



Northeast Site Solutions  
Denise Sabo  
4 Angela's Way, Burlington CT 06013  
203-435-3640  
denise@northeastsitesolutions.com

July 13, 2021

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

RE: Exempt Modification Application  
123 Campville Road, Harwinton CT, 06791  
Latitude: 41.736678  
Longitude: -73.097033  
Site#: 876376\_Crown\_VZW

Dear Ms. Bachman:

Verizon Wireless is requesting to file an exempt modification for an existing tower located at 123 Campville Road, Harwinton CT, 06791. Verizon Wireless currently maintains twelve (12) antennas at the 154-foot level of the existing 177-foot tower. The property is owned by Harwinton Rod and Gun Club and the tower is owned by Crown Castle. Verizon now intends to add three (3) antenna. The new antennas would be installed at the 154-foot level of the tower. This modification includes B2, B5 hardware that is both 4G (LTE), and 5G capable. Antenna mount medications will be completed as per the attached Maser mount analysis dated May 6, 2021.

**Verizon Planned Modifications:**

Remove: NONE

Remove and Replace:

- (3) Antel-BXA-70063-6CF Antenna (REMOVE) - (3) Quintel QS6656-5D Antenna
- (3) Antenna Spare (Dummy model) (REMOVE) - (3) Samsung MT6407-77A Antenna

Install New:

- (3) Quintel QS6656-5D Antenna
- (1) Raycap
- (3) Samsung B2/B66A -BRO49 – RFV01U-D1A RRU
- (3) Samsung B5/B13 -BRO4C – RFV01U-D2A RRU

Existing to Remain:

- (4) LPA-80080-6CF-5 Antenna
- (2) LPA-80063-6CF-5 Antenna
- (6) Coax Lines
- (1) 1-5/8" Hybrid



The facility was approved by the Town of Harwinton Zoning Commission by way of a Special Use Permit on June 26, 2000. Verizon was approved on January 13, 2004 by the CT Siting Council EM-VER-06+6-040108. Please see attached

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-SOj-73, a copy of this letter is being sent to Michael R. Criss, First Selectman, and Jeffrey Neumann, Building Official, for the Town of Harwinton. A copy is also being sent to the tower owner, and property owner.

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

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

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

Sincerely,

Denise Sabo  
Mobile: 203-435-3640  
Fax: 413-521-0558  
Office: 4 Angela's Way, Burlington CT 06013  
Email: [denise@northeastsitesolutions.com](mailto:denise@northeastsitesolutions.com)



**NSS** **NORTHEAST**  
SITE SOLUTIONS  
*Turnkey Wireless Development*

Attachments

cc: Michael R. Criss, First Selectman (via email only to [mcriss@harwinton.us](mailto:mcriss@harwinton.us))  
Town of Harwinton 100 Bentley Drive Harwinton CT, 06791

Jeffrey Neumann, Building Official (via email only to [building@harwinton.us](mailto:building@harwinton.us))  
Polly Redmond, Land Use Coordinator (via email only to [landuse@harwinton.us](mailto:landuse@harwinton.us))  
Town of Harwinton 100 Bentley Drive Harwinton CT, 06791

Harwinton Rod and Gun Club, Property Owner  
PO Box 181, Harwinton CT 06791

Crown Castle Tower Owner (via email to [Sarah.Snell@crowncastle.com](mailto:Sarah.Snell@crowncastle.com))

# Exhibit A

## **Original Facility Approval**



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@po.state.ct.us](mailto:siting.council@po.state.ct.us)

Web Site: [www.ct.gov/csc](http://www.ct.gov/csc)

February 4, 2004

Kenneth C. Baldwin  
Robinson & Cole  
280 Trumbull Street  
Hartford, CT 06103-3597

RE: **EM-VER-066-040108** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 123 Campville Hill Road, Harwinton, Connecticut.

Dear Attorney Baldwin:

At a public meeting held on February 3, 2004, the Connecticut Siting Council (Council) acknowledged your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated January 8, 2004. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

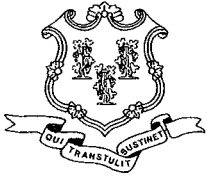
Thank you for your attention and cooperation.

Very truly yours,

Pamela B. Katz, P.E.  
Chairman

PBK/laf

- c: Honorable Marie M. Knudsen, First Selectman, Town of Harwinton  
William J. Tracy, Jr., Planning Chairman, Town of Harwinton  
Thomas J. Regan, Esq., Brown Rudnick Berlack Israels LLP  
Stephen J. Humes, Esq., LeBoeuf, Lamb, Green & MacRae LLP  
Christopher B. Fisher, Esq., Cuddy & Feder LLP



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@po.state.ct.us](mailto:siting.council@po.state.ct.us)

Web Site: [www.ct.gov/csc](http://www.ct.gov/csc)

January 13, 2004

Honorable Marie M. Knudsen  
First Selectman  
Town of Harwinton  
Town Hall  
100 Bentley Drive  
Harwinton, CT 06791

RE: **EM-VER-066-040108** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 123 Campville Hill Road, Harwinton, Connecticut.

Dear Ms. Knudsen:

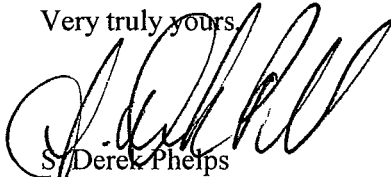
The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

The Council will consider this item at the next meeting tentatively scheduled for February 3, 2004, at 1:30 p.m. in Hearing Room One, Ten Franklin Square, New Britain, Connecticut.

Please call me or inform the Council if you have any questions or comments regarding this proposal.

Thank you for your cooperation and consideration.

Very truly yours,



S/ Derek Phelps  
Executive Director

SDP/cm

Enclosure: Notice of Intent

c: William J. Tracy, Jr., Planning Chairman, Town of Harwinton

280 Trumbull Street  
Hartford, CT 06103-3597  
Main (860) 275-8200  
Fax (860) 275-8299  
kbaldwin@rc.com  
Direct (860) 275-8345

January 8, 2004

*Via Hand Delivery*

S. Derek Phelps  
Executive Director  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

**RECEIVED**  
JAN - 8 2004  
CONNECTICUT  
SITING COUNCIL

Re: **Notice of Exempt Modification**  
**123 Campville Hill Road**  
**Harwinton, Connecticut**

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") intends to install antennas on an existing tower at 123 Campville Hill Road in Harwinton, Connecticut. Please accept this letter as notification pursuant to R.C.S.A. § 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 the Harwinton First Selectman, Marie Knudsen.

The facility consists of a 177-foot self-supporting monopole tower, capable of supporting multiple carriers within an approximately 64' x 72' site compound. The tower is owned and operated by Sprint Sites USA ("Sprint"). The tower is currently shared by Sprint PCS at the 180-foot level, T-Mobile at the 168-foot level and AT&T at the 157-foot level. Cellco proposes to install twelve (12) panel-type antennas at the 147-foot level on the tower and a 12' x 30' single-story equipment shelter near the base of the tower. (See Attachment 1- Project Plans).

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

1. The proposed modification will not increase the overall height of the existing tower. Cellco's antennas will be mounted with their centerline at the 147-foot level on the 177-foot tower.



Law Offices

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NEW LONDON

STAMFORD

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NEW YORK

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HART1-1138009-1

S. Derek Phelps  
January 8, 2004  
Page 2

2. The proposed installation of twelve (12) panel-type antennas and a 12' x 30' equipment shelter will not require an extension of the site boundaries.
3. The proposed modification will not increase the noise levels at the facility by six decibels or more.
4. The operation of the antennas will not increase radio frequency (RF) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. The combined worst-case RF power density calculations for existing and Cellco antennas would be 6.44% of the FCC standard (See Attachment 2).

Also included as Attachment 3 is an engineer's certification verifying that the tower can accommodate the existing and proposed antennas and related equipment.

For the foregoing reasons, Cellco respectfully submits that the proposed antenna installation at the Harwinton facility tower constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,



Kenneth C. Baldwin

Attachments

cc: Marie Knudsen, Harwinton First Selectman  
Sandy M. Carter





# Exhibit B

## Property Card

**Summary**

**ParcelId** 1225  
**Account Number** 2581  
**Location Address** 123 CAMPVILLE HILL  
**Map-Block-Lot** A4 /05 /0002  
  
**Use Class/Description** 1-1 RES LAND  
**Assessing Neighborhood** 0001A  
**Census Tract** 298400000000  
**Acres** 49  
**Utilities**



**Owner**

HARWINTON ROD & GUN CLUB  
 PO BOX 181  
 HARWINTON, CT 06791

**Current Appraised Value**

	2019	2018	2017
+ Building Value	\$196,600	\$196,600	\$205,400
+ XF Value	\$0	\$0	\$0
+ OB Value	\$0	\$0	\$0
+ Land Value	\$594,300	\$594,300	\$391,460
+ Special Land Value			
+ Total Appraised Value	\$790,900	\$790,900	\$596,860
+ Net Appraised Value	\$790,900	\$790,900	\$596,860
+ Current Assessment	\$324,650	\$324,650	\$220,070

**Assessment History**

	2018	2017	2016	2015
+ Building Value	\$137,620	\$143,780	\$143,780	\$143,780
+ OB/Misc	\$0	\$0	\$0	\$0
+ Land	\$187,030	\$76,290	\$76,290	\$76,290
+ Total Assessment	\$324,650	\$220,070	\$220,070	\$220,070

**Land**

Use	Class	Zoning	Area	Value
1-1 RES LAND	R	CR2	2 AC	\$75,900
6-2 FOREST LD	R		47 AC	\$338,400
3-1 IND LAND	I		1 BL	\$180,000

**Building Data**

**Building #** 1  
**Style** Camp  
**Actual Year Built** 1977  
**Effective Year Built** 1980  
**Living Area** 5892  
**Stories** 1  
**Grade** Average  
**Exterior Wall** Wood on Sheath  
**Interior Wall** Wall Brd/Wood  
**Fireplaces**  
**Roof Cover** Asph/F Gls/Cmp  
**Roof Structure** Gable/Hip  
**Floor Type** Average  
**Heat Type** Forced Air-Duc  
**Fuel Type** Oil  
**AC** None  
**Bdrms/Ful Bth/Hlf Bth/Ttl Rm** 0/1/0/2

## Building Sub Areas

Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	5892	5892	5892
FST	Utility Storage	0	2400	1200
PTO	Patio	0	210	21
	Totals	5892	8502	7113

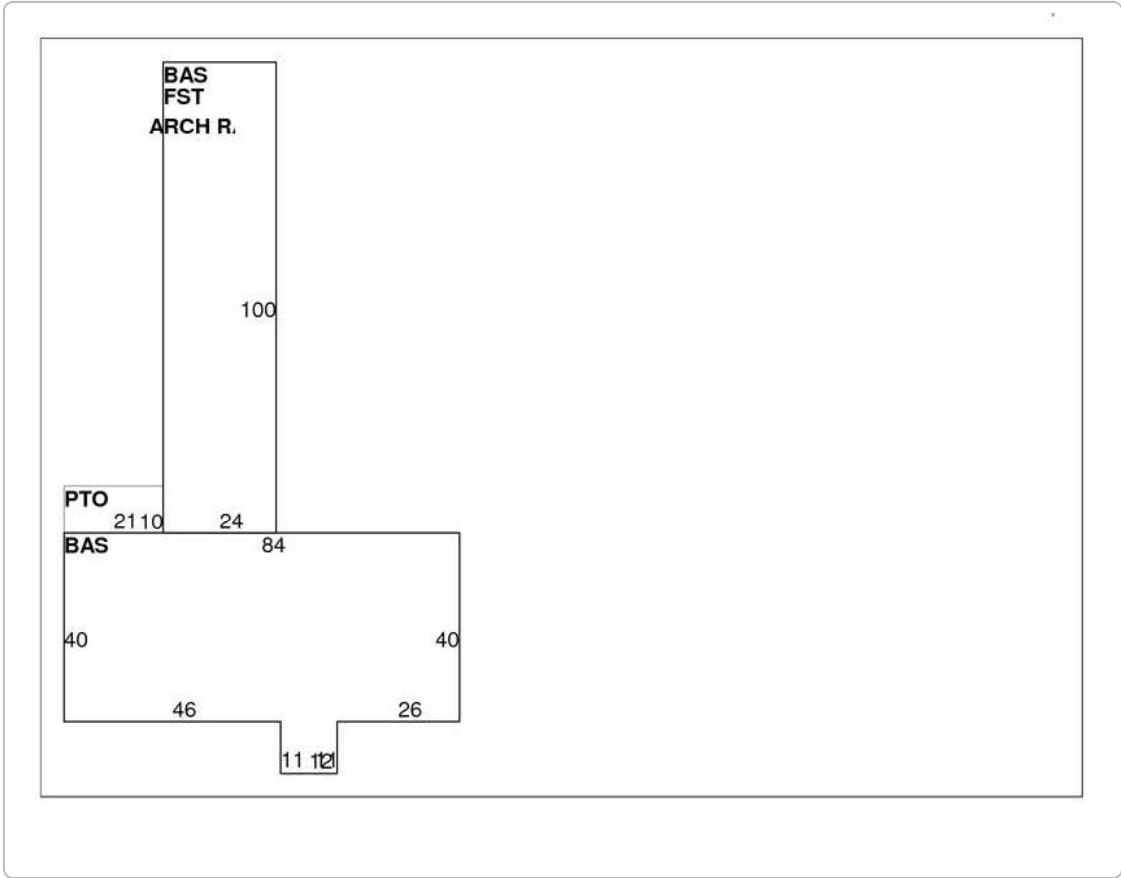
## Sales History

Sales Date	Type of Document	Grantee	Vacant/Improved	Book/Page	Amount
12-30-1997	Q	HARWINTON ROD & GUN CLUB	Improved	0152/0053	\$50,000
07-08-1957		SLATE ALICE	Improved	0049/0488	\$0

## Permit Information

Permit ID	Issue Date	Type	Description	Amount	Inspection Date	% Complete	Date Complete	Comments
19171B	12-06-2019		14X20 PAVILLION	\$6,000		100		
1864E	11-05-2019		STAND BY GENERATOR	\$8,500		100		
198E	01-31-2019	EL	Electric	\$2,500		100		
17164B	11-09-2017		ADD 3 ANTENNAS	\$20,000		100		
176CA	02-06-2017	CO	CO ISSUED	\$0		100		T-MOBILE
16146B	08-02-2016		CONCRETE PATIO 30X30	\$6,175		0		
1647E	03-08-2016	EL	Electric	\$2,500		0		
9416	10-24-2014		MODIFICATIONS	\$20,000		0		
8760	01-17-2013		FACILITY MODIFICATIO	\$25,000		0		
8757	01-02-2013		ANTENNA SWAP	\$10,000		0		
8704	11-21-2012		ANTENNAS	\$12,000		0		
8339	01-13-2012			\$92		0		REPLACING 6 ANTENNAS WITH NEWER MODELS
7560	09-28-2009	DE	Demolish	\$1,500		0		
0000	09-10-2009	CO	CO ISSUED	\$0		0		
7495	07-14-2009	EL	Electric	\$3,000		0		
7486	07-01-2009	AD	Addition	\$31,395		0		CEL TOWER
	03-17-2009	EL	Electric	\$0		0		INSTALLING ANTENNAS & RADIO
7201	07-09-2008			\$28,000		0		NEW VINYL SIDING
6437	06-21-2008	EL	Electric	\$8,000		0		

## Sketch



**Photos**



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

[User Privacy Policy](#)  
[GDPR Privacy Notice](#)

[Last Data Upload: 7/24/2020, 8:28:22 PM](#)



[Version 2.3.72](#)



# Exhibit C

## **Construction Drawings**



**VERIZON SITE NUMBER:** 468296  
**VERIZON SITE NAME:** HARWINTON W CT  
**SITE TYPE:** MONOPOLE  
**TOWER HEIGHT:** 177'-0"

**BUSINESS UNIT #:** 876376  
**SITE ADDRESS:** 123 CAMPVILLE HILL RD.  
 HARWINTON, CT 06791  
**COUNTY:** LITCHFIELD  
**JURISDICTION:** LITCHFIELD COUNTY

**VERIZON FUZE PROJECT #: 16271950**

**verizon**  
 180 WASHINGTON VALLEY ROAD  
 BEDMINSTER, NJ 07921

**CROWN CASTLE**  
 1500 CORPORATE DRIVE  
 CANONSBURG, PA 15317

**INFINIGY**  
 FROM ZERO TO INFINIGY  
 the solutions are endless  
 BELLEVUE, WA 98004

**VERIZON SITE NUMBER:**  
 468296  
**BU #:** 876376  
**SCOVILLE HILL / HARWINTON ROD**  
 123 CAMPVILLE HILL RD.  
 HARWINTON, CT 06791  
 EXISTING 177'-0" MONOPOLE

**SITE INFORMATION**

CROWN CASTLE USA INC. SCOVILLE HILL / HARWINTON ROD  
 SITE NAME:  
 SITE ADDRESS: 123 CAMPVILLE HILL RD.  
 HARWINTON, CT 06791  
 COUNTY: LITCHFIELD  
 MAP/PARCEL #: VERIFY  
 AREA OF CONSTRUCTION: EXISTING  
 LATITUDE: 41° 44' 12.04" N (41.736678°)  
 LONGITUDE: 73° 5' 49.32" W (-73.097033°)  
 LAT/LONG TYPE: NAD83  
 GROUND ELEVATION: 728.2'  
 CURRENT ZONING: TBD  
 JURISDICTION: LITCHFIELD COUNTY  
 OCCUPANCY CLASSIFICATION: U  
 TYPE OF CONSTRUCTION: IIB  
 A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION  
 PROPERTY OWNER: TBD  
 TOWER OWNER: CCAIT LLC  
 1500 CORPORATE DRIVE  
 CANONSBURG, PA 15317  
 CARRIER/APPLICANT: VERIZON WIRELESS  
 180 WASHINGTON VALLEY ROAD  
 BEDMINSTER, NJ 07921  
 ELECTRIC PROVIDER: TBD  
 TELCO PROVIDER: TBD

**DRAWING INDEX**

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN
C-2	TOWER ELEVATION & ANTENNA PLANS
C-3	EQUIPMENT SCHEDULES
C-4	EQUIPMENT DETAILS
C-5	EQUIPMENT DETAILS
C-6	PLUMBING DIAGRAM
G-1	GROUNDING DETAILS
G-2	GROUNDING DETAILS

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.

**APPROVALS**

SIGNATURE	DATE
_____	_____
_____	_____
_____	_____
_____	_____

**CONTRACTOR PMI REQUIREMENTS**

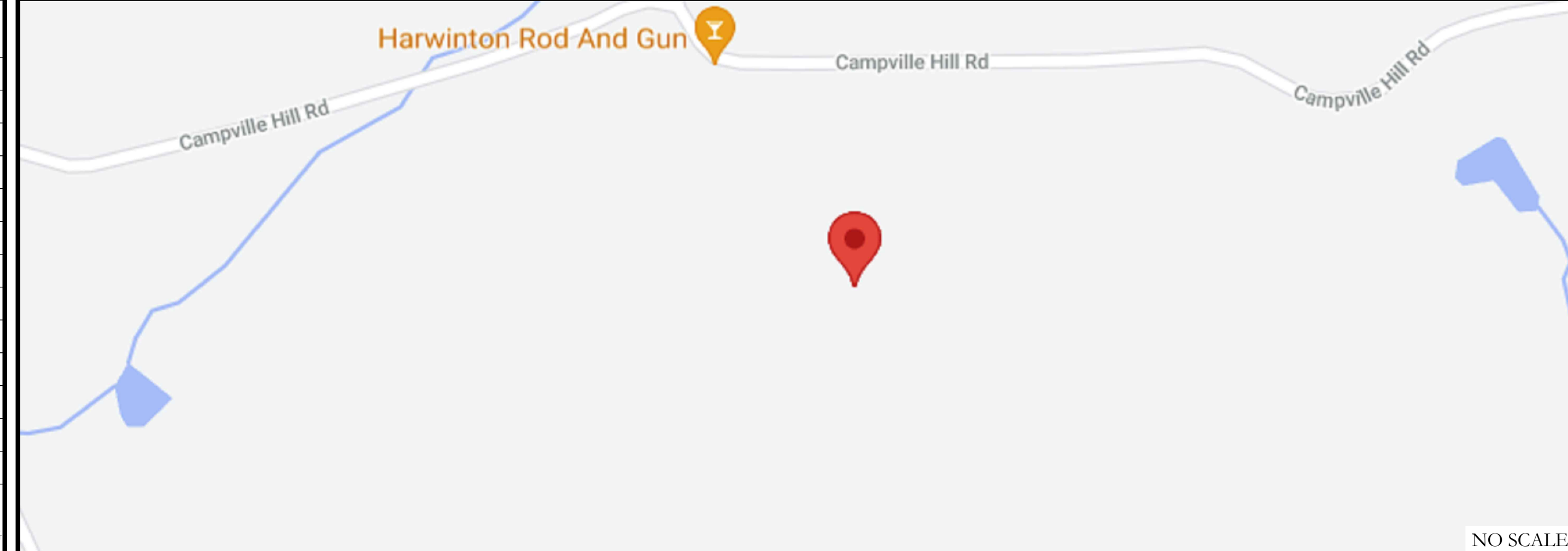
PMI ACCESSED AT <https://pmi.vxwsmart.com>  
 SMART TOOL VENDOR PROJECT NUMBER 6039-Z0001-C  
 VzW LOCATION CODE (PSLC) 468296  
 \*\*\* PMI AND REQUIREMENTS ALSO EMBEDDED IN MOUNT ANALYSIS REPORT

**MOUNT MODIFICATION REQUIRED** N

**VzW APPROVED SMART KIT VENDORS**

REFER TO MOUNT MODIFICATION DRAWINGS PAGE FOR VzW SMART KIT APPROVED VENDORS

**LOCATION MAP**



DRIVING DIRECTIONS FROM VERIZON LOCAL OFFICE (180 WASHINGTON VALLEY RD, BEDMINSTER, NJ 07921) DEPART AND HEAD TOWARDS WASHINGTON VALLEY RD / COUNTY HWY-620, TURN LEFT ONTO WASHINGTON VALLEY RD / COUNTY HWY-620, BEAR RIGHT ONTO US-206 N / US-202 N / US HIGHWAY 202 206, BEAR RIGHT ONTO US-202 N / US-206 N / US HIGHWAY 202 206, TURN RIGHT ONTO SCHLEY MOUNTAIN RD, TAKE THE RAMP ON THE RIGHT FOR I-287 N, KEEP STRAIGHT TO GET ONTO I-95 N / NEW JERSEY TPKE N, KEEP LEFT TO STAY ON I-95 N, KEEP STRAIGHT TO GET ONTO US-6 E / CT-8 N / JAMES H DARCEY MEMORIAL HWY N, KEEP STRAIGHT TO GET ONTO CT-8 N / JAMES H DARCEY MEMORIAL HWY N, TURN RIGHT ONTO CAMPVILLE RD TOWARDS CAMPVILLE, ROAD NAME CHANGES TO NORTHFIELD RD, KEEP STRAIGHT TO GET ONTO VALLEY RD, BEAR RIGHT ONTO CAMPVILLE HILL RD, ARRIVE AT 123 CAMPVILLE HILL RD., HARWINTON, CT 06791.

**APPLICABLE CODES/REFERENCE DOCUMENTS**

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

**REFERENCE DOCUMENTS:**

STRUCTURAL ANALYSIS: BY OTHERS  
 DATED:  
 MOUNT ANALYSIS: MASER CONSULTING CONNECTICUT  
 DATED: 05/13/2021  
 RFDS REVISION: TBD  
 DATED: 03/18/2021  
 ORDER ID: 552650  
 REVISION: 0

**PROJECT DESCRIPTION**

THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

- TOWER SCOPE OF WORK:
- REMOVE (6) ANTENNAS
  - INSTALL (9) ANTENNAS
  - INSTALL (3) ANTENNA MOUNTING BRACKETS
  - INSTALL (6) RRHs
  - INSTALL (1) OVP
  - REMOVE (1) COAXIAL CABLE
  - INSTALL (1) HYBRID CABLE

- GROUND SCOPE OF WORK:
- REMOVE (3) B13 RRH 4x30

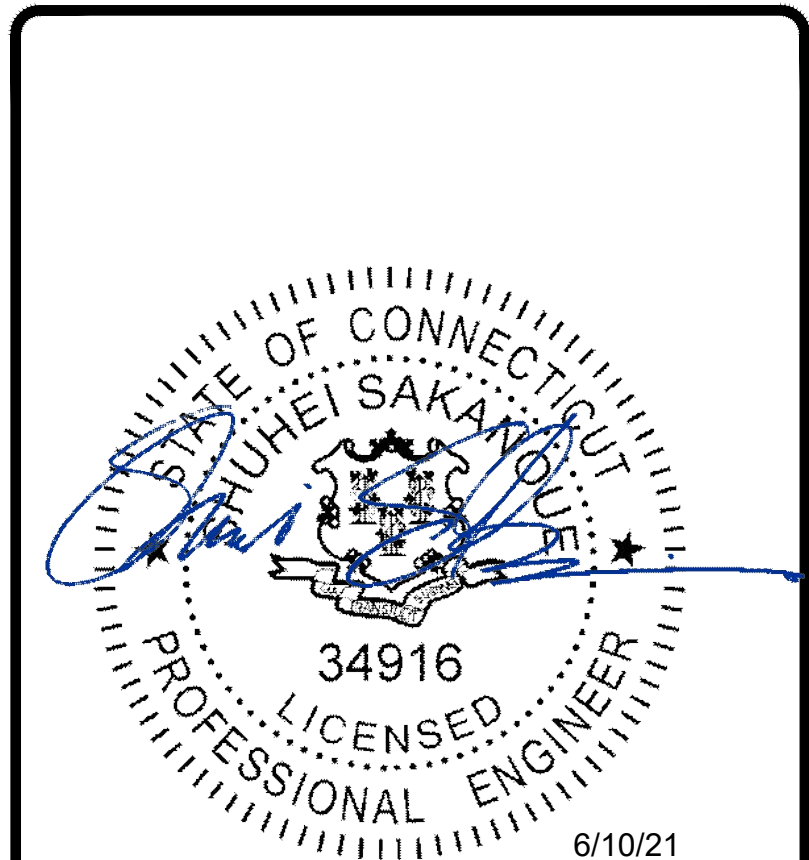
NOTE:  
 PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER

**PROJECT TEAM**

A&E FIRM: CROWN CASTLE USA INC.  
 2000 CORPORATE DRIVE  
 CANONSBURG, PA 15317  
 CROWNNAE.APPROVAL@CROWNCastle.COM  
 CROWN CASTLE USA INC. DISTRICT CONTACTS:  
 1505 WESTLAKE AVENUE NORTH, SUTTE 800  
 SEATTLE, WA 98109  
 TBD - PROJECT MANAGER  
 --  
 TBD - CONSTRUCTION MANAGER  
 --  
 VERIZON CONTACT: TIMOTHY PARKS  
 TIMOTHY.PARKS@VERIZONWIRELESS.COM

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	06/07/2021	RCD	FINAL CDs	--



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

**SHEET NUMBER:** T-1  
**REVISION:** 0

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

- 1. NOTICE TO PROCEED- NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800-788-7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.

GREENFIELD GROUNDING NOTES:

- 1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

GENERAL NOTES:

- 1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY: CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION CARRIER: VERIZON TOWER OWNER: CROWN CASTLE USA INC.

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

- 1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.

ELECTRICAL INSTALLATION NOTES:

- 1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.

Table with columns: SYSTEM, CONDUCTOR, COLOR. Lists color codes for various conductor sizes and types, including DC voltage and color key.

\* SEE NEC 210.5(C)(1) AND (2) \*\* POLARITY MARKED AT TERMINATION

ABBREVIATIONS:

- ANT ANTENNA (E) EXISTING FIF FACILITY INTERFACE FRAME GEN GENERATOR GPS GLOBAL POSITIONING SYSTEM GSM GLOBAL SYSTEM FOR MOBILE LTE LONG TERM EVOLUTION MGB MASTER GROUND BAR MW MICROWAVE (N) NEW NEC NATIONAL ELECTRIC CODE (P) PROPOSED PP POWER PLANT QTY QUANTITY RECT RECTIFIER RBS RADIO BASE STATION RBT REMOTE ELECTRIC TILT RFDS RADIO FREQUENCY DATA SHEET RRH REMOTE RADIO HEAD RRU REMOTE RADIO UNIT SIAD SMART INTEGRATED DEVICE TMA TOWER MOUNTED AMPLIFIER TYP TYPICAL UMS UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM W.P. WORK POINT



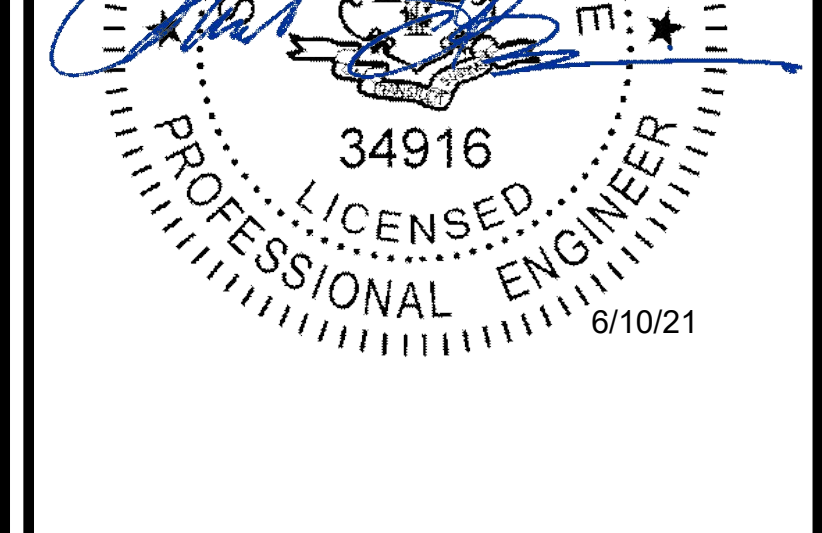
VERIZON SITE NUMBER: 468296 BU #: 876376 SCOVILLE HILL / HARWINTON ROD 123 CAMPVILLE HILL RD. HARWINTON, CT 06791 EXISTING 177'-0" MONOPOLE

Table with columns: REV, DATE, DRWN, DESCRIPTION, DES./QA. Shows revision 0 dated 06/07/2021 by RCD for FINAL CDs.

ISSUED FOR:

Table with columns: REV, DATE, DRWN, DESCRIPTION, DES./QA. Shows revision 0 dated 06/07/2021 by RCD for FINAL CDs.

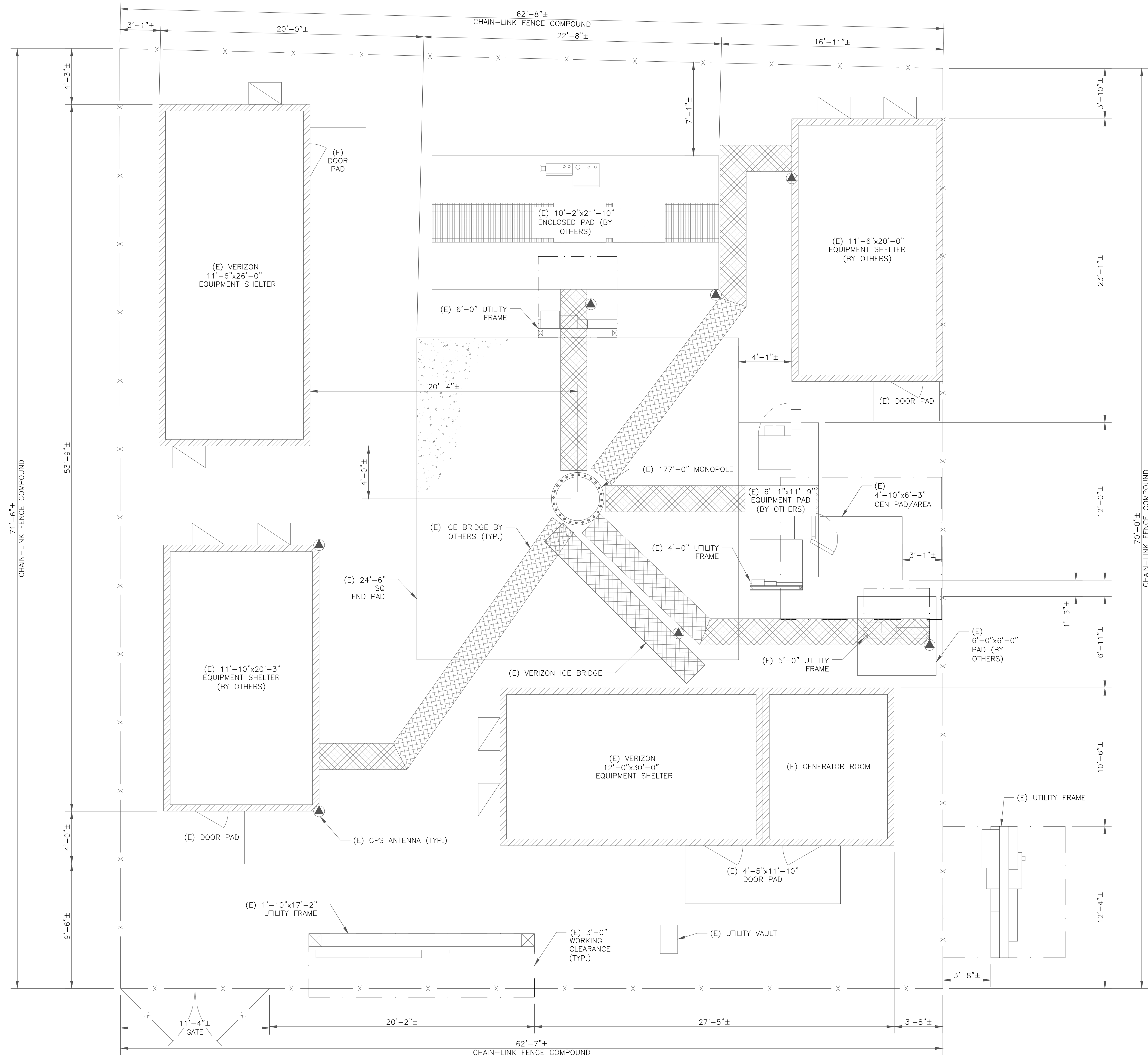
Color key table for APWA Uniform Color Code: WHITE (PROPOSED EXCAVATION), PINK (TEMPORARY SURVEY MARKINGS), RED (ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES), YELLOW (GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS), ORANGE (COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS), BLUE (POTABLE WATER), PURPLE (RECLAIMED WATER, IRRIGATION, AND SLURRY LINES), GREEN (SEWERS AND DRAIN LINES)



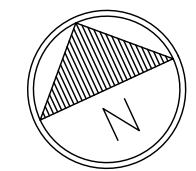
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Table with columns: SHEET NUMBER, REVISION. Shows SHEET NUMBER: T-2 and REVISION: 0.





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



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180 WASHINGTON VALLEY ROAD  
 BEDMINSTER, NJ 07921

**CROWN CASTLE**

1500 CORPORATE DRIVE  
 CANONSBURG, PA 15317

**INFINIGY**

FROM ZERO TO INFINIGY  
 the solutions are endless

BELLEVUE, WA 98004

VERIZON SITE NUMBER:  
**468296**

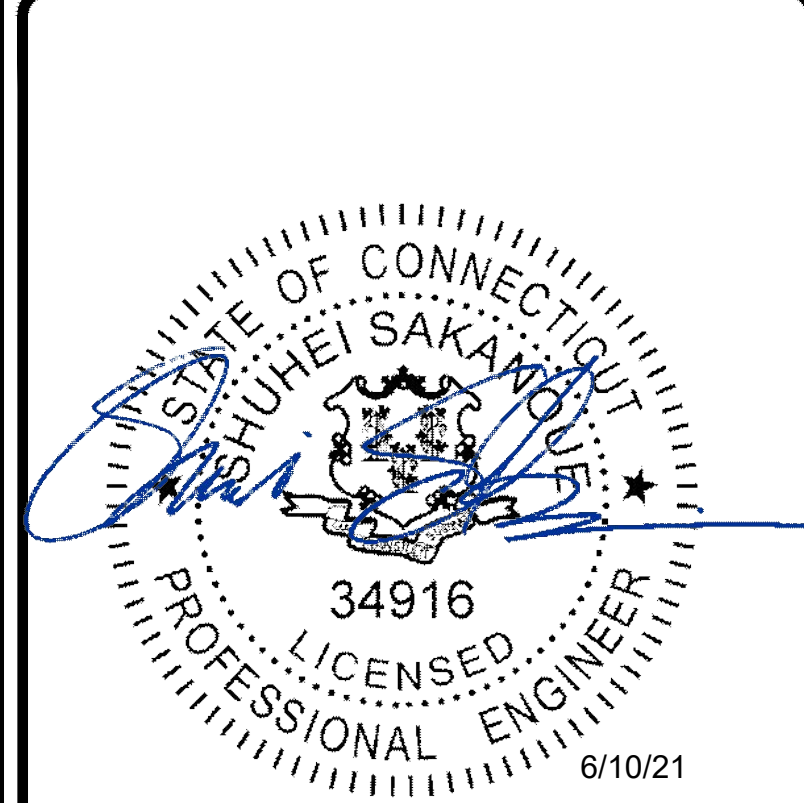
BU #: 876376  
**SCOVILLE HILL / HARWINTON ROD**

123 CAMPVILLE HILL RD.  
 HARWINTON, CT 06791

EXISTING 177'-0" MONOPOLE

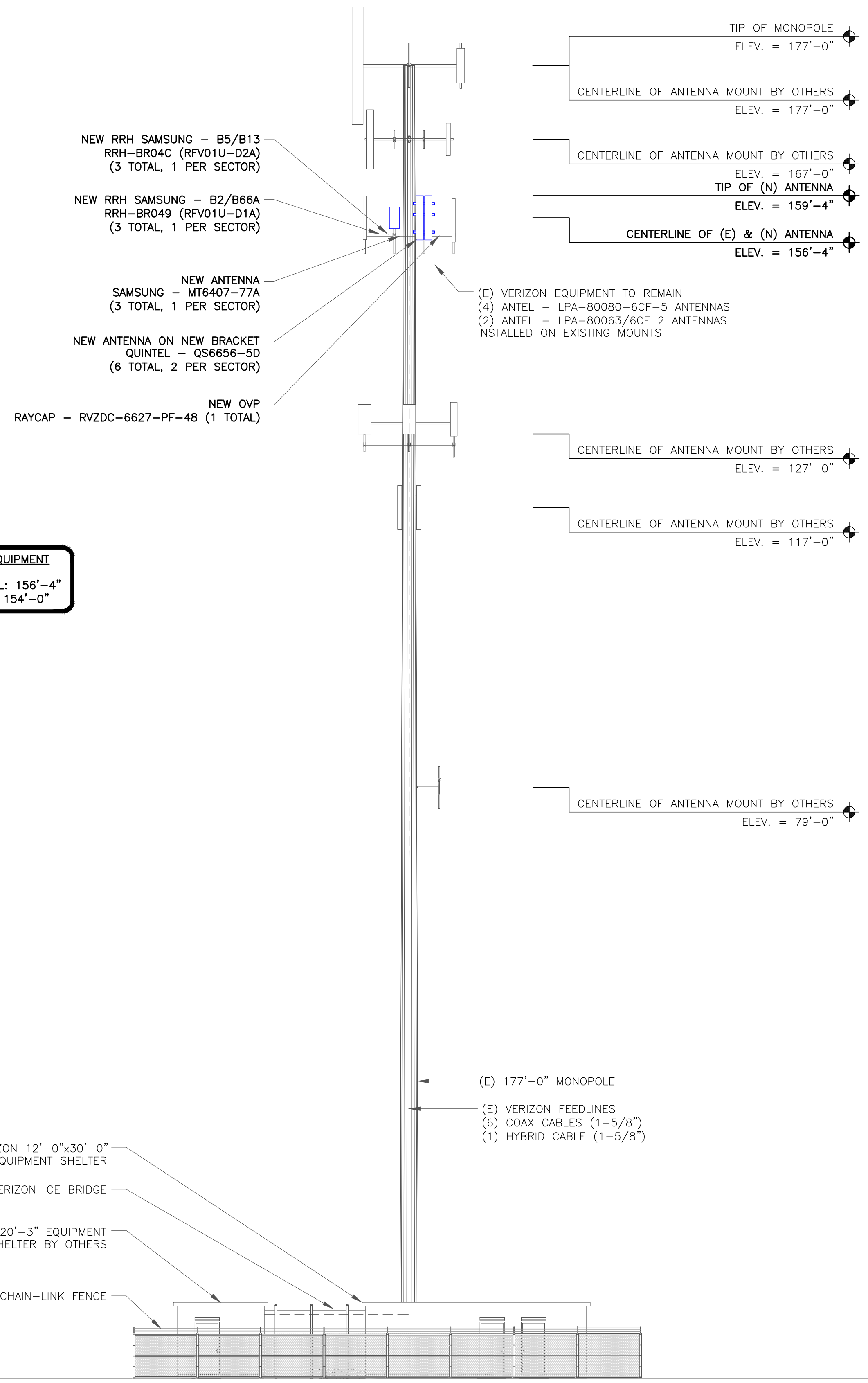
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REV	DATE	DRWN	DESCRIPTION	DES./QA
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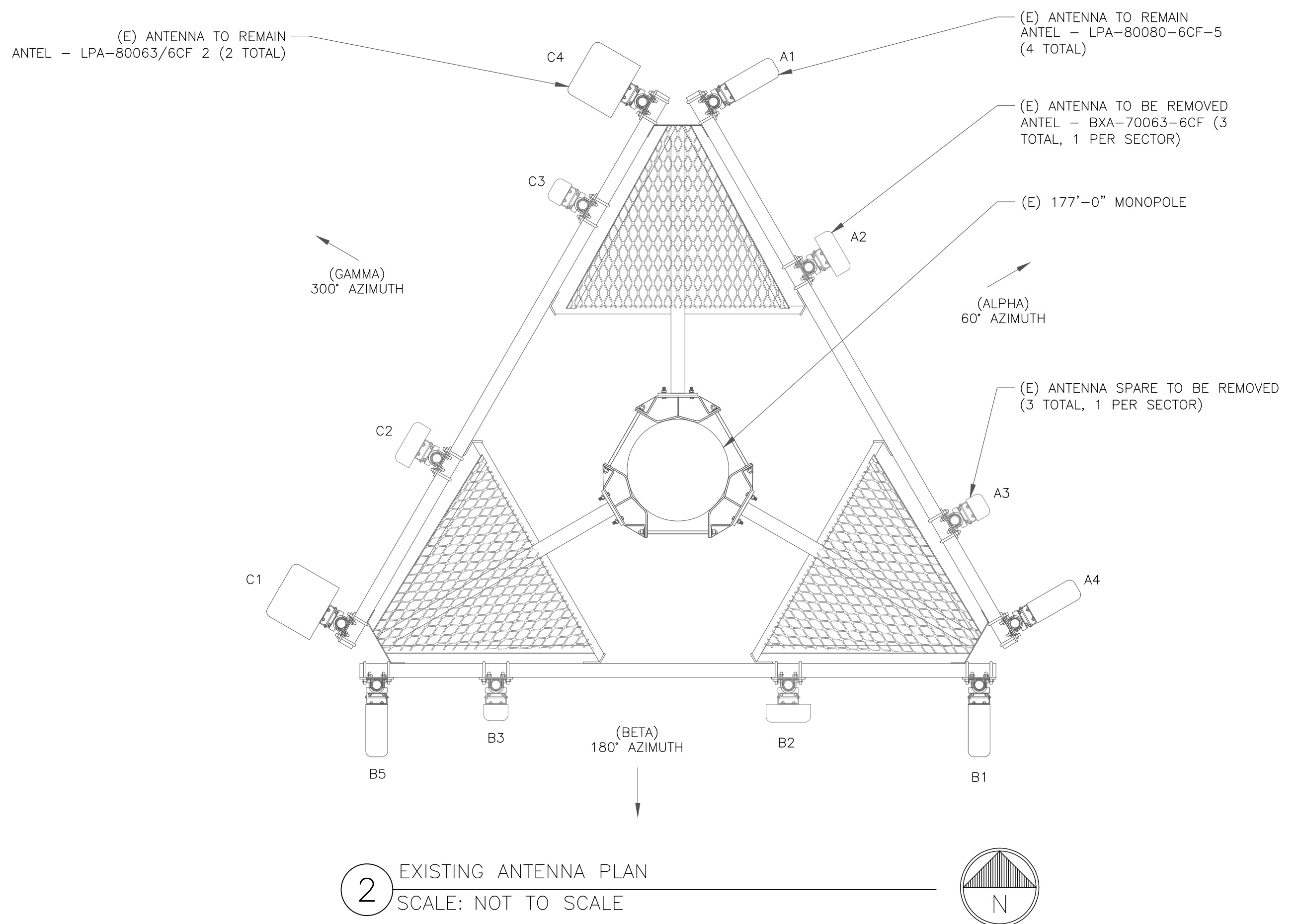
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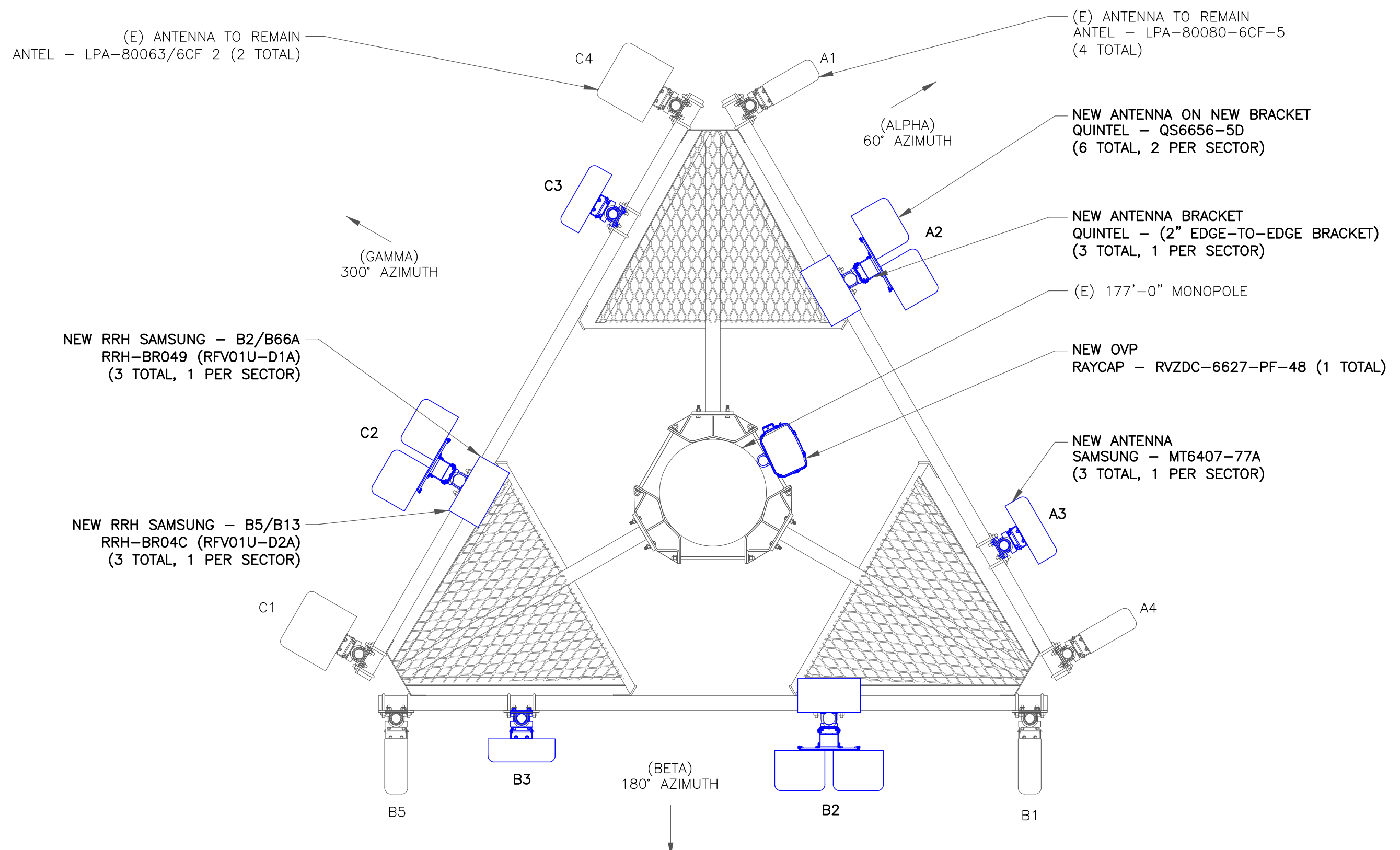


**VERIZON EQUIPMENT**  
 ANTENNA CL: 156'-4"  
 MOUNT CL: 154'-0"

**1** TOWER ELEVATION  
 SCALE: NOT TO SCALE



**2** EXISTING ANTENNA PLAN  
 SCALE: NOT TO SCALE



**3** NEW ANTENNA PLAN  
 SCALE: NOT TO SCALE

**verizon**  
 180 WASHINGTON VALLEY ROAD  
 BEDMINSTER, NJ 07921

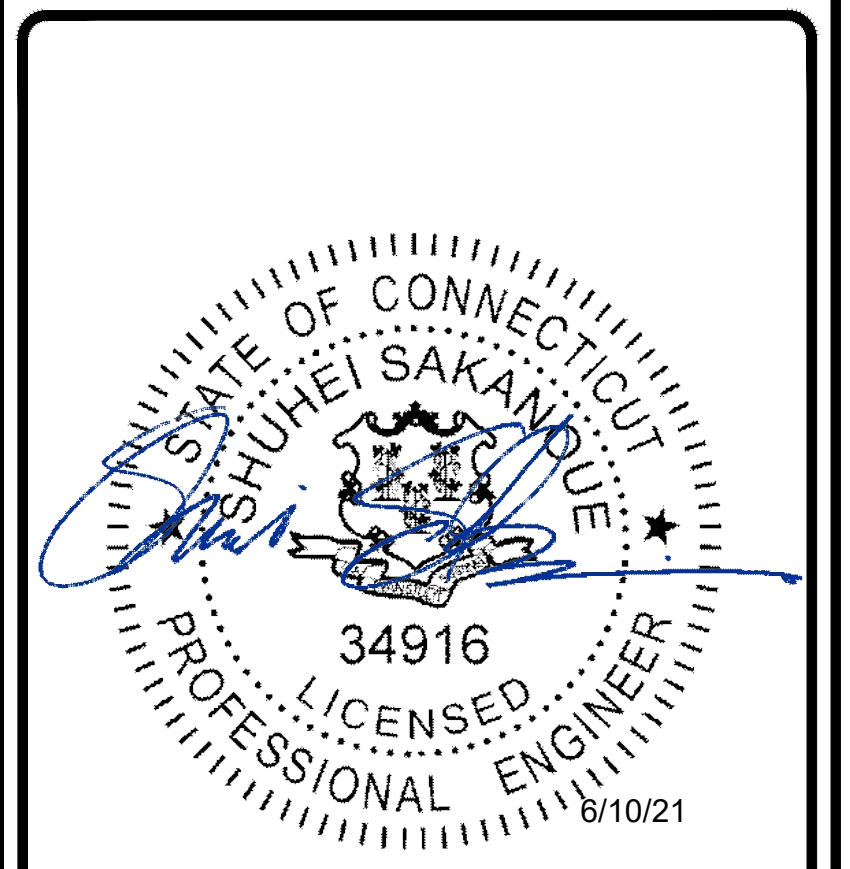
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VERIZON SITE NUMBER:  
**468296**  
 BU #: 876376  
**SCOVILLE HILL / HARWINTON ROD**  
 123 CAMPVILLE HILL RD.  
 HARWINTON, CT 06791  
 EXISTING 177'-0" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	06/07/2021	RCD	FINAL CDs	-



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ANTENNA/RRH SCHEDULE

SECTOR	STATUS	ANTENNA MANUFACTURER	ANTENNA MODEL	ANTENNA CENTERLINE	AZIMUTH	MECHANICAL DOWNTILTS	ELECTRICAL DOWNTILTS	TOWER EQUIPMENT MANUFACTURER	TOWER EQUIPMENT QTY/MODEL
A1	EXISTING	ANTEL	LPA-80080-6CF-5	156'-4"	60°	2'	0'	-	-
A2	NEW	QUINTEL	QS6656-5D	156'-4"	60°	0'	2'/2'/2'/2'	SAMSUNG	(1)B2/B66A RRH-BR049 (RFV01U-D1A) (1) B5/B13 RRH-BR04C (RFV01U-D2A)
A3	NEW	SAMSUNG	MT6407-77A	156'-4"	60°	0'	6'	-	-
A4	EXISTING	ANTEL	LPA-80080-6CF-5	156'-4"	60°	2'	0'	-	-
B1	EXISTING	ANTEL	LPA-80080-6CF-5	156'-4"	60°	2'	5'	-	-
B2	NEW	QUINTEL	QS6656-5D	156'-4"	180°	0'	2'/2'/2'/2'	SAMSUNG	(1)B2/B66A RRH-BR049 (RFV01U-D1A) (1) B5/B13 RRH-BR04C (RFV01U-D2A)
B3	NEW	SAMSUNG	MT6407-77A	156'-4"	180°	0'	6'	-	-
B4	EXISTING	ANTEL	LPA-80080-6CF-5	156'-4"	60°	2'	5'	-	-
C1	EXISTING	ANTEL	LPA-80063/6CF 2	156'-4"	270°	3'	2'	-	-
C2	NEW	QUINTEL	QS6656-5D	156'-4"	300°	0'	2'/2'/2'/2'	SAMSUNG	(1)B2/B66A RRH-BR049 (RFV01U-D1A) (1) B5/B13 RRH-BR04C (RFV01U-D2A)
C3	NEW	SAMSUNG	MT6407-77A	156'-4"	180°	0'	6'	-	-
C4	EXISTING	ANTEL	LPA-80063/6CF 2	156'-4"	270°	3'	2'	-	-

CABLE SCHEDULE

STATUS	CABLE TYPE	SIZE	LENGTH	QTY
EXISTING	COAX	1-5/8"	206'-0"±	6
NEW	HYBRID	1-5/8"	206'-0"±	1
TOTAL CABLE QTY:				7

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VERIZON SITE NUMBER:  
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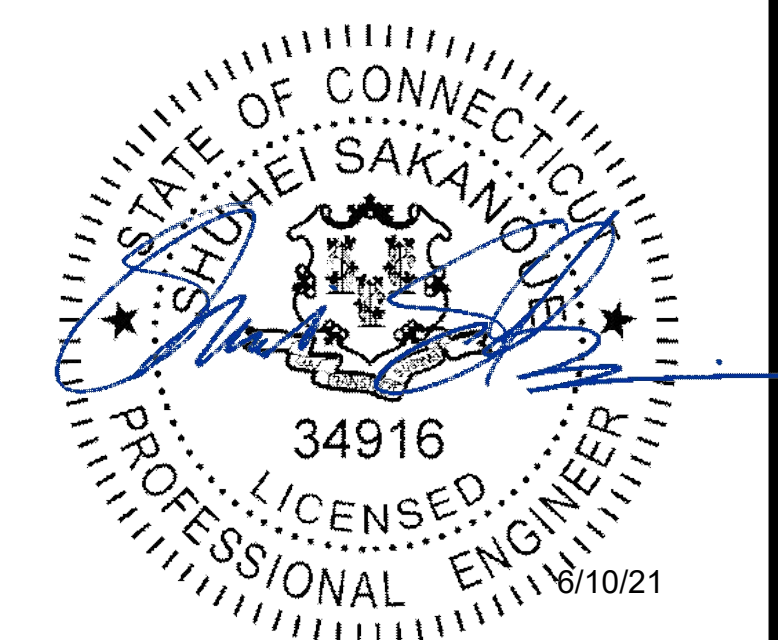
BU #: **876376**  
**SCOVILLE HILL / HARWINTON ROD**

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HARWINTON, CT 06791

EXISTING 177'-0" MONOPOLE

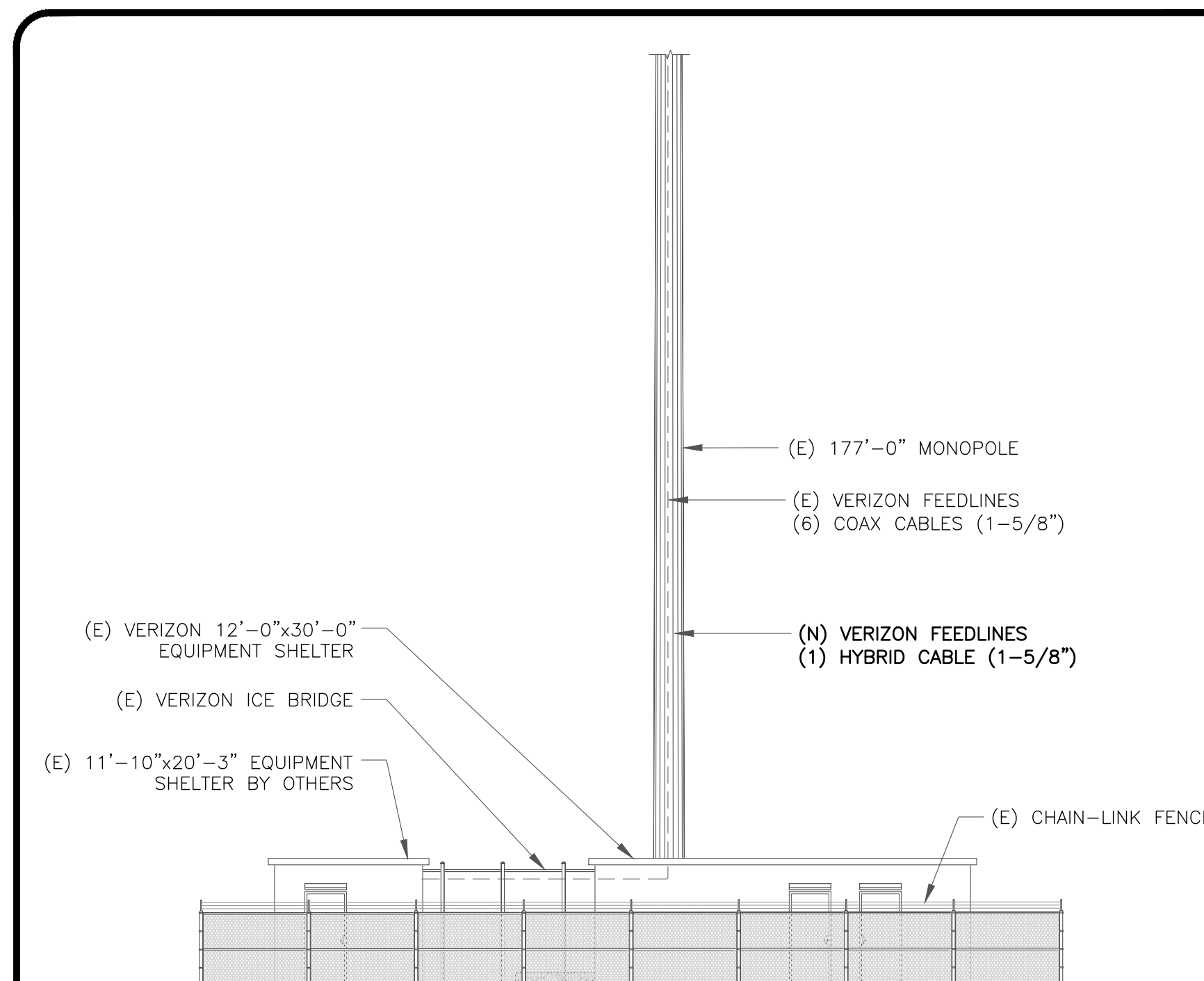
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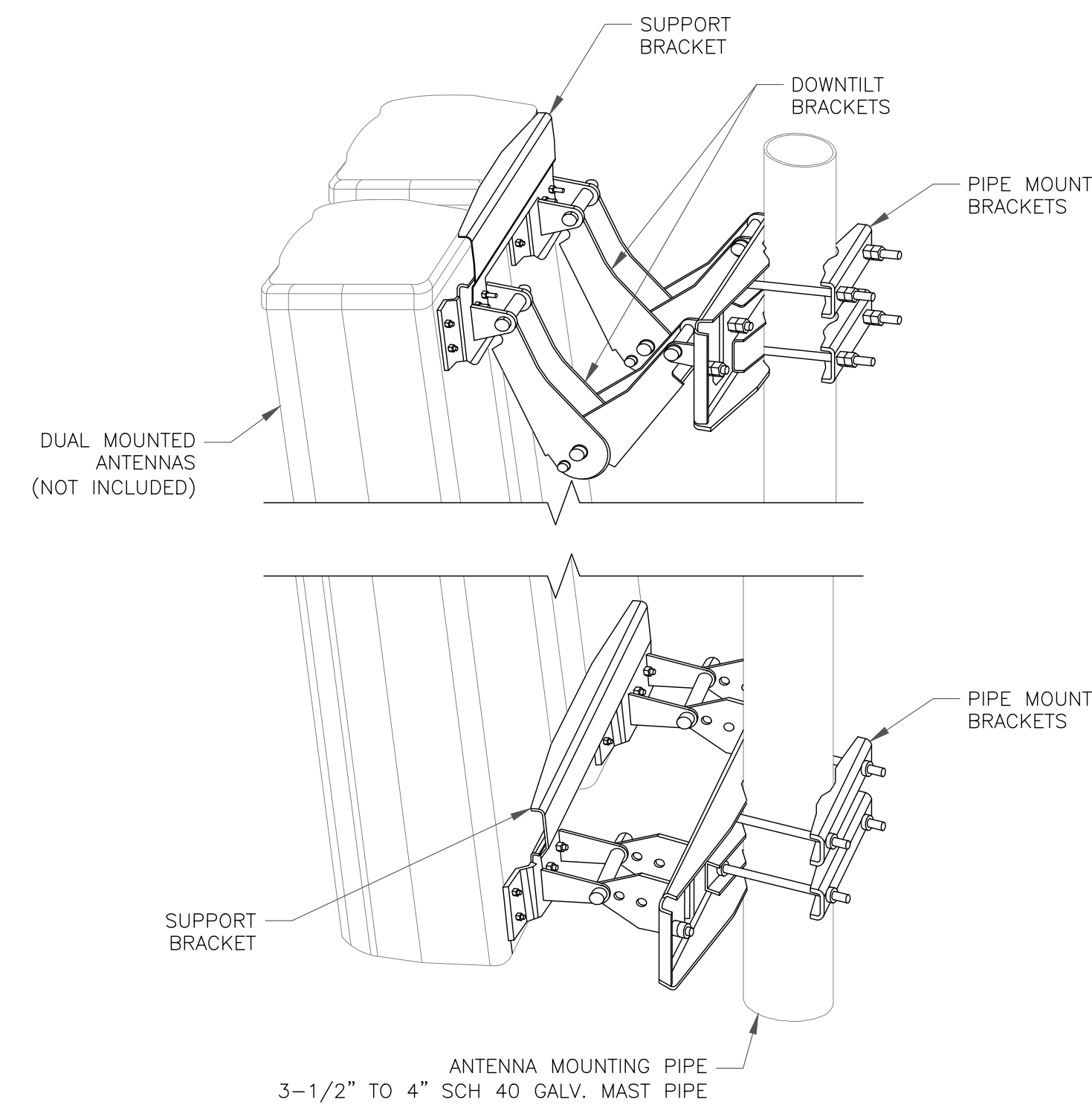
SHEET NUMBER: **C-3** REVISION: **0**



1 VERIZON TOWER EQUIPMENT SCHEDULE  
SCALE: NOT TO SCALE

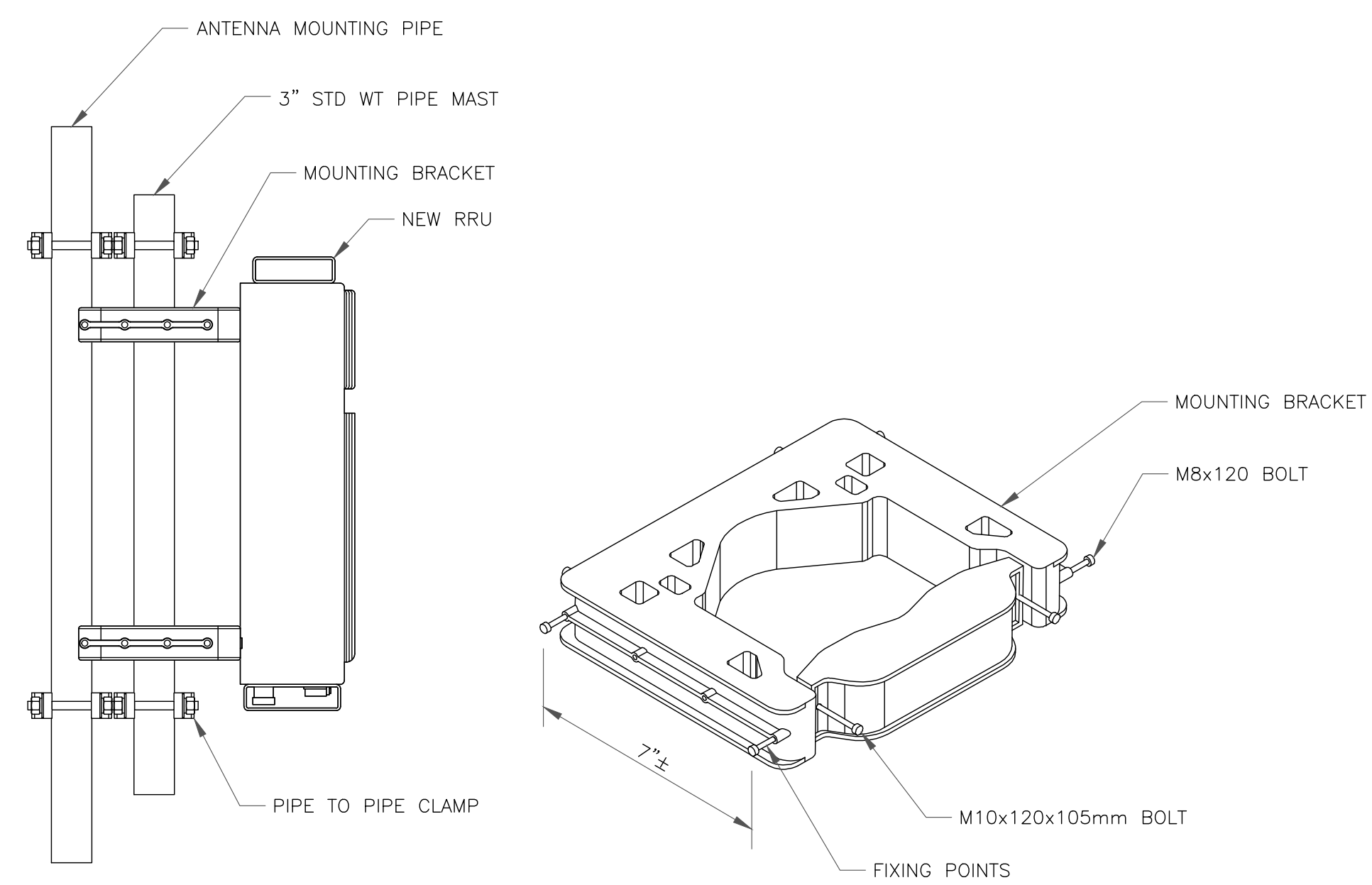
2 BASE LEVEL DETAIL  
SCALE: NOT TO SCALE



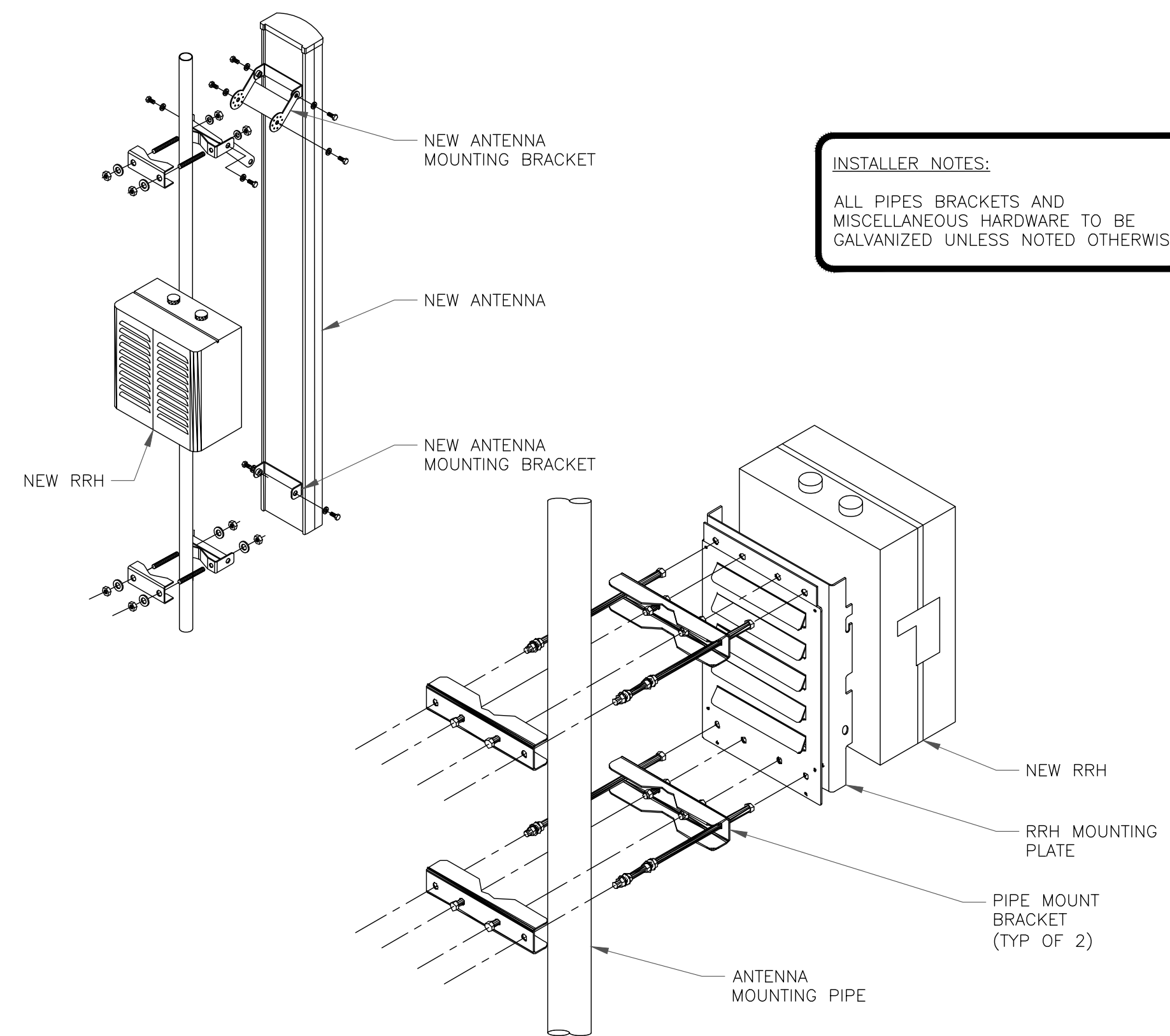


1 QUINTEL – AS-005245  
SCALE: NOT TO SCALE

2 NOT USED  
SCALE: NOT TO SCALE



3 NOKIA – FPKA BRACKET MOUNTING DETAIL  
SCALE: NOT TO SCALE



4 ANTENNA & RRH MOUNTING DETAIL  
SCALE: NOT TO SCALE

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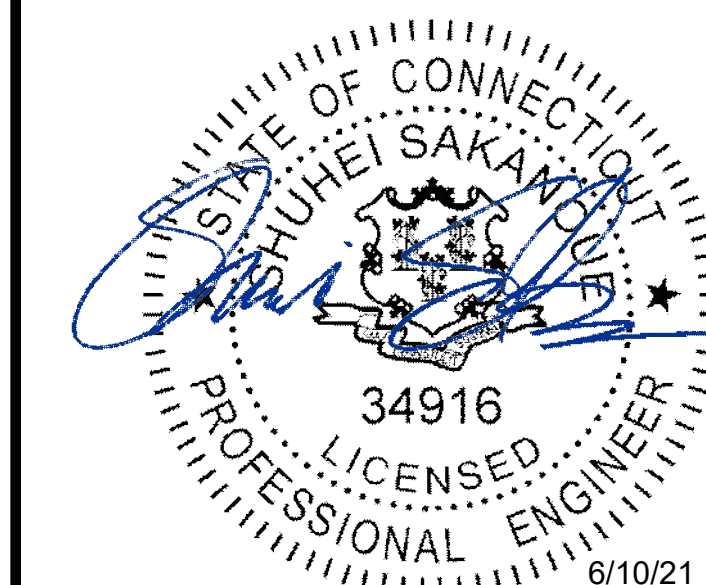
BU #: 876376  
SCOVILLE HILL /  
HARWINTON ROD

123 CAMPVILLE HILL RD.  
HARWINTON, CT 06791

EXISTING 177'-0" MONOPOLE

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SHEET NUMBER:

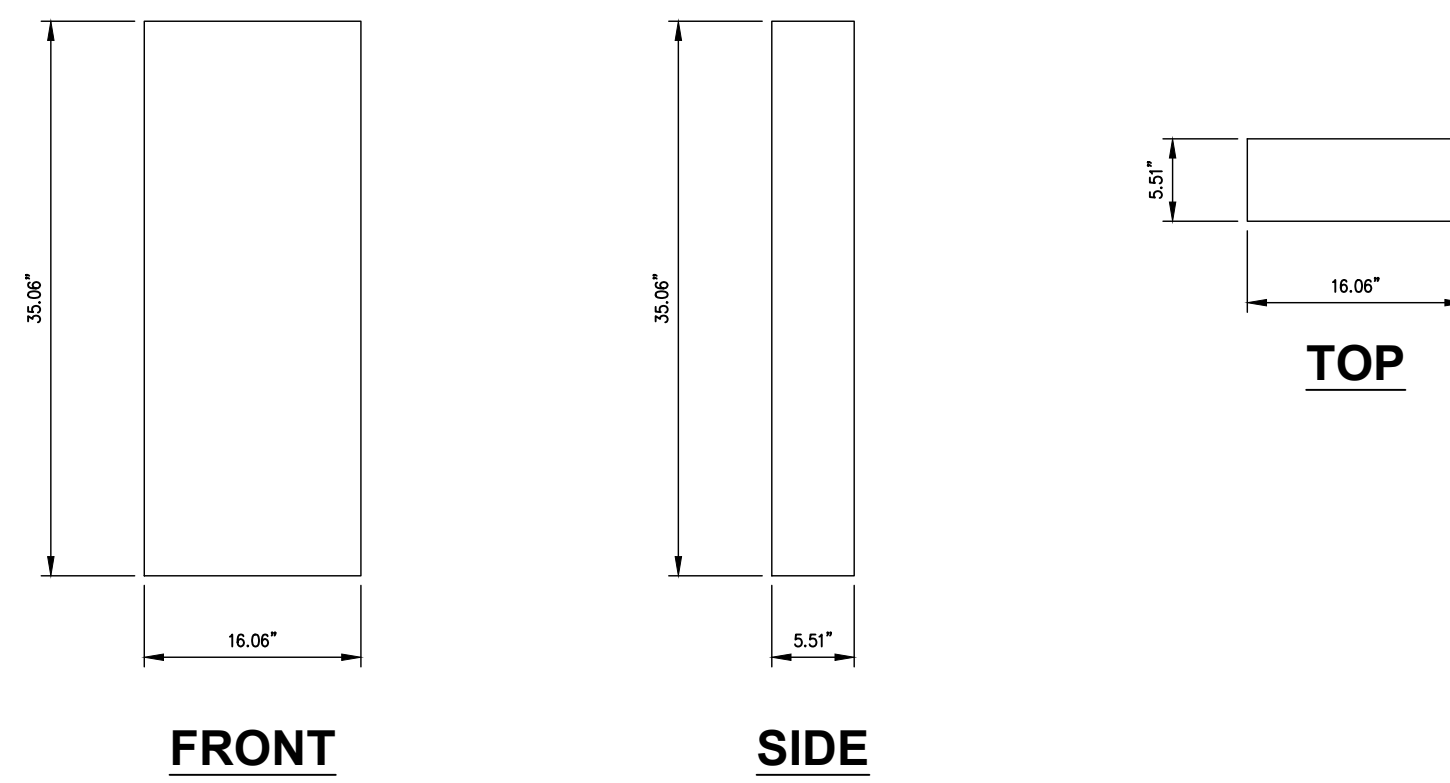
C-4

REVISION:

0

**SAMSUNG PANEL ANTENNA (MT6407-77A)**

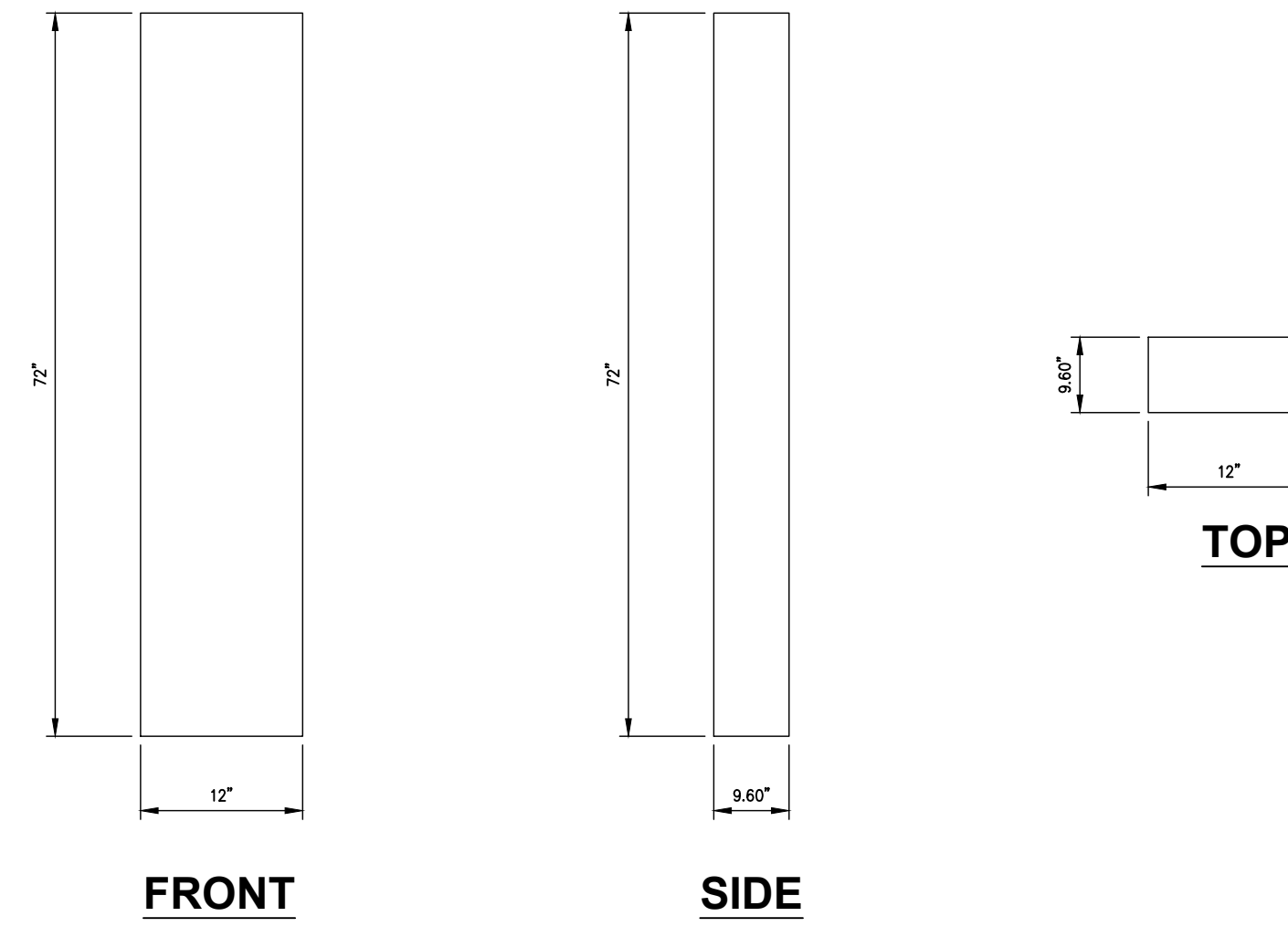
DIMENSIONS, HxWxD: 35.06"x16.06"x5.51"  
 WEIGHT, W/O BRACKETS: 81.57 lbs



1 SAMSUNG MT6407-77A ANTENNA DETAIL  
 SCALE: NOT TO SCALE

**QUINTEL PANEL ANTENNA (QS6656-5D)**

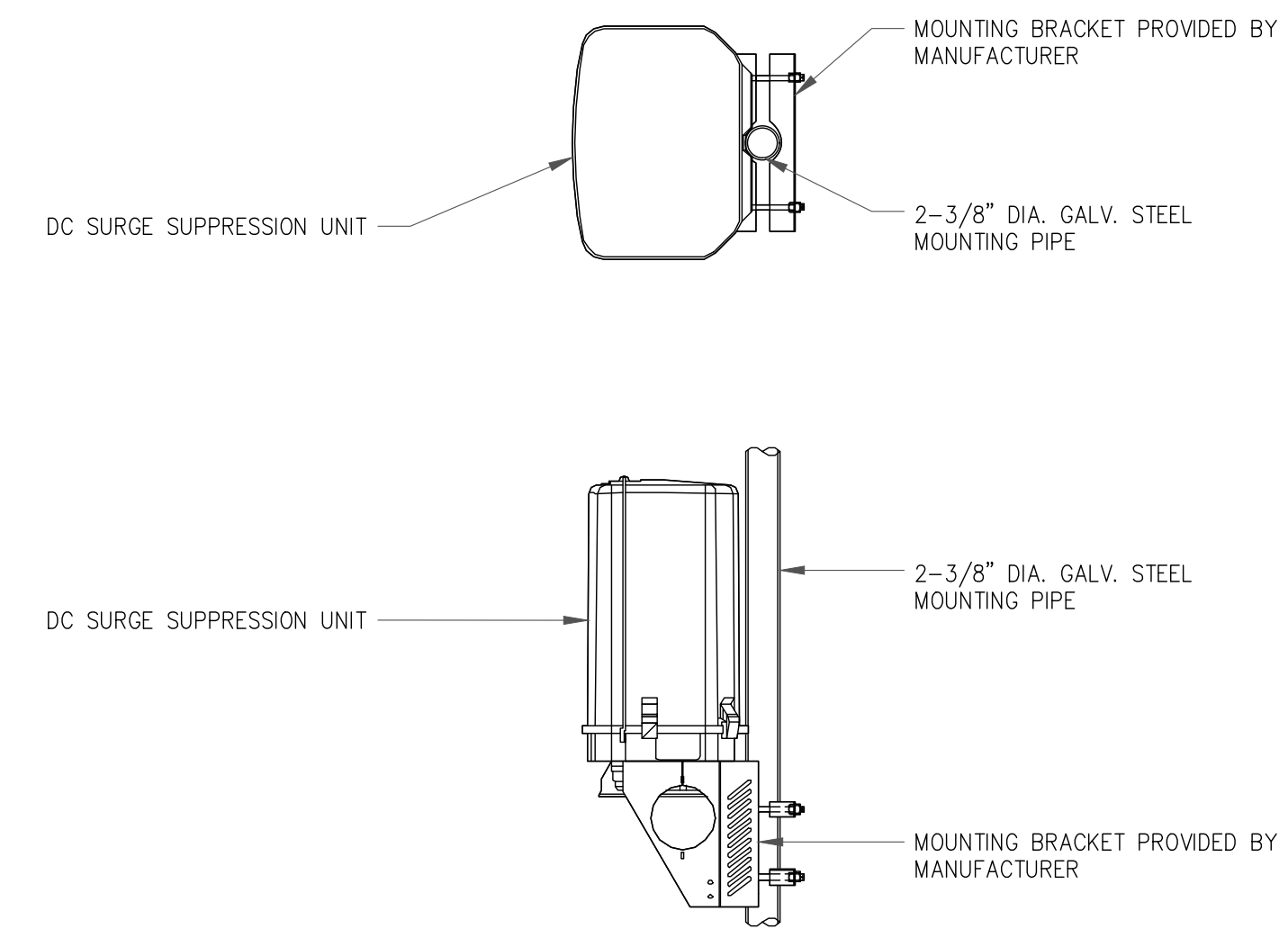
DIMENSIONS, HxWxD: 72"x12"x9.60"  
 WEIGHT, W/O BRACKETS: 88.00 lbs



2 QUINTEL QS6656-5D ANTENNA DETAIL  
 SCALE: NOT TO SCALE

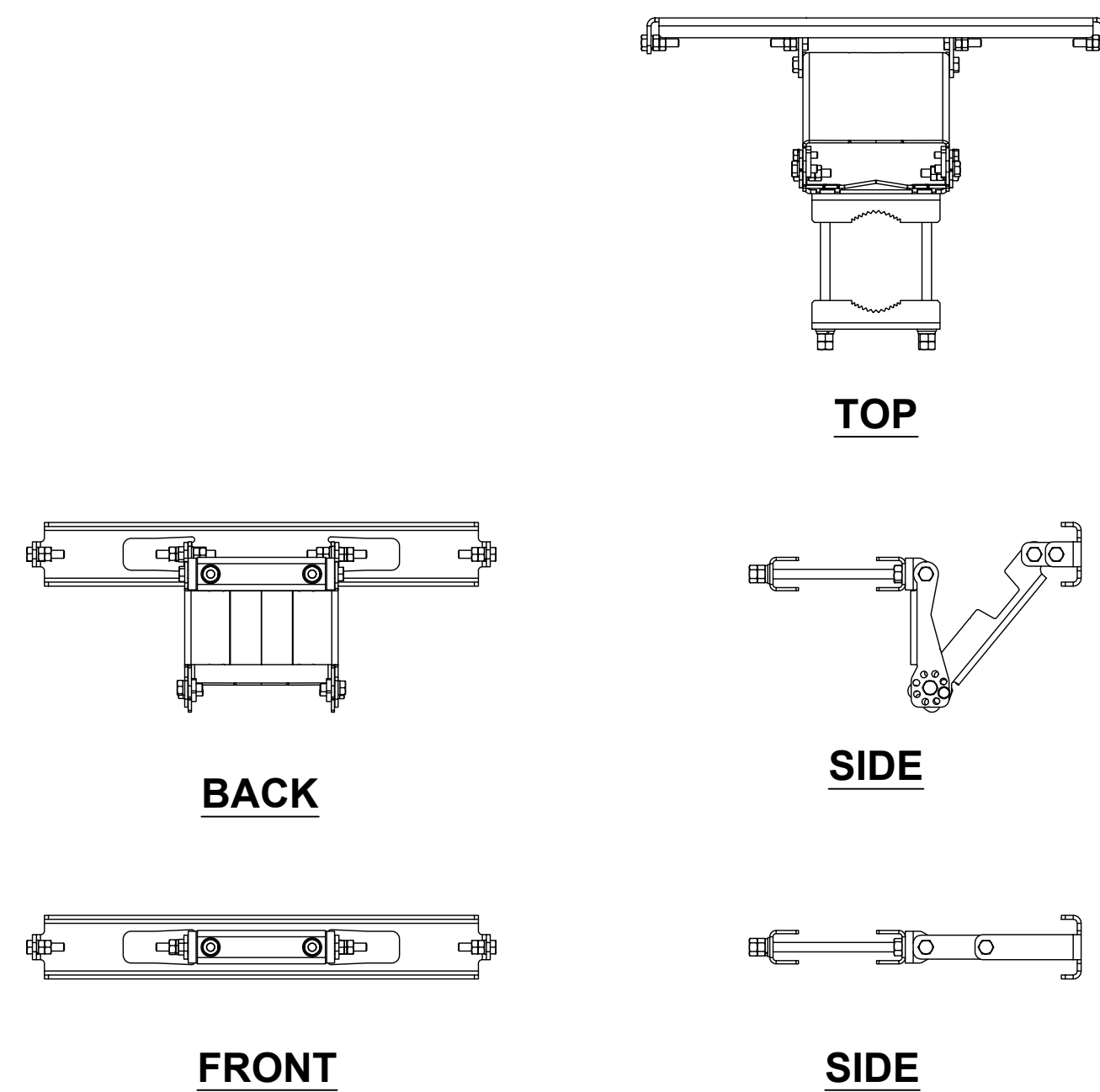
**RAYCAP (RCMDC-6627-PF-48)**

DIMENSIONS, HxWxD: 29.50"x16.50"x12.60"  
 WEIGHT, W/O BRACKETS: 32.0 lbs



3 RCMDC-6627-PF-48 OVP DETAIL  
 SCALE: NOT TO SCALE

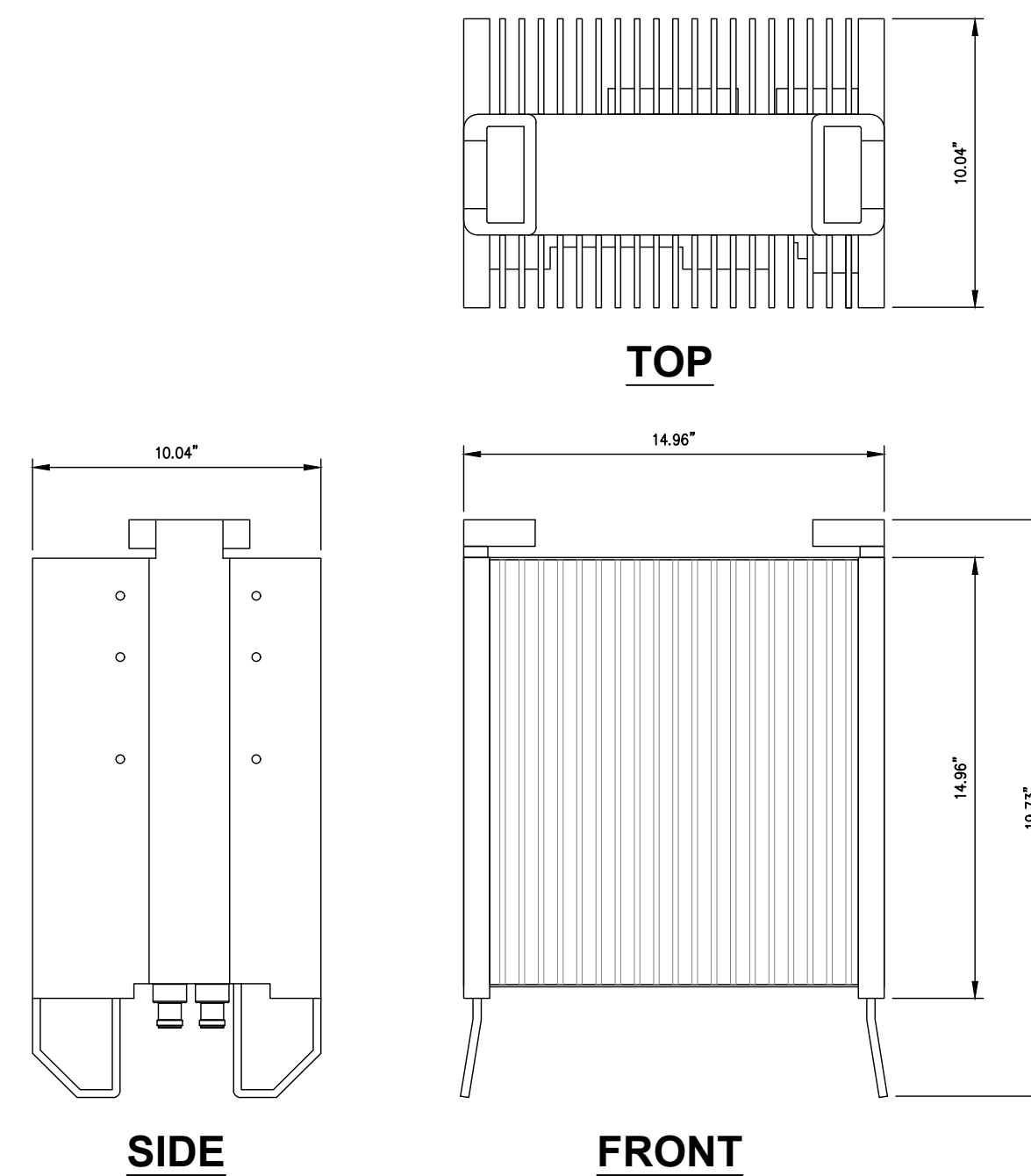
**QUINTEL ANTENNA BRACKET (2" EDGE-TO-EDGE BRACKET)**



4 QUINTEL 2" EDGE-TO-EDGE ANTENNA BRACKET DETAIL  
 SCALE: NOT TO SCALE

**SAMSUNG - RRH (RFV01U-D1A)**

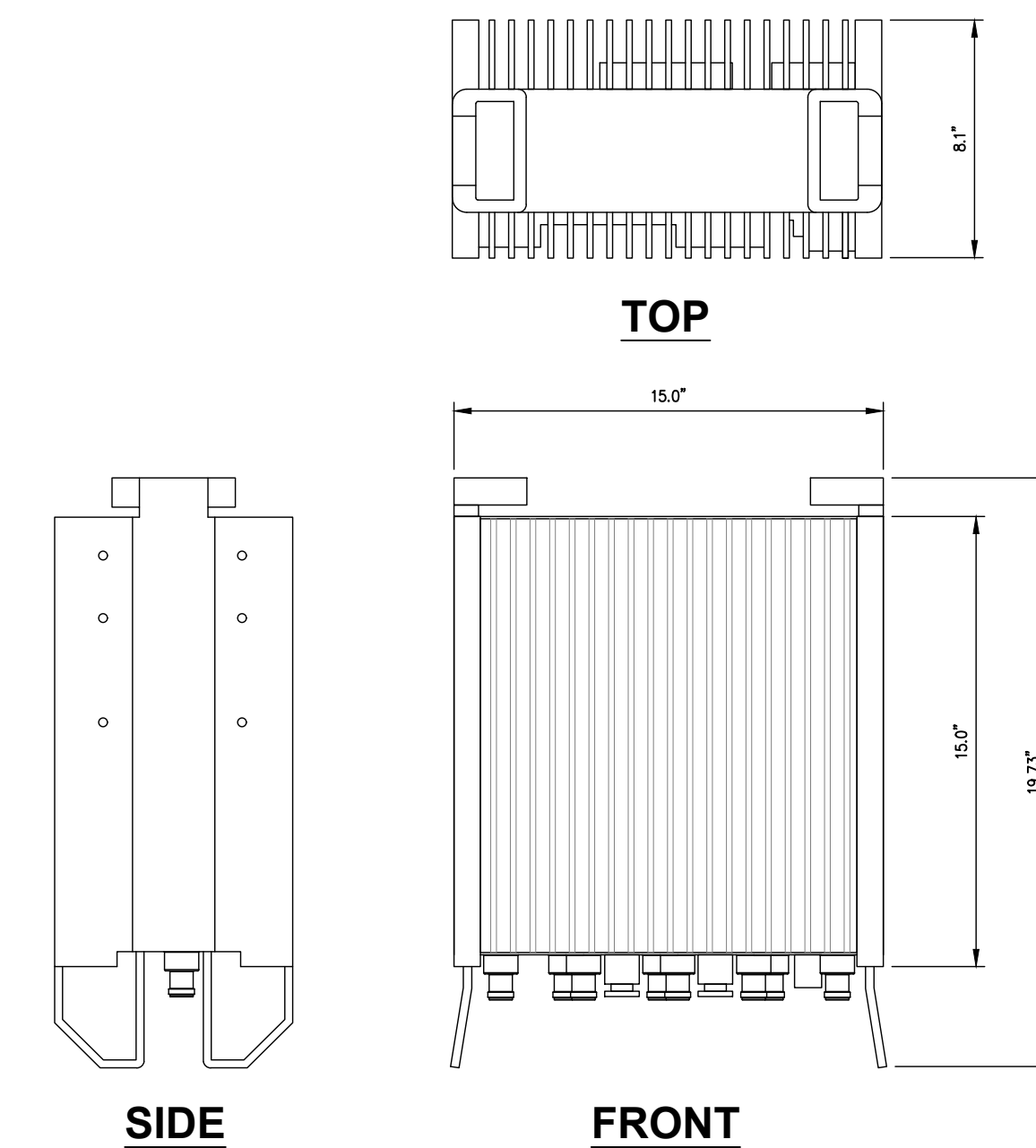
DIMENSIONS, HxWxD: 19.73"x14.96"x10.04"  
 WEIGHT, W/O BRACKETS: 84.4 lbs



5 SAMSUNG - RFV01U-D1A RRH DETAIL  
 SCALE: NOT TO SCALE

**SAMSUNG - RRH (RFV01U-D2A)**

DIMENSIONS, HxWxD: 19.73"x15.0"x8.1"  
 WEIGHT, W/O BRACKETS: 70.3 lbs



6 SAMSUNG - RFV01U-D2A RRH DETAIL  
 SCALE: NOT TO SCALE

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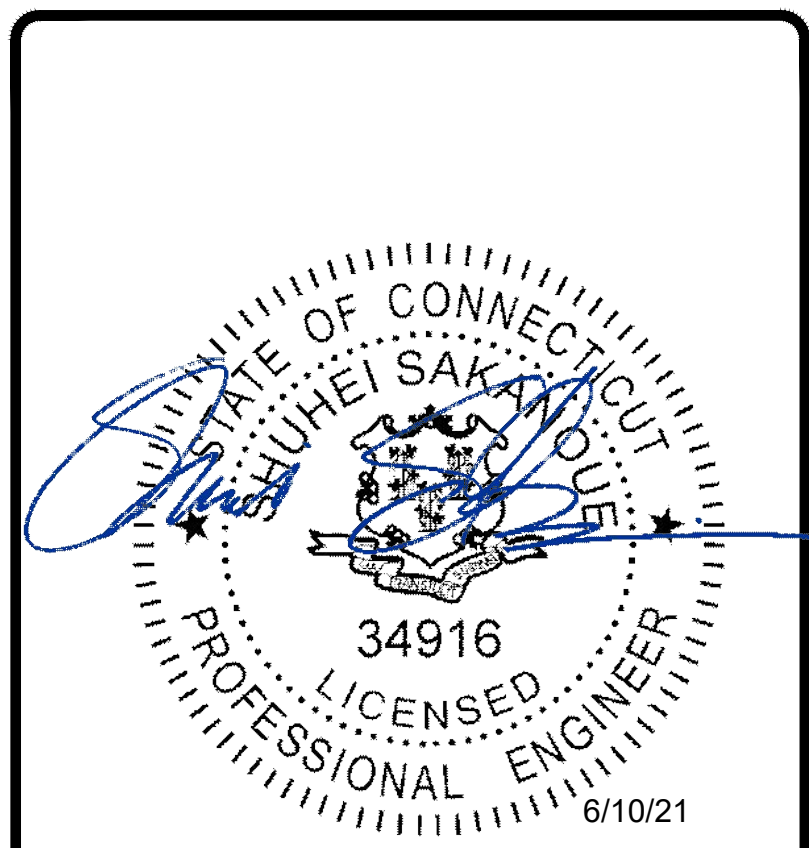
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VERIZON SITE NUMBER:  
**468296**  
 BU #: **876376**  
**SCOVILLE HILL / HARWINTON ROD**  
 123 CAMPVILLE HILL RD.  
 HARWINTON, CT 06791  
 EXISTING 177'-0" MONOPOLE

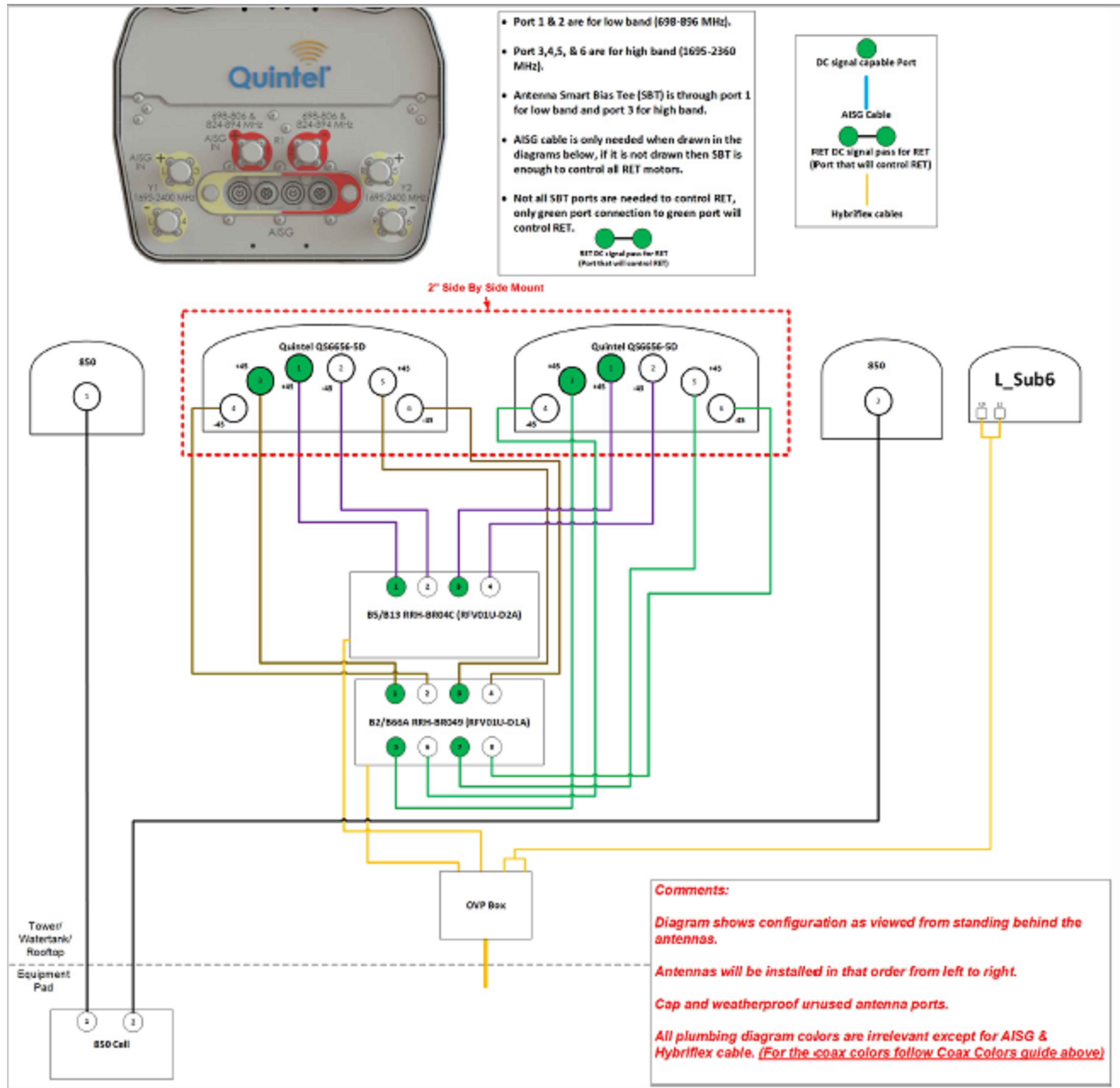
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**Comments:**

Diagram shows configuration as viewed from standing behind the antennas.

Antennas will be installed in that order from left to right.

Cap and weatherproof unused antenna ports.

All plumbing diagram colors are irrelevant except for AISG & Hybriflex cable. (For the coax colors follow Coax Colors guide above)

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VERIZON SITE NUMBER:  
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BU #: 876376  
SCOVILLE HILL /  
HARWINTON ROD

123 CAMPVILLE HILL RD.  
HARWINTON, CT 06791

EXISTING 177'-0" MONOPOLE

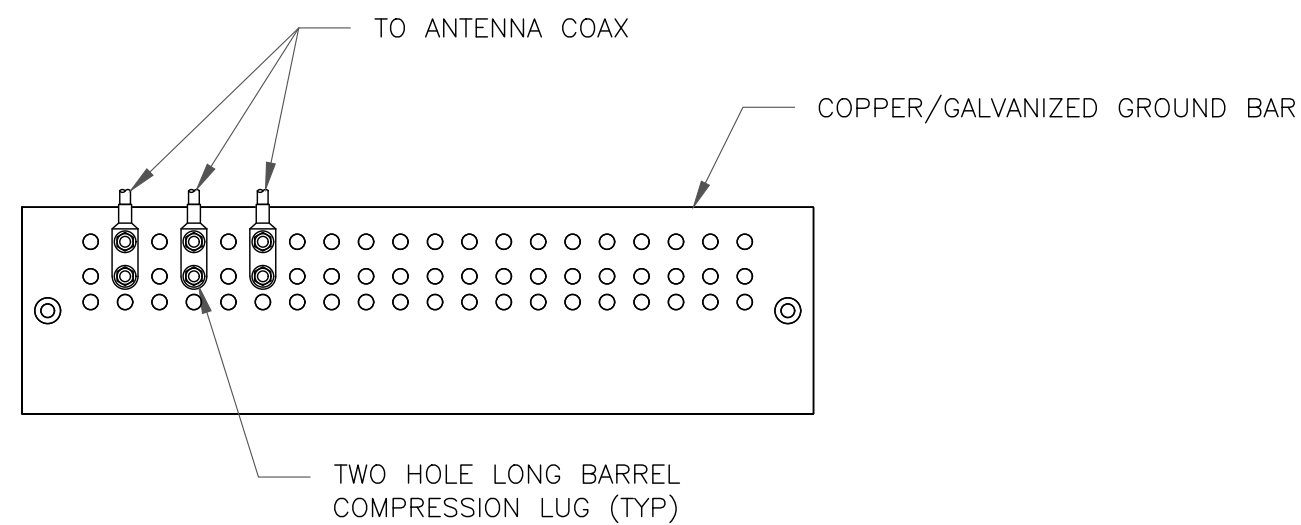
ISSUED FOR:

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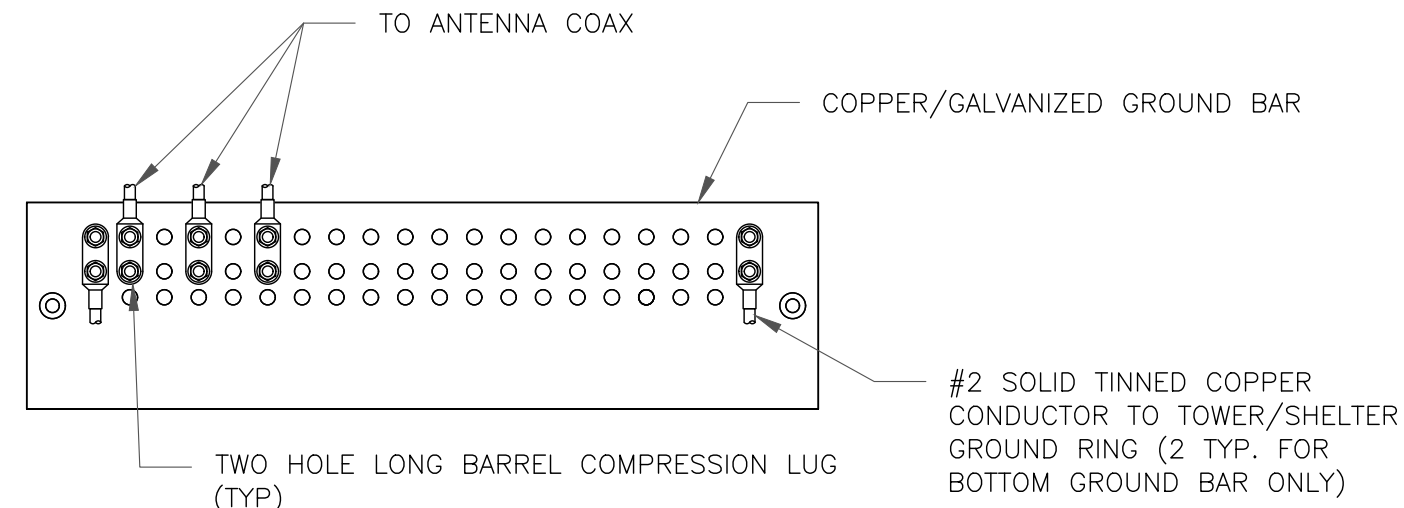
SHEET NUMBER: **C-6** REVISION: **0**



NOTES:

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

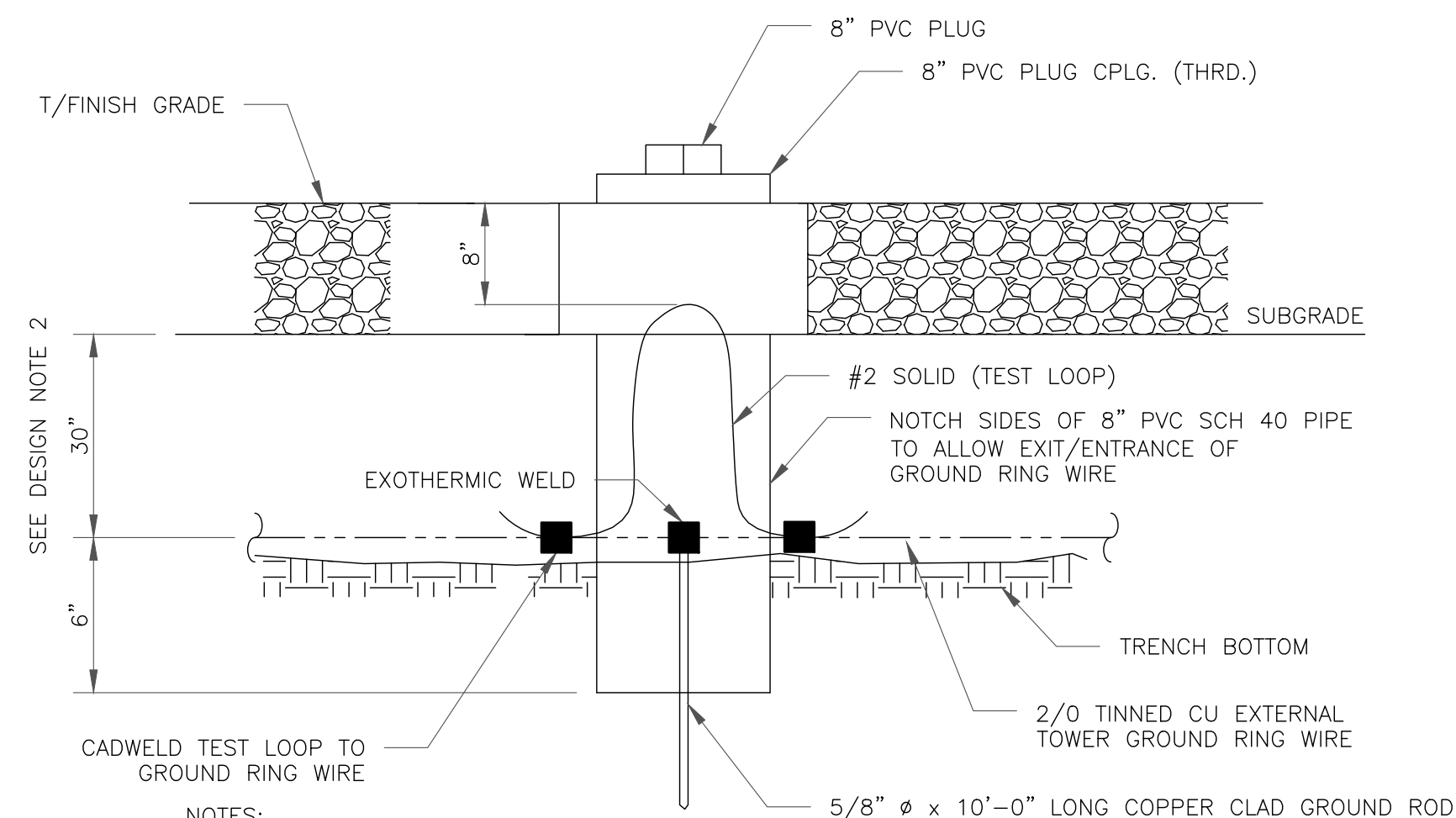
1 ANTENNA SECTOR GROUND BAR DETAIL  
SCALE: NOT TO SCALE



NOTES:

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

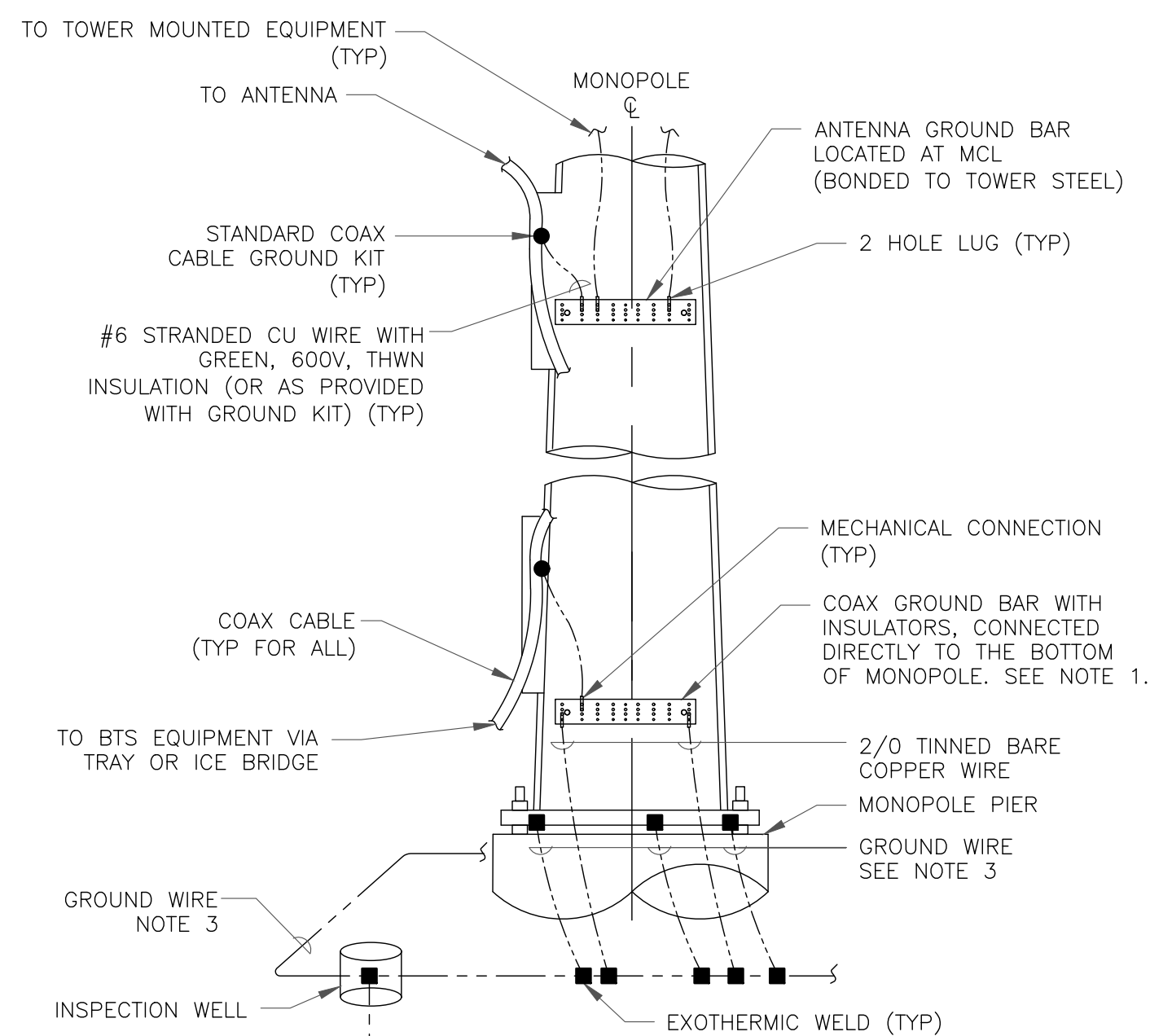
2 TOWER/SHELTER GROUND BAR DETAIL  
SCALE: NOT TO SCALE



NOTES:

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

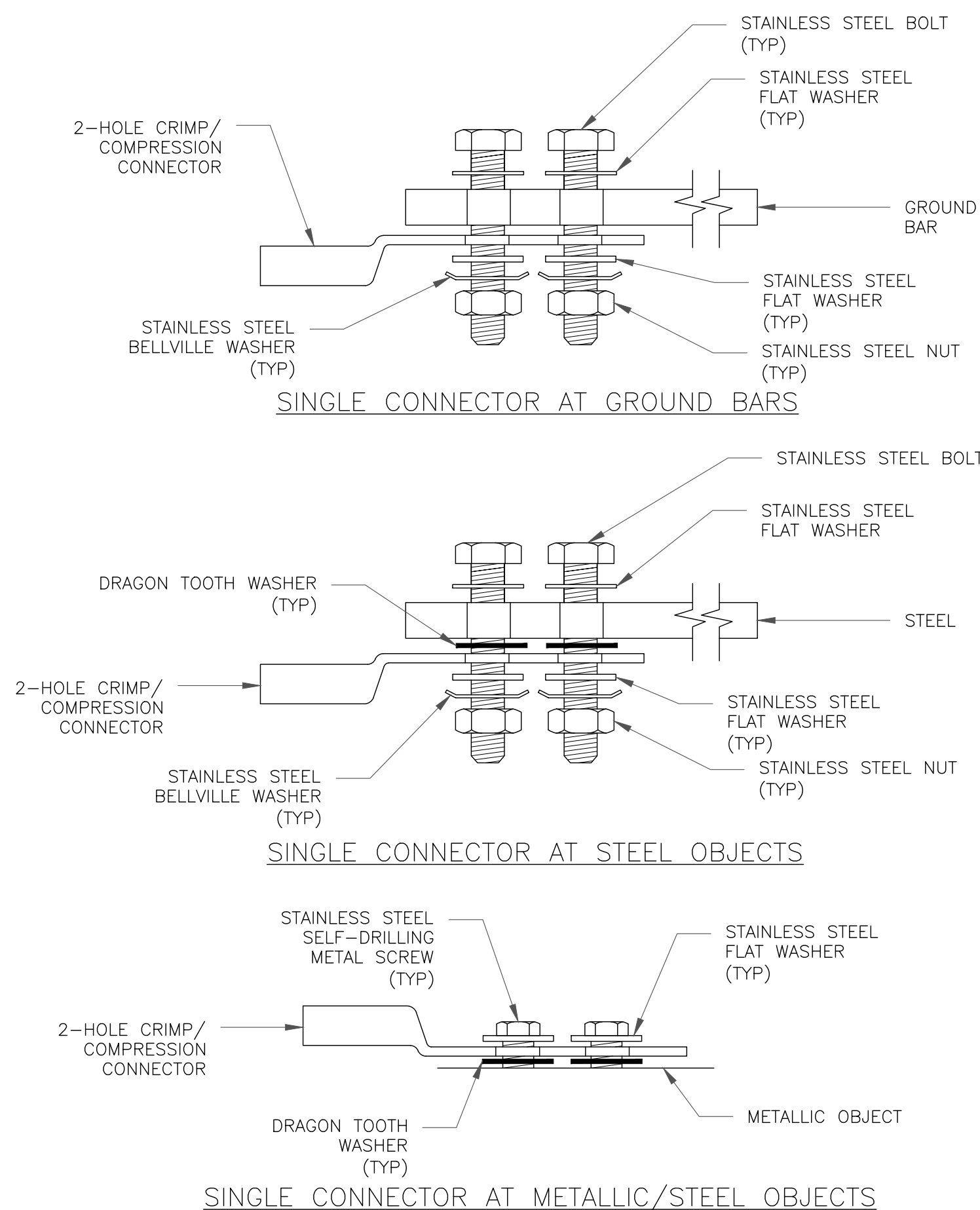
3 INSPECTION WELL DETAIL  
SCALE: NOT TO SCALE



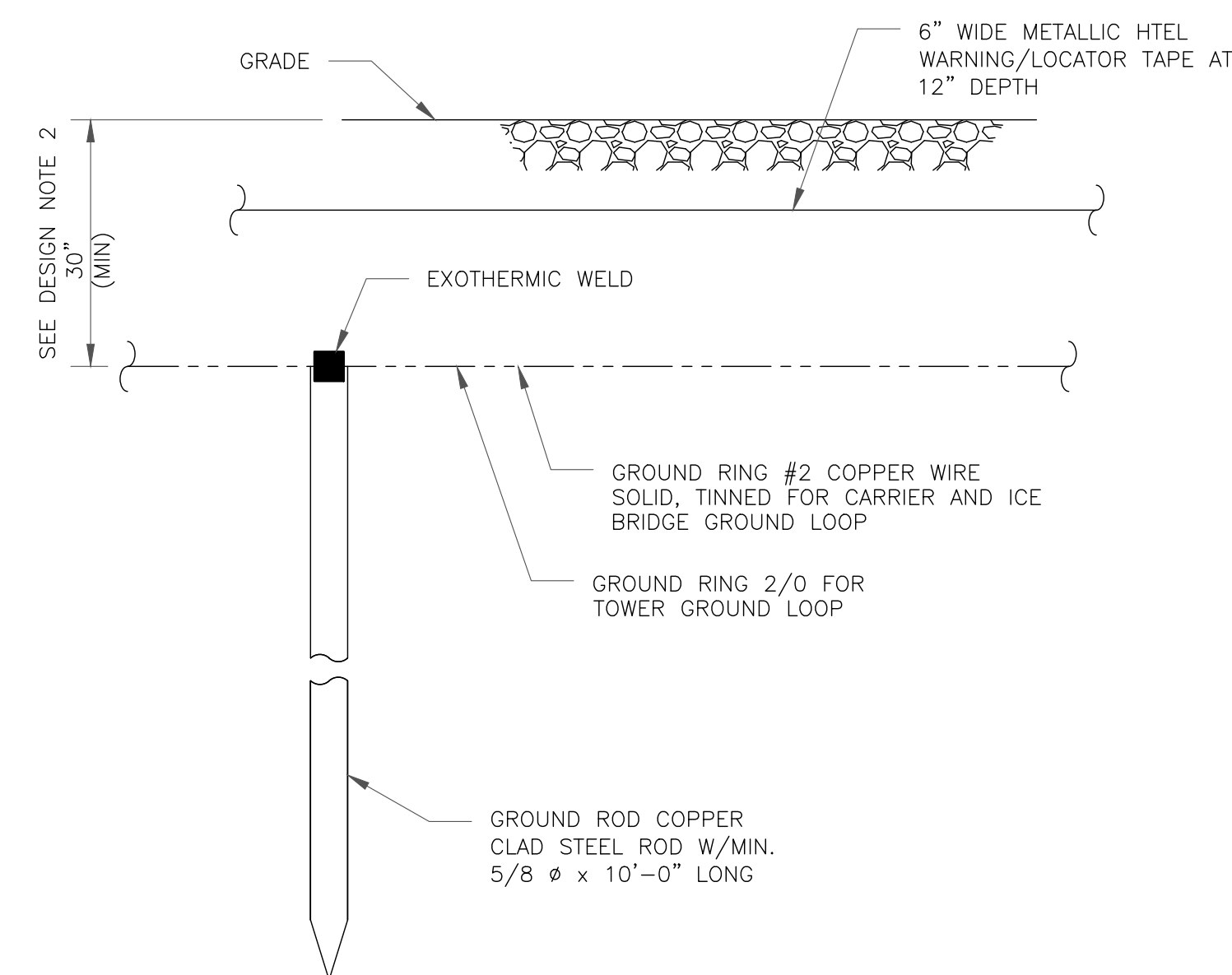
NOTES:

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

4 TYPICAL ANTENNA CABLE GROUNDING  
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS  
SCALE: NOT TO SCALE



NOTES:

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

6 GROUND ROD DETAIL  
SCALE: NOT TO SCALE

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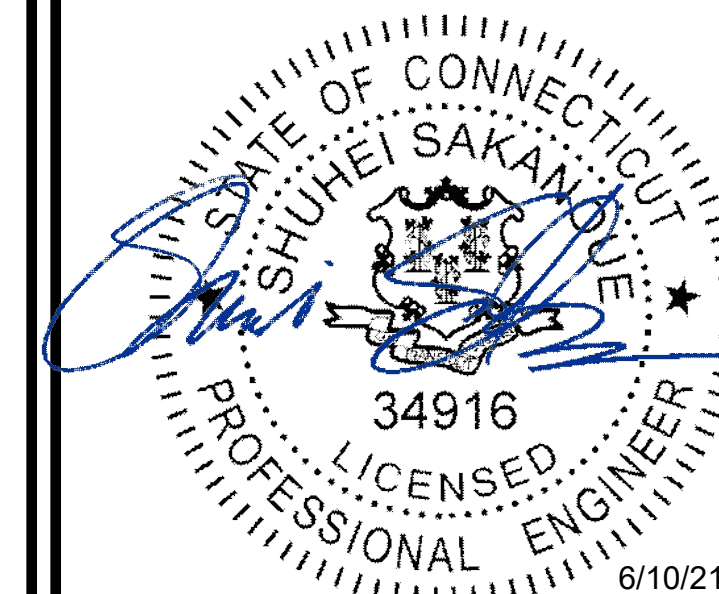
BU #: 876376  
SCOVILLE HILL /  
HARWINTON ROD

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EXISTING 177'-0" MONOPOLE

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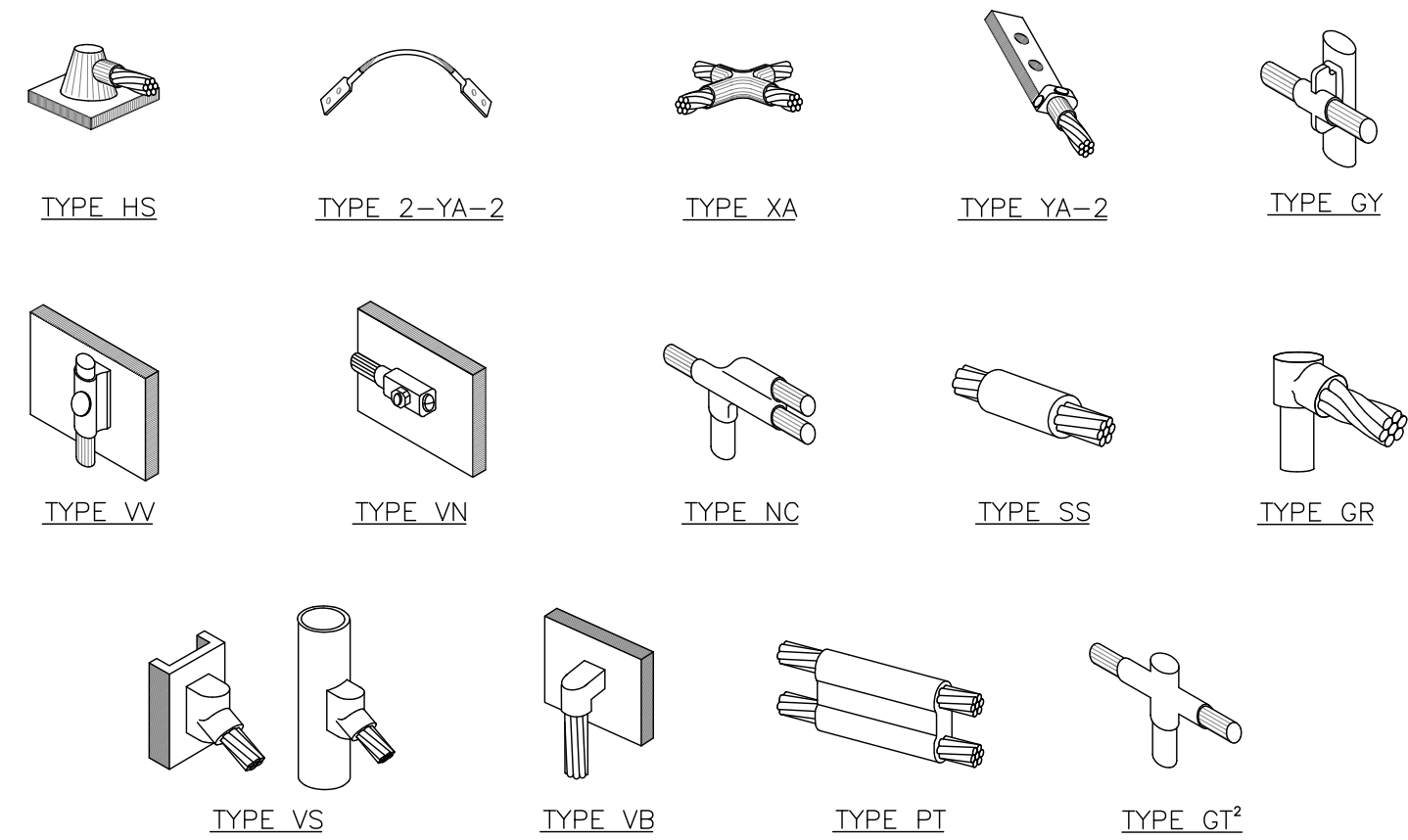
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SHEET NUMBER:

G-1

REVISION:

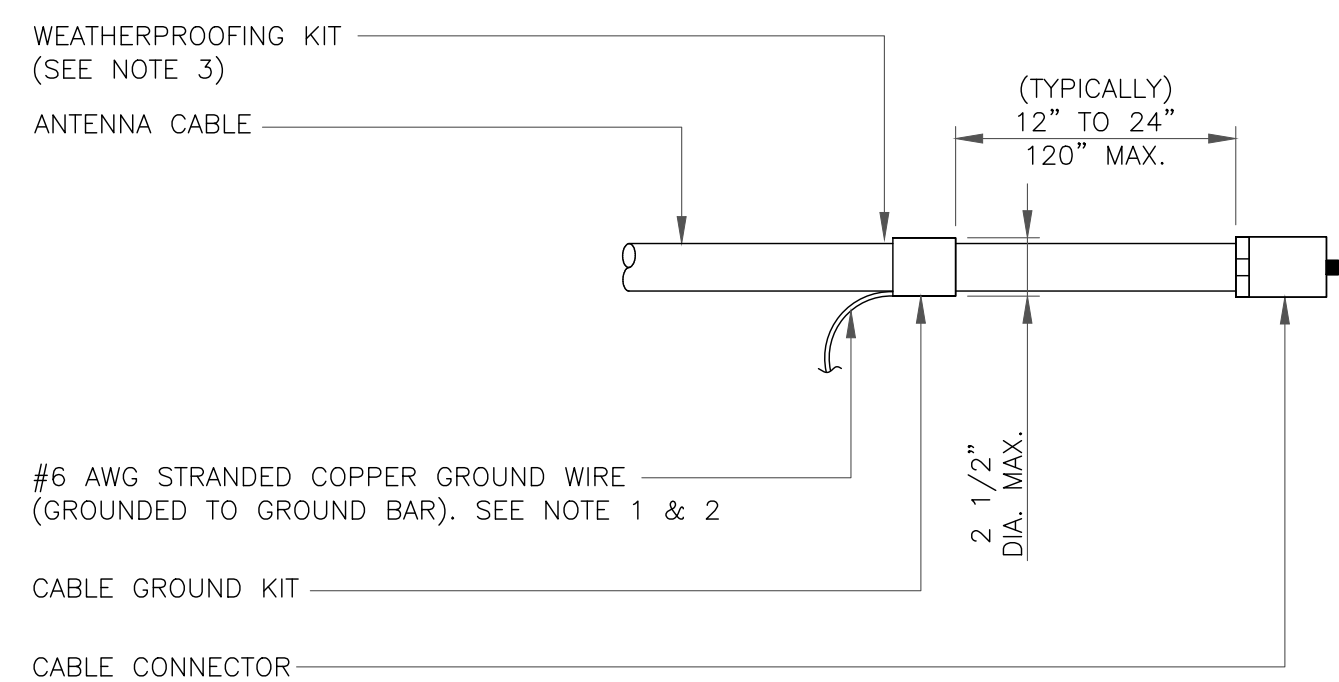
0



**NOTE:**

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

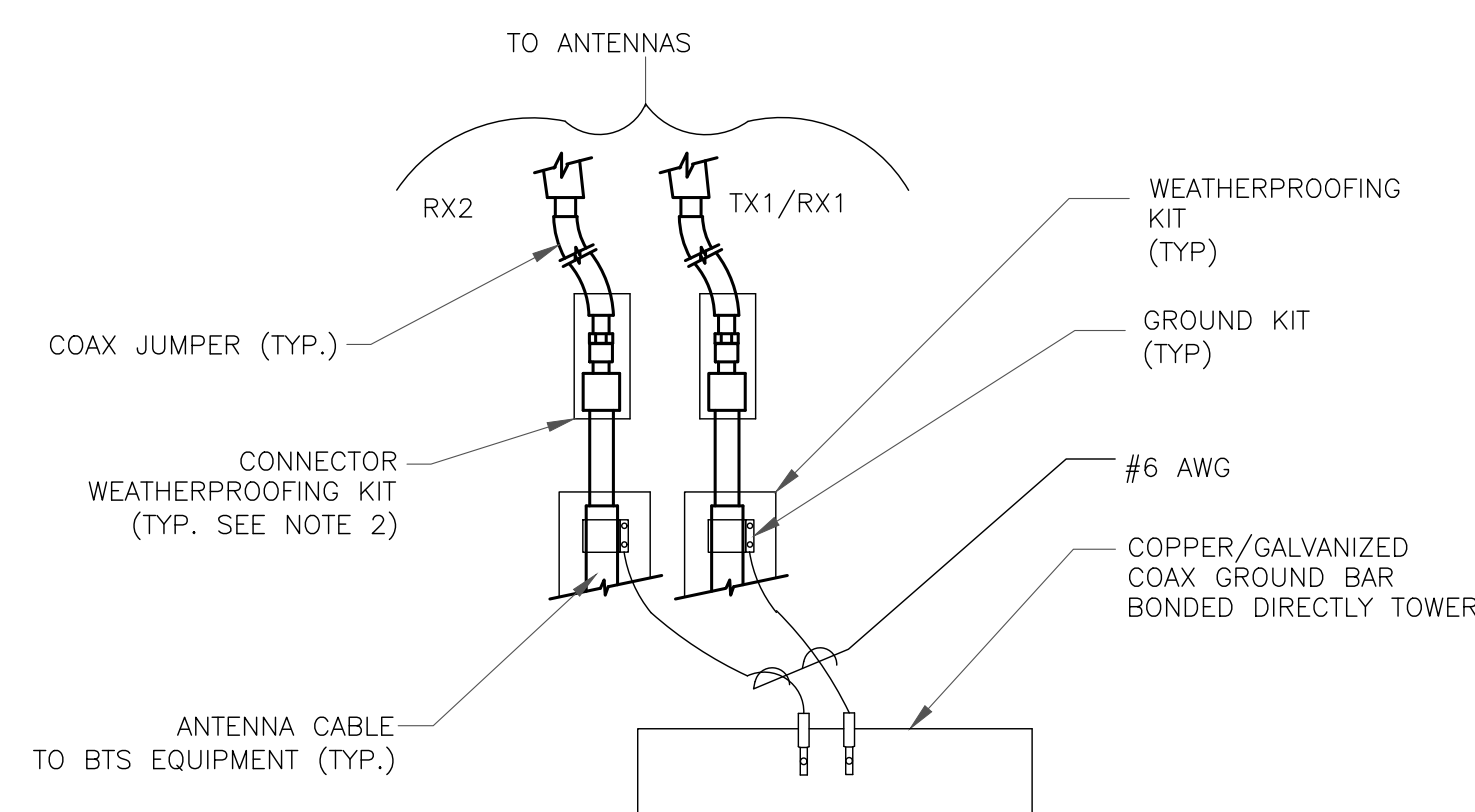
**1 CADWELD GROUNDING CONNECTIONS**  
SCALE: NOT TO SCALE



**NOTES:**

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

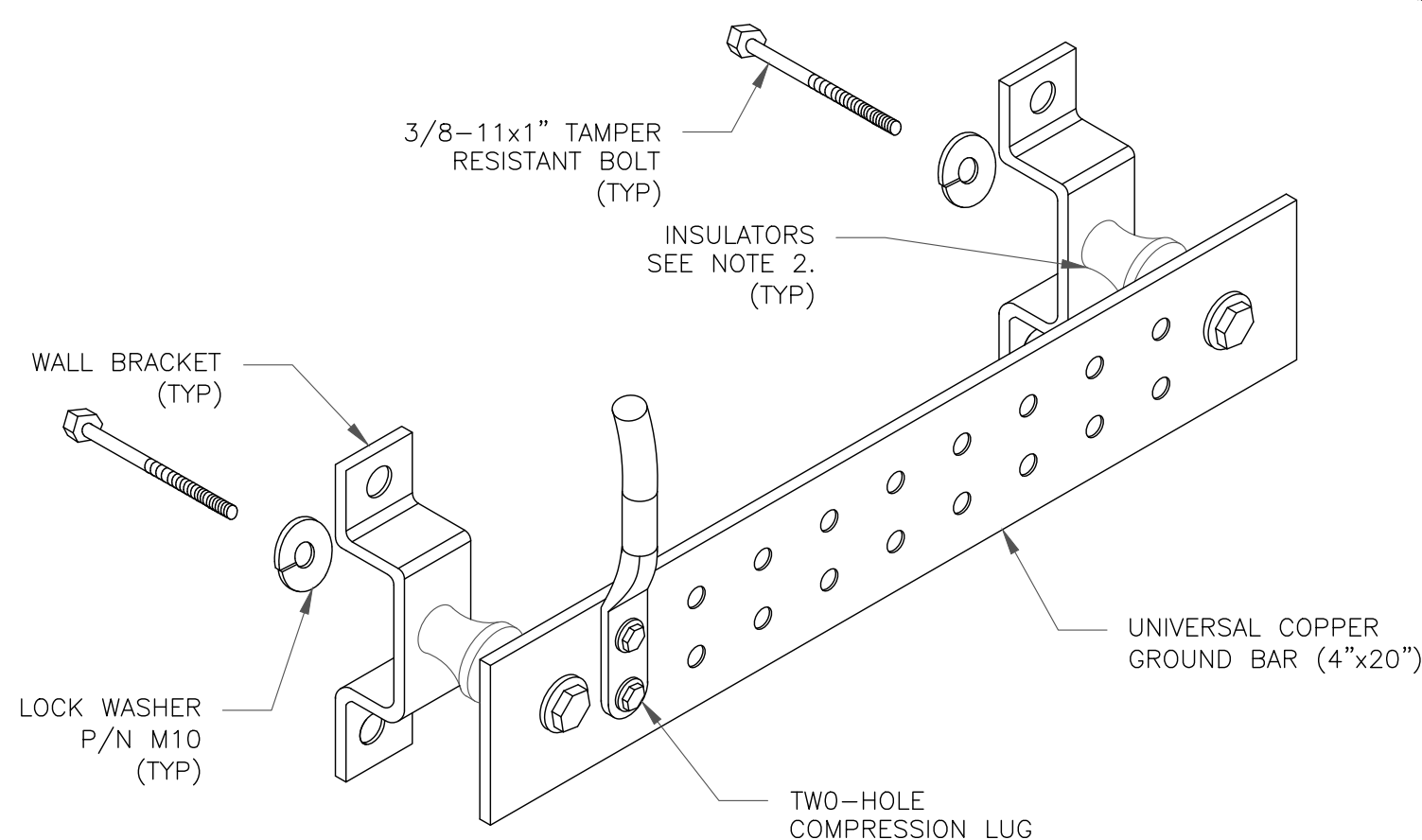
**3 CABLE GROUND KIT CONNECTION**  
SCALE: NOT TO SCALE



**NOTES:**

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

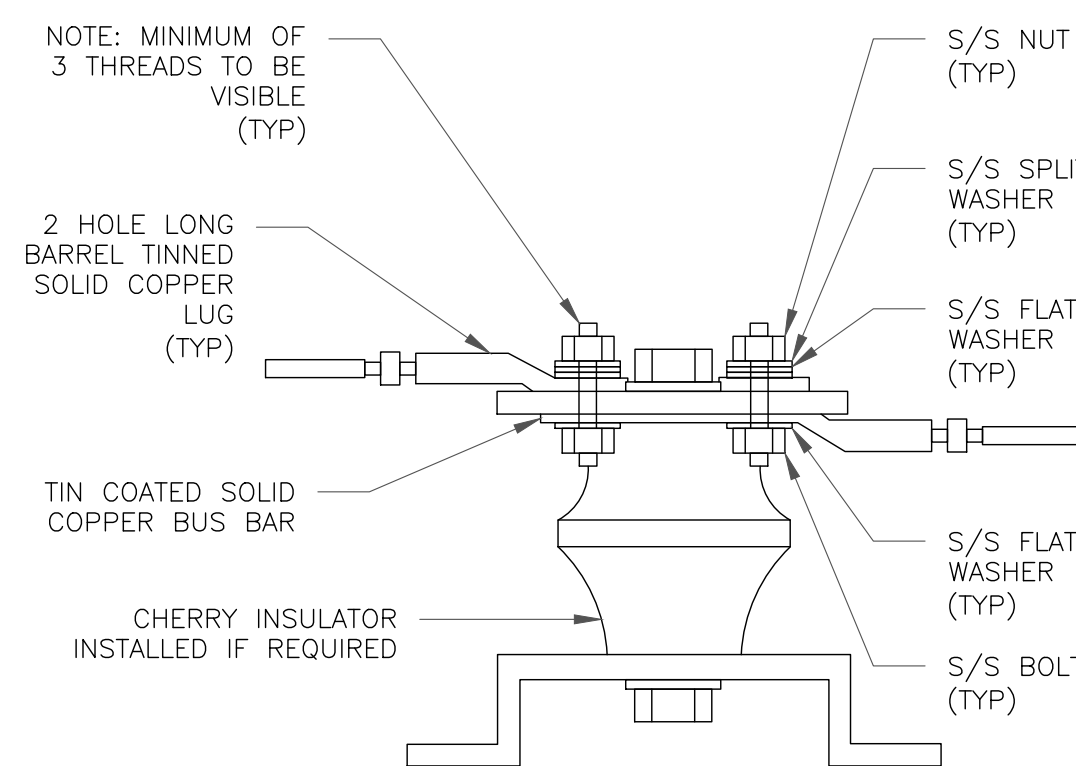
**4 GROUND CABLE CONNECTION**  
SCALE: NOT TO SCALE



**NOTES:**

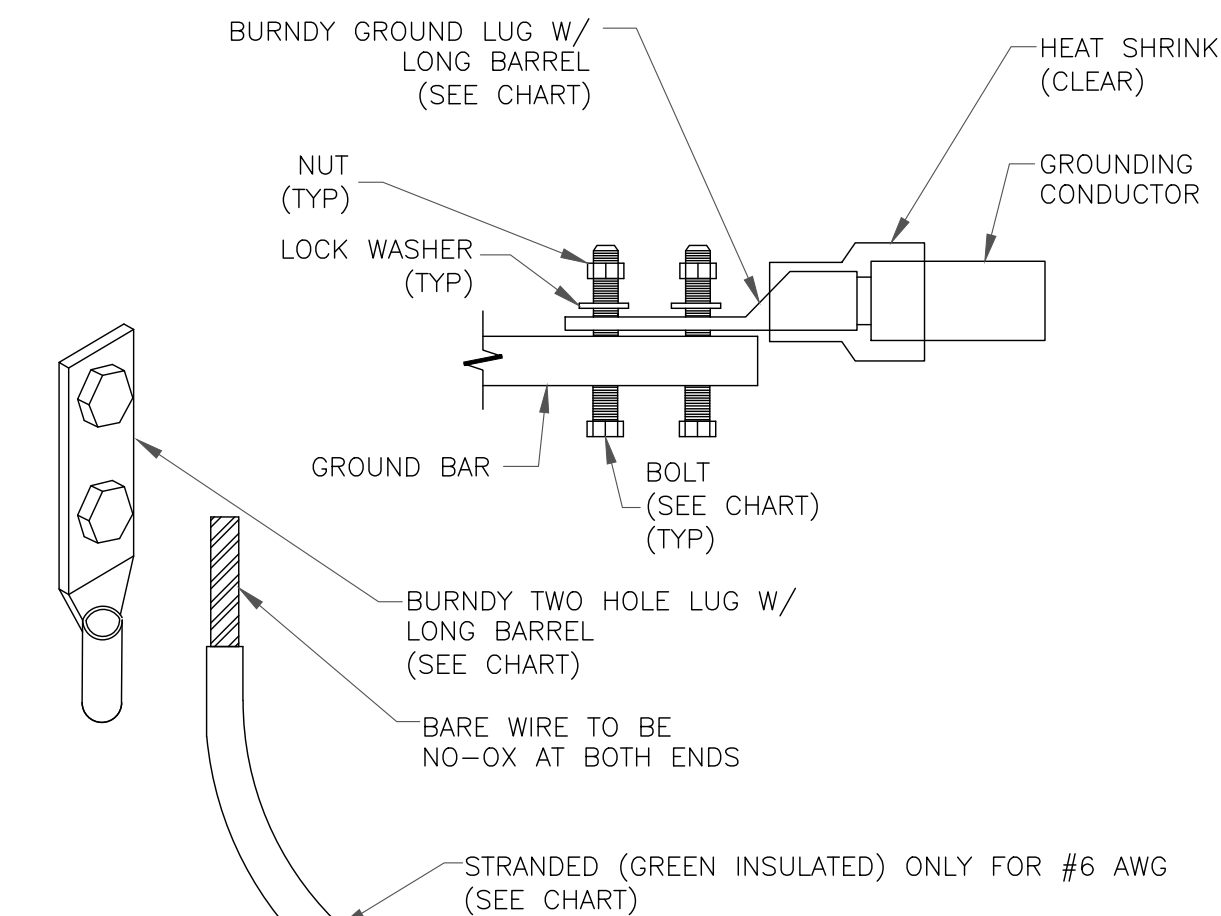
1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION. CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR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

**6 GROUND BAR DETAIL**  
SCALE: NOT TO SCALE



**7 LUG DETAIL**  
SCALE: NOT TO SCALE

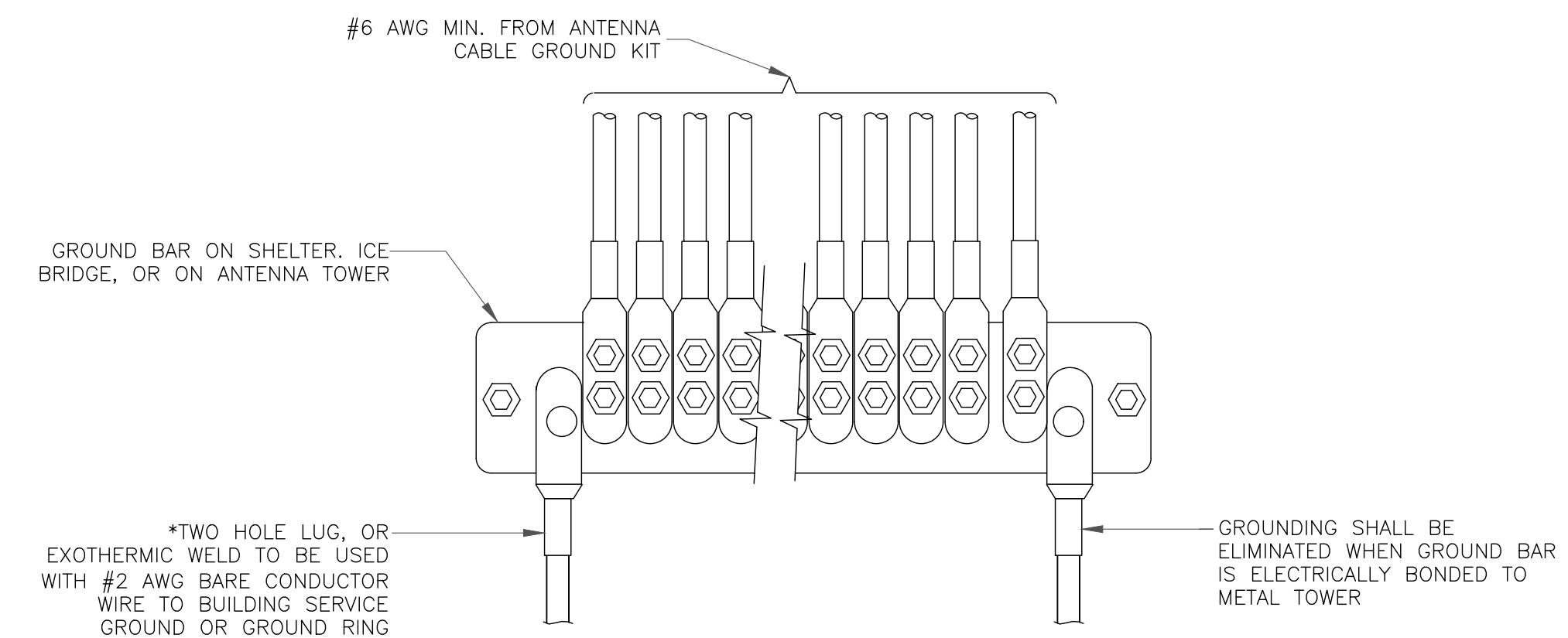
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



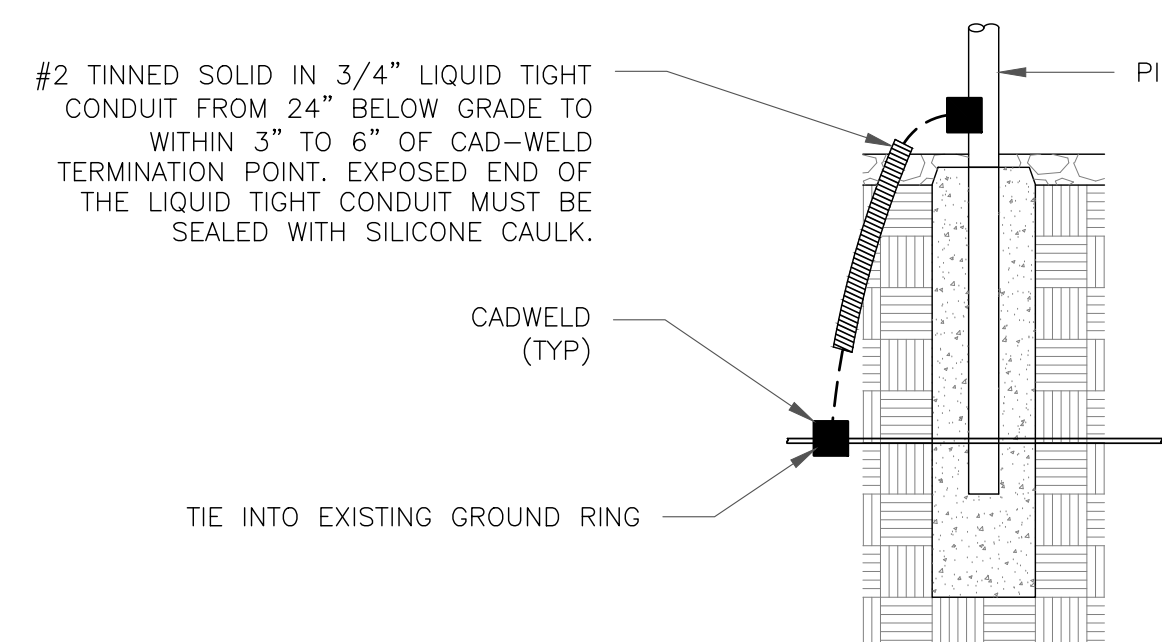
**NOTES:**

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

**2 MECHANICAL LUG CONNECTION**  
SCALE: NOT TO SCALE



**5 GROUNDWIRE INSTALLATION**  
SCALE: NOT TO SCALE



**8 TRANSITIONING GROUND DETAIL**  
SCALE: NOT TO SCALE

**verizon**  
180 WASHINGTON VALLEY ROAD  
BEDMINSTER, NJ 07921

**CROWN CASTLE**  
1500 CORPORATE DRIVE  
CANONSBURG, PA 15317

**INFINIGY**  
FROM ZERO TO INFINIGY  
the solutions are endless  
BELLEVUE, WA 98004

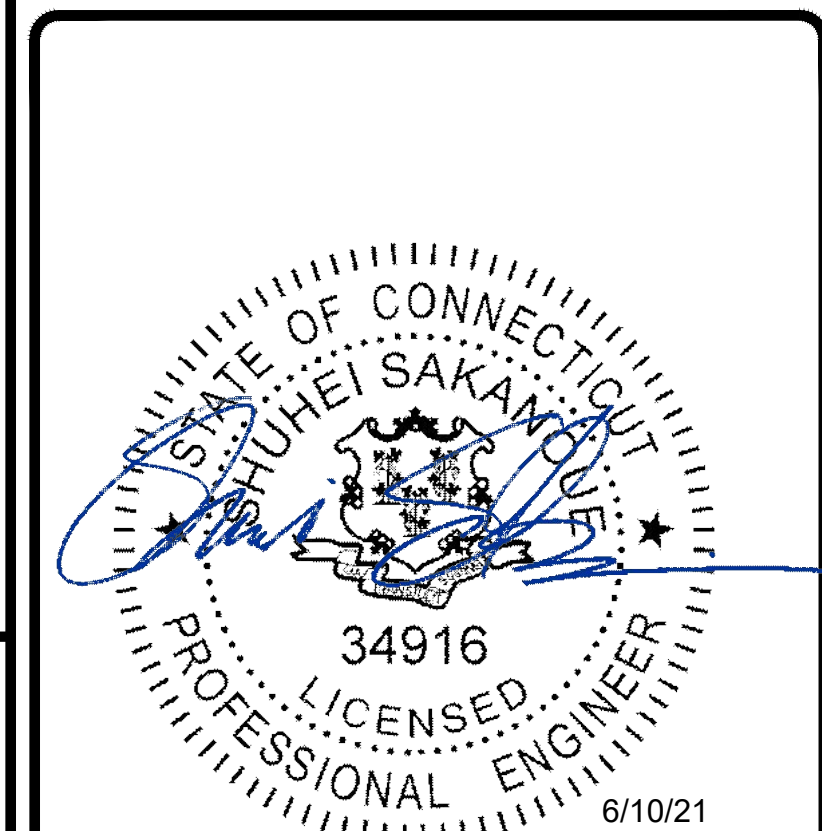
VERIZON SITE NUMBER:  
**468296**

BU #: **876376**  
**SCOVILLE HILL / HARWINTON ROD**

123 CAMPVILLE HILL RD.  
HARWINTON, CT 06791

EXISTING 177'-0" MONOPOLE

ISSUED FOR:				
REV	DATE	DRWN	DESCRIPTION	DES./QA
0	06/07/2021	RCD	FINAL CDs	--



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

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



# Exhibit D

## **Structural Analysis Report**



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

Date: **May 11, 2021**

**Subject:** **Structural Analysis Report**

**Carrier Designation:** **Verizon Wireless Co-Locate**  
**Site Number:** 468296  
**Site Name:** Harwinton W CT

**Crown Castle Designation:** **BU Number:** 876376  
**Site Name:** Scoville Hill / Harwinton Rod  
**JDE Job Number:** 644656  
**Work Order Number:** 1957204  
**Order Number:** 552650 Rev. 0

**Engineering Firm Designation:** **B+T Group Project Number:** 83609.010.01

**Site Data:** **123 Campville Hill Rd., Harwinton, Litchfield County, CT**  
**Latitude 41° 44' 12.4", Longitude -73° 5' 49.4"**  
**177 Foot - Monopole**

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

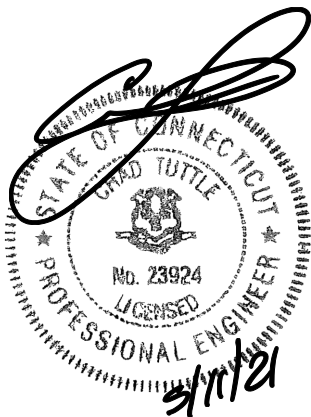
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Proposed Equipment Configuration **Sufficient Capacity - 87.9%**

This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Carlon Bethell II

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



Chad E. Tuttle, P.E.

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- Table 2 - Other Considered Equipment

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- 3.1) Analysis Method
- 3.2) Assumptions

### 4) ANALYSIS RESULTS

- Table 4 - Section Capacity (Summary)
- Table 5 - Tower Component Stresses vs. Capacity
- 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 177 ft Monopole designed by Summit in August of 2000.

The tower has been modified multiple times to accommodate additional loading.

Modifications designed by Hutter Trankina Engineering in August of 2004 are found to be ineffective and are considered for wind area only.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	120 mph
<b>Exposure Category:</b>	B
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	1.5 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	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)
154.0	156.0	2	Antel	LPA-80063/6CF	7	1-5/8
		4	Antel	LPA-80080/6CF		
		6	Quintel Tech.	QS6656-5D		
		1	RFS Celwave	DB-C1-12C-24AB-0Z		
		3	Samsung Telecom.	MT6407-77A		
		3	Samsung Telecom.	RFV01U-D1A		
	3	Samsung Telecom.	RFV01U-D2A			
	154.0	1	--	Platform Mount [LP 303-1]		

**Table 2 - Other Considered Equipment**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
177.0	179.0	3	Alcatel Lucent	1900MHZ RRH (65MHZ)	4	1-1/4
		3	Alcatel Lucent	800 External Notch Filter		
		3	Alcatel Lucent	800MHZ RRH		
		3	Alcatel Lucent	TD-RRH8x20-25		
		9	RFS Celwave	ACU-A20-N		
	177.0	3	RFS Celwave	APXVSPP18-C-A20		
		3	RFS Celwave	APXVTM14-C-120		
		1	--	Platform Mount [LP 1201-1]		
167.0	169.0	3	Commscope	LNx-6515DS-A1M	12	1-5/8
		3	RFS Celwave	APXV18-206516S-C-A20		
	168.0	3	Ericsson	KRY 112 75/1		
	167.0	1	--	T-Arm Mount [TA 602-3]		
127.0	129.0	3	CCI Antennas	DMP65R-BU4D	6	1-5/8
		3	CCI Antennas	OPA65R-BU4D	2	7/8

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	Ericsson	RRUS 4449 B5/B12	2	5/8
		3	Ericsson	RRUS 4478 B14_CCIV2	2	3/8
		3	Ericsson	RRUS 8843 B2/B66A		
		3	Powerwave Tech.	7770.00		
		6	Powerwave Tech.	LGP21401		
		1	Raycap	DC6-48-60-18-8C-EV		
		1	Raycap	DC6-48-60-18-8F		
	127.0	1	--	Platform Mount [LP 303-1_HR-1]		
117.0	117.0	3	RFS Celwave	APXV18-206517S-C	6	1-5/8
79.0	80.0	1	Spectracom	8225	1	1/2
	79.0	1	--	Side Arm Mount [SO 701-1]		

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Reference	Source
Tower Manufacturing Drawings	1613568	CCI Sites
Tower Modification Drawings	1634507	CCI Sites
Legacy Modification Inspection	7041633	CCI Sites
Tower Modification Drawings	1623517	CCI Sites
Post Modification Inspection	2176310	CCI Sites
Tower Modification Drawings	2461486	CCI Sites
Post Modification Inspection	2461484	CCI Sites
Tower Modification Drawings	3384748	CCI Sites
Post Modification Inspection	3841069	CCI Sites
Foundation Drawings	1613623	CCI Sites
Geotech Report	1531965	CCI Sites
Crown CAD Package	Date: 04/20/2021	CCI Sites

#### 3.1) Analysis Method

tnxTower (version 8.0.9.0), 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. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

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

### 3.2) Assumptions

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

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

### 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	177 - 172	Pole	TP22.875x22x0.2188	1	-3.912	966.244	4.3	Pass
L2	172 - 167	Pole	TP23.75x22.875x0.2188	2	-4.227	1003.557	7.5	Pass
L3	167 - 162	Pole	TP24.625x23.75x0.2188	3	-6.007	1040.871	12.5	Pass
L4	162 - 157	Pole	TP25.5x24.625x0.2188	4	-6.411	1078.182	16.8	Pass
L5	157 - 152	Pole	TP26.375x25.5x0.2188	5	-9.939	1115.499	23.2	Pass
L6	152 - 147	Pole	TP27.25x26.375x0.2188	6	-10.432	1152.816	29.8	Pass
L7	147 - 142	Pole	TP28.124x27.25x0.2188	7	-10.945	1190.122	35.9	Pass
L8	142 - 137	Pole	TP28.999x28.124x0.2188	8	-11.478	1227.439	41.6	Pass
L9	137 - 133.5	Pole	TP30.268x28.999x0.2188	9	-11.861	1253.563	45.4	Pass
L10	133.5 - 128.5	Pole	TP30.049x29.174x0.25	10	-12.770	1452.433	43.4	Pass
L11	128.5 - 123.5	Pole	TP30.924x30.049x0.25	11	-16.785	1495.084	49.4	Pass
L12	123.5 - 118.58	Pole	TP31.785x30.924x0.25	12	-17.538	1537.021	54.6	Pass
L13	118.58 - 118.33	Pole + Reinf.	TP31.828x31.785x0.3875	13	-17.597	2375.289	49.5	Pass
L14	118.33 - 113.33	Pole + Reinf.	TP32.703x31.828x0.3875	14	-18.773	2441.386	54.1	Pass
L15	113.33 - 108.33	Pole + Reinf.	TP33.578x32.703x0.3813	15	-20.076	2467.510	58.4	Pass
L16	108.33 - 106.42	Pole + Reinf.	TP33.913x33.578x0.3813	16	-20.769	2492.427	60.0	Pass
L17	106.42 - 106.17	Pole	TP33.957x33.913x0.25	17	-20.860	1642.914	66.8	Pass
L18	106.17 - 101.17	Pole	TP34.832x33.957x0.25	18	-22.481	1685.554	71.3	Pass
L19	101.17 - 96.17	Pole	TP35.707x34.832x0.25	19	-25.050	1728.195	75.7	Pass
L20	96.17 - 91.17	Pole	TP36.582x35.707x0.25	20	-26.693	1770.846	80.3	Pass
L21	91.17 - 88.75	Pole	TP37.836x36.582x0.25	21	-27.494	1791.457	82.4	Pass
L22	88.75 - 83.75	Pole	TP37.38x36.505x0.3125	22	-29.826	2258.361	65.7	Pass
L23	83.75 - 78.75	Pole	TP38.255x37.38x0.3125	23	-33.718	2311.669	68.9	Pass
L24	78.75 - 73.75	Pole	TP39.13x38.255x0.3125	24	-35.673	2364.978	72.0	Pass
L25	73.75 - 68.75	Pole	TP40.005x39.13x0.3125	25	-37.658	2418.286	75.0	Pass
L26	68.75 - 63.75	Pole	TP40.88x40.005x0.3125	26	-39.688	2471.595	77.8	Pass
L27	63.75 - 58.75	Pole	TP41.755x40.88x0.3125	27	-44.201	2524.903	80.7	Pass
L28	58.75 - 53.75	Pole	TP42.63x41.755x0.3125	28	-46.283	2578.212	83.4	Pass
L29	53.75 - 48.75	Pole	TP43.505x42.63x0.3125	29	-48.388	2631.520	86.0	Pass
L30	48.75 - 45	Pole	TP45.167x43.505x0.3125	30	-50.761	2671.494	87.9	Pass
L31	45 - 38.25	Pole	TP44.717x43.536x0.375	31	-56.514	3241.885	73.2	Pass
L32	38.25 - 33.25	Pole	TP45.592x44.717x0.375	32	-58.837	3305.851	74.8	Pass
L33	33.25 - 28.25	Pole	TP46.467x45.592x0.375	33	-61.185	3369.817	76.4	Pass
L34	28.25 - 23.25	Pole	TP47.342x46.467x0.375	34	-63.556	3433.783	77.9	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L35	23.25 - 18.25	Pole	TP48.217x47.342x0.375	35	-68.463	3497.749	79.4	Pass
L36	18.25 - 13.25	Pole	TP49.091x48.217x0.375	36	-70.988	3561.715	80.7	Pass
L37	13.25 - 8.25	Pole	TP49.966x49.091x0.375	37	-73.536	3625.681	82.0	Pass
L38	8.25 - 3.25	Pole	TP50.841x49.966x0.375	38	-76.108	3689.647	83.2	Pass
L39	3.25 - 0	Pole	TP51.41x50.841x0.375	39	-77.790	3731.227	84.0	Pass
							Summary	
						Pole (L30)	87.9	Pass
						Reinforcement	60.0	Pass
						Rating =	87.9	Pass

**Table 5 - Tower Component Stresses vs. Capacity**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rod Brackets	Base	43.0	Pass
1,2	Anchor Rods	Base	62.5	Pass
1,2	Base Plate	Base	58.4	Pass
1,2	Base Foundation (Structure)	Base	42.7	Pass
1,2	Base Foundation (Soil Interaction)	Base	83.0	Pass
1,2	Concrete Breakout	Base	72.1	Pass

<b>Structure Rating (max from all components) =</b>	<b>87.9%</b>
---	--------------

Notes:

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

#### 4.1) Recommendations

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

**APPENDIX A**

**TNXTOWER OUTPUT**



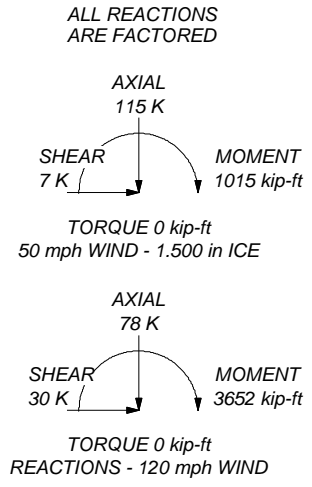
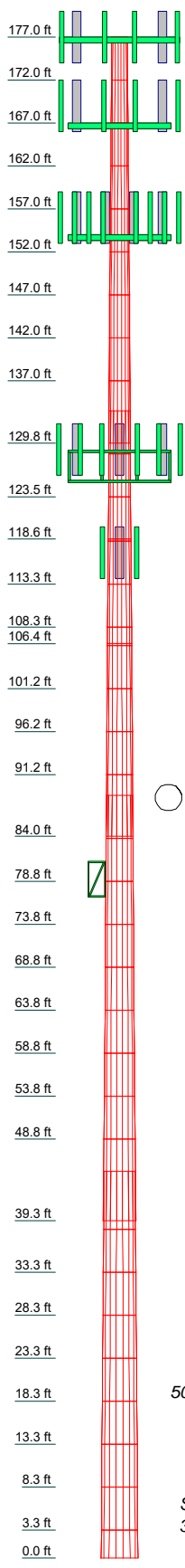
### MATERIAL STRENGTH

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

### TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 87.9%

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1		18	0.219	3.750	28.124	27.250	0.3	0.3
2		18	0.219	3.750	28.124	27.250	0.3	0.3
3		18	0.219	3.750	28.124	27.250	0.3	0.3
4		18	0.219	3.750	28.124	27.250	0.3	0.3
5		18	0.219	3.750	28.124	27.250	0.3	0.3
6		18	0.219	3.750	28.124	27.250	0.3	0.3
7		18	0.219	3.750	28.124	27.250	0.3	0.3
8		18	0.219	3.750	28.124	27.250	0.3	0.3
9		18	0.219	3.750	28.124	27.250	0.3	0.3
10		18	0.219	3.750	28.124	27.250	0.3	0.3
11		18	0.219	3.750	28.124	27.250	0.3	0.3
12		18	0.219	3.750	28.124	27.250	0.3	0.3
13		18	0.219	3.750	28.124	27.250	0.3	0.3
14		18	0.219	3.750	28.124	27.250	0.3	0.3
15		18	0.219	3.750	28.124	27.250	0.3	0.3
16		18	0.219	3.750	28.124	27.250	0.3	0.3
17		18	0.219	3.750	28.124	27.250	0.3	0.3
18		18	0.219	3.750	28.124	27.250	0.3	0.3
19		18	0.219	3.750	28.124	27.250	0.3	0.3
20		18	0.219	3.750	28.124	27.250	0.3	0.3
21		18	0.219	3.750	28.124	27.250	0.3	0.3
22		18	0.219	3.750	28.124	27.250	0.3	0.3
23		18	0.219	3.750	28.124	27.250	0.3	0.3
24		18	0.219	3.750	28.124	27.250	0.3	0.3
25		18	0.219	3.750	28.124	27.250	0.3	0.3
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27		18	0.219	3.750	28.124	27.250	0.3	0.3
28		18	0.219	3.750	28.124	27.250	0.3	0.3
29		18	0.219	3.750	28.124	27.250	0.3	0.3
30		18	0.219	3.750	28.124	27.250	0.3	0.3
31		18	0.219	3.750	28.124	27.250	0.3	0.3
32		18	0.219	3.750	28.124	27.250	0.3	0.3
33		18	0.219	3.750	28.124	27.250	0.3	0.3
34		18	0.219	3.750	28.124	27.250	0.3	0.3
35		18	0.219	3.750	28.124	27.250	0.3	0.3
36		18	0.219	3.750	28.124	27.250	0.3	0.3
37		18	0.219	3.750	28.124	27.250	0.3	0.3
38		18	0.219	3.750	28.124	27.250	0.3	0.3
39		18	0.219	3.750	28.124	27.250	0.3	0.3



**B+T Group**  
 1717 S. Boulder, Suite 300  
 Tulsa, OK 74119  
 Phone: (918) 587-4630  
 FAX: (918) 295-0265

Job: **83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 87637)**

Project:	Client: Crown Castle	Drawn by: JD Prabhu	App'd:
Code: TIA-222-H	Date: 05/08/21	Scale: NTS	Dwg No. E-1

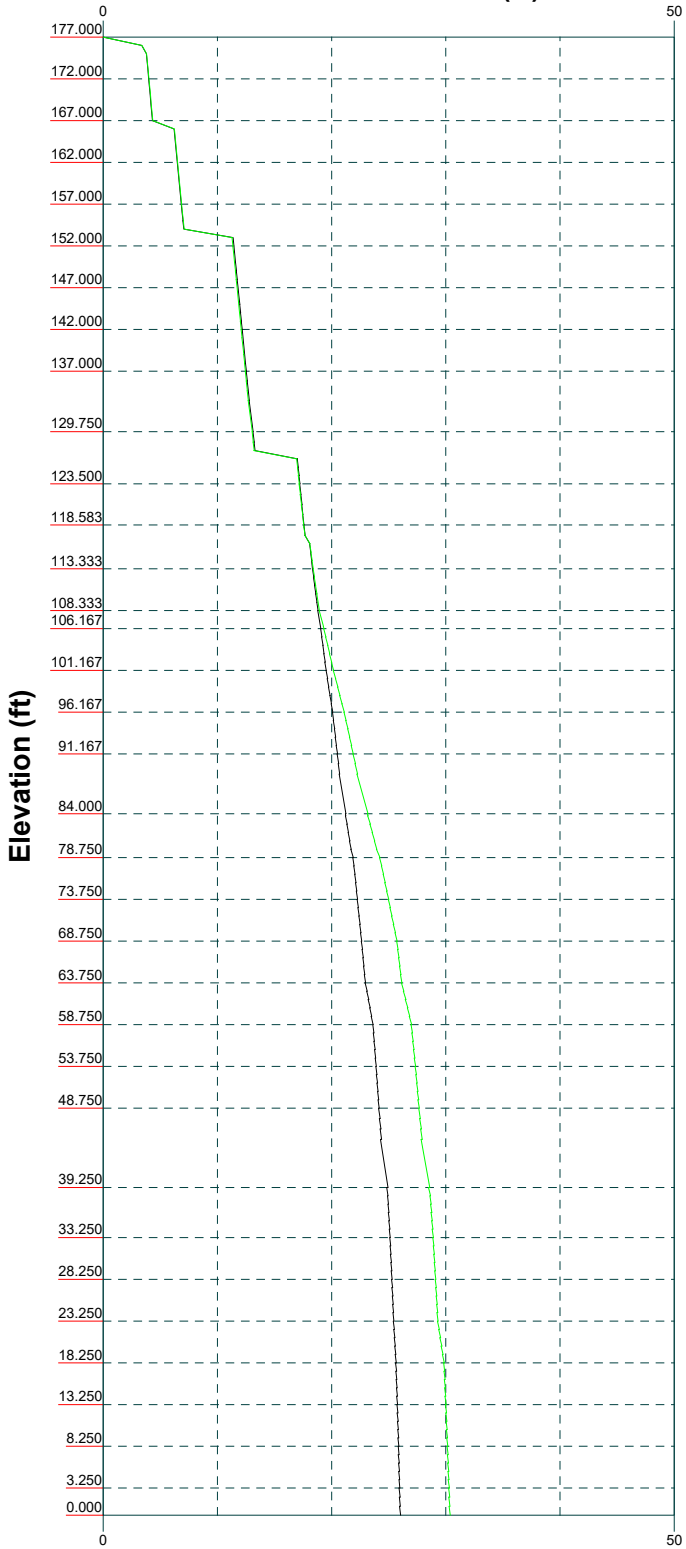
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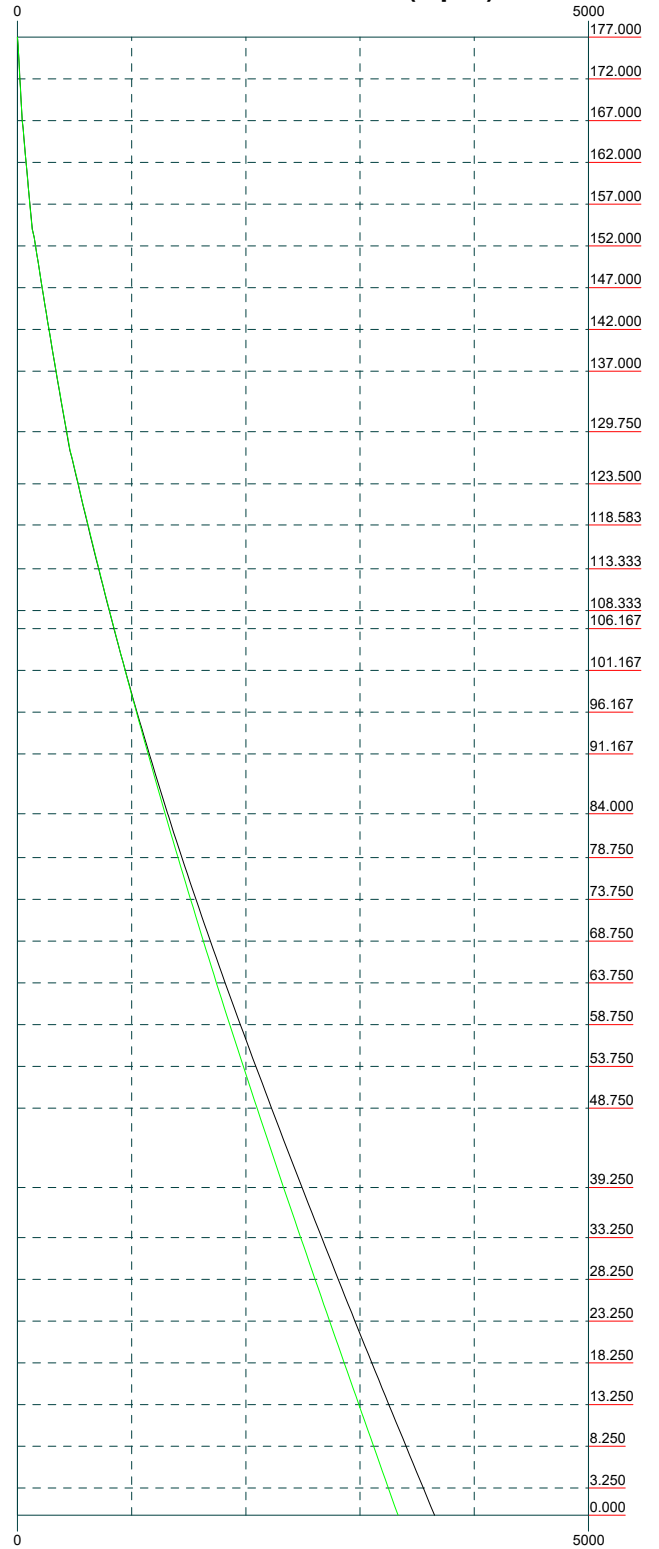
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Mz

Global Mast Shear (K)

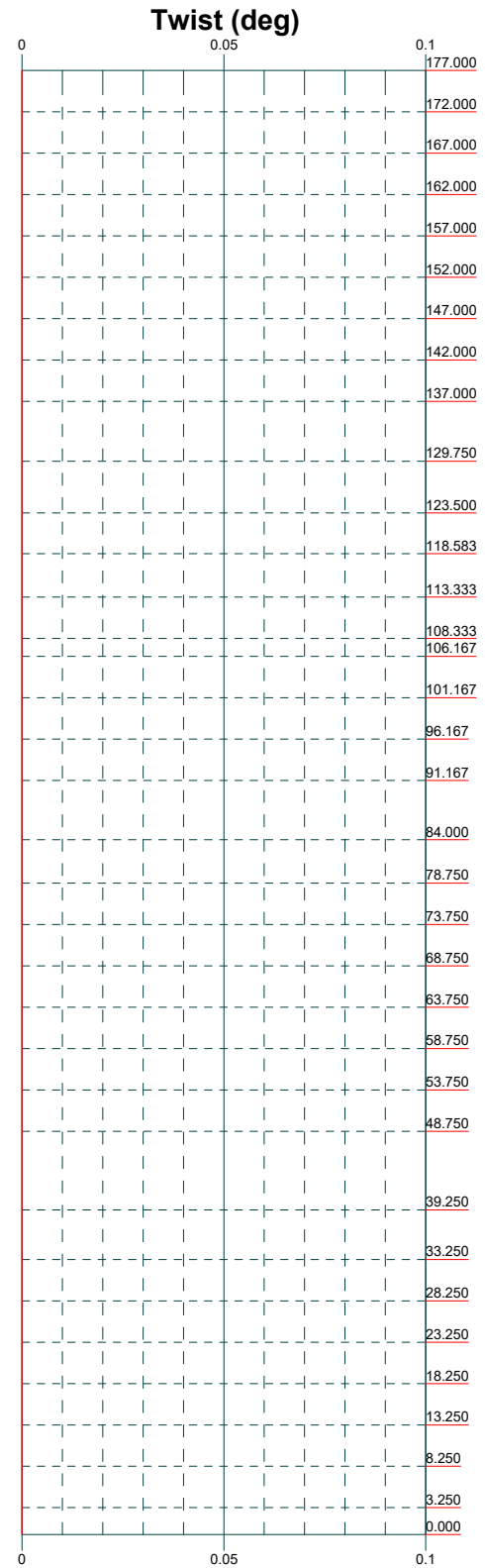
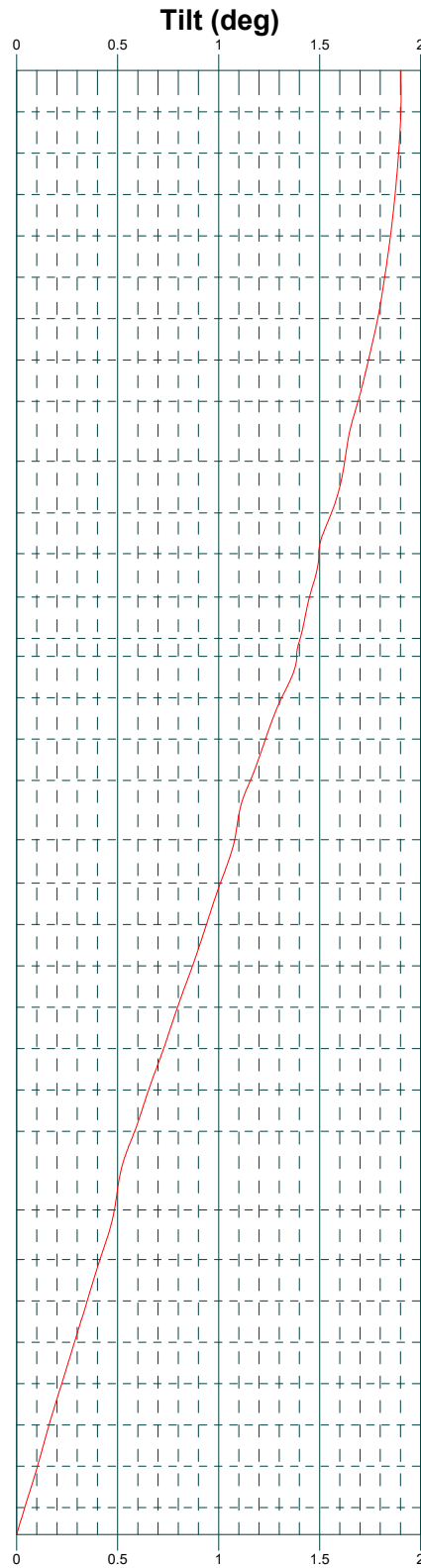
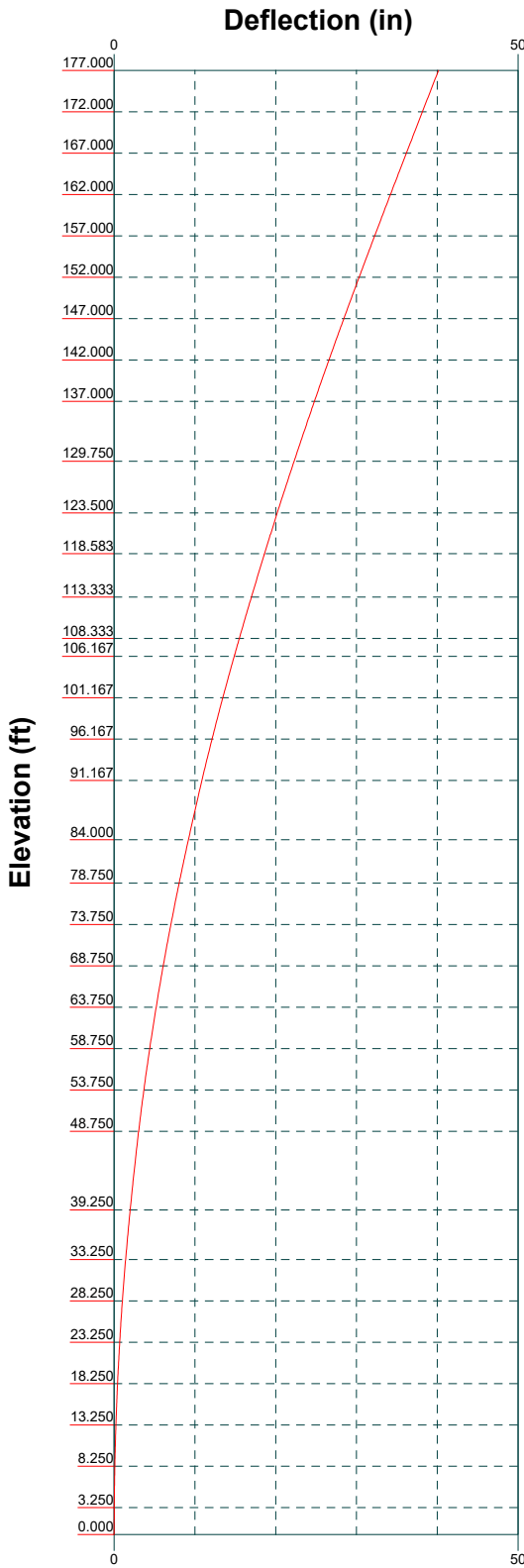


Global Mast Moment (kip-ft)



**B+T Group**  
 1717 S. Boulder, Suite 300  
 Tulsa, OK 74119  
 Phone: (918) 587-4630  
 FAX: (918) 295-0265

Job: <b>83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 87637)</b>		
Project:		
Client: Crown Castle	Drawn by: JD Prabhu	App'd:
Code: TIA-222-H	Date: 05/08/21	Scale: NTS
Path:	Dwg No. E-4	



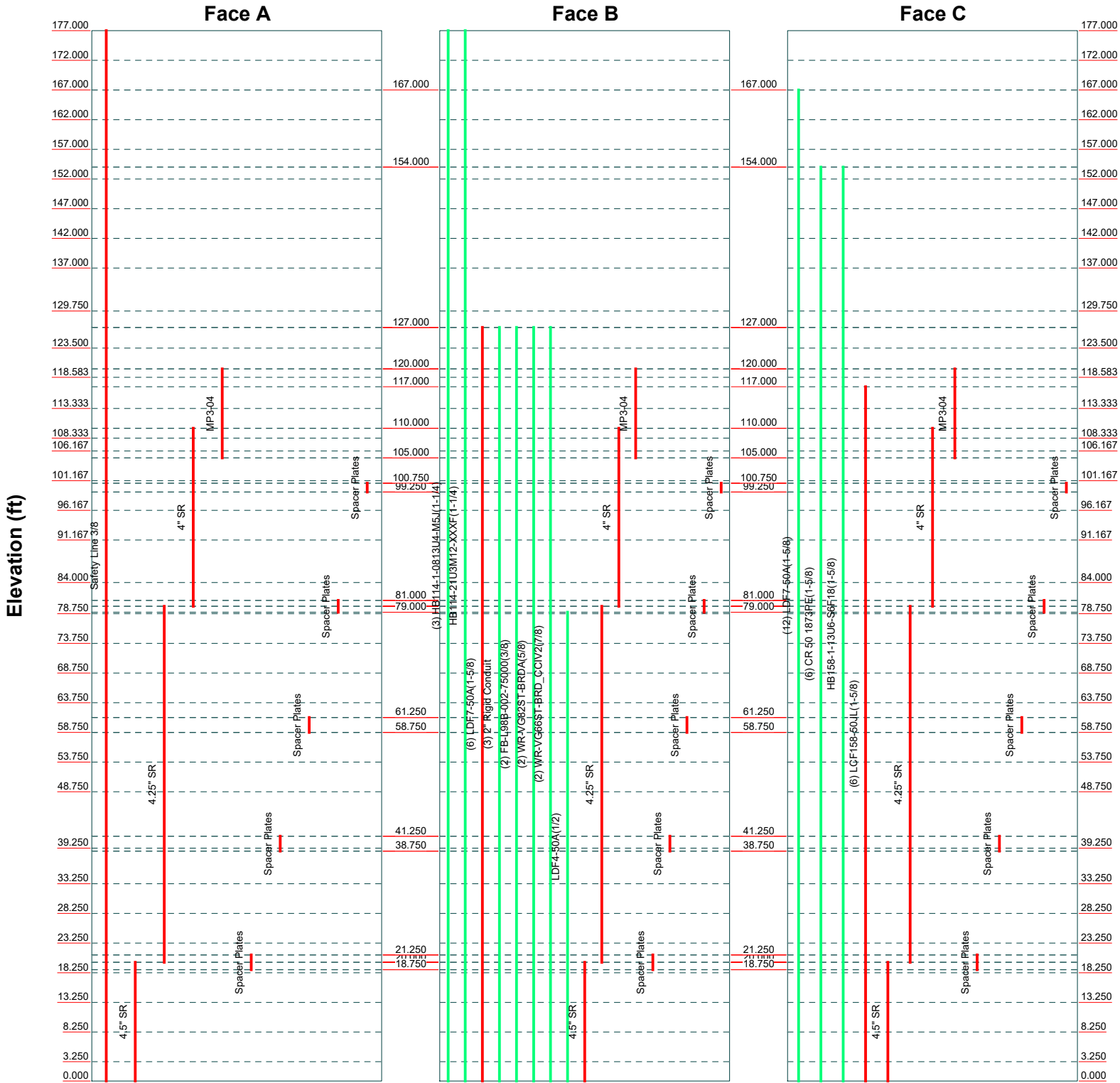
**B+T Group**  
 1717 S. Boulder, Suite 300  
 Tulsa, OK 74119  
 Phone: (918) 587-4630  
 FAX: (918) 295-0265

Job: <b>83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 87637)</b>		
Project:		
Client: Crown Castle	Drawn by: JD Prabhu	App'd:
Code: TIA-222-H	Date: 05/08/21	Scale: NTS
Path:	Dwg No. E-5	

# Feed Line Distribution Chart

## 0' - 177'

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



**B+T Group**  
 1717 S. Boulder, Suite 300  
 Tulsa, OK 74119  
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Job: <b>83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 87637)</b>		
Project:		
Client: <b>Crown Castle</b>	Drawn by: <b>JD Prabhu</b>	App'd:
Code: <b>TIA-222-H</b>	Date: <b>05/08/21</b>	Scale: <b>NTS</b>
Path:	Dwg No. <b>E-7</b>	

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 876376)	<b>Page</b> 1 of 44
	<b>Project</b>	<b>Date</b> 21:20:50 05/08/21
	<b>Client</b> Crown Castle	<b>Designed by</b> JD Prabhu

## 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 Litchfield County, Connecticut.

Tower base elevation above sea level: 735.000 ft.

Basic wind speed of 120 mph.

Risk Category II.

Exposure Category B.

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

Topographic Category: 1.

Crest Height: 0.000 ft.

Nominal ice thickness of 1.500 in.

Ice thickness is considered to increase with height.

Ice density of 56.000 pcf.

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

Temperature drop of 50.000 °F.

Deflections calculated using a wind speed of 60 mph.

TIA-222-H Annex S.

TOWER RATING: 87.9%.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

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

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

Maximum demand-capacity ratio is: 1.05.

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

## Options

<ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>√ Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul>	<ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>Add IBC .6D+W Combination</li> <li>Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> <li>Ignore KL/ry For 60 Deg. Angle Legs</li> </ul>	<ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-H Bracing Resist. Exemption</li> <li>Use TIA-222-H Tension Splice Exemption</li> <li style="background-color: #e0e0e0;">Poles</li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> <li>Pole Without Linear Attachments</li> <li>Pole With Shroud Or No Appurtenances</li> <li>Outside and Inside Corner Radii Are Known</li> </ul>
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**tnxTower**

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**Job**  
 83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT  
 (BU# 876376)

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**Project**

**Date**  
 21:20:50 05/08/21

**Client**  
 Crown Castle

**Designed by**  
 JD Prabhu

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	177.000-172.000	5.000	0.000	18	22.000	22.875	0.219	0.875	A607-65 (65 ksi)
L2	172.000-167.000	5.000	0.000	18	22.875	23.750	0.219	0.875	A607-65 (65 ksi)
L3	167.000-162.000	5.000	0.000	18	23.750	24.625	0.219	0.875	A607-65 (65 ksi)
L4	162.000-157.000	5.000	0.000	18	24.625	25.500	0.219	0.875	A607-65 (65 ksi)
L5	157.000-152.000	5.000	0.000	18	25.500	26.375	0.219	0.875	A607-65 (65 ksi)
L6	152.000-147.000	5.000	0.000	18	26.375	27.250	0.219	0.875	A607-65 (65 ksi)
L7	147.000-142.000	5.000	0.000	18	27.250	28.124	0.219	0.875	A607-65 (65 ksi)
L8	142.000-137.000	5.000	0.000	18	28.124	28.999	0.219	0.875	A607-65 (65 ksi)
L9	137.000-129.750	7.250	3.750	18	28.999	30.268	0.219	0.875	A607-65 (65 ksi)
L10	129.750-128.500	5.000	0.000	18	29.174	30.049	0.250	1.000	A607-65 (65 ksi)
L11	128.500-123.500	5.000	0.000	18	30.049	30.924	0.250	1.000	A607-65 (65 ksi)
L12	123.500-118.583	4.917	0.000	18	30.924	31.785	0.250	1.000	A607-65 (65 ksi)
L13	118.583-118.333	0.250	0.000	18	31.785	31.828	0.388	1.550	A607-65 (65 ksi)
L14	118.333-113.333	5.000	0.000	18	31.828	32.703	0.388	1.550	A607-65 (65 ksi)
L15	113.333-108.333	5.000	0.000	18	32.703	33.578	0.381	1.525	A607-65 (65 ksi)
L16	108.333-106.417	1.916	0.000	18	33.578	33.913	0.381	1.525	A607-65 (65 ksi)
L17	106.417-106.167	0.250	0.000	18	33.913	33.957	0.250	1.000	A607-65 (65 ksi)
L18	106.167-101.167	5.000	0.000	18	33.957	34.832	0.250	1.000	A607-65 (65 ksi)
L19	101.167-96.167	5.000	0.000	18	34.832	35.707	0.250	1.000	A607-65 (65 ksi)
L20	96.167-91.167	5.000	0.000	18	35.707	36.582	0.250	1.000	A607-65 (65 ksi)
L21	91.167-84.000	7.167	4.750	18	36.582	37.836	0.250	1.000	A607-65 (65 ksi)
L22	84.000-83.750	5.000	0.000	18	36.505	37.380	0.313	1.250	A607-65 (65 ksi)
L23	83.750-78.750	5.000	0.000	18	37.380	38.255	0.313	1.250	A607-65 (65 ksi)
L24	78.750-73.750	5.000	0.000	18	38.255	39.130	0.313	1.250	A607-65 (65 ksi)
L25	73.750-68.750	5.000	0.000	18	39.130	40.005	0.313	1.250	A607-65 (65 ksi)
L26	68.750-63.750	5.000	0.000	18	40.005	40.880	0.313	1.250	A607-65 (65 ksi)
L27	63.750-58.750	5.000	0.000	18	40.880	41.755	0.313	1.250	A607-65 (65 ksi)
L28	58.750-53.750	5.000	0.000	18	41.755	42.630	0.313	1.250	A607-65 (65 ksi)

<b>Job</b>	83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 876376)
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<b>Designed by</b>	JD Prabhu

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L29	53.750-48.750	5.000	0.000	18	42.630	43.505	0.313	1.250	A607-65 (65 ksi)
L30	48.750-39.250	9.500	5.750	18	43.505	45.167	0.313	1.250	A607-65 (65 ksi)
L31	39.250-38.250	6.750	0.000	18	43.536	44.717	0.375	1.500	A607-65 (65 ksi)
L32	38.250-33.250	5.000	0.000	18	44.717	45.592	0.375	1.500	A607-65 (65 ksi)
L33	33.250-28.250	5.000	0.000	18	45.592	46.467	0.375	1.500	A607-65 (65 ksi)
L34	28.250-23.250	5.000	0.000	18	46.467	47.342	0.375	1.500	A607-65 (65 ksi)
L35	23.250-18.250	5.000	0.000	18	47.342	48.217	0.375	1.500	A607-65 (65 ksi)
L36	18.250-13.250	5.000	0.000	18	48.217	49.091	0.375	1.500	A607-65 (65 ksi)
L37	13.250-8.250	5.000	0.000	18	49.091	49.966	0.375	1.500	A607-65 (65 ksi)
L38	8.250-3.250	5.000	0.000	18	49.966	50.841	0.375	1.500	A607-65 (65 ksi)
L39	3.250-0.000	3.250		18	50.841	51.410	0.375	1.500	A607-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I <sup>2</sup> /Q in <sup>2</sup>	w in	w/t
L1	22.306	15.123	906.444	7.732	11.176	81.106	1814.080	7.563	3.487	15.941
L2	23.194	15.730	1020.122	8.043	11.620	87.787	2041.586	7.867	3.641	16.645
L3	24.082	16.338	1142.927	8.354	12.065	94.731	2287.359	8.171	3.795	17.348
L4	24.971	16.945	1275.213	8.664	12.509	101.941	2552.105	8.474	3.949	18.052
L5	25.859	17.553	1417.332	8.975	12.954	109.414	2836.530	8.778	4.103	18.756
L6	26.748	18.160	1569.637	9.285	13.398	117.152	3141.338	9.082	4.257	19.46
L7	27.636	18.768	1732.479	9.596	13.843	125.154	3467.237	9.386	4.411	20.164
L8	28.525	19.375	1906.211	9.907	14.287	133.421	3814.930	9.689	4.565	20.868
L9	29.413	19.983	2091.186	10.217	14.732	141.952	4185.123	9.993	4.719	21.572
L10	30.301	20.590	2286.090	10.547	15.176	150.781	4584.998	10.297	4.873	22.276
L11	31.189	21.197	2491.186	10.877	15.620	160.000	5000.000	10.591	5.027	22.980
L12	32.077	21.804	2706.282	11.207	16.064	169.619	5431.250	10.885	5.181	23.684
L13	32.965	22.411	2931.378	11.537	16.508	179.638	5878.562	11.179	5.335	24.388
L14	33.853	23.018	3166.474	11.867	16.952	190.057	6341.925	11.473	5.489	25.092
L15	34.741	23.625	3411.570	12.197	17.396	200.876	6821.338	11.767	5.643	25.796

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L16	34.037	40.171	5593.012	11.785	17.058	327.888	11193.384	20.089	5.239	13.741
	34.037	40.171	5593.012	11.785	17.058	327.888	11193.384	20.089	5.239	13.741
	34.378	40.577	5764.188	11.904	17.228	334.582	11535.960	20.292	5.298	13.896
L17	34.398	26.712	3824.353	11.951	17.228	221.985	7653.739	13.358	5.529	22.115
	34.442	26.747	3839.282	11.966	17.250	222.564	7683.616	13.376	5.536	22.146
L18	34.442	26.747	3839.282	11.966	17.250	222.564	7683.616	13.376	5.536	22.146
	35.331	27.441	4146.072	12.277	17.695	234.312	8297.599	13.723	5.690	22.762
L19	35.331	27.441	4146.072	12.277	17.695	234.312	8297.599	13.723	5.690	22.762
	36.219	28.135	4468.784	12.587	18.139	246.361	8943.449	14.070	5.844	23.378
L20	36.219	28.135	4468.784	12.587	18.139	246.361	8943.449	14.070	5.844	23.378
	37.108	28.829	4807.822	12.898	18.584	258.713	9621.971	14.417	5.998	23.994
L21	37.108	28.829	4807.822	12.898	18.584	258.713	9621.971	14.417	5.998	23.994
	38.381	29.824	5323.077	13.343	19.221	276.945	10653.157	14.915	6.219	24.877
L22	37.864	35.898	5940.787	12.848	18.544	320.354	11889.390	17.953	5.875	18.8
	37.908	36.766	6382.151	13.159	18.989	336.098	12772.700	18.387	6.029	19.292
L23	37.908	36.766	6382.151	13.159	18.989	336.098	12772.700	18.387	6.029	19.292
	38.797	37.634	6844.852	13.470	19.433	352.221	13698.710	18.821	6.183	19.785
L24	38.797	37.634	6844.852	13.470	19.433	352.221	13698.710	18.821	6.183	19.785
	39.685	38.502	7329.392	13.780	19.878	368.721	14668.428	19.255	6.337	20.278
L25	39.685	38.502	7329.392	13.780	19.878	368.721	14668.428	19.255	6.337	20.278
	40.574	39.370	7836.276	14.091	20.322	385.598	15682.864	19.689	6.491	20.771
L26	40.574	39.370	7836.276	14.091	20.322	385.598	15682.864	19.689	6.491	20.771
	41.462	40.238	8366.008	14.401	20.767	402.854	16743.024	20.123	6.645	21.263
L27	41.462	40.238	8366.008	14.401	20.767	402.854	16743.024	20.123	6.645	21.263
	42.351	41.105	8919.090	14.712	21.211	420.487	17849.917	20.557	6.799	21.756
L28	42.351	41.105	8919.090	14.712	21.211	420.487	17849.917	20.557	6.799	21.756
	43.239	41.973	9496.028	15.023	21.656	438.497	19004.550	20.991	6.953	22.249
L29	43.239	41.973	9496.028	15.023	21.656	438.497	19004.550	20.991	6.953	22.249
	44.127	42.841	10097.323	15.333	22.100	456.886	20207.932	21.425	7.107	22.742
L30	44.127	42.841	10097.323	15.333	22.100	456.886	20207.932	21.425	7.107	22.742
	45.016	43.710	10700.000	15.644	22.545	475.375	21413.000	21.857	7.261	23.235
L31	45.171	51.372	12090.485	15.322	22.116	546.681	24196.880	25.691	7.002	18.673
	45.349	52.778	13110.496	15.741	22.716	577.143	26238.243	26.394	7.210	19.227
L32	45.349	52.778	13110.496	15.741	22.716	577.143	26238.243	26.394	7.210	19.227
	46.237	53.819	13901.960	16.052	23.161	600.240	27822.213	26.915	7.364	19.638
L33	46.237	53.819	13901.960	16.052	23.161	600.240	27822.213	26.915	7.364	19.638
	47.126	54.861	14724.654	16.363	23.605	623.791	29468.683	27.436	7.518	20.048
L34	47.126	54.861	14724.654	16.363	23.605	623.791	29468.683	27.436	7.518	20.048
	48.014	55.902	15579.180	16.673	24.050	647.795	31178.859	27.956	7.672	20.459
L35	48.014	55.902	15579.180	16.673	24.050	647.795	31178.859	27.956	7.672	20.459
	48.903	56.943	16466.144	16.984	24.494	672.252	32953.955	28.477	7.826	20.87
L36	48.903	56.943	16466.144	16.984	24.494	672.252	32953.955	28.477	7.826	20.87
	49.791	57.985	17386.149	17.294	24.938	697.162	34795.175	28.998	7.980	21.28
L37	49.791	57.985	17386.149	17.294	24.938	697.162	34795.175	28.998	7.980	21.28
	50.679	59.026	18339.801	17.605	25.383	722.525	36703.734	29.519	8.134	21.691
L38	50.679	59.026	18339.801	17.605	25.383	722.525	36703.734	29.519	8.134	21.691
	51.568	60.068	19327.702	17.916	25.827	748.341	38680.835	30.039	8.288	22.102
L39	51.568	60.068	19327.702	17.916	25.827	748.341	38680.835	30.039	8.288	22.102
	52.456	61.110	20320.000	18.227	26.271	773.311	40700.000	30.561	8.442	22.513
	52.145	60.744	19988.490	18.117	26.116	765.365	40003.282	30.378	8.388	22.368

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1 177.000-172.0 00				1	1	1			
L2 172.000-167.0 00				1	1	1			



<p><b>tnxTower</b></p> <p><b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<p><b>Job</b> 83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 876376)</p>	<p><b>Page</b> 5 of 44</p>
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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft <sup>2</sup>	in							
L3 167.000-162.000				1	1	1			
L4 162.000-157.000				1	1	1			
L5 157.000-152.000				1	1	1			
L6 152.000-147.000				1	1	1			
L7 147.000-142.000				1	1	1			
L8 142.000-137.000				1	1	1			
L9 137.000-129.750				1	1	1			
L10 129.750-128.500				1	1	1			
L11 128.500-123.500				1	1	1			
L12 123.500-118.583				1	1	1			
L13 118.583-118.333				1	1	0.968399			
L14 118.333-113.333				1	1	0.959648			
L15 113.333-108.333				1	1	0.966772			
L16 108.333-106.417				1	1	0.963662			
L17 106.417-106.167				1	1	1			
L18 106.167-101.167				1	1	1			
L19 101.167-96.167				1	1	1			
L20 96.167-91.167				1	1	1			
L21 91.167-84.000				1	1	1			
L22 84.000-83.750				1	1	1			
L23 83.750-78.750				1	1	1			

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	<p><b>Project</b></p>	<p><b>Date</b> 21:20:50 05/08/21</p>
	<p><b>Client</b> Crown Castle</p>	<p><b>Designed by</b> JD Prabhu</p>

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft <sup>2</sup>	in							
L24				1	1	1			
78.750-73.750									
L25				1	1	1			
73.750-68.750									
L26				1	1	1			
68.750-63.750									
L27				1	1	1			
63.750-58.750									
L28				1	1	1			
58.750-53.750									
L29				1	1	1			
53.750-48.750									
L30				1	1	1			
48.750-39.250									
L31				1	1	1			
39.250-38.250									
L32				1	1	1			
38.250-33.250									
L33				1	1	1			
33.250-28.250									
L34				1	1	1			
28.250-23.250									
L35				1	1	1			
23.250-18.250									
L36				1	1	1			
18.250-13.250									
L37				1	1	1			
13.250-8.250									
L38				1	1	1			
8.250-3.250									
L39				1	1	1			
3.250-0.000									

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
* LDF7-50A(1-5/8)	B	No	Surface Ar (CaAa)	127.000 - 0.000	6	4	0.000 0.250	1.980		0.001
* LCF158-50JL(1-5/8)	C	No	Surface Ar (CaAa)	117.000 - 0.000	6	6	0.000 0.250	1.980		0.001
* Safety Line 3/8	A	No	Surface Ar (CaAa)	177.000 - 0.000	1	1	0.500 0.500	0.375		0.000
** MODS **										
* 4.5" SR	A	No	Surface Ar (CaAa)	20.000 - 0.000	1	1	0.300 0.350	4.500		0.054
4.5" SR	B	No	Surface Ar (CaAa)	20.000 - 0.000	1	1	0.300 0.350	4.500		0.054



<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 876376)	<b>Page</b> 8 of 44
	<b>Project</b>	<b>Date</b> 21:20:50 05/08/21
	<b>Client</b> Crown Castle	<b>Designed by</b> JD Prabhu

**Feed Line/Linear Appurtenances - Entered As Area**

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight klf
HB114-1-0813U4-M 5J(1-1/4)	B	No	No	Inside Pole	177.000 - 0.000	3	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
HB114-21U3M12-X XXF(1-1/4)	B	No	No	Inside Pole	177.000 - 0.000	1	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
* LDF7-50A(1-5/8)	C	No	No	Inside Pole	167.000 - 0.000	12	No Ice	0.000	0.001
1/2" Ice							0.000	0.001	
1" Ice							0.000	0.001	
2" Ice							0.000	0.001	
* CR 50 1873PE(1-5/8)	C	No	No	Inside Pole	154.000 - 0.000	6	No Ice	0.000	0.001
1/2" Ice							0.000	0.001	
1" Ice							0.000	0.001	
2" Ice							0.000	0.001	
HB158-1-13U6-S6F 18(1-5/8)	C	No	No	Inside Pole	154.000 - 0.000	1	No Ice	0.000	0.002
							1/2" Ice	0.000	0.002
							1" Ice	0.000	0.002
							2" Ice	0.000	0.002
2" Rigid Conduit	B	No	No	Inside Pole	127.000 - 0.000	3	No Ice	0.000	0.003
							1/2" Ice	0.000	0.003
							1" Ice	0.000	0.003
							2" Ice	0.000	0.003
FB-L98B-002-75000 (3/8)	B	No	No	Inside Pole	127.000 - 0.000	2	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
WR-VG82ST-BRD A(5/8)	B	No	No	Inside Pole	127.000 - 0.000	2	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
WR-VG66ST-BRD_ CCIV2(7/8)	B	No	No	Inside Pole	127.000 - 0.000	2	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
* LDF4-50A(1/2)	B	No	No	Inside Pole	79.000 - 0.000	1	No Ice	0.000	0.000
1/2" Ice							0.000	0.000	
1" Ice							0.000	0.000	
2" Ice							0.000	0.000	
* ** MODS ** *									

**Feed Line/Linear Appurtenances Section Areas**

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	<p><b>Project</b></p>	<p><b>Date</b> 21:20:50 05/08/21</p>
	<p><b>Client</b> Crown Castle</p>	<p><b>Designed by</b> JD Prabhu</p>

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	177.000-172.000	A	0.000	0.000	0.188	0.000	0.001
		B	0.000	0.000	0.000	0.000	0.024
		C	0.000	0.000	0.000	0.000	0.000
L2	172.000-167.000	A	0.000	0.000	0.188	0.000	0.001
		B	0.000	0.000	0.000	0.000	0.024
		C	0.000	0.000	0.000	0.000	0.000
L3	167.000-162.000	A	0.000	0.000	0.188	0.000	0.001
		B	0.000	0.000	0.000	0.000	0.024
		C	0.000	0.000	0.000	0.000	0.049
L4	162.000-157.000	A	0.000	0.000	0.188	0.000	0.001
		B	0.000	0.000	0.000	0.000	0.024
		C	0.000	0.000	0.000	0.000	0.049
L5	157.000-152.000	A	0.000	0.000	0.188	0.000	0.001
		B	0.000	0.000	0.000	0.000	0.024
		C	0.000	0.000	0.000	0.000	0.063
L6	152.000-147.000	A	0.000	0.000	0.188	0.000	0.001
		B	0.000	0.000	0.000	0.000	0.024
		C	0.000	0.000	0.000	0.000	0.084
L7	147.000-142.000	A	0.000	0.000	0.188	0.000	0.001
		B	0.000	0.000	0.000	0.000	0.024
		C	0.000	0.000	0.000	0.000	0.084
L8	142.000-137.000	A	0.000	0.000	0.188	0.000	0.001
		B	0.000	0.000	0.000	0.000	0.024
		C	0.000	0.000	0.000	0.000	0.084
L9	137.000-129.750	A	0.000	0.000	0.272	0.000	0.002
		B	0.000	0.000	0.000	0.000	0.035
		C	0.000	0.000	0.000	0.000	0.121
L10	129.750-128.500	A	0.000	0.000	0.047	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.006
		C	0.000	0.000	0.000	0.000	0.021
L11	128.500-123.500	A	0.000	0.000	0.188	0.000	0.001
		B	0.000	0.000	2.772	0.000	0.079
		C	0.000	0.000	0.000	0.000	0.084
L12	123.500-118.583	A	0.000	0.000	1.313	0.000	0.001
		B	0.000	0.000	5.023	0.000	0.101
		C	0.000	0.000	1.129	0.000	0.082
L13	118.583-118.333	A	0.000	0.000	0.209	0.000	0.000
		B	0.000	0.000	0.397	0.000	0.005
		C	0.000	0.000	0.199	0.000	0.004
L14	118.333-113.333	A	0.000	0.000	4.171	0.000	0.001
		B	0.000	0.000	7.943	0.000	0.103
		C	0.000	0.000	8.340	0.000	0.095
L15	113.333-108.333	A	0.000	0.000	4.838	0.000	0.072
		B	0.000	0.000	8.610	0.000	0.174
		C	0.000	0.000	10.590	0.000	0.170
L16	108.333-106.417	A	0.000	0.000	2.365	0.000	0.082
		B	0.000	0.000	3.810	0.000	0.121
		C	0.000	0.000	4.569	0.000	0.120
L17	106.417-106.167	A	0.000	0.000	0.309	0.000	0.011
		B	0.000	0.000	0.497	0.000	0.016
		C	0.000	0.000	0.596	0.000	0.016
L18	106.167-101.167	A	0.000	0.000	3.117	0.000	0.215
		B	0.000	0.000	6.890	0.000	0.317
		C	0.000	0.000	8.870	0.000	0.313
L19	101.167-96.167	A	0.000	0.000	5.225	0.000	0.525
		B	0.000	0.000	8.998	0.000	0.627
		C	0.000	0.000	10.977	0.000	0.623
L20	96.167-91.167	A	0.000	0.000	2.188	0.000	0.215
		B	0.000	0.000	5.960	0.000	0.317
		C	0.000	0.000	7.940	0.000	0.313
L21	91.167-84.000	A	0.000	0.000	3.136	0.000	0.308

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	<p><b>Project</b></p>	<p><b>Date</b> 21:20:50 05/08/21</p>
	<p><b>Client</b> Crown Castle</p>	<p><b>Designed by</b> JD Prabhu</p>

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
		B	0.000	0.000	8.543	0.000	0.454
		C	0.000	0.000	11.381	0.000	0.449
L22	84.000-83.750	A	0.000	0.000	0.109	0.000	0.011
		B	0.000	0.000	0.298	0.000	0.016
		C	0.000	0.000	0.397	0.000	0.016
L23	83.750-78.750	A	0.000	0.000	6.269	0.000	0.773
		B	0.000	0.000	10.041	0.000	0.875
		C	0.000	0.000	12.021	0.000	0.871
L24	78.750-73.750	A	0.000	0.000	2.313	0.000	0.242
		B	0.000	0.000	6.085	0.000	0.345
		C	0.000	0.000	8.065	0.000	0.341
L25	73.750-68.750	A	0.000	0.000	2.313	0.000	0.242
		B	0.000	0.000	6.085	0.000	0.345
		C	0.000	0.000	8.065	0.000	0.341
L26	68.750-63.750	A	0.000	0.000	2.313	0.000	0.242
		B	0.000	0.000	6.085	0.000	0.345
		C	0.000	0.000	8.065	0.000	0.341
L27	63.750-58.750	A	0.000	0.000	7.375	0.000	0.932
		B	0.000	0.000	11.148	0.000	1.034
		C	0.000	0.000	13.128	0.000	1.030
L28	58.750-53.750	A	0.000	0.000	2.313	0.000	0.242
		B	0.000	0.000	6.085	0.000	0.345
		C	0.000	0.000	8.065	0.000	0.341
L29	53.750-48.750	A	0.000	0.000	2.313	0.000	0.242
		B	0.000	0.000	6.085	0.000	0.345
		C	0.000	0.000	8.065	0.000	0.341
L30	48.750-39.250	A	0.000	0.000	8.444	0.000	1.012
		B	0.000	0.000	15.611	0.000	1.207
		C	0.000	0.000	19.374	0.000	1.198
L31	39.250-38.250	A	0.000	0.000	1.475	0.000	0.186
		B	0.000	0.000	2.229	0.000	0.207
		C	0.000	0.000	2.626	0.000	0.206
L32	38.250-33.250	A	0.000	0.000	2.313	0.000	0.242
		B	0.000	0.000	6.085	0.000	0.345
		C	0.000	0.000	8.065	0.000	0.341
L33	33.250-28.250	A	0.000	0.000	2.313	0.000	0.242
		B	0.000	0.000	6.085	0.000	0.345
		C	0.000	0.000	8.065	0.000	0.341
L34	28.250-23.250	A	0.000	0.000	2.313	0.000	0.242
		B	0.000	0.000	6.085	0.000	0.345
		C	0.000	0.000	8.065	0.000	0.341
L35	23.250-18.250	A	0.000	0.000	7.419	0.000	0.942
		B	0.000	0.000	11.191	0.000	1.045
		C	0.000	0.000	13.171	0.000	1.040
L36	18.250-13.250	A	0.000	0.000	2.438	0.000	0.272
		B	0.000	0.000	6.210	0.000	0.375
		C	0.000	0.000	8.190	0.000	0.370
L37	13.250-8.250	A	0.000	0.000	2.438	0.000	0.272
		B	0.000	0.000	6.210	0.000	0.375
		C	0.000	0.000	8.190	0.000	0.370
L38	8.250-3.250	A	0.000	0.000	2.438	0.000	0.272
		B	0.000	0.000	6.210	0.000	0.375
		C	0.000	0.000	8.190	0.000	0.370
L39	3.250-0.000	A	0.000	0.000	1.584	0.000	0.177
		B	0.000	0.000	4.037	0.000	0.243
		C	0.000	0.000	5.324	0.000	0.240

**Feed Line/Linear Appurtenances Section Areas - With Ice**

<b>Job</b>	83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 876376)
<b>Project</b>	
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<b>Designed by</b>	JD Prabhu

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	177.000-172.000	A	1.506	0.000	0.000	1.694	0.000	0.018
		B		0.000	0.000	0.000	0.000	0.024
		C		0.000	0.000	0.000	0.000	0.000
L2	172.000-167.000	A	1.502	0.000	0.000	1.689	0.000	0.018
		B		0.000	0.000	0.000	0.000	0.024
		C		0.000	0.000	0.000	0.000	0.000
L3	167.000-162.000	A	1.497	0.000	0.000	1.685	0.000	0.018
		B		0.000	0.000	0.000	0.000	0.024
		C		0.000	0.000	0.000	0.000	0.049
L4	162.000-157.000	A	1.493	0.000	0.000	1.680	0.000	0.018
		B		0.000	0.000	0.000	0.000	0.024
		C		0.000	0.000	0.000	0.000	0.049
L5	157.000-152.000	A	1.488	0.000	0.000	1.675	0.000	0.018
		B		0.000	0.000	0.000	0.000	0.024
		C		0.000	0.000	0.000	0.000	0.063
L6	152.000-147.000	A	1.483	0.000	0.000	1.670	0.000	0.018
		B		0.000	0.000	0.000	0.000	0.024
		C		0.000	0.000	0.000	0.000	0.084
L7	147.000-142.000	A	1.478	0.000	0.000	1.665	0.000	0.018
		B		0.000	0.000	0.000	0.000	0.024
		C		0.000	0.000	0.000	0.000	0.084
L8	142.000-137.000	A	1.473	0.000	0.000	1.660	0.000	0.018
		B		0.000	0.000	0.000	0.000	0.024
		C		0.000	0.000	0.000	0.000	0.084
L9	137.000-129.750	A	1.466	0.000	0.000	2.398	0.000	0.026
		B		0.000	0.000	0.000	0.000	0.035
		C		0.000	0.000	0.000	0.000	0.121
L10	129.750-128.500	A	1.461	0.000	0.000	0.413	0.000	0.004
		B		0.000	0.000	0.000	0.000	0.006
		C		0.000	0.000	0.000	0.000	0.021
L11	128.500-123.500	A	1.458	0.000	0.000	1.645	0.000	0.017
		B		0.000	0.000	4.741	0.000	0.136
		C		0.000	0.000	0.000	0.000	0.084
L12	123.500-118.583	A	1.452	0.000	0.000	3.137	0.000	0.032
		B		0.000	0.000	8.178	0.000	0.196
		C		0.000	0.000	1.525	0.000	0.097
L13	118.583-118.333	A	1.449	0.000	0.000	0.351	0.000	0.003
		B		0.000	0.000	0.607	0.000	0.012
		C		0.000	0.000	0.269	0.000	0.007
L14	118.333-113.333	A	1.446	0.000	0.000	7.010	0.000	0.068
		B		0.000	0.000	12.134	0.000	0.235
		C		0.000	0.000	12.147	0.000	0.215
L15	113.333-108.333	A	1.439	0.000	0.000	8.145	0.000	0.155
		B		0.000	0.000	13.267	0.000	0.322
		C		0.000	0.000	15.742	0.000	0.331
L16	108.333-106.417	A	1.435	0.000	0.000	3.995	0.000	0.126
		B		0.000	0.000	5.957	0.000	0.190
		C		0.000	0.000	6.906	0.000	0.193
L17	106.417-106.167	A	1.433	0.000	0.000	0.521	0.000	0.016
		B		0.000	0.000	0.777	0.000	0.025
		C		0.000	0.000	0.901	0.000	0.025
L18	106.167-101.167	A	1.430	0.000	0.000	6.299	0.000	0.290
		B		0.000	0.000	11.419	0.000	0.456
		C		0.000	0.000	13.894	0.000	0.465
L19	101.167-96.167	A	1.423	0.000	0.000	8.319	0.000	0.631
		B		0.000	0.000	13.437	0.000	0.796
		C		0.000	0.000	15.912	0.000	0.806
L20	96.167-91.167	A	1.415	0.000	0.000	5.018	0.000	0.277
		B		0.000	0.000	10.134	0.000	0.442
		C		0.000	0.000	12.609	0.000	0.452

<b>Job</b>	83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 876376)	<b>Page</b>	12 of 44
<b>Project</b>		<b>Date</b>	21:20:50 05/08/21
<b>Client</b>	Crown Castle	<b>Designed by</b>	JD Prabhu

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L21	91.167-84.000	A	1.406	0.000	0.000	7.165	0.000	0.396
		B		0.000	0.000	14.496	0.000	0.633
		C		0.000	0.000	18.043	0.000	0.646
L22	84.000-83.750	A	1.400	0.000	0.000	0.250	0.000	0.014
		B		0.000	0.000	0.506	0.000	0.022
		C		0.000	0.000	0.629	0.000	0.023
L23	83.750-78.750	A	1.395	0.000	0.000	9.385	0.000	0.893
		B		0.000	0.000	14.496	0.000	1.058
		C		0.000	0.000	16.971	0.000	1.067
L24	78.750-73.750	A	1.386	0.000	0.000	5.085	0.000	0.305
		B		0.000	0.000	10.194	0.000	0.470
		C		0.000	0.000	12.669	0.000	0.478
L25	73.750-68.750	A	1.377	0.000	0.000	5.066	0.000	0.305
		B		0.000	0.000	10.173	0.000	0.469
		C		0.000	0.000	12.648	0.000	0.477
L26	68.750-63.750	A	1.367	0.000	0.000	5.047	0.000	0.304
		B		0.000	0.000	10.151	0.000	0.468
		C		0.000	0.000	12.626	0.000	0.476
L27	63.750-58.750	A	1.356	0.000	0.000	10.483	0.000	1.063
		B		0.000	0.000	15.585	0.000	1.227
		C		0.000	0.000	18.060	0.000	1.235
L28	58.750-53.750	A	1.345	0.000	0.000	5.002	0.000	0.303
		B		0.000	0.000	10.101	0.000	0.466
		C		0.000	0.000	12.576	0.000	0.474
L29	53.750-48.750	A	1.332	0.000	0.000	4.977	0.000	0.302
		B		0.000	0.000	10.073	0.000	0.465
		C		0.000	0.000	12.548	0.000	0.472
L30	48.750-39.250	A	1.312	0.000	0.000	13.736	0.000	1.177
		B		0.000	0.000	23.408	0.000	1.485
		C		0.000	0.000	28.110	0.000	1.499
L31	39.250-38.250	A	1.296	0.000	0.000	2.076	0.000	0.212
		B		0.000	0.000	3.094	0.000	0.244
		C		0.000	0.000	3.589	0.000	0.246
L32	38.250-33.250	A	1.285	0.000	0.000	4.883	0.000	0.299
		B		0.000	0.000	9.967	0.000	0.460
		C		0.000	0.000	12.442	0.000	0.467
L33	33.250-28.250	A	1.266	0.000	0.000	4.844	0.000	0.298
		B		0.000	0.000	9.923	0.000	0.458
		C		0.000	0.000	12.398	0.000	0.465
L34	28.250-23.250	A	1.244	0.000	0.000	4.800	0.000	0.296
		B		0.000	0.000	9.873	0.000	0.456
		C		0.000	0.000	12.348	0.000	0.463
L35	23.250-18.250	A	1.217	0.000	0.000	10.208	0.000	1.058
		B		0.000	0.000	15.275	0.000	1.216
		C		0.000	0.000	17.750	0.000	1.223
L36	18.250-13.250	A	1.184	0.000	0.000	4.806	0.000	0.324
		B		0.000	0.000	9.864	0.000	0.481
		C		0.000	0.000	12.339	0.000	0.488
L37	13.250-8.250	A	1.140	0.000	0.000	4.717	0.000	0.322
		B		0.000	0.000	9.764	0.000	0.477
		C		0.000	0.000	12.239	0.000	0.483
L38	8.250-3.250	A	1.070	0.000	0.000	4.578	0.000	0.318
		B		0.000	0.000	9.609	0.000	0.470
		C		0.000	0.000	12.084	0.000	0.476
L39	3.250-0.000	A	0.943	0.000	0.000	2.811	0.000	0.202
		B		0.000	0.000	6.060	0.000	0.298
		C		0.000	0.000	7.668	0.000	0.301



<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 876376)	<b>Page</b> 13 of 44
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	<b>Client</b> Crown Castle	<b>Designed by</b> JD Prabhu

### Feed Line Center of Pressure

Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub> Ice	CP <sub>z</sub> Ice
	ft	in	in	in	in
L1	177.000-172.000	0.000	-0.301	0.000	-1.325
L2	172.000-167.000	0.000	-0.301	0.000	-1.333
L3	167.000-162.000	0.000	-0.301	0.000	-1.340
L4	162.000-157.000	0.000	-0.301	0.000	-1.346
L5	157.000-152.000	0.000	-0.301	0.000	-1.351
L6	152.000-147.000	0.000	-0.301	0.000	-1.356
L7	147.000-142.000	0.000	-0.301	0.000	-1.360
L8	142.000-137.000	0.000	-0.301	0.000	-1.363
L9	137.000-129.750	0.000	-0.302	0.000	-1.367
L10	129.750-128.500	0.000	-0.302	0.000	-1.370
L11	128.500-123.500	3.744	-1.237	3.111	-1.831
L12	123.500-118.583	3.692	-1.152	3.448	-1.701
L13	118.583-118.333	2.471	-0.771	2.587	-1.276
L14	118.333-113.333	1.553	1.577	1.621	0.994
L15	113.333-108.333	1.185	2.119	1.285	1.575
L16	108.333-106.417	0.989	1.772	1.169	1.436
L17	106.417-106.167	0.992	1.777	1.173	1.442
L18	106.167-101.167	1.250	2.242	1.440	1.774
L19	101.167-96.167	1.077	1.936	1.319	1.630
L20	96.167-91.167	1.377	2.481	1.584	1.965
L21	91.167-84.000	1.391	2.512	1.608	2.003
L22	84.000-83.750	1.393	2.516	1.612	2.009
L23	83.750-78.750	1.038	1.877	1.304	1.630
L24	78.750-73.750	1.394	2.526	1.630	2.045
L25	73.750-68.750	1.405	2.550	1.648	2.076
L26	68.750-63.750	1.607	2.922	1.667	2.107
L27	63.750-58.750	1.013	1.846	1.303	1.654
L28	58.750-53.750	1.649	3.008	1.702	2.169
L29	53.750-48.750	1.670	3.051	1.719	2.201
L30	48.750-39.250	1.400	2.564	1.555	2.004
L31	39.250-38.250	1.052	1.927	1.360	1.754
L32	38.250-33.250	1.719	3.151	1.757	2.281
L33	33.250-28.250	1.739	3.192	1.772	2.314
L34	28.250-23.250	1.758	3.232	1.787	2.348
L35	23.250-18.250	1.084	1.995	1.403	1.858
L36	18.250-13.250	1.767	3.256	1.802	2.408
L37	13.250-8.250	1.786	3.295	1.813	2.451
L38	8.250-3.250	1.805	3.334	1.821	2.507
L39	3.250-0.000	1.820	3.365	1.819	2.587

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 <sub>a</sub> No Ice	K <sub>a</sub> Ice
L1	20	Safety Line 3/8	172.00 - 177.00	1.0000	1.0000
L2	20	Safety Line 3/8	167.00 - 172.00	1.0000	1.0000
L3	20	Safety Line 3/8	162.00 -	1.0000	1.0000

# tnxTower

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Tulsa, OK 74119  
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Crown Castle  
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JD Prabhu

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L4	20	Safety Line 3/8	167.00 157.00 - 162.00	1.0000	1.0000
L5	20	Safety Line 3/8	152.00 - 157.00	1.0000	1.0000
L6	20	Safety Line 3/8	147.00 - 152.00	1.0000	1.0000
L7	20	Safety Line 3/8	142.00 - 147.00	1.0000	1.0000
L8	20	Safety Line 3/8	137.00 - 142.00	1.0000	1.0000
L9	20	Safety Line 3/8	129.75 - 137.00	1.0000	1.0000
L10	20	Safety Line 3/8	128.50 - 129.75	1.0000	1.0000
L11	10	LDF7-50A(1-5/8)	123.50 - 127.00	1.0000	1.0000
L11	20	Safety Line 3/8	123.50 - 128.50	1.0000	1.0000
L12	10	LDF7-50A(1-5/8)	118.58 - 123.50	1.0000	1.0000
L12	20	Safety Line 3/8	118.58 - 123.50	1.0000	1.0000
L12	34	MP3-04	118.58 - 120.00	1.0000	1.0000
L12	35	MP3-04	118.58 - 120.00	1.0000	1.0000
L12	36	MP3-04	118.58 - 120.00	1.0000	1.0000
L13	10	LDF7-50A(1-5/8)	118.33 - 118.58	1.0000	1.0000
L13	20	Safety Line 3/8	118.33 - 118.58	1.0000	1.0000
L13	34	MP3-04	118.33 - 118.58	1.0000	1.0000
L13	35	MP3-04	118.33 - 118.58	1.0000	1.0000
L13	36	MP3-04	118.33 - 118.58	1.0000	1.0000
L14	10	LDF7-50A(1-5/8)	113.33 - 118.33	1.0000	1.0000
L14	16	LCF158-50JL(1-5/8)	113.33 - 117.00	1.0000	1.0000
L14	20	Safety Line 3/8	113.33 - 118.33	1.0000	1.0000
L14	34	MP3-04	113.33 - 118.33	1.0000	1.0000
L14	35	MP3-04	113.33 - 118.33	1.0000	1.0000
L14	36	MP3-04	113.33 - 118.33	1.0000	1.0000
L15	10	LDF7-50A(1-5/8)	108.33 - 113.33	1.0000	1.0000
L15	16	LCF158-50JL(1-5/8)	108.33 - 113.33	1.0000	1.0000
L15	20	Safety Line 3/8	108.33 - 113.33	1.0000	1.0000
L15	30	4" SR	108.33 - 110.00	1.0000	1.0000
L15	31	4" SR	108.33 - 110.00	1.0000	1.0000
L15	32	4" SR	108.33 -	1.0000	1.0000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L15	34	MP3-04	110.00 108.33 - 113.33	1.0000	1.0000
L15	35	MP3-04	108.33 - 113.33	1.0000	1.0000
L15	36	MP3-04	108.33 - 113.33	1.0000	1.0000
L16	10	LDF7-50A(1-5/8)	106.42 - 108.33	1.0000	1.0000
L16	16	LCF158-50JL(1-5/8)	106.42 - 108.33	1.0000	1.0000
L16	20	Safety Line 3/8	106.42 - 108.33	1.0000	1.0000
L16	30	4" SR	106.42 - 108.33	1.0000	1.0000
L16	31	4" SR	106.42 - 108.33	1.0000	1.0000
L16	32	4" SR	106.42 - 108.33	1.0000	1.0000
L16	34	MP3-04	106.42 - 108.33	1.0000	1.0000
L16	35	MP3-04	106.42 - 108.33	1.0000	1.0000
L16	36	MP3-04	106.42 - 108.33	1.0000	1.0000
L17	10	LDF7-50A(1-5/8)	106.17 - 106.42	1.0000	1.0000
L17	16	LCF158-50JL(1-5/8)	106.17 - 106.42	1.0000	1.0000
L17	20	Safety Line 3/8	106.17 - 106.42	1.0000	1.0000
L17	30	4" SR	106.17 - 106.42	1.0000	1.0000
L17	31	4" SR	106.17 - 106.42	1.0000	1.0000
L17	32	4" SR	106.17 - 106.42	1.0000	1.0000
L17	34	MP3-04	106.17 - 106.42	1.0000	1.0000
L17	35	MP3-04	106.17 - 106.42	1.0000	1.0000
L17	36	MP3-04	106.17 - 106.42	1.0000	1.0000
L18	10	LDF7-50A(1-5/8)	101.17 - 106.17	1.0000	1.0000
L18	16	LCF158-50JL(1-5/8)	101.17 - 106.17	1.0000	1.0000
L18	20	Safety Line 3/8	101.17 - 106.17	1.0000	1.0000
L18	30	4" SR	101.17 - 106.17	1.0000	1.0000
L18	31	4" SR	101.17 - 106.17	1.0000	1.0000
L18	32	4" SR	101.17 - 106.17	1.0000	1.0000
L18	34	MP3-04	105.00 - 106.17	1.0000	1.0000
L18	35	MP3-04	105.00 - 106.17	1.0000	1.0000
L18	36	MP3-04	105.00 - 106.17	1.0000	1.0000
L19	10	LDF7-50A(1-5/8)	96.17 - 101.17	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L19	16	LCF158-50JL(1-5/8)	96.17 - 101.17	1.0000	1.0000
L19	20	Safety Line 3/8	96.17 - 101.17	1.0000	1.0000
L19	30	4" SR	96.17 - 101.17	1.0000	1.0000
L19	31	4" SR	96.17 - 101.17	1.0000	1.0000
L19	32	4" SR	96.17 - 101.17	1.0000	1.0000
L19	54	Spacer Plates	99.25 - 100.75	1.0000	1.0000
L19	55	Spacer Plates	99.25 - 100.75	1.0000	1.0000
L19	56	Spacer Plates	99.25 - 100.75	1.0000	1.0000
L20	10	LDF7-50A(1-5/8)	91.17 - 96.17	1.0000	1.0000
L20	16	LCF158-50JL(1-5/8)	91.17 - 96.17	1.0000	1.0000
L20	20	Safety Line 3/8	91.17 - 96.17	1.0000	1.0000
L20	30	4" SR	91.17 - 96.17	1.0000	1.0000
L20	31	4" SR	91.17 - 96.17	1.0000	1.0000
L20	32	4" SR	91.17 - 96.17	1.0000	1.0000
L21	10	LDF7-50A(1-5/8)	84.00 - 91.17	1.0000	1.0000
L21	16	LCF158-50JL(1-5/8)	84.00 - 91.17	1.0000	1.0000
L21	20	Safety Line 3/8	84.00 - 91.17	1.0000	1.0000
L21	30	4" SR	84.00 - 91.17	1.0000	1.0000
L21	31	4" SR	84.00 - 91.17	1.0000	1.0000
L21	32	4" SR	84.00 - 91.17	1.0000	1.0000
L22	10	LDF7-50A(1-5/8)	83.75 - 84.00	1.0000	1.0000
L22	16	LCF158-50JL(1-5/8)	83.75 - 84.00	1.0000	1.0000
L22	20	Safety Line 3/8	83.75 - 84.00	1.0000	1.0000
L22	30	4" SR	83.75 - 84.00	1.0000	1.0000
L22	31	4" SR	83.75 - 84.00	1.0000	1.0000
L22	32	4" SR	83.75 - 84.00	1.0000	1.0000
L23	10	LDF7-50A(1-5/8)	78.75 - 83.75	1.0000	1.0000
L23	16	LCF158-50JL(1-5/8)	78.75 - 83.75	1.0000	1.0000
L23	20	Safety Line 3/8	78.75 - 83.75	1.0000	1.0000
L23	27	4.25" SR	78.75 - 80.00	1.0000	1.0000
L23	28	4.25" SR	78.75 - 80.00	1.0000	1.0000
L23	29	4.25" SR	78.75 - 80.00	1.0000	1.0000
L23	30	4" SR	80.00 - 83.75	1.0000	1.0000
L23	31	4" SR	80.00 - 83.75	1.0000	1.0000
L23	32	4" SR	80.00 - 83.75	1.0000	1.0000
L23	50	Spacer Plates	79.00 - 81.00	1.0000	1.0000
L23	51	Spacer Plates	79.00 - 81.00	1.0000	1.0000
L23	52	Spacer Plates	79.00 - 81.00	1.0000	1.0000
L24	10	LDF7-50A(1-5/8)	73.75 - 78.75	1.0000	1.0000
L24	16	LCF158-50JL(1-5/8)	73.75 - 78.75	1.0000	1.0000
L24	20	Safety Line 3/8	73.75 - 78.75	1.0000	1.0000
L24	27	4.25" SR	73.75 - 78.75	1.0000	1.0000
L24	28	4.25" SR	73.75 - 78.75	1.0000	1.0000
L24	29	4.25" SR	73.75 - 78.75	1.0000	1.0000
L25	10	LDF7-50A(1-5/8)	68.75 - 73.75	1.0000	1.0000
L25	16	LCF158-50JL(1-5/8)	68.75 - 73.75	1.0000	1.0000
L25	20	Safety Line 3/8	68.75 - 73.75	1.0000	1.0000
L25	27	4.25" SR	68.75 - 73.75	1.0000	1.0000
L25	28	4.25" SR	68.75 - 73.75	1.0000	1.0000
L25	29	4.25" SR	68.75 - 73.75	1.0000	1.0000
L26	10	LDF7-50A(1-5/8)	63.75 - 68.75	1.0000	1.0000
L26	16	LCF158-50JL(1-5/8)	63.75 - 68.75	1.0000	1.0000
L26	20	Safety Line 3/8	63.75 - 68.75	1.0000	1.0000
L26	27	4.25" SR	63.75 - 68.75	1.0000	1.0000
L26	28	4.25" SR	63.75 - 68.75	1.0000	1.0000
L26	29	4.25" SR	63.75 - 68.75	1.0000	1.0000
L27	10	LDF7-50A(1-5/8)	58.75 - 63.75	1.0000	1.0000
L27	16	LCF158-50JL(1-5/8)	58.75 - 63.75	1.0000	1.0000
L27	20	Safety Line 3/8	58.75 - 63.75	1.0000	1.0000
L27	27	4.25" SR	58.75 - 63.75	1.0000	1.0000
L27	28	4.25" SR	58.75 - 63.75	1.0000	1.0000
L27	29	4.25" SR	58.75 - 63.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L27	46	Spacer Plates	58.75 - 61.25	1.0000	1.0000
L27	47	Spacer Plates	58.75 - 61.25	1.0000	1.0000
L27	48	Spacer Plates	58.75 - 61.25	1.0000	1.0000
L28	10	LDF7-50A(1-5/8)	53.75 - 58.75	1.0000	1.0000
L28	16	LCF158-50JL(1-5/8)	53.75 - 58.75	1.0000	1.0000
L28	20	Safety Line 3/8	53.75 - 58.75	1.0000	1.0000
L28	27	4.25" SR	53.75 - 58.75	1.0000	1.0000
L28	28	4.25" SR	53.75 - 58.75	1.0000	1.0000
L28	29	4.25" SR	53.75 - 58.75	1.0000	1.0000
L29	10	LDF7-50A(1-5/8)	48.75 - 53.75	1.0000	1.0000
L29	16	LCF158-50JL(1-5/8)	48.75 - 53.75	1.0000	1.0000
L29	20	Safety Line 3/8	48.75 - 53.75	1.0000	1.0000
L29	27	4.25" SR	48.75 - 53.75	1.0000	1.0000
L29	28	4.25" SR	48.75 - 53.75	1.0000	1.0000
L29	29	4.25" SR	48.75 - 53.75	1.0000	1.0000
L30	10	LDF7-50A(1-5/8)	39.25 - 48.75	1.0000	1.0000
L30	16	LCF158-50JL(1-5/8)	39.25 - 48.75	1.0000	1.0000
L30	20	Safety Line 3/8	39.25 - 48.75	1.0000	1.0000
L30	27	4.25" SR	39.25 - 48.75	1.0000	1.0000
L30	28	4.25" SR	39.25 - 48.75	1.0000	1.0000
L30	29	4.25" SR	39.25 - 48.75	1.0000	1.0000
L30	42	Spacer Plates	39.25 - 41.25	1.0000	1.0000
L30	43	Spacer Plates	39.25 - 41.25	1.0000	1.0000
L30	44	Spacer Plates	39.25 - 41.25	1.0000	1.0000
L31	10	LDF7-50A(1-5/8)	38.25 - 39.25	1.0000	1.0000
L31	16	LCF158-50JL(1-5/8)	38.25 - 39.25	1.0000	1.0000
L31	20	Safety Line 3/8	38.25 - 39.25	1.0000	1.0000
L31	27	4.25" SR	38.25 - 39.25	1.0000	1.0000
L31	28	4.25" SR	38.25 - 39.25	1.0000	1.0000
L31	29	4.25" SR	38.25 - 39.25	1.0000	1.0000
L31	42	Spacer Plates	38.75 - 39.25	1.0000	1.0000
L31	43	Spacer Plates	38.75 - 39.25	1.0000	1.0000
L31	44	Spacer Plates	38.75 - 39.25	1.0000	1.0000
L32	10	LDF7-50A(1-5/8)	33.25 - 38.25	1.0000	1.0000
L32	16	LCF158-50JL(1-5/8)	33.25 - 38.25	1.0000	1.0000
L32	20	Safety Line 3/8	33.25 - 38.25	1.0000	1.0000
L32	27	4.25" SR	33.25 - 38.25	1.0000	1.0000
L32	28	4.25" SR	33.25 - 38.25	1.0000	1.0000
L32	29	4.25" SR	33.25 - 38.25	1.0000	1.0000
L33	10	LDF7-50A(1-5/8)	28.25 - 33.25	1.0000	1.0000
L33	16	LCF158-50JL(1-5/8)	28.25 - 33.25	1.0000	1.0000
L33	20	Safety Line 3/8	28.25 - 33.25	1.0000	1.0000
L33	27	4.25" SR	28.25 - 33.25	1.0000	1.0000
L33	28	4.25" SR	28.25 - 33.25	1.0000	1.0000
L33	29	4.25" SR	28.25 - 33.25	1.0000	1.0000
L34	10	LDF7-50A(1-5/8)	23.25 - 28.25	1.0000	1.0000
L34	16	LCF158-50JL(1-5/8)	23.25 - 28.25	1.0000	1.0000
L34	20	Safety Line 3/8	23.25 - 28.25	1.0000	1.0000
L34	27	4.25" SR	23.25 - 28.25	1.0000	1.0000
L34	28	4.25" SR	23.25 - 28.25	1.0000	1.0000
L34	29	4.25" SR	23.25 - 28.25	1.0000	1.0000
L35	10	LDF7-50A(1-5/8)	18.25 - 23.25	1.0000	1.0000
L35	16	LCF158-50JL(1-5/8)	18.25 - 23.25	1.0000	1.0000
L35	20	Safety Line 3/8	18.25 - 23.25	1.0000	1.0000
L35	24	4.5" SR	18.25 - 20.00	1.0000	1.0000
L35	25	4.5" SR	18.25 - 20.00	1.0000	1.0000
L35	26	4.5" SR	18.25 - 20.00	1.0000	1.0000
L35	27	4.25" SR	20.00 - 23.25	1.0000	1.0000
L35	28	4.25" SR	20.00 - 23.25	1.0000	1.0000
L35	29	4.25" SR	20.00 - 23.25	1.0000	1.0000
L35	38	Spacer Plates	18.75 - 21.25	1.0000	1.0000
L35	39	Spacer Plates	18.75 - 21.25	1.0000	1.0000

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 876376)	<b>Page</b> 18 of 44
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	<b>Client</b> Crown Castle	<b>Designed by</b> JD Prabhu

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L35	40	Spacer Plates	18.75 - 21.25	1.0000	1.0000
L36	10	LDF7-50A(1-5/8)	13.25 - 18.25	1.0000	1.0000
L36	16	LCF158-50JL(1-5/8)	13.25 - 18.25	1.0000	1.0000
L36	20	Safety Line 3/8	13.25 - 18.25	1.0000	1.0000
L36	24	4.5" SR	13.25 - 18.25	1.0000	1.0000
L36	25	4.5" SR	13.25 - 18.25	1.0000	1.0000
L36	26	4.5" SR	13.25 - 18.25	1.0000	1.0000
L37	10	LDF7-50A(1-5/8)	8.25 - 13.25	1.0000	1.0000
L37	16	LCF158-50JL(1-5/8)	8.25 - 13.25	1.0000	1.0000
L37	20	Safety Line 3/8	8.25 - 13.25	1.0000	1.0000
L37	24	4.5" SR	8.25 - 13.25	1.0000	1.0000
L37	25	4.5" SR	8.25 - 13.25	1.0000	1.0000
L37	26	4.5" SR	8.25 - 13.25	1.0000	1.0000
L38	10	LDF7-50A(1-5/8)	3.25 - 8.25	1.0000	1.0000
L38	16	LCF158-50JL(1-5/8)	3.25 - 8.25	1.0000	1.0000
L38	20	Safety Line 3/8	3.25 - 8.25	1.0000	1.0000
L38	24	4.5" SR	3.25 - 8.25	1.0000	1.0000
L38	25	4.5" SR	3.25 - 8.25	1.0000	1.0000
L38	26	4.5" SR	3.25 - 8.25	1.0000	1.0000
L39	10	LDF7-50A(1-5/8)	0.00 - 3.25	1.0000	1.0000
L39	16	LCF158-50JL(1-5/8)	0.00 - 3.25	1.0000	1.0000
L39	20	Safety Line 3/8	0.00 - 3.25	1.0000	1.0000
L39	24	4.5" SR	0.00 - 3.25	1.0000	1.0000
L39	25	4.5" SR	0.00 - 3.25	1.0000	1.0000
L39	26	4.5" SR	0.00 - 3.25	1.0000	1.0000

### Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L12	34	MP3-04	118.58 - 120.00	Auto	0.0000
L12	35	MP3-04	118.58 - 120.00	Auto	0.0000
L12	36	MP3-04	118.58 - 120.00	Auto	0.0000
L13	34	MP3-04	118.33 - 118.58	Auto	0.0000
L13	35	MP3-04	118.33 - 118.58	Auto	0.0000
L13	36	MP3-04	118.33 - 118.58	Auto	0.0000
L14	34	MP3-04	113.33 - 118.33	Auto	0.0000
L14	35	MP3-04	113.33 - 118.33	Auto	0.0000
L14	36	MP3-04	113.33 - 118.33	Auto	0.0000
L15	34	MP3-04	108.33 - 113.33	Auto	0.0000
L15	35	MP3-04	108.33 - 113.33	Auto	0.0000
L15	36	MP3-04	108.33 - 113.33	Auto	0.0000

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Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L16	34	MP3-04	113.33 106.42 - 108.33	Auto	0.0000
L16	35	MP3-04	106.42 - 108.33	Auto	0.0000
L16	36	MP3-04	106.42 - 108.33	Auto	0.0000
L17	34	MP3-04	106.17 - 106.42	Auto	0.0000
L17	35	MP3-04	106.17 - 106.42	Auto	0.0000
L17	36	MP3-04	106.17 - 106.42	Auto	0.0000
L18	34	MP3-04	105.00 - 106.17	Auto	0.0000
L18	35	MP3-04	105.00 - 106.17	Auto	0.0000
L18	36	MP3-04	105.00 - 106.17	Auto	0.0000
L19	54	Spacer Plates	99.25 - 100.75	Auto	0.7172
L19	55	Spacer Plates	99.25 - 100.75	Auto	0.7172
L19	56	Spacer Plates	99.25 - 100.75	Auto	0.7172
L23	50	Spacer Plates	79.00 - 81.00	Auto	0.6966
L23	51	Spacer Plates	79.00 - 81.00	Auto	0.6966
L23	52	Spacer Plates	79.00 - 81.00	Auto	0.6966
L27	46	Spacer Plates	58.75 - 61.25	Auto	0.6662
L27	47	Spacer Plates	58.75 - 61.25	Auto	0.6662
L27	48	Spacer Plates	58.75 - 61.25	Auto	0.6662
L30	42	Spacer Plates	39.25 - 41.25	Auto	0.6361
L30	43	Spacer Plates	39.25 - 41.25	Auto	0.6361
L30	44	Spacer Plates	39.25 - 41.25	Auto	0.6361
L31	42	Spacer Plates	38.75 - 39.25	Auto	0.6451
L31	43	Spacer Plates	38.75 - 39.25	Auto	0.6451
L31	44	Spacer Plates	38.75 - 39.25	Auto	0.6451
L35	38	Spacer Plates	18.75 - 21.25	Auto	0.6162
L35	39	Spacer Plates	18.75 - 21.25	Auto	0.6162
L35	40	Spacer Plates	18.75 - 21.25	Auto	0.6162

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	CA <sub>AA</sub> Front	CA <sub>AA</sub> Side	Weight	
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
APXVSP18-C-A20 w/ Mount Pipe	A	From Leg	4.000	0.000	177.000	No Ice	4.600	4.010	0.095
			0.000			1/2" Ice	5.050	4.450	0.160
			0.000			1" Ice	5.500	4.890	0.235
						2" Ice	6.440	5.820	0.419
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.000	0.000	177.000	No Ice	4.600	4.010	0.095
			0.000			1/2" Ice	5.050	4.450	0.160
			0.000			1" Ice	5.500	4.890	0.235

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	<b>Project</b>				<b>Date</b>		21:20:50 05/08/21	
	<b>Client</b>		Crown Castle		<b>Designed by</b>		JD Prabhu	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
			Horz Lateral ft	Vert ft						
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	177.000	2" Ice	6.440	5.820	0.419
			0.000	0.000			No Ice	4.600	4.010	0.095
			0.000	0.000			1/2" Ice	5.050	4.450	0.160
			0.000	0.000			1" Ice	5.500	4.890	0.235
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	177.000	2" Ice	6.440	5.820	0.419
			0.000	0.000			No Ice	4.090	2.860	0.077
			0.000	0.000			1/2" Ice	4.480	3.230	0.127
			0.000	0.000			1" Ice	4.880	3.610	0.185
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	177.000	2" Ice	5.710	4.400	0.331
			0.000	0.000			No Ice	4.090	2.860	0.077
			0.000	0.000			1/2" Ice	4.480	3.230	0.127
			0.000	0.000			1" Ice	4.880	3.610	0.185
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	177.000	2" Ice	5.710	4.400	0.331
			0.000	0.000			No Ice	4.090	2.860	0.077
			0.000	0.000			1/2" Ice	4.480	3.230	0.127
			0.000	0.000			1" Ice	4.880	3.610	0.185
(3) ACU-A20-N	A	From Leg	1.000	0.000	0.000	177.000	2" Ice	5.710	4.400	0.331
			0.000	0.000			No Ice	0.067	0.117	0.001
			2.000	0.000			1/2" Ice	0.104	0.162	0.002
			0.000	0.000			1" Ice	0.148	0.215	0.004
(3) ACU-A20-N	B	From Leg	1.000	0.000	0.000	177.000	2" Ice	0.259	0.343	0.012
			0.000	0.000			No Ice	0.067	0.117	0.001
			2.000	0.000			1/2" Ice	0.104	0.162	0.002
			0.000	0.000			1" Ice	0.148	0.215	0.004
(3) ACU-A20-N	C	From Leg	1.000	0.000	0.000	177.000	2" Ice	0.259	0.343	0.012
			0.000	0.000			No Ice	0.067	0.117	0.001
			2.000	0.000			1/2" Ice	0.104	0.162	0.002
			0.000	0.000			1" Ice	0.148	0.215	0.004
800 EXTERNAL NOTCH FILTER	A	From Leg	1.000	0.000	0.000	177.000	2" Ice	0.259	0.343	0.012
			0.000	0.000			No Ice	0.660	0.321	0.011
			2.000	0.000			1/2" Ice	0.763	0.398	0.017
			0.000	0.000			1" Ice	0.873	0.483	0.024
800 EXTERNAL NOTCH FILTER	B	From Leg	1.000	0.000	0.000	177.000	2" Ice	1.115	0.674	0.045
			0.000	0.000			No Ice	0.660	0.321	0.011
			2.000	0.000			1/2" Ice	0.763	0.398	0.017
			0.000	0.000			1" Ice	0.873	0.483	0.024
800 EXTERNAL NOTCH FILTER	C	From Leg	1.000	0.000	0.000	177.000	2" Ice	1.115	0.674	0.045
			0.000	0.000			No Ice	0.660	0.321	0.011
			2.000	0.000			1/2" Ice	0.763	0.398	0.017
			0.000	0.000			1" Ice	0.873	0.483	0.024
1900MHZ RRH (65MHZ)	A	From Leg	1.000	0.000	0.000	177.000	2" Ice	1.115	0.674	0.045
			0.000	0.000			No Ice	2.313	2.375	0.060
			2.000	0.000			1/2" Ice	2.517	2.581	0.084
			0.000	0.000			1" Ice	2.728	2.794	0.111
1900MHZ RRH (65MHZ)	B	From Leg	1.000	0.000	0.000	177.000	2" Ice	3.174	3.243	0.176
			0.000	0.000			No Ice	2.313	2.375	0.060
			2.000	0.000			1/2" Ice	2.517	2.581	0.084
			0.000	0.000			1" Ice	2.728	2.794	0.111
1900MHZ RRH (65MHZ)	C	From Leg	1.000	0.000	0.000	177.000	2" Ice	3.174	3.243	0.176
			0.000	0.000			No Ice	2.313	2.375	0.060
			2.000	0.000			1/2" Ice	2.517	2.581	0.084
			0.000	0.000			1" Ice	2.728	2.794	0.111
800MHZ RRH	A	From Leg	1.000	0.000	0.000	177.000	2" Ice	3.174	3.243	0.176
			0.000	0.000			No Ice	2.134	1.773	0.053
			2.000	0.000			1/2" Ice	2.320	1.946	0.074
			0.000	0.000			1" Ice	2.512	2.127	0.098
						2" Ice	2.920	2.510	0.157	



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	<b>Client</b> Crown Castle	<b>Designed by</b> JD Prabhu

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub>		Weight K
			Horz Lateral ft	Vert ft			Front ft <sup>2</sup>	Side ft <sup>2</sup>	
800MHZ RRH	B	From Leg	1.000	0.000	177.000	No Ice	2.134	1.773	0.053
			0.000			1/2" Ice	2.320	1.946	0.074
			2.000			1" Ice	2.512	2.127	0.098
						2" Ice	2.920	2.510	0.157
800MHZ RRH	C	From Leg	1.000	0.000	177.000	No Ice	2.134	1.773	0.053
			0.000			1/2" Ice	2.320	1.946	0.074
			2.000			1" Ice	2.512	2.127	0.098
						2" Ice	2.920	2.510	0.157
TD-RRH8x20-25	A	From Leg	4.000	0.000	177.000	No Ice	4.045	1.535	0.070
			0.000			1/2" Ice	4.298	1.714	0.097
			2.000			1" Ice	4.557	1.901	0.128
						2" Ice	5.098	2.295	0.201
TD-RRH8x20-25	B	From Leg	4.000	0.000	177.000	No Ice	4.045	1.535	0.070
			0.000			1/2" Ice	4.298	1.714	0.097
			2.000			1" Ice	4.557	1.901	0.128
						2" Ice	5.098	2.295	0.201
TD-RRH8x20-25	C	From Leg	4.000	0.000	177.000	No Ice	4.045	1.535	0.070
			0.000			1/2" Ice	4.298	1.714	0.097
			2.000			1" Ice	4.557	1.901	0.128
						2" Ice	5.098	2.295	0.201
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	177.000	No Ice	1.425	1.425	0.022
			0.000			1/2" Ice	1.925	1.925	0.033
			1.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	177.000	No Ice	1.425	1.425	0.022
			0.000			1/2" Ice	1.925	1.925	0.033
			1.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	177.000	No Ice	1.425	1.425	0.022
			0.000			1/2" Ice	1.925	1.925	0.033
			1.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
Platform Mount [LP 1201-1]	C	None		0.000	177.000	No Ice	18.380	18.380	2.100
						1/2" Ice	22.110	22.110	2.652
						1" Ice	25.870	25.870	3.263
						2" Ice	33.470	33.470	4.662
6' x 2" Mount Pipe	A	From Leg	1.000	0.000	176.000	No Ice	1.425	1.425	0.022
			0.000			1/2" Ice	1.925	1.925	0.033
			3.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	B	From Leg	1.000	0.000	176.000	No Ice	1.425	1.425	0.022
			0.000			1/2" Ice	1.925	1.925	0.033
			3.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
6' x 2" Mount Pipe	C	From Leg	1.000	0.000	176.000	No Ice	1.425	1.425	0.022
			0.000			1/2" Ice	1.925	1.925	0.033
			3.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090
Side Arm Mount [SO 102-3]	C	None		0.000	176.000	No Ice	3.600	3.600	0.075
						1/2" Ice	4.180	4.180	0.105
						1" Ice	4.750	4.750	0.135
						2" Ice	5.900	5.900	0.195
* APXV18-206516S-C-A20 w/ Mount Pipe	A	From Leg	4.000	0.000	167.000	No Ice	2.550	2.150	0.039
			0.000			1/2" Ice	2.960	2.550	0.068
			2.000			1" Ice	3.380	2.960	0.106
						2" Ice	4.260	3.830	0.207

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	<b>Client</b> Crown Castle	<b>Designed by</b> JD Prabhu

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
APXV18-206516S-C-A20 w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	167.000	No Ice	2.550	2.150	0.039
			0.000				1/2" Ice	2.960	2.550	0.068
			2.000				1" Ice	3.380	2.960	0.106
							2" Ice	4.260	3.830	0.207
APXV18-206516S-C-A20 w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	167.000	No Ice	2.550	2.150	0.039
			0.000				1/2" Ice	2.960	2.550	0.068
			2.000				1" Ice	3.380	2.960	0.106
							2" Ice	4.260	3.830	0.207
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	167.000	No Ice	5.310	4.270	0.083
			0.000				1/2" Ice	5.800	4.750	0.165
			2.000				1" Ice	6.300	5.240	0.261
							2" Ice	7.330	6.240	0.495
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	167.000	No Ice	5.310	4.270	0.083
			0.000				1/2" Ice	5.800	4.750	0.165
			2.000				1" Ice	6.300	5.240	0.261
							2" Ice	7.330	6.240	0.495
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	167.000	No Ice	5.310	4.270	0.083
			0.000				1/2" Ice	5.800	4.750	0.165
			2.000				1" Ice	6.300	5.240	0.261
							2" Ice	7.330	6.240	0.495
KRY 112 75/1	A	From Leg	4.000	0.000	0.000	167.000	No Ice	1.104	0.442	0.030
			0.000				1/2" Ice	1.235	0.534	0.039
			1.000				1" Ice	1.374	0.635	0.049
							2" Ice	1.674	0.860	0.077
KRY 112 75/1	B	From Leg	4.000	0.000	0.000	167.000	No Ice	1.104	0.442	0.030
			0.000				1/2" Ice	1.235	0.534	0.039
			1.000				1" Ice	1.374	0.635	0.049
							2" Ice	1.674	0.860	0.077
KRY 112 75/1	C	From Leg	4.000	0.000	0.000	167.000	No Ice	1.104	0.442	0.030
			0.000				1/2" Ice	1.235	0.534	0.039
			1.000				1" Ice	1.374	0.635	0.049
							2" Ice	1.674	0.860	0.077
(2) 6' x 2" Mount Pipe	A	From Leg	4.000	0.000	0.000	167.000	No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
(2) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	0.000	167.000	No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
(2) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	0.000	167.000	No Ice	1.425	1.425	0.022
			0.000				1/2" Ice	1.925	1.925	0.033
			0.000				1" Ice	2.294	2.294	0.048
							2" Ice	3.060	3.060	0.090
T-Arm Mount [TA 602-3]	C	None			0.000	167.000	No Ice	13.400	13.400	0.774
							1/2" Ice	16.440	16.440	1.004
							1" Ice	19.700	19.700	1.292
							2" Ice	25.860	25.860	2.053
* (2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	154.000	No Ice	4.564	10.259	0.046
			0.000				1/2" Ice	5.105	11.427	0.113
			2.000				1" Ice	5.612	12.312	0.187
							2" Ice	6.651	14.129	0.363
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	154.000	No Ice	4.564	10.259	0.046
			0.000				1/2" Ice	5.105	11.427	0.113
			2.000				1" Ice	5.612	12.312	0.187
							2" Ice	6.651	14.129	0.363

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b>		83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 876376)		<b>Page</b>		23 of 44	
	<b>Project</b>				<b>Date</b>		21:20:50 05/08/21	
	<b>Client</b>		Crown Castle		<b>Designed by</b>		JD Prabhu	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz Lateral	Vert						°
(2) LPA-80063/6CF w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	154.000	No Ice	9.831	10.215	0.052
			0.000				1/2" Ice	10.400	11.384	0.145
			2.000				1" Ice	10.933	12.269	0.246
							2" Ice	12.026	14.086	0.476
(2) QS6656-5D w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	154.000	No Ice	4.040	4.180	0.114
			0.000				1/2" Ice	4.420	4.570	0.183
			2.000				1" Ice	4.820	4.970	0.264
							2" Ice	5.630	5.790	0.459
(2) QS6656-5D w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	154.000	No Ice	4.040	4.180	0.114
			0.000				1/2" Ice	4.420	4.570	0.183
			2.000				1" Ice	4.820	4.970	0.264
							2" Ice	5.630	5.790	0.459
(2) QS6656-5D w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	154.000	No Ice	4.040	4.180	0.114
			0.000				1/2" Ice	4.420	4.570	0.183
			2.000				1" Ice	4.820	4.970	0.264
							2" Ice	5.630	5.790	0.459
MT6407-77A w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	154.000	No Ice	4.907	2.682	0.096
			0.000				1/2" Ice	5.256	3.145	0.136
			2.000				1" Ice	5.615	3.624	0.180
							2" Ice	6.362	4.631	0.288
MT6407-77A w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	154.000	No Ice	4.907	2.682	0.096
			0.000				1/2" Ice	5.256	3.145	0.136
			2.000				1" Ice	5.615	3.624	0.180
							2" Ice	6.362	4.631	0.288
MT6407-77A w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	154.000	No Ice	4.907	2.682	0.096
			0.000				1/2" Ice	5.256	3.145	0.136
			2.000				1" Ice	5.615	3.624	0.180
							2" Ice	6.362	4.631	0.288
RFV01U-D1A	A	From Leg	4.000	0.000	0.000	154.000	No Ice	1.875	1.250	0.084
			0.000				1/2" Ice	2.045	1.393	0.103
			2.000				1" Ice	2.223	1.543	0.124
							2" Ice	2.601	1.865	0.175
RFV01U-D1A	B	From Leg	4.000	0.000	0.000	154.000	No Ice	1.875	1.250	0.084
			0.000				1/2" Ice	2.045	1.393	0.103
			2.000				1" Ice	2.223	1.543	0.124
							2" Ice	2.601	1.865	0.175
RFV01U-D1A	C	From Leg	4.000	0.000	0.000	154.000	No Ice	1.875	1.250	0.084
			0.000				1/2" Ice	2.045	1.393	0.103
			2.000				1" Ice	2.223	1.543	0.124
							2" Ice	2.601	1.865	0.175
RFV01U-D2A	A	From Leg	4.000	0.000	0.000	154.000	No Ice	1.875	1.013	0.070
			0.000				1/2" Ice	2.045	1.145	0.087
			2.000				1" Ice	2.223	1.284	0.106
							2" Ice	2.601	1.585	0.153
RFV01U-D2A	B	From Leg	4.000	0.000	0.000	154.000	No Ice	1.875	1.013	0.070
			0.000				1/2" Ice	2.045	1.145	0.087
			2.000				1" Ice	2.223	1.284	0.106
							2" Ice	2.601	1.585	0.153
RFV01U-D2A	C	From Leg	4.000	0.000	0.000	154.000	No Ice	1.875	1.013	0.070
			0.000				1/2" Ice	2.045	1.145	0.087
			2.000				1" Ice	2.223	1.284	0.106
							2" Ice	2.601	1.585	0.153
DB-C1-12C-24AB-0Z	A	From Leg	4.000	0.000	0.000	154.000	No Ice	4.056	3.098	0.032
			0.000				1/2" Ice	4.316	3.335	0.068
			2.000				1" Ice	4.582	3.580	0.109
							2" Ice	5.138	4.092	0.203
Platform Mount [LP 303-1]	C	None		0.000	154.000	No Ice	14.690	14.690	1.250	

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	<b>Client</b> Crown Castle	<b>Designed by</b> JD Prabhu

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
			Horz Lateral ft	Vert ft						
							1/2" Ice	18.010	18.010	1.569
							1" Ice	21.340	21.340	1.942
							2" Ice	28.080	28.080	2.852
* 7770.00	A	From Leg	4.000	0.000	127.000	No Ice	5.508	2.928	0.035	
			0.000			1/2" Ice	5.867	3.273	0.068	
			2.000			1" Ice	6.233	3.625	0.105	
						2" Ice	6.986	4.352	0.195	
7770.00	B	From Leg	4.000	0.000	127.000	No Ice	5.508	2.928	0.035	
			0.000			1/2" Ice	5.867	3.273	0.068	
			2.000			1" Ice	6.233	3.625	0.105	
						2" Ice	6.986	4.352	0.195	
7770.00	C	From Leg	4.000	0.000	127.000	No Ice	5.508	2.928	0.035	
			0.000			1/2" Ice	5.867	3.273	0.068	
			2.000			1" Ice	6.233	3.625	0.105	
						2" Ice	6.986	4.352	0.195	
OPA65R-BU4D	A	From Leg	4.000	0.000	127.000	No Ice	8.060	2.990	0.062	
			0.000			1/2" Ice	8.620	3.450	0.115	
			2.000			1" Ice	9.190	3.910	0.173	
						2" Ice	10.380	4.900	0.305	
OPA65R-BU4D	B	From Leg	4.000	0.000	127.000	No Ice	8.060	2.990	0.062	
			0.000			1/2" Ice	8.620	3.450	0.115	
			2.000			1" Ice	9.190	3.910	0.173	
						2" Ice	10.380	4.900	0.305	
OPA65R-BU4D	C	From Leg	4.000	0.000	127.000	No Ice	8.060	2.990	0.062	
			0.000			1/2" Ice	8.620	3.450	0.115	
			2.000			1" Ice	9.190	3.910	0.173	
						2" Ice	10.380	4.900	0.305	
DMP65R-BU4D	A	From Leg	4.000	0.000	127.000	No Ice	7.480	2.810	0.076	
			0.000			1/2" Ice	8.010	3.230	0.128	
			2.000			1" Ice	8.550	3.670	0.185	
						2" Ice	9.670	4.600	0.316	
DMP65R-BU4D	B	From Leg	4.000	0.000	127.000	No Ice	7.480	2.810	0.076	
			0.000			1/2" Ice	8.010	3.230	0.128	
			2.000			1" Ice	8.550	3.670	0.185	
						2" Ice	9.670	4.600	0.316	
DMP65R-BU4D	C	From Leg	4.000	0.000	127.000	No Ice	7.480	2.810	0.076	
			0.000			1/2" Ice	8.010	3.230	0.128	
			2.000			1" Ice	8.550	3.670	0.185	
						2" Ice	9.670	4.600	0.316	
RRUS 4478 B14_CCIV2	A	From Leg	4.000	0.000	127.000	No Ice	2.021	1.246	0.059	
			0.000			1/2" Ice	2.200	1.396	0.077	
			2.000			1" Ice	2.386	1.554	0.097	
						2" Ice	2.780	1.891	0.147	
RRUS 4478 B14_CCIV2	B	From Leg	4.000	0.000	127.000	No Ice	2.021	1.246	0.059	
			0.000			1/2" Ice	2.200	1.396	0.077	
			2.000			1" Ice	2.386	1.554	0.097	
						2" Ice	2.780	1.891	0.147	
RRUS 4478 B14_CCIV2	C	From Leg	4.000	0.000	127.000	No Ice	2.021	1.246	0.059	
			0.000			1/2" Ice	2.200	1.396	0.077	
			2.000			1" Ice	2.386	1.554	0.097	
						2" Ice	2.780	1.891	0.147	
RRUS 4449 B5/B12	A	From Leg	4.000	0.000	127.000	No Ice	1.968	1.408	0.071	
			0.000			1/2" Ice	2.144	1.564	0.090	
			2.000			1" Ice	2.328	1.727	0.111	
						2" Ice	2.718	2.075	0.163	
RRUS 4449 B5/B12	B	From Leg	4.000	0.000	127.000	No Ice	1.968	1.408	0.071	

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	<b>Client</b>		Crown Castle		<b>Designed by</b>		JD Prabhu	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			Horz Lateral ft	Vert ft					
			0.000			1/2" Ice	2.144	1.564	0.090
			2.000			1" Ice	2.328	1.727	0.111
						2" Ice	2.718	2.075	0.163
RRUS 4449 B5/B12	C	From Leg	4.000	0.000	127.000	No Ice	1.968	1.408	0.071
			0.000			1/2" Ice	2.144	1.564	0.090
			2.000			1" Ice	2.328	1.727	0.111
						2" Ice	2.718	2.075	0.163
RRUS 8843 B2/B66A	A	From Leg	4.000	0.000	127.000	No Ice	1.639	1.353	0.072
			0.000			1/2" Ice	1.799	1.500	0.090
			2.000			1" Ice	1.966	1.655	0.110
						2" Ice	2.323	1.986	0.159
RRUS 8843 B2/B66A	B	From Leg	4.000	0.000	127.000	No Ice	1.639	1.353	0.072
			0.000			1/2" Ice	1.799	1.500	0.090
			2.000			1" Ice	1.966	1.655	0.110
						2" Ice	2.323	1.986	0.159
RRUS 8843 B2/B66A	C	From Leg	4.000	0.000	127.000	No Ice	1.639	1.353	0.072
			0.000			1/2" Ice	1.799	1.500	0.090
			2.000			1" Ice	1.966	1.655	0.110
						2" Ice	2.323	1.986	0.159
DC6-48-60-18-8F	A	From Leg	2.000	0.000	127.000	No Ice	1.212	1.212	0.033
			0.000			1/2" Ice	1.892	1.892	0.055
			2.000			1" Ice	2.105	2.105	0.080
						2" Ice	2.570	2.570	0.138
DC6-48-60-18-8C-EV	B	From Leg	2.000	0.000	127.000	No Ice	2.736	2.736	0.026
			0.000			1/2" Ice	2.962	2.962	0.052
			2.000			1" Ice	3.195	3.195	0.082
						2" Ice	3.683	3.683	0.152
(2) LGP21401	A	From Leg	4.000	0.000	127.000	No Ice	1.104	0.207	0.014
			0.000			1/2" Ice	1.239	0.274	0.021
			2.000			1" Ice	1.381	0.348	0.030
						2" Ice	1.688	0.521	0.055
(2) LGP21401	B	From Leg	4.000	0.000	127.000	No Ice	1.104	0.207	0.014
			0.000			1/2" Ice	1.239	0.274	0.021
			2.000			1" Ice	1.381	0.348	0.030
						2" Ice	1.688	0.521	0.055
(2) LGP21401	C	From Leg	4.000	0.000	127.000	No Ice	1.104	0.207	0.014
			0.000			1/2" Ice	1.239	0.274	0.021
			2.000			1" Ice	1.381	0.348	0.030
						2" Ice	1.688	0.521	0.055
(3) 8' x 2" Mount Pipe	A	From Leg	4.000	0.000	127.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			2.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
(3) 8' x 2" Mount Pipe	B	From Leg	4.000	0.000	127.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			2.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
(3) 8' x 2" Mount Pipe	C	From Leg	4.000	0.000	127.000	No Ice	1.900	1.900	0.029
			0.000			1/2" Ice	2.728	2.728	0.044
			2.000			1" Ice	3.401	3.401	0.063
						2" Ice	4.396	4.396	0.119
4' x 2" Pipe Mount	A	From Leg	2.000	0.000	127.000	No Ice	0.785	0.785	0.029
			0.000			1/2" Ice	1.028	1.028	0.035
			1.000			1" Ice	1.281	1.281	0.044
						2" Ice	1.814	1.814	0.072
4' x 2" Pipe Mount	B	From Leg	2.000	0.000	127.000	No Ice	0.785	0.785	0.029
			0.000			1/2" Ice	1.028	1.028	0.035

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	<b>Client</b> Crown Castle	<b>Designed by</b> JD Prabhu

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
			Horz ft	Lateral ft						
			1.000							
Platform Mount [LP 303-1_HR-1]	C	None			0.000	127.000	1" Ice	1.281	1.281	0.044
			2" Ice	1.814			1.814	0.072		
			No Ice	17.090			17.090	1.495		
			1/2" Ice	21.470			21.470	1.881		
			1" Ice	25.720			25.720	2.346		
			1.000							
* APXV18-206517S-C w/ Mount Pipe	A	From Leg	0.000		0.000	117.000	No Ice	3.790	3.160	0.053
			1/2" Ice	4.380			3.750	0.094		
			1" Ice	4.990			4.350	0.145		
			2" Ice	6.250			5.590	0.281		
			0.000							
APXV18-206517S-C w/ Mount Pipe	B	From Leg	1.000		0.000	117.000	No Ice	3.790	3.160	0.053
			0.000				1/2" Ice	4.380	3.750	0.094
			0.000				1" Ice	4.990	4.350	0.145
							2" Ice	6.250	5.590	0.281
APXV18-206517S-C w/ Mount Pipe	C	From Leg	1.000		0.000	117.000	No Ice	3.790	3.160	0.053
			0.000				1/2" Ice	4.380	3.750	0.094
			0.000				1" Ice	4.990	4.350	0.145
							2" Ice	6.250	5.590	0.281
			1.000							
* 8225	C	From Leg	3.000		0.000	79.000	No Ice	0.894	0.894	0.001
			0.000				1/2" Ice	1.060	1.060	0.009
			1.000				1" Ice	1.230	1.230	0.018
							2" Ice	1.590	1.590	0.046
Side Arm Mount [SO 701-1]	C	From Leg	1.500		0.000	79.000	No Ice	0.850	1.670	0.065
			0.000				1/2" Ice	1.140	2.340	0.079
			0.000				1" Ice	1.430	3.010	0.093
							2" Ice	2.010	4.350	0.121

## Load Combinations

Comb. No.	Description
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

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Comb. No.	Description
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	177 - 172	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-9.076	0.015	0.009
			Max. Mx	8	-3.931	-21.407	0.027
			Max. My	2	-3.912	-0.024	21.498
			Max. Vy	8	3.983	-21.407	0.027
			Max. Vx	2	-4.001	-0.024	21.498
			Max. Torque	2			0.003
L2	172 - 167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-9.681	0.031	0.018
			Max. Mx	8	-4.247	-42.158	0.055
			Max. My	2	-4.227	-0.050	42.348
			Max. Vy	8	4.321	-42.158	0.055
			Max. Vx	2	-4.341	-0.050	42.348
			Max. Torque	2			0.003
L3	167 - 162	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-14.516	0.048	0.027
			Max. Mx	8	-6.038	-75.167	0.096
			Max. My	2	-6.007	-0.087	75.497
			Max. Vy	8	6.484	-75.167	0.096
			Max. Vx	2	-6.512	-0.087	75.497

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	162 - 157	Pole	Max. Torque	2			0.005
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-15.219	0.064	0.037
			Max. Mx	8	-6.444	-108.471	0.139
			Max. My	2	-6.411	-0.126	108.950
			Max. Vy	8	6.842	-108.471	0.139
			Max. Vx	2	-6.872	-0.126	108.950
L5	157 - 152	Pole	Max. Torque	2			0.005
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-24.597	0.844	0.427
			Max. Mx	20	-9.951	158.547	-0.649
			Max. My	2	-9.914	-0.698	158.771
			Max. Vy	8	11.450	-158.436	0.870
			Max. Vx	2	-11.359	-0.698	158.771
L6	152 - 147	Pole	Max. Torque	8			0.554
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-25.380	0.862	0.437
			Max. Mx	20	-10.444	216.680	-1.441
			Max. My	2	-10.404	-1.498	216.464
			Max. Vy	8	11.813	-216.576	1.674
			Max. Vx	2	-11.724	-1.498	216.464
L7	147 - 142	Pole	Max. Torque	8			0.554
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-26.183	0.880	0.447
			Max. Mx	20	-10.956	276.620	-2.234
			Max. My	2	-10.915	-2.300	275.977
			Max. Vy	8	12.175	-276.524	2.479
			Max. Vx	2	-12.089	-2.300	275.977
L8	142 - 137	Pole	Max. Torque	8			0.554
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-27.005	0.899	0.458
			Max. Mx	20	-11.489	338.370	-3.030
			Max. My	2	-11.445	-3.102	337.311
			Max. Vy	8	12.538	-338.281	3.285
			Max. Vx	2	-12.454	-3.102	337.311
L9	137 - 129.75	Pole	Max. Torque	8			0.554
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-27.593	0.912	0.466
			Max. Mx	20	-11.872	382.669	-3.587
			Max. My	2	-11.826	-3.665	381.329
			Max. Vy	8	12.791	-382.586	3.850
			Max. Vx	2	-12.709	-3.665	381.329
L10	129.75 - 128.5	Pole	Max. Torque	8			0.553
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-29.026	0.932	0.477
			Max. Mx	20	-12.780	447.688	-4.385
			Max. My	2	-12.731	-4.471	445.961
			Max. Vy	8	13.218	-447.614	4.658
			Max. Vx	2	-13.141	-4.471	445.961
L11	128.5 - 123.5	Pole	Max. Torque	8			0.553
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-38.000	0.340	0.822
			Max. Mx	8	-16.791	-532.647	5.628
			Max. My	2	-16.724	-5.467	530.608
			Max. Vy	8	17.228	-532.647	5.628
			Max. Vx	2	-17.169	-5.467	530.608
L12	123.5 - 118.583	Pole	Max. Torque	10			0.642
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-39.146	0.221	0.913
			Max. Mx	8	-17.543	-618.214	6.462



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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L13	118.583 - 118.333	Pole	Max. My	2	-17.470	-6.316	615.977
			Max. Vy	8	17.581	-618.214	6.462
			Max. Vx	2	-17.564	-6.316	615.977
			Max. Torque	10			0.642
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-39.223	0.215	0.918
			Max. Mx	8	-17.602	-622.612	6.508
			Max. My	2	-17.528	-6.362	620.370
			Max. Vy	8	17.596	-622.612	6.508
			Max. Vx	2	-17.583	-6.362	620.370
L14	118.333 - 113.333	Pole	Max. Torque	10			0.642
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-41.500	0.092	0.894
			Max. Mx	8	-18.777	-712.822	7.336
			Max. My	2	-18.692	-7.224	710.654
			Max. Vy	8	18.333	-712.822	7.336
			Max. Vx	2	-18.389	-7.224	710.654
			Max. Torque	10			0.642
			Max Tension	1	0.000	0.000	0.000
			L15	113.333 - 108.333	Pole	Max. Compression	26
Max. Mx	8	-20.076				-805.671	8.161
Max. My	2	-19.982				-8.092	803.915
Max. Vy	8	18.805				-805.671	8.161
Max. Vx	2	-18.931				-8.092	803.915
Max. Torque	10						0.641
Max Tension	1	0.000				0.000	0.000
Max. Compression	26	-44.478				-0.083	0.800
Max. Mx	8	-20.767				-841.916	8.477
Max. My	2	-20.658				-8.423	840.514
L16	108.333 - 106.417	Pole	Max. Vy	8	19.035	-841.916	8.477
			Max. Vx	2	-19.295	-8.423	840.514
			Max. Torque	10			0.641
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-44.596	-0.089	0.797
			Max. Mx	8	-20.857	-846.677	8.521
			Max. My	2	-20.747	-8.469	845.339
			Max. Vy	8	19.054	-846.677	8.521
			Max. Vx	2	-19.331	-8.469	845.339
			Max. Torque	10			0.632
L17	106.417 - 106.167	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-46.845	-0.219	0.727
			Max. Mx	8	-22.473	-943.134	9.346
			Max. My	2	-22.326	-9.335	944.044
			Max. Vy	8	19.533	-943.134	9.346
			Max. Vx	2	-20.173	-9.335	944.044
			Max. Torque	10			0.631
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-50.323	-0.351	0.656
			Max. Mx	8	-25.231	-1042.188	10.175
L18	106.167 - 101.167	Pole	Max. My	2	-25.050	-10.207	1047.187
			Max. Vy	8	20.097	-1042.188	10.175
			Max. Vx	2	-21.111	-10.207	1047.187
			Max. Torque	10			0.630
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-46.845	-0.219	0.727
			Max. Mx	8	-22.473	-943.134	9.346
			Max. My	2	-22.326	-9.335	944.044
			Max. Vy	8	19.533	-943.134	9.346
			Max. Vx	2	-20.173	-9.335	944.044
L19	101.167 - 96.167	Pole	Max. Torque	10			0.631
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-50.323	-0.351	0.656
			Max. Mx	8	-25.231	-1042.188	10.175
			Max. My	2	-25.050	-10.207	1047.187
			Max. Vy	8	20.097	-1042.188	10.175
			Max. Vx	2	-21.111	-10.207	1047.187
			Max. Torque	10			0.630
			Max Tension	1	0.000	0.000	0.000
			L20	96.167 -	Pole	Max. Compression	26
Max. Mx	8	-25.231				-1042.188	10.175
Max. My	2	-25.050				-10.207	1047.187
Max. Vy	8	20.097				-1042.188	10.175
Max. Vx	2	-21.111				-10.207	1047.187
Max. Torque	10						0.630
Max Tension	1	0.000				0.000	0.000
Max. Compression	26	-50.323				-0.351	0.656
Max. Mx	8	-25.231				-1042.188	10.175
Max. My	2	-25.050				-10.207	1047.187

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
	91.167		Max. Compression	26	-52.573	-0.485	0.583
			Max. Mx	8	-26.901	-1143.687	11.005
			Max. My	2	-26.693	-11.080	1154.643
			Max. Vy	8	20.516	-1143.687	11.005
			Max. Vx	2	-21.903	-11.080	1154.643
			Max. Torque	10			0.604
L21	91.167 - 84	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-53.668	-0.552	0.547
			Max. Mx	8	-27.715	-1193.487	11.405
			Max. My	2	-27.494	-11.501	1207.991
			Max. Vy	8	20.712	-1193.487	11.405
			Max. Vx	2	-22.279	-11.501	1207.991
			Max. Torque	10			0.603
L22	84 - 83.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-56.972	-0.689	0.473
			Max. Mx	8	-30.073	-1298.348	12.236
			Max. My	2	-29.826	-12.377	1321.590
			Max. Vy	8	21.237	-1298.348	12.236
			Max. Vx	2	-23.185	-12.377	1321.590
			Max. Torque	10			0.603
L23	83.75 - 78.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-61.737	-0.398	0.149
			Max. Mx	8	-33.986	-1405.827	12.951
			Max. My	2	-33.718	-13.058	1439.804
			Max. Vy	8	21.897	-1405.827	12.951
			Max. Vx	2	-24.239	-13.058	1439.804
			Max. Torque	10			0.603
L24	78.75 - 73.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-64.297	-0.539	0.073
			Max. Mx	8	-35.956	-1516.224	13.726
			Max. My	2	-35.673	-13.880	1562.802
			Max. Vy	8	22.279	-1516.224	13.726
			Max. Vx	2	-24.998	-13.880	1562.802
			Max. Torque	8			0.417
L25	73.75 - 68.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-66.876	-0.683	-0.005
			Max. Mx	8	-37.949	-1628.473	14.497
			Max. My	2	-37.658	-14.700	1689.533
			Max. Vy	8	22.640	-1628.473	14.497
			Max. Vx	2	-25.735	-14.700	1689.533
			Max. Torque	8			0.417
L26	68.75 - 63.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-69.475	-0.828	-0.084
			Max. Mx	8	-39.965	-1742.462	15.264
			Max. My	2	-39.688	-15.519	1819.144
			Max. Vy	8	22.977	-1742.462	15.264
			Max. Vx	2	-26.152	-15.519	1819.144
			Max. Torque	8			0.416
L27	63.75 - 58.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-74.787	-0.976	-0.164
			Max. Mx	8	-44.469	-1858.957	16.028
			Max. My	2	-44.201	-16.336	1951.948
			Max. Vy	8	23.641	-1858.957	16.028
			Max. Vx	2	-27.012	-16.336	1951.948
			Max. Torque	8			0.416
L28	58.75 - 53.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-77.424	-1.126	-0.245
			Max. Mx	8	-46.532	-1977.788	16.789
			Max. My	2	-46.283	-17.151	2087.755
			Max. Vy	8	23.919	-1977.788	16.789

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L29	53.75 - 48.75	Pole	Max. Vx	2	-27.361	-17.151	2087.755
			Max. Torque	8			0.416
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-80.080	-1.277	-0.327
			Max. Mx	8	-48.616	-2097.940	17.543
			Max. My	2	-48.388	-17.961	2225.223
			Max. Vy	8	24.171	-2097.940	17.543
			Max. Vx	2	-27.679	-17.961	2225.223
L30	48.75 - 39.25	Pole	Max. Torque	8			0.416
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-82.930	-1.393	-0.390
			Max. Mx	8	-50.973	-2188.910	18.104
			Max. My	2	-50.761	-18.564	2329.400
			Max. Vy	8	24.383	-2188.910	18.104
			Max. Vx	2	-27.944	-18.564	2329.400
			Max. Torque	8			0.415
L31	39.25 - 38.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-90.072	-1.602	-0.503
			Max. Mx	8	-56.713	-2355.336	19.111
			Max. My	2	-56.514	-19.648	2520.166
			Max. Vy	8	24.944	-2355.336	19.111
			Max. Vx	2	-28.666	-19.648	2520.166
			Max. Torque	8			0.415
			Max Tension	1	0.000	0.000	0.000
L32	38.25 - 33.25	Pole	Max. Compression	26	-92.941	-1.757	-0.586
			Max. Mx	8	-59.014	-2480.466	19.852
			Max. My	2	-58.837	-20.447	2663.977
			Max. Vy	8	25.139	-2480.466	19.852
			Max. Vx	2	-28.914	-20.447	2663.977
			Max. Torque	8			0.415
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-95.826	-1.913	-0.671
L33	33.25 - 28.25	Pole	Max. Mx	8	-61.338	-2606.495	20.584
			Max. My	2	-61.185	-21.238	2808.940
			Max. Vy	8	25.305	-2606.495	20.584
			Max. Vx	2	-29.129	-21.238	2808.940
			Max. Torque	8			0.415
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-98.728	-2.070	-0.755
			Max. Mx	8	-63.684	-2733.312	21.308
L34	28.25 - 23.25	Pole	Max. My	2	-63.556	-22.022	2954.924
			Max. Vy	8	25.455	-2733.312	21.308
			Max. Vx	2	-29.325	-22.022	2954.924
			Max. Torque	8			0.415
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-104.350	-2.229	-0.840
			Max. Mx	8	-68.571	-2861.031	22.024
			Max. My	2	-68.463	-22.797	3102.762
L35	23.25 - 18.25	Pole	Max. Vy	8	25.664	-2861.031	22.024
			Max. Vx	2	-29.870	-22.797	3102.762
			Max. Torque	8			0.415
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-107.383	-2.387	-0.924
			Max. Mx	8	-71.068	-2989.554	22.730
			Max. My	2	-70.988	-23.563	3252.352
			Max. Vy	8	25.782	-2989.554	22.730
L36	18.25 - 13.25	Pole	Max. Vx	2	-30.032	-23.563	3252.352
			Max. Torque	8			0.415
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-110.419	-2.544	-1.007
			Max. Mx	8	-73.588	-3118.633	23.425
			Max. My	2			
			Max. Vy	8			
			Max. Vx	2			
L37	13.25 - 8.25	Pole	Max. Torque	8			0.415
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-110.419	-2.544	-1.007
			Max. Mx	8	-73.588	-3118.633	23.425

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L38	8.25 - 3.25	Pole	Max. My	2	-73.536	-24.320	3402.706
			Max. Vy	8	25.888	-3118.633	23.425
			Max. Vx	2	-30.178	-24.320	3402.706
			Max. Torque	8			0.415
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-113.441	-2.699	-1.087
			Max. Mx	8	-76.130	-3248.205	24.109
			Max. My	2	-76.107	-25.066	3553.747
			Max. Vy	8	25.981	-3248.205	24.109
			Max. Vx	2	-30.308	-25.066	3553.747
L39	3.25 - 0	Pole	Max. Torque	8			0.415
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-115.372	-2.794	-1.135
			Max. Mx	8	-77.793	-3332.663	24.547
			Max. My	2	-77.790	-25.545	3652.258
			Max. Vy	8	26.037	-3332.663	24.547
			Max. Vx	2	-30.388	-25.545	3652.258
			Max. Torque	8			0.415

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	115.372	0.021	-7.416
	Max. H <sub>x</sub>	20	77.805	25.819	-0.135
	Max. H <sub>z</sub>	2	77.805	-0.135	30.350
	Max. M <sub>x</sub>	2	3652.258	-0.135	30.350
	Max. M <sub>z</sub>	8	3332.663	-26.002	0.135
	Max. Torsion	8	0.415	-26.002	0.135
	Min. Vert	5	58.354	-12.652	21.670
	Min. H <sub>x</sub>	8	77.805	-26.002	0.135
	Min. H <sub>z</sub>	14	77.805	0.135	-30.350
	Min. M <sub>x</sub>	14	-3651.970	0.135	-30.350
	Min. M <sub>z</sub>	20	-3318.660	25.819	-0.135
	Min. Torsion	3	-0.409	-0.135	30.350

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturing Moment, M <sub>x</sub> kip-ft	Overturing Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	64.837	0.000	0.000	-0.091	-0.884	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	77.805	0.135	-30.350	-3652.258	-25.545	0.405
0.9 Dead+1.0 Wind 0 deg - No Ice	58.354	0.135	-30.350	-3566.345	-24.577	0.409
1.2 Dead+1.0 Wind 30 deg - No Ice	77.805	12.652	-21.670	-2819.334	-1654.357	-0.141
0.9 Dead+1.0 Wind 30 deg - No Ice	58.354	12.652	-21.670	-2750.165	-1613.443	-0.136
1.2 Dead+1.0 Wind 60 deg - No Ice	77.805	21.907	-12.663	-1646.960	-2848.949	-0.322

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Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
0.9 Dead+1.0 Wind 60 deg - No Ice	58.354	21.907	-12.663	-1606.555	-2778.853	-0.316
1.2 Dead+1.0 Wind 90 deg - No Ice	77.805	26.002	-0.135	-24.547	-3332.663	-0.415
0.9 Dead+1.0 Wind 90 deg - No Ice	58.354	26.002	-0.135	-23.841	-3251.304	-0.411
1.2 Dead+1.0 Wind 120 deg - No Ice	77.805	23.933	13.676	1698.419	-2987.367	-0.288
0.9 Dead+1.0 Wind 120 deg - No Ice	58.354	23.933	13.676	1657.784	-2915.401	-0.287
1.2 Dead+1.0 Wind 150 deg - No Ice	77.805	13.827	23.975	2996.186	-1728.425	-0.211
0.9 Dead+1.0 Wind 150 deg - No Ice	58.354	13.827	23.975	2924.399	-1686.721	-0.214
1.2 Dead+1.0 Wind 180 deg - No Ice	77.805	-0.135	30.350	3651.970	23.267	-0.341
0.9 Dead+1.0 Wind 180 deg - No Ice	58.354	-0.135	30.350	3566.144	22.905	-0.348
1.2 Dead+1.0 Wind 210 deg - No Ice	77.805	-12.767	21.869	2831.778	1659.404	0.195
0.9 Dead+1.0 Wind 210 deg - No Ice	58.354	-12.767	21.869	2762.544	1619.016	0.188
1.2 Dead+1.0 Wind 240 deg - No Ice	77.805	-21.907	12.663	1646.690	2846.652	0.316
0.9 Dead+1.0 Wind 240 deg - No Ice	58.354	-21.907	12.663	1606.366	2777.166	0.311
1.2 Dead+1.0 Wind 270 deg - No Ice	77.805	-25.819	0.135	24.281	3318.660	0.355
0.9 Dead+1.0 Wind 270 deg - No Ice	58.354	-25.819	0.135	23.656	3238.048	0.353
1.2 Dead+1.0 Wind 300 deg - No Ice	77.805	-23.933	-13.676	-1698.695	2985.087	0.233
0.9 Dead+1.0 Wind 300 deg - No Ice	58.354	-23.933	-13.676	-1657.976	2913.728	0.233
1.2 Dead+1.0 Wind 330 deg - No Ice	77.805	-13.896	-24.095	-3004.133	1730.569	0.216
0.9 Dead+1.0 Wind 330 deg - No Ice	58.354	-13.896	-24.095	-2932.169	1689.419	0.219
1.2 Dead+1.0 Ice+1.0 Temp	115.372	0.000	0.000	1.135	-2.794	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	115.372	0.021	-7.416	-1012.478	-7.701	0.030
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	115.372	3.526	-6.070	-846.391	-497.180	-0.088
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	115.372	6.087	-3.517	-490.816	-854.279	-0.107
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	115.372	7.017	-0.021	-3.427	-983.356	-0.097
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	115.372	6.202	3.559	492.694	-862.728	-0.045
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	115.372	3.568	6.185	859.070	-497.929	-0.011
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	115.372	-0.021	7.416	1014.739	1.417	-0.026
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	115.372	-3.527	6.071	848.685	490.912	0.091
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	115.372	-6.087	3.517	493.081	847.994	0.106
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	115.372	-7.016	0.021	5.692	977.036	0.093
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	115.372	-6.202	-3.559	-490.432	856.446	0.042

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Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	115.372	-3.568	-6.185	-856.841	491.664	0.011
Dead+Wind 0 deg - Service	64.837	0.032	-7.148	-848.973	-6.607	0.092
Dead+Wind 30 deg - Service	64.837	2.980	-5.104	-654.883	-384.898	-0.040
Dead+Wind 60 deg - Service	64.837	5.159	-2.982	-382.609	-662.377	-0.080
Dead+Wind 90 deg - Service	64.837	6.124	-0.032	-5.778	-774.801	-0.099
Dead+Wind 120 deg - Service	64.837	5.636	3.221	394.526	-694.748	-0.069
Dead+Wind 150 deg - Service	64.837	3.256	5.646	696.056	-402.269	-0.055
Dead+Wind 180 deg - Service	64.837	-0.032	7.148	848.737	4.714	-0.089
Dead+Wind 210 deg - Service	64.837	-3.007	5.150	657.626	384.725	0.043
Dead+Wind 240 deg - Service	64.837	-5.159	2.982	382.373	660.484	0.080
Dead+Wind 270 deg - Service	64.837	-6.081	0.032	5.543	770.165	0.096
Dead+Wind 300 deg - Service	64.837	-5.636	-3.221	-394.762	692.855	0.066
Dead+Wind 330 deg - Service	64.837	-3.273	-5.675	-698.086	401.412	0.055

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-64.837	0.000	0.000	64.837	0.000	0.000%
2	0.135	-77.805	-30.350	-0.135	77.805	30.350	0.000%
3	0.135	-58.354	-30.350	-0.135	58.354	30.350	0.000%
4	12.652	-77.805	-21.670	-12.652	77.805	21.670	0.000%
5	12.652	-58.354	-21.670	-12.652	58.354	21.670	0.000%
6	21.907	-77.805	-12.663	-21.907	77.805	12.663	0.000%
7	21.907	-58.354	-12.663	-21.907	58.354	12.663	0.000%
8	26.002	-77.805	-0.135	-26.002	77.805	0.135	0.000%
9	26.002	-58.354	-0.135	-26.002	58.354	0.135	0.000%
10	23.933	-77.805	13.676	-23.933	77.805	-13.676	0.000%
11	23.933	-58.354	13.676	-23.933	58.354	-13.676	0.000%
12	13.827	-77.805	23.975	-13.827	77.805	-23.975	0.000%
13	13.827	-58.354	23.975	-13.827	58.354	-23.975	0.000%
14	-0.135	-77.805	30.350	0.135	77.805	-30.350	0.000%
15	-0.135	-58.354	30.350	0.135	58.354	-30.350	0.000%
16	-12.767	-77.805	21.869	12.767	77.805	-21.869	0.000%
17	-12.767	-58.354	21.869	12.767	58.354	-21.869	0.000%
18	-21.907	-77.805	12.663	21.907	77.805	-12.663	0.000%
19	-21.907	-58.354	12.663	21.907	58.354	-12.663	0.000%
20	-25.819	-77.805	0.135	25.819	77.805	-0.135	0.000%
21	-25.819	-58.354	0.135	25.819	58.354	-0.135	0.000%
22	-23.933	-77.805	-13.676	23.933	77.805	13.676	0.000%
23	-23.933	-58.354	-13.676	23.933	58.354	13.676	0.000%
24	-13.896	-77.805	-24.095	13.896	77.805	24.095	0.000%
25	-13.896	-58.354	-24.095	13.896	58.354	24.095	0.000%
26	0.000	-115.372	0.000	0.000	115.372	0.000	0.000%
27	0.021	-115.372	-7.416	-0.021	115.372	7.416	0.000%
28	3.526	-115.372	-6.070	-3.526	115.372	6.070	0.000%
29	6.087	-115.372	-3.517	-6.087	115.372	3.517	0.000%
30	7.017	-115.372	-0.021	-7.017	115.372	0.021	0.000%
31	6.202	-115.372	3.559	-6.202	115.372	-3.559	0.000%
32	3.568	-115.372	6.185	-3.568	115.372	-6.185	0.000%
33	-0.021	-115.372	7.416	0.021	115.372	-7.416	0.000%
34	-3.527	-115.372	6.071	3.527	115.372	-6.071	0.000%
35	-6.087	-115.372	3.517	6.087	115.372	-3.517	0.000%
36	-7.016	-115.372	0.021	7.016	115.372	-0.021	0.000%
37	-6.202	-115.372	-3.559	6.202	115.372	3.559	0.000%
38	-3.568	-115.372	-6.185	3.568	115.372	6.185	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	
39	0.032	-64.837	-7.148	-0.032	64.837	7.148	0.000%
40	2.980	-64.837	-5.104	-2.980	64.837	5.104	0.000%
41	5.159	-64.837	-2.982	-5.159	64.837	2.982	0.000%
42	6.124	-64.837	-0.032	-6.124	64.837	0.032	0.000%
43	5.636	-64.837	3.221	-5.636	64.837	-3.221	0.000%
44	3.256	-64.837	5.646	-3.256	64.837	-5.646	0.000%
45	-0.032	-64.837	7.148	0.032	64.837	-7.148	0.000%
46	-3.007	-64.837	5.150	3.007	64.837	-5.150	0.000%
47	-5.159	-64.837	2.982	5.159	64.837	-2.982	0.000%
48	-6.081	-64.837	0.032	6.081	64.837	-0.032	0.000%
49	-5.636	-64.837	-3.221	5.636	64.837	3.221	0.000%
50	-3.273	-64.837	-5.675	3.273	64.837	5.675	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	6	0.00000001	0.00066098
3	Yes	6	0.00000001	0.00023263
4	Yes	8	0.00000001	0.00021631
5	Yes	7	0.00000001	0.00053891
6	Yes	8	0.00000001	0.00021843
7	Yes	7	0.00000001	0.00054404
8	Yes	6	0.00000001	0.00067522
9	Yes	6	0.00000001	0.00024232
10	Yes	8	0.00000001	0.00022137
11	Yes	7	0.00000001	0.00054806
12	Yes	8	0.00000001	0.00022709
13	Yes	7	0.00000001	0.00056205
14	Yes	6	0.00000001	0.00034149
15	Yes	6	0.00000001	0.00011322
16	Yes	8	0.00000001	0.00021715
17	Yes	7	0.00000001	0.00054097
18	Yes	8	0.00000001	0.00021641
19	Yes	7	0.00000001	0.00053881
20	Yes	6	0.00000001	0.00029156
21	Yes	6	0.00000001	0.00009619
22	Yes	8	0.00000001	0.00022369
23	Yes	7	0.00000001	0.00055443
24	Yes	8	0.00000001	0.00022533
25	Yes	7	0.00000001	0.00055706
26	Yes	4	0.00000001	0.00000001
27	Yes	8	0.00000001	0.00029711
28	Yes	8	0.00000001	0.00056892
29	Yes	8	0.00000001	0.00057170
30	Yes	8	0.00000001	0.00029257
31	Yes	8	0.00000001	0.00056512
32	Yes	8	0.00000001	0.00057020
33	Yes	8	0.00000001	0.00029671
34	Yes	8	0.00000001	0.00056645
35	Yes	8	0.00000001	0.00056522
36	Yes	8	0.00000001	0.00029144
37	Yes	8	0.00000001	0.00056580
38	Yes	8	0.00000001	0.00056530
39	Yes	5	0.00000001	0.00029340

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40	Yes	6	0.00000001	0.00025486
41	Yes	6	0.00000001	0.00026086
42	Yes	5	0.00000001	0.00029070
43	Yes	6	0.00000001	0.00026180
44	Yes	6	0.00000001	0.00027595
45	Yes	5	0.00000001	0.00026000
46	Yes	6	0.00000001	0.00025596
47	Yes	6	0.00000001	0.00025296
48	Yes	5	0.00000001	0.00025165
49	Yes	6	0.00000001	0.00026976
50	Yes	6	0.00000001	0.00026898

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	177 - 172	40.148	39	1.904	0.001
L2	172 - 167	38.156	39	1.900	0.001
L3	167 - 162	36.172	39	1.890	0.001
L4	162 - 157	34.200	39	1.874	0.001
L5	157 - 152	32.249	39	1.852	0.001
L6	152 - 147	30.325	39	1.823	0.001
L7	147 - 142	28.435	39	1.785	0.001
L8	142 - 137	26.589	39	1.741	0.001
L9	137 - 129.75	24.792	39	1.690	0.001
L10	133.5 - 128.5	23.567	39	1.652	0.001
L11	128.5 - 123.5	21.852	39	1.617	0.001
L12	123.5 - 118.583	20.189	39	1.559	0.001
L13	118.583 - 118.333	18.614	39	1.498	0.001
L14	118.333 - 113.333	18.536	39	1.496	0.001
L15	113.333 - 108.333	16.992	39	1.452	0.001
L16	108.333 - 106.417	15.496	39	1.406	0.001
L17	106.417 - 106.167	14.936	39	1.388	0.000
L18	106.167 - 101.167	14.863	39	1.384	0.000
L19	101.167 - 96.167	13.452	39	1.310	0.000
L20	96.167 - 91.167	12.120	39	1.234	0.000
L21	91.167 - 84	10.869	39	1.156	0.000
L22	88.75 - 83.75	10.293	39	1.117	0.000
L23	83.75 - 78.75	9.142	39	1.079	0.000
L24	78.75 - 73.75	8.048	39	1.010	0.000
L25	73.75 - 68.75	7.027	39	0.940	0.000
L26	68.75 - 63.75	6.079	39	0.870	0.000
L27	63.75 - 58.75	5.206	39	0.798	0.000
L28	58.75 - 53.75	4.407	39	0.727	0.000
L29	53.75 - 48.75	3.684	39	0.654	0.000
L30	48.75 - 39.25	3.037	39	0.582	0.000
L31	45 - 38.25	2.602	39	0.527	0.000
L32	38.25 - 33.25	1.889	39	0.476	0.000
L33	33.25 - 28.25	1.425	39	0.412	0.000
L34	28.25 - 23.25	1.026	39	0.349	0.000
L35	23.25 - 18.25	0.693	39	0.286	0.000
L36	18.25 - 13.25	0.426	39	0.224	0.000
L37	13.25 - 8.25	0.224	39	0.162	0.000
L38	8.25 - 3.25	0.087	39	0.100	0.000
L39	3.25 - 0	0.013	39	0.039	0.000



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	<b>Client</b> Crown Castle	<b>Designed by</b> JD Prabhu

### Critical Deflections and Radius of Curvature - Service Wind

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>		<i>Comb.</i>	<i>in</i>	<i>°</i>	<i>°</i>	<i>ft</i>
177.000	APXVSPP18-C-A20 w/ Mount Pipe	39	40.148	1.904	0.001	41837
176.000	6' x 2" Mount Pipe	39	39.749	1.903	0.001	41837
167.000	APXV18-206516S-C-A20 w/ Mount Pipe	39	36.172	1.890	0.001	22517
154.000	(2) LPA-80080/6CF w/ Mount Pipe	39	31.091	1.835	0.001	9621
127.000	7770.00	39	21.347	1.603	0.001	5385
117.000	APXV18-206517S-C w/ Mount Pipe	39	18.120	1.485	0.001	5904
79.000	8225	39	8.101	1.014	0.000	4163

### Maximum Tower Deflections - Design Wind

<i>Section No.</i>	<i>Elevation</i>	<i>Horz. Deflection</i>	<i>Gov. Load</i>	<i>Tilt</i>	<i>Twist</i>
	<i>ft</i>	<i>in</i>	<i>Comb.</i>	<i>°</i>	<i>°</i>
L1	177 - 172	172.817	2	8.213	0.005
L2	172 - 167	164.253	2	8.196	0.005
L3	167 - 162	155.719	2	8.155	0.005
L4	162 - 157	147.242	2	8.085	0.005
L5	157 - 152	138.852	2	7.988	0.005
L6	152 - 147	130.575	2	7.863	0.005
L7	147 - 142	122.448	2	7.702	0.005
L8	142 - 137	114.504	2	7.510	0.004
L9	137 - 129.75	106.773	2	7.292	0.004
L10	133.5 - 128.5	101.502	2	7.126	0.003
L11	128.5 - 123.5	94.124	2	6.977	0.003
L12	123.5 - 118.583	86.964	2	6.727	0.003
L13	118.583 - 118.333	80.187	2	6.461	0.003
L14	118.333 - 113.333	79.850	2	6.452	0.003
L15	113.333 - 108.333	73.204	2	6.264	0.002
L16	108.333 - 106.417	66.761	2	6.064	0.002
L17	106.417 - 106.167	64.347	2	5.986	0.002
L18	106.167 - 101.167	64.035	2	5.971	0.002
L19	101.167 - 96.167	57.959	2	5.652	0.002
L20	96.167 - 91.167	52.220	2	5.323	0.002
L21	91.167 - 84	46.829	2	4.986	0.001
L22	88.75 - 83.75	44.350	2	4.820	0.001
L23	83.75 - 78.75	39.391	2	4.654	0.001
L24	78.75 - 73.75	34.677	2	4.357	0.001
L25	73.75 - 68.75	30.276	2	4.056	0.001
L26	68.75 - 63.75	26.191	2	3.751	0.001
L27	63.75 - 58.75	22.427	2	3.443	0.001
L28	58.75 - 53.75	18.986	2	3.132	0.001
L29	53.75 - 48.75	15.871	2	2.820	0.000
L30	48.75 - 39.25	13.082	2	2.507	0.000
L31	45 - 38.25	11.206	2	2.272	0.000
L32	38.25 - 33.25	8.136	2	2.049	0.000
L33	33.25 - 28.25	6.134	2	1.776	0.000
L34	28.25 - 23.25	4.417	2	1.504	0.000
L35	23.25 - 18.25	2.984	2	1.233	0.000
L36	18.25 - 13.25	1.834	2	0.964	0.000
L37	13.25 - 8.25	0.964	2	0.697	0.000
L38	8.25 - 3.25	0.373	2	0.432	0.000
L39	3.25 - 0	0.058	2	0.169	0.000

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	<b>Client</b> Crown Castle	<b>Designed by</b> JD Prabhu

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
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### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.000	APXVSP18-C-A20 w/ Mount Pipe	2	172.817	8.213	0.006	10054
176.000	6' x 2" Mount Pipe	2	171.103	8.211	0.006	10054
167.000	APXV18-206516S-C-A20 w/ Mount Pipe	2	155.719	8.155	0.006	5406
154.000	(2) LPA-80080/6CF w/ Mount Pipe	2	133.870	7.917	0.005	2310
127.000	7770.00	2	91.951	6.916	0.003	1286
117.000	APXV18-206517S-C w/ Mount Pipe	2	78.059	6.404	0.002	1405
79.000	8225	2	34.906	4.374	0.001	975

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
L1	177 - 172 (1)	TP22.875x22x0.219	5.000	0.000	0.0	15.731	-3.912	920.232	0.004
L2	172 - 167 (2)	TP23.75x22.875x0.219	5.000	0.000	0.0	16.338	-4.227	955.769	0.004
L3	167 - 162 (3)	TP24.625x23.75x0.219	5.000	0.000	0.0	16.945	-6.007	991.306	0.006
L4	162 - 157 (4)	TP25.5x24.625x0.219	5.000	0.000	0.0	17.553	-6.411	1026.840	0.006
L5	157 - 152 (5)	TP26.375x25.5x0.219	5.000	0.000	0.0	18.160	-9.939	1062.380	0.009
L6	152 - 147 (6)	TP27.25x26.375x0.219	5.000	0.000	0.0	18.768	-10.432	1097.920	0.010
L7	147 - 142 (7)	TP28.124x27.25x0.219	5.000	0.000	0.0	19.375	-10.945	1133.450	0.010
L8	142 - 137 (8)	TP28.999x28.124x0.219	5.000	0.000	0.0	19.983	-11.478	1168.990	0.010
L9	137 - 129.75 (9)	TP30.268x28.999x0.219	7.250	0.000	0.0	20.408	-11.861	1193.870	0.010
L10	129.75 - 128.5 (10)	TP30.049x29.174x0.25	5.000	0.000	0.0	23.646	-12.770	1383.270	0.009
L11	128.5 - 123.5 (11)	TP30.924x30.049x0.25	5.000	0.000	0.0	24.340	-16.785	1423.890	0.012
L12	123.5 - 118.583 (12)	TP31.785x30.924x0.25	4.917	0.000	0.0	25.023	-17.538	1463.830	0.012
L13	118.583 - 118.333 (13)	TP31.828x31.785x0.388	0.250	0.000	0.0	38.670	-17.597	2262.180	0.008
L14	118.333 - 113.333 (14)	TP32.703x31.828x0.388	5.000	0.000	0.0	39.746	-18.773	2325.130	0.008
L15	113.333 - 108.333 (15)	TP33.578x32.703x0.381	5.000	0.000	0.0	40.171	-20.076	2350.010	0.009
L16	108.333 - 106.417 (16)	TP33.913x33.578x0.381	1.916	0.000	0.0	40.577	-20.769	2373.740	0.009
L17	106.417 - 106.167 (17)	TP33.957x33.913x0.25	0.250	0.000	0.0	26.747	-20.860	1564.680	0.013
L18	106.167 - 101.167 (18)	TP34.832x33.957x0.25	5.000	0.000	0.0	27.441	-22.481	1605.290	0.014

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	<p><b>Client</b> Crown Castle</p>	<p><b>Designed by</b> JD Prabhu</p>

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
L19	101.167 - 96.167 (19)	TP35.707x34.832x0.25	5.000	0.000	0.0	28.135	-25.050	1645.900	0.015
L20	96.167 - 91.167 (20)	TP36.582x35.707x0.25	5.000	0.000	0.0	28.829	-26.693	1686.520	0.016
L21	91.167 - 84 (21)	TP37.836x36.582x0.25	7.167	0.000	0.0	29.165	-27.494	1706.150	0.016
L22	84 - 83.75 (22)	TP37.38x36.505x0.313	5.000	0.000	0.0	36.766	-29.826	2150.820	0.014
L23	83.75 - 78.75 (23)	TP38.255x37.38x0.313	5.000	0.000	0.0	37.634	-33.718	2201.590	0.015
L24	78.75 - 73.75 (24)	TP39.13x38.255x0.313	5.000	0.000	0.0	38.502	-35.673	2252.360	0.016
L25	73.75 - 68.75 (25)	TP40.005x39.13x0.313	5.000	0.000	0.0	39.370	-37.658	2303.130	0.016
L26	68.75 - 63.75 (26)	TP40.88x40.005x0.313	5.000	0.000	0.0	40.238	-39.688	2353.900	0.017
L27	63.75 - 58.75 (27)	TP41.755x40.88x0.313	5.000	0.000	0.0	41.105	-44.201	2404.670	0.018
L28	58.75 - 53.75 (28)	TP42.63x41.755x0.313	5.000	0.000	0.0	41.973	-46.283	2455.440	0.019
L29	53.75 - 48.75 (29)	TP43.505x42.63x0.313	5.000	0.000	0.0	42.841	-48.388	2506.210	0.019
L30	48.75 - 39.25 (30)	TP45.167x43.505x0.313	9.500	0.000	0.0	43.492	-50.761	2544.280	0.020
L31	39.25 - 38.25 (31)	TP44.717x43.536x0.375	6.750	0.000	0.0	52.778	-56.514	3087.510	0.018
L32	38.25 - 33.25 (32)	TP45.592x44.717x0.375	5.000	0.000	0.0	53.819	-58.837	3148.430	0.019
L33	33.25 - 28.25 (33)	TP46.467x45.592x0.375	5.000	0.000	0.0	54.861	-61.185	3209.350	0.019
L34	28.25 - 23.25 (34)	TP47.342x46.467x0.375	5.000	0.000	0.0	55.902	-63.556	3270.270	0.019
L35	23.25 - 18.25 (35)	TP48.217x47.342x0.375	5.000	0.000	0.0	56.943	-68.463	3331.190	0.021
L36	18.25 - 13.25 (36)	TP49.091x48.217x0.375	5.000	0.000	0.0	57.985	-70.988	3392.110	0.021
L37	13.25 - 8.25 (37)	TP49.966x49.091x0.375	5.000	0.000	0.0	59.026	-73.536	3453.030	0.021
L38	8.25 - 3.25 (38)	TP50.841x49.966x0.375	5.000	0.000	0.0	60.068	-76.108	3513.950	0.022
L39	3.25 - 0 (39)	TP51.41x50.841x0.375	3.250	0.000	0.0	60.744	-77.790	3553.550	0.022

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>ux</sub> kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M <sub>uy</sub> kip-ft	φM <sub>uy</sub> kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	177 - 172 (1)	TP22.875x22x0.219	21.498	531.913	0.040	0.000	531.913	0.000
L2	172 - 167 (2)	TP23.75x22.875x0.219	42.348	568.109	0.075	0.000	568.109	0.000
L3	167 - 162 (3)	TP24.625x23.75x0.219	75.497	605.013	0.125	0.000	605.013	0.000
L4	162 - 157 (4)	TP25.5x24.625x0.219	108.950	642.573	0.170	0.000	642.573	0.000
L5	157 - 152 (5)	TP26.375x25.5x0.219	158.875	680.742	0.233	0.000	680.742	0.000
L6	152 - 147 (6)	TP27.25x26.375x0.219	217.467	719.470	0.302	0.000	719.470	0.000
L7	147 - 142 (7)	TP28.124x27.25x0.219	277.867	758.707	0.366	0.000	758.707	0.000
L8	142 - 137 (8)	TP28.999x28.124x0.219	340.074	798.404	0.426	0.000	798.404	0.000
L9	137 - 129.75 (9)	TP30.268x28.999x0.219	384.693	826.440	0.465	0.000	826.440	0.000
L10	129.75 - 128.5	TP30.049x29.174x0.25	450.168	1010.808	0.445	0.000	1010.808	0.000

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft	$\phi M_{rx}$ kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	$M_{uy}$ kip-ft	$\phi M_{ry}$ kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
L11	(10) 128.5 - 123.5	TP30.924x30.049x0.25	535.691	1061.283	0.505	0.000	1061.283	0.000
L12	(11) 123.5 - 118.583 (12)	TP31.785x30.924x0.25	621.696	1111.500	0.559	0.000	1111.500	0.000
L13	118.583 - 118.333 (13)	TP31.828x31.785x0.388	626.116	1849.258	0.339	0.000	1849.258	0.000
L14	118.333 - 113.333 (14)	TP32.703x31.828x0.388	716.757	1954.258	0.367	0.000	1954.258	0.000
L15	113.333 - 108.333 (15)	TP33.578x32.703x0.381	809.933	2030.033	0.399	0.000	2030.033	0.000
L16	108.333 - 106.417 (16)	TP33.913x33.578x0.381	846.250	2071.483	0.409	0.000	2071.483	0.000
L17	106.417 - 106.167 (17)	TP33.957x33.913x0.25	851.017	1240.542	0.686	0.000	1240.542	0.000
L18	106.167 - 101.167 (18)	TP34.832x33.957x0.25	947.483	1293.292	0.733	0.000	1293.292	0.000
L19	101.167 - 96.167 (19)	TP35.707x34.832x0.25	1047.233	1346.417	0.778	0.000	1346.417	0.000
L20	96.167 - 91.167 (20)	TP36.582x35.707x0.25	1154.700	1399.867	0.825	0.000	1399.867	0.000
L21	91.167 - 84 (21)	TP37.836x36.582x0.25	1208.050	1425.800	0.847	0.000	1425.800	0.000
L22	84 - 83.75 (22)	TP37.38x36.505x0.313	1321.650	1957.967	0.675	0.000	1957.967	0.000
L23	83.75 - 78.75 (23)	TP38.255x37.38x0.313	1439.867	2036.583	0.707	0.000	2036.583	0.000
L24	78.75 - 73.75 (24)	TP39.13x38.255x0.313	1562.867	2115.958	0.739	0.000	2115.958	0.000
L25	73.75 - 68.75 (25)	TP40.005x39.13x0.313	1689.600	2196.050	0.769	0.000	2196.050	0.000
L26	68.75 - 63.75 (26)	TP40.88x40.005x0.313	1819.208	2276.808	0.799	0.000	2276.808	0.000
L27	63.75 - 58.75 (27)	TP41.755x40.88x0.313	1952.017	2358.192	0.828	0.000	2358.192	0.000
L28	58.75 - 53.75 (28)	TP42.63x41.755x0.313	2087.825	2440.133	0.856	0.000	2440.133	0.000
L29	53.75 - 48.75 (29)	TP43.505x42.63x0.313	2225.292	2522.600	0.882	0.000	2522.600	0.000
L30	48.75 - 39.25 (30)	TP45.167x43.505x0.313	2329.475	2584.767	0.901	0.000	2584.767	0.000
L31	39.25 - 38.25 (31)	TP44.717x43.536x0.375	2520.242	3365.508	0.749	0.000	3365.508	0.000
L32	38.25 - 33.25 (32)	TP45.592x44.717x0.375	2664.058	3478.458	0.766	0.000	3478.458	0.000
L33	33.25 - 28.25 (33)	TP46.467x45.592x0.375	2809.017	3592.342	0.782	0.000	3592.342	0.000
L34	28.25 - 23.25 (34)	TP47.342x46.467x0.375	2955.008	3707.108	0.797	0.000	3707.108	0.000
L35	23.25 - 18.25 (35)	TP48.217x47.342x0.375	3102.850	3822.717	0.812	0.000	3822.717	0.000
L36	18.25 - 13.25 (36)	TP49.091x48.217x0.375	3252.433	3939.117	0.826	0.000	3939.117	0.000
L37	13.25 - 8.25 (37)	TP49.966x49.091x0.375	3402.792	4056.250	0.839	0.000	4056.250	0.000
L38	8.25 - 3.25 (38)	TP50.841x49.966x0.375	3553.833	4174.083	0.851	0.000	4174.083	0.000
L39	3.25 - 0 (39)	TP51.41x50.841x0.375	3652.350	4251.017	0.859	0.000	4251.017	0.000

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	<p><b>Client</b> Crown Castle</p>	<p><b>Designed by</b> JD Prabhu</p>

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	177 - 172 (1)	TP22.875x22x0.219	4.001	276.070	0.014	0.003	547.753	0.000
L2	172 - 167 (2)	TP23.75x22.875x0.219	4.341	286.731	0.015	0.003	590.876	0.000
L3	167 - 162 (3)	TP24.625x23.75x0.219	6.512	297.392	0.022	0.005	635.632	0.000
L4	162 - 157 (4)	TP25.5x24.625x0.219	6.872	308.053	0.022	0.005	682.022	0.000
L5	157 - 152 (5)	TP26.375x25.5x0.219	11.541	318.714	0.036	0.457	730.046	0.001
L6	152 - 147 (6)	TP27.25x26.375x0.219	11.903	329.375	0.036	0.457	779.702	0.001
L7	147 - 142 (7)	TP28.124x27.25x0.219	12.265	340.036	0.036	0.457	830.994	0.001
L8	142 - 137 (8)	TP28.999x28.124x0.219	12.628	350.697	0.036	0.457	883.917	0.001
L9	137 - 129.75 (9)	TP30.268x28.999x0.219	12.881	358.160	0.036	0.456	921.942	0.000
L10	129.75 - 128.5 (10)	TP30.049x29.174x0.25	13.308	414.982	0.032	0.456	1082.967	0.000
L11	128.5 - 123.5 (11)	TP30.924x30.049x0.25	17.316	427.166	0.041	0.325	1147.492	0.000
L12	123.5 - 118.583 (12)	TP31.785x30.924x0.25	17.669	439.148	0.040	0.325	1212.767	0.000
L13	118.583 - 118.333 (13)	TP31.828x31.785x0.388	17.688	678.655	0.026	0.325	1868.625	0.000
L14	118.333 - 113.333 (14)	TP32.703x31.828x0.388	18.420	697.540	0.026	0.325	1974.075	0.000
L15	113.333 - 108.333 (15)	TP33.578x32.703x0.381	18.853	705.003	0.027	0.325	2049.600	0.000
L16	108.333 - 106.417 (16)	TP33.913x33.578x0.381	19.064	712.123	0.027	0.325	2091.208	0.000
L17	106.417 - 106.167 (17)	TP33.957x33.913x0.25	19.081	469.403	0.041	0.325	1385.633	0.000
L18	106.167 - 101.167 (18)	TP34.832x33.957x0.25	19.513	481.587	0.041	0.324	1458.500	0.000
L19	101.167 - 96.167 (19)	TP35.707x34.832x0.25	21.112	493.771	0.043	0.398	1533.233	0.000
L20	96.167 - 91.167 (20)	TP36.582x35.707x0.25	21.904	505.955	0.043	0.439	1609.833	0.000
L21	91.167 - 84 (21)	TP37.836x36.582x0.25	22.280	511.845	0.044	0.459	1647.525	0.000
L22	84 - 83.75 (22)	TP37.38x36.505x0.313	23.186	645.245	0.036	0.500	2094.575	0.000
L23	83.75 - 78.75 (23)	TP38.255x37.38x0.313	24.240	657.430	0.037	0.523	2194.625	0.000
L24	78.75 - 73.75 (24)	TP39.13x38.255x0.313	24.999	675.707	0.037	0.308	2297.008	0.000
L25	73.75 - 68.75 (25)	TP40.005x39.13x0.313	25.735	690.938	0.037	0.350	2401.733	0.000
L26	68.75 - 63.75 (26)	TP40.88x40.005x0.313	26.152	706.169	0.037	0.349	2508.783	0.000
L27	63.75 - 58.75 (27)	TP41.755x40.88x0.313	27.013	721.400	0.037	0.376	2618.175	0.000
L28	58.75 - 53.75 (28)	TP42.63x41.755x0.313	27.361	736.631	0.037	0.376	2729.892	0.000
L29	53.75 - 48.75 (29)	TP43.505x42.63x0.313	27.680	751.862	0.037	0.376	2843.950	0.000
L30	48.75 - 39.25 (30)	TP45.167x43.505x0.313	27.944	763.285	0.037	0.376	2931.025	0.000
L31	39.25 - 38.25 (31)	TP44.717x43.536x0.375	28.666	926.253	0.031	0.380	3596.867	0.000
L32	38.25 - 33.25 (32)	TP45.592x44.717x0.375	28.915	944.529	0.031	0.380	3740.208	0.000
L33	33.25 - 28.25 (33)	TP46.467x45.592x0.375	29.129	962.805	0.030	0.380	3886.350	0.000

<p><b>tnxTower</b></p> <p><b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<p><b>Job</b> 83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 876376)</p>	<p><b>Page</b> 42 of 44</p>
	<p><b>Project</b></p>	<p><b>Date</b> 21:20:50 05/08/21</p>
	<p><b>Client</b> Crown Castle</p>	<p><b>Designed by</b> JD Prabhu</p>

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L34	28.25 - 23.25 (34)	TP47.342x46.467x0.375	29.325	981.081	0.030	0.380	4035.292	0.000
L35	23.25 - 18.25 (35)	TP48.217x47.342x0.375	29.870	999.357	0.030	0.405	4187.033	0.000
L36	18.25 - 13.25 (36)	TP49.091x48.217x0.375	30.032	1017.630	0.030	0.405	4341.575	0.000
L37	13.25 - 8.25 (37)	TP49.966x49.091x0.375	30.178	1035.910	0.029	0.405	4498.917	0.000
L38	8.25 - 3.25 (38)	TP50.841x49.966x0.375	30.309	1054.190	0.029	0.405	4659.058	0.000
L39	3.25 - 0 (39)	TP51.41x50.841x0.375	30.389	1066.060	0.029	0.405	4764.658	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	177 - 172 (1)	0.004	0.040	0.000	0.014	0.000	0.045	1.050	4.8.2 ✓
L2	172 - 167 (2)	0.004	0.075	0.000	0.015	0.000	0.079	1.050	4.8.2 ✓
L3	167 - 162 (3)	0.006	0.125	0.000	0.022	0.000	0.131	1.050	4.8.2 ✓
L4	162 - 157 (4)	0.006	0.170	0.000	0.022	0.000	0.176	1.050	4.8.2 ✓
L5	157 - 152 (5)	0.009	0.233	0.000	0.036	0.001	0.244	1.050	4.8.2 ✓
L6	152 - 147 (6)	0.010	0.302	0.000	0.036	0.001	0.313	1.050	4.8.2 ✓
L7	147 - 142 (7)	0.010	0.366	0.000	0.036	0.001	0.377	1.050	4.8.2 ✓
L8	142 - 137 (8)	0.010	0.426	0.000	0.036	0.001	0.437	1.050	4.8.2 ✓
L9	137 - 129.75 (9)	0.010	0.465	0.000	0.036	0.000	0.477	1.050	4.8.2 ✓
L10	129.75 - 128.5 (10)	0.009	0.445	0.000	0.032	0.000	0.456	1.050	4.8.2 ✓
L11	128.5 - 123.5 (11)	0.012	0.505	0.000	0.041	0.000	0.518	1.050	4.8.2 ✓
L12	123.5 - 118.583 (12)	0.012	0.559	0.000	0.040	0.000	0.573	1.050	4.8.2 ✓
L13	118.583 - 118.333 (13)	0.008	0.339	0.000	0.026	0.000	0.347	1.050	4.8.2 ✓
L14	118.333 - 113.333 (14)	0.008	0.367	0.000	0.026	0.000	0.376	1.050	4.8.2 ✓
L15	113.333 - 108.333 (15)	0.009	0.399	0.000	0.027	0.000	0.408	1.050	4.8.2 ✓
L16	108.333 - 106.417 (16)	0.009	0.409	0.000	0.027	0.000	0.418	1.050	4.8.2 ✓
L17	106.417 - 106.167 (17)	0.013	0.686	0.000	0.041	0.000	0.701	1.050	4.8.2 ✓

Section No.	Elevation ft	Ratio $P_u$	Ratio $M_{ux}$	Ratio $M_{uy}$	Ratio $V_u$	Ratio $T_u$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$\phi P_n$	$\phi M_{nx}$	$\phi M_{ny}$	$\phi V_n$	$\phi T_n$			
L18	106.167 - 101.167 (18)	0.014	0.733	0.000	0.041	0.000	0.748	1.050	4.8.2 ✓
L19	101.167 - 96.167 (19)	0.015	0.778	0.000	0.043	0.000	0.795	1.050	4.8.2 ✓
L20	96.167 - 91.167 (20)	0.016	0.825	0.000	0.043	0.000	0.843	1.050	4.8.2 ✓
L21	91.167 - 84 (21)	0.016	0.847	0.000	0.044	0.000	0.865	1.050	4.8.2 ✓
L22	84 - 83.75 (22)	0.014	0.675	0.000	0.036	0.000	0.690	1.050	4.8.2 ✓
L23	83.75 - 78.75 (23)	0.015	0.707	0.000	0.037	0.000	0.724	1.050	4.8.2 ✓
L24	78.75 - 73.75 (24)	0.016	0.739	0.000	0.037	0.000	0.756	1.050	4.8.2 ✓
L25	73.75 - 68.75 (25)	0.016	0.769	0.000	0.037	0.000	0.787	1.050	4.8.2 ✓
L26	68.75 - 63.75 (26)	0.017	0.799	0.000	0.037	0.000	0.817	1.050	4.8.2 ✓
L27	63.75 - 58.75 (27)	0.018	0.828	0.000	0.037	0.000	0.848	1.050	4.8.2 ✓
L28	58.75 - 53.75 (28)	0.019	0.856	0.000	0.037	0.000	0.876	1.050	4.8.2 ✓
L29	53.75 - 48.75 (29)	0.019	0.882	0.000	0.037	0.000	0.903	1.050	4.8.2 ✓
L30	48.75 - 39.25 (30)	0.020	0.901	0.000	0.037	0.000	0.923	1.050	4.8.2 ✓
L31	39.25 - 38.25 (31)	0.018	0.749	0.000	0.031	0.000	0.768	1.050	4.8.2 ✓
L32	38.25 - 33.25 (32)	0.019	0.766	0.000	0.031	0.000	0.786	1.050	4.8.2 ✓
L33	33.25 - 28.25 (33)	0.019	0.782	0.000	0.030	0.000	0.802	1.050	4.8.2 ✓
L34	28.25 - 23.25 (34)	0.019	0.797	0.000	0.030	0.000	0.817	1.050	4.8.2 ✓
L35	23.25 - 18.25 (35)	0.021	0.812	0.000	0.030	0.000	0.833	1.050	4.8.2 ✓
L36	18.25 - 13.25 (36)	0.021	0.826	0.000	0.030	0.000	0.847	1.050	4.8.2 ✓
L37	13.25 - 8.25 (37)	0.021	0.839	0.000	0.029	0.000	0.861	1.050	4.8.2 ✓
L38	8.25 - 3.25 (38)	0.022	0.851	0.000	0.029	0.000	0.874	1.050	4.8.2 ✓
L39	3.25 - 0 (39)	0.022	0.859	0.000	0.029	0.000	0.882	1.050	4.8.2 ✓

<b>tnxTower</b>  <b>B+T Group</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 83609.010.01 - SCOVILLE HILL / HARWINTON ROD, CT (BU# 876376)	<b>Page</b> 44 of 44
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	<b>Client</b> Crown Castle	<b>Designed by</b> JD Prabhu

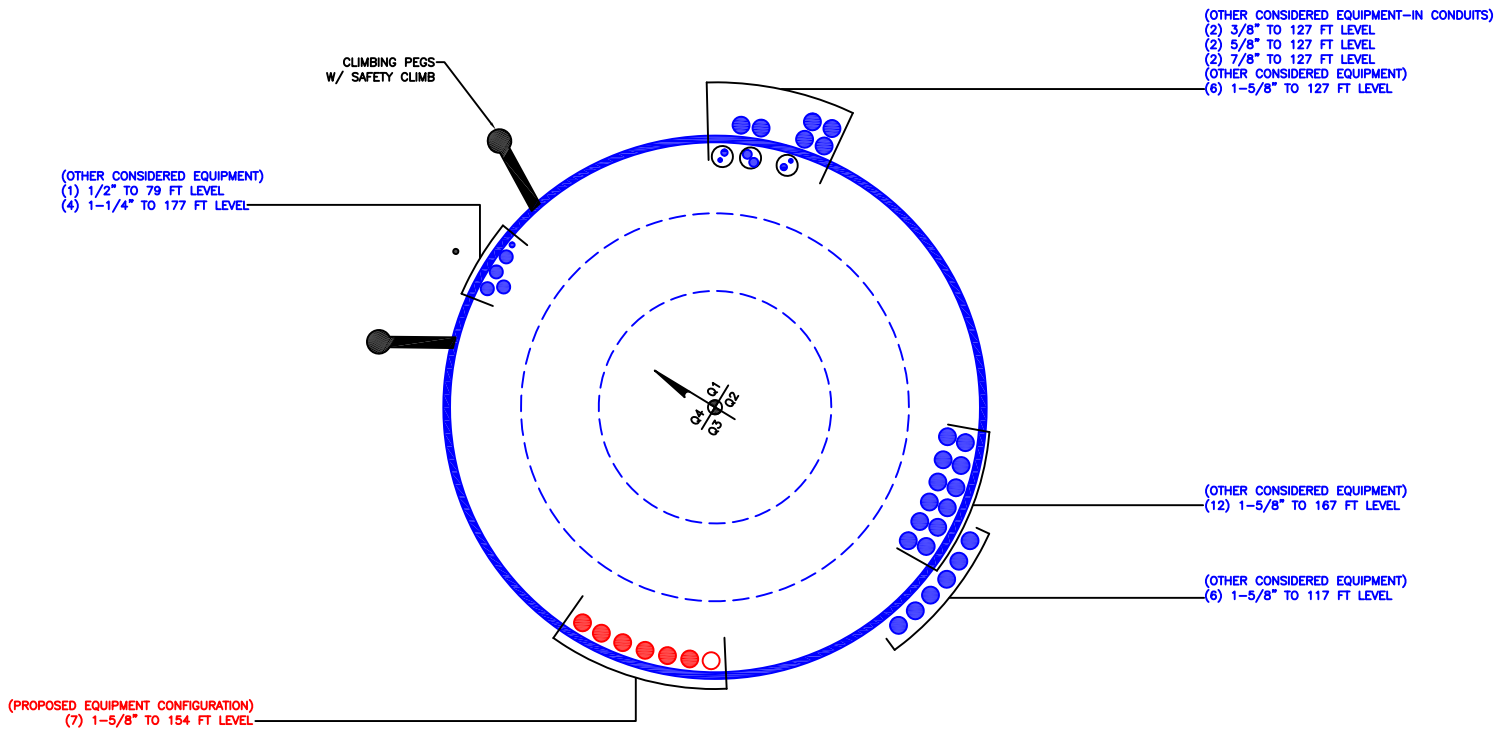
### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L1	177 - 172	Pole	TP22.875x22x0.219	1	-3.912	966.244	**	**	
L2	172 - 167	Pole	TP23.75x22.875x0.219	2	-4.227	1003.557	**	**	
L3	167 - 162	Pole	TP24.625x23.75x0.219	3	-6.007	1040.871	**	**	
L4	162 - 157	Pole	TP25.5x24.625x0.219	4	-6.411	1078.182	**	**	
L5	157 - 152	Pole	TP26.375x25.5x0.219	5	-9.939	1115.499	**	**	
L6	152 - 147	Pole	TP27.25x26.375x0.219	6	-10.432	1152.816	**	**	
L7	147 - 142	Pole	TP28.124x27.25x0.219	7	-10.945	1190.122	**	**	
L8	142 - 137	Pole	TP28.999x28.124x0.219	8	-11.478	1227.439	**	**	
L9	137 - 129.75	Pole	TP30.268x28.999x0.219	9	-11.861	1253.563	**	**	
L10	129.75 - 128.5	Pole	TP30.049x29.174x0.25	10	-12.770	1452.433	**	**	
L11	128.5 - 123.5	Pole	TP30.924x30.049x0.25	11	-16.785	1495.084	**	**	
L12	123.5 - 118.583	Pole	TP31.785x30.924x0.25	12	-17.538	1537.021	**	**	
L13	118.583 - 118.333	Pole	TP31.828x31.785x0.388	13	-17.597	2375.289	**	**	
L14	118.333 - 113.333	Pole	TP32.703x31.828x0.388	14	-18.773	2441.386	**	**	
L15	113.333 - 108.333	Pole	TP33.578x32.703x0.381	15	-20.076	2467.510	**	**	
L16	108.333 - 106.417	Pole	TP33.913x33.578x0.381	16	-20.769	2492.427	**	**	
L17	106.417 - 106.167	Pole	TP33.957x33.913x0.25	17	-20.860	1642.914	**	**	
L18	106.167 - 101.167	Pole	TP34.832x33.957x0.25	18	-22.481	1685.554	**	**	
L19	101.167 - 96.167	Pole	TP35.707x34.832x0.25	19	-25.050	1728.195	**	**	
L20	96.167 - 91.167	Pole	TP36.582x35.707x0.25	20	-26.693	1770.846	**	**	
L21	91.167 - 84	Pole	TP37.836x36.582x0.25	21	-27.494	1791.457	**	**	
L22	84 - 83.75	Pole	TP37.38x36.505x0.313	22	-29.826	2258.361	**	**	
L23	83.75 - 78.75	Pole	TP38.255x37.38x0.313	23	-33.718	2311.669	**	**	
L24	78.75 - 73.75	Pole	TP39.13x38.255x0.313	24	-35.673	2364.978	**	**	
L25	73.75 - 68.75	Pole	TP40.005x39.13x0.313	25	-37.658	2418.286	**	**	
L26	68.75 - 63.75	Pole	TP40.88x40.005x0.313	26	-39.688	2471.595	**	**	
L27	63.75 - 58.75	Pole	TP41.755x40.88x0.313	27	-44.201	2524.903	**	**	
L28	58.75 - 53.75	Pole	TP42.63x41.755x0.313	28	-46.283	2578.212	**	**	
L29	53.75 - 48.75	Pole	TP43.505x42.63x0.313	29	-48.388	2631.520	**	**	
L30	48.75 - 39.25	Pole	TP45.167x43.505x0.313	30	-50.761	2671.494	**	**	
L31	39.25 - 38.25	Pole	TP44.717x43.536x0.375	31	-56.514	3241.885	**	**	
L32	38.25 - 33.25	Pole	TP45.592x44.717x0.375	32	-58.837	3305.851	**	**	
L33	33.25 - 28.25	Pole	TP46.467x45.592x0.375	33	-61.185	3369.817	**	**	
L34	28.25 - 23.25	Pole	TP47.342x46.467x0.375	34	-63.556	3433.783	**	**	
L35	23.25 - 18.25	Pole	TP48.217x47.342x0.375	35	-68.463	3497.749	**	**	
L36	18.25 - 13.25	Pole	TP49.091x48.217x0.375	36	-70.988	3561.715	**	**	
L37	13.25 - 8.25	Pole	TP49.966x49.091x0.375	37	-73.536	3625.681	**	**	
L38	8.25 - 3.25	Pole	TP50.841x49.966x0.375	38	-76.108	3689.647	**	**	
L39	3.25 - 0	Pole	TP51.41x50.841x0.375	39	-77.790	3731.227	**	**	
							Summary		
							Pole (L30)	**	**
							<b>RATING =</b>	**	**

\*\* Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.



**APPENDIX B**  
**BASE LEVEL DRAWING**



BUSINESS UNIT: 876376

**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

**Pole Geometry**

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	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	177	47.25	3.75	18	22	30.268	0.21875	Auto	A607-65
2	133.5	49.5	4.75	18	29.17	37.836	0.25	Auto	A607-65
3	88.75	49.5	5.75	18	36.50	45.167	0.3125	Auto	A607-65
4	45	45	0	18	43.54	51.41	0.375	Auto	A607-65

**Reinforcement Configuration**

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number																														
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18												
1	106.417	118.583	channel	MP3-04 (1.1875in)	3	E4										E4																			
2																																			
3																																			
4																																			
5																																			
6																																			
7																																			
8																																			
9																																			
10																																			

**Reinforcement Details**

	B (in)	H (in)	Gross Area (in <sup>2</sup> )	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in <sup>2</sup> )	Bolt Hole Size (in)	Reinforcement Material
1	4.78	1.61	4.13	0.61	PC 8.8 - M20 (100)	17	PC 8.8 - M20 (100)	17.000	18.000	3.593	1.1875	A572-65

# TNX Geometry Input

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

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	177 - 172	5		18	22.000	22.875	0.21875	A607-65	1.000
2	172 - 167	5		18	22.875	23.750	0.21875	A607-65	1.000
3	167 - 162	5		18	23.750	24.625	0.21875	A607-65	1.000
4	162 - 157	5		18	24.625	25.500	0.21875	A607-65	1.000
5	157 - 152	5		18	25.500	26.375	0.21875	A607-65	1.000
6	152 - 147	5		18	26.375	27.250	0.21875	A607-65	1.000
7	147 - 142	5		18	27.250	28.124	0.21875	A607-65	1.000
8	142 - 137	5		18	28.124	28.999	0.21875	A607-65	1.000
9	137 - 133.5	7.25	3.75	18	28.999	30.268	0.21875	A607-65	1.000
10	133.5 - 128.5	5		18	29.174	30.049	0.25	A607-65	1.000
11	128.5 - 123.5	5		18	30.049	30.924	0.25	A607-65	1.000
12	123.5 - 118.583	4.917		18	30.924	31.785	0.25	A607-65	1.000
13	118.583 - 118.333	0.25		18	31.785	31.828	0.3875	A607-65	0.968
14	118.333 - 113.333	5		18	31.828	32.703	0.3875	A607-65	0.960
15	113.333 - 108.333	5		18	32.703	33.578	0.38125	A607-65	0.967
16	108.333 - 106.417	1.916		18	33.578	33.913	0.38125	A607-65	0.964
17	106.417 - 106.167	0.25		18	33.913	33.957	0.25	A607-65	1.000
18	106.167 - 101.167	5		18	33.957	34.832	0.25	A607-65	1.000
19	101.167 - 96.167	5		18	34.832	35.707	0.25	A607-65	1.000
20	96.167 - 91.167	5		18	35.707	36.582	0.25	A607-65	1.000
21	91.167 - 88.75	7.167	4.75	18	36.582	37.836	0.25	A607-65	1.000
22	88.75 - 83.75	5		18	36.505	37.380	0.3125	A607-65	1.000
23	83.75 - 78.75	5		18	37.380	38.255	0.3125	A607-65	1.000
24	78.75 - 73.75	5		18	38.255	39.130	0.3125	A607-65	1.000
25	73.75 - 68.75	5		18	39.130	40.005	0.3125	A607-65	1.000
26	68.75 - 63.75	5		18	40.005	40.880	0.3125	A607-65	1.000
27	63.75 - 58.75	5		18	40.880	41.755	0.3125	A607-65	1.000
28	58.75 - 53.75	5		18	41.755	42.630	0.3125	A607-65	1.000
29	53.75 - 48.75	5		18	42.630	43.505	0.3125	A607-65	1.000
30	48.75 - 45	9.5	5.75	18	43.505	45.167	0.3125	A607-65	1.000
31	45 - 38.25	6.75		18	43.536	44.717	0.375	A607-65	1.000
32	38.25 - 33.25	5		18	44.717	45.592	0.375	A607-65	1.000
33	33.25 - 28.25	5		18	45.592	46.467	0.375	A607-65	1.000
34	28.25 - 23.25	5		18	46.467	47.342	0.375	A607-65	1.000
35	23.25 - 18.25	5		18	47.342	48.217	0.375	A607-65	1.000
36	18.25 - 13.25	5		18	48.217	49.091	0.375	A607-65	1.000
37	13.25 - 8.25	5		18	49.091	49.966	0.375	A607-65	1.000
38	8.25 - 3.25	5		18	49.966	50.841	0.375	A607-65	1.000
39	3.25 - 0	3.25		18	50.841	51.410	0.375	A607-65	1.000

## TNX Section Forces

Increment (ft):		TNX Output			
	5	Section Height (ft)	P <sub>u</sub> (K)	M <sub>ux</sub> (kip-ft)	V <sub>u</sub> (K)
1	177 - 172		3.91	21.50	4.00
2	172 - 167		4.23	42.35	4.34
3	167 - 162		6.01	75.50	6.51
4	162 - 157		6.41	108.95	6.87
5	157 - 152		9.94	158.87	11.54
6	152 - 147		10.43	217.47	11.90
7	147 - 142		10.94	277.87	12.27
8	142 - 137		11.48	340.07	12.63
9	137 - 133.5		11.86	384.69	12.88
10	133.5 - 128.5		12.77	450.17	13.31
11	128.5 - 123.5		16.78	535.69	17.32
12	123.5 - 118.583		17.54	621.70	17.67
13	118.583 - 118.333		17.60	626.12	17.69
14	118.333 - 113.333		18.77	716.76	18.42
15	113.333 - 108.333		20.08	809.93	18.85
16	108.333 - 106.417		20.77	846.25	19.06
17	106.417 - 106.167		20.86	851.02	19.08
18	106.167 - 101.167		22.48	947.48	19.51
19	101.167 - 96.167		25.05	1047.24	21.11
20	96.167 - 91.167		26.69	1154.70	21.90
21	91.167 - 88.75		27.49	1208.05	22.28
22	88.75 - 83.75		29.83	1321.65	23.19
23	83.75 - 78.75		33.72	1439.86	24.24
24	78.75 - 73.75		35.67	1562.86	25.00
25	73.75 - 68.75		37.66	1689.60	25.74
26	68.75 - 63.75		39.69	1819.21	26.15
27	63.75 - 58.75		44.20	1952.02	27.01
28	58.75 - 53.75		46.28	2087.83	27.36
29	53.75 - 48.75		48.39	2225.30	27.68
30	48.75 - 45		50.76	2329.47	27.94
31	45 - 38.25		56.51	2520.24	28.67
32	38.25 - 33.25		58.84	2664.05	28.91
33	33.25 - 28.25		61.18	2809.02	29.13
34	28.25 - 23.25		63.56	2955.01	29.33
35	23.25 - 18.25		68.46	3102.85	29.87
36	18.25 - 13.25		70.99	3252.44	30.03
37	13.25 - 8.25		73.54	3402.79	30.18
38	8.25 - 3.25		76.11	3553.84	30.31
39	3.25 - 0		77.79	3652.35	30.39

## Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
177 - 172	Pole	TP22.875x22x0.2188	Pole	4.3%	Pass
172 - 167	Pole	TP23.75x22.875x0.2188	Pole	7.5%	Pass
167 - 162	Pole	TP24.625x23.75x0.2188	Pole	12.5%	Pass
162 - 157	Pole	TP25.5x24.625x0.2188	Pole	16.8%	Pass
157 - 152	Pole	TP26.375x25.5x0.2188	Pole	23.2%	Pass
152 - 147	Pole	TP27.25x26.375x0.2188	Pole	29.8%	Pass
147 - 142	Pole	TP28.124x27.25x0.2188	Pole	35.9%	Pass
142 - 137	Pole	TP28.999x28.124x0.2188	Pole	41.6%	Pass
137 - 133.5	Pole	TP30.268x28.999x0.2188	Pole	45.4%	Pass
133.5 - 128.5	Pole	TP30.049x29.174x0.25	Pole	43.4%	Pass
128.5 - 123.5	Pole	TP30.924x30.049x0.25	Pole	49.4%	Pass
123.5 - 118.58	Pole	TP31.785x30.924x0.25	Pole	54.6%	Pass
118.58 - 118.33	Pole + Reinf.	TP31.828x31.785x0.3875	Reinf. 1 Tension Rupture	49.5%	Pass
118.33 - 113.33	Pole + Reinf.	TP32.703x31.828x0.3875	Reinf. 1 Tension Rupture	54.1%	Pass
113.33 - 108.33	Pole + Reinf.	TP33.578x32.703x0.3813	Reinf. 1 Tension Rupture	58.4%	Pass
108.33 - 106.42	Pole + Reinf.	TP33.913x33.578x0.3813	Reinf. 1 Tension Rupture	60.0%	Pass
106.42 - 106.17	Pole	TP33.957x33.913x0.25	Pole	66.8%	Pass
106.17 - 101.17	Pole	TP34.832x33.957x0.25	Pole	71.3%	Pass
101.17 - 96.17	Pole	TP35.707x34.832x0.25	Pole	75.7%	Pass
96.17 - 91.17	Pole	TP36.582x35.707x0.25	Pole	80.3%	Pass
91.17 - 88.75	Pole	TP37.836x36.582x0.25	Pole	82.4%	Pass
88.75 - 83.75	Pole	TP37.38x36.505x0.3125	Pole	65.7%	Pass
83.75 - 78.75	Pole	TP38.255x37.38x0.3125	Pole	68.9%	Pass
78.75 - 73.75	Pole	TP39.13x38.255x0.3125	Pole	72.0%	Pass
73.75 - 68.75	Pole	TP40.005x39.13x0.3125	Pole	75.0%	Pass
68.75 - 63.75	Pole	TP40.88x40.005x0.3125	Pole	77.8%	Pass
63.75 - 58.75	Pole	TP41.755x40.88x0.3125	Pole	80.7%	Pass
58.75 - 53.75	Pole	TP42.63x41.755x0.3125	Pole	83.4%	Pass
53.75 - 48.75	Pole	TP43.505x42.63x0.3125	Pole	86.0%	Pass
48.75 - 45	Pole	TP45.167x43.505x0.3125	Pole	87.9%	Pass
45 - 38.25	Pole	TP44.717x43.536x0.375	Pole	73.2%	Pass
38.25 - 33.25	Pole	TP45.592x44.717x0.375	Pole	74.8%	Pass
33.25 - 28.25	Pole	TP46.467x45.592x0.375	Pole	76.4%	Pass
28.25 - 23.25	Pole	TP47.342x46.467x0.375	Pole	77.9%	Pass
23.25 - 18.25	Pole	TP48.217x47.342x0.375	Pole	79.4%	Pass
18.25 - 13.25	Pole	TP49.091x48.217x0.375	Pole	80.7%	Pass
13.25 - 8.25	Pole	TP49.966x49.091x0.375	Pole	82.0%	Pass
8.25 - 3.25	Pole	TP50.841x49.966x0.375	Pole	83.2%	Pass
3.25 - 0	Pole	TP51.41x50.841x0.375	Pole	84.0%	Pass
				Summary	
			Pole	87.9%	Pass
			Reinforcement	60.0%	Pass
			Overall	87.9%	Pass

## Additional Calculations

Section Elevation (ft)	Moment of Inertia (in <sup>4</sup> )			Area (in <sup>2</sup> )			% Capacity*	
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1
177 - 172	1020	n/a	1020	15.73	n/a	15.73	4.3%	
172 - 167	1143	n/a	1143	16.34	n/a	16.34	7.5%	
167 - 162	1275	n/a	1275	16.94	n/a	16.94	12.5%	
162 - 157	1417	n/a	1417	17.55	n/a	17.55	16.8%	
157 - 152	1569	n/a	1569	18.16	n/a	18.16	23.2%	
152 - 147	1732	n/a	1732	18.77	n/a	18.77	29.8%	
147 - 142	1906	n/a	1906	19.37	n/a	19.37	35.9%	
142 - 137	2090	n/a	2090	19.98	n/a	19.98	41.6%	
137 - 133.5	2227	n/a	2227	20.41	n/a	20.41	45.4%	
133.5 - 128.5	2652	n/a	2652	23.64	n/a	23.64	43.4%	
128.5 - 123.5	2892	n/a	2892	24.34	n/a	24.34	49.4%	
123.5 - 118.58	3143	n/a	3143	25.02	n/a	25.02	54.6%	
118.58 - 118.33	3156	1698	4854	25.06	12.39	37.45	35.1%	49.5%
118.33 - 113.33	3425	1789	5214	25.75	12.39	38.14	38.8%	54.1%
113.33 - 108.33	3710	1882	5592	26.44	12.39	38.83	42.3%	58.4%
108.33 - 106.42	3823	1918	5741	26.71	12.39	39.10	43.7%	60.0%
106.42 - 106.17	3838	n/a	3838	26.75	n/a	26.75	66.8%	
106.17 - 101.17	4145	n/a	4145	27.44	n/a	27.44	71.3%	
101.17 - 96.17	4467	n/a	4467	28.13	n/a	28.13	75.7%	
96.17 - 91.17	4806	n/a	4806	28.83	n/a	28.83	80.3%	
91.17 - 88.75	4976	n/a	4976	29.16	n/a	29.16	82.4%	
88.75 - 83.75	6380	n/a	6380	36.76	n/a	36.76	65.7%	
83.75 - 78.75	6842	n/a	6842	37.63	n/a	37.63	68.9%	
78.75 - 73.75	7327	n/a	7327	38.50	n/a	38.50	72.0%	
73.75 - 68.75	7833	n/a	7833	39.37	n/a	39.37	75.0%	
68.75 - 63.75	8363	n/a	8363	40.24	n/a	40.24	77.8%	
63.75 - 58.75	8916	n/a	8916	41.10	n/a	41.10	80.7%	
58.75 - 53.75	9493	n/a	9493	41.97	n/a	41.97	83.4%	
53.75 - 48.75	10094	n/a	10094	42.84	n/a	42.84	86.0%	
48.75 - 45	10561	n/a	10561	43.49	n/a	43.49	87.9%	
45 - 38.25	13106	n/a	13106	52.78	n/a	52.78	73.2%	
38.25 - 33.25	13897	n/a	13897	53.82	n/a	53.82	74.8%	
33.25 - 28.25	14719	n/a	14719	54.86	n/a	54.86	76.4%	
28.25 - 23.25	15574	n/a	15574	55.90	n/a	55.90	77.9%	
23.25 - 18.25	16460	n/a	16460	56.94	n/a	56.94	79.4%	
18.25 - 13.25	17380	n/a	17380	57.98	n/a	57.98	80.7%	
13.25 - 8.25	18333	n/a	18333	59.02	n/a	59.02	82.0%	
8.25 - 3.25	19321	n/a	19321	60.07	n/a	60.07	83.2%	
3.25 - 0	19981	n/a	19981	60.74	n/a	60.74	84.0%	

Note: Section capacity checked using 5 degree increments.

Rating per TIA-222-H Section 15.5.



PROJECT **83609.010.01 - SCOVILLE HILL /HARWINTON ROD, CT**

SUBJECT **Anchor Rod Bracket Analysis**

DATE **05/08/21**

TIA-222 Rev.

H

v4.6.1

Apply TIA-222-H Section 15.5?

Yes



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

Analysis Criteria	
Design/Analysis	Analysis
Load Type	Current Load
Current load	111.12 kips
AR Capacity	276.4 kips

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

Manufacturers Tower Prop.	
Pole Thickness	0.375 in
Pole Grade	A572-65
Fy	65 ksi
Fu	80 ksi
Base Plate Gr.	Custom
Fy	55 ksi
Fu	70 ksi

Post-Installed Adhesive AR Mod.	
ARB Type	Welded
Size	1.75 in
Grade	'22-150 (William
Fy	127.7 ksi
Fu	150 ksi

Anchor Rod Bracket Analysis Checks		
Tube Bearing	28.7%	-
Tube Compression	43.0%	-
Gusset Shear	22.4%	-
Gusset Flexure	N/A	-
Welds	Gusset to Tower and BP	32.4%
	Gusset to Tube	22.7%
	Geometry	N/A
Tower Punching	20.3%	-
Tube Punching	28.7%	-
<b>Utilization</b>		<b>43.0%</b>

Bracket Properties		
Gusset	Pipe/Tube	Weld - Gusset to Pipe/Tube
Thickness	1.25 in	FEXX
Width at Tube	6 in	70 ksi
Height at Pole	30 in	Weld Type
Height at Tube	10.5 in	CJP - Double Bevel
Grade	A572-65	Fillet Size
Fy	65 ksi	3/8 in
Fu	80 ksi	Bevel Depth
		3/8 in
Weld - Gusset to Tower	Weld - Gusset to Base Plate	
FEXX	70 ksi	FEXX
70 ksi		70 ksi
Weld Type	Double Fillet	Weld Type
Double Fillet		CJP - Double Bevel
Fillet Size	3/8 in	Fillet Size
3/8 in		1/2 in
		Bevel Depth
		1/2 in
		Gap
		0 in
		Notch (horiz)
		0.75 in
		Notch (vert)
		0.75 in
		Pipe/Tube Welded to
		Base/Footpad?
		Yes
		Fillet Size
		1/2 in

# Monopole Base Plate Connection

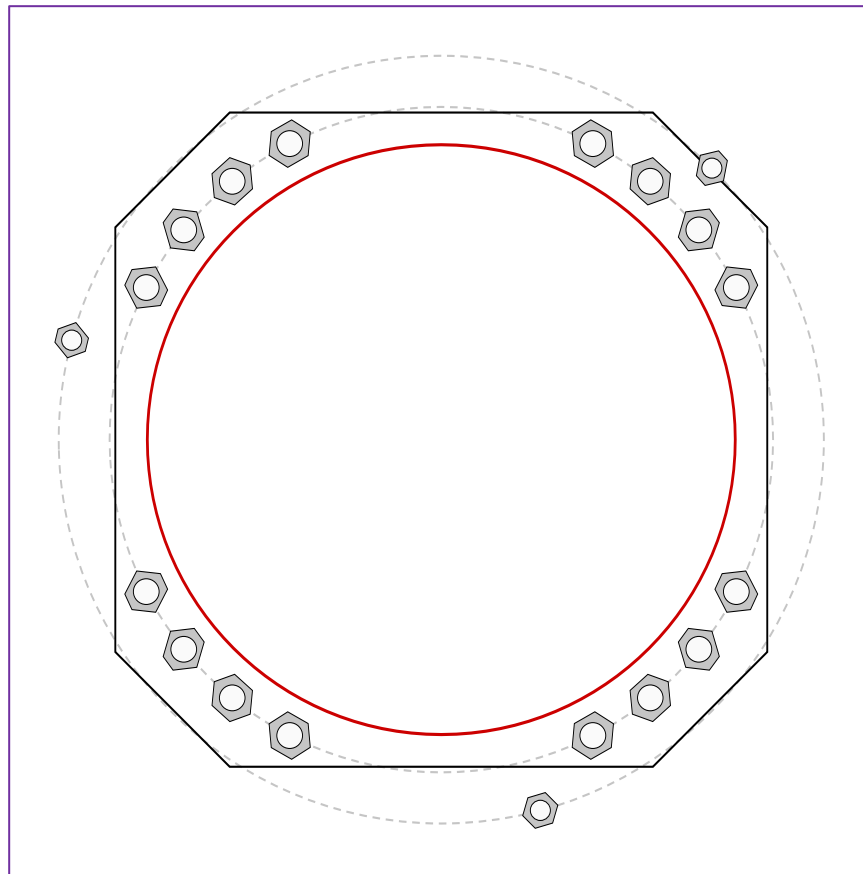


Site Info	
BU #	876376
Site Name	LE HILL /HARWINTON #
Order #	552650, Rev# 0

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

Applied Loads	
Moment (kip-ft)	3652.35
Axial Force (kips)	77.79
Shear Force (kips)	30.39

\*TIA-222-H Section 15.5 Applied



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

Anchor Rod Data
GROUP 1: (16) 2-1/4" $\phi$ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 58" BC <i>Anchor Spacing: 6 in</i>
GROUP 2: (3) 1-3/4" $\phi$ bolts (A722 N; $F_y=127.7$ ksi, $F_u=125$ ksi) on 66.91" BC
Base Plate Data
57" W x 2.75" Plate (A572-55; $F_y=55$ ksi, $F_u=70$ ksi); Clip: 10 in
Stiffener Data
N/A
Pole Data
51.41" x 0.375" 18-sided pole (A607-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary <span style="float: right;">(units of kips, kip-in)</span>		
GROUP 1:		
$P_{u,t} = 159.89$	$\phi P_{n,t} = 243.75$	<b>Stress Rating</b>
$V_u = 1.9$	$\phi V_n = 149.1$	<b>62.5%</b>
$M_u = n/a$	$\phi M_n = n/a$	<b>Pass</b>
GROUP 2:		
$P_{u,t} = 111.12$	$\phi P_{n,t} = 178.13$	<b>Stress Rating</b>
$V_u = 0$	$\phi V_n = 112.75$	<b>59.4%</b>
$M_u = n/a$	$\phi M_n = n/a$	<b>Pass</b>
Base Plate Summary		
Max Stress (ksi):	30.35	(Flexural)
Allowable Stress (ksi):	49.5	
Stress Rating:	<b>58.4%</b>	<b>Pass</b>

# CCIplate

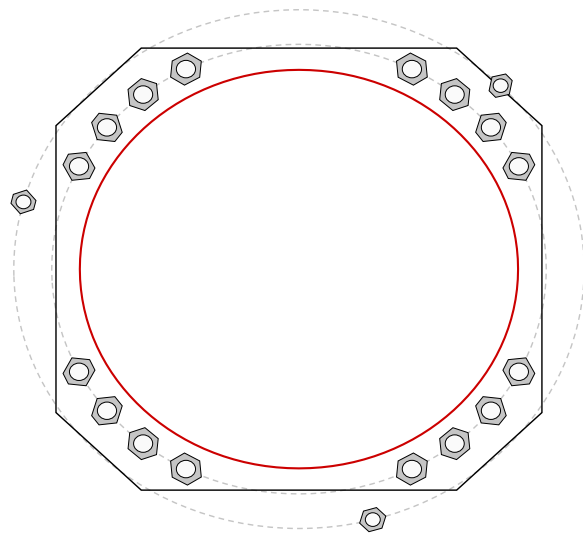
Elevation (ft) 0 (Base)

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

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

Custom Bolt Connection										
Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, $\eta$ :	$I_{ar}$ (in):	Thread Type	Area Override, in <sup>2</sup>	Tension Only
1	1	27.186683	2.25	A615-75	58	0.5	0	N-Included		No
2	1	39.062228	2.25	A615-75	58	0.5	0	N-Included		No
3	1	50.937772	2.25	A615-75	58	0.5	0	N-Included		No
4	1	62.813317	2.25	A615-75	58	0.5	0	N-Included		No
5	1	117.18668	2.25	A615-75	58	0.5	0	N-Included		No
6	1	129.06223	2.25	A615-75	58	0.5	0	N-Included		No
7	1	140.93777	2.25	A615-75	58	0.5	0	N-Included		No
8	1	152.81332	2.25	A615-75	58	0.5	0	N-Included		No
9	1	207.18668	2.25	A615-75	58	0.5	0	N-Included		No
10	1	219.06223	2.25	A615-75	58	0.5	0	N-Included		No
11	1	230.93777	2.25	A615-75	58	0.5	0	N-Included		No
12	1	242.81332	2.25	A615-75	58	0.5	0	N-Included		No
13	1	297.18668	2.25	A615-75	58	0.5	0	N-Included		No
14	1	309.06223	2.25	A615-75	58	0.5	0	N-Included		No
15	1	320.93777	2.25	A615-75	58	0.5	0	N-Included		No
16	1	332.81332	2.25	A615-75	58	0.5	0	N-Included		No
17	2	45	1.75	A722	66.91	0.5	0	N-Included		No
18	2	165	1.75	A722	66.91	0.5	0	N-Included		No
19	2	285	1.75	A722	66.91	0.5	0	N-Included		No

## Plot Graphic




www.hilti.com

Company:	B+T grp	Page:	1
Address:	1717 S.Boulder, Suite 300	Specifier:	Manish
Phone   Fax:	83609_010_01_SCOVILLE HILL /	E-Mail:	
Design:	HARWINTON ROD, CT	Date:	5/9/2021
Fastening point:			

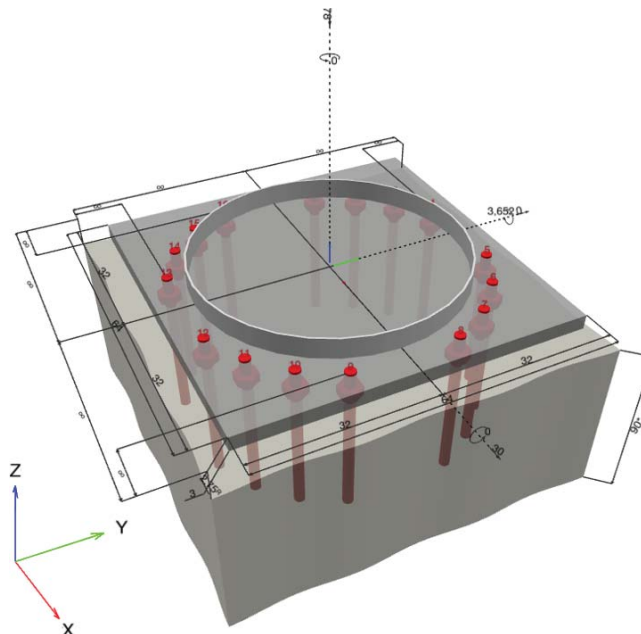
Specifier's comments:

## 1 Input data

<b>Anchor type and diameter:</b>	<b>Heavy Hex Head 2.25" dia Anchor Rods</b>	
Item number:	not available	
Effective embedment depth:	$h_{ef} = 84\text{in}$	
Material:	ASTM F 1554	
Evaluation Service Report:	Hilti Technical Data	
Issued   Valid:	-   -	
Proof:	Design Method ACI 318-08 / CIP	
Stand-off installation:	without clamping (anchor); restraint level (anchor plate): 1.00; $e_b = 3.000\text{ in.}$ ; $t = 2.750\text{ in.}$	
Anchor plate <sup>R</sup> :	$l_x \times l_y \times t = 57\text{in} \times 57\text{in} \times 2.750\text{ in.}$ ; (Recommended plate thickness: not calculated)	
Profile:	Steel pipe, ; (L x W x T) = 51.410 in. x 51.410 in. x 0.375 in.	
Base material:	cracked concrete, 3000, $f'_c = 3,000\text{ psi}$ ; $h = 90.000\text{ in.}$	
Reinforcement:	tension: condition B, shear: condition B; edge reinforcement: none or < No. 4 bar	
Seismic loads (cat. C, D, E, or F)	no	

<sup>R</sup> - The anchor calculation is based on a rigid anchor plate assumption.

### Geometry [in.] & Loading [kip, ft.kip]





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Company:	B+T grp	Page:	2
Address:	1717 S.Boulder, Suite 300	Specifier:	Manish
Phone   Fax:	83609_010_01_SCOVILLE HILL / HARWINTON ROD, CT	E-Mail:	
Design:		Date:	5/9/2021
Fastening point:			

1.1 Design results

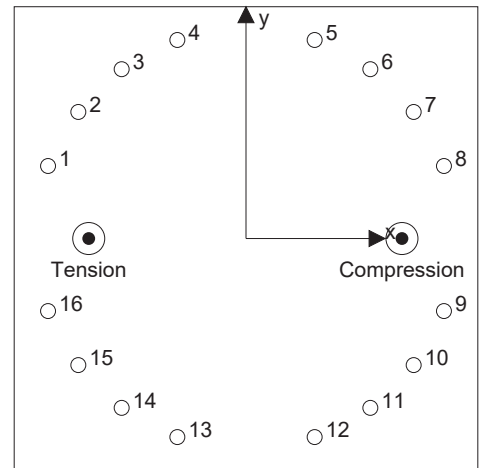
Case	Description	Forces [kip] / Moments [ft.kip]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = -78.000; V <sub>x</sub> = 30.000; V <sub>y</sub> = 0.000; M <sub>x</sub> = 0.00000; M <sub>y</sub> = 3,652.00000; M <sub>z</sub> = 0.00000;	no	408

2 Load case/Resulting anchor forces

Anchor reactions [kip]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	174.734	1.875	1.875	0.000
2	147.261	1.875	1.875	0.000
3	107.940	1.875	1.875	0.000
4	57.415	1.875	1.875	0.000
5	-67.166	1.875	1.875	-0.000
6	-117.691	1.875	1.875	-0.000
7	-157.009	1.875	1.875	-0.000
8	-184.484	1.875	1.875	-0.000
9	-184.483	1.875	1.875	-0.000
10	-157.009	1.875	1.875	-0.000
11	-117.691	1.875	1.875	-0.000
12	-67.165	1.875	1.875	-0.000
13	57.415	1.875	1.875	0.000
14	107.940	1.875	1.875	0.000
15	147.259	1.875	1.875	0.000
16	174.733	1.875	1.875	0.000



max. concrete compressive strain: - [‰]  
 max. concrete compressive stress: - [ksi]  
 resulting tension force in (x/y)=(-21.709/0.000): 974.698 [kip]  
 resulting compression force in (x/y)=(21.529/0.000): 1,052.698 [kip]

Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

	Load N <sub>ua</sub> [kip]	Capacity $\phi N_n$ [kip]	Utilization $\beta_N = N_{ua} / \phi N_n$	Status
Steel Strength*	-184.484	243.75	75.68%	OK
Concrete Breakout Failure**	974.698	1495.661	65.17%	not recommended
Concrete Side-Face Blowout, direction **	N/A	N/A	N/A	N/A

\* highest loaded anchor \*\*anchor group (anchors in tension)

Governing Rating:  
 75.68/1.05  
 = 72.07%

Input data and results must be checked for conformity with the existing conditions and for pl...  
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Company:	B+T grp	Page:	3
Address:	1717 S.Boulder, Suite 300	Specifier:	Manish
Phone   Fax:	83609_010_01_SCOVILLE HILL / HARWINTON ROD, CT	E-Mail:	
Design:		Date:	5/9/2021
Fastening point:			

3.1 Steel Strength

$$N_{sa} = A_{se,N} f_{uta} \quad \text{ACI 318-08 Eq. (D-3)}$$

$$\phi N_{sa} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

Variables

$A_{se,N}$ [in. <sup>2</sup> ]	$f_{uta}$ [ksi]
3.25	100

Calculations

$N_{sa}$ [kip]
325

Results

$N_{sa}$ [kip]	$\phi_{steel}$	$\phi N_{sa}$ [kip]	$N_{ua}$ [kip]
325	0.750	243.75	-184.484

The steel proof was done for the highest absolute force per anchor - in this case compression loading. Please be aware that buckling should be verified separately

**www.hilti.com**

Company:	B+T grp	Page:	4
Address:	1717 S.Boulder, Suite 300	Specifier:	Manish
Phone   Fax:		E-Mail:	
Design:	<b>83609_010_01_SCOVILLE HILL /</b>	Date:	5/9/2021
Fastening point:	<b>HARWINTON ROD, CT</b>		

**3.3 Concrete Breakout Failure**

$$N_{cbg} = \left( \frac{A_{Nc}}{A_{Nc0}} \right) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b \quad \text{ACI 318-08 Eq. (D-5)}$$

$$\phi N_{cbg} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

 $A_{Nc}$  see ACI 318-08, Part D.5.2.1, Fig. RD.5.2.1(b)

$$A_{Nc0} = 9 h_{ef}^2 \quad \text{ACI 318-08 Eq. (D-6)}$$

$$\Psi_{ec,N} = \left( \frac{1}{1 + \frac{2 e_N}{3 h_{ef}}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-9)}$$

$$\Psi_{ed,N} = 0.7 + 0.3 \left( \frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-11)}$$

$$\Psi_{cp,N} = \text{MAX} \left( \frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-13)}$$

$$N_b = 16 \lambda \sqrt{f_c} h_{ef}^{5/3} \quad \text{ACI 318-08 Eq. (D-8)}$$

**Variables**

$h_{ef}$ [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]	$\Psi_{c,N}$
<b>84</b>	2.431	0.000	$\infty$	1.000
$c_{ac}$ [in.]	$k_c$	$\lambda$	$f_c$ [psi]	
-	16	1	3,000	

**Calculations**

$A_{Nc}$ [in. <sup>2</sup> ]	$A_{Nc0}$ [in. <sup>2</sup> ]	$\Psi_{ec1,N}$	$\Psi_{ec2,N}$	$\Psi_{ed,N}$	$\Psi_{cp,N}$	$N_b$ [kip]
<b>96100</b>	<b>63504</b>	<b>1</b>	1.000	1.000	1.000	<b>1411.929</b>

**Results**

$N_{cbg}$ [kip]	$\phi_{concrete}$	$\phi N_{cbg}$ [kip]	$N_{ua}$ [kip]
<b>2136.659</b>	0.700	<b>1495.661</b>	974.698

# Pier and Pad Foundation



**BU #:** 876376  
**Site Name:** SCOVILLE HILL /H  
**App. Number:** 552650, Rev. 0

**TIA-222 Revision:** H  
**Tower Type:** Monopole

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

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	78	kips
Base Shear, $Vu_{comp}$ :	30	kips
Moment, $M_u$ :	3652	ft-kips
Tower Height, $H$ :	177	ft
BP Dist. Above Fdn, $bp_{dist}$ :	3.75	in
Bolt Circle / Bearing Plate Width, $BC$ :	58	in

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
<i>Lateral (Sliding) (kips)</i>	204.88	30.00	<b>13.9%</b>	<b>Pass</b>
<i>Bearing Pressure (ksf)</i>	30.00	5.18	<b>17.3%</b>	<b>Pass</b>
<i>Overturning (kip*ft)</i>	4554.82	3781.38	<b>83.0%</b>	<b>Pass</b>
<i>Pad Flexure (kip*ft)</i>	4945.31	2217.04	<b>42.7%</b>	<b>Pass</b>
<i>Pad Shear - 1-way (kips)</i>	1046.09	294.44	<b>26.8%</b>	<b>Pass</b>
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.164	0.000	<b>0.0%</b>	<b>Pass</b>
<i>Flexural 2-way (Comp) (kip*ft)</i>	7561.23	0.00	<b>0.0%</b>	<b>Pass</b>

\*Rating per TIA-222-H Section 15.5

Soil Rating*:	<b>83.0%</b>
Structural Rating*:	<b>42.7%</b>

Pad Properties		
Depth, $D$ :	3.5	ft
Pad Width, $W_1$ :	24.5	ft
Pad Thickness, $T$ :	4	ft
Pad Rebar Size (Bottom dir. 2), $Sp_2$ :	9	
Pad Rebar Quantity (Bottom dir. 2), $mp_2$ :	26	
Pad Clear Cover, $cc_{pad}$ :	3	in

Material Properties		
Rebar Grade, $F_y$ :	60	ksi
Concrete Compressive Strength, $F'_c$ :	3	ksi
Dry Concrete Density, $\delta_c$ :	150	pcf

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	125	pcf
Ultimate Gross Bearing, $Q_{ult}$ :	40.000	ksf
Cohesion, $C_u$ :	0.000	ksf
Friction Angle, $\phi$ :	30	degrees
SPT Blow Count, $N_{blows}$ :		
Base Friction, $\mu$ :	0.7	
Neglected Depth, $N$ :	3.33	ft
Foundation Bearing on Rock?	Yes	
Groundwater Depth, $gw$ :	N/A	ft

<--Toggle between Gross and Net

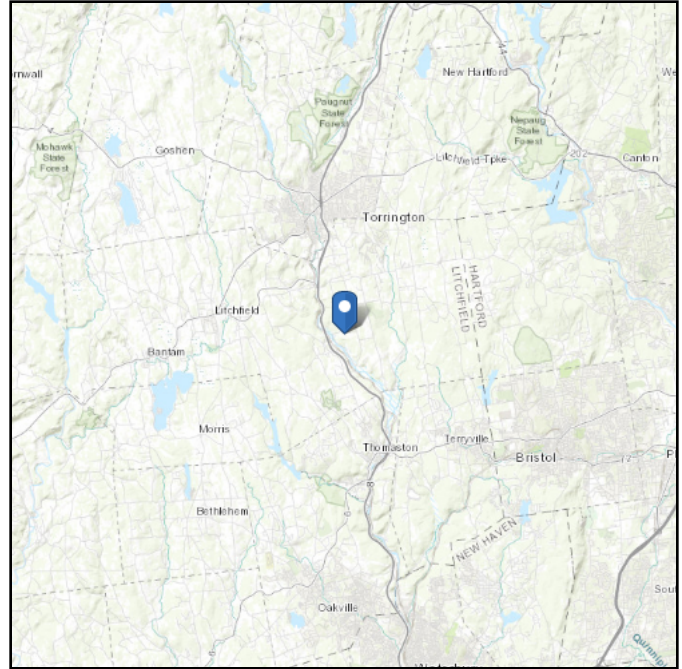


# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

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

**Elevation:** 734.96 ft (NAVD 88)  
**Latitude:** 41.736778  
**Longitude:** -73.097056

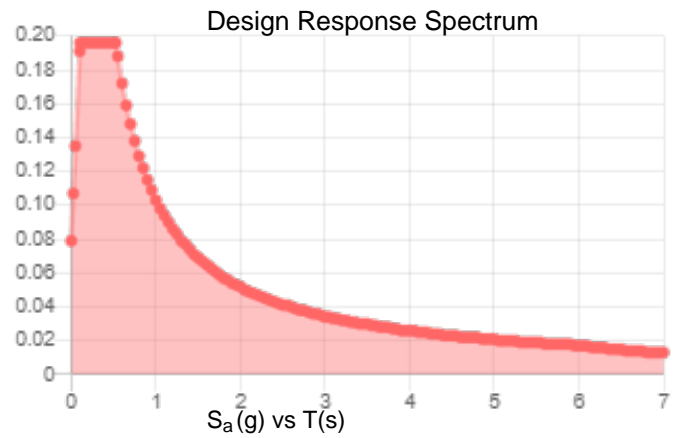
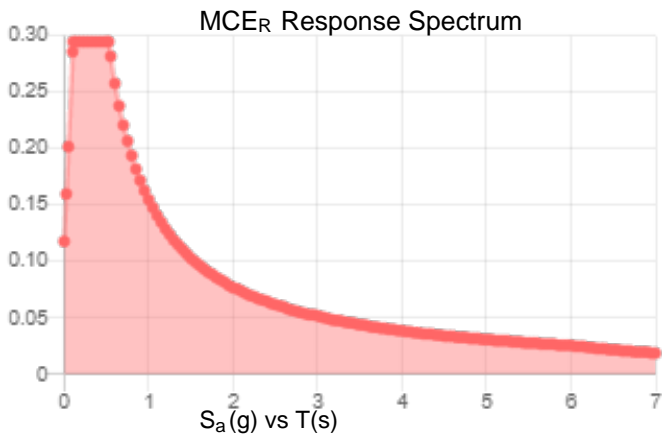


**Site Soil Class:** D - Stiff Soil

**Results:**

$S_S$ :	0.184	$S_{DS}$ :	0.196
$S_1$ :	0.065	$S_{D1}$ :	0.103
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.093
$S_{MS}$ :	0.295	PGA <sub>M</sub> :	0.15
$S_{M1}$ :	0.155	F <sub>PGA</sub> :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Wed Apr 28 2021

**Date Source:**

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

## Ice

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**Results:**

Ice Thickness: 0.75 in.

Concurrent Temperature: 5 F

Gust Speed: 50 mph

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

**Date Accessed:** Wed Apr 28 2021

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

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

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

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# Exhibit E

## **Mount Analysis**



Maser Consulting Connecticut  
2000 Midlantic Drive, Suite 100  
Mt. Laurel, NJ 08054  
(856) 797-0412  
peter.albano@colliersengineering.com

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## Post-Mod Antenna Mount Analysis Report and PMI Requirements

Mount Fix

SMART Tool Project #: 10061734  
Maser Consulting Connecticut Project #: 21777069A

May 6, 2021

### Site Information

Site ID: 468296-VZW / HARWINTON W CT  
Site Name: HARWINTON W CT  
Carrier Name: Verizon Wireless  
Address: 123 Campville Rd  
Harwinton, Connecticut 06791  
Litchfield County  
Latitude: 41.736678°  
Longitude: -73.097033°

### Structure Information

Tower Type: Monopole  
Mount Type: 13.08-Ft Platform

FUZE ID # 16271950

### Analysis Results

Platform: 72.0% Pass

### \*\*\*Contractor PMI Requirements:

*Included at the end of this MA report*

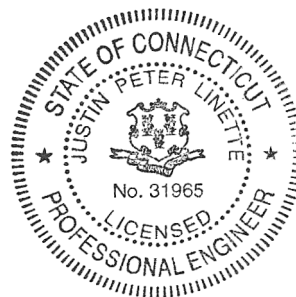
*Available & Submitted via portal at <https://pmi.vzwsmart.com>*

*Contractor - Please Review Specific Site PMI Requirements Upon Award*

*Requirements also Noted on Mount Modification Drawings*

*Requirements may also be Noted on A & E drawings*

Report Prepared By: Selene Chen



**Executive Summary:**

The objective of this report is to summarize the analysis results of the antenna support mount including the proposed modifications at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

This analysis is inclusive of the mount structure only and does not address the structural capacity of the supporting structure. This mounting frame was not analyzed as an anchor attachment point for fall protection. All climbing activities are required to have a fall protection plan completed by a competent person.

**Sources of Information:**

Document Type	Remarks
Radio Frequency Data Sheet (RFDS)	Verizon RFDS, Site ID: 324071, dated January 7, 2021
Mount Mapping Report	Level-Up Towers, Site ID: 468296, dated February 24, 2021
Mount Analysis Report	Maser Consulting Connecticut, Project #: 21777069A, dated April 1, 2021
Mount Modification Drawings	Maser Consulting Connecticut, Project #: 21777069A, dated May 6, 2021

**Analysis Criteria:**

Codes and Standards:	ANSI/TIA-222-H
Wind Parameters:	Basic Wind Speed (Ultimate 3-sec. Gust), $V_{ULT}$ : 115 mph Ice Wind Speed (3-sec. Gust): 50 mph Design Ice Thickness: 1.00 in Risk Category: II Exposure Category: B Topographic Category: 1 Topographic Feature Considered: N/A Topographic Method: N/A Ground Elevation Factor, $K_e$ : 0.974
Seismic Parameters:	$S_s$ : 0.179 $S_1$ : 0.054
Maintenance Parameters:	Wind Speed (3-sec. Gust): 30 mph Maintenance Live Load, $L_v$ : 250 lbs. Maintenance Live Load, $L_m$ : 500 lbs.
Analysis Software:	RISA-3D (V17)

**Final Loading Configuration:**

The following equipment has been considered for the analysis of the mount:

Mount Elevation (ft)	Equipment Elevation (ft)	Quantity	Manufacturer	Model	Status
156.30	156.30	6	Quintel	QS6656-5D	Added
		3	Samsung	MT6407-77A	
		1	RFS	DB-C1-12C-24AB-0Z	
		3	Samsung	B2/B66A RRH-BRO49	
		3	Samsung	B5/B13 RRH-BRO4C	
		2	Amphenol Antel	LPA-80063-6CF 2	Retained
		2	Antel	LPA-80080-6CF	
		2	Amphenol Antel	LPA-80080-6CF-5	

Any proposed antennas not currently installed should be mounted such that the centerline of the antennas does not exceed 6 inches vertically from the center of the antenna mount.

**Standard Conditions:**

1. All engineering services are performed on the basis that the information provided to Maser Consulting Connecticut and used in this analysis is current and correct. The existing equipment loading has been applied at locations determined from the supplied documentation. Any deviation from the loading locations specified in this report shall be communicated to Maser Consulting Connecticut to verify deviation will not adversely impact the analysis.
2. Mounts are assumed to have been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer’s specifications.

Obvious safety and structural issues/deficiencies noticed at the time of the mount mapping and reported in the Mount Mapping Report are assumed to be corrected and documented as part of the PMI process and are not considered in the mount analysis.

The mount analysis and the mount mapping are not a condition assessment of the mount. Proper maintenance and condition assessments are still required post analysis.

3. For mount analyses completed from other data sources (including new replacement mounts) and not specifically mapped by Maser Consulting Connecticut, the mounts are assumed to have been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer’s specifications.
4. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
5. The mount was checked up to, and including, the bolts that fasten it to the mount collar/attachment and threaded rod connections in collar members if applicable. Local deformation and interaction between the mount collar/attachment and the supporting tower structure are outside the scope of this analysis.
6. All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Maser Consulting Connecticut is not responsible for the conclusion, opinions, and recommendations made by others based on the information supplied.

7. Structural Steel Grades have been assumed as follows, if applicable, unless otherwise noted in this analysis:
- Channel, Solid Round, Angle, Plate      ASTM A36 (Gr. 36)
  - HSS (Rectangular)                            ASTM 500 (Gr. B-46)
  - Pipe    ASTM A53 (Gr. B-35)
  - Threaded Rod                                  F1554 (Gr. 36)
  - Bolts    ASTM A325
8. Any mount modifications listed under Sources of Information are assumed to have been installed per the design specifications.

**Discrepancies between in-field conditions and the assumptions listed above may render this analysis invalid unless explicitly approved by Maser Consulting Connecticut.**

**Analysis Results:**

Component	Utilization %	Pass/Fail
Connection	72.0%	Pass
Standoff HSS	34.8%	Pass
Crossmember	21.8%	Pass
Corner Plate	39.0%	Pass
Cross Arm Plate	39.2%	Pass
Face Horizontal	16.7%	Pass
Mount Pipe	30.7%	Pass
Support Rail	14.5%	Pass
Support Rail Corner	9.6%	Pass

<b>Structure Rating – (Controlling Utilization of all Components)</b>	<b>72.0%</b>
---	--------------

**Recommendation:**

The existing mount will be **SUFFICIENT** for the final loading after the proposed modifications are successfully completed.

ANSI/ASSP rigging plan review services compliant with the requirements of ANSI/TIA 322 are available for a Construction Class IV site or other, if required. Separate review fees will apply.

**Attachments:**

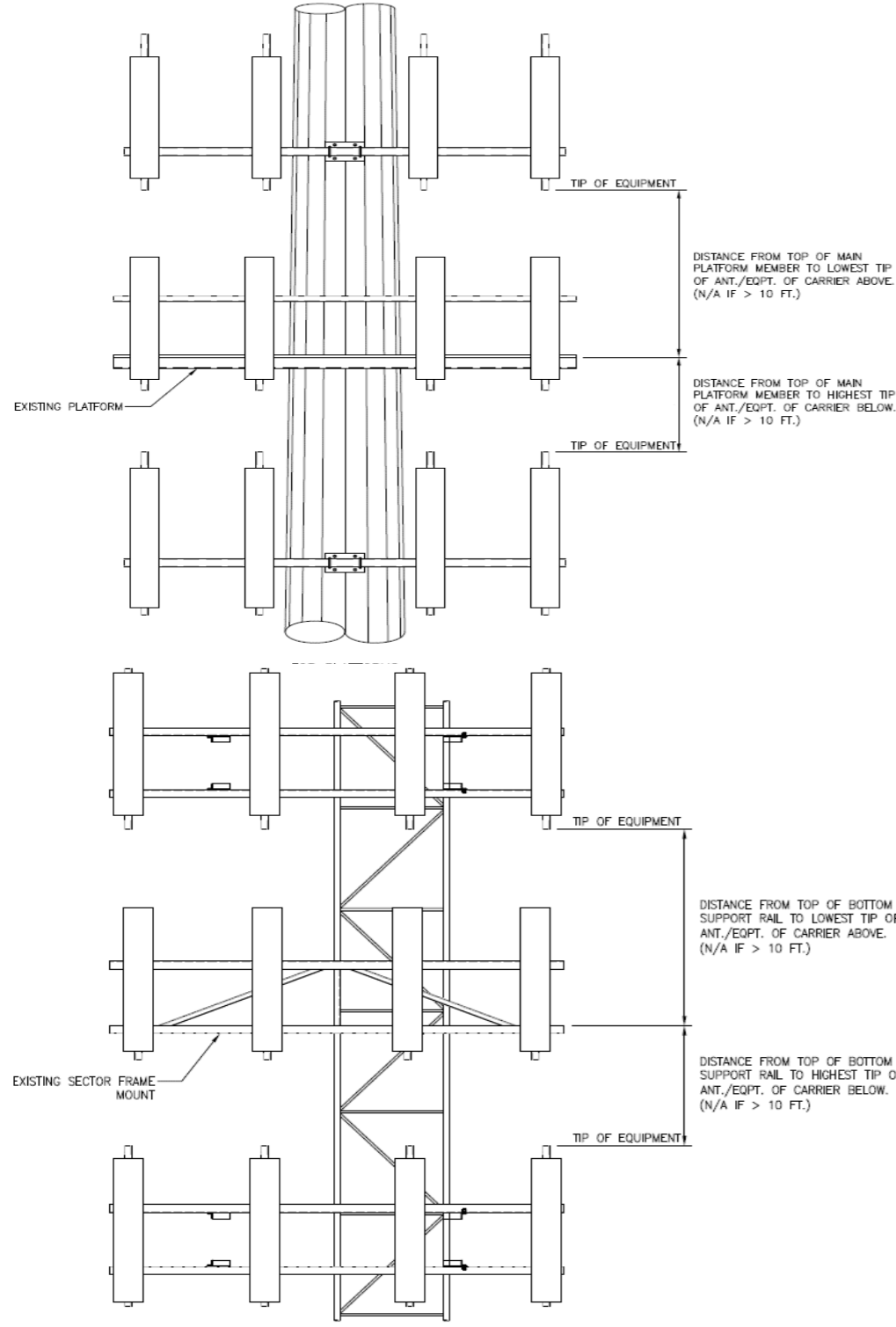
1. Mount Photos
2. Mount Mapping Report (for reference only)
3. Analysis Calculations
- 4. Contractor Required PMI Report Deliverables**
5. Antenna Placement Diagrams
6. TIA Adoption and Wind Speed Usage Letter







Mount Azimuth (Degree) for Each Sector				Tower Leg Azimuth (Degree) for Each Sector				Sector B										
Sector A:	30.00	Deg	Leg A:		Deg			Ant <sub>1a</sub>	Amphenol LPA80080/	14.00	6.00	72.00		153.417	31.00	18.00	150.00	102, 125
Sector B:	150.00	Deg	Leg B:		Deg			Ant <sub>1b</sub>										
Sector C:	270.00	Deg	Leg C:		Deg			Ant <sub>1c</sub>										
Sector D:		Deg	Leg D:		Deg			Ant <sub>2a</sub>	Amphenol BXA70063/	11.00	5.00	69.00	(1) 1-5/8	152.917	37.00	10.00	150.00	108, 129
<b>Climbing Facility Information</b>								Ant <sub>2b</sub>	RFS Diplexer	7.00	0.75	5.00	(1) 1-5/8	154.5	18.00	-3.00		
Location:		Deg						Ant <sub>2c</sub>										
Climbing Facility	Corrosion Type:							Ant <sub>3a</sub>	Amphenol BXA17108/	6.00	4.00	48.00	(1) 1-5/8	153.917	25.00	7.00	150.00	134, 153
	Access:							Ant <sub>3b</sub>	RFS Diplexer	7.00	0.75	5.00	(1) 1-5/8	154.5	18.00	-3.00		135, 151
	Condition:							Ant <sub>3c</sub>										
								Ant <sub>4a</sub>	Amphenol LPA80080/	15.00	12.00	72.00		153.25	33.00	16.00	150.00	138, 157



Sector C											
Ant <sub>1a</sub>	Amphenol LPA80080/	14.00	6.00	72.00		153.417	31.00	18.00	270.00	102, 145	
Ant <sub>1b</sub>											
Ant <sub>1c</sub>											
Ant <sub>2a</sub>	Amphenol BXA70063/	11.00	5.00	69.00	(1) 1-5/8	152.917	37.00	10.00	270.00	108, 146	
Ant <sub>2b</sub>	RFS Diplexer	7.00	0.75	5.00	(1) 1-5/8	154.5	18.00	-3.00			
Ant <sub>2c</sub>											
Ant <sub>3a</sub>	Amphenol BXA17108/	6.00	4.00	48.00	(1) 1-5/8	153.917	25.00	7.00	270.00	152, 154	
Ant <sub>3b</sub>	RFS Diplexer	7.00	0.75	5.00	(1) 1-5/8	154.5	18.00	-3.00		151	
Ant <sub>3c</sub>											
Ant <sub>4a</sub>	Amphenol LPA80080/	15.00	12.00	72.00		153.25	33.00	16.00	270.00	120, 157	
Ant <sub>4b</sub>											
Ant <sub>4c</sub>											
Ant <sub>5a</sub>											
Ant <sub>5b</sub>											
Ant <sub>5c</sub>											
Ant on Standoff											
Ant on Standoff											
Ant on Tower											
Ant on Tower											
Sector D											
Ant <sub>1a</sub>											
Ant <sub>1b</sub>											
Ant <sub>1c</sub>											
Ant <sub>2a</sub>											
Ant <sub>2b</sub>											
Ant <sub>2c</sub>											
Ant <sub>3a</sub>											
Ant <sub>3b</sub>											
Ant <sub>3c</sub>											
Ant <sub>4a</sub>											
Ant <sub>4b</sub>											
Ant <sub>4c</sub>											
Ant <sub>5a</sub>											
Ant <sub>5b</sub>											
Ant <sub>5c</sub>											
Ant on Standoff											
Ant on Standoff											
Ant on Tower											
Ant on Tower											

**Observed Safety and Structural Issues During the Mount Mapping**

Issue #	Description of Issue	Photo #
---------	----------------------	---------

1		
2		
3		
4		
5		
6		
7		
8		

Mapping Notes
---------------

1. Please report any visible structural or safety issues observed on the antenna mounts (Damaged members, loose connections, tilting mounts, safety climb issues, etc.)
2. If the thickness of the existing pipes or tubing can't be obtained from a general tool (such as Caliper), please use an ultrasonic measurement tool (thickness gauge) to measure the thickness.
3. Please create all required detail sketches of the mounts and insert them into the "Sketches" tab.
4. Please measure and enter the bolt sizes and types under the Members Box in the spreadsheet of the mount type.
5. Take and label the photos of the tower, mounts, connections, antennas and all measurements. Minimum 50 photos are required.
6. Please measure and report the size and length of all existing antenna mounting pipes.
7. Please measure and report the antenna information for all sectors.
8. Don't delete or rearrange any sheet or contents of any sheet from this mapping form.

Standard Conditions
---------------------

1. Obvious safety and structural issues/deficiencies noticed at the time of the mount mapping are to be reported in this mapping. However, this mount mapping is not a condition assessment of the mount.

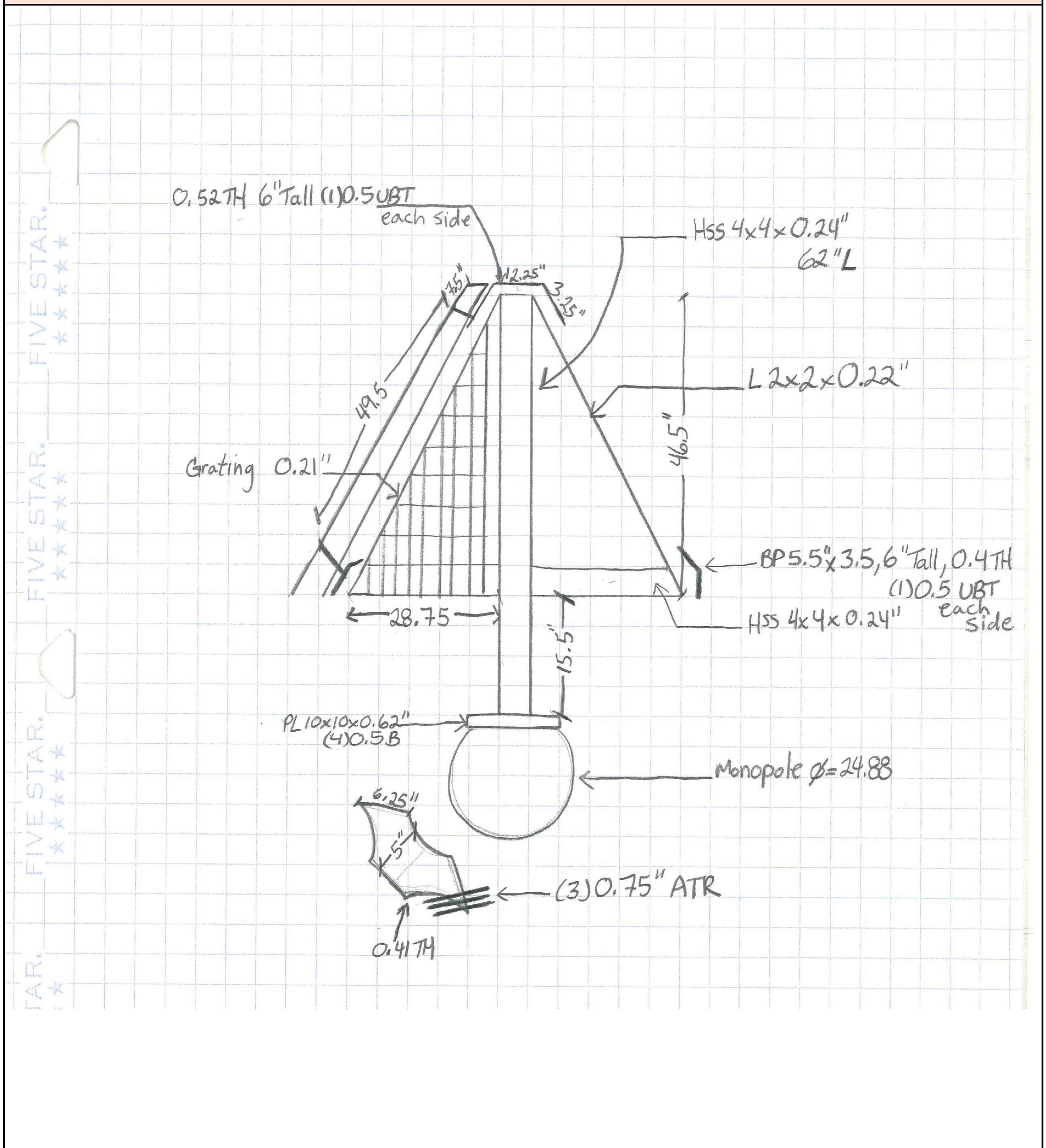
## Antenna Mount Mapping Form (PATENT PENDING)

FCC #

Tower Owner:	Crown Castle	Mapping Date:	2/24/2021
Site Name:	HARWINTON W CT	Tower Type:	Monopole
Site Number or ID:	468296	Tower Height (Ft.):	
Mapping Contractor:	Level-Up Towers	Mount Elevation (Ft.):	153

This antenna mapping form is the property of TES and under **PATENT PENDING**. The formation contained herein is considered confidential in nature and is to be used only for the specific customer it was intended for. Reproduction, transmission, publication, modification or disclosure by any method is prohibited except by express written permission of TES. All means and methods are the responsibility of the contractor and the work shall be compliant with ANSI/ASSE A 10.48, OSHA, FCC, FAA and other safety requirements that may apply. TES is not warranting the usability of the safety climb as it must be assessed prior to each use in compliance with OSHA requirements.

Please Insert Sketches of the Antenna Mount



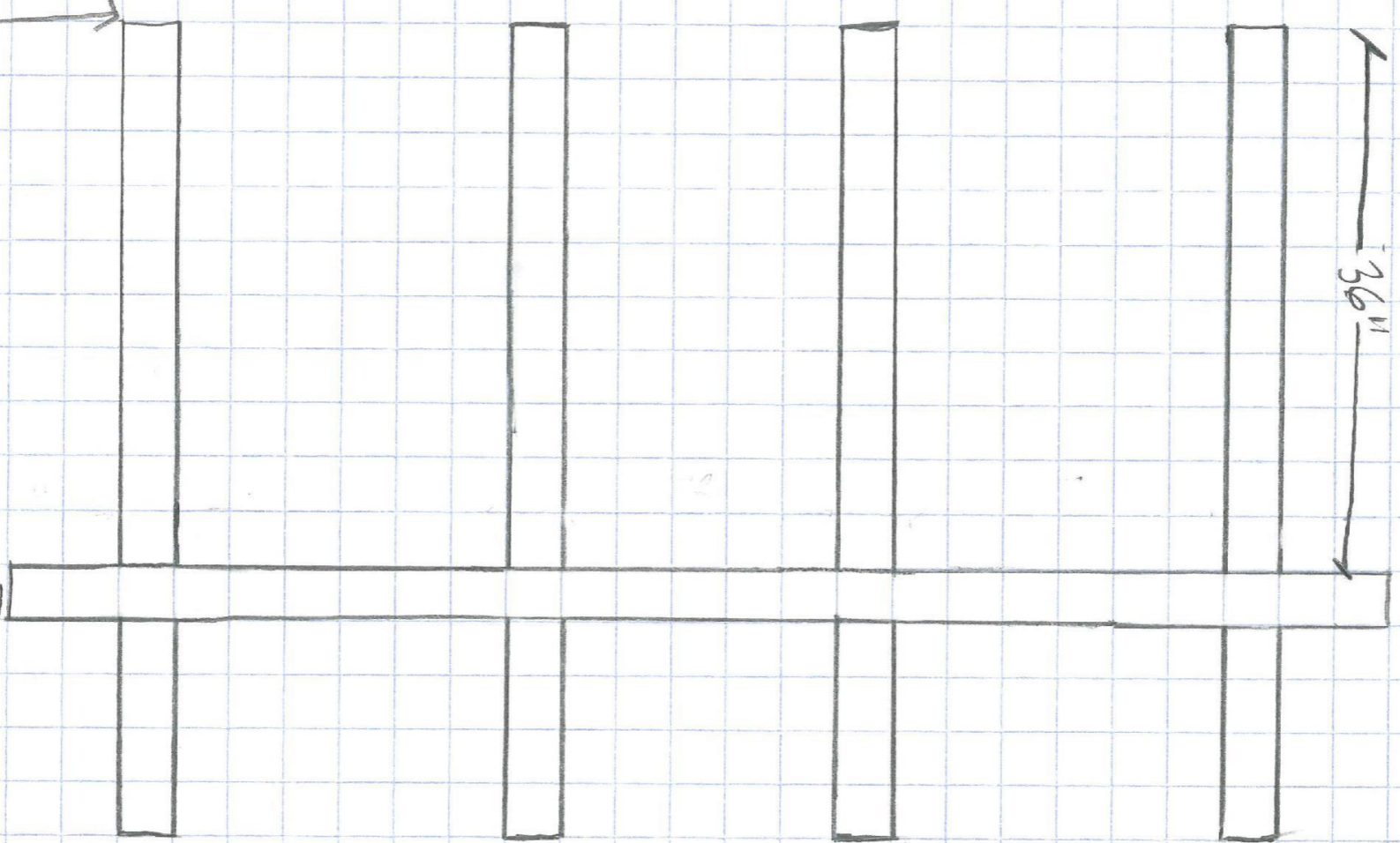
FIVE STAR. ★★★★★ FIVE STAR. ★★★★★ FIVE STAR. ★★★★★ FIVE STAR. ★★★★★

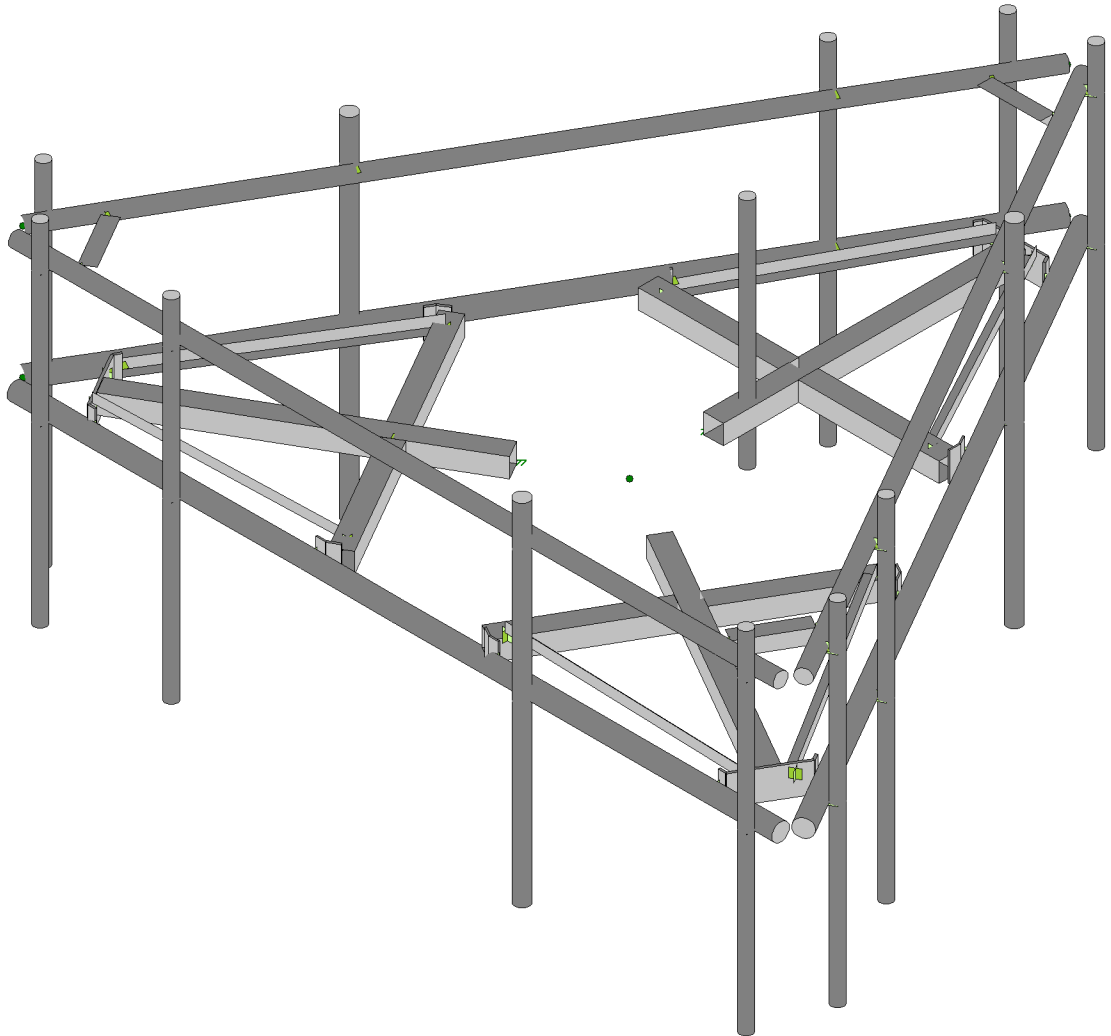
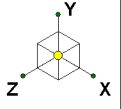
P 72" x 2.38 x 0.16"

Foot Rail

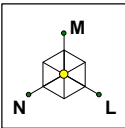
P 3.48 x 23, 157" Long

36"

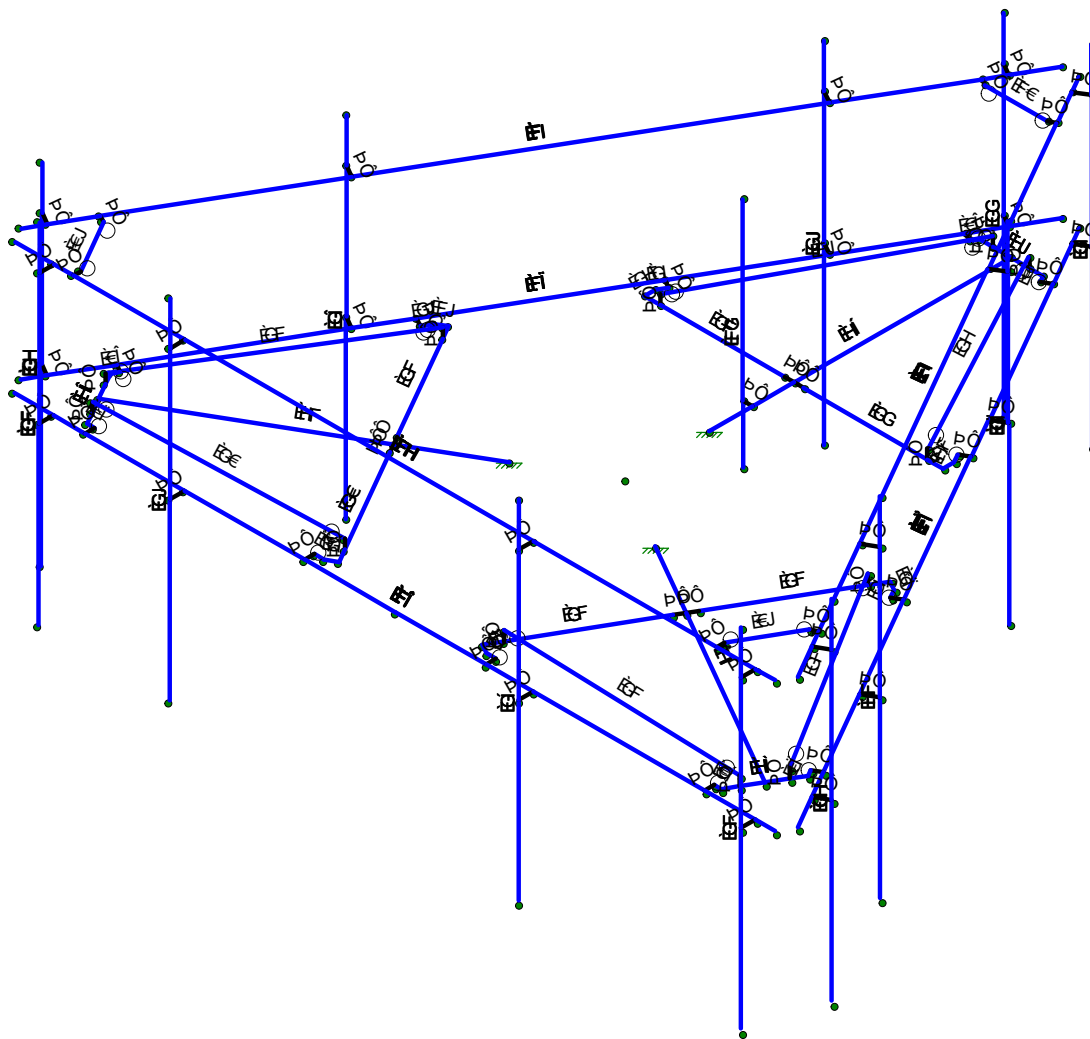





SK - 1  
May 4, 2021 at 12:18 PM  
468296-VZW\_MT\_LO\_H.r3d



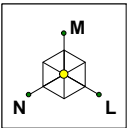
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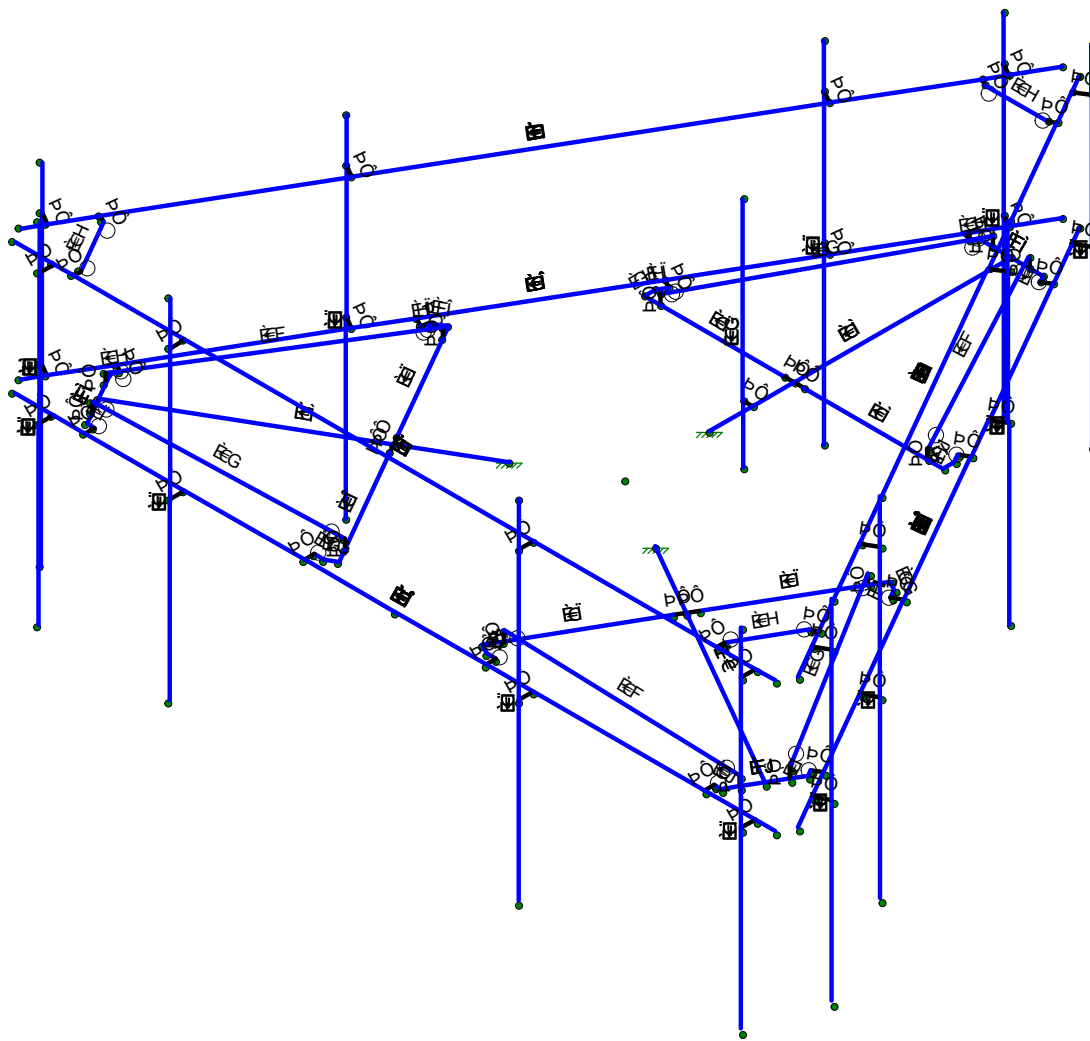
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ÚSÁG
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I i G j É Z Y ' T V Š U ' P é h





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ÚSĀH  
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<chFc`YX`GhYY`DfcdYfHjYg`fV`cbHjbi`YXL

	Šæ^	ÔÃ•ã	ÕÃ•ã	Þ	V@!{ (ÀÞÒÈÈ^)}•æ`ŽĐçÈÈ`Ýà ãŽ•ã	Û	Ø`Ž•ã	Ûc		
Í	œ HÓ:ÈÖ	GJ€€€	FFFÍ I	ÈÈ	ÈÉ	ÈJ	HÍ	FÈ	Í€	FÈG
İ	œFÉ Í	GJ€€€	FFFÍ I	ÈÈ	ÈÉ	ÈJ	Í€	FÈ	ÍÍ	FÈH
Ï	ÛGHÍ	GJ€€€	FFFÍ I	ÈÈ	ÈÉ	ÈJ	HÍ	FÈ	ÍÌ	FÈG

A Ya VYf`Df`Ja Ufm8`UU

	Šæ^	ÓR`ãc	RÁR`ãc	SÁR`ãc	Û ææ`Q^*D`Ú^&ç `È Èæ^`V `^	Ô•ã) /ãc	Tæ!ææ`	Ô•ã) /Û`^•
F	TÍGÈ	ÞFFGÈ	ÞFFI		Ûçà `~À `iãÈÈ`Ó`æ	Û`~æ^V`à^	œÈÖ:ÈÖÈÈ`V`]ææ	
G	TÍH	ÞFG	ÞFGÍ		Ûæf {`ÁÓ:•ÈÈ`Ó`æ	V`à^	œÈÖ:ÈÖÈÈ`V`]ææ	
H	TÍI	ÞFG	ÞFFÍ		Ûæf {`ÁÓ:•ÈÈ`Ó`æ	V`à^	œÈÖ:ÈÖÈÈ`V`]ææ	
I	TÍÍ	ÞFGJ	ÞFG		Ó[ ]`^!`Á `Jæ`Ó`æ	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
Í	TÍÏ	ÞFFÍ	ÞFGÈÓ		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
İ	TÍÏ	ÞFFÍ È	ÞFFJ		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
Ï	TÍJ	ÞFGF	ÞFFÍ È		Ó:ææ`*Á`][`ic`Ó`æ	Ûã`*^`ÁÈ`*^`^	œH`ÁÓ:ÈÈ`V`]ææ	
J	TÍ€	ÞFGG	ÞFG È		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
F€	TÍF	ÞFGF	ÞFGH		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
FF	TÍG	ÞFG	ÞFFHÈ		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
FG	TÍH	ÞFFHÈ	ÞFG		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
FH	TÍI	ÞFFÍ	ÞFHÈ		Ó[••`ÁÈ(`Á `Jæ`Ó[ ]`{`}	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
FI	TÍÍ	ÞFHÈ	ÞFHG		Ó[••`ÁÈ(`Á `Jæ`Ó[ ]`{`}	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
FÍ	TÍÏÈ	ÞFGJ	ÞFHÍ		Ó[ ]`^!`Á `Jæ`Ó`æ	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
FÌ	TÍÏ	ÞFHÍ	ÞFHÍ		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
FÏ	TÍJÈ	ÞFG	ÞFHF		Ó[••`ÁÈ(`Á `Jæ`Ó[ ]`{`}	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
Fİ	TJÈÈ	ÞFHF	ÞFHÍ		Ó[••`ÁÈ(`Á `Jæ`Ó[ ]`{`}	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
FJ	TJG	ÞFG	ÞFHÍ		Ó[ ]`^!`Á `Jæ`Ó`æ	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
GÈ	TJHÈ	ÞFHÍ	ÞFHJ		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
GF	TFFÍ È	ÞFÍ ÈÈ	ÞFÍ GÈ		Ûçà `~À `iãÈÈ`Ó`æ	Û`~æ^V`à^	œÈÖ:ÈÖÈÈ`V`]ææ	
GG	TFFÍ È	ÞFÍ GÈ	ÞFÍ I È		Ûæf {`ÁÓ:•ÈÈ`Ó`æ	V`à^	œÈÖ:ÈÖÈÈ`V`]ææ	
GH	TFFJÈ	ÞFÍ HÈ	ÞFÍ HÈ		Ûæf {`ÁÓ:•ÈÈ`Ó`æ	V`à^	œÈÖ:ÈÖÈÈ`V`]ææ	
G	TFGÈÈ	ÞFÍ ÍÈ	ÞFÍ I È		Ó[ ]`^!`Á `Jæ`Ó`æ	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
GÍ	TFGÈÈ	ÞFÍ I È	ÞFÍ I È		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
Gİ	TFGÈÈ	ÞFÍ I È	ÞFÍ I È		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
GÏ	TFGÈÈ	ÞFÍ I È	ÞFÍ I È		Ó:ææ`*Á`][`ic`Ó`æ	Ûã`*^`ÁÈ`*^`^	œH`ÁÓ:ÈÈ`V`]ææ	
Gİ	TFGÈÈ	ÞFÍ I È	ÞFÍ JÈ		Ó:ææ`*Á`][`ic`Ó`æ	Ûã`*^`ÁÈ`*^`^	œH`ÁÓ:ÈÈ`V`]ææ	
GJ	TFGÈÈ	ÞFÍ JÈ	ÞFÍ FÈ		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
HÈ	TFGÈÈ	ÞFÍ I È	ÞFÍ ÈÈ		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
HF	TFGÈÈ	ÞFÍ HÈ	ÞFÍ FÈ		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
HG	TFGÈÈ	ÞFÍ FÈ	ÞFÍ I È		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
HH	TFGÈÈ	ÞFÍ HÈ	ÞFÍ I È		Ó[••`ÁÈ(`Á `Jæ`Ó[ ]`{`}	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
HI	TFHÈÈ	ÞFÍ I È	ÞFÍ JÈ		Ó[••`ÁÈ(`Á `Jæ`Ó[ ]`{`}	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
HÍ	TFHÈÈ	ÞFÍ JÈ	ÞG FÈ		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
HÌ	TFHÈÈ	ÞFÍ ÍÈ	ÞFJFÈ		Ó[ ]`^!`Á `Jæ`Ó`æ	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
HÏ	TFHÈÈ	ÞFJFÈ	ÞFJGÈ		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
Hİ	TFHÈÈ	ÞFÍ GÈ	ÞFÍ I È		Ó[••`ÁÈ(`Á `Jæ`Ó[ ]`{`}	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
HJ	TFHÈÈ	ÞFÍ I È	ÞFJHÈ		Ó[••`ÁÈ(`Á `Jæ`Ó[ ]`{`}	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
I€	TFHÈÈ	ÞFÍ I È	ÞFJÍ È		Ó[ ]`^!`Á `Jæ`Ó`æ	ÛÖÖV	œH`ÁÓ:ÈÈ`V`]ææ	
IF	TFHÈÈ	ÞFJÍ È	ÞFJÍ È		ÛÖÖ	Þ[ ]`^	ÛÖÖ	V`]ææ
IG	TFHJÈÈ	ÞFJÍ ÈÈ	ÞGÈÈÈÈ		Ûçà `~À `iãÈÈ`Ó`æ	Û`~æ^V`à^	œÈÖ:ÈÖÈÈ`V`]ææ	
IH	TFIÈÈÈ	ÞGFÈÈÈ	ÞGFÈÈÈ		Ûæf {`ÁÓ:•ÈÈ`Ó`æ	V`à^	œÈÖ:ÈÖÈÈ`V`]ææ	
II	TFIÈÈÈ	ÞGFÈÈÈ	ÞGFÈÈÈ		Ûæf {`ÁÓ:•ÈÈ`Ó`æ	V`à^	œÈÖ:ÈÖÈÈ`V`]ææ	









































**A Ya Vyf'Dc]bhi@UXg'f6 @ '+: '5 bhYbbUK c'fP&\$ '8 YJ tL'f7 c bhbi YXL**

	T^{\ à^/Àæ^ ^}	Öä^&ç\}	T æ } æ ^ à^ ŽaB Êéá	Š &ç\} ŽčÁ á
I H	T ÚHÓ	Ý	Í Î È €	G
I I	T ÚHÓ	Z	H Í È Í	G
I Í	T ÚHÓ	T ç	€	G
I Î	T ÚHÓ	Ý	Í Î È €	I
I Ì	T ÚHÓ	Z	H Í È Í	I
I Ï	T ÚHÓ	T ç	€	I
I J	T ÚHÓ	Ý	H Í È FI	G
I €	T ÚHÓ	Z	G G G F Í	G
I F	T ÚHÓ	T ç	È È FI	G
I G	T ÚHÓ	Ý	H Í È FI	I
I H	T ÚHÓ	Z	G G G F Í	I
I I	T ÚHÓ	T ç	È È FI	I
I Í	T J Í Ç	Ý	FFF È Í	F È
I Î	T J Í Ç	Z	Í I È Í	F È
I Ï	T J Í Ç	T ç	€	F È
I Ì	T Ú G Ç	Ý	H Í È €	G
I J	T Ú G Ç	Z	G G G H G	G
I €	T Ú G Ç	T ç	È È F J	G
I F	T Ú G Ó	Ý	Í F È G	G
I G	T Ú G Ó	Z	G J È J F	G
I H	T Ú G Ó	T ç	€	G
I I	T Ú G Ó	Ý	H Í È €	G
I Í	T Ú G Ó	Z	G G G H G	G
I Î	T Ú G Ó	T ç	È È F J	G
I Ï	T Ú F Ç	Ý	H È G	G
I Ì	T Ú F Ç	Z	F J È FI	G
I J	T Ú F Ç	T ç	È È FI	G
I €	T Ú F Ó	Ý	Í F È G	G
I F	T Ú F Ó	Z	G J È J F	G
I G	T Ú F Ó	T ç	€	G
I H	T Ú F Ó	Ý	H È G	G
I I	T Ú F Ó	Z	F J È FI	G
I Í	T Ú F Ó	T ç	È È FI	G
I Î	T Ú F Ó	Ý	F G È F J	È
I Ï	T Ú F Ó	Z	Í J È Í	È
I Ì	T Ú F Ó	T ç	È È F	È
I J	T Ú F Ó	Ý	F G È F J	Í È
I €	T Ú F Ó	Z	Í J È Í	Í È
I F	T Ú F Ó	T ç	È È F	Í È
I G	T Ú Í Ó	Ý	F G È F J	È
I H	T Ú Í Ó	Z	Í J È Í	È
I I	T Ú Í Ó	T ç	È È F	È
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I Î	T Ú Í Ó	Z	Í J È Í	Í È
I Ï	T Ú Í Ó	T ç	È È F	Í È
I Ì	T Ú F Ç	Ý	F È È FI	È
I J	T Ú F Ç	Z	Í J È Í	È
I €	T Ú F Ç	T ç	È È G	È
I F	T Ú F Ç	Ý	F È È FI	Í È
I G	T Ú F Ç	Z	Í J È Í	Í È
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**A Ya Vyf'8 ]gfh]Vi hYX' @ UXg'f6 @' (, : 'Gfi Wh fy'Kc''f&\$ 8 Y] tL'fV cb]hbi YXL**

	T { à^!Àæ^ ^ }	Öä^&çä }	ÙçæóÁ æ } á à^!ZaDæííííí) áÁ æ } á à^!ZaDæííííí	ÙçæóÁ æ } á à^!ZaDæííííí	ÙçæóÁ æ } á à^!ZaDæííííí	ŽdĀ á	Ò) áÁ æ } ŽdĀ á
ì J	T ùí ò	Ý	ÈÈ Ì	ÈÈ Ì	€	À FEE	
J€	T ùí ò	Z	ÎÈ€	ÎÈ€	€	À FEE	
JF	T ùfò	Ý	ÈÈ Ì	ÈÈ Ì	€	À FEE	
JG	T ùfò	Z	ÎÈ€	ÎÈ€	€	À FEE	
JH	T ì J	Ý	€	€	€	À FEE	
JI	T ì J	Z	€	€	€	À FEE	
JÍ	T ùgó	Ý	ÈÈ Í J	ÈÈ Í J	€	À FEE	
JĪ	T ùgó	Z	ÎÈÌ	ÎÈÌ	€	À FEE	
JĲ	T ùhó	Ý	ÈÈ Ì	ÈÈ Ì	€	À FEE	
JÌ	T ùhó	Z	ÎÈ€	ÎÈ€	€	À FEE	
JJ	T ùí ó	Ý	ÈÈ Ì	ÈÈ Ì	€	À FEE	
F€€	T ùí ó	Z	ÎÈ€	ÎÈ€	€	À FEE	
F€F	T ùfó	Ý	ÈÈ Ì	ÈÈ Ì	€	À FEE	
F€G	T ùfó	Z	ÎÈ€	ÎÈ€	€	À FEE	
F€H	T jíœ	Ý	ÈÈ Ğ	ÈÈ Ğ	€	À FEE	
F€Ī	T jíœ	Z	ÍÈHG	ÍÈHG	€	À FEE	
F€Ĳ	T jíœ	Ý	€	€	€	À FEE	
F€Ì	T jíœ	Z	€	€	€	À FEE	
F€Ĵ	T f€f	Ý	ÈÈ FG	ÈÈ FG	€	À FEE	
F€Ķ	T f€f	Z	ÍÈF	ÍÈF	€	À FEE	
F€J	T f€j	Ý	ÈÈ FG	ÈÈ FG	€	À FEE	
FF€	T f€j	Z	ÍÈF	ÍÈF	€	À FEE	
FFF	T ffĲ	Ý	€	€	€	À FEE	
FFG	T ffĲ	Z	€	€	€	À FEE	
FFH	T ffĲ	Ý	ÈÈ Ĵ	ÈÈ Ĵ	€	À FEE	
FFĪ	T ffĲ	Z	ÎÈÌ	ÎÈÌ	€	À FEE	
FFĲ	T ffĴ	Ý	ÈÈ Ĵ	ÈÈ Ĵ	€	À FEE	
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**A Ya Vyf'8 ]gfh]Vi hYX' @ UXg'f6 @' (- : 'Gfi Wh fy'Kc''f&(\$ 8 Y] tL**

	T { à^!Àæ^ ^ }	Öä^&çä }	ÙçæóÁ æ } á à^!ZaDæííííí) áÁ æ } á à^!ZaDæííííí	ÙçæóÁ æ } á à^!ZaDæííííí	ÙçæóÁ æ } á à^!ZaDæííííí	ŽdĀ á	Ò) áÁ æ } ŽdĀ á
F	T Ĳœ	Ý	ÈÈ Ĵ	ÈÈ Ĵ	€	À FEE	
G	T Ĳœ	Z	ÍÈF	ÍÈF	€	À FEE	
H	T ĲH	Ý	ÈÈ Í	ÈÈ Í	€	À FEE	
I	T ĲH	Z	FÈĴ	FÈĴ	€	À FEE	
Í	T ĲĲ	Ý	ÈÈ Í	ÈÈ Í	€	À FEE	
Ī	T ĲĲ	Z	FÈĴ	FÈĴ	€	À FEE	
Ĳ	T ĲĲ	Ý	ÈÈ FF	ÈÈ FF	€	À FEE	
Ĵ	T ĲĲ	Z	ÈÈ Ĳ	ÈÈ Ĳ	€	À FEE	
J	T ĲĲ	Ý	ÈÈ Ğ	ÈÈ Ğ	€	À FEE	
F€	T ĲĲ	Z	ÍÈ Ĵ	ÍÈ Ĵ	€	À FEE	
FF	T ĲĴ	Ý	ÈÈ Ĳ	ÈÈ Ĳ	€	À FEE	
FG	T ĲĴ	Z	FÈĲ	FÈĲ	€	À FEE	
FH	T ĲĲ	Ý	ÈÈ Ğ F	ÈÈ Ğ F	€	À FEE	
FI	T ĲĲ	Z	ÍÈ Ĳ	ÍÈ Ĳ	€	À FEE	
FÍ	T ĲĲ	Ý	ÈÈ Ĳ	ÈÈ Ĳ	€	À FEE	
FĲ	T ĲĲ	Z	ÈÈ F	ÈÈ F	€	À FEE	
FĴ	T ĲĲœ	Ý	ÈÈ Ĳ	ÈÈ Ĳ	€	À FEE	
FĶ	T ĲĲœ	Z	ÈÈ €	ÈÈ €	€	À FEE	
FJ	T ĲĴœ	Ý	ÈÈ Ğ F	ÈÈ Ğ F	€	À FEE	
GE	T ĲĴœ	Z	ÍÈ Ĳ	ÍÈ Ĳ	€	À FEE	























Ó[ { ] æ ^ K  
 Ó• ¢ } ^! K  
 R á Á { à ^! K  
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T æ Á É Æ Ç F  
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### A Ya Vyf '8 jg|V|vi hX' @ UXg'f6 @ ' )' : Ghf i Wh fY'K ]'f6'8 Y| 4: f7 cb|jbi YXl

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F€	TÏ	Z	€	€	€	À FEE
FF	TÏJ	Ý	€	€	€	À FEE
FG	TÏJ	Z	€	€	€	À FEE
FH	TÏ	Ý	€	€	€	À FEE
FI	TÏ	Z	€	€	€	À FEE
FÍ	TÏ	Ý	€	€	€	À FEE
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Fİ	TÏÖ	Ý	€	€	€	À FEE
FÌ	TÏÖ	Z	€	€	€	À FEE
FJ	TÏJÖ	Ý	€	€	€	À FEE
Ç€	TÏJÖ	Z	€	€	€	À FEE
ÇF	TJÖ	Ý	€	€	€	À FEE
ÇG	TJÖ	Z	€	€	€	À FEE
GH	TJG	Ý	€	€	€	À FEE
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Ĝ	TFFÖ	Ý	€	€	€	À FEE
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HH	TFGÖ	Ý	€	€	€	À FEE
H	TFGÖ	Z	€	€	€	À FEE
HÍ	TFGÖ	Ý	€	€	€	À FEE
HĪ	TFGÖ	Z	€	€	€	À FEE
Hİ	TFGÖ	Ý	€	€	€	À FEE
HÌ	TFGÖ	Z	€	€	€	À FEE
HJ	TFHÖ	Ý	€	€	€	À FEE
I€	TFHÖ	Z	€	€	€	À FEE
IF	TFHÖ	Ý	€	€	€	À FEE
IG	TFHÖ	Z	€	€	€	À FEE
IH	TFHÖ	Ý	€	€	€	À FEE
II	TFHÖ	Z	€	€	€	À FEE
IÍ	TFHÖ	Ý	€	€	€	À FEE
IĪ	TFHÖ	Z	€	€	€	À FEE
Iİ	TFHÖ	Ý	€	€	€	À FEE
IÌ	TFHÖ	Z	€	€	€	À FEE
IJ	TFHJÖ	Ý	€	€	€	À FEE
I€	TFHJÖ	Z	€	€	€	À FEE
IF	TFIÖ	Ý	€	€	€	À FEE
IG	TFIÖ	Z	€	€	€	À FEE
IH	TFIFÖ	Ý	€	€	€	À FEE
IĪ	TFIFÖ	Z	€	€	€	À FEE
IÍ	TFIÖ	Ý	€	€	€	À FEE
IĪ	TFIÖ	Z	€	€	€	À FEE
Iİ	TFIÖ	Ý	€	€	€	À FEE
IÌ	TFIÖ	Z	€	€	€	À FEE
IJ	TFIÖ	Ý	€	€	€	À FEE
I€	TFIÖ	Z	€	€	€	À FEE









**A Ya Vyf'8 ]gqf]Vi hyX' @ UXg'f6 @ ) ( : 'Gfi Wfi fY'K]''fl \$'8 Y] ıı.f7 cb]bi YXL**

	T^( à\Aæ^)	Öá^&ç)	ÚçeoÁ æ } á á^ žaDóHÈ) áÁ æ } á á^ žaDóHÈ ÚçeoÁ &ç)	žčÁ á	Ò) áÁ &ç)	žčÁ á
Jİ	T ÚHÓ	Ý	FE Ę	FE Ę	€	Ă FEE
Jİ	T ÚHÓ	Z	ĚĚ I F	ĚĚ I F	€	Ă FEE
JJ	T ÚI Ó	Ý	FE Ę	FE Ę	€	Ă FEE
FĚ	T ÚI Ó	Z	ĚĚ I F	ĚĚ I F	€	Ă FEE
FĚ	T ÚFÓ	Ý	FE Ę	FE Ę	€	Ă FEE
FĚ	T ÚFÓ	Z	ĚĚ I F	ĚĚ I F	€	Ă FEE
FĚ	T JÍ Ě	Ý	FE Ę	FE Ę	€	Ă FEE
FĚ	T JÍ Ě	Z	ĚĚ G	ĚĚ G	€	Ă FEE
FĚ	T JÍ Ě	Ý	€	€	€	Ă FEE
FĚ	T JÍ Ě	Z	€	€	€	Ă FEE
FĚ	T FĚ	Ý	FE Ę	FE Ę	€	Ă FEE
FĚ	T FĚ	Z	ĚĚ Ę	ĚĚ Ę	€	Ă FEE
FĚ	T FĚ	Ý	FE Ę	FE Ę	€	Ă FEE
FFĚ	T FĚ	Z	ĚĚ Ę	ĚĚ Ę	€	Ă FEE
FFF	T FFĚ	Ý	€	€	€	Ă FEE
FFG	T FFĚ	Z	€	€	€	Ă FEE
FFH	T FFĚ	Ý	FE Ę	FE Ę	€	Ă FEE
FFI	T FFĚ	Z	ĚĚ Ę	ĚĚ Ę	€	Ă FEE
FFI	T FFJ	Ý	FE Ę	FE Ę	€	Ă FEE
FFI	T FFJ	Z	ĚĚ Ę	ĚĚ Ę	€	Ă FEE

**A Ya Vyf'8 ]gqf]Vi hyX' @ UXg'f6 @ ) ( : 'Gfi Wfi fY'K]''fl \$'8 Y] ıı**

	T^( à\Aæ^)	Öá^&ç)	ÚçeoÁ æ } á á^ žaDóHÈ) áÁ æ } á á^ žaDóHÈ ÚçeoÁ &ç)	žčÁ á	Ò) áÁ &ç)	žčÁ á
F	T Ě Ę	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
G	T Ě Ę	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
H	T Ě Ě	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
I	T Ě Ě	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
Í	T Ě Ě	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
Ī	T Ě Ě	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
Ī	T Ě Ě	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
Ī	T Ě Ě	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
J	T Ě Ě	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
FĚ	T Ě Ě	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
FF	T Ě Ě	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
FG	T Ě Ě	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
FH	T Ě Ě	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
FI	T Ě Ě	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
FÍ	T Ě Ě	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
FĪ	T Ě Ě	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
FĪ	T Ě Ě	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
FĪ	T Ě Ě	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
FJ	T Ě Ě	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
ĚĚ	T Ě Ě	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
GF	T Ě Ě	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
GG	T Ě Ě	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
GH	T Ě Ě	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
G	T Ě Ě	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
G	T FFĚ Ě	Ý	€	€	€	Ă FEE
G	T FFĚ Ě	Z	€	€	€	Ă FEE
G	T FFĚ Ě	Ý	ĚĚ Ě	ĚĚ Ě	€	Ă FEE
G	T FFĚ Ě	Z	ĚĚ Ě	ĚĚ Ě	€	Ă FEE



**A Ya Vyf'8 ]glf]Vi hYX' @ UXg'f6 @ ) ) : 'Gfi Wñ fy'K ]'ft \$'8 Y] tL'f7 cb]hbi YXL**

	T ^ ( à^ / A æ ^ )	Ö á & ç )	Ü ç è Á æ } æ á ^ Z à D ( H ) Ò á Á æ } æ á ^ Z à D ( H ) Ü ç è Á æ } æ á ^ Z à D ( H )	Ü ç è Á æ } æ á ^ Z à D ( H ) Ò á Á æ } æ á ^ Z à D ( H )	Ü ç è Á æ } æ á ^ Z à D ( H ) Ò á Á æ } æ á ^ Z à D ( H )	Ü ç è Á æ } æ á ^ Z à D ( H ) Ò á Á æ } æ á ^ Z à D ( H )
Ì F	T ÚFOE	Ý	GÈ I F	GÈ I F	€	À FEE
Ì G	T ÚFOE	Z	ÈÈ È €	ÈÈ È €	€	À FEE
Ì H	T Ì Ì OE	Ý	HÈ G	HÈ G	€	À FEE
Ì I	T Ì Ì OE	Z	ÈÈ È Ì	ÈÈ È Ì	€	À FEE
Ì Í	T ÚGÒ	Ý	GÈ	GÈ	€	À FEE
Ì Î	T ÚGÒ	Z	ÈÈ È Í	ÈÈ È Í	€	À FEE
Ì Ï	T ÚHÒ	Ý	GÈ I F	GÈ I F	€	À FEE
Ì Ì	T ÚHÒ	Z	ÈÈ È €	ÈÈ È €	€	À FEE
Ì J	T ÚÌ Ò	Ý	GÈ I F	GÈ I F	€	À FEE
J €	T ÚÌ Ò	Z	ÈÈ È €	ÈÈ È €	€	À FEE
J F	T ÚFÒ	Ý	GÈ I F	GÈ I F	€	À FEE
J G	T ÚFÒ	Z	ÈÈ È €	ÈÈ È €	€	À FEE
J H	T Ì J	Ý	È Ì Ì	È Ì Ì	€	À FEE
J I	T Ì J	Z	È È Ì	È È Ì	€	À FEE
J Í	T ÚGÓ	Ý	GÈ	GÈ	€	À FEE
J Î	T ÚGÓ	Z	ÈÈ È Í	ÈÈ È Í	€	À FEE
J Ï	T ÚHÓ	Ý	GÈ I F	GÈ I F	€	À FEE
J Ì	T ÚHÓ	Z	ÈÈ È €	ÈÈ È €	€	À FEE
J J	T ÚÌ Ó	Ý	GÈ I F	GÈ I F	€	À FEE
F €€	T ÚÌ Ó	Z	ÈÈ È €	ÈÈ È €	€	À FEE
F € F	T ÚFÓ	Ý	GÈ I F	GÈ I F	€	À FEE
F € G	T ÚFÓ	Z	ÈÈ È €	ÈÈ È €	€	À FEE
F € H	T J Í OE	Ý	G È G H	G È G H	€	À FEE
F € I	T J Í OE	Z	È È G J	È È G J	€	À FEE
F € Í	T J Í OE	Ý	È Ì Ì	È Ì Ì	€	À FEE
F € Î	T J Í OE	Z	È È J	È È J	€	À FEE
F € Ï	T F € F	Ý	È Ì Ì	È Ì Ì	€	À FEE
F € Ì	T F € F	Z	È È J	È È J	€	À FEE
F € J	T F €	Ý	GÈ	GÈ	€	À FEE
F F €	T F €	Z	ÈÈ È Í	ÈÈ È Í	€	À FEE
F F F	T F F	Ý	È È €	È È €	€	À FEE
F F G	T F F	Z	È È Í F	È È Í F	€	À FEE
F F H	T F F	Ý	È È €	È È €	€	À FEE
F F I	T F F	Z	È È Í F	È È Í F	€	À FEE
F F Í	T F F J	Ý	GÈ H G	GÈ H G	€	À FEE
F F Î	T F F J	Z	ÈÈ È €	ÈÈ È €	€	À FEE

**A Ya Vyf'8 ]glf]Vi hYX' @ UXg'f6 @ ) ) \* : 'Gfi Wñ fy'K ]'ft \$'8 Y] tL**

	T ^ ( à^ / A æ ^ )	Ö á & ç )	Ü ç è Á æ } æ á ^ Z à D ( H ) Ò á Á æ } æ á ^ Z à D ( H )	Ü ç è Á æ } æ á ^ Z à D ( H ) Ò á Á æ } æ á ^ Z à D ( H )	Ü ç è Á æ } æ á ^ Z à D ( H ) Ò á Á æ } æ á ^ Z à D ( H )	Ü ç è Á æ } æ á ^ Z à D ( H ) Ò á Á æ } æ á ^ Z à D ( H )
F	T Ì GE	Ý	H È G G	H È G G	€	À FEE
G	T Ì GE	Z	€	€	€	À FEE
H	T Ì H	Ý	€	€	€	À FEE
I	T Ì H	Z	€	€	€	À FEE
Í	T Ì I	Ý	€	€	€	À FEE
Î	T Ì I	Z	€	€	€	À FEE
Ì	T Ì I	Ý	€	€	€	À FEE
Ì	T Ì I	Z	€	€	€	À FEE
J	T Ì I	Ý	GÈ Í J	GÈ Í J	€	À FEE
F €	T Ì I	Z	€	€	€	À FEE
FF	T Ì J	Ý	GÈ Í J	GÈ Í J	€	À FEE
FG	T Ì J	Z	€	€	€	À FEE













**A Ya Vyf'8 jgflVl hYX'@ Uxg'f6 @ ), : 'Gfi Wl fY'K]'fD \$'8 Yl lL'fT cbjbi YXL**

	T\{ à^/Àæ^ ^	Ôá^&ç	ÚçæA æ } á à^ZaDe(ÉD) áA æ } á à^ZaDe(ÉÉ) ÚçæA(Ç &æ) } ZçÁ á	Ò) á Á(Ç &æ) } ZçÁ á	
Hĩ	T FGJŒ	Ÿ	GÇF	GÇF €	Á FEE
Hì	T FGJŒ	Z	HÈH	HÈH €	Á FEE
HJ	T FHŒ	Ÿ	FÈÌ	FÈÌ €	Á FEE
I€	T FHŒ	Z	GÈŒ	GÈŒ €	Á FEE
IF	T FHŒ	Ÿ	FÈĠ	FÈĠ €	Á FEE
IG	T FHŒ	Z	GÈJF	GÈJF €	Á FEE
IH	T FH Œ	Ÿ	GÇF	GÇF €	Á FEE
Iì	T FH Œ	Z	HÈH	HÈH €	Á FEE
Ií	T FH Œ	Ÿ	FÈÌ	FÈÌ €	Á FEE
IÎ	T FH Œ	Z	GÈŒ	GÈŒ €	Á FEE
Iï	T FH Œ	Ÿ	FÈĠ	FÈĠ €	Á FEE
Iÿ	T FH Œ	Z	GÈJF	GÈJF €	Á FEE
IJ	T FHJŒ	Ÿ	ÈÌ	ÈÌ €	Á FEE
I€	T FHJŒ	Z	ÈÎH	ÈÎH €	Á FEE
IF	T FÍŒ	Ÿ	FÈH	FÈH €	Á FEE
IG	T FÍŒ	Z	FÈÌ	FÈÌ €	Á FEE
IH	T FÍ FŒ	Ÿ	FÈH	FÈH €	Á FEE
Iì	T FÍ FŒ	Z	FÈÌ	FÈÌ €	Á FEE
Ií	T FÍ Œ	Ÿ	FÈĠ	FÈĠ €	Á FEE
IÎ	T FÍ Œ	Z	GÈFH	GÈFH €	Á FEE
Iï	T FÍ Œ	Ÿ	FÈJG	FÈJG €	Á FEE
Iÿ	T FÍ Œ	Z	GÈI	GÈI €	Á FEE
IJ	T FÍ Œ	Ÿ	ÈEG	ÈEG €	Á FEE
I€	T FÍ Œ	Z	ÈEH	ÈEH €	Á FEE
IF	T FÍ FŒ	Ÿ	ÈÎH	ÈÎH €	Á FEE
IG	T FÍ FŒ	Z	ÈÌ	ÈÌ €	Á FEE
IH	T FÍ GŒ	Ÿ	€	€ €	Á FEE
Iì	T FÍ GŒ	Z	€	€ €	Á FEE
Ií	T FÍ Œ	Ÿ	€	€ €	Á FEE
IÎ	T FÍ Œ	Z	€	€ €	Á FEE
Iï	T FÍ Œ	Ÿ	ÈÎH	ÈÎH €	Á FEE
Iÿ	T FÍ Œ	Z	ÈÌ	ÈÌ €	Á FEE
IJ	T FÍ Œ	Ÿ	FÈÌ	FÈÌ €	Á FEE
I€	T FÍ Œ	Z	GÈŒ	GÈŒ €	Á FEE
IF	T FÍ JŒ	Ÿ	FÈĠ	FÈĠ €	Á FEE
IG	T FÍ JŒ	Z	GÈJF	GÈJF €	Á FEE
IH	T FÍ FŒ	Ÿ	FÈHJ	FÈHJ €	Á FEE
Iì	T FÍ FŒ	Z	GÈÌ	GÈÌ €	Á FEE
Ií	T ÚGŒ	Ÿ	FÈÌJ	FÈÌJ €	Á FEE
IÎ	T ÚGŒ	Z	GÈ	GÈ €	Á FEE
Iï	T ÚHŒ	Ÿ	FÈĠ	FÈĠ €	Á FEE
Iÿ	T ÚHŒ	Z	GÈIF	GÈIF €	Á FEE
IJ	T ÚÍ Œ	Ÿ	FÈĠ	FÈĠ €	Á FEE
I€	T ÚÍ Œ	Z	GÈIF	GÈIF €	Á FEE
IF	T ÚFŒ	Ÿ	FÈĠ	FÈĠ €	Á FEE
IG	T ÚFŒ	Z	GÈIF	GÈIF €	Á FEE
IH	T Í Œ	Ÿ	€	€ €	Á FEE
Iì	T Í Œ	Z	€	€ €	Á FEE
Ií	T ÚGÔ	Ÿ	FÈÌJ	FÈÌJ €	Á FEE
IÎ	T ÚGÔ	Z	GÈ	GÈ €	Á FEE
Iï	T ÚHÔ	Ÿ	FÈĠ	FÈĠ €	Á FEE
Iÿ	T ÚHÔ	Z	GÈIF	GÈIF €	Á FEE



**A Ya Vyf'8 ]g|f]Vi hYX' @ UXg'f6 @' ) - : 'Gfi Wñ fy'K ]''fp, \$ '8 Yl ěL'ff c bh]bi YXL**

	T { á^ Ááæ^ }	Öá^&ca }	ÚœóÁ æ' } á á^ ŽáD(Ě) áÁ æ' } á á^ ŽáD(Ě) ÚœóÁ &ca }	ŽáÁ á	Ö) áÁ &ca }	ŽáÁ á
GF	T J€œ	Ý	€	€	€	Ă F€œ
GG	T J€œ	Z	FĚFĪ	FĚFĪ	€	Ă F€œ
GH	T JG	Ý	€	€	€	Ă F€œ
G	T JG	Z	FĚÍ F	FĚÍ F	€	Ă F€œ
G	T FFĪ œ	Ý	€	€	€	Ă F€œ
GĪ	T FFĪ œ	Z	GĚ Ī G	GĚ Ī G	€	Ă F€œ
GĪ	T FFĪ œ	Ý	€	€	€	Ă F€œ
GĪ	T FFĪ œ	Z	Ě Ī Ī	Ě Ī Ī	€	Ă F€œ
GJ	T FFJ œ	Ý	€	€	€	Ă F€œ
H€	T FFJ œ	Z	Ě Ī Ī	Ě Ī Ī	€	Ă F€œ
HF	T FGœœ	Ý	€	€	€	Ă F€œ
HG	T FGœœ	Z	FĚGF	FĚGF	€	Ă F€œ
HH	T FGœœ	Ý	€	€	€	Ă F€œ
HI	T FGœœ	Z	ĚGF	ĚGF	€	Ă F€œ
HÍ	T FG œ	Ý	€	€	€	Ă F€œ
HĪ	T FG œ	Z	HĚGF	HĚGF	€	Ă F€œ
HĪ	T FGJ œ	Ý	€	€	€	Ă F€œ
HĪ	T FGJ œ	Z	HĚHG	HĚHG	€	Ă F€œ
HJ	T FHœœ	Ý	€	€	€	Ă F€œ
I €	T FHœœ	Z	I ĚÍ F	I ĚÍ F	€	Ă F€œ
IF	T FHœœ	Ý	€	€	€	Ă F€œ
IG	T FHœœ	Z	I Ě Ę	I Ě Ę	€	Ă F€œ
I H	T FH œ	Ý	€	€	€	Ă F€œ
I Ī	T FH œ	Z	HĚHG	HĚHG	€	Ă F€œ
I Ī	T FH œ	Ý	€	€	€	Ă F€œ
I Ī	T FH œ	Z	FĚFĪ	FĚFĪ	€	Ă F€œ
I Ī	T FH œ	Ý	€	€	€	Ă F€œ
I Ī	T FH œ	Z	FĚÍ F	FĚÍ F	€	Ă F€œ
I J	T FJœœ	Ý	€	€	€	Ă F€œ
I €	T FJœœ	Z	GĚ Ī G	GĚ Ī G	€	Ă F€œ
I F	T FÍ œœ	Ý	€	€	€	Ă F€œ
I G	T FÍ œœ	Z	Ě Ī Ī	Ě Ī Ī	€	Ă F€œ
I H	T FÍ F œœ	Ý	€	€	€	Ă F€œ
I Ī	T FÍ F œœ	Z	Ě Ī Ī	Ě Ī Ī	€	Ă F€œ
I Ī	T FÍ œœ	Ý	€	€	€	Ă F€œ
I Ī	T FÍ œœ	Z	FĚGF	FĚGF	€	Ă F€œ
I Ī	T FÍ Ī œœ	Ý	€	€	€	Ă F€œ
I Ī	T FÍ Ī œœ	Z	HĚĪ	HĚĪ	€	Ă F€œ
I J	T FÍ Ī œœ	Ý	€	€	€	Ă F€œ
I €	T FÍ Ī œœ	Z	ĚGF	ĚGF	€	Ă F€œ
I F	T FÍ F œœ	Ý	€	€	€	Ă F€œ
I G	T FÍ F œœ	Z	HĚHG	HĚHG	€	Ă F€œ
I H	T FÍ œœ	Ý	€	€	€	Ă F€œ
I Ī	T FÍ œœ	Z	FĚFĪ	FĚFĪ	€	Ă F€œ
I Ī	T FÍ Ī œœ	Ý	€	€	€	Ă F€œ
I Ī	T FÍ Ī œœ	Z	FĚÍ F	FĚÍ F	€	Ă F€œ
I Ī	T FÍ Ī œœ	Ý	€	€	€	Ă F€œ
I Ī	T FÍ Ī œœ	Z	HĚHG	HĚHG	€	Ă F€œ
I J	T FÍ Ī œœ	Ý	€	€	€	Ă F€œ
I €	T FÍ Ī œœ	Z	I ĚÍ F	I ĚÍ F	€	Ă F€œ
I F	T FÍ J œœ	Ý	€	€	€	Ă F€œ
I G	T FÍ J œœ	Z	I Ě Ę	I Ě Ę	€	Ă F€œ

































**A Ya Vyf'8]gfh]Vi hYX'@UXg'f6 @'\*) :.Gfi Wf fY'Ka 'f6 \$ 8 Y] tL'f7 cbh]bi YXL**

	T^{ à^/Àæ^}	Öá^&á}	ÚcæóÁ æ} æ á^ ZæDæ(Ö) áÁ æ} æ á^ ZæDæ(Ö) ÚcæóÁ &æá} ZæÁ á	Ö) áÁ &æá} ZæÁ á		
ì F	T ÚFOE	Ý	€	€	€	À FEE
ì G	T ÚFOE	Z	€ FG	€ FG	€	À FEE
ì H	T ÌÍOE	Ý	€	€	€	À FEE
ì I	T ÌÍOE	Z	€ Ì	€ Ì	€	À FEE
ì Í	T ÚGÔ	Ý	€	€	€	À FEE
ì Î	T ÚGÔ	Z	€ FJ	€ FJ	€	À FEE
ì Ï	T ÚHÔ	Ý	€	€	€	À FEE
ì Ì	T ÚHÔ	Z	€ FG	€ FG	€	À FEE
ì J	T ÚÍ Ô	Ý	€	€	€	À FEE
J€	T ÚÍ Ô	Z	€ FG	€ FG	€	À FEE
JF	T ÚFÔ	Ý	€	€	€	À FEE
JG	T ÚFÔ	Z	€ FG	€ FG	€	À FEE
JH	T Ì J	Ý	€	€	€	À FEE
JI	T Ì J	Z	€ Ì	€ Ì	€	À FEE
JÍ	T ÚGÓ	Ý	€	€	€	À FEE
JÎ	T ÚGÓ	Z	€ FJ	€ FJ	€	À FEE
JÏ	T ÚHÓ	Ý	€	€	€	À FEE
JÌ	T ÚHÓ	Z	€ FG	€ FG	€	À FEE
JJ	T ÚÍ Ó	Ý	€	€	€	À FEE
F€€	T ÚÍ Ó	Z	€ FG	€ FG	€	À FEE
F€F	T ÚFÓ	Ý	€	€	€	À FEE
F€G	T ÚFÓ	Z	€ FG	€ FG	€	À FEE
F€H	T JÍ OE	Ý	€	€	€	À FEE
F€I	T JÍ OE	Z	€ Ì	€ Ì	€	À FEE
F€Í	T JÍ OE	Ý	€	€	€	À FEE
F€Î	T JÍ OE	Z	€ Ì	€ Ì	€	À FEE
F€Ï	T F€F	Ý	€	€	€	À FEE
F€Ì	T F€F	Z	€ FJ	€ FJ	€	À FEE
F€J	T F€Í	Ý	€	€	€	À FEE
FF€	T F€Í	Z	€ Ì	€ Ì	€	À FEE
FFF	T FFÌ	Ý	€	€	€	À FEE
FFG	T FFÌ	Z	€ Ì G	€ Ì G	€	À FEE
FFH	T FFÌ	Ý	€	€	€	À FEE
FFI	T FFÌ	Z	€ Ì J	€ Ì J	€	À FEE
FFÍ	T FFJ	Ý	€	€	€	À FEE
FFÎ	T FFJ	Z	€ Ì G	€ Ì G	€	À FEE

**A Ya Vyf'8]gfh]Vi hYX'@UXg'f6 @'\*\*) :.Gfi Wf fY'Ka 'fi \$ 8 Y] tL**

	T^{ à^/Àæ^}	Öá^&á}	ÚcæóÁ æ} æ á^ ZæDæ(Ö) áÁ æ} æ á^ ZæDæ(Ö) ÚcæóÁ &æá} ZæÁ á	Ö) áÁ &æá} ZæÁ á		
F	T Ì OE	Ý	€ Ì	€ Ì	€	À FEE
G	T Ì OE	Z	€ Ì	€ Ì	€	À FEE
H	T Ì H	Ý	€ Ì	€ Ì	€	À FEE
I	T Ì H	Z	€ Ì	€ Ì	€	À FEE
Í	T Ì I	Ý	€ Ì	€ Ì	€	À FEE
Î	T Ì I	Z	€ Ì	€ Ì	€	À FEE
Ï	T Ì Í	Ý	€ Ì	€ Ì	€	À FEE
Ì	T Ì Í	Z	€ HU	€ HU	€	À FEE
J	T Ì I	Ý	€ J	€ J	€	À FEE
F€	T Ì I	Z	€ Ì	€ Ì	€	À FEE
FF	T Ì J	Ý	€ Ì	€ Ì	€	À FEE
FG	T Ì J	Z	€ Ì I	€ Ì I	€	À FEE







**A Ya Vyf'8 ]g]f]Vi hYX' @ UXg'f6 @' \*+ : 'Gfi Wñ fy'K a ''ff \$'8 Yl È'ff cb]bi YXL**

	T { à^!Àæ^ }	Ôã^&ç }	ÙçèóÁ æ } à^!ZaDè(È) áÁ æ } à^!ZaDè(È) ÙçèóÁ &ç }	ZèÁ á	Ò) áÁ &ç }	ZèÁ á
íH	T Fí FÖE	Ý	Èí H	Èí H	€	À FEE
íI	T Fí FÖE	Z	Èí I	Èí I	€	À FEE
íÍ	T Fí GÖE	Ý	Èí G	Èí G	€	À FEE
íÎ	T Fí GÖE	Z	Èí G	Èí G	€	À FEE
íÏ	T Fí Í ÖE	Ý	Èí H	Èí H	€	À FEE
íÌ	T Fí Í ÖE	Z	Èí	Èí	€	À FEE
íJ	T Fí Î ÖE	Ý	Èí G	Èí G	€	À FEE
í€	T Fí Î ÖE	Z	Èí J	Èí J	€	À FEE
íF	T Fí FÖE	Ý	Èí Í	Èí Í	€	À FEE
íG	T Fí FÖE	Z	Èí Ì	Èí Ì	€	À FEE
íH	T Fí GÖE	Ý	FÈí	FÈí	€	À FEE
íI	T Fí GÖE	Z	Èí Ï	Èí Ï	€	À FEE
íÍ	T Fí Í ÖE	Ý	FÈí F	FÈí F	€	À FEE
íÎ	T Fí Í ÖE	Z	Èí G	Èí G	€	À FEE
íÏ	T Fí Î ÖE	Ý	Èí Í	Èí Í	€	À FEE
íÌ	T Fí Î ÖE	Z	Èí Ï	Èí Ï	€	À FEE
íJ	T Fí Î ÖE	Ý	Èí Í	Èí Í	€	À FEE
í€	T Fí Î ÖE	Z	Èí Ï	Èí Ï	€	À FEE
íF	T Fí JÖE	Ý	Èí J	Èí J	€	À FEE
íG	T Fí JÖE	Z	Èí F	Èí F	€	À FEE
íH	T Fí FÖE	Ý	Èí H	Èí H	€	À FEE
íI	T Fí FÖE	Z	Èí J	Èí J	€	À FEE
íÍ	T ÚGÖE	Ý	Èí H	Èí H	€	À FEE
íÎ	T ÚGÖE	Z	Èí F	Èí F	€	À FEE
íÏ	T ÚHÖE	Ý	Èí H	Èí H	€	À FEE
íÌ	T ÚHÖE	Z	Èí Í	Èí Í	€	À FEE
íJ	T ÚÍ ÖE	Ý	Èí H	Èí H	€	À FEE
í€	T ÚÍ ÖE	Z	Èí Í	Èí Í	€	À FEE
íF	T ÚFÖE	Ý	Èí H	Èí H	€	À FEE
íG	T ÚFÖE	Z	Èí Í	Èí Í	€	À FEE
íH	T Í Í ÖE	Ý	Èí H	Èí H	€	À FEE
íI	T Í Í ÖE	Z	Èí Í	Èí Í	€	À FEE
íÍ	T ÚGÔ	Ý	Èí H	Èí H	€	À FEE
íÎ	T ÚGÔ	Z	Èí F	Èí F	€	À FEE
íÏ	T ÚHÔ	Ý	Èí H	Èí H	€	À FEE
íÌ	T ÚHÔ	Z	Èí Í	Èí Í	€	À FEE
íJ	T ÚÍ Ô	Ý	Èí H	Èí H	€	À FEE
J€	T ÚÍ Ô	Z	Èí Í	Èí Í	€	À FEE
JF	T ÚFÔ	Ý	Èí H	Èí H	€	À FEE
JG	T ÚFÔ	Z	Èí Í	Èí Í	€	À FEE
JH	T Í J	Ý	Èí H	Èí H	€	À FEE
JI	T Í J	Z	Èí J	Èí J	€	À FEE
JÍ	T ÚGÓ	Ý	Èí H	Èí H	€	À FEE
JÎ	T ÚGÓ	Z	Èí F	Èí F	€	À FEE
JÏ	T ÚHÓ	Ý	Èí H	Èí H	€	À FEE
JÌ	T ÚHÓ	Z	Èí Í	Èí Í	€	À FEE
JJ	T ÚÍ Ó	Ý	Èí H	Èí H	€	À FEE
F€€	T ÚÍ Ó	Z	Èí Í	Èí Í	€	À FEE
F€F	T ÚFÓ	Ý	Èí H	Èí H	€	À FEE
F€G	T ÚFÓ	Z	Èí Í	Èí Í	€	À FEE
F€H	T J Í ÖE	Ý	Èí	Èí	€	À FEE
F€I	T J Í ÖE	Z	Èí H	Èí H	€	À FEE







**A Ya Vyf'8 ]g]f]Vi hYX' @ UXg'f6 @ '\*, : 'Gfi Wí fY'Ka ''fi \$'8 Y] ÈÈf' c]h]i YXL**

	T { à^!Àæ^ ^ }	Öã^&çá }	ÙçæóÁ æ } á à^!ZaDfíE) áÁ æ } á à^!ZaDfíE) ÙçæóÁ } &çá }	ŽdĀ á	Ò) áÁ } &çá }	ŽdĀ á
Ì J	T ÛÍ Ô	Ý	È FG	È FG	€	À FEE
J€	T ÛÍ Ô	Z	€	€	€	À FEE
JF	T ÛF Ô	Ý	È FG	È FG	€	À FEE
JG	T ÛF Ô	Z	€	€	€	À FEE
JH	T Ì J	Ý	È Í Í	È Í Í	€	À FEE
JI	T Ì J	Z	€	€	€	À FEE
JÍ	T ÛG Ó	Ý	È FJ	È FJ	€	À FEE
JĪ	T ÛG Ó	Z	€	€	€	À FEE
JĲ	T ÛH Ó	Ý	È FG	È FG	€	À FEE
JÌ	T ÛH Ó	Z	€	€	€	À FEE
JJ	T ÛÍ Ó	Ý	È FG	È FG	€	À FEE
F€€	T ÛÍ Ó	Z	€	€	€	À FEE
F€F	T ÛF Ó	Ý	È FG	È FG	€	À FEE
F€G	T ÛF Ó	Z	€	€	€	À FEE
F€H	T JÍ OE	Ý	È Í Í	È Í Í	€	À FEE
F€I	T JÍ OE	Z	€	€	€	À FEE
F€Ī	T JÍ OE	Ý	È Í Í	È Í Í	€	À FEE
F€Ĳ	T JÍ OE	Z	€	€	€	À FEE
F€Ĵ	T F€F	Ý	€	€	€	À FEE
F€Ķ	T F€F	Z	€	€	€	À FEE
F€J	T F€Í	Ý	È Í Í	È Í Í	€	À FEE
FF€	T F€Í	Z	€	€	€	À FEE
FFF	T FFĪ	Ý	È FĪ	È FĪ	€	À FEE
FFG	T FFĪ	Z	€	€	€	À FEE
FFH	T FFÌ	Ý	€	€	€	À FEE
FFI	T FFÌ	Z	€	€	€	À FEE
FFĪ	T FFJ	Ý	È FĪ	È FĪ	€	À FEE
FFĲ	T FFJ	Z	€	€	€	À FEE

**A Ya Vyf'8 ]g]f]Vi hYX' @ UXg'f6 @ '\*- : 'Gfi Wí fY'Ka ''fV\$'8 Y] ÈÈ**

	T { à^!Àæ^ ^ }	Öã^&çá }	ÙçæóÁ æ } á à^!ZaDfíE) áÁ æ } á à^!ZaDfíE) ÙçæóÁ } &çá }	ŽdĀ á	Ò) áÁ } &çá }	ŽdĀ á
F	T Ī OE	Ý	È JĪ	È JĪ	€	À FEE
G	T Ī OE	Z	È Ī	È Ī	€	À FEE
H	T Ī H	Ý	È Ī H	È Ī H	€	À FEE
I	T Ī H	Z	È Ī	È Ī	€	À FEE
Í	T Ī Ī	Ý	È Ī H	È Ī H	€	À FEE
Ī	T Ī Ī	Z	È Ī	È Ī	€	À FEE
Ĳ	T Ī Ī	Ý	È Ī	È Ī	€	À FEE
Ì	T Ī Ī	Z	È Ī G	È Ī G	€	À FEE
J	T Ī Ī	Ý	È Ī H	È Ī H	€	À FEE
F€	T Ī Ī	Z	È	È	€	À FEE
FF	T Ī J	Ý	È GF	È GF	€	À FEE
FG	T Ī J	Z	È Ī J	È Ī J	€	À FEE
FH	T Ī Ī	Ý	È Í Í	È Í Í	€	À FEE
FI	T Ī Ī	Z	È Ī Ī	È Ī Ī	€	À FEE
FĪ	T Ī Ī	Ý	FÈ Ī	FÈ Ī	€	À FEE
FĲ	T Ī Ī	Z	È Ī Ī	È Ī Ī	€	À FEE
FĴ	T Ī Ī OE	Ý	FÈ Ī F	FÈ Ī F	€	À FEE
FĶ	T Ī Ī OE	Z	È Ī G	È Ī G	€	À FEE
FJ	T Ī JOE	Ý	È Í Í	È Í Í	€	À FEE
GE	T Ī JOE	Z	È Ī Ī	È Ī Ī	€	À FEE



**A Ya Vyf'8 ]g]f]Vi hYX' @ UXg'f6 @ '\*- :. Gfi Wf fY'Ka ''fV&\$'8 Yf Lf'fV cb]bi YXL**

	T ^{ à^/Àæ^ ^	Öä^&çä}	ÚçæóÁ æ} æ à^ à^ZaDæf(È) áÁ æ} æ à^ à^ZaDæf(È) ÚçæóÁ &æçä} ŽdĀ á	Ò) áÁ &æçä} ŽdĀ á		
ĪH	T FĪ FOE	Ý	ĒĪH	ĒĪH	€	Ă FEE
ĪI	T FĪ FOE	Z	ĒĪI	ĒĪI	€	Ă FEE
ĪĪ	T ÚGOE	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T ÚGOE	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T ÚHOE	Ý	ĒĪH	ĒĪH	€	Ă FEE
ĪĪ	T ÚHOE	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪJ	T ÚIOE	Ý	ĒĪH	ĒĪH	€	Ă FEE
Ī€	T ÚIOE	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪF	T ÚFOE	Ý	ĒĪH	ĒĪH	€	Ă FEE
ĪG	T ÚFOE	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪH	T ĪĪOE	Ý	ĒĪH	ĒĪH	€	Ă FEE
ĪI	T ĪĪOE	Z	ĒĪI	ĒĪI	€	Ă FEE
ĪĪ	T ÚGÔ	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T ÚGÔ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T ÚHÔ	Ý	ĒĪH	ĒĪH	€	Ă FEE
ĪĪ	T ÚHÔ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪJ	T ÚIO	Ý	ĒĪH	ĒĪH	€	Ă FEE
Ī€	T ÚIO	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪF	T ÚFÔ	Ý	ĒĪH	ĒĪH	€	Ă FEE
ĪG	T ÚFÔ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪH	T ĪJ	Ý	ĒĪH	ĒĪH	€	Ă FEE
ĪI	T ĪJ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T ÚGÓ	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T ÚGÓ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T ÚHÓ	Ý	ĒĪH	ĒĪH	€	Ă FEE
ĪI	T ÚHÓ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪJ	T ÚIO	Ý	ĒĪH	ĒĪH	€	Ă FEE
Ī€	T ÚIO	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪF	T ÚFÓ	Ý	ĒĪH	ĒĪH	€	Ă FEE
ĪG	T ÚFÓ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪH	T ĪJ OE	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪI	T ĪJ OE	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T ĪJ OE	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T ĪJ OE	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T FĪ	Ý	ĒĪH	ĒĪH	€	Ă FEE
ĪI	T FĪ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪJ	T FĪ	Ý	ĒĪH	ĒĪH	€	Ă FEE
Ī€	T FĪ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪF	T FĪ	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪG	T FĪ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪH	T FĪ	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪI	T FĪ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪJ	T FĪ	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
Ī€	T FĪ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪF	T FĪ	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪG	T FĪ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪH	T FĪ	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪI	T FĪ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T FĪ	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T FĪ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T FĪ	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
ĪĪ	T FĪ	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE

**A Ya Vyf'8 ]g]f]Vi hYX' @ UXg'f6 @ '+\$. Gfi Wf fY'Ka ''fV) \$'8 Yf Lf**

	T ^{ à^/Àæ^ ^	Öä^&çä}	ÚçæóÁ æ} æ à^ à^ZaDæf(È) áÁ æ} æ à^ à^ZaDæf(È) ÚçæóÁ &æçä} ŽdĀ á	Ò) áÁ &æçä} ŽdĀ á		
F	T Ī GOE	Ý	ĒĪI	ĒĪI	€	Ă FEE
G	T Ī GOE	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE
H	T ĪH	Ý	ĒĪĪ	ĒĪĪ	€	Ă FEE
I	T ĪH	Z	ĒĪĪ	ĒĪĪ	€	Ă FEE

































### A Ya Vyf'8]gfl]Vi hYX'@ UXg'f6 @' +\* :.Gfi Wh fy'Ka "fl' \$'8 Yl £:fl' cb]i YXL

	T\{ á^Aæ ^	Öá^&ca}	ÚcæA æ } á^ á^ZaDæ(Ö) áA æ } á^ á^ZaDæ(Ö) ÚcæA(Ö) &ca }	Zá á	Ö) áA(Ö) &ca }	Zá á
FH	T I I	Y	H H	H	€	Å FEE
FI	T I I	Z	H G	H G	€	Å FEE
FÍ	T I Í	Y	H JI	H JI	€	Å FEE
FÌ	T I Í	Z	H Í	H Í	€	Å FEE
FÏ	T I Î Æ	Y	H FG	H FG	€	Å FEE
FÌ	T I Î Æ	Z	H Ï	H Ï	€	Å FEE
FJ	T I J Æ	Y	H H	H H	€	Å FEE
œ	T I J Æ	Z	H G	H G	€	Å FEE
GF	T J Æ	Y	€	€	€	Å FEE
GG	T J Æ	Z	€	€	€	Å FEE
GH	T J G	Y	€	€	€	Å FEE
G	T J G	Z	€	€	€	Å FEE
G	T FF Æ	Y	H G	H G	€	Å FEE
G	T FF Æ	Z	H Æ	H Æ	€	Å FEE
G	T FF Æ	Y	€	€	€	Å FEE
G	T FF Æ	Z	€	€	€	Å FEE
GJ	T FF J Æ	Y	€	€	€	Å FEE
H€	T FF J Æ	Z	€	€	€	Å FEE
HF	T FG Æ	Y	€	€	€	Å FEE
HG	T FG Æ	Z	€	€	€	Å FEE
HH	T FGH Æ	Y	H J	H J	€	Å FEE
H	T FGH Æ	Z	H H	H H	€	Å FEE
HÍ	T FG Æ	Y	H J	H J	€	Å FEE
HÌ	T FG Æ	Z	H H	H H	€	Å FEE
HÏ	T FG Æ	Y	H Í	H Í	€	Å FEE
HÌ	T FG Æ	Z	H Æ	H Æ	€	Å FEE
HJ	T FH Æ	Y	H JI	H JI	€	Å FEE
I €	T FH Æ	Z	H Í	H Í	€	Å FEE
IF	T FH Æ	Y	H FG	H FG	€	Å FEE
IG	T FH Æ	Z	H Í	H Í	€	Å FEE
I H	T FH Æ	Y	H Í	H Í	€	Å FEE
II	T FH Æ	Z	H Æ	H Æ	€	Å FEE
IÍ	T FH Æ	Y	H JI	H JI	€	Å FEE
IÌ	T FH Æ	Z	H Í	H Í	€	Å FEE
IÏ	T FH Æ	Y	H FG	H FG	€	Å FEE
IÌ	T FH Æ	Z	H Ï	H Ï	€	Å FEE
I J	T FHJ Æ	Y	H J	H J	€	Å FEE
I €	T FHJ Æ	Z	H Ï	H Ï	€	Å FEE
IF	T FI Æ	Y	H Í	H Í	€	Å FEE
IG	T FI Æ	Z	H Ï	H Ï	€	Å FEE
I H	T FI F Æ	Y	H Í	H Í	€	Å FEE
IÌ	T FI F Æ	Z	H Ï	H Ï	€	Å FEE
IÍ	T FI G Æ	Y	H Í	H Í	€	Å FEE
IÌ	T FI G Æ	Z	H HJ	H HJ	€	Å FEE
IÏ	T FI Í Æ	Y	H J	H J	€	Å FEE
IÌ	T FI Í Æ	Z	H Ï	H Ï	€	Å FEE
I J	T FI Í Æ	Y	H H	H H	€	Å FEE
I €	T FI Í Æ	Z	H Í	H Í	€	Å FEE
IF	T FI F Æ	Y	H H	H H	€	Å FEE
IG	T FI F Æ	Z	H G	H G	€	Å FEE
I H	T FI G Æ	Y	€	€	€	Å FEE
IÌ	T FI G Æ	Z	€	€	€	Å FEE



Ó[ { ]æ^ K  
 Ô•ã}^! K  
 R àÁ~{ à^! K  
 T [ à^|Áæ^ ^ K

T æÁ ËœGF  
 FKH ÁÚT  
 Ô@&^àÁÓK''''

**A Ya Vyf'8 jgflVi hYX' @ UXg'f6 @' +\* : Gfi Wh fY'Ka 'fl' \$'8 Yl L'f7 cbljpi YXL**

T { à^ Áæ^	Ôá^&á}	ÙœóÁ æ} æ' à^ Áæ^} áÁ æ} æ' à^ Áæ^} ÙœóÁ &æ^} ZéÁ á	ÙœóÁ æ} æ' à^ Áæ^} áÁ æ} æ' à^ Áæ^} ÙœóÁ &æ^} ZéÁ á	ÙœóÁ æ} æ' à^ Áæ^} áÁ æ} æ' à^ Áæ^} ÙœóÁ &æ^} ZéÁ á	ÙœóÁ æ} æ' à^ Áæ^} áÁ æ} æ' à^ Áæ^} ÙœóÁ &æ^} ZéÁ á
ÍÍ	T FÍI OE	Y	€	€	€
ÎÎ	T FÍI OE	Z	€	€	€
ÏÏ	T FÍI OE	Y	€H	€H	€
ÏÏ	T FÍI OE	Z	€G	€G	€
ÏJ	T FÍI OE	Y	€J	€J	€
Ï€	T FÍI OE	Z	€I	€I	€
ÏF	T FÍJ OE	Y	€FG	€FG	€
ÏG	T FÍJ OE	Z	€I	€I	€
ÏH	T FÍ FOE	Y	€H	€H	€
ÏI	T FÍ FOE	Z	€J	€J	€
ÏÍ	T ÚGOE	Y	€F	€F	€
ÏÎ	T ÚGOE	Z	€H	€H	€
ÏÏ	T ÚHOE	Y	€I	€I	€
ÏÏ	T ÚHOE	Z	€H	€H	€
ÏJ	T ÚI OE	Y	€I	€I	€
Ï€	T ÚI OE	Z	€H	€H	€
ÏF	T ÚFOE	Y	€I	€I	€
ÏG	T ÚFOE	Z	€H	€H	€
ÏH	T ÎI OE	Y	€	€	€
ÏI	T ÎI OE	Z	€	€	€
ÏÍ	T ÚGÔ	Y	€F	€F	€
ÏÎ	T ÚGÔ	Z	€H	€H	€
ÏÏ	T ÚHÔ	Y	€I	€I	€
ÏÏ	T ÚHÔ	Z	€H	€H	€
ÏJ	T ÚI Ô	Y	€I	€I	€
J€	T ÚI Ô	Z	€H	€H	€
JF	T ÚFÔ	Y	€I	€I	€
JG	T ÚFÔ	Z	€H	€H	€
JH	T ÎJ	Y	€H	€H	€
JI	T ÎJ	Z	€J	€J	€
JÍ	T ÚGÓ	Y	€F	€F	€
JÎ	T ÚGÓ	Z	€H	€H	€
JÏ	T ÚHÓ	Y	€I	€I	€
JÏ	T ÚHÓ	Z	€H	€H	€
JJ	T ÚI Ó	Y	€I	€I	€
F€€	T ÚI Ó	Z	€H	€H	€
F€F	T ÚFÔ	Y	€I	€I	€
F€G	T ÚFÔ	Z	€H	€H	€
F€H	T JÍ OE	Y	€H	€H	€
F€I	T JÍ OE	Z	€I	€I	€
F€Í	T JÍ OE	Y	€G	€G	€
F€Î	T JÍ OE	Z	€G	€G	€
F€Ï	T F€F	Y	€G	€G	€
F€Ï	T F€F	Z	€G	€G	€
F€J	T F€I	Y	€	€	€
FF€	T F€I	Z	€	€	€
FFF	T FFÍ	Y	€I	€I	€
FFG	T FFÍ	Z	€I	€I	€
FFH	T FFÍ	Y	€I	€I	€
FFI	T FFÍ	Z	€I	€I	€
FFÍ	T FFJ	Y	€	€	€
FFÎ	T FFJ	Z	€	€	€



**A Ya VYf 8 jgf]Vi hYX @ UXg'f6 @ ' , & : 6 @ ( \$ 'Hf Ubg]Ybh5 fYU @ UXgL'f7 c bh]bi YXL**

	T{ à^/Áæ^	Öá^&ç	ÙceóÁ æ} æ à^ZaD(=) áÁ æ} æ à^ZaD(=) ÙceóÁ &æç	ZáÁ á	Ô) áÁ &æç	ZáÁ á
FJ	TIJ	ÿ	ÊÍÊHG	ÊËÏG	GËG	HËÍ
GE	TIJ	ÿ	ÊËÏG	ÊËG	HËÍ	IËÉ
GF	TFIÓE	ÿ	ÊËË	ÊËË	€	ËIF
GG	TFIÓE	ÿ	ÊËË	ÊÍÊHH	ËIF	FËÏG
GH	TFIÓE	ÿ	ÊÍÊHH	ÊÍËÍ	FËÏG	GËGH
G	TFIÓE	ÿ	ÊÍËÍ	ÊFHGH	GËGH	HËÍ
GÍ	TFIÓE	ÿ	ÊFHGH	ÊËÏ	HËÍ	IËÉ
GË	TFIÓE	ÿ	ÊËÏ	ÊFHÏF	€	ËIF
GË	TFIÓE	ÿ	ÊFHÏF	ÊÍËÏG	ËIF	FËÏG
GË	TFIÓE	ÿ	ÊÍËÏG	ÊÍÊHG	FËÏG	GËG
GJ	TFIÓE	ÿ	ÊÍÊHG	ÊËÏG	GËG	HËÍ
HE	TFIÓE	ÿ	ÊËÏG	ÊËG	HËÍ	IËÉ

**A Ya VYf 5 fYU @ UXg'f6 @ " - : Ghf Wi fy8L**

	R ā óE	R ā óÓ	R ā óÓ	R ā óÓ	Öá^&ç	Öá d ā ç	T æ} æ à^Z•á
F	pFIÓE	pFIÓE	pFIÓE	pFIÓE	ÿ	V,   Á æ	ËËË
G	pFFÍ	pFGG	pFGF	pFFÍ ÓE	ÿ	V,   Á æ	ËËË
H	pGEHCE	pEGOE	pGEÍ ÓE	pGEÍ ÓE	ÿ	V,   Á æ	ËËË

**A Ya VYf 5 fYU @ UXg'f6 @ ( \$ : Ghf Wi fy8L**

	R ā óE	R ā óÓ	R ā óÓ	R ā óÓ	Öá^&ç	Öá d ā ç	T æ} æ à^Z•á
F	pFIÓE	pFIÓE	pFIÓE	pFIÓE	ÿ	V,   Á æ	ËËFF
G	pFFÍ	pFGG	pFGF	pFFÍ ÓE	ÿ	V,   Á æ	ËËFF
H	pGEHCE	pGEÍ ÓE	pGEÍ ÓE	pEGOE	ÿ	V,   Á æ	ËËFF

**9bj YcdY > c]bhFYUM]cbg**

	R ā c	YÁá	SÔ	YÁá	SÔ	ZÁá	SÔ	TÝÁË Écá	SÔ	TÝÁË Écá	SÔ	TZÁË Écá	SÔ
F	pFFOE	{ æ	FÍ HË HH	F€	GÍ JËH	FH	GFGË HG	F	Í ÊÏ	FH	FËH	I	ËÏ
G		{ ā	ÊFI GË ÏG	I	JÍ ÊÏJ	HF	ÊGH JËFF	Í	FËG	Í	ÊËH	F€	ËËÉ
H	pFÍ ÓE	{ æ	GÊ Í Ê F	J	GHÍ ÊJ	GF	FÍ Í BÍ	G	ËÏG	H	FËÍ	FG	ËËH
I		{ ā	ÊGÍ ÊÍ	H	JÍ BÍ	H	ÊFGÊÍ Í	Í	ËËË	Í	ÊËÍ	Í	ËËÉ
Í	pFJÍ ÓE	{ æ	FÍ FÍ BÍ	FF	GÍ ÊÍ	FÍ	FÍ GË Í	FG	ÊÍ H	FF	FË Í F	Í	IËF
ï		{ ā	ÊÍ Í Í BÍ	Í	JÍ Ê Í	FF	Ê Í FJÊ	Í	ËËH	FÍ	ÊË Í	G	FË Í H
ï	V  cø K	{ æ	IJJÊÍ	F€	Í GÍ Ê F	GF	IÍ HÊ Í	F					
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**9bj YcdY5 =G7 % á h fl \* \$!% L ' @ : 8 'GhY 7 cXY7\ YWg**

	T{ à!	Ùcæ^	Ô) á Á ÓÊËŞ &Zca SÔ	ÙcæÁÊË Ş &Zca Óá SÔ	@E) &Áá	@E) oÁá	@E) ÁÊË	@E) ÁÊËÓá	Ô)			
F	TÍ GE	PÜIYÍ YÍ	ÊÍ Ì	€	FÍ	ÊÍ	€	^	FÍ FGÍ ÊÍ FHÍ FÍ	FÍ ÊÍ F	FÍ ÊÍ F	HËËPËÉá
G	TÍ H	PÜIYÍ YH	ÊFÍ	GË Ê	G€	ÊÍ	GË Ê	^	GF FÊ HÍ FËH	FÊ Í FG	FÊ Í G	FËËPËÉá
H	TÍ I	PÜIYÍ YH	ÊF€	€	FH	ÊÍ	€	^	FÍ FÊ HÍ FËH	FÊ Í FG	FÊ Í G	FËËPËÉá
I	TÍ I	USFDYÍ	ÊIU€	ÊÍ Í	I	ÊÍ J	€	^	FGÍ GÍ ÊG	JÍ G€€	FÊFG	FÊFÍ
Í	TÍ I	SGGcH	ÊGÍ	IËÉ	G	ÊFI	€	^	G€ JÍ ÊÍ HÍ	GHUGË	ÊÍ Í	FÊÍ
ï	TÍ J	SGGcH	ÊJ€	€	FG	ÊFI	€	^	G	JÍ GË Í	GHUGË	ÊÍ Í
Ï	TÍ I	USHDçÍ	ÊG€	€	F	ÊG	€	^	FÍ Í FG ÊÍ Í	I GJ€€	ÊÍ	JÊFH
Ï	TÍ I	USHDçÍ	ÊGÍ	ÊÍ Í	Í	ÊÍ I	€	^	FHÍ FÍ ÊÍ G	I GJ€€	ÊÍ	JÊFH
J	TÍ ÓE	USFDYÍ	ÊÍ F	€	F	ÊH	ÊG	^	IÍ JÍ Í Í BÍ G	JÍ G€€	FÊFG	FÊFÍ

ÚÙÓË H Ó Á^•ā} Á Í ÊË L M N O P Q R S T U V W X Y Z ÚÙÓÁ Ì Í Î Ñ R S T V ' Š Ú P Ê H Á Ú æ ^ Á Ì G



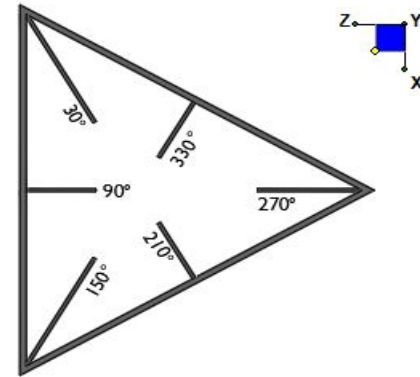




## I. Mount-to-Tower Connection Check

### RISA Model Data

Nodes (labeled per RISA)	Orientation (per graphic of typical platform)
N170A	30
N112A	270
N198A	150



TYPICAL PLATFORM

### Tower Connection Bolt Checks

Any moment resistance?:

Bolt Quantity per Reaction:

$d_x$  (in) (Delta X of typ. bolt config. sketch):

$d_y$  (in) (Delta Y of typ. bolt config. sketch):

Bolt Type:

Bolt Diameter (in):

Required Tensile Strength (kips):

Required Shear Strength (kips):

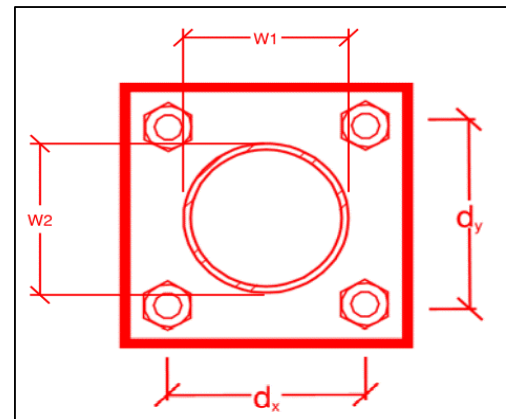
Tensile Strength / bolt (kips):

Shear Strength / bolt (kips):

Tensile Capacity Overall:

Shear Capacity Overall:

yes
4
7
7
A325N
0.5
18.6
4.2
13.3
8.0
<b>35.1%*</b>
<b>13.1%</b>



\*Note: Tension reduction not required if tension or shear capacity < 30%

### Tower Connection Plate and Weld Check

Connecting Standoff Member Shape:

Plate Width (in):

Plate Height (in):

W1 (in):

W2 (in):

Fy (ksi, plate):

$t_{plate}$  (in):

Weld Size (1/16 in):

$\Phi * R_n$  (kip/in):

Required Weld Strength (kip/in):

Plate Bending Capacity:

Weld Capacity:

Rect
10
10
4
4
36
0.625
3
4.18
3.01
<b>46.1%</b>
<b>72.0%</b>

### Max Plate Bending Strengths

$Mu_{xx}$ (kip-in):	13.6
$\Phi * Mn_{xx}$ (kip-in):	31.6
$Mu_{yy}$ (kip-in):	1.0
$\Phi * Mn_{yy}$ (kip-in):	31.6

# Mount Desktop – Post Modification Inspection (PMI) Report Requirements

## Documents & Photos Required from Contractor – Mount Modification

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**Purpose** – to provide Maser Consulting Connecticut the proper documentation in order to complete the required Mount Desktop review of the Post Modification Inspection Report.

- Contractor is responsible for making certain the photos provided as noted below provide confirmation that the modification was completed in accordance with the modification drawings.
- Contractor shall relay any data that can impact the performance of the mount or the mount modification, this includes safety issues.

### **Base Requirements:**

- Any special photos outside of the standard requirements will be indicated on the drawings
- Provide “as built drawings” showing contractor’s name, preparer’s signature, and date. Any deviations from the drawings (proposed modification) must be shown.
- Notation that all hardware was properly installed, and the existing hardware was inspected for any issues.
- Verification that loading is as communicated in the modification drawings. NOTE If loading is different than what is conveyed in the modification drawing contact Maser Consulting Connecticut immediately.
- Each photo should be time and date stamped
- Photos should be high resolution and submitted in a Zip File and should be organized in the file structure as depicted in Schedule A attached.
- Contractor shall ensure that the safety climb wire rope is supported and not adversely impacted by the install of the modification components. This may involve the install of wire rope guides, or other items to protect the wire rope.
- The photos in the file structure should be uploaded to <https://pmi.vzsmart.com> as depicted on the drawings

### **Photo Requirements:**

- Base and “During Installation Photos”
  - Base pictures include
    - Photo of Gate Signs showing the tower owner, site name, and number
    - Photo of carrier shelter showing the carrier site name and number if available
    - Photos of the galvanizing compound and/or paint used (if applicable), clearly showing the label and name
  - “During Installation Photos if provided - must be placed only in this folder
- Photos taken at ground level
  - Overall tower structure before and after installation of the modifications
  - Photos of the appropriate mount before and after installation of the modifications; if the mounts are at different rad elevations, pictures must be provided for all elevations that the modifications were installed

- Photos taken at Mount Elevation

- Photos showing each individual sector before and also after installation of modifications. Each entire sector must be in one photo to show in the inter-connection of members.
  - These photos should also certify that the placement and geometry of the equipment on the mount is as depicted on the sketch and table in the mount analysis
- Close-up photos of each installed modification per the modification drawings; pictures should also include connection hardware (U-bolts, bolts, nuts, all-threaded rods, etc.)
- Photos showing the measurements of the installed modification member sizes (i.e. lengths, widths, depths, diameters, thicknesses)
- Photos showing the elevation or distances of the installed modifications from the appropriate reference locations shown in the modification drawings
- Photos showing the installed modifications onto the tower with tape drop measurements (if applicable) (i.e. ring/collar mounts, tie-backs, V-bracing kits, etc.); if the existing mount elevation needs to be changed according to the modification drawings, a tape drop measurement shall be provided before the elevation change
- Photos showing the safety climb wire rope above and below the mount prior to modification.
- Photos showing the climbing facility and safety climb if present.

**Material Certification:**

- Materials utilized must be as per specification on the drawings or the equivalent as validated by Maser Consulting Connecticut.
  - If the drawings are as specified on the drawings
    - The contractor should provide the packing list or the materials utilized to perform the mount modification
  - If an equivalent is utilized
    - It is required that the Maser Consulting Connecticut certification of such is included in the contractor submission package. There may be an additional charge for this certification if the equivalent submission doesn't meet specifications as prescribed in the drawings.
- The contractor must certify that the materials meet these specifications by one of these methods.

The Material utilized was as specified on the Maser Consulting Connecticut Mount Modification Drawings and included in the Material certification folder is a packing list or invoice for these materials


















The material utilized was an "equivalent" and included as part of the contractor submission is the Maser Consulting Connecticut certification, invoices, or specifications validating accepted status

Certifying Individual: Company \_\_\_\_\_

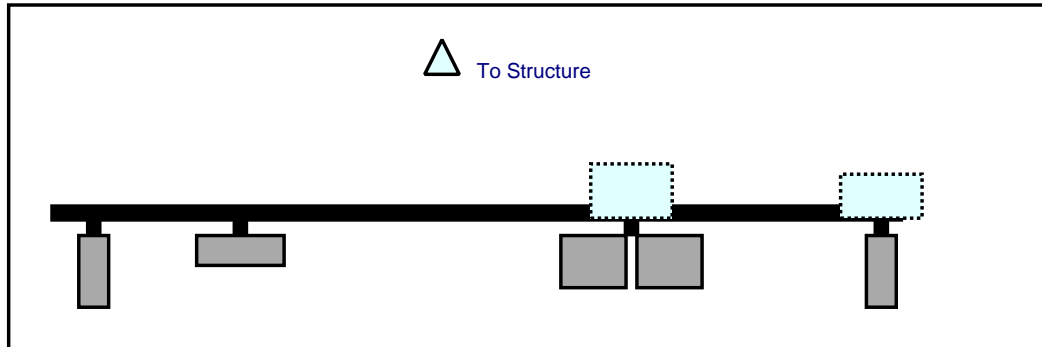
Name \_\_\_\_\_



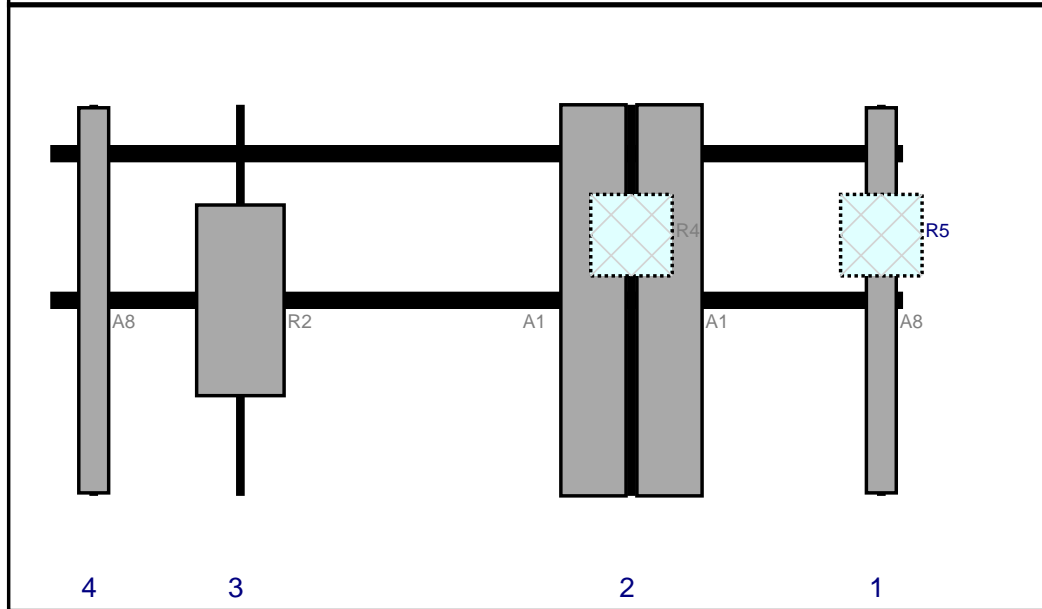
## **Schedule A – Photo & Document File Structure**

-  VzW Site Number / Name
  -  Base & “During Installation” Photos
  -  Pre-Installation Photos
    -  Alpha
    -  Beta
    -  Gamma
    -  Ground Level
    -  Tape Drop
  -  Post-Installation Photos
    -  Alpha
    -  Beta
    -  Gamma
    -  Ground Level
    -  Tape Drop
    -  Photos of climbing facility and safety climb – If Present
-  Certifications – Submission of this document including certifications
-  Specific Required Additional Photos

Plan View

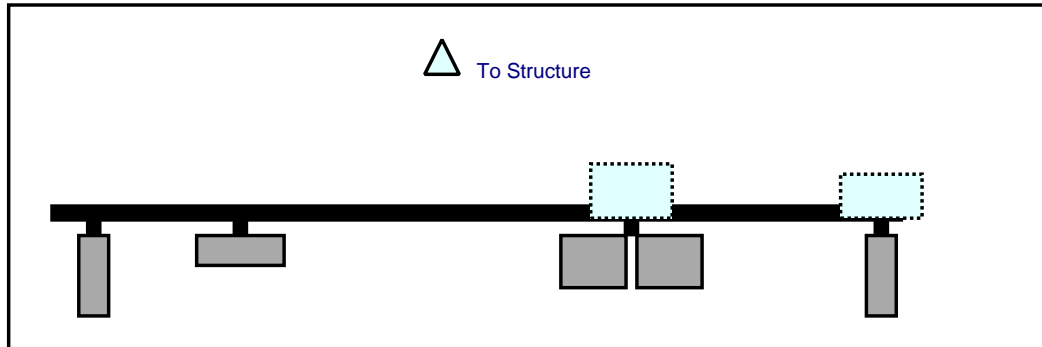


Front View  
Looking at Structure

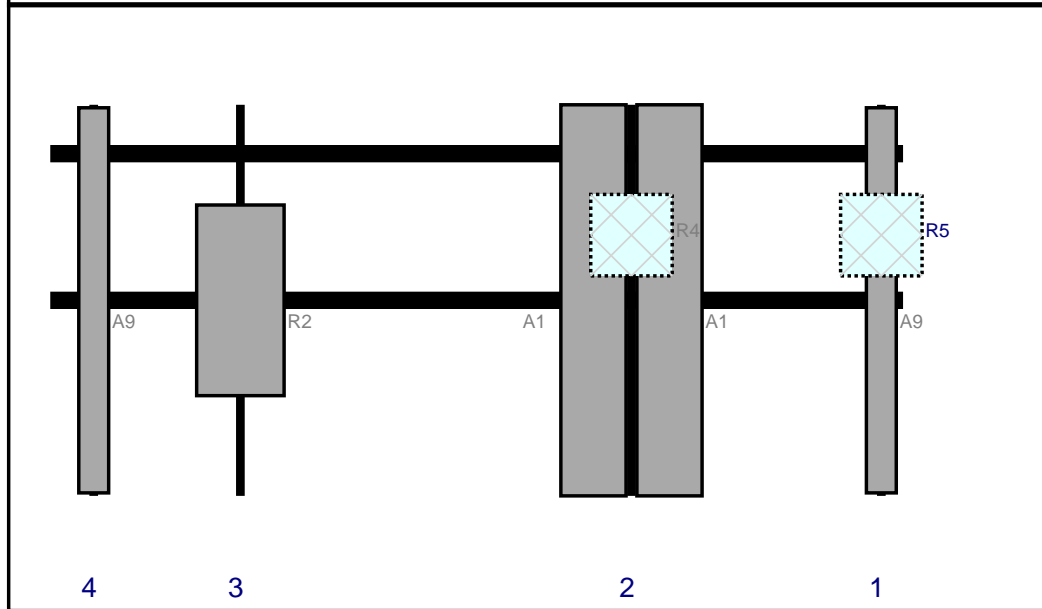


Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
A8	LPA-80080-6CF	70.9	5.5	153	1	a	Front	36	0	Retained	02/24/2021
R5	B5/B13 RRH-BRO4C	15	15	153	1	a	Behind	24	0	Added	
A1	QS6656-5D	72	12	107	2	a	Front	36	7	Added	
A1	QS6656-5D	72	12	107	2	b	Front	36	-7	Added	
R4	B2/B66A RRH-BRO49	15	15	107	2	a	Behind	24	0	Added	
R2	MT6407-77A	35.1	16.1	35	3	a	Front	36	0	Added	
A8	LPA-80080-6CF	70.9	5.5	8	4	a	Front	36	0	Retained	02/24/2021

Plan View

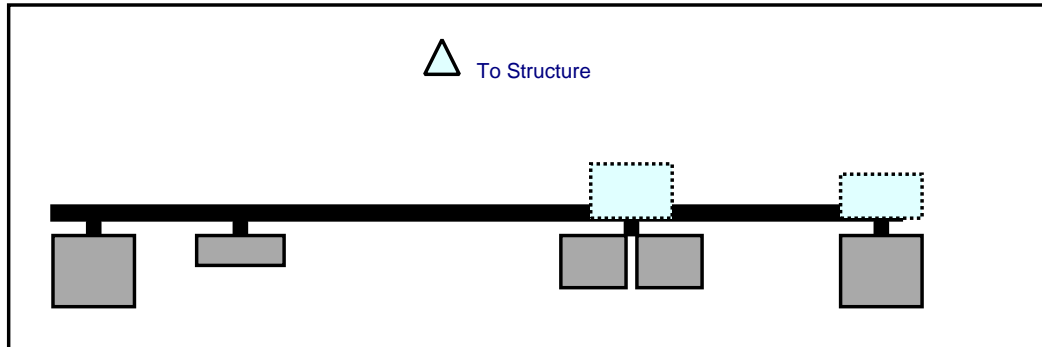


Front View  
Looking at Structure

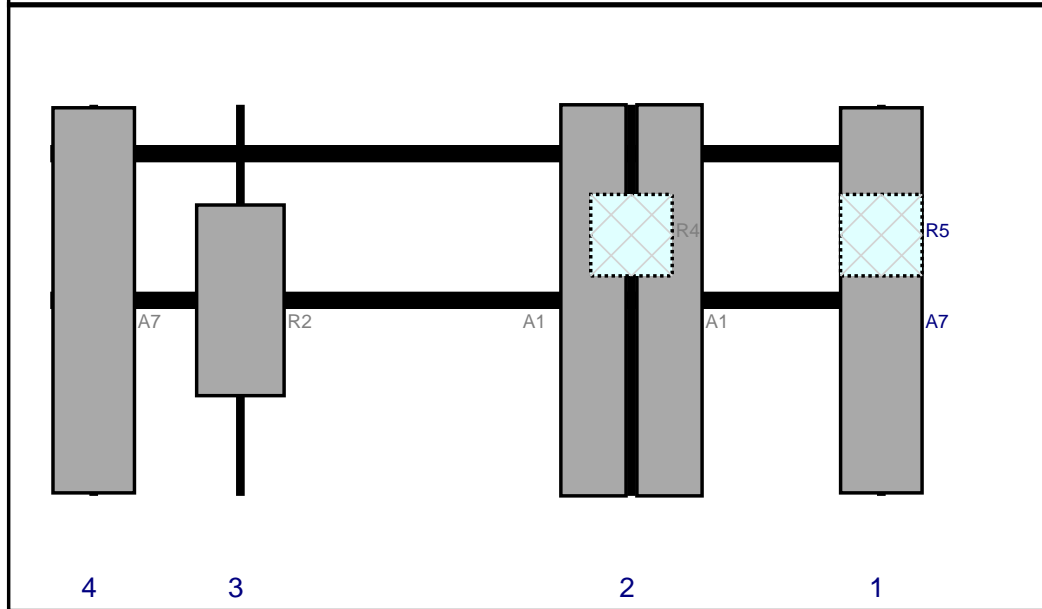


Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
A9	LPA-80080-6CF-5	70.9	5.5	153	1	a	Front	36	0	Retained	02/24/2021
R5	B5/B13 RRH-BRO4C	15	15	153	1	a	Behind	24	0	Added	
A1	QS6656-5D	72	12	107	2	a	Front	36	7	Added	
A1	QS6656-5D	72	12	107	2	b	Front	36	-7	Added	
R4	B2/B66A RRH-BRO49	15	15	107	2	a	Behind	24	0	Added	
R2	MT6407-77A	35.1	16.1	35	3	a	Front	36	0	Added	
A9	LPA-80080-6CF-5	70.9	5.5	8	4	a	Front	36	0	Retained	02/24/2021

Plan View



Front View  
Looking at Structure



Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
A7	LPA-80063-6CF 2	70.9	15	153	1	a	Front	36	0	Retained	02/24/2021
R5	B5/B13 RRH-BRO4C	15	15	153	1	a	Behind	24	0	Added	
A1	QS6656-5D	72	12	107	2	a	Front	36	7	Added	
A1	QS6656-5D	72	12	107	2	b	Front	36	-7	Added	
R4	B2/B66A RRH-BRO49	15	15	107	2	a	Behind	24	0	Added	
R2	MT6407-77A	35.1	16.1	35	3	a	Front	36	0	Added	
A7	LPA-80063-6CF 2	70.9	15	8	4	a	Front	36	0	Retained	02/24/2021



# Maser Consulting Connecticut

**Subject**

TIA-222-H Usage

**Site Information**

Site ID: 468296-VZW /  
HARWINTON W CT  
Site Name: HARWINTON W CT  
Carrier Name: Verizon Wireless  
Address:  
123 Campville Hill Rd  
Harwinton, Connecticut 06791  
Litchfield County  
Latitude: 41.736678°  
Longitude: -73.097033°

**Structure Information**

Tower Type: Monopole  
Mount Type: 13.08-Ft Platform

To Whom It May Concern,

We respectfully submit the above referenced Antenna Mount Structural Analysis report in conformance with ANSI/TIA-222-H, Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures.

The 2015 International Building Code states that, in Section 3108, telecommunication towers shall be designed and constructed in accordance with the provisions of TIA-222. TIA-222-H is the latest revision of the TIA-222 Standard, effective as of January 01, 2018.

As with all ANSI standards and engineering best practice is to apply the most current revision of the standard. This ensures the engineer is applying all updates. As an example, the TIA-222-H Standard includes updates to bring it in line with the latest AISC and ACI standards and it also incorporates the latest wind speed maps by ASCE 7 based on updated studies of the wind data.

The TIA-222-H standard clarifies these specific requirements for the antenna mount analysis such as modeling methods, seismic analysis, 30-degree increment wind directions and maintenance loading. Therefore, it is our opinion that TIA-222-H is the most appropriate standard for antenna mount structural analysis and is acceptable for use at this site to ensure the engineer is taking into account the most current engineering standard available.

Sincerely,

Justin Linette, PE  
Senior Technical Manager

# Exhibit F

## **Power Density/RF Emissions Report**

**Site Name: HARWINTON 1 CT**  
**Cumulative Power Density**

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density
	(MHz)		(watts)	(watts)	(feet)	(mW/cm <sup>2</sup> )
VZW 700	751	4	452	1807	170	0.0022
VZW CDMA	878.49	2	491	982	170	0.0012
VZW Cellular	874	4	452	1807	170	0.0022
VZW PCS	1975	4	1640	6559	170	0.0082
VZW AWS	2120	4	1883	7531	170	0.0094
VZW CBAND	3730.005	4	6531	26125	170	0.0325

**Total Percentage of Maximum Permissible Exposure**

\*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Part 1 based on NCRP Report 86, 1986 and generally on ANSI

\*\*Calculation includes a -10 dB Off Beam Antenna Pattern Adjustment pursuant to Attachments B and C of the Siting Council

MHz = Megahertz

mW/cm<sup>2</sup> = milliwatts per square centimeter

ERP = Effective Radiated Power

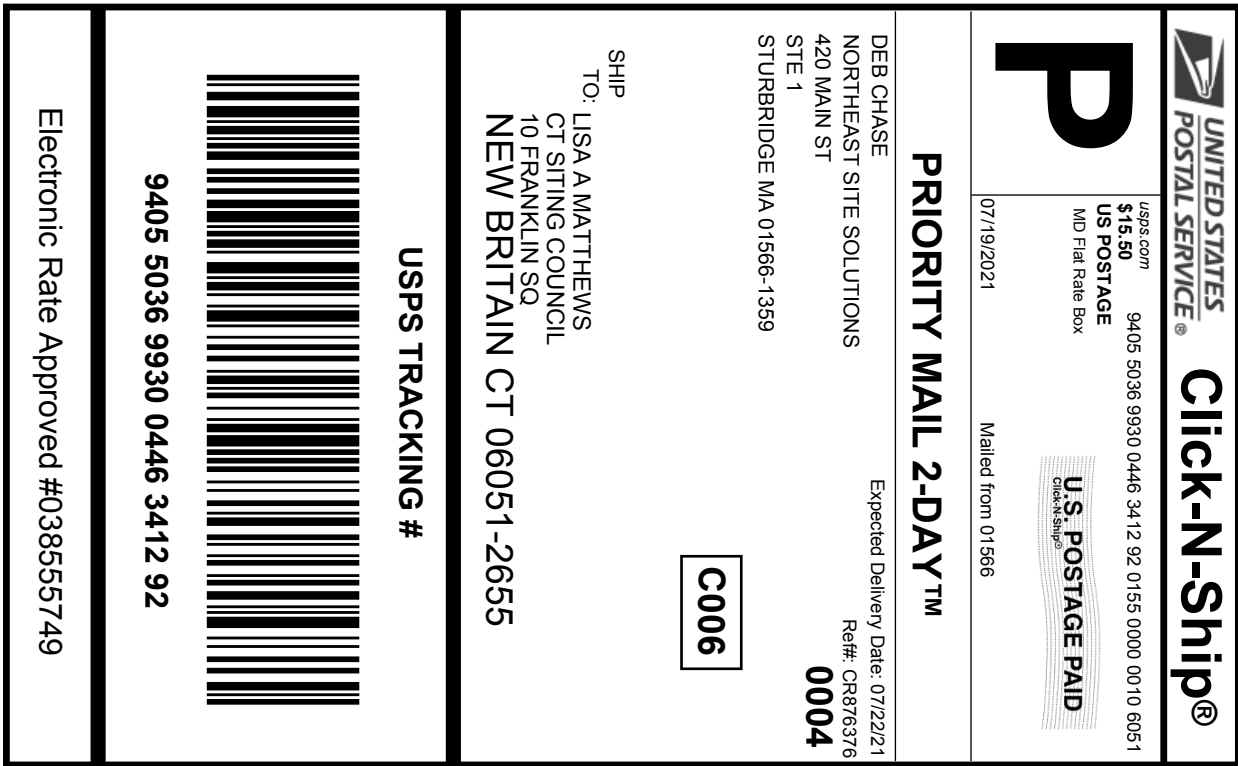
Absolute worst case maximum values used.

Maximum Permissible Exposure*	Fraction of MPE
(mW/cm <sup>2</sup> )	(%)
0.5007	0.45%
0.5857	0.21%
0.5827	0.39%
1.0000	0.82%
1.0000	0.94%
1.0000	3.25%
	6.05%

/IEEE C95.1-1992  
 il's November 10, 2015 Memorandum for Exempt Modification filings

# Exhibit G

## Recipient Mailings



Cut on dotted line.

### Instructions

1. Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
2. Place your label so it does not wrap around the edge of the package.
3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
5. Mail your package on the "Ship Date" you selected when creating this label.

### Click-N-Ship® Label Record

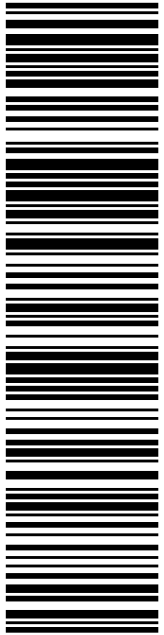
<b>USPS TRACKING # :</b>	
<b>9405 5036 9930 0446 3412 92</b>	
Trans. #:	538525229
Print Date:	07/16/2021
Ship Date:	07/19/2021
Expected Delivery Date:	07/22/2021
Priority Mail® Postage:	<b>\$15.50</b>
Total:	<b>\$15.50</b>
<b>From:</b>	DEB CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359
<b>To:</b>	LISA A MATTHEWS CT SITING COUNCIL 10 FRANKLIN SQ NEW BRITAIN CT 06051-2655
	Ref#: CR876376

\* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.



Thank you for shipping with the United States Postal Service!

Check the status of your shipment on the USPS Tracking® page at [usps.com](https://usps.com)



**USPS TRACKING #**

**9405 5036 9930 0451 5624 08**

Electronic Rate Approved #038555749

**SHIP**

TO: MICHAEL R CRISS  
 FIRST SELECTMAN- HARWINTON  
 100 BENTLEY DR  
 HARWINTON CT 06791-2200

**P**

**PRIORITY MAIL 2-DAY™**

DEB CHASE  
 NORTHEAST SITE SOLUTIONS  
 420 MAIN ST  
 STE 1  
 STURBRIDGE MA 01566-1359

Expected Delivery Date: 07/26/21  
 Ref#: CR876376  
**0004**

**R006**

**UNITED STATES POSTAL SERVICE®**

**Click-N-Ship®**

**U.S. POSTAGE PAID**

click-n-ship®

Mailed from 01566

07/23/2021

USPS.com 9405 5036 9930 0451 5624 08 0155 0000 0010 6791  
**US POSTAGE \$15.50**  
 MD Flat Rate Box



Cut on dotted line.

### Instructions

1. Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
2. Place your label so it does not wrap around the edge of the package.
3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
5. Mail your package on the "Ship Date" you selected when creating this label.

### Click-N-Ship® Label Record

**USPS TRACKING # :**  
**9405 5036 9930 0451 5624 08**

Trans. #: 538955113	Priority Mail® Postage: <b>\$15.50</b>
Print Date: 07/21/2021	Total: <b>\$15.50</b>
Ship Date: 07/23/2021	
Expected Delivery Date: 07/26/2021	

**From:** DEB CHASE  
 NORTHEAST SITE SOLUTIONS  
 420 MAIN ST  
 STE 1  
 STURBRIDGE MA 01566-1359

Ref#: CR876376

**To:** MICHAEL R CRISS  
 FIRST SELECTMAN- HARWINTON  
 100 BENTLEY DR  
 HARWINTON CT 06791-2200

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Thank you for shipping with the United States Postal Service!  
 Check the status of your shipment on the USPS Tracking® page at [usps.com](https://usps.com)

Tracking Number: 9405503699300451562408

Rem

Your item was delivered to an individual at the address at 12:55 pm on July 26, 2021 in HARWINTON, CT 06791.

USPS Tracking Plus™ Available 

## Status

 **Delivered, Left with Individual**

July 26, 2021 at 12:55 pm  
HARWINTON, CT 06791

Get Updates 

**Delivered**

Text & Email Updates



Tracking History



USPS Tracking Plus™

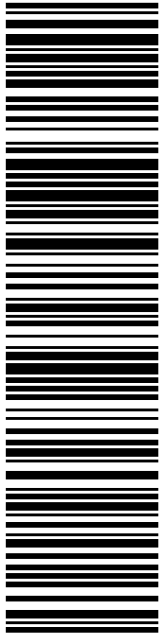


Product Information



See Less 





**USPS TRACKING #**

**9405 5036 9930 0451 5624 15**

Electronic Rate Approved #038555749

**SHIP**

TO: JEFFREY NEUMANN  
BUILDING OFFICIAL  
100 BENTLEY DR  
HARWINTON CT 06791-2200

**P**

**PRIORITY MAIL 2-DAY™**

DEB CHASE  
NORTHEAST SITE SOLUTIONS  
420 MAIN ST  
STE 1  
STURBRIDGE MA 01566-1359

Expected Delivery Date: 07/26/21  
Ref#: CR-876376  
**0004**

**R006**

**UNITED STATES POSTAL SERVICE®**

**Click-N-Ship®**

U.S. POSTAGE PAID  
click-n-ship®

usps.com 9405 5036 9930 0451 5624 15 0155 0000 0010 6791  
**US POSTAGE \$15.50**  
MD Flat Rate Box

Mailed from 01566  
07/23/2021



Cut on dotted line.

### Instructions

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5. Mail your package on the "Ship Date" you selected when creating this label.

### Click-N-Ship® Label Record

**USPS TRACKING # :**  
**9405 5036 9930 0451 5624 15**

Trans. #: 538955113	Priority Mail® Postage: <b>\$15.50</b>
Print Date: 07/21/2021	Total: <b>\$15.50</b>
Ship Date: 07/23/2021	
Expected Delivery Date: 07/26/2021	

**From:** DEB CHASE  
NORTHEAST SITE SOLUTIONS  
420 MAIN ST  
STE 1  
STURBRIDGE MA 01566-1359

Ref#: CR-876376

**To:** JEFFREY NEUMANN  
BUILDING OFFICIAL  
100 BENTLEY DR  
HARWINTON CT 06791-2200

\* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.



Thank you for shipping with the United States Postal Service!  
Check the status of your shipment on the USPS Tracking® page at usps.com

Tracking Number: 9405503699300451562415

Rem

Your item was delivered to an individual at the address at 12:55 pm on July 26, 2021 in HARWINTON, CT 06791.

### Status

 **Delivered, Left with Individual**

July 26, 2021 at 12:55 pm  
HARWINTON, CT 06791

USPS Tracking Plus™ Available 

Get Updates 

**Delivered**

Text & Email Updates



Tracking History



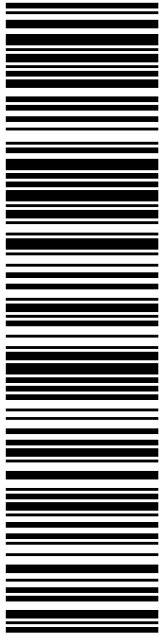
USPS Tracking Plus™



Product Information



See Less 



**USPS TRACKING #**

**9405 5036 9930 0451 5624 39**

Electronic Rate Approved #038555749

**SHIP TO:**

HARWINTON ROD AND GUN CLUB  
PO BOX 181  
HARWINTON CT 06791-0181

**P**

**PRIORITY MAIL 2-DAY™**

Expected Delivery Date: 07/26/21  
Ref#: CR876376  
**0004**

**B002**

**UNITED STATES POSTAL SERVICE®**

**Click-N-Ship®**

U.S. POSTAGE PAID  
click-n-ship®

Mailed from 01566

07/23/2021

USPS.com 9405 5036 9930 0451 5624 39 0155 0000 0010 6791  
US POSTAGE \$15.50  
MD Flat Rate Box



Cut on dotted line.

### Instructions

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5. Mail your package on the "Ship Date" you selected when creating this label.

### Click-N-Ship® Label Record

**USPS TRACKING # :**  
**9405 5036 9930 0451 5624 39**

Trans. #: 538955113	Priority Mail® Postage: <b>\$15.50</b>
Print Date: 07/21/2021	Total: <b>\$15.50</b>
Ship Date: 07/23/2021	
Expected Delivery Date: 07/26/2021	

**From:** DEB CHASE  
NORTHEAST SITE SOLUTIONS  
420 MAIN ST  
STE 1  
STURBRIDGE MA 01566-1359

Ref#: CR876376

**To:** HARWINTON ROD AND GUN CLUB  
PO BOX 181  
HARWINTON CT 06791-0181

\* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.



Thank you for shipping with the United States Postal Service!  
Check the status of your shipment on the USPS Tracking® page at [usps.com](https://usps.com)

Tracking Number: 9405503699300451562439

Remove

Your item arrived at the HARWINTON, CT 06791 post office at 9:35 am on July 24, 2021 and is ready for pickup.

USPS Tracking Plus™ Available ✓

## Status

### Available for Pickup

July 24, 2021 at 9:35 am  
HARWINTON, CT 06791

Get Updates ✓

Available for Pickup

Text & Email Updates



Tracking History



USPS Tracking Plus™



Product Information



See Less ^