	2.51	0.16
800MHZ RRH	B	From Leg	4.00	0.0000	150.00	No Ice	2.13	1.77	0.05
			0.00			1/2" Ice	2.32	1.95	0.07
			0.00			1" Ice	2.51	2.13	0.10
						2" Ice	2.92	2.51	0.16
800MHZ RRH	C	From Leg	4.00	0.0000	150.00	No Ice	2.13	1.77	0.05
			0.00			1/2" Ice	2.32	1.95	0.07
			0.00			1" Ice	2.51	2.13	0.10
						2" Ice	2.92	2.51	0.16

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	Project	19BKIIY1400	Date	09:00:00 06/19/19
	Client	Crown Castle	Designed by	Ricardo.Goncalves

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
(3) ACU-A20-N	A	From Leg	4.00	0.0000	150.00	No Ice	0.07	0.12	0.00
			0.00			1/2" Ice	0.10	0.16	0.00
			0.00			1" Ice	0.15	0.21	0.00
						2" Ice	0.26	0.34	0.01
(3) ACU-A20-N	B	From Leg	4.00	0.0000	150.00	No Ice	0.07	0.12	0.00
			0.00			1/2" Ice	0.10	0.16	0.00
			0.00			1" Ice	0.15	0.21	0.00
						2" Ice	0.26	0.34	0.01
(3) ACU-A20-N	C	From Leg	4.00	0.0000	150.00	No Ice	0.07	0.12	0.00
			0.00			1/2" Ice	0.10	0.16	0.00
			0.00			1" Ice	0.15	0.21	0.00
						2" Ice	0.26	0.34	0.01
TD-RRH8x20-25	A	From Leg	4.00	0.0000	150.00	No Ice	3.70	1.29	0.07
			0.00			1/2" Ice	3.95	1.46	0.09
			0.00			1" Ice	4.20	1.64	0.12
						2" Ice	4.72	2.02	0.18
TD-RRH8x20-25	A	From Leg	4.00	0.0000	150.00	No Ice	3.70	1.29	0.07
			0.00			1/2" Ice	3.95	1.46	0.09
			0.00			1" Ice	4.20	1.64	0.12
						2" Ice	4.72	2.02	0.18
TD-RRH8x20-25	C	From Leg	4.00	0.0000	150.00	No Ice	3.70	1.29	0.07
			0.00			1/2" Ice	3.95	1.46	0.09
			0.00			1" Ice	4.20	1.64	0.12
						2" Ice	4.72	2.02	0.18
1900MHz RRH (65MHz)	A	From Leg	4.00	0.0000	150.00	No Ice	2.31	2.38	0.06
			0.00			1/2" Ice	2.52	2.58	0.08
			0.00			1" Ice	2.73	2.79	0.11
						2" Ice	3.17	3.24	0.18
1900MHz RRH (65MHz)	B	From Leg	4.00	0.0000	150.00	No Ice	2.31	2.38	0.06
			0.00			1/2" Ice	2.52	2.58	0.08
			0.00			1" Ice	2.73	2.79	0.11
						2" Ice	3.17	3.24	0.18
1900MHz RRH (65MHz)	C	From Leg	4.00	0.0000	150.00	No Ice	2.31	2.38	0.06
			0.00			1/2" Ice	2.52	2.58	0.08
			0.00			1" Ice	2.73	2.79	0.11
						2" Ice	3.17	3.24	0.18
* (2) Pipe Mount	A	From Leg	4.00	0.0000	150.00	No Ice	1.20	1.20	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			0.00			1" Ice	1.81	1.81	0.04
						2" Ice	2.47	2.47	0.08
(2) Pipe Mount	B	From Leg	4.00	0.0000	150.00	No Ice	1.20	1.20	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			0.00			1" Ice	1.81	1.81	0.04
						2" Ice	2.47	2.47	0.08
(2) Pipe Mount	C	From Leg	4.00	0.0000	150.00	No Ice	1.20	1.20	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			0.00			1" Ice	1.81	1.81	0.04
						2" Ice	2.47	2.47	0.08
MC-PA 12L-B	C	None		0.0000	150.00	No Ice	15.60	15.60	1.23
						1/2" Ice	19.40	19.40	1.54
						1" Ice	23.20	23.20	1.85
						2" Ice	30.80	30.80	2.47
* * 142 * METRO * [I] APXV18-206517S-C	A	From Leg	1.00	0.0000	142.00	No Ice	3.83	1.81	0.03
			0.00			1/2" Ice	4.46	2.41	0.05

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	Client	Crown Castle	Designed by	Ricardo.Goncalves

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
			0.00				1" Ice	5.11	3.03	0.09
							2" Ice	6.44	4.31	0.17
APXV18-206517S-C	B	From Leg	1.00		0.0000	142.00	No Ice	3.83	1.81	0.03
			0.00				1/2" Ice	4.46	2.41	0.05
			0.00				1" Ice	5.11	3.03	0.09
							2" Ice	6.44	4.31	0.17
APXV18-206517S-C	C	From Leg	1.00		0.0000	142.00	No Ice	3.83	1.81	0.03
			0.00				1/2" Ice	4.46	2.41	0.05
			0.00				1" Ice	5.11	3.03	0.09
							2" Ice	6.44	4.31	0.17
Pipe Mount [PM 601-3]	C	None			0.0000	142.00	No Ice	4.39	4.39	0.20
							1/2" Ice	5.48	5.48	0.24
							1" Ice	6.57	6.57	0.28
							2" Ice	8.75	8.75	0.36
*										
* 134 * SPRINT * [ABN]										
(4) 844G90VTA-SX w/ Mount Pipe	A	From Leg	4.00		0.0000	134.00	No Ice	3.30	4.80	0.03
			0.00				1/2" Ice	3.67	5.42	0.07
			1.00				1" Ice	4.03	6.04	0.11
							2" Ice	4.80	7.34	0.23
(4) 844G90VTA-SX w/ Mount Pipe	B	From Leg	4.00		0.0000	134.00	No Ice	3.30	4.80	0.03
			0.00				1/2" Ice	3.67	5.42	0.07
			1.00				1" Ice	4.03	6.04	0.11
							2" Ice	4.80	7.34	0.23
(4) 844G90VTA-SX w/ Mount Pipe	C	From Leg	4.00		0.0000	134.00	No Ice	3.30	4.80	0.03
			0.00				1/2" Ice	3.67	5.42	0.07
			1.00				1" Ice	4.03	6.04	0.11
							2" Ice	4.80	7.34	0.23
Platform Mount [LP 1201-1]	C	None			0.0000	134.00	No Ice	23.10	23.10	2.10
							1/2" Ice	26.80	26.80	2.50
							1" Ice	30.50	30.50	2.90
							2" Ice	37.90	37.90	3.70
*										
*** 119 * T-MOBILE * [I]										

*										
*** 119 * T-MOBILE * [P]										

ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00		0.0000	119.00	No Ice	6.33	5.64	0.11
			0.00				1/2" Ice	6.78	6.43	0.17
			1.00				1" Ice	7.21	7.13	0.23
							2" Ice	8.12	8.59	0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00		0.0000	119.00	No Ice	6.33	5.64	0.11
			0.00				1/2" Ice	6.78	6.43	0.17
			1.00				1" Ice	7.21	7.13	0.23
							2" Ice	8.12	8.59	0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00		0.0000	119.00	No Ice	6.33	5.64	0.11
			0.00				1/2" Ice	6.78	6.43	0.17
			1.00				1" Ice	7.21	7.13	0.23
							2" Ice	8.12	8.59	0.38
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00		0.0000	119.00	No Ice	14.69	6.87	0.19
			0.00				1/2" Ice	15.46	7.55	0.31
			1.00				1" Ice	16.23	8.25	0.46
							2" Ice	17.82	9.67	0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00		0.0000	119.00	No Ice	14.69	6.87	0.19
			0.00				1/2" Ice	15.46	7.55	0.31
			1.00				1" Ice	16.23	8.25	0.46

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	Client	Crown Castle	Designed by	Ricardo.Goncalves

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00	0.0000	119.00	2" Ice	17.82	9.67	0.79
			0.00			No Ice	14.69	6.87	0.19
			1.00			1/2" Ice	15.46	7.55	0.31
						1" Ice	16.23	8.25	0.46
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Face	4.00	0.0000	119.00	2" Ice	17.82	9.67	0.79
			0.00			No Ice	6.75	6.07	0.15
			1.00			1/2" Ice	7.20	6.87	0.21
						1" Ice	7.65	7.58	0.28
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Face	4.00	0.0000	119.00	2" Ice	8.57	9.06	0.44
			0.00			No Ice	6.75	6.07	0.15
			1.00			1/2" Ice	7.20	6.87	0.21
						1" Ice	7.65	7.58	0.28
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Face	4.00	0.0000	119.00	2" Ice	8.57	9.06	0.44
			0.00			No Ice	6.75	6.07	0.15
			1.00			1/2" Ice	7.20	6.87	0.21
						1" Ice	7.65	7.58	0.28
KRY 112 144/1	A	From Leg	4.00	0.0000	119.00	2" Ice	0.70	0.44	0.03
			0.00			No Ice	0.35	0.16	0.01
			1.00			1/2" Ice	0.43	0.22	0.01
						1" Ice	0.51	0.28	0.02
KRY 112 144/1	B	From Leg	4.00	0.0000	119.00	2" Ice	0.70	0.44	0.03
			0.00			No Ice	0.35	0.16	0.01
			1.00			1/2" Ice	0.43	0.22	0.01
						1" Ice	0.51	0.28	0.02
KRY 112 144/1	C	From Leg	4.00	0.0000	119.00	2" Ice	0.70	0.44	0.03
			0.00			No Ice	0.35	0.16	0.01
			1.00			1/2" Ice	0.43	0.22	0.01
						1" Ice	0.51	0.28	0.02
RADIO 4449 B12/B71	A	From Leg	4.00	0.0000	119.00	2" Ice	0.70	0.44	0.03
			0.00			No Ice	1.65	1.30	0.08
			1.00			1/2" Ice	1.81	1.44	0.09
						1" Ice	1.98	1.60	0.11
RADIO 4449 B12/B71	B	From Leg	4.00	0.0000	119.00	2" Ice	2.34	1.92	0.16
			0.00			No Ice	1.65	1.30	0.08
			1.00			1/2" Ice	1.81	1.44	0.09
						1" Ice	1.98	1.60	0.11
RADIO 4449 B12/B71	C	From Leg	4.00	0.0000	119.00	2" Ice	2.34	1.92	0.16
			0.00			No Ice	1.65	1.30	0.08
			1.00			1/2" Ice	1.81	1.44	0.09
						1" Ice	1.98	1.60	0.11
Platform Mount [LP 303-1]	C	None		0.0000	119.00	2" Ice	2.34	1.92	0.16
						No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						1" Ice	23.08	23.08	1.71
SitePro1 [P/N: PRK-1245]	C	None		0.0000	119.00	2" Ice	31.50	31.50	2.18
						No Ice	11.84	11.84	0.47
						1/2" Ice	16.96	16.96	0.79
						1" Ice	22.08	22.08	1.11
SitePro1 [P/N: HRK-12-U]	C	None		0.0000	119.00	2" Ice	32.32	32.32	1.75
						No Ice	5.38	5.38	0.41
						1/2" Ice	7.22	7.22	0.50
						1" Ice	8.88	8.88	0.63
			2" Ice	12.20	12.20	0.88			
* * 99 * SPRINT * [1] * KS24019-L112A	B	From Leg	4.00	0.0000	99.00	No Ice	0.14	0.14	0.01
			0.00			1/2" Ice	0.20	0.20	0.01

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	Client	Crown Castle	Designed by	Ricardo.Goncalves

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	K
			1.00			1" Ice 0.26	0.26	0.01
						2" Ice 0.41	0.41	0.02
Side Arm Mount [SO 702-1]	B	None		0.0000	99.00	No Ice 1.00	1.43	0.03
						1/2" Ice 1.25	2.05	0.04
						1" Ice 1.50	2.67	0.05
						2" Ice 2.00	3.91	0.07

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				ft	°	°	ft	ft	ft ²	K
* 150 *										
CLEARWIRE * [1]										
A-ANT-23G-2-C	A	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 2.00	0.0000		150.00	2.17	No Ice 3.72 1/2" Ice 4.01 1" Ice 4.30 2" Ice 4.88	0.03 0.05 0.07 0.11
A-ANT-23G-2-C	B	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 2.00	0.0000		150.00	2.17	No Ice 3.72 1/2" Ice 4.01 1" Ice 4.30 2" Ice 4.88	0.03 0.05 0.07 0.11
A-ANT-23G-2-C	C	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 2.00	0.0000		150.00	2.17	No Ice 3.72 1/2" Ice 4.01 1" Ice 4.30 2" Ice 4.88	0.03 0.05 0.07 0.11
A-ANT-23G-1-C	C	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 3.00	0.0000		150.00	1.13	No Ice 0.99 1/2" Ice 1.15 1" Ice 1.30 2" Ice 1.60	0.03 0.04 0.05 0.06

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation	z	K _Z	q _z	A _G	F _a	A _F	A _R	A _{leg}	Leg %	C _{AA} In Face	C _{AA} Out Face
ft	ft		psf	ft ²	c	ft ²	ft ²	ft ²		ft ²	ft ²
L1 150.00-108.00	128.12	1.061	38	94.628	A	0.000	94.628	94.628	100.00	0.000	0.000
					B	0.000	94.628		100.00	0.000	0.000
					C	0.000	94.628		100.00	1.575	0.000
L2 108.00-69.75	88.44	0.954	34	110.946	A	0.000	110.946	110.946	100.00	0.000	0.000
					B	0.000	110.946		100.00	0.000	0.000

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Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e ft ²	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L3 69.75-32.50	51.04	0.815	29	130.236	C	0.000	110.946	130.236	100.00	1.434	0.000
					A	0.000	130.236			0.000	0.000
					B	0.000	130.236			0.000	0.000
L4 32.50-0.00	15.87	0.7	25	131.026	C	0.000	130.236	131.026	100.00	1.397	0.000
					A	0.000	131.026			0.000	0.000
					B	0.000	131.026			0.000	0.000
					C	0.000	131.026		100.00	1.031	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e ft ²	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 150.00-108.00	128.12	1.061	6	1.4602	104.850	A	0.000	104.850	104.850	100.00	0.000	0.000
						B	0.000	104.850			0.000	0.000
						C	0.000	104.850			13.841	0.000
L2 108.00-69.75	88.44	0.954	5	1.4071	120.255	A	0.000	120.255	120.255	100.00	0.000	0.000
						B	0.000	120.255			0.000	0.000
						C	0.000	120.255			12.605	0.000
L3 69.75-32.50	51.04	0.815	5	1.3318	138.972	A	0.000	138.972	138.972	100.00	0.000	0.000
						B	0.000	138.972			0.000	0.000
						C	0.000	138.972			11.880	0.000
L4 32.50-0.00	15.87	0.7	4	1.1850	138.240	A	0.000	138.240	138.240	100.00	0.000	0.000
						B	0.000	138.240			0.000	0.000
						C	0.000	138.240			8.356	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e ft ²	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 150.00-108.00	128.12	1.061	8	94.628	A	0.000	94.628	94.628	100.00	0.000	0.000
					B	0.000	94.628			0.000	0.000
					C	0.000	94.628			1.575	0.000
L2 108.00-69.75	88.44	0.954	7	110.946	A	0.000	110.946	110.946	100.00	0.000	0.000
					B	0.000	110.946			0.000	0.000
					C	0.000	110.946			1.434	0.000
L3 69.75-32.50	51.04	0.815	6	130.236	A	0.000	130.236	130.236	100.00	0.000	0.000
					B	0.000	130.236			0.000	0.000
					C	0.000	130.236			1.397	0.000
L4 32.50-0.00	15.87	0.7	5	131.026	A	0.000	131.026	131.026	100.00	0.000	0.000
					B	0.000	131.026			0.000	0.000
					C	0.000	131.026			1.031	0.000

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Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 150.00-108.00	0.70	2.99	A	1	0.95	38	1	1	94.628	3.75	89.29	C
			B	1	0.95							
			C	1	0.95							
L2 108.00-69.75	1.12	4.75	A	1	0.95	34	1	1	110.946	3.95	103.31	C
			B	1	0.95							
			C	1	0.95							
L3 69.75-32.50	1.09	6.87	A	1	0.95	29	1	1	130.236	3.95	105.99	C
			B	1	0.95							
			C	1	0.95							
L4 32.50-0.00	0.95	8.36	A	1	0.95	25	1	1	131.026	3.43	105.57	C
			B	1	0.95							
			C	1	0.95							
Sum Weight:	3.86	22.97						OTM	1085.95 kip-ft	15.08		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 150.00-108.00	0.70	2.99	A	1	0.95	38	1	1	94.628	3.75	89.29	C
			B	1	0.95							
			C	1	0.95							
L2 108.00-69.75	1.12	4.75	A	1	0.95	34	1	1	110.946	3.95	103.31	C
			B	1	0.95							
			C	1	0.95							
L3 69.75-32.50	1.09	6.87	A	1	0.95	29	1	1	130.236	3.95	105.99	C
			B	1	0.95							
			C	1	0.95							
L4 32.50-0.00	0.95	8.36	A	1	0.95	25	1	1	131.026	3.43	105.57	C
			B	1	0.95							
			C	1	0.95							
Sum Weight:	3.86	22.97						OTM	1085.95 kip-ft	15.08		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 150.00-108.00	0.70	2.99	A	1	0.95	38	1	1	94.628	3.75	89.29	C
			B	1	0.95							
			C	1	0.95							
L2	1.12	4.75	A	1	0.95	34	1	1	110.946	3.95	103.31	C

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Section Elevation ft	Add Weight K	Self Weight K	Face	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
108.00-69.75			B	1	0.95		1	1	110.946			
			C	1	0.95		1	1	110.946			
L3 69.75-32.50	1.09	6.87	A	1	0.95	29	1	1	130.236	3.95	105.99	C
			B	1	0.95		1	1	130.236			
			C	1	0.95		1	1	130.236			
L4 32.50-0.00	0.95	8.36	A	1	0.95	25	1	1	131.026	3.43	105.57	C
			B	1	0.95		1	1	131.026			
			C	1	0.95		1	1	131.026			
Sum Weight:	3.86	22.97						OTM	1085.95 kip-ft	15.08		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 150.00-108.00	0.84	5.11	A	1	1.2	6	1	1	104.850	0.84	20.00	C
			B	1	1.2		1	1	104.850			
			C	1	1.2		1	1	104.850			
L2 108.00-69.75	1.24	7.12	A	1	1.2	5	1	1	120.255	0.87	22.63	C
			B	1	1.2		1	1	120.255			
			C	1	1.2		1	1	120.255			
L3 69.75-32.50	1.20	9.48	A	1	1.2	5	1	1	138.972	0.85	22.86	C
			B	1	1.2		1	1	138.972			
			C	1	1.2		1	1	138.972			
L4 32.50-0.00	1.03	10.68	A	1	1.2	4	1	1	138.240	0.73	22.51	C
			B	1	1.2		1	1	138.240			
			C	1	1.2		1	1	138.240			
Sum Weight:	4.31	32.38						OTM	239.23 kip-ft	3.29		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 150.00-108.00	0.84	5.11	A	1	1.2	6	1	1	104.850	0.84	20.00	C
			B	1	1.2		1	1	104.850			
			C	1	1.2		1	1	104.850			
L2 108.00-69.75	1.24	7.12	A	1	1.2	5	1	1	120.255	0.87	22.63	C
			B	1	1.2		1	1	120.255			
			C	1	1.2		1	1	120.255			
L3 69.75-32.50	1.20	9.48	A	1	1.2	5	1	1	138.972	0.85	22.86	C
			B	1	1.2		1	1	138.972			
			C	1	1.2		1	1	138.972			
L4 32.50-0.00	1.03	10.68	A	1	1.2	4	1	1	138.240	0.73	22.51	C
			B	1	1.2		1	1	138.240			
			A	1	1.2		1	1	138.240			

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Section Elevation <i>ft</i>	Add Weight <i>K</i>	Self Weight <i>K</i>	F a c e	<i>e</i>	C_F	q_z <i>psf</i>	D_F	D_R	A_E <i>ft²</i>	F <i>K</i>	w <i>plf</i>	Ctrl. Face
Sum Weight:	4.31	32.38	C	1	1.2		1	1 OTM	138.240 239.23 kip-ft	3.29		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation <i>ft</i>	Add Weight <i>K</i>	Self Weight <i>K</i>	F a c e	<i>e</i>	C_F	q_z <i>psf</i>	D_F	D_R	A_E <i>ft²</i>	F <i>K</i>	w <i>plf</i>	Ctrl. Face
L1 150.00-108.00	0.84	5.11	A B C	1	1.2	6	1	1 1 1	104.850 104.850 104.850	0.84	20.00	C
L2 108.00-69.75	1.24	7.12	A B C	1	1.2	5	1	1 1 1	120.255 120.255 120.255	0.87	22.63	C
L3 69.75-32.50	1.20	9.48	A B C	1	1.2	5	1	1 1 1	138.972 138.972 138.972	0.85	22.86	C
L4 32.50-0.00	1.03	10.68	A B C	1	1.2	4	1	1 1 1	138.240 138.240 138.240	0.73	22.51	C
Sum Weight:	4.31	32.38		1	1.2		1	1 OTM	239.23 kip-ft	3.29		

Tower Forces - Service - Wind Normal To Face

Section Elevation <i>ft</i>	Add Weight <i>K</i>	Self Weight <i>K</i>	F a c e	<i>e</i>	C_F	q_z <i>psf</i>	D_F	D_R	A_E <i>ft²</i>	F <i>K</i>	w <i>plf</i>	Ctrl. Face
L1 150.00-108.00	0.70	2.99	A B C	1	0.95	8	1	1 1 1	94.628 94.628 94.628	0.81	19.38	C
L2 108.00-69.75	1.12	4.75	A B C	1	0.95	7	1	1 1 1	110.946 110.946 110.946	0.86	22.42	C
L3 69.75-32.50	1.09	6.87	A B C	1	0.95	6	1	1 1 1	130.236 130.236 130.236	0.86	23.00	C
L4 32.50-0.00	0.95	8.36	A B C	1	0.95	5	1	1 1 1	131.026 131.026 131.026	0.74	22.91	C
Sum Weight:	3.86	22.97		1	0.95		1	1 OTM	235.65 kip-ft	3.27		

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Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 150.00-108.00	0.70	2.99	A	1	0.95	8	1	1	94.628	0.81	19.38	C
			B	1	0.95							
			C	1	0.95							
L2 108.00-69.75	1.12	4.75	A	1	0.95	7	1	1	110.946	0.86	22.42	C
			B	1	0.95							
			C	1	0.95							
L3 69.75-32.50	1.09	6.87	A	1	0.95	6	1	1	130.236	0.86	23.00	C
			B	1	0.95							
			C	1	0.95							
L4 32.50-0.00	0.95	8.36	A	1	0.95	5	1	1	131.026	0.74	22.91	C
			B	1	0.95							
			C	1	0.95							
Sum Weight:	3.86	22.97						OTM	235.65 kip-ft	3.27		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
L1 150.00-108.00	0.70	2.99	A	1	0.95	8	1	1	94.628	0.81	19.38	C
			B	1	0.95							
			C	1	0.95							
L2 108.00-69.75	1.12	4.75	A	1	0.95	7	1	1	110.946	0.86	22.42	C
			B	1	0.95							
			C	1	0.95							
L3 69.75-32.50	1.09	6.87	A	1	0.95	6	1	1	130.236	0.86	23.00	C
			B	1	0.95							
			C	1	0.95							
L4 32.50-0.00	0.95	8.36	A	1	0.95	5	1	1	131.026	0.74	22.91	C
			B	1	0.95							
			C	1	0.95							
Sum Weight:	3.86	22.97						OTM	235.65 kip-ft	3.27		

Discrete Appurtenance Pressures - No Ice G_H = 1.100

Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z psf	C _{Ac} Front ft ²	C _{Ac} Side ft ²
LLPX310R w/ Mount Pipe	0.0000	0.05	0.00	-4.92	148.00	1.105	40	4.54	2.98
LLPX310R w/ Mount Pipe	120.0000	0.05	4.26	2.46	148.00	1.105	40	4.54	2.98

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Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z psf	C _{AAc} Front ft ²	C _{AAc} Side ft ²
LLPX310R w/ Mount Pipe	240.0000	0.05	-4.26	2.46	148.00	1.105	40	4.54	2.98
FDD_R6_RRH	0.0000	0.06	0.00	-4.92	148.00	1.105	40	3.07	1.37
FDD_R6_RRH	120.0000	0.06	4.26	2.46	148.00	1.105	40	3.07	1.37
FDD_R6_RRH	240.0000	0.06	-4.26	2.46	148.00	1.105	40	3.07	1.37
APXVTM14-C-120 w/ Mount Pipe	0.0000	0.08	0.00	-4.92	150.00	1.110	40	4.09	2.86
APXVTM14-C-120 w/ Mount Pipe	120.0000	0.08	4.26	2.46	150.00	1.110	40	4.09	2.86
APXVTM14-C-120 w/ Mount Pipe	240.0000	0.08	-4.26	2.46	150.00	1.110	40	4.09	2.86
APXVSP18-C-A20 w/ Mount Pipe	0.0000	0.10	0.00	-4.92	150.00	1.110	40	4.60	4.01
APXVSP18-C-A20 w/ Mount Pipe	120.0000	0.10	4.26	2.46	150.00	1.110	40	4.60	4.01
APXVSP18-C-A20 w/ Mount Pipe	240.0000	0.10	-4.26	2.46	150.00	1.110	40	4.60	4.01
800 EXTERNAL NOTCH FILTER	0.0000	0.01	0.00	-4.92	150.00	1.110	40	0.66	0.32
800 EXTERNAL NOTCH FILTER	120.0000	0.01	4.26	2.46	150.00	1.110	40	0.66	0.32
800 EXTERNAL NOTCH FILTER	240.0000	0.01	-4.26	2.46	150.00	1.110	40	0.66	0.32
800MHZ RRH	0.0000	0.05	0.00	-4.92	150.00	1.110	40	2.13	1.77
800MHZ RRH	120.0000	0.05	4.26	2.46	150.00	1.110	40	2.13	1.77
800MHZ RRH	240.0000	0.05	-4.26	2.46	150.00	1.110	40	2.13	1.77
ACU-A20-N	0.0000	0.00	0.00	-4.92	150.00	1.110	40	0.20	0.35
ACU-A20-N	120.0000	0.00	4.26	2.46	150.00	1.110	40	0.20	0.35
ACU-A20-N	240.0000	0.00	-4.26	2.46	150.00	1.110	40	0.20	0.35
TD-RRH8x20-25	0.0000	0.07	0.00	-4.92	150.00	1.110	40	3.70	1.29
TD-RRH8x20-25	0.0000	0.07	0.00	-4.92	150.00	1.110	40	3.70	1.29
TD-RRH8x20-25	240.0000	0.07	-4.26	2.46	150.00	1.110	40	3.70	1.29
1900MHz RRH (65MHz)	0.0000	0.06	0.00	-4.92	150.00	1.110	40	2.31	2.38
1900MHz RRH (65MHz)	120.0000	0.06	4.26	2.46	150.00	1.110	40	2.31	2.38
1900MHz RRH (65MHz)	240.0000	0.06	-4.26	2.46	150.00	1.110	40	2.31	2.38
Pipe Mount	0.0000	0.04	0.00	-4.92	150.00	1.110	40	2.40	2.40
Pipe Mount	120.0000	0.04	4.26	2.46	150.00	1.110	40	2.40	2.40
Pipe Mount	240.0000	0.04	-4.26	2.46	150.00	1.110	40	2.40	2.40
MC-PA 12L-B	0.0000	1.23	0.00	0.00	150.00	1.110	40	15.60	15.60
APXV18-206517S-C	0.0000	0.03	0.00	-1.98	142.00	1.092	39	3.83	1.81
APXV18-206517S-C	120.0000	0.03	1.72	0.99	142.00	1.092	39	3.83	1.81
APXV18-206517S-C	240.0000	0.03	-1.72	0.99	142.00	1.092	39	3.83	1.81
Pipe Mount [PM 601-3]	0.0000	0.20	0.00	0.00	142.00	1.092	39	4.39	4.39
844G90VTA-SX w/ Mount Pipe	0.0000	0.12	0.00	-5.05	135.00	1.077	39	13.19	19.21
844G90VTA-SX w/ Mount Pipe	120.0000	0.12	4.37	2.53	135.00	1.077	39	13.19	19.21
844G90VTA-SX w/ Mount Pipe	240.0000	0.12	-4.37	2.53	135.00	1.077	39	13.19	19.21
Platform Mount [LP 1201-1]	0.0000	2.10	0.00	0.00	134.00	1.074	38	23.10	23.10
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	0.0000	0.11	0.00	-5.18	120.00	1.041	37	6.33	5.64
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120.0000	0.11	4.48	2.59	120.00	1.041	37	6.33	5.64
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	240.0000	0.11	-4.48	2.59	120.00	1.041	37	6.33	5.64
APXVAARR24_43-U-N A20 w/ Mount Pipe	0.0000	0.19	0.00	-5.18	120.00	1.041	37	14.69	6.87
APXVAARR24_43-U-N A20 w/ Mount Pipe	120.0000	0.19	4.48	2.59	120.00	1.041	37	14.69	6.87

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Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z psf	C _{AAc} Front ft ²	C _{AAc} Side ft ²
APXVAARR24_43-U-N A20 w/ Mount Pipe	240.0000	0.19	-4.48	2.59	120.00	1.041	37	14.69	6.87
AIR -32 B2A/B66AA w/ Mount Pipe	300.0000	0.15	-4.48	-2.59	120.00	1.041	37	6.75	6.07
AIR -32 B2A/B66AA w/ Mount Pipe	60.0000	0.15	4.48	-2.59	120.00	1.041	37	6.75	6.07
AIR -32 B2A/B66AA w/ Mount Pipe	180.0000	0.15	0.00	5.18	120.00	1.041	37	6.75	6.07
KRY 112 144/1	0.0000	0.01	0.00	-5.18	120.00	1.041	37	0.35	0.16
KRY 112 144/1	120.0000	0.01	4.48	2.59	120.00	1.041	37	0.35	0.16
KRY 112 144/1	240.0000	0.01	-4.48	2.59	120.00	1.041	37	0.35	0.16
RADIO 4449 B12/B71	0.0000	0.08	0.00	-5.18	120.00	1.041	37	1.65	1.30
RADIO 4449 B12/B71	120.0000	0.08	4.48	2.59	120.00	1.041	37	1.65	1.30
RADIO 4449 B12/B71	240.0000	0.08	-4.48	2.59	120.00	1.041	37	1.65	1.30
Platform Mount [LP 303-1]	0.0000	1.25	0.00	0.00	119.00	1.039	37	14.66	14.66
SitePro1 [P/N: PRK-1245]	0.0000	0.47	0.00	0.00	119.00	1.039	37	11.84	11.84
SitePro1 [P/N: HRK-12-U]	0.0000	0.41	0.00	0.00	119.00	1.039	37	5.38	5.38
KS24019-L112A	120.0000	0.01	4.61	2.66	100.00	0.988	35	0.14	0.14
Side Arm Mount [SO 702-1]	0.0000	0.03	0.00	0.00	99.00	0.985	35	1.00	1.43
Sum Weight:		9.28							

Discrete Appurtenance Pressures - With Ice G_H = 1.100

Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z psf	C _{AAc} Front ft ²	C _{AAc} Side ft ²	t _z in
LLPX310R w/ Mount Pipe	0.0000	0.18	0.00	-4.92	148.00	1.105	6	5.62	4.64	1.4814
LLPX310R w/ Mount Pipe	120.0000	0.18	4.26	2.46	148.00	1.105	6	5.62	4.64	1.4814
LLPX310R w/ Mount Pipe	240.0000	0.18	-4.26	2.46	148.00	1.105	6	5.62	4.64	1.4814
FDD_R6_RRH	0.0000	0.15	0.00	-4.92	148.00	1.105	6	4.04	2.11	1.4814
FDD_R6_RRH	120.0000	0.15	4.26	2.46	148.00	1.105	6	4.04	2.11	1.4814
FDD_R6_RRH	240.0000	0.15	-4.26	2.46	148.00	1.105	6	4.04	2.11	1.4814
APXVTM14-C-120 w/ Mount Pipe	0.0000	0.26	0.00	-4.92	150.00	1.110	6	5.28	3.99	1.4834
APXVTM14-C-120 w/ Mount Pipe	120.0000	0.26	4.26	2.46	150.00	1.110	6	5.28	3.99	1.4834
APXVTM14-C-120 w/ Mount Pipe	240.0000	0.26	-4.26	2.46	150.00	1.110	6	5.28	3.99	1.4834
APXVSP18-C-A20 w/ Mount Pipe	0.0000	0.32	0.00	-4.92	150.00	1.110	6	5.95	5.34	1.4834
APXVSP18-C-A20 w/ Mount Pipe	120.0000	0.32	4.26	2.46	150.00	1.110	6	5.95	5.34	1.4834
APXVSP18-C-A20 w/ Mount Pipe	240.0000	0.32	-4.26	2.46	150.00	1.110	6	5.95	5.34	1.4834
800 EXTERNAL NOTCH FILTER	0.0000	0.03	0.00	-4.92	150.00	1.110	6	0.99	0.58	1.4834
800 EXTERNAL NOTCH FILTER	120.0000	0.03	4.26	2.46	150.00	1.110	6	0.99	0.58	1.4834
800 EXTERNAL NOTCH FILTER	240.0000	0.03	-4.26	2.46	150.00	1.110	6	0.99	0.58	1.4834

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Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z psf	C _{AAc} Front ft ²	C _{AAc} Side ft ²	t _z in
800MHZ RRH	0.0000	0.13	0.00	-4.92	150.00	1.110	6	2.71	2.31	1.4834
800MHZ RRH	120.0000	0.13	4.26	2.46	150.00	1.110	6	2.71	2.31	1.4834
800MHZ RRH	240.0000	0.13	-4.26	2.46	150.00	1.110	6	2.71	2.31	1.4834
ACU-A20-N	0.0000	0.02	0.00	-4.92	150.00	1.110	6	0.61	0.83	1.4834
ACU-A20-N	120.0000	0.02	4.26	2.46	150.00	1.110	6	0.61	0.83	1.4834
ACU-A20-N	240.0000	0.02	-4.26	2.46	150.00	1.110	6	0.61	0.83	1.4834
TD-RRH8x20-25	0.0000	0.15	0.00	-4.92	150.00	1.110	6	4.45	1.82	1.4834
TD-RRH8x20-25	0.0000	0.15	0.00	-4.92	150.00	1.110	6	4.45	1.82	1.4834
TD-RRH8x20-25	240.0000	0.15	-4.26	2.46	150.00	1.110	6	4.45	1.82	1.4834
1900MHz RRH (65MHz)	0.0000	0.14	0.00	-4.92	150.00	1.110	6	2.94	3.01	1.4834
1900MHz RRH (65MHz)	120.0000	0.14	4.26	2.46	150.00	1.110	6	2.94	3.01	1.4834
1900MHz RRH (65MHz)	240.0000	0.14	-4.26	2.46	150.00	1.110	6	2.94	3.01	1.4834
Pipe Mount	0.0000	0.12	0.00	-4.92	150.00	1.110	6	4.26	4.26	1.4834
Pipe Mount	120.0000	0.12	4.26	2.46	150.00	1.110	6	4.26	4.26	1.4834
Pipe Mount	240.0000	0.12	-4.26	2.46	150.00	1.110	6	4.26	4.26	1.4834
MC-PA 12L-B	0.0000	2.15	0.00	0.00	150.00	1.110	6	26.87	26.87	1.4834
APXV18-206517S-C	0.0000	0.13	0.00	-1.98	142.00	1.092	6	5.74	3.64	1.4753
APXV18-206517S-C	120.0000	0.13	1.72	0.99	142.00	1.092	6	5.74	3.64	1.4753
APXV18-206517S-C	240.0000	0.13	-1.72	0.99	142.00	1.092	6	5.74	3.64	1.4753
Pipe Mount [PM 601-3]	0.0000	0.32	0.00	0.00	142.00	1.092	6	7.61	7.61	1.4753
844G90VTA-SX w/ Mount Pipe	0.0000	0.67	0.00	-5.05	135.00	1.077	6	17.56	26.59	1.4679
844G90VTA-SX w/ Mount Pipe	120.0000	0.67	4.37	2.53	135.00	1.077	6	17.56	26.59	1.4679
844G90VTA-SX w/ Mount Pipe	240.0000	0.67	-4.37	2.53	135.00	1.077	6	17.56	26.59	1.4679
Platform Mount [LP 1201-1]	0.0000	3.27	0.00	0.00	134.00	1.074	6	33.95	33.95	1.4668
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	0.0000	0.30	0.00	-5.18	120.00	1.041	6	7.62	7.79	1.4507
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120.0000	0.30	4.48	2.59	120.00	1.041	6	7.62	7.79	1.4507
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	240.0000	0.30	-4.48	2.59	120.00	1.041	6	7.62	7.79	1.4507
APXVAARR24 43-U-N A20 w/ Mount Pipe	0.0000	0.61	0.00	-5.18	120.00	1.041	6	16.95	8.89	1.4507
APXVAARR24 43-U-N A20 w/ Mount Pipe	120.0000	0.61	4.48	2.59	120.00	1.041	6	16.95	8.89	1.4507
APXVAARR24 43-U-N A20 w/ Mount Pipe	240.0000	0.61	-4.48	2.59	120.00	1.041	6	16.95	8.89	1.4507
AIR -32 B2A/B66AA w/ Mount Pipe	300.0000	0.35	-4.48	-2.59	120.00	1.041	6	8.06	8.25	1.4507
AIR -32 B2A/B66AA w/ Mount Pipe	60.0000	0.35	4.48	-2.59	120.00	1.041	6	8.06	8.25	1.4507
AIR -32 B2A/B66AA w/ Mount Pipe	180.0000	0.35	0.00	5.18	120.00	1.041	6	8.06	8.25	1.4507
KRY 112 144/1	0.0000	0.02	0.00	-5.18	120.00	1.041	6	0.60	0.35	1.4507
KRY 112 144/1	120.0000	0.02	4.48	2.59	120.00	1.041	6	0.60	0.35	1.4507
KRY 112 144/1	240.0000	0.02	-4.48	2.59	120.00	1.041	6	0.60	0.35	1.4507
RADIO 4449 B12/B71	0.0000	0.13	0.00	-5.18	120.00	1.041	6	2.14	1.74	1.4507
RADIO 4449 B12/B71	120.0000	0.13	4.48	2.59	120.00	1.041	6	2.14	1.74	1.4507
RADIO 4449 B12/B71	240.0000	0.13	-4.48	2.59	120.00	1.041	6	2.14	1.74	1.4507
Platform Mount [LP 303-1]	0.0000	1.92	0.00	0.00	119.00	1.039	6	26.86	26.86	1.4495
SitePro1 [P/N: PRK-1245]	0.0000	1.39	0.00	0.00	119.00	1.039	6	26.68	26.68	1.4495
SitePro1 [P/N: HRK-12-U]	0.0000	0.74	0.00	0.00	119.00	1.039	6	10.37	10.37	1.4495
KS24019-L112A	120.0000	0.01	4.61	2.66	100.00	0.988	6	0.33	0.33	1.4245
Side Arm Mount [SO 702-1]	0.0000	0.06	0.00	0.00	99.00	0.985	6	1.71	3.19	1.4231

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Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z psf	C _{AAc} Front ft ²	C _{AAc} Side ft ²	t _z in
Sum Weight:		21.01								

Discrete Appurtenance Pressures - Service G_H = 1.100

Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z psf	C _{AAc} Front ft ²	C _{AAc} Side ft ²
LLPX310R w/ Mount Pipe	0.0000	0.05	0.00	-4.92	148.00	1.105	9	4.54	2.98
LLPX310R w/ Mount Pipe	120.0000	0.05	4.26	2.46	148.00	1.105	9	4.54	2.98
LLPX310R w/ Mount Pipe	240.0000	0.05	-4.26	2.46	148.00	1.105	9	4.54	2.98
FDD_R6_RRH	0.0000	0.06	0.00	-4.92	148.00	1.105	9	3.07	1.37
FDD_R6_RRH	120.0000	0.06	4.26	2.46	148.00	1.105	9	3.07	1.37
FDD_R6_RRH	240.0000	0.06	-4.26	2.46	148.00	1.105	9	3.07	1.37
APXVTM14-C-120 w/ Mount Pipe	0.0000	0.08	0.00	-4.92	150.00	1.110	9	4.09	2.86
APXVTM14-C-120 w/ Mount Pipe	120.0000	0.08	4.26	2.46	150.00	1.110	9	4.09	2.86
APXVTM14-C-120 w/ Mount Pipe	240.0000	0.08	-4.26	2.46	150.00	1.110	9	4.09	2.86
APXVSP18-C-A20 w/ Mount Pipe	0.0000	0.10	0.00	-4.92	150.00	1.110	9	4.60	4.01
APXVSP18-C-A20 w/ Mount Pipe	120.0000	0.10	4.26	2.46	150.00	1.110	9	4.60	4.01
APXVSP18-C-A20 w/ Mount Pipe	240.0000	0.10	-4.26	2.46	150.00	1.110	9	4.60	4.01
800 EXTERNAL NOTCH FILTER	0.0000	0.01	0.00	-4.92	150.00	1.110	9	0.66	0.32
800 EXTERNAL NOTCH FILTER	120.0000	0.01	4.26	2.46	150.00	1.110	9	0.66	0.32
800 EXTERNAL NOTCH FILTER	240.0000	0.01	-4.26	2.46	150.00	1.110	9	0.66	0.32
800MHZ RRH	0.0000	0.05	0.00	-4.92	150.00	1.110	9	2.13	1.77
800MHZ RRH	120.0000	0.05	4.26	2.46	150.00	1.110	9	2.13	1.77
800MHZ RRH	240.0000	0.05	-4.26	2.46	150.00	1.110	9	2.13	1.77
ACU-A20-N	0.0000	0.00	0.00	-4.92	150.00	1.110	9	0.20	0.35
ACU-A20-N	120.0000	0.00	4.26	2.46	150.00	1.110	9	0.20	0.35
ACU-A20-N	240.0000	0.00	-4.26	2.46	150.00	1.110	9	0.20	0.35
TD-RRH8x20-25	0.0000	0.07	0.00	-4.92	150.00	1.110	9	3.70	1.29
TD-RRH8x20-25	0.0000	0.07	0.00	-4.92	150.00	1.110	9	3.70	1.29
TD-RRH8x20-25	240.0000	0.07	-4.26	2.46	150.00	1.110	9	3.70	1.29
1900MHz RRH (65MHz)	0.0000	0.06	0.00	-4.92	150.00	1.110	9	2.31	2.38
1900MHz RRH (65MHz)	120.0000	0.06	4.26	2.46	150.00	1.110	9	2.31	2.38
1900MHz RRH (65MHz)	240.0000	0.06	-4.26	2.46	150.00	1.110	9	2.31	2.38
Pipe Mount	0.0000	0.04	0.00	-4.92	150.00	1.110	9	2.40	2.40
Pipe Mount	120.0000	0.04	4.26	2.46	150.00	1.110	9	2.40	2.40
Pipe Mount	240.0000	0.04	-4.26	2.46	150.00	1.110	9	2.40	2.40
MC-PA 12L-B	0.0000	1.23	0.00	0.00	150.00	1.110	9	15.60	15.60
APXV18-206517S-C	0.0000	0.03	0.00	-1.98	142.00	1.092	8	3.83	1.81
APXV18-206517S-C	120.0000	0.03	1.72	0.99	142.00	1.092	8	3.83	1.81
APXV18-206517S-C	240.0000	0.03	-1.72	0.99	142.00	1.092	8	3.83	1.81
Pipe Mount [PM 601-3]	0.0000	0.20	0.00	0.00	142.00	1.092	8	4.39	4.39
844G90VTA-SX w/ Mount Pipe	0.0000	0.12	0.00	-5.05	135.00	1.077	8	13.19	19.21
844G90VTA-SX w/	120.0000	0.12	4.37	2.53	135.00	1.077	8	13.19	19.21

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Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	z ft	K _z	q _z psf	C _A A _C Front ft ²	C _A A _C Side ft ²
Mount Pipe									
844G90VTA-SX w/	240.0000	0.12	-4.37	2.53	135.00	1.077	8	13.19	19.21
Mount Pipe									
Platform Mount [LP	0.0000	2.10	0.00	0.00	134.00	1.074	8	23.10	23.10
1201-1]									
ERICSSON AIR 21 B2A	0.0000	0.11	0.00	-5.18	120.00	1.041	8	6.33	5.64
B4P w/ Mount Pipe									
ERICSSON AIR 21 B2A	120.0000	0.11	4.48	2.59	120.00	1.041	8	6.33	5.64
B4P w/ Mount Pipe									
ERICSSON AIR 21 B2A	240.0000	0.11	-4.48	2.59	120.00	1.041	8	6.33	5.64
B4P w/ Mount Pipe									
APXVAARR24_43-U-N	0.0000	0.19	0.00	-5.18	120.00	1.041	8	14.69	6.87
A20 w/ Mount Pipe									
APXVAARR24_43-U-N	120.0000	0.19	4.48	2.59	120.00	1.041	8	14.69	6.87
A20 w/ Mount Pipe									
APXVAARR24_43-U-N	240.0000	0.19	-4.48	2.59	120.00	1.041	8	14.69	6.87
A20 w/ Mount Pipe									
AIR -32 B2A/B66AA w/	300.0000	0.15	-4.48	-2.59	120.00	1.041	8	6.75	6.07
Mount Pipe									
AIR -32 B2A/B66AA w/	60.0000	0.15	4.48	-2.59	120.00	1.041	8	6.75	6.07
Mount Pipe									
AIR -32 B2A/B66AA w/	180.0000	0.15	0.00	5.18	120.00	1.041	8	6.75	6.07
Mount Pipe									
KRY 112 144/1	0.0000	0.01	0.00	-5.18	120.00	1.041	8	0.35	0.16
KRY 112 144/1	120.0000	0.01	4.48	2.59	120.00	1.041	8	0.35	0.16
KRY 112 144/1	240.0000	0.01	-4.48	2.59	120.00	1.041	8	0.35	0.16
RADIO 4449 B12/B71	0.0000	0.08	0.00	-5.18	120.00	1.041	8	1.65	1.30
RADIO 4449 B12/B71	120.0000	0.08	4.48	2.59	120.00	1.041	8	1.65	1.30
RADIO 4449 B12/B71	240.0000	0.08	-4.48	2.59	120.00	1.041	8	1.65	1.30
Platform Mount [LP	0.0000	1.25	0.00	0.00	119.00	1.039	8	14.66	14.66
303-1]									
SitePro1 [P/N:	0.0000	0.47	0.00	0.00	119.00	1.039	8	11.84	11.84
PRK-1245]									
SitePro1 [P/N:	0.0000	0.41	0.00	0.00	119.00	1.039	8	5.38	5.38
HRK-12-U]									
KS24019-L112A	120.0000	0.01	4.61	2.66	100.00	0.988	8	0.14	0.14
Side Arm Mount [SO	0.0000	0.03	0.00	0.00	99.00	0.985	8	1.00	1.43
702-1]									
Sum		9.28							
Weight:									

Dish Pressures - No Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	K _z	A _A ft ²	q _z psf
152.00	A-ANT-23G-2-C	0.0000	0.03	0.00	-4.92	1.114	3.72	40
152.00	A-ANT-23G-2-C	120.0000	0.03	4.26	2.46	1.114	3.72	40
152.00	A-ANT-23G-2-C	240.0000	0.03	-4.26	2.46	1.114	3.72	40
153.00	A-ANT-23G-1-C	240.0000	0.03	-4.26	2.46	1.116	0.99	40
	Sum		0.12					
	Weight:							

Dish Pressures - With Ice

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Elevation ft	Dish Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	K _z	A _A ft ²	q _z psf	t _z in
152.00	A-ANT-23G-2-C	0.0000	0.09	0.00	-4.92	1.114	4.58	6	1.4854
152.00	A-ANT-23G-2-C	120.0000	0.09	4.26	2.46	1.114	4.58	6	1.4854
152.00	A-ANT-23G-2-C	240.0000	0.09	-4.26	2.46	1.114	4.58	6	1.4854
153.00	A-ANT-23G-1-C	240.0000	0.05	-4.26	2.46	1.116	1.45	6	1.4864
	Sum		0.32						
	Weight:								

Dish Pressures - Service

Elevation ft	Dish Description	Aiming Azimuth °	Weight K	Offset _x ft	Offset _z ft	K _z	A _A ft ²	q _z psf
152.00	A-ANT-23G-2-C	0.0000	0.03	0.00	-4.92	1.114	3.72	9
152.00	A-ANT-23G-2-C	120.0000	0.03	4.26	2.46	1.114	3.72	9
152.00	A-ANT-23G-2-C	240.0000	0.03	-4.26	2.46	1.114	3.72	9
153.00	A-ANT-23G-1-C	240.0000	0.03	-4.26	2.46	1.116	0.99	9
	Sum		0.12					
	Weight:							

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M _x kip-ft	Sum of Overturning Moments, M _z kip-ft	Sum of Torques kip-ft
Leg Weight	22.97					
Bracing Weight	0.00					
Total Member Self-Weight	22.97			-0.38	0.40	
Total Weight	36.22			-0.38	0.40	
Wind 0 deg - No Ice		0.07	-25.76	-2526.58	-9.98	-0.27
Wind 30 deg - No Ice		12.90	-22.33	-2192.11	-1266.29	-0.19
Wind 60 deg - No Ice		22.24	-12.94	-1272.04	-2177.54	-0.41
Wind 90 deg - No Ice		25.65	-0.09	-13.82	-2509.71	-0.52
Wind 120 deg - No Ice		22.18	12.82	1253.73	-2167.92	-0.14
Wind 150 deg - No Ice		12.75	22.31	2188.38	-1242.91	0.33
Wind 180 deg - No Ice		-0.06	25.78	2528.75	9.20	0.29
Wind 210 deg - No Ice		-12.84	22.36	2194.77	1257.86	0.19
Wind 240 deg - No Ice		-22.21	12.92	1268.80	2174.06	0.41
Wind 270 deg - No Ice		-25.64	0.02	3.34	2508.86	0.53
Wind 300 deg - No Ice		-22.19	-12.84	-1257.33	2170.47	0.12
Wind 330 deg - No Ice		-12.81	-22.28	-2183.81	1252.95	-0.33
Member Ice	9.42					
Total Weight Ice	58.03			-0.21	0.81	
Wind 0 deg - Ice		0.01	-5.79	-575.08	-1.25	-0.06
Wind 30 deg - Ice		2.90	-5.02	-498.80	-287.59	-0.05
Wind 60 deg - Ice		5.00	-2.90	-289.26	-495.56	-0.09
Wind 90 deg - Ice		5.77	-0.02	-2.81	-571.47	-0.11
Wind 120 deg - Ice		4.99	2.88	285.45	-493.79	-0.03
Wind 150 deg - Ice		2.87	5.01	497.89	-283.05	0.07
Wind 180 deg - Ice		-0.01	5.79	575.23	2.50	0.06
Wind 210 deg - Ice		-2.89	5.02	499.02	287.34	0.04
Wind 240 deg - Ice		-4.99	2.90	288.33	496.28	0.09
Wind 270 deg - Ice		-5.77	0.00	0.47	572.70	0.11
Wind 300 deg - Ice		-4.99	-2.89	-286.46	495.71	0.03
Wind 330 deg - Ice		-2.88	-5.01	-497.23	286.53	-0.07

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Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Total Weight	36.22			-0.38	0.40	
Wind 0 deg - Service		0.01	-5.59	-548.61	-1.85	-0.06
Wind 30 deg - Service		2.80	-4.85	-476.03	-274.47	-0.04
Wind 60 deg - Service		4.83	-2.81	-276.37	-472.21	-0.09
Wind 90 deg - Service		5.57	-0.02	-3.35	-544.29	-0.11
Wind 120 deg - Service		4.81	2.78	271.71	-470.12	-0.03
Wind 150 deg - Service		2.77	4.84	474.53	-269.39	0.07
Wind 180 deg - Service		-0.01	5.59	548.39	2.31	0.06
Wind 210 deg - Service		-2.79	4.85	475.91	273.27	0.04
Wind 240 deg - Service		-4.82	2.80	274.98	472.08	0.09
Wind 270 deg - Service		-5.56	0.01	0.38	544.73	0.11
Wind 300 deg - Service		-4.82	-2.79	-273.18	471.30	0.03
Wind 330 deg - Service		-2.78	-4.83	-474.23	272.20	-0.07

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 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

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Comb. No.	Description
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	150 - 108	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29.17	1.00	0.94
			Max. Mx	20	-14.20	328.88	-0.47
			Max. My	2	-14.18	-2.33	333.59
			Max. Vy	8	14.93	-328.30	4.20
			Max. Vx	14	15.06	2.91	-333.33
			Max. Torque	8			0.58
L2	108 - 69.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.47	0.94	0.72
			Max. Mx	20	-21.01	956.03	-1.47
			Max. My	14	-21.00	5.25	-966.02
			Max. Vy	8	18.74	-955.91	7.78
			Max. Vx	14	18.88	5.25	-966.02
			Max. Torque	8			0.58
L3	69.75 - 32.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-50.49	0.94	0.52
			Max. Mx	8	-30.43	-1706.92	11.21
			Max. My	14	-30.42	7.52	-1721.96
			Max. Vy	8	22.31	-1706.92	11.21
			Max. Vx	14	22.45	7.52	-1721.96
			Max. Torque	8			0.57
L4	32.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.23	0.94	0.33
			Max. Mx	8	-43.45	-2619.47	14.66
			Max. My	14	-43.45	9.80	-2639.48
			Max. Vy	8	25.67	-2619.47	14.66
			Max. Vx	14	25.80	9.80	-2639.48
			Max. Torque	8			0.57

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	28	66.23	-2.90	5.02
	Max. H _x	20	43.46	25.64	-0.02
	Max. H _z	2	43.46	-0.07	25.76

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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M _x	2	2637.40	-0.07	25.76
	Max. M _z	8	2619.47	-25.65	0.09
	Max. Torsion	8	0.57	-25.65	0.09
	Min. Vert	11	32.60	-22.18	-12.82
	Min. H _x	8	43.46	-25.65	0.09
	Min. H _z	14	43.46	0.06	-25.78
	Min. M _x	14	-2639.48	0.06	-25.78
	Min. M _z	20	-2618.78	25.64	-0.02
	Min. Torsion	20	-0.57	25.64	-0.02

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	36.22	0.00	0.00	-0.38	0.40	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	43.46	0.07	-25.76	-2637.40	-10.42	-0.30
0.9 Dead+1.0 Wind 0 deg - No Ice	32.60	0.07	-25.76	-2607.80	-10.41	-0.29
1.2 Dead+1.0 Wind 30 deg - No Ice	43.46	12.90	-22.33	-2288.32	-1321.72	-0.24
0.9 Dead+1.0 Wind 30 deg - No Ice	32.60	12.90	-22.33	-2262.60	-1307.07	-0.22
1.2 Dead+1.0 Wind 60 deg - No Ice	43.46	22.24	-12.94	-1327.98	-2272.79	-0.47
0.9 Dead+1.0 Wind 60 deg - No Ice	32.60	22.24	-12.94	-1312.98	-2247.54	-0.45
1.2 Dead+1.0 Wind 90 deg - No Ice	43.46	25.65	-0.09	-14.66	-2619.47	-0.57
0.9 Dead+1.0 Wind 90 deg - No Ice	32.60	25.65	-0.09	-14.33	-2590.38	-0.56
1.2 Dead+1.0 Wind 120 deg - No Ice	43.46	22.18	12.82	1308.51	-2262.69	-0.16
0.9 Dead+1.0 Wind 120 deg - No Ice	32.60	22.18	12.82	1294.03	-2237.58	-0.16
1.2 Dead+1.0 Wind 150 deg - No Ice	43.46	12.75	22.31	2284.22	-1297.09	0.35
0.9 Dead+1.0 Wind 150 deg - No Ice	32.60	12.75	22.31	2258.81	-1282.78	0.34
1.2 Dead+1.0 Wind 180 deg - No Ice	43.46	-0.06	25.78	2639.48	9.80	0.34
0.9 Dead+1.0 Wind 180 deg - No Ice	32.60	-0.06	25.78	2610.11	9.53	0.33
1.2 Dead+1.0 Wind 210 deg - No Ice	43.46	-12.84	22.36	2290.92	1313.03	0.24
0.9 Dead+1.0 Wind 210 deg - No Ice	32.60	-12.84	22.36	2265.42	1298.24	0.23
1.2 Dead+1.0 Wind 240 deg - No Ice	43.46	-22.21	12.92	1324.38	2269.34	0.46
0.9 Dead+1.0 Wind 240 deg - No Ice	32.60	-22.21	12.92	1309.68	2243.87	0.45
1.2 Dead+1.0 Wind 270 deg - No Ice	43.46	-25.64	0.02	3.43	2618.78	0.57
0.9 Dead+1.0 Wind 270 deg - No Ice	32.60	-25.64	0.02	3.51	2589.43	0.55
1.2 Dead+1.0 Wind 300 deg - No Ice	43.46	-22.19	-12.84	-1312.50	2265.58	0.13

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Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
No Ice						
0.9 Dead+1.0 Wind 300 deg - No Ice	32.60	-22.19	-12.84	-1297.72	2240.16	0.13
1.2 Dead+1.0 Wind 330 deg - No Ice	43.46	-12.81	-22.28	-2279.61	1307.88	-0.35
0.9 Dead+1.0 Wind 330 deg - No Ice	32.60	-12.81	-22.28	-2254.01	1293.15	-0.34
1.2 Dead+1.0 Ice+1.0 Temp	66.23	-0.00	-0.00	-0.33	0.94	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	66.23	0.01	-5.79	-624.08	-1.22	-0.08
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	66.23	2.90	-5.02	-541.34	-311.85	-0.07
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	66.23	5.00	-2.90	-314.03	-537.43	-0.12
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	66.23	5.77	-0.02	-3.28	-619.76	-0.13
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	66.23	4.99	2.88	309.47	-535.47	-0.04
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	66.23	2.87	5.01	540.00	-306.83	0.07
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	66.23	-0.01	5.79	623.90	2.92	0.08
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	66.23	-2.89	5.02	541.24	311.89	0.07
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	66.23	-5.00	2.90	312.66	538.55	0.12
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	66.23	-5.77	0.00	0.34	621.45	0.13
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	66.23	-4.99	-2.89	-310.93	537.91	0.03
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	66.23	-2.88	-5.01	-539.60	311.01	-0.07
Dead+Wind 0 deg - Service	36.22	0.01	-5.59	-568.87	-1.92	-0.07
Dead+Wind 30 deg - Service	36.22	2.80	-4.85	-493.62	-284.61	-0.05
Dead+Wind 60 deg - Service	36.22	4.83	-2.81	-286.58	-489.64	-0.10
Dead+Wind 90 deg - Service	36.22	5.57	-0.02	-3.46	-564.38	-0.12
Dead+Wind 120 deg - Service	36.22	4.81	2.78	281.78	-487.46	-0.03
Dead+Wind 150 deg - Service	36.22	2.77	4.84	492.12	-279.31	0.07
Dead+Wind 180 deg - Service	36.22	-0.01	5.59	568.71	2.43	0.07
Dead+Wind 210 deg - Service	36.22	-2.79	4.85	493.57	283.38	0.05
Dead+Wind 240 deg - Service	36.22	-4.82	2.80	285.20	489.54	0.10
Dead+Wind 270 deg - Service	36.22	-5.56	0.01	0.43	564.87	0.12
Dead+Wind 300 deg - Service	36.22	-4.82	-2.79	-283.25	488.72	0.03
Dead+Wind 330 deg - Service	36.22	-2.78	-4.83	-491.73	282.27	-0.07

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	0.00	-36.22	0.00	0.00	36.22	0.00	0.000%
2	0.07	-43.46	-25.76	-0.07	43.46	25.76	0.000%
3	0.07	-32.60	-25.76	-0.07	32.60	25.76	0.000%
4	12.90	-43.46	-22.33	-12.90	43.46	22.33	0.000%
5	12.90	-32.60	-22.33	-12.90	32.60	22.33	0.000%
6	22.24	-43.46	-12.94	-22.24	43.46	12.94	0.000%
7	22.24	-32.60	-12.94	-22.24	32.60	12.94	0.000%
8	25.65	-43.46	-0.09	-25.65	43.46	0.09	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	
9	25.65	-32.60	-0.09	-25.65	32.60	0.09	0.000%
10	22.18	-43.46	12.82	-22.18	43.46	-12.82	0.000%
11	22.18	-32.60	12.82	-22.18	32.60	-12.82	0.000%
12	12.75	-43.46	22.31	-12.75	43.46	-22.31	0.000%
13	12.75	-32.60	22.31	-12.75	32.60	-22.31	0.000%
14	-0.06	-43.46	25.78	0.06	43.46	-25.78	0.000%
15	-0.06	-32.60	25.78	0.06	32.60	-25.78	0.000%
16	-12.84	-43.46	22.36	12.84	43.46	-22.36	0.000%
17	-12.84	-32.60	22.36	12.84	32.60	-22.36	0.000%
18	-22.21	-43.46	12.92	22.21	43.46	-12.92	0.000%
19	-22.21	-32.60	12.92	22.21	32.60	-12.92	0.000%
20	-25.64	-43.46	0.02	25.64	43.46	-0.02	0.000%
21	-25.64	-32.60	0.02	25.64	32.60	-0.02	0.000%
22	-22.19	-43.46	-12.84	22.19	43.46	12.84	0.000%
23	-22.19	-32.60	-12.84	22.19	32.60	12.84	0.000%
24	-12.81	-43.46	-22.28	12.81	43.46	22.28	0.000%
25	-12.81	-32.60	-22.28	12.81	32.60	22.28	0.000%
26	0.00	-66.23	0.00	0.00	66.23	0.00	0.000%
27	0.01	-66.23	-5.79	-0.01	66.23	5.79	0.000%
28	2.90	-66.23	-5.02	-2.90	66.23	5.02	0.000%
29	5.00	-66.23	-2.90	-5.00	66.23	2.90	0.000%
30	5.77	-66.23	-0.02	-5.77	66.23	0.02	0.000%
31	4.99	-66.23	2.88	-4.99	66.23	-2.88	0.000%
32	2.87	-66.23	5.01	-2.87	66.23	-5.01	0.000%
33	-0.01	-66.23	5.79	0.01	66.23	-5.79	0.000%
34	-2.89	-66.23	5.02	2.89	66.23	-5.02	0.000%
35	-4.99	-66.23	2.90	5.00	66.23	-2.90	0.000%
36	-5.77	-66.23	0.00	5.77	66.23	-0.00	0.000%
37	-4.99	-66.23	-2.89	4.99	66.23	2.89	0.000%
38	-2.88	-66.23	-5.01	2.88	66.23	5.01	0.000%
39	0.01	-36.22	-5.59	-0.01	36.22	5.59	0.000%
40	2.80	-36.22	-4.85	-2.80	36.22	4.85	0.000%
41	4.83	-36.22	-2.81	-4.83	36.22	2.81	0.000%
42	5.57	-36.22	-0.02	-5.57	36.22	0.02	0.000%
43	4.81	-36.22	2.78	-4.81	36.22	-2.78	0.000%
44	2.77	-36.22	4.84	-2.77	36.22	-4.84	0.000%
45	-0.01	-36.22	5.59	0.01	36.22	-5.59	0.000%
46	-2.79	-36.22	4.85	2.79	36.22	-4.85	0.000%
47	-4.82	-36.22	2.80	4.82	36.22	-2.80	0.000%
48	-5.56	-36.22	0.01	5.56	36.22	-0.01	0.000%
49	-4.82	-36.22	-2.79	4.82	36.22	2.79	0.000%
50	-2.78	-36.22	-4.83	2.78	36.22	4.83	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00042658
3	Yes	4	0.00000001	0.00016165
4	Yes	5	0.00000001	0.00091554
5	Yes	5	0.00000001	0.00042476
6	Yes	5	0.00000001	0.00092563
7	Yes	5	0.00000001	0.00043005
8	Yes	4	0.00000001	0.00081683
9	Yes	4	0.00000001	0.00048042

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10	Yes	5	0.0000001	0.00088649
11	Yes	5	0.0000001	0.00041278
12	Yes	5	0.0000001	0.00088735
13	Yes	5	0.0000001	0.00041266
14	Yes	4	0.0000001	0.00061216
15	Yes	4	0.0000001	0.00032411
16	Yes	5	0.0000001	0.00092058
17	Yes	5	0.0000001	0.00042740
18	Yes	5	0.0000001	0.00089951
19	Yes	5	0.0000001	0.00041773
20	Yes	4	0.0000001	0.00057040
21	Yes	4	0.0000001	0.00029656
22	Yes	5	0.0000001	0.00090050
23	Yes	5	0.0000001	0.00041881
24	Yes	5	0.0000001	0.00091164
25	Yes	5	0.0000001	0.00042385
26	Yes	4	0.0000001	0.00000650
27	Yes	5	0.0000001	0.00031710
28	Yes	5	0.0000001	0.00036373
29	Yes	5	0.0000001	0.00036304
30	Yes	5	0.0000001	0.00031315
31	Yes	5	0.0000001	0.00035670
32	Yes	5	0.0000001	0.00035804
33	Yes	5	0.0000001	0.00031562
34	Yes	5	0.0000001	0.00036392
35	Yes	5	0.0000001	0.00036190
36	Yes	5	0.0000001	0.00031539
37	Yes	5	0.0000001	0.00036232
38	Yes	5	0.0000001	0.00036377
39	Yes	4	0.0000001	0.00004429
40	Yes	4	0.0000001	0.00020953
41	Yes	4	0.0000001	0.00022035
42	Yes	4	0.0000001	0.00004932
43	Yes	4	0.0000001	0.00020181
44	Yes	4	0.0000001	0.00020003
45	Yes	4	0.0000001	0.00004558
46	Yes	4	0.0000001	0.00021635
47	Yes	4	0.0000001	0.00020344
48	Yes	4	0.0000001	0.00004792
49	Yes	4	0.0000001	0.00021079
50	Yes	4	0.0000001	0.00021644

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 108	17.929	40	1.0239	0.0016
L2	111.75 - 69.75	10.130	40	0.8739	0.0006
L3	74.5 - 32.5	4.396	40	0.5675	0.0003
L4	38 - 0	1.129	40	0.2695	0.0001

Critical Deflections and Radius of Curvature - Service Wind

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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.00	A-ANT-23G-1-C	40	17.929	1.0239	0.0016	58985
152.00	A-ANT-23G-2-C	40	17.929	1.0239	0.0016	58985
150.00	LLPX310R w/ Mount Pipe	40	17.929	1.0239	0.0016	58985
142.00	APXV18-206517S-C	40	16.222	1.0014	0.0014	36865
134.00	(4) 844G90VTA-SX w/ Mount Pipe	40	14.536	0.9764	0.0011	18432
119.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	40	11.503	0.9146	0.0008	9513
99.00	KS24019-L112A	40	7.912	0.7819	0.0004	7416

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 108	83.201	4	4.7556	0.0076
L2	111.75 - 69.75	47.027	4	4.0616	0.0029
L3	74.5 - 32.5	20.405	4	2.6366	0.0012
L4	38 - 0	5.241	4	1.2512	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.00	A-ANT-23G-1-C	4	83.201	4.7556	0.0076	12899
152.00	A-ANT-23G-2-C	4	83.201	4.7556	0.0076	12899
150.00	LLPX310R w/ Mount Pipe	4	83.201	4.7556	0.0076	12899
142.00	APXV18-206517S-C	4	75.285	4.6517	0.0065	8061
134.00	(4) 844G90VTA-SX w/ Mount Pipe	4	67.464	4.5364	0.0054	4029
119.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	4	53.396	4.2505	0.0036	2077
99.00	KS24019-L112A	4	36.730	3.6337	0.0020	1611

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 P _u /φP _n
L1	150 - 108 (1)	TP30.401x22x0.25	42.00	0.00	0.0	23.6677	-14.17	1278.06	0.011
L2	108 - 69.75 (2)	TP37.553x29.1509x0.3125	42.00	0.00	0.0	36.5171	-20.99	1971.92	0.011
L3	69.75 - 32.5 (3)	TP44.379x35.9778x0.375	42.00	0.00	0.0	51.8064	-30.42	3030.67	0.010
L4	32.5 - 0 (4)	TP50.13x42.5288x0.4375	38.00	0.00	0.0	70.0043	-43.45	4095.25	0.011

tnxTower FDH Infrastructure Services, LLC 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 919.755.1012 FAX: 919.755.1031	Job 876319 Naugatuck 2 Uniroyal	Page 29 of 29
	Project 19BK1Y1400	Date 09:00:00 06/19/19
	Client Crown Castle	Designed by Ricardo.Goncalves

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	150 - 108 (1)	TP30.401x22x0.25	334.72	857.03	0.391	0.00	857.03	0.000
L2	108 - 69.75 (2)	TP37.553x29.1509x0.3125	968.01	1641.28	0.590	0.00	1641.28	0.000
L3	69.75 - 32.5 (3)	TP44.379x35.9778x0.375	1724.52	2949.93	0.585	0.00	2949.93	0.000
L4	32.5 - 0 (4)	TP50.13x42.5288x0.4375	2642.60	4631.98	0.571	0.00	4631.98	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual	ϕV_n	Ratio	Actual	ϕT_n	Ratio
			V_u K	K	$\frac{V_u}{\phi V_n}$	T_u kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	150 - 108 (1)	TP30.401x22x0.25	15.08	383.42	0.039	0.27	991.59	0.000
L2	108 - 69.75 (2)	TP37.553x29.1509x0.3125	18.90	591.58	0.032	0.24	1888.43	0.000
L3	69.75 - 32.5 (3)	TP44.379x35.9778x0.375	22.46	909.20	0.025	0.24	3431.28	0.000
L4	32.5 - 0 (4)	TP50.13x42.5288x0.4375	25.82	1228.58	0.021	0.24	5370.23	0.000

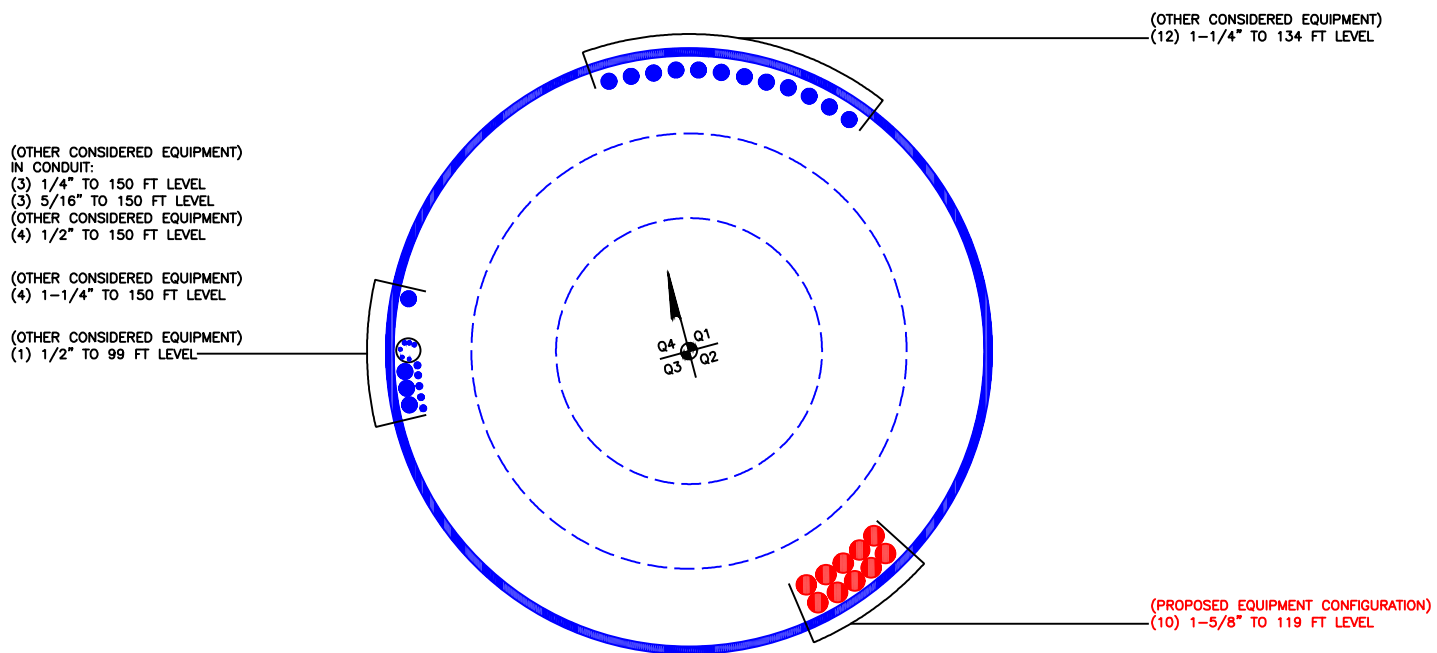
Pole Interaction Design Data

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb.	Allow.	Criteria
		$\frac{P_u}{\phi P_n}$	$\frac{M_{ux}}{\phi M_{ux}}$	$\frac{M_{uy}}{\phi M_{uy}}$	$\frac{V_u}{\phi V_n}$	$\frac{T_u}{\phi T_n}$	Stress Ratio	Stress Ratio	
L1	150 - 108 (1)	0.011	0.391	0.000	0.039	0.000	0.403	1.050	4.8.2
L2	108 - 69.75 (2)	0.011	0.590	0.000	0.032	0.000	0.601	1.050	4.8.2
L3	69.75 - 32.5 (3)	0.010	0.585	0.000	0.025	0.000	0.595	1.050	4.8.2
L4	32.5 - 0 (4)	0.011	0.571	0.000	0.021	0.000	0.582	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	150 - 108	Pole	TP30.401x22x0.25	1	-14.17	1341.96	38.4	Pass
L2	108 - 69.75	Pole	TP37.553x29.1509x0.3125	2	-20.99	2070.52	57.3	Pass
L3	69.75 - 32.5	Pole	TP44.379x35.9778x0.375	3	-30.42	3182.20	56.7	Pass
L4	32.5 - 0	Pole	TP50.13x42.5288x0.4375	4	-43.45	4300.01	55.4	Pass
Summary								
Pole (L2)							57.3	Pass
RATING =							57.3	Pass

APPENDIX B
BASE LEVEL DRAWING



BUSINESS UNIT: 876319 TOWER ID: C_BASELEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

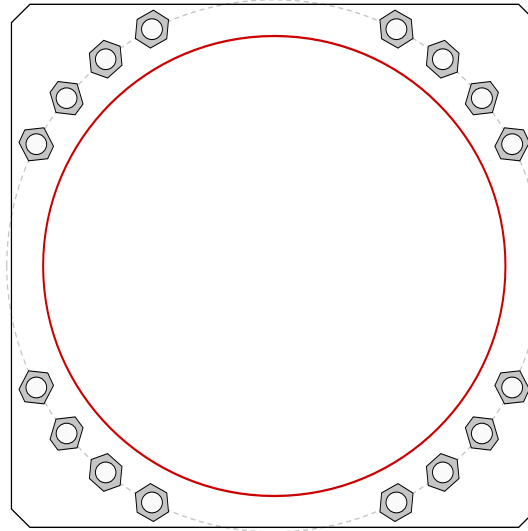


Site Info	
BU #	876319
Site Name	Naugatuck 2 Uniroyal
Order #	479854

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0

Applied Loads	
Moment (kip-ft)	2642.60
Axial Force (kips)	43.45
Shear Force (kips)	25.82

*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
 (16) 2-1/4" ϕ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 58" BC
 Anchor Spacing: 6 in

Base Plate Data
 57" OD x 3" Plate (A572-50; $F_y=50$ ksi, $F_u=65$ ksi)

Stiffener Data
 N/A

Pole Data
 50.13" x 0.4375" 12-sided pole (A607-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary *(units of kips, kip-in)*

$P_{u_c} = 139.32$	$\phi P_{n_c} = 243.75$	Stress Rating
$V_u = 1.61$	$\phi V_n = 73.13$	54.5%
$M_u = n/a$	$\phi M_n = n/a$	Pass

Base Plate Summary

Max Stress (ksi):	25.13	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	53.2%	Pass

Drilled Pier Foundation

BU # :	876319
Site Name:	Naugatuck 2 Uniroyal
Order Number:	479854

TIA-222 Revison:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	2642.6	
Axial Force (kips)	43.45	
Shear Force (kips)	25.82	

Material Properties		
Concrete Strength, f _c :	3	ksi
Rebar Strength, F _y :	60	ksi

Pier Design Data		
Depth	26	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
<i>From 0.5' above grade to 26' below grade</i>		
Pier Diameter	7	ft
Rebar Quantity	32	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity	Compression	Uplift
D _{v=0} (ft from TOC)	6.73	-
Soil Safety Factor	4.74	-
Max Moment (kip-ft)	2785.90	-
Rating*	26.7%	-

Soil Vertical Capacity	Compression	Uplift
Skin Friction (kips)	643.56	-
End Bearing (kips)	115.45	-
Weight of Concrete (kips)	174.93	-
Total Capacity (kips)	759.02	-
Axial (kips)	218.38	-
Rating*	27.4%	-

Reinforced Concrete Capacity	Compression	Uplift
Critical Depth (ft from TOC)	6.65	-
Critical Moment (kip-ft)	2785.86	-
Critical Moment Capacity	7500.45	-
Rating*	35.4%	-

Soil Interaction Rating*	27.4%
Structural Foundation Rating*	35.4%

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
N/A	<input type="checkbox"/>

Soil Profile			
Groundwater Depth	23	ft	# of Layers
			5

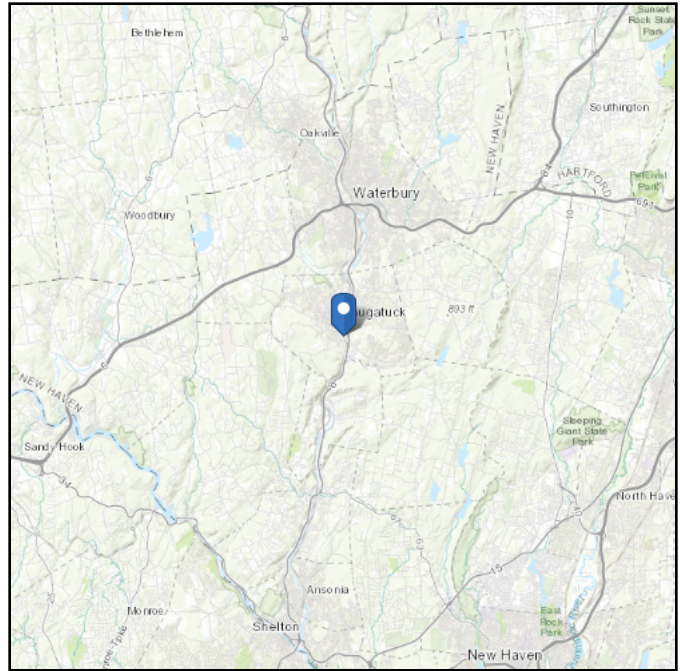
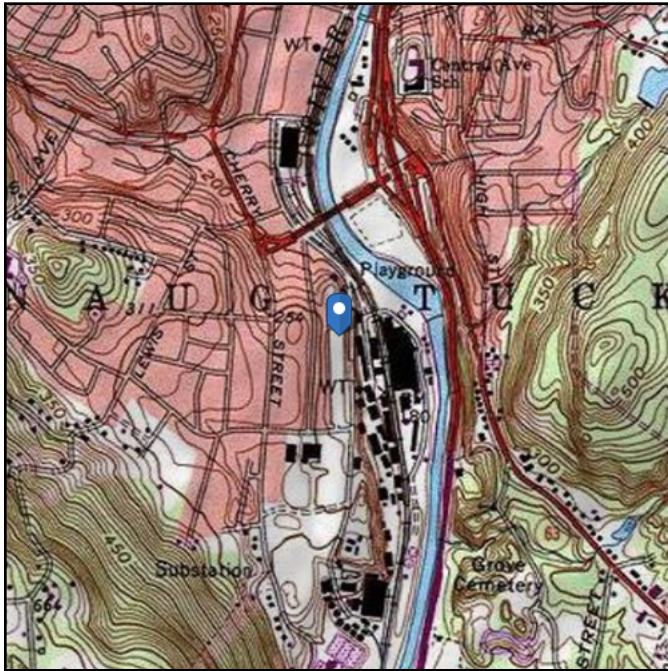
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ _{soil} (pcf)	γ _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.5	3.5	125	150		0	0.000	0.000					Cohesionless
2	3.5	8	4.5	125	150		34	0.845	0.845				48	Cohesionless
3	8	15	7	125	150		34	1.498	1.498				22	Cohesionless
4	15	23	8	125	150		34	2.165	2.165				16	Cohesionless
5	23	26	3	62.6	87.6		34	2.469	2.469			4	57	Cohesionless

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 232.9 ft (NAVD 88)
Latitude: 41.481261
Longitude: -73.053242



Wind

Results:

Wind Speed:	121 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph

125 Mph per Jurisdiction

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

Date Accessed: Fri Jun 14 2019

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.

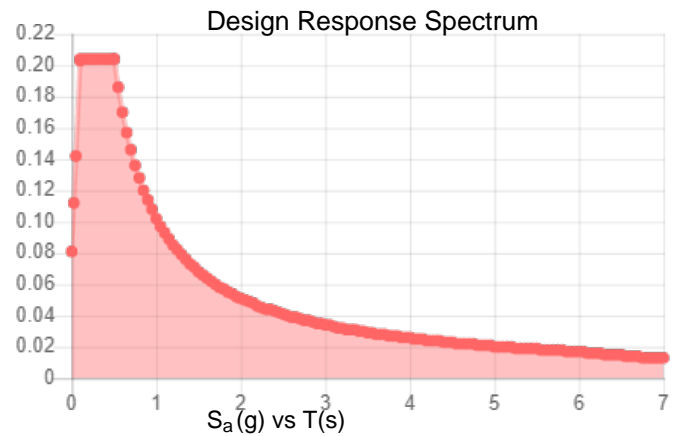
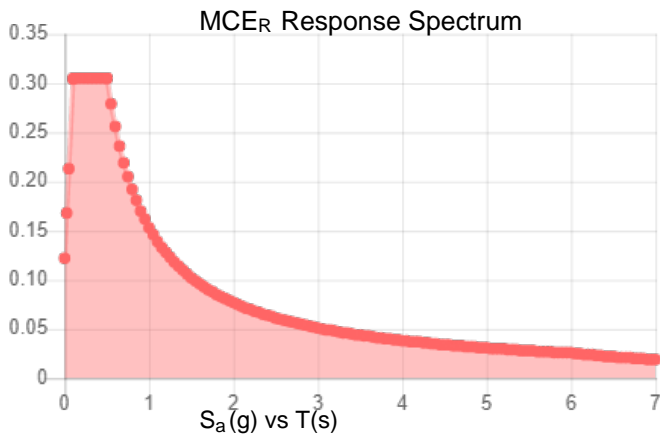
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Site Soil Class: D - Stiff Soil

Results:

S_S :	0.191	S_{DS} :	0.204
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.1
S_{MS} :	0.305	PGA _M :	0.159
S_{M1} :	0.153	F _{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Fri Jun 14 2019

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: Fri Jun 14 2019

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.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

Exhibit E

Mount Analysis

Date: May 29, 2019



Charles R. McGuirt II
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6607

CLS Engineering PLLC
319 Chapanoke Road, Suite 118
Raleigh, NC 27603
(405) 348-5460
Engineering@clsengineeringpllc.com

Subject: Mount Analysis Report

Carrier Designation: T-Mobile Equipment Change-Out
Carrier Site Number: CTNH312
Carrier Site Name: NH312/Crown-Naugatuck

Crown Castle Designation: **Crown Castle BU Number:** 876319
Crown Castle Site Name: Naugatuck 2 Uniroyal
Crown Castle JDE Job Number: 559322
Crown Castle Order Number: 479854 Rev. 0

Engineering Firm Designation: **CLS Engineering PLLC Project #:** 42284-CTNH312-01-MA-R1

Site Data: **280 Elm Street, Naugatuck, CT 06770, New Haven County**
Latitude: 41° 28' 52.54" Longitude: -73° 3' 11.67"

Structure Information: **Tower Height & Type:** 150 ft Monopole
Mount Elevation: 119 ft
Mount Width & Type: 13.0 ft Low Profile Platform

Dear Charles R. McGuirt II,

CLS Engineering PLLC is pleased to submit this “**Mount Analysis Report**” to determine the structural integrity of T-Mobile’s antenna mounting system with the proposed appurtenance and equipment addition on the above mentioned 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:

Low Profile Platform

Sufficient*

***Sufficient upon completion of the changes listed in the ‘Conclusion and Recommendations’ section of this report.**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Asad Sayeed, E.I.

Respectfully Submitted by:

Tyler M. Barker, P.E.
Director of Engineering



Tyler M. Barker
CLS Engineering, PLLC
Director of Engineering
PE # 32402 Exp. 1/31/2020
COA # PEC.001833 Exp. 8/14/2019



Digitally signed by
Tyler Barker
DN: c=US, o=Telamon
Corporation,
ou=A01427E0000016
A4525ADF800001D17
, cn=Tyler Barker
Date: 2019.05.29
16:03:57 -04'00'

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Mount Modification Sketches and Assembly Drawings

1. INTRODUCTION

The proposed equipment is to be mounted to the existing Low Profile Platform. This proposed mounting configuration was analyzed using RISA-3D, a commercially available finite element analysis software package. A selection of input and output from our analysis is attached to the end of this report.

2. ANALYSIS CRITERIA

STANDARD	2015 IBC / 2018 Connecticut State Building Code / TIA-222-H
BASIC WIND SPEED	125 mph, V_{ult} (3-Second Gust)
BASIC WIND SPEED W/ ICE	50 mph (3-Second Gust) w/ 1.5" Radial Ice (Escalating)
EXPOSURE CATEGORY	B
MAX. TOPOGRAPHIC FACTOR,	1.00
RISK CATEGORY	II
MAINTENANCE LIVE LOAD	L_M : 500 lb

Table 1 - Final Equipment Configuration

ELEVATION (ft)		ANTENNAS	
MOUNT	RAD.	#	NAME
119.0	120.0	3	RFS Celwave APXVAARR24_43-U-NA20
		3	Ericsson AIR 32 B2A/B66AA
		3	Ericsson AIR 21 B2A/B4P
		3	Ericsson RADIO 4449 B12/B71
		3	Ericsson KRY 112 144/1

3. ANALYSIS PROCEDURE

Table 2 - Documents Provided

STRUCTURAL DATA	Mount Mapping report by Pier Structural Engineering Corp., Project #19651-05, dated April 12, 2019 Site Photos dated June 5, 2018 Site Pro 1 Assembly drawing #HRK12-U, dated March 10, 2015 Site Pro 1 Assembly drawing #PRK-1245, dated April 10, 2014
PREVIOUS ANALYSES	SA by FDH Velocitel, Project #17QJIZ1400, dated August 2, 2017
LOADING DATA	Crown Order ID 479854, Revision 0, dated April 22, 2019

3.1. Analysis Method

RISA-3D, 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. This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 Tower Mount Analysis (Revision B).

4. ANALYSIS RESULTS

Table 3a - Existing Mount Component Stresses vs. Capacity

COMPONENT	PEAK USAGE	RESULT
Collar Reactions	115%	Fail
Mount Pipes	96%	Pass
Offset Side Plate	83%	Pass
Stand-Off Tube	47%	Pass
Connections	44%	Pass
Platform Base	16%	Pass

Table 3b - Modified Mount Component Stresses vs. Capacity

COMPONENT	PEAK USAGE	RESULT
Mount Pipes	57%	Pass
Offset Plate	38%	Pass
Collar Reactions	32%	Pass
Connections	18%	Pass
Stand-Off Horizontals	17%	Pass
Platform Base	13%	Pass

Structure Rating (max from all components) =	57%
---	------------

Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.

4.1 Conclusion and Recommendations

According to our structural analysis, the mounts have been found to **CONDITIONALLY PASS**. The mounting configuration considered in this analysis will be capable of supporting the referenced loading pursuant to referenced standards once the following scope is executed:

- Install (1) proposed Site Pro 1 PRK-1245 platform reinforcement kit on existing platform mount as shown in the following sketches. Collar to be installed flush with existing monopole at a height of ± 2.5 ft. below the centerline of existing platform mount collar. **DO NOT PINCH SAFETY CLIMB.**
- Install (1) proposed Site Pro 1 HRK12-U support rail kit at 3'-6" above the existing platform horizontal pipe. Connect to all mount pipes using Site Pro 1 SCX2 crossover plate kits included in the Support Rail kit.
- Relocate equipment, as required, to facilitate installation of proposed modifications on existing platform mount.

See "Appendix E: Mount Modification Sketches and Assembly Drawings" for additional details.

5. ASSUMPTIONS AND CONDITIONS

This analysis is inclusive of the antenna supporting frames/mounts and all recorded connections that will support the equipment listed in this report. It considers only the theoretical capacity of structural components and it is not a condition assessment. The validity of the analysis may be dependent on the accuracy of structural information supplied by others. The client is responsible for verifying this information. If any provided information is revised after completion of this analysis, CLS Engineering PLLC should be notified immediately to revise results.

This analysis assumes the following:

1. The tower or other superstructure and mounts (if existing) were properly constructed as per the original design and have been properly maintained in accordance with applicable code standards.
2. Member sizes and strengths are accurate as supplied or are assumed as stated in the calculations.
3. In the absence of sufficient design information, all welds and connections are assumed to develop at least the capacity of the connected member, unless otherwise stated in this analysis.
4. All prior structural modifications, if any, are assumed to be correctly installed and fully effective.
5. The loading configuration is complete and accurate as supplied and/or as modeled in the previous analysis. All appurtenances are assumed to be properly installed and supported as per manufacturer requirements.
6. Some conservative assumptions may be used regarding appurtenances and their projected areas based on careful interpretation of data supplied, previous experience and standard industry practice.

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of the report. All opinions and conclusions contained herein are subject to revision based upon receipt of new or updated information. All services are provided exercising a level of care and diligence equivalent to the standard of our profession. No warranty or guarantee, either expressed or implied, is offered. All services are confidential in nature and this report will not be released to any other party without the client's consent. The use of this analysis is limited to the expressed purpose for which it was commissioned and it may not be reused, copied or disseminated for any other purpose without consent from CLS Engineering PLLC.

All services were performed, results obtained and recommendations made in accordance with generally accepted engineering principles and practices. CLS Engineering PLLC is not responsible for the conclusions, opinions or recommendations made by others based on the information supplied in this analysis.

It is not possible to have the fully detailed information necessary to perform a complete and thorough analysis of every structural sub-component of an existing structure. The structural analysis by CLS Engineering PLLC verifies the adequacy of the primary members of the structure. CLS Engineering PLLC provides a limited scope of service in that we cannot verify the adequacy of every weld, bolt, gusset, etc.

APPENDIX A
SOFTWARE INPUT CALCULATIONS

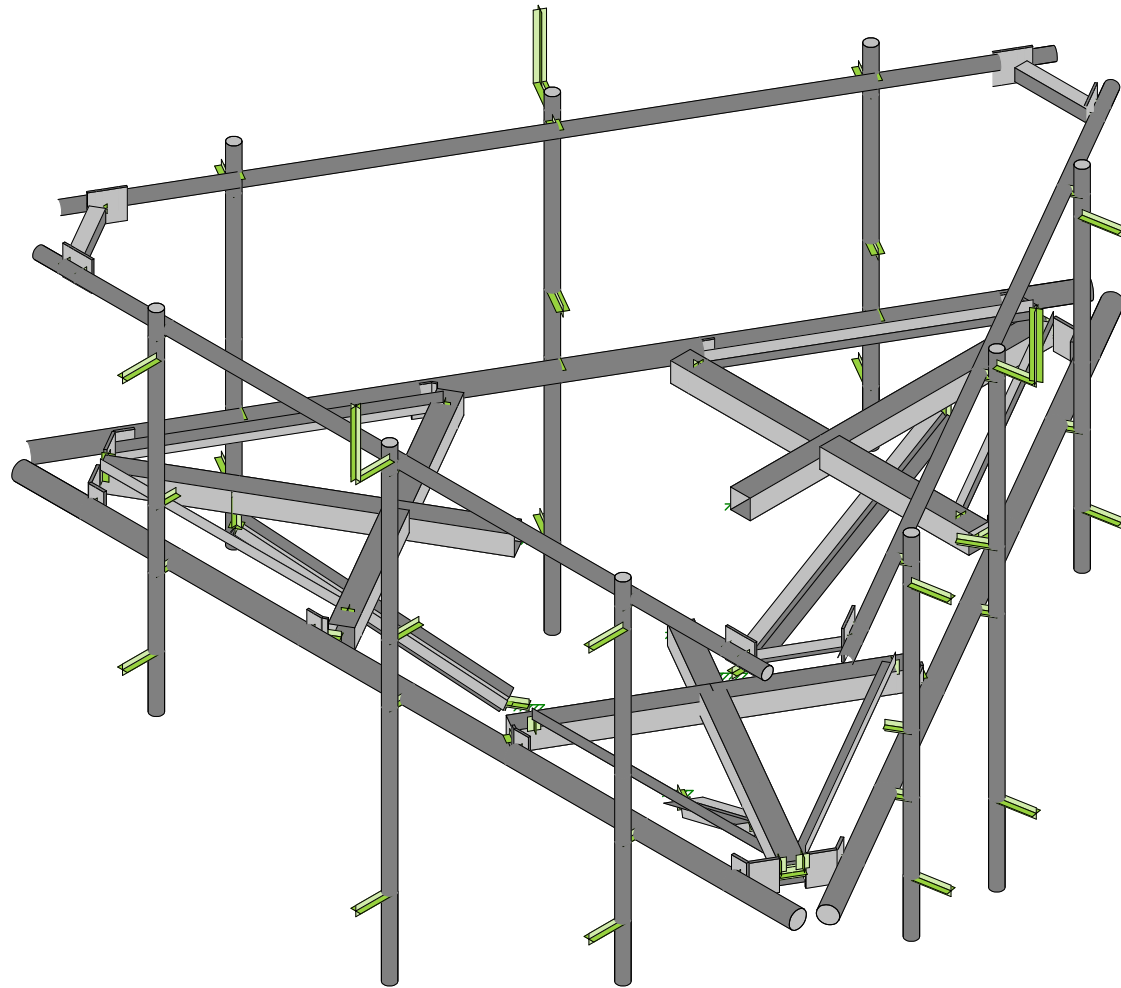
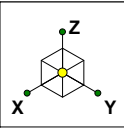
Wind & Ice Loading			
Nominal Mount Elevation (AGL), Z_{mount}	119 ft	K_a	0.90
Nominal Rad Elevation (AGL), Z_{rad}	120 ft	K_d	0.95
TIA Standard	H	K_z	1.04
Basic Wind Speed, V_{ult} (bare)	125 mph	K_{zt}	1.00
Basic Wind Speed, V (ice)	50 mph	K_s	1.00
Design Ice Thickness, t_i	1 1/2 in	t_{iz}	1.71 in
Exposure Category	B	G_h	1.00
Risk Category	II	q_z (bare)	39.1 psf
Seismic Response Coeff., C_s	-	q_z (ice)	6.3 psf

Live Loading	
At Mount Pipes, L_M	500 lb
Joint Labels Considered	M1
	M2
	M3

Member Distributed Loading				
Section Set Label	Shape Label	F_A (lb/ft)		Ice Wt. (lb/ft)
		Bare	Ice	
Offset Tube	HSS4X4X4	23.48	2.20	14.16
Offset End Plate	0.5 x 6 Plate	35.22	5.31	12.17
Offset Side Plate	0.38 X 6 Plate	35.22	5.31	12.01
Grating Angle	L2x2x3	11.74	2.06	8.62
Platform Horizontal Pipe	PIPE 3.0	12.33	3.89	10.84
Mount Pipe	PIPE 2.0	8.37	3.26	8.50
MOD PRK	L2.5x2.5x3	14.68	2.10	9.94
MOD Support Rail	PIPE 2.0	8.37	3.26	8.50
MOD SR Conn Plate	PL6x0.375	35.22	5.31	12.01
MOD SR Conn Angle	L2.5x2.5x4	14.68	2.10	9.94

Appurtenances																																		
Appurtenance Model	Status	Azimuth Offset ($^\circ$, \cup)	Rad Elev. Override (ft)	Swap Width & Depth	Area Factor		Qty. per Azimuth			Total Qty. Override	30° Joints		150° Joints		270° Joints		Height (in)	Width (in)	Depth (in)	Weight (Bare) (lb)	Shape	Weight of Ice (lb)	EPA_A (Bare) (ft ²)				EPA_A (Ice) (ft ²)				F_A (Bare) (lb)		F_A (Ice) (lb)	
					Front	Side	30°	150°	270°		1	2	1	2	1	2							N	T	N	T	N	T	N	T				
AIR 21 B2A/B4P				<input type="checkbox"/>			1	1			A1	A2	B1	B2				55	12	7.9	83	Flat	139.96	5.92	4.22	7.86	6.05	209.17	148.96	44.41	34.18			
APXVAARR24_43-U-NA20				<input type="checkbox"/>			1	1			A3	A4	B3	B4				95.9	24	8.7	128	Flat	384.33	20.24	8.89	23.63	12.03	714.68	313.82	133.49	67.96			
AIR 32 B2A/B66AA				<input type="checkbox"/>			1	1			A5	A6	B5	B6				56.6	12.9	8.7	132.2	Flat	156.42	6.51	4.71	8.51	6.61	229.84	166.37	48.10	37.33			
KRY 112 144/1				<input type="checkbox"/>	0.5		1	1			TA1		TB1					7	6	3	11	Flat	10.84	0.18	0.18	0.41	0.56	6.18	6.18	2.31	3.14			
RADIO 4449 B12/B71				<input type="checkbox"/>	0.5		1	1			RA1		RB1					15	13.2	10.4	75	Flat	58.73	0.83	1.30	1.27	2.12	29.13	45.90	7.20	11.97			
AIR 21 B2A/B4P		20		<input type="checkbox"/>				1							G1	G2		55	12	7.9	83	Flat	139.96	5.92	4.22	7.86	6.05	209.17	148.96	44.41	34.18			
APXVAARR24_43-U-NA20		20		<input type="checkbox"/>				1							G3	G4		95.9	24	8.7	128	Flat	384.33	20.24	8.89	23.63	12.03	714.68	313.82	133.49	67.96			
AIR 32 B2A/B66AA		20		<input type="checkbox"/>				1							G5	G6		56.6	12.9	8.7	132.2	Flat	156.42	6.51	4.71	8.51	6.61	229.84	166.37	48.10	37.33			
KRY 112 144/1		20		<input type="checkbox"/>	0.5			1							TG1			7	6	3	11	Flat	10.84	0.18	0.18	0.41	0.56	6.18	6.18	2.31	3.14			
RADIO 4449 B12/B71		20		<input type="checkbox"/>	0.5			1							RG1			15	13.2	10.4	75	Flat	58.73	0.83	1.30	1.27	2.12	29.13	45.90	7.20	11.97			

APPENDIX B
WIRE FRAME AND RENDERED MODELS

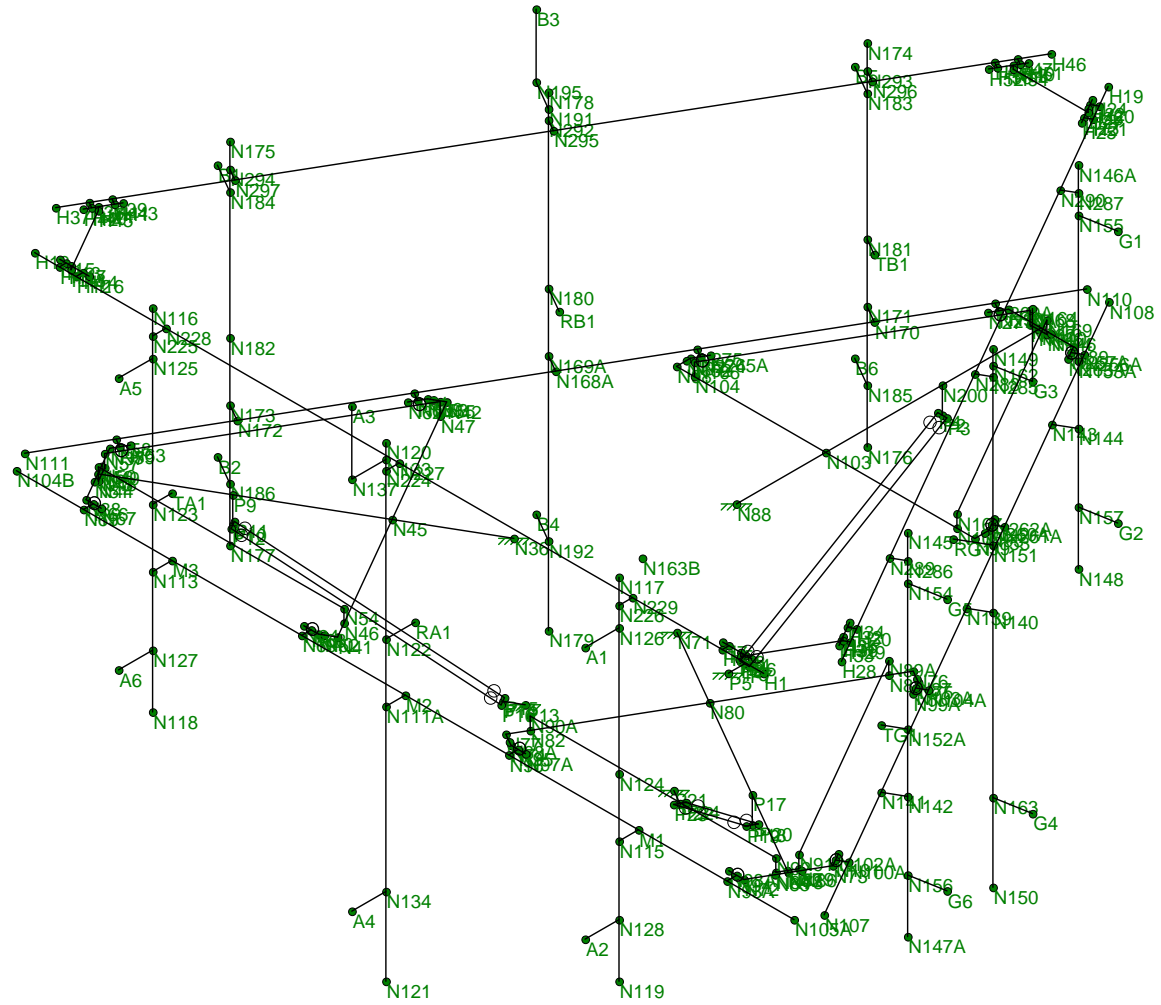
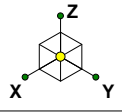


Envelope Only Solution

CLS
AAS
42284-CTNH312-01-MA-R1

42284-CTNH312-NH312/Crown-Naugatuck
Rendered

SK - 1
May 29, 2019 at 2:00 PM
42284-CTNH312-01-MA-R1.r3d

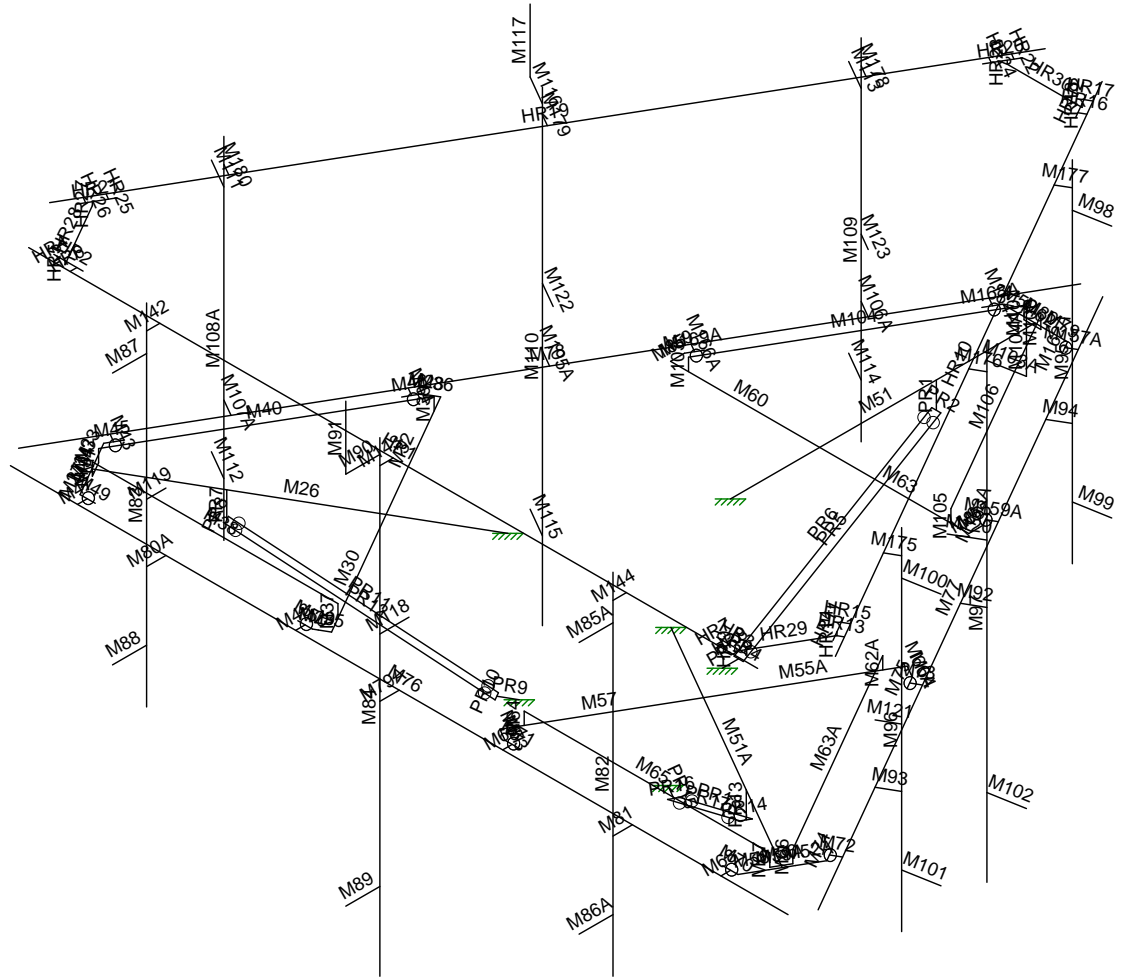
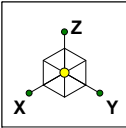


Envelope Only Solution

CLS
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42284-CTNH312-01-MA-R1

42284-CTNH312-NH312/Crown-Naugatuck
Joint Labels

SK - 2
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42284-CTNH312-01-MA-R1.r3d

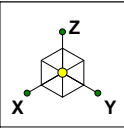


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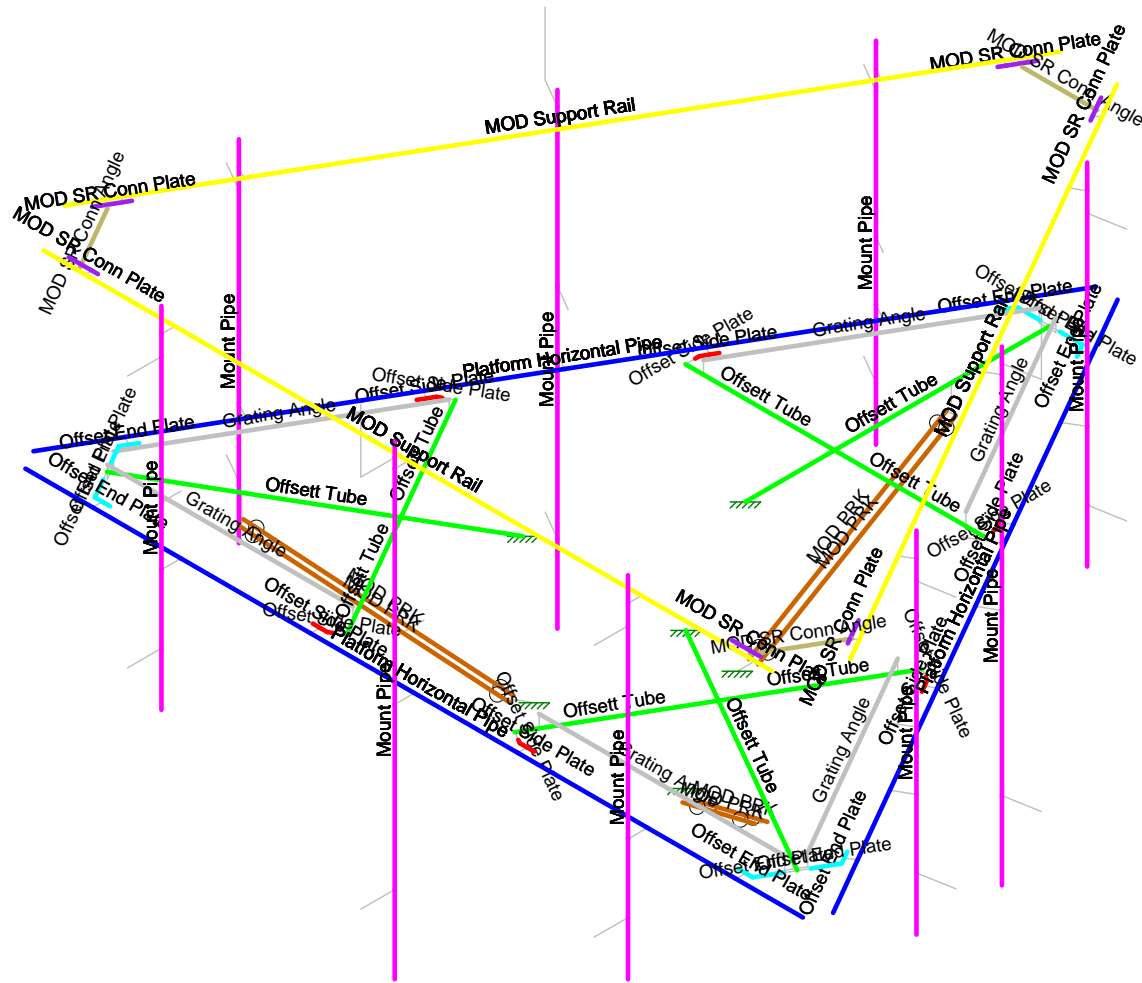
CLS
AAS
42284-CTNH312-01-MA-R1

42284-CTNH312-NH312/Crown-Naugatuck
Member Labels

SK - 3
May 29, 2019 at 2:00 PM
42284-CTNH312-01-MA-R1.r3d



- Section Sets
- Platform Horizontal Pipe
 - Offset Tube
 - Offset Side Plate
 - Grating Angle
 - Mount Pipe
 - Offset End Plate
 - MOD PRK
 - MOD Support Rail
 - MOD SR Conn Plate
 - MOD SR Conn Angle
 - RIGID

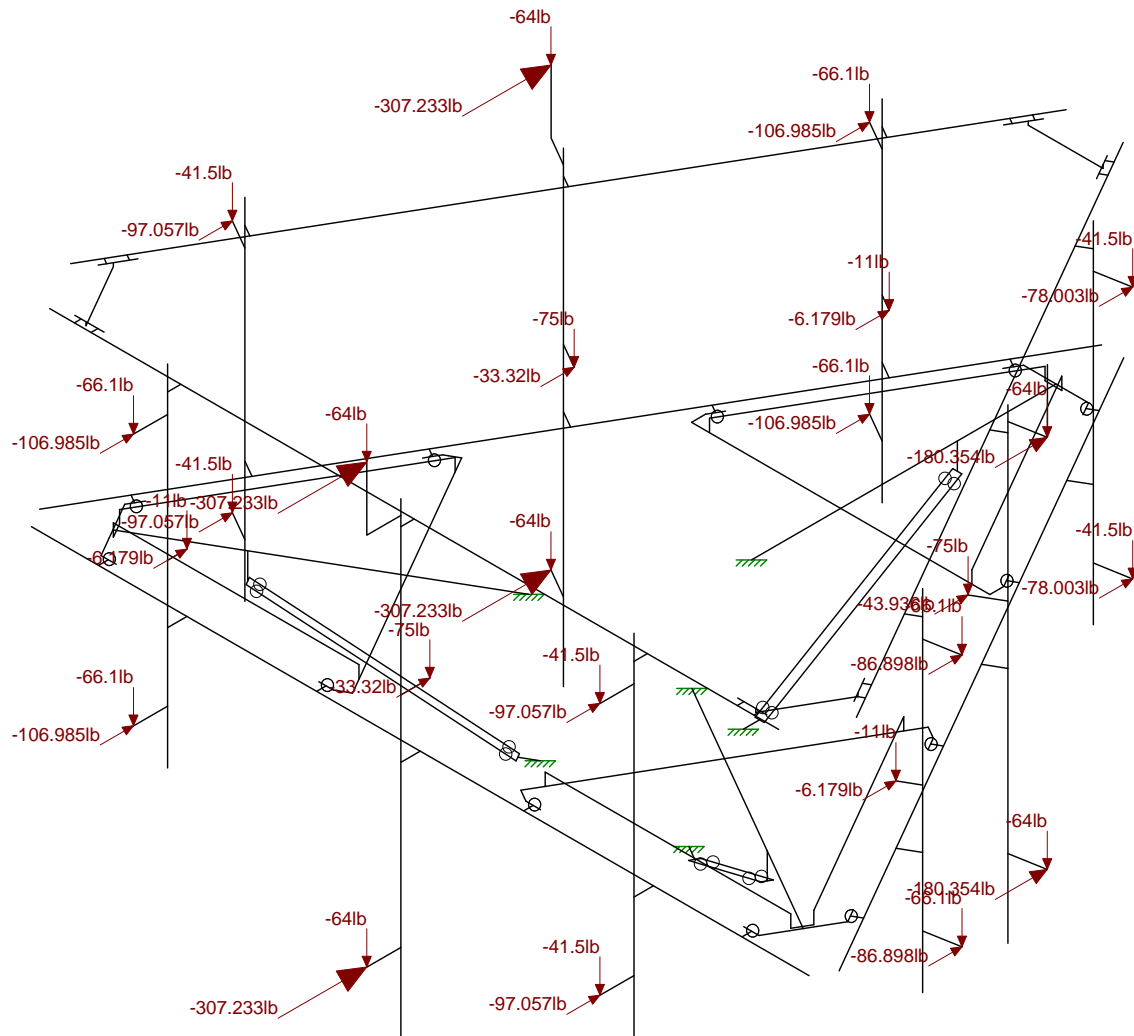
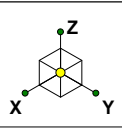


Envelope Only Solution

CLS
AAS
42284-CTNH312-01-MA-R1

42284-CTNH312-NH312/Crown-Naugatuck
Section Sets

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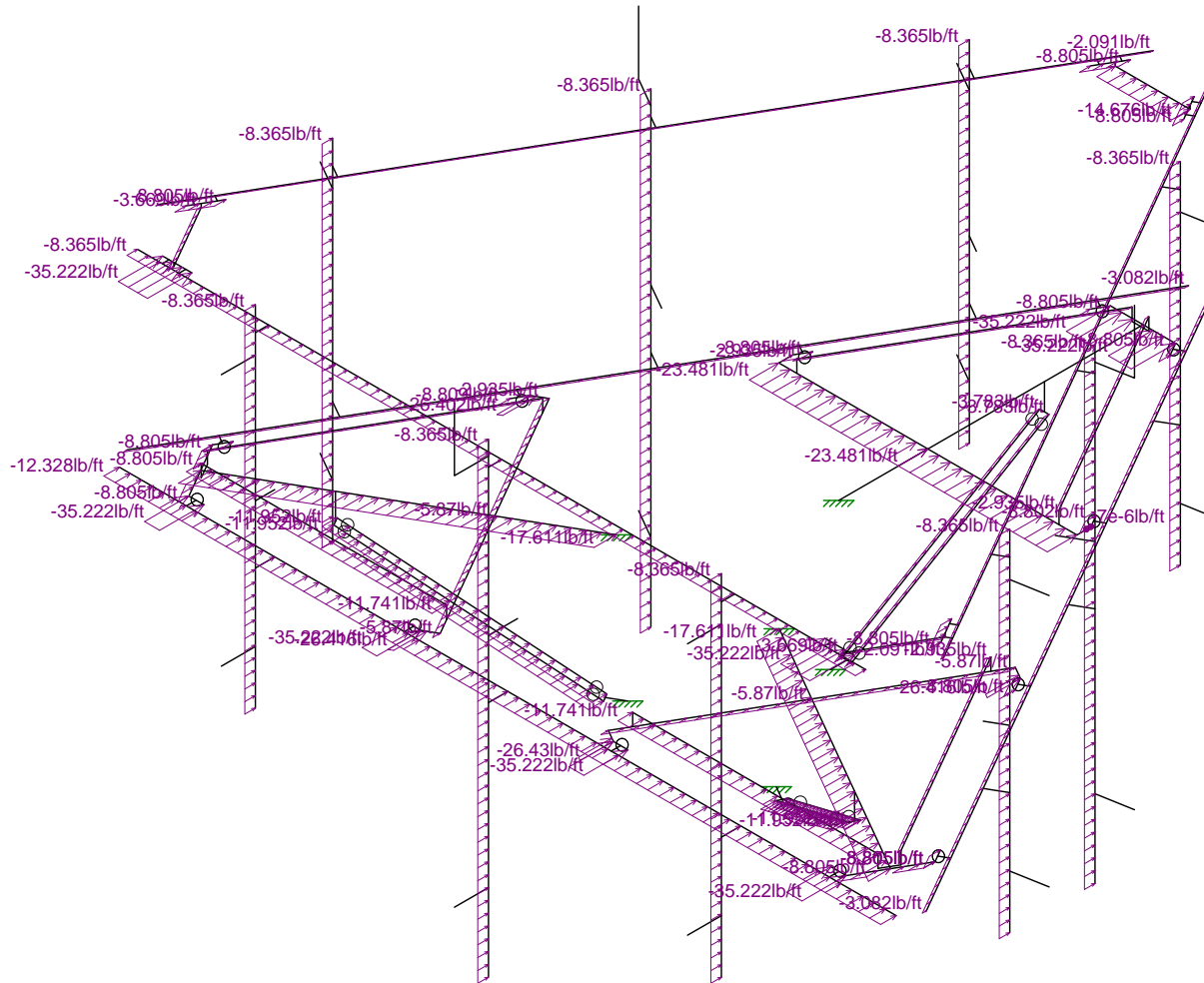
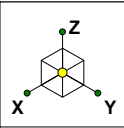


Loads: LC 1, DISPLAY (1.0D + 1.0W_0°)
Envelope Only Solution

CLS
AAS
42284-CTNH312-01-MA-R1

42284-CTNH312-NH312/Crown-Naugatuck
Joint Loads - Dead and Normal Wind

SK - 5
May 29, 2019 at 2:02 PM
42284-CTNH312-01-MA-R1.r3d

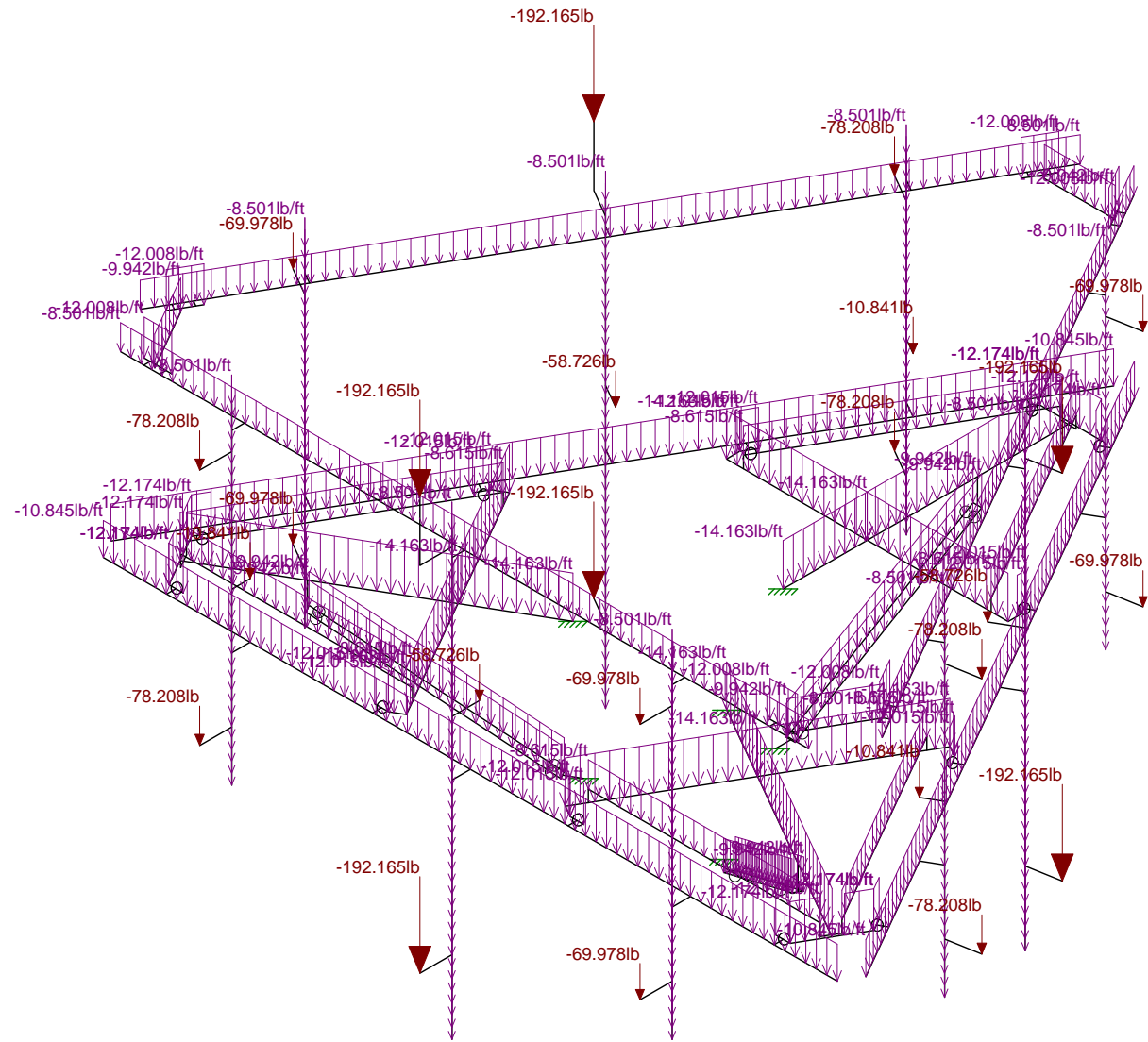
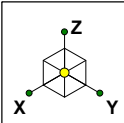


Loads: BLC 4, Structure Wind 0°
Envelope Only Solution

CLS
AAS
42284-CTNH312-01-MA-R1

42284-CTNH312-NH312/Crown-Naugatuck
Distributed Load - Normal Wind

SK - 6
May 29, 2019 at 2:03 PM
42284-CTNH312-01-MA-R1.r3d

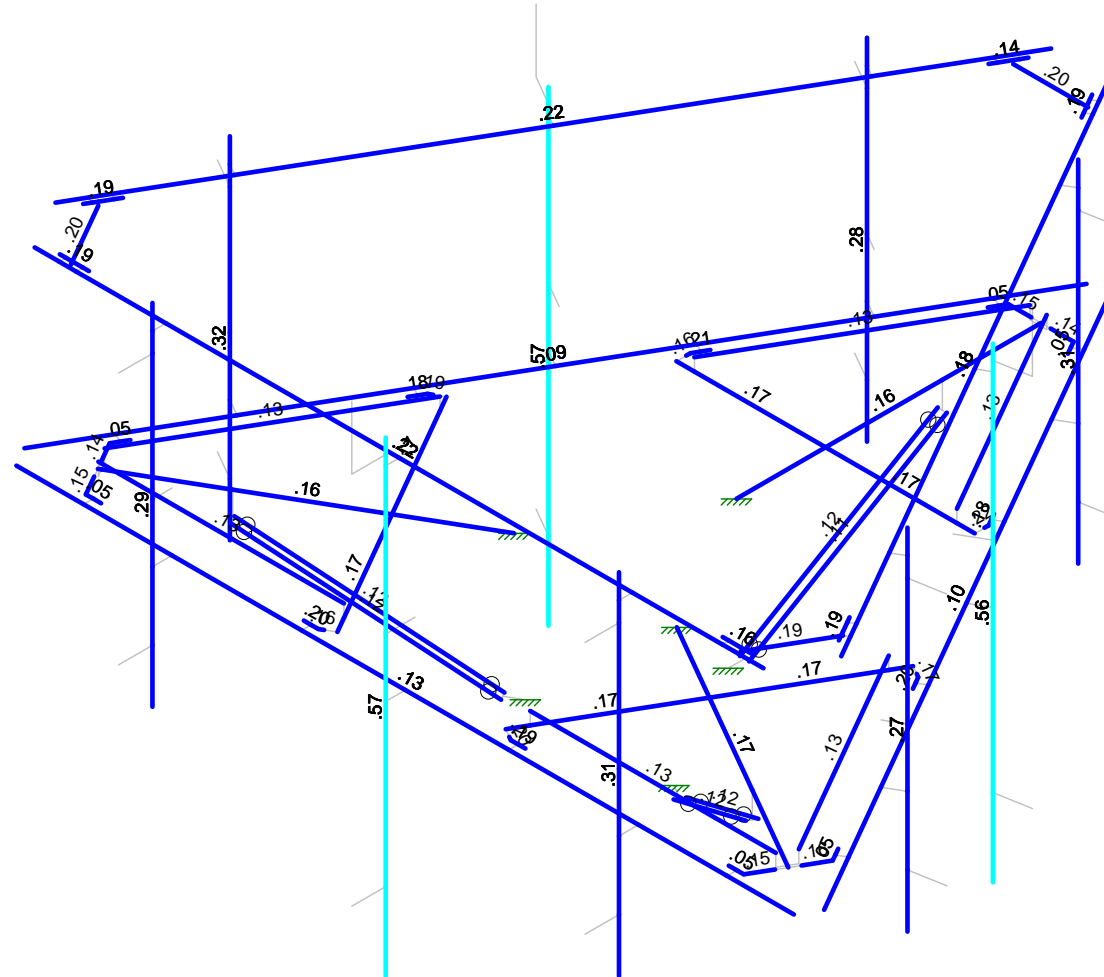
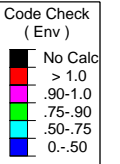
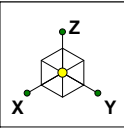


Loads: BLC 2, Ice Dead
Envelope Only Solution

CLS
AAS
42284-CTNH312-01-MA-R1

42284-CTNH312-NH312/Crown-Naugatuck
Ice Dead Loads

SK - 7
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42284-CTNH312-01-MA-R1.r3d

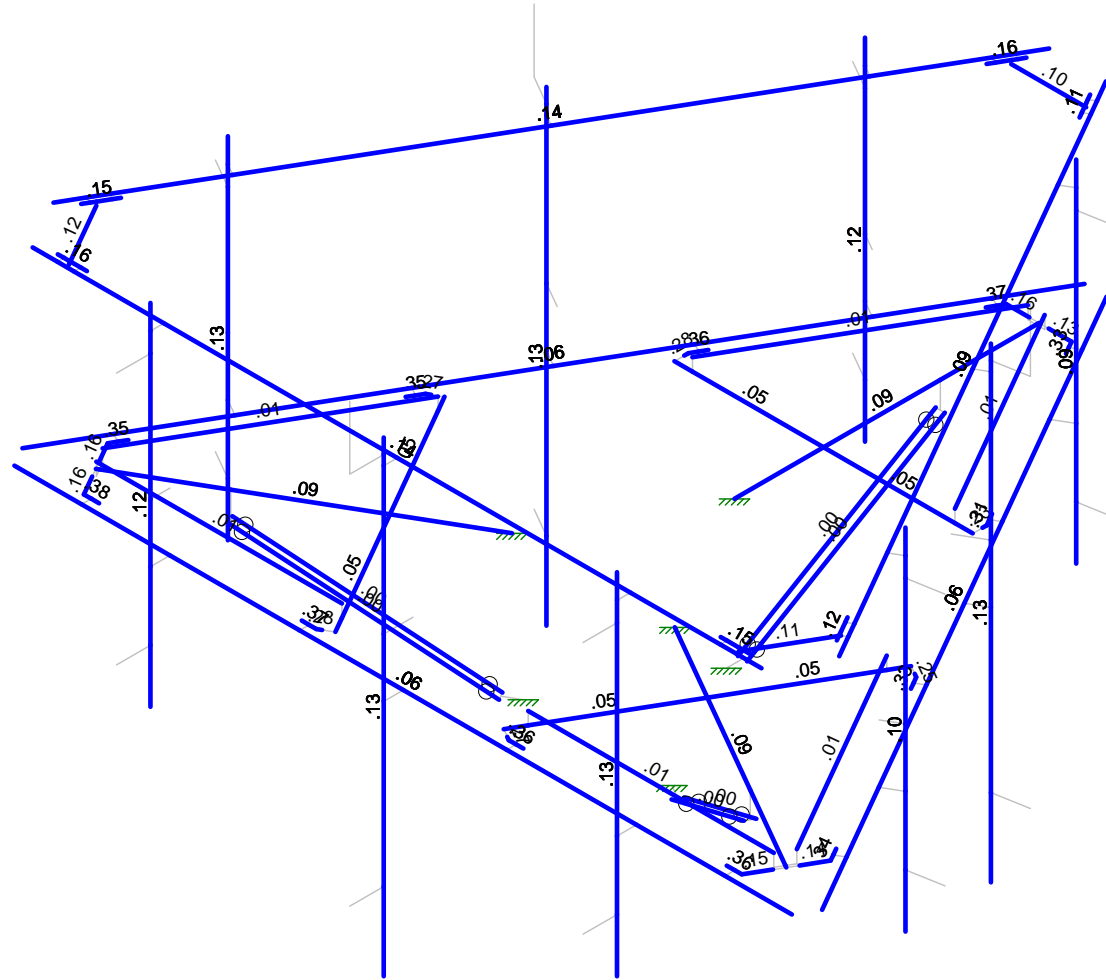
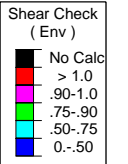
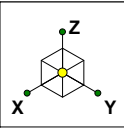


Member Code Checks Displayed (Enveloped)
Envelope Only Solution

CLS
AAS
42284-CTNH312-01-MA-R1

42284-CTNH312-NH312/Crown-Naugatuck
Envelope Member Unity Check Results - Bending

SK - 8
May 29, 2019 at 2:04 PM
42284-CTNH312-01-MA-R1.r3d



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

CLS
AAS
42284-CTNH312-01-MA-R1

42284-CTNH312-NH312/Crown-Naugatuck
Envelope Member Check Results - Shear

SK - 9
May 29, 2019 at 2:04 PM
42284-CTNH312-01-MA-R1.r3d

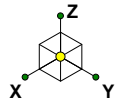
APPENDIX C
SOFTWARE ANALYSIS OUTPUT

APPENDIX D
ADDITIONAL CALCULATIONS

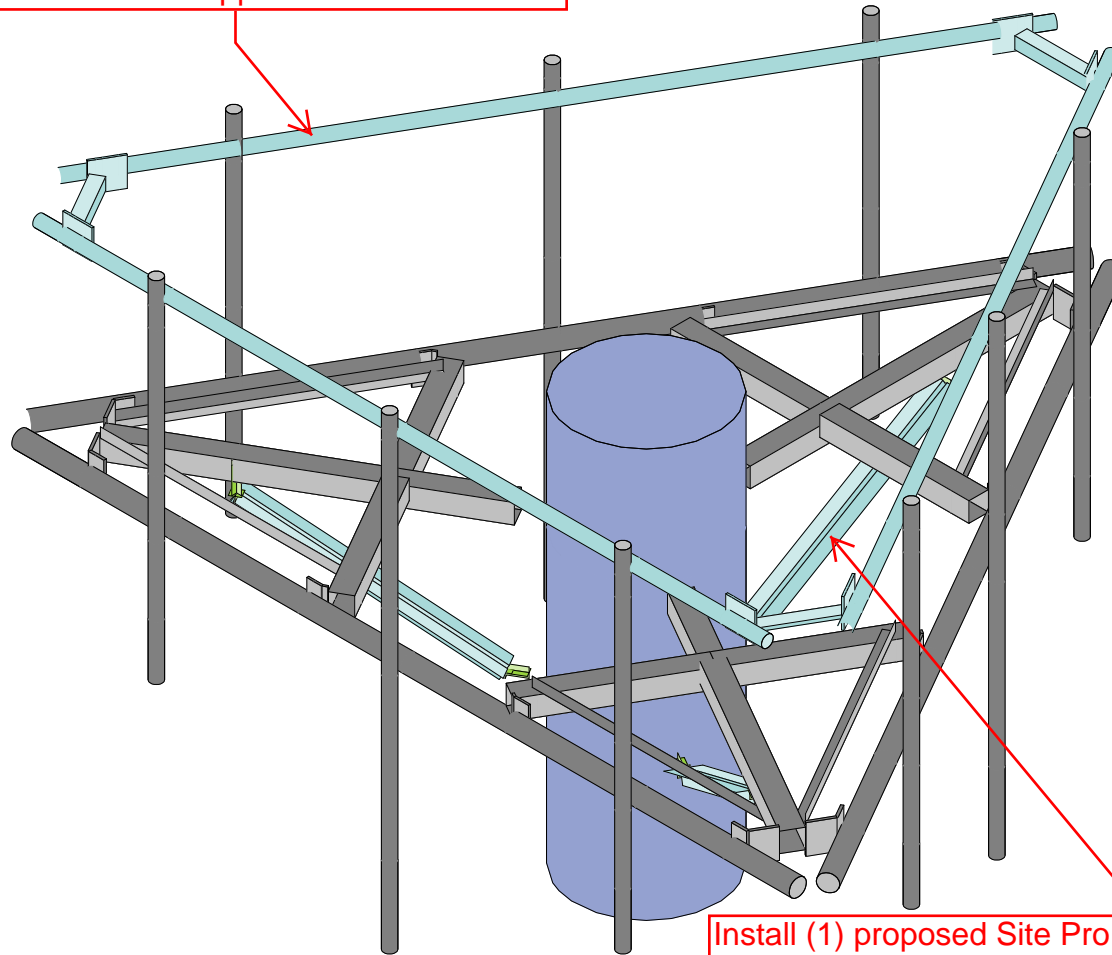
Member/Node Number	Load Comb.	Tensile Load, T_u (kips)	Shear Load, V_u (kips)	Bolt Diameter (in)	Number of Bolts	Shear Planes per Bolt	Bolt Tensile Strength, F_{nt} (ksi)	Bolt Shear Strength, F_{nv} (ksi)	Connected Member Thickness (in)	Connected Member Edge Clear Distance (in)	Connected Member Ultimate Strength, F_u (ksi)	Bolt Tensile Usage	Bolt Shear Usage	Member Bearing Usage
M146	11	1.820	0.566	0.625	1	1	43.5	23.2	0.625	0.9375	58	18%	11%	2%
M79A	3	0.627	0.319	0.5	1	1	43.5	23.2	0.375	0.75	58	10%	9%	2%

APPENDIX E

MOUNT MODIFICATION SKETCHES AND ASSEMBLY DRAWINGS



Install (1) proposed Site Pro 1 HRK12-U support rail kit at $\pm 3'-6''$ above the existing platform horizontal pipe. Connect to all mount pipes using Site Pro 1 SCX2 crossover plate kits included in the Support Rail kit.



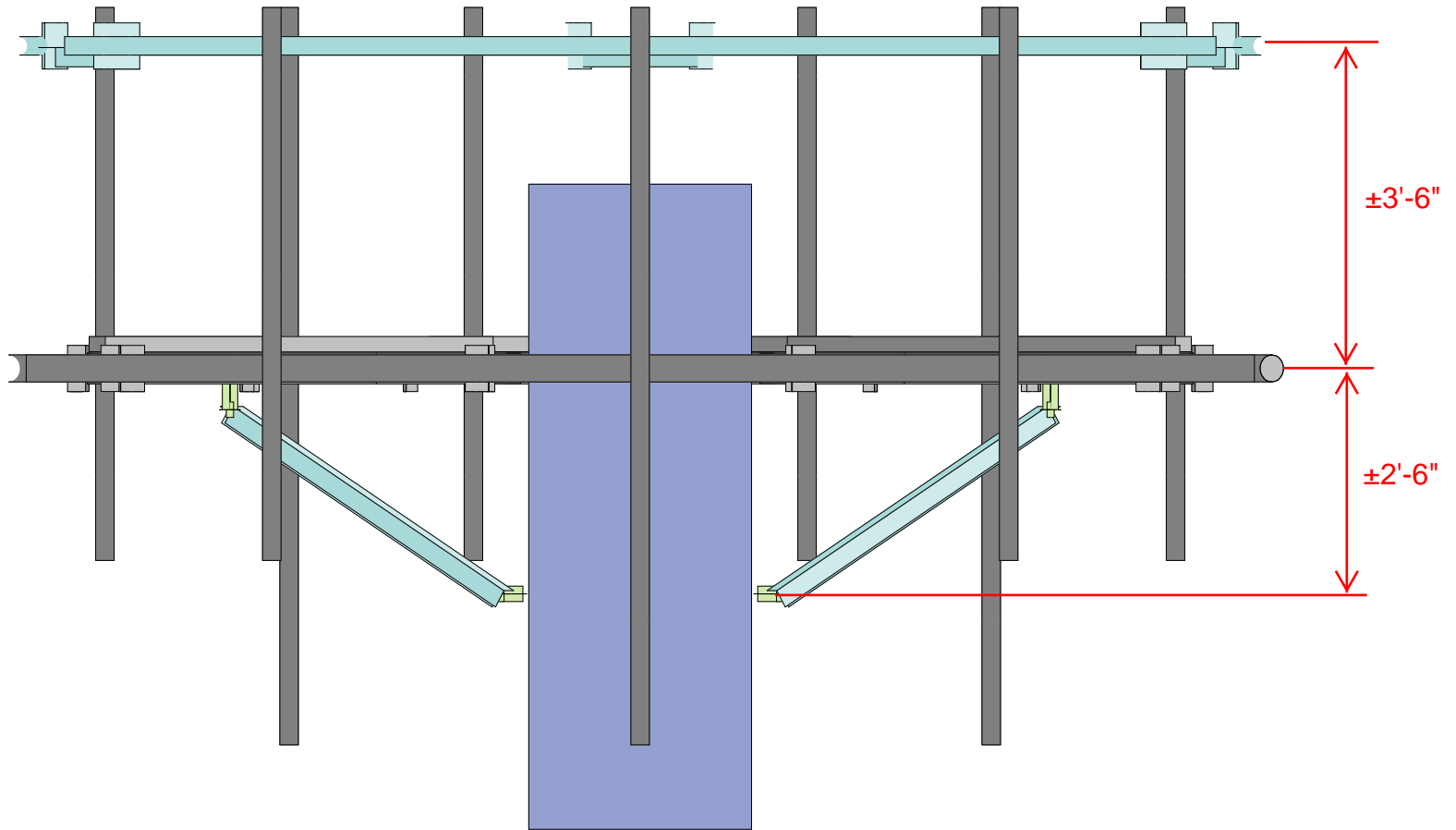
Install (1) proposed Site Pro 1 PRK-1245 platform reinforcement kit on existing platform mount as shown. Collar to be installed flush with existing monopole at a height of $\pm 2'-6''$ below the centerline of existing platform mount collar.

**NOTE:
DO NOT PINCH SAFETY CLIMB**

CLS
AAS
42284-CTNH312-01-MA-R1

42284-CTNH312-NH312/Crown-Naugatuck
Installation Sketch - Isometric View

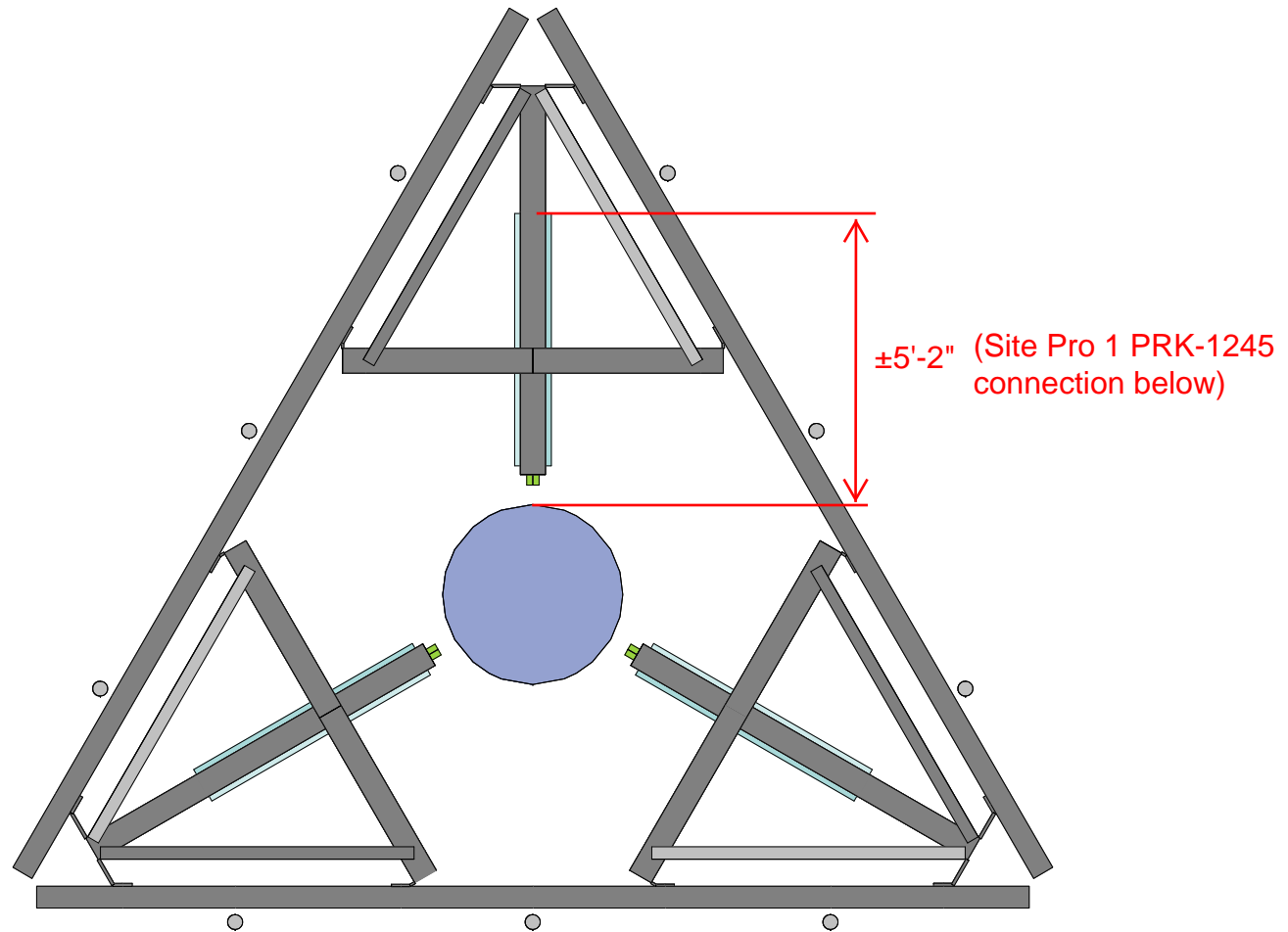
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42284-CTNH312-01-MA-R1.r3d



CLS
AAS
42284-CTNH312-01-MA-R1

42284-CTNH312-NH312/Crown-Naugatuck
Installation Sketch - Front Elevation

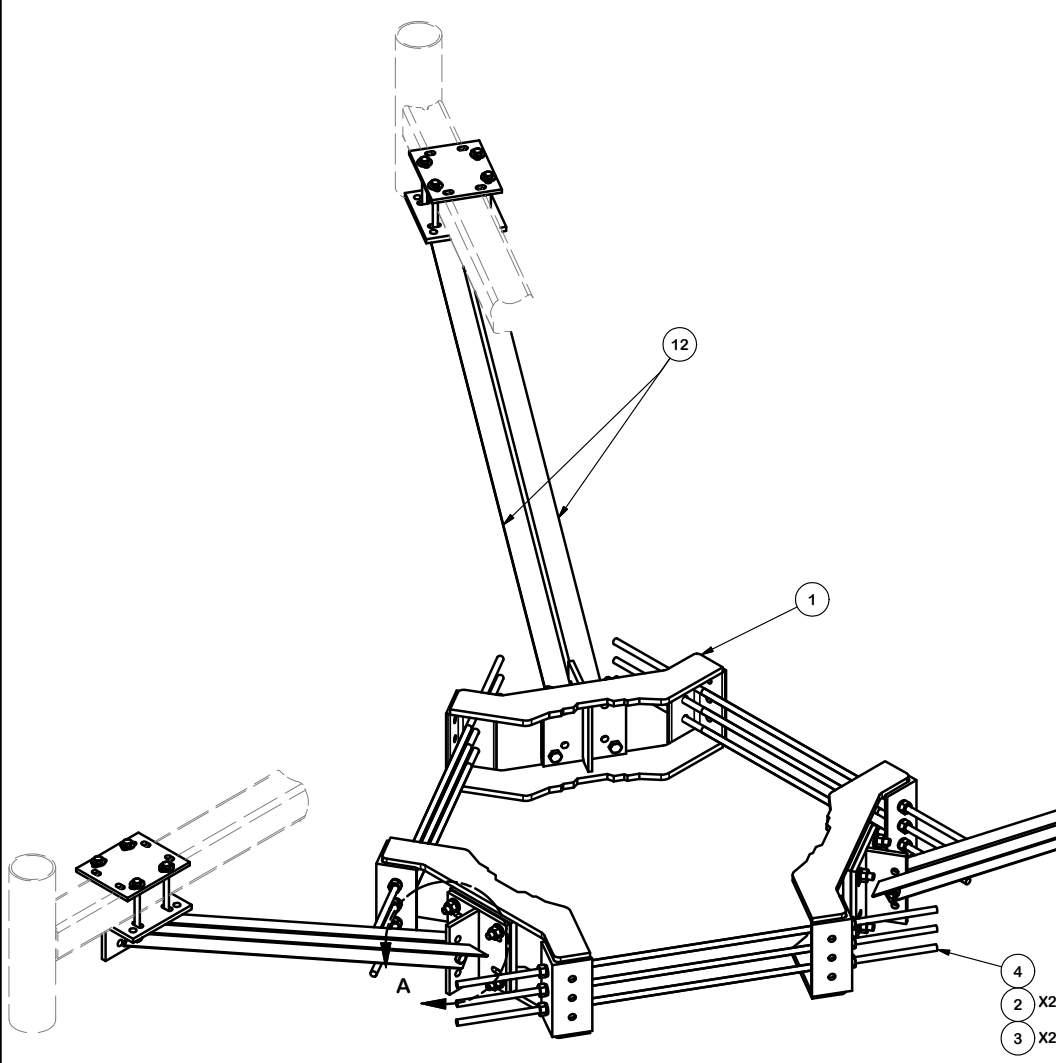
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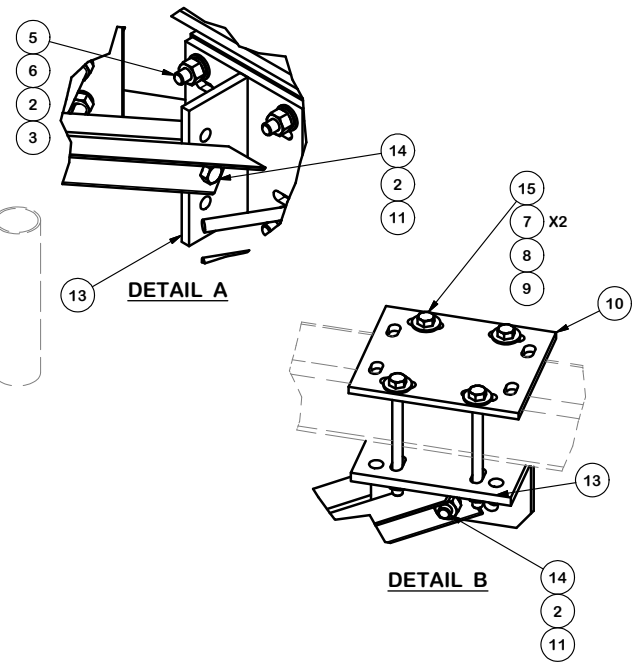
CLS
AAS
42284-CTNH312-01-MA-R1

42284-CTNH312-NH312/Crown-Naugatuck
Installation Sketch - Plan View

IN - 3
May 29, 2019 at 2:14 PM
42284-CTNH312-01-MA-R1.r3d



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	36	G58LW	5/8" HDG LOCKWASHER		0.03	0.94
3	30	A58NUT	5/8" HDG A325 HEX NUT		0.13	3.90
4	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.55	4.94
4	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.55	4.94
5	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	4.27
6	12	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.41
7	24	G12FW	1/2" HDG USS FLATWASHER		0.03	0.82
8	12	G12LW	1/2" HDG LOCKWASHER		0.01	0.17
9	12	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	0.86
10	3	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	18.06
11	6	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	0.78
12	6	X-253993	PLATFORM REINFORCEMENT KIT ANGLE	52 25/32 in	14.33	85.99
13	6	X-253992	T-BRACKET FOR REINFORCEMENT KIT		13.55	81.27
14	6	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.62
15	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
TOTAL WT. #						464.91



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
 SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.030"$)
 DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
 LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
 BENDS ARE $\pm 1/2$ DEGREE
 ALL OTHER MACHINING ($\pm 0.030"$)
 ALL OTHER ASSEMBLY ($\pm 0.060"$)

PROPRIETARY NOTE:
 THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION
**PLATFORM REINFORCEMENT
 ON A 12" TO 45" POLE
 4' 6" ANGLE**

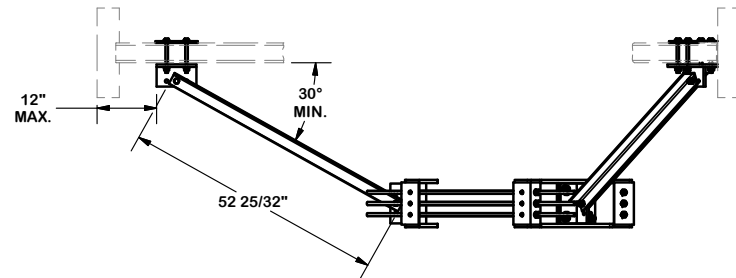
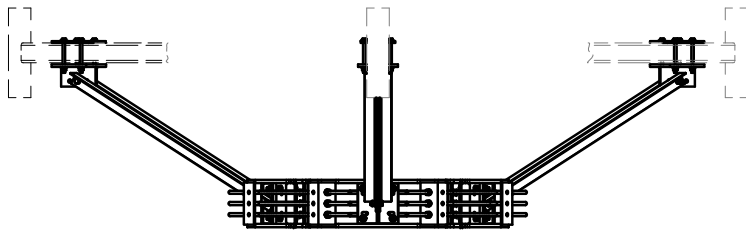
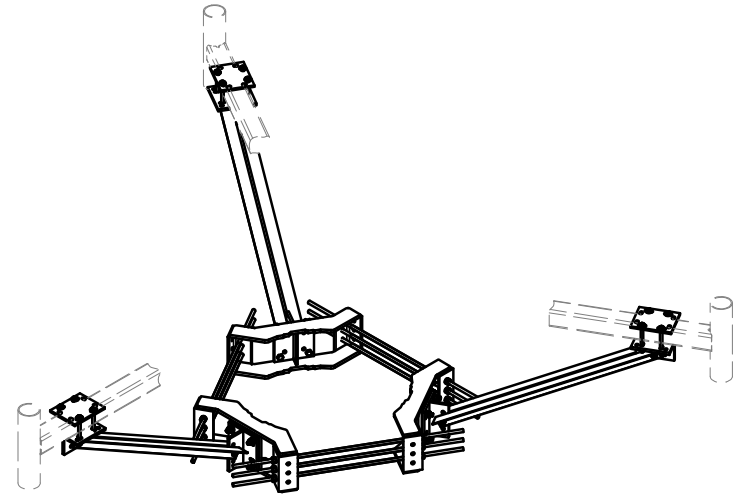
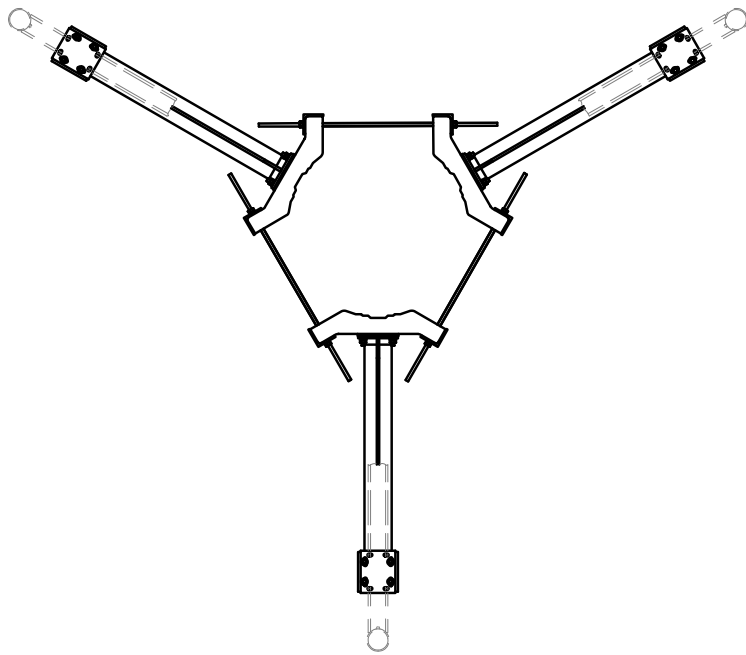
CPD NO. 4488	DRAWN BY CEK 4/10/2014	ENG. APPROVAL
CLASS 81	SUB 01	DRAWING USAGE CUSTOMER
		CHECKED BY BMC 4/10/2014

SITE PRO 1
 A valmont COMPANY

Locations:
 New York, NY
 Atlanta, GA
 Los Angeles, CA
 Plymouth, IN
 Salem, OR
 Dallas, TX

Engineering Support Team:
 1-888-753-7446

PART NO. PRK-1245	PAGE 1 OF 2
DWG. NO. PRK-1245	



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
 SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.030"$)
 DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
 LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
 BENDS ARE $\pm 1/2$ DEGREE
 ALL OTHER MACHINING ($\pm 0.030"$)
 ALL OTHER ASSEMBLY ($\pm 0.060"$)

PROPRIETARY NOTE:
 THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION

PLATFORM REINFORCEMENT
 ON A 12" TO 45" POLE
 4' 6" ANGLE



Engineering Support Team:
 1-888-753-7446

Locations:
 New York, NY
 Atlanta, GA
 Los Angeles, CA
 Plymouth, IN
 Salem, OR
 Dallas, TX

CPD NO.
4488

DRAWN BY
CEK 4/10/2014

ENG. APPROVAL

PART NO.

PRK-1245

CLASS SUB
81 01

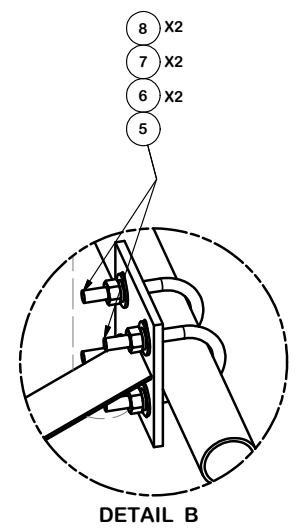
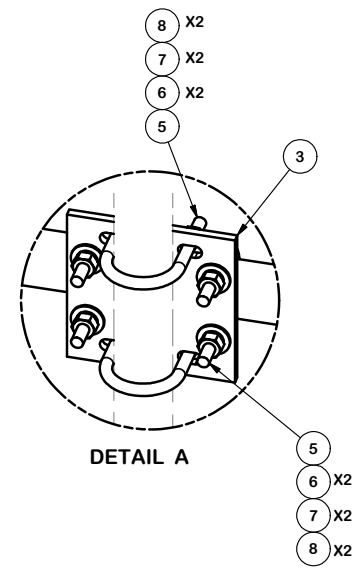
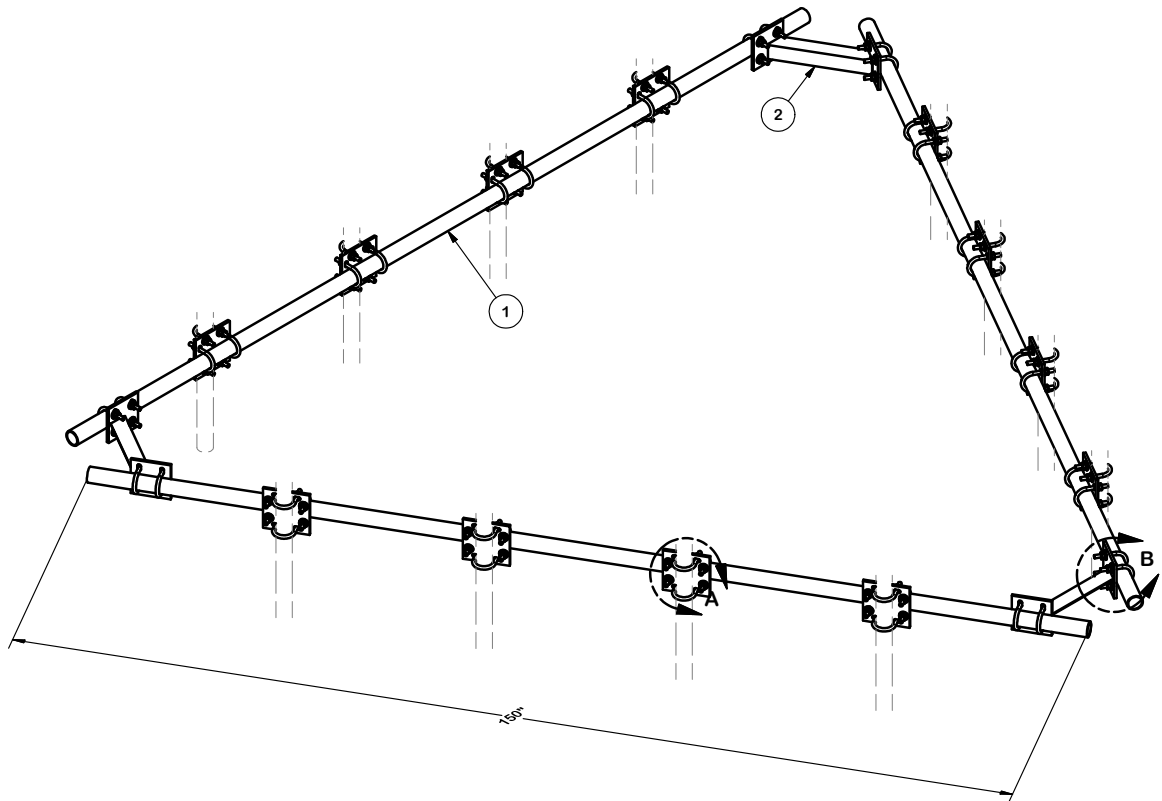
DRAWING USAGE
CUSTOMER

CHECKED BY
BMC 4/10/2014

DWG. NO.

PRK-1245

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2150	2-3/8" OD X 150" SCH 40 GALVANIZED PIPE	150 in	45.77	137.31
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
4	24	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.73	17.56
5	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	43.90
6	120	G12FW	1/2" HDG USS FLATWASHER		0.03	4.09
7	120	G12LW	1/2" HDG LOCKWASHER		0.01	1.67
8	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.60
					TOTAL WT. #	302.21



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
 SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.030"$)
 DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
 LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
 BENDS ARE $\pm 1/2$ DEGREE
 ALL OTHER MACHINING ($\pm 0.030"$)
 ALL OTHER ASSEMBLY ($\pm 0.060"$)

PROPRIETARY NOTE:
 THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION
UNIVERSAL HANDRAIL KIT FOR 12' PLATFORM
 2-3/8" & 2-7/8" ANTENNA PIPES

SITE PRO 1
 Engineering Support Team:
 1-888-753-7446
 Locations:
 New York, NY
 Atlanta, GA
 Los Angeles, CA
 Plymouth, IN
 Salem, OR
 Dallas, TX

CPD NO.	DRAWN BY CEK	3/9/2015	ENG. APPROVAL
CLASS 81	SUB 01	DRAWING USAGE CUSTOMER	CHECKED BY BMC 3/10/2015

PART NO.	HRK12-U
DWG. NO.	HRK12-U

Exhibit F

Power Density/RF Emissions Report

Transcom Engineering, Inc.

Wireless Network Design and Deployment

Radio Frequency Emissions Analysis Report

T-MOBILE Existing Facility

Site ID: CTNH312A

NH312/Crown-Naugatuck
280 Elm Street
Naugatuck, CT 06770

May 20, 2019

Transcom Engineering Project Number: 737001-0024

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	9.58 %

Transcom Engineering, Inc.

Wireless Network Design and Deployment

May 20, 2019

T-MOBILE

Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 6009

Emissions Analysis for Site: **CTNH312A – NH312/Crown-Naugatuck**

Transcom Engineering, Inc (“Transcom”) was directed to analyze the proposed upgrades to the T-MOBILE facility located at **280 Elm Street, Naugatuck, CT**, 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.

Population 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 & 700 MHz 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) and 2100 MHz (AWS) 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.

Transcom Engineering, Inc.

Wireless Network Design and Deployment

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.

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CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **280 Elm Street, Naugatuck, CT**, 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 manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE	1900 MHz (PCS)	4	40
LTE	2100 MHz (AWS)	2	60
UMTS	1900 MHz (PCS)	1	40
GSM	1900 MHz (PCS)	2	15
UMTS	2100 MHz (AWS)	1	40
LTE / 5G NR	600 MHz	2	20
LTE	700 MHz	2	60

Table 1: Channel Data Table

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The following antennas listed in *Table 2* were used in the modeling for transmission in the 600, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Ericsson AIR32 B66A / B2A	120
A	2	Ericsson AIR21 B2A/B4P	120
A	3	RFS APXVAARR24_43-U-NA20	120
B	1	Ericsson AIR32 B66A / B2A	120
B	2	Ericsson AIR21 B2A/B4P	120
B	3	RFS APXVAARR24_43-U-NA20	120
C	1	Ericsson AIR32 B66A / B2A	120
C	2	Ericsson AIR21 B2A/B4P	120
C	3	RFS APXVAARR24_43-U-NA20	120

Table 2: Antenna Data

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

Cable losses were factored in the calculations for this site. Since all **2100 MHz (AWS) UMTS** radios are ground mounted the following cable loss values were used. For each ground mounted **2100 MHz (AWS) UMTS** radio there was **1.48 dB** of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for **140 feet of 1-5/8” coax**.

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RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85	6	280	10,768.57	2.98
Antenna A2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	3	95	3,246.52	0.90
Antenna A3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.60
Sector A Composite MPE%							5.48
Antenna B1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85	6	280	10,768.57	2.98
Antenna B2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	3	95	3,246.52	0.90
Antenna B3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.60
Sector B Composite MPE%							5.48
Antenna C1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85	6	280	10,768.57	2.98
Antenna C2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	3	95	3,246.52	0.90
Antenna C3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	1.60
Sector C Composite MPE%							5.48

Table 3: T-MOBILE Emissions Levels

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The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	MPE%
T-MOBILE – Max Per Sector Value	5.48 %
Nextel	0.37 %
Verizon Wireless	1.08 %
Clearwire	0.09 %
Sprint	2.56 %
Site Total MPE %:	9.58 %

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	5.48 %
T-MOBILE Sector B Total:	5.48 %
T-MOBILE Sector C Total:	5.48 %
Site Total:	9.58 %

Table 5: Site MPE Summary

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FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

T-MOBILE _ Frequency Band /	# 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 1900 MHz (PCS) LTE	4	1,538.37	120	17.02	1900 MHz (PCS)	1000	1.70%
T-Mobile 2100 MHz (AWS) LTE	2	2,307.55	120	12.77	2100 MHz (AWS)	1000	1.28%
T-Mobile 1900 MHz (PCS) UMTS	1	1,556.18	120	4.30	1900 MHz (PCS)	1000	0.43%
T-Mobile 1900 MHz (PCS) GSM	1	583.57	120	1.61	1900 MHz (PCS)	1000	0.16%
T-Mobile 2100 MHz (AWS) LTE	1	1,106.78	120	3.06	2100 MHz (AWS)	1000	0.31%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	120	4.37	600 MHz	400	1.09%
T-Mobile 700 MHz LTE	2	432.54	120	2.39	700 MHz	467	0.51%
						Total:	5.48%

Table 6: T-MOBILE Maximum Sector MPE Power Values

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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:	5.48 %
Sector B:	5.48 %
Sector C:	5.48 %
T-MOBILE Maximum Total (per sector):	5.48 %
Site Total:	9.58 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **9.58 %** 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.



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