5/1/2018

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

Regarding: Notice of Exempt Modification – Antenna Swap
Property Address: 218 Wheeler Road (2 Richard Road), Torrington CT 06790
AT&T Site: CTL01267 / FA: 10128238

Dear Ms. Bachman:

On behalf of AT&T, please accept this application 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).

AT&T currently maintains a wireless telecommunications facility on an existing monopole at the above-referenced address. Crown Castle, owns said facility. The site consists of nine (9) wireless telecommunication antennas at an antenna centerline height of 130-feet on an existing 160 -foot monopole tower. AT&T now intends to remove (3) Powerwave 7770 panel antennas on position 3 all sectors, while retaining three (3) Powerwave 7770 panel antennas on positions 1, all sectors, and install two (2) new CCI HPA-65R-BUU-H6 and one (1) Andrew SBNHH-1D65A on position 3 all sectors (for a total of (9) panel antennas), at the 130-foot level. AT&T also intends to install three (3) RRU-32 B2 on the existing antenna masts.

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-5I0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to The Honorable Elinor Carbone, Mayor of Torrington, Zoning Enforcement Officer of the City of Torrington, Crown Castle tower owner and Lucille Lefebvre property owner.

The planned modifications to AT&T's 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 tower. AT&T's replacement antennas will be installed at the 130-foot level of the 160-foot monopole.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A

cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included,

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included).

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

Sincerely,

Kristen LeDuc
Real Estate Specialist | Smartlink, LLC
85 Rangeway Road, Building 3, Suite 102
North Billerica, MA 01862

Enclosures

CC w/ enclosures:

The Honorable Elinor Carbone

Zoning Enforcement Officer of the City of Torrington

Crown Castle Tower Owner

Lucille Lefebvre Property Owner

FedEx

Patrick

FedEx® Tracking

Life just got easier.

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Get started ▸

Track a Shipment

Help

Enter a FedEx tracking, door tag or FedEx Office order number.

Track

My Shipments

30 | 1

771982734828
Wed 4/18 — To: Wireless S... — Pend...
Delivery exce...
Unable to deliver shi...

772138038958
Mon 5/07 — To: Old Post R... — Wed 5/09 10:52 am
Delivered
Signature not required

772178769618
Tue 5/08 — To: Attn: Buildi... — Wed 5/09 12:16

launchAdvancedTrackingButton

772125967845 Save tracking results

Print Help

Ship date:
Wed 5/02/2018

Delivered
Signature not required

Actual delivery:
Thu 5/03/2018 10:20 am

Smartlink LLC
Kristen LeDuc
Bldg #3, Suite 102
85 Rangeway Rd
North Billerica, MA US 01862
978 828-3264

Lucille Lefebvre
Lucille Lefebvre
218 WHEELER RD
LITCHFIELD, CT US 06759281818
978 828-3264

Customize Delivery | Request Notifications | Obtain Proof of Delivery

More actions▾

Travel History

Help Hide

Date/Time	Activity	Location
5/03/2018 - Thursday		
10:20 am	Delivered Left at back door. Signature Service not requested.	Litchfield, CT
7:18 am	On FedEx vehicle for delivery	SOUTH WINDSOR, CT
2:53 am	At local FedEx facility	SOUTH WINDSOR, CT
2:37 am	Arrived at FedEx location	SOUTH WINDSOR, CT
5/02/2018 - Wednesday		
9:55 pm	Left FedEx origin facility	LONDONDERRY, NH
7:02 pm	Arrived at FedEx location	LONDONDERRY, NH
6:24 pm	Picked up	LONDONDERRY, NH
5/01/2018 - Tuesday		
3:28 pm	Shipment information sent to FedEx	

Select time zone: Local Scan Time

Ask

Shipment Facts

Hide

Tracking Number	772125967845	Service	FedEx Ground
Weight	1 lbs / 0.45 kgs	Delivery attempts	1
Total pieces	1	Terms	Not Available
Packaging	Package	Standard transit	5/03/2018

OUR COMPANY

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Our Portfolio | Corporate Responsibility
Investor Relations | Newsroom
Careers | Contact Us

MORE FROM FEDEX

FedEx Compatible
Developer Resource Center
FedEx Cross Border

LANGUAGE

Change Country

English

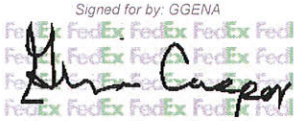
FedEx® Tracking

772125830271

Ship date
Wed 5/02/2018

Smartlink LLC
Kristen LeDuc
Bldg #3, Suite 102
85 Rangeway Rd
North Billerica, MA US 01862
978 828-3264

Delivered
Signed for by: GGENA



G. GENA
#38, 12:13, 4 Del, 0 NonDel

Actual delivery
Thu 5/03/2018 12:17 pm

City of Torrington CT
Zoning Official
RM 324
140 MAIN ST
TORRINGTON, CT US 06790520140
978 828-3264

Travel History

Date/Time	Activity	Location
- 5/03/2018 - Thursday		
12:17 pm	Delivered	Torrington, CT
4:13 am	On FedEx vehicle for delivery	SOUTH WINDSOR, CT
2:53 am	At local FedEx facility	SOUTH WINDSOR, CT
2:37 am	Arrived at FedEx location	SOUTH WINDSOR, CT
- 5/02/2018 - Wednesday		
9:55 pm	Left FedEx origin facility	LONDONDERRY, NH
7:02 pm	Arrived at FedEx location	LONDONDERRY, NH
6:24 pm	Picked up	LONDONDERRY, NH
- 5/01/2018 - Tuesday		
3:13 pm	Shipment information sent to FedEx	

Shipment Facts

Tracking Number	772125830271	**Service**	FedEx Ground
Weight	1 lbs / 0.45 kgs	**Delivery attempts**	1
Total pieces	1	**Terms**	Not Available
Packaging	Package	**Standard transit**	5/03/2018

Kristen Leduc

From: TrackingUpdates@fedex.com
Sent: Thursday, May 03, 2018 12:21 PM
To: Kristen Leduc
Subject: FedEx Shipment 772125751016 Delivered

Your package has been delivered

Tracking # 772125751016

Ship date:
Wed, 5/2/2018

Kristen LeDuc
Smartlink LLC
North Billerica, MA 01862
US

Delivered

Delivery date:
Thu, 5/3/2018 12:17 pm

The Honorable Elinor Carbone
THE HONORABLE ELINOR CARBONE
140 MAIN ST
TORRINGTON, CT
06790520140
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	772125751016
Status:	Delivered: 05/03/2018 12:17 PM Signed for By: GGENA
Signed for by:	GGENA
Delivery location:	Torrington, CT
Service type:	FedEx Ground
Packaging type:	Package
Number of pieces:	1
Weight:	1.00 lb.
Standard transit:	5/3/2018

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 11:21 AM CDT on 05/03/2018.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above.

FedEx® Tracking

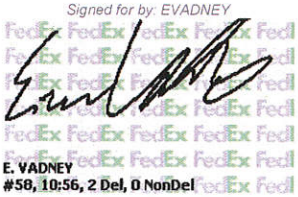
772125897981

Ship date
Wed 5/02/2018

Smartlink LLC
Kristen LeDuc
Bldg #3, Suite 102
85 Rangeway Rd
North Billerica, MA US 01862
978 828-3264

Delivered

Signed for by: EVADNEY



E. VADNEY
#58, 10:56, 2 Del, 0 NonDel

Actual delivery
Fri 5/04/2018 10:57 am

Crown Castle
Crown Castle
STE 101
3 CORPORATE DR
CLIFTON PARK, NY US
12065863526
978 828-3264

Travel History

Date/Time	Activity	Location
- 5/04/2018 - Friday		
10:57 am	Delivered	Clifton Park, NY
5:16 am	On FedEx vehicle for delivery	RENSSELAER, NY
4:55 am	At local FedEx facility	RENSSELAER, NY
- 5/03/2018 - Thursday		
9:34 pm	Departed FedEx location	WILLINGTON, CT
2:54 am	Arrived at FedEx location	WILLINGTON, CT
- 5/02/2018 - Wednesday		
9:19 pm	Left FedEx origin facility	LONDONDERRY, NH
7:02 pm	Arrived at FedEx location	LONDONDERRY, NH
6:24 pm	Picked up	LONDONDERRY, NH
- 5/01/2018 - Tuesday		
3:28 pm	Shipment information sent to FedEx	

Shipment Facts

Tracking Number	772125897981	**Service**	FedEx Ground
Weight	1 lbs / 0.45 kgs	**Delivery attempts**	1
Total pieces	1	**Terms**	Not Available
Packaging	Package	**Standard transit**	5/03/2018

218 WHEELER RD

Location 218 WHEELER RD
Mblu 147/ 1A/ 3/ /
Acct# 012101
Owner LEFEBVRE LUCILLE G
Assessment $148,900
PID 1873
Building Count 1

Current Value

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$67,630	$81,270	$148,900

Owner of Record

Owner LEFEBVRE LUCILLE G
Co-Owner

Sale Price $0
Certificate
Book & Page 194/ 911
Sale Date 01/21/1988
Instrument 25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
LEFEBVRE LUCILLE G	$0		194/ 911	25	01/21/1988
LEFEBVRE,LUCILLE G&ESTATE OF HENRY	$0		189/ 965		03/02/1987

Building Information

Building 1 : Section 1

Year Built: 1955
Living Area: 992
Replacement Cost: $138,022
Building Percent Good: 70
Replacement Cost Less Depreciation: $96,620

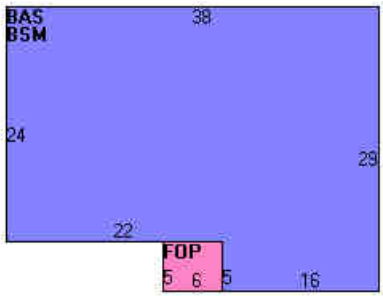
Building Attributes	
Field	**Description**
Style	Ranch
Model	Residential

Grade	C
Stories	1.00
Occupancy	1
Exterior Wall 1	Brick
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Hardwood
Interior Floor 2	
Heat Fuel	Oil
Heat Type	Hot Water
AC Type	None
Bedrooms	3 Bedrooms
Full Baths	1
Half Baths	0
Extra Fixtures	0
Total Rooms	5
Bath Style	Average
Kitchen Style	Average
Extra Kitchens	
Fireplace(s)	1
Bsmt Garage	
SF FBM	
FBM Quality	

Building Photo

(http://images.vgsi.com/photos/LitchfieldCTPhotos//\00\00\67/2

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	992	992
BSM	Basement	992	0
FOP	Open Porch	30	0
		2,014	992

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 101

Land Line Valuation

Size (Acres) 4

Description	Res Dwelling	**Frontage**	
Zone	5	**Depth**	
Neighborhood	170	**Assessed Value**	$81,270
Category			

Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$67,630	$81,270	$148,900
2015	$67,630	$81,270	$148,900
2014	$67,630	$81,270	$148,900

SITESAFE
RF COMPLIANCE EXPERTS

200 North Glebe Road, Suite 1000, Arlington, VA 22203-3728
703.276.1100 • 703.276.1169 fax
info@sitesafe.com • www.sitesafe.com

Smartlink on behalf of AT&T Mobility, LLC
Site FA – 10128238
Site ID – CT1267 (MRCTB024498-MRCTB024413)
USID – 99338
Site Name – Torrington CT Wheeler Rd
Site Compliance Report

2 Richard Road
Torrington, CT 06790

Latitude: N41-46-50.16
Longitude: W73-8-10.32
Structure Type: Monopole

Report generated date: March 1, 2018
Report by: Leo Romero
Customer Contact: Kristen LeDuc

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Yes
RF Sign(s) @ access point(s)	No
RF Sign(s) @ antennas	No
Barrier(s) @ sectors	No
Max cumulative simulated RFE level on the Ground Level	<1% General Public Limit at AT&T Mobility, LLC Alpha, Beta and Gamma Sectors
FCC & AT&T Compliant?	Will Be Compliant

The following documents were provided by the client and were utilized to create this report:

RFDS: NEW-ENGLAND_CONNECTICUT_CTV1267_2018-LTE-Next-Carrier_LTE_mm093q_2051A0BGBQ_10128238_99338_06-01-2017_Final-Approved_v1.00 (1)

CD's: 10128238_AE201_171019_CTL01267_REV1

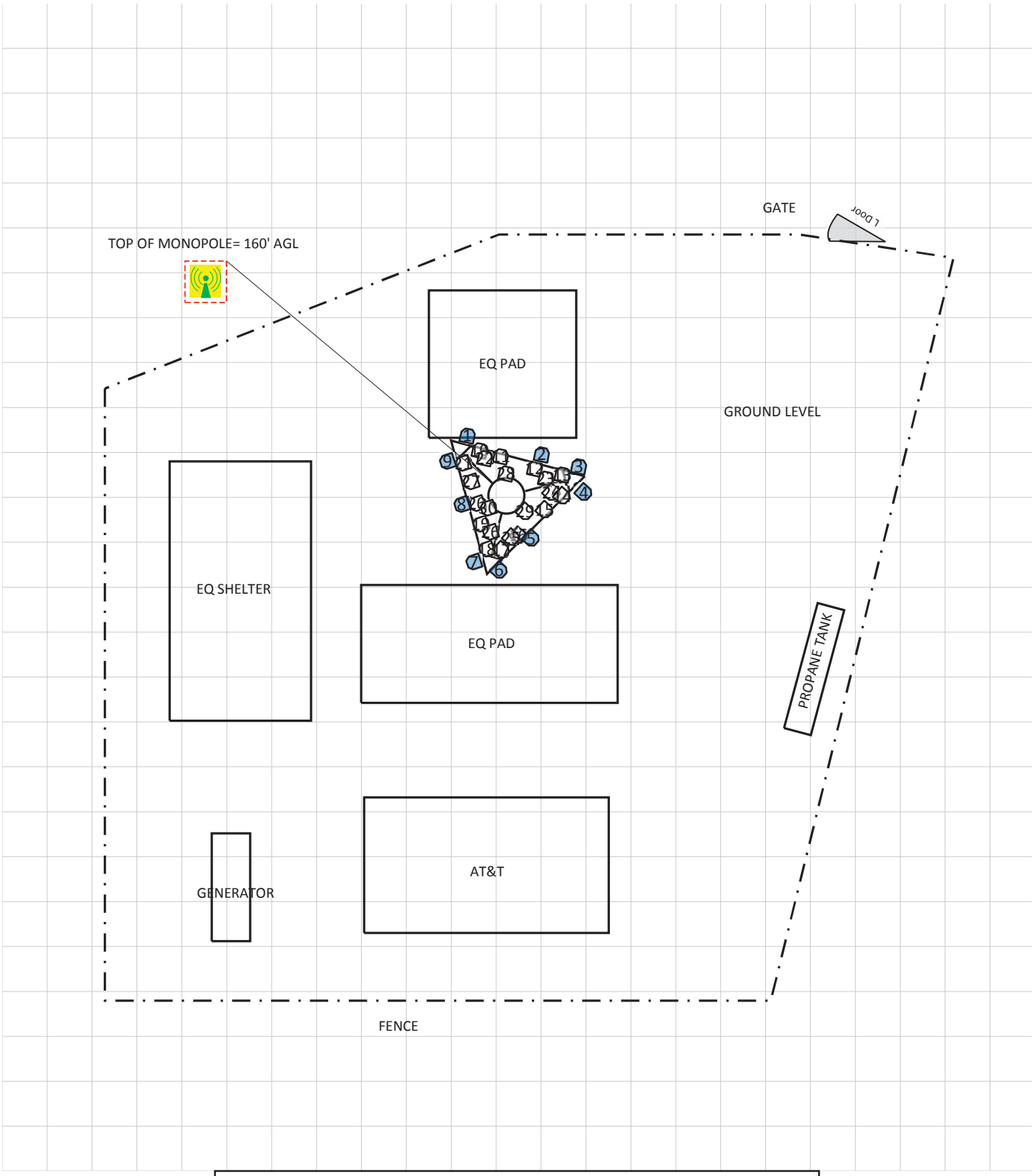
RF Powers Used: RFDS ERP Values

2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- AT&T Mobility, LLC Contribution
- Elevation View

Site Scale Map For: Torrington CT Wheeler Rd



(Feet)

0 5.7 11.5

www.sitesafe.com
Site Name:Torrington CT Wheeler Rd
3/1/2018 3:33:56 PM

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Sign Legend

Caution 1 | Caution 2 | Notice 2 | Notice 1 | Warning | Info 1 | Info 2

Barrier

Proposed Barriers/ Signs

3 Antenna Inventory

The following antenna inventory on this and the following page, were obtained by the customer and were utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	30	82	4.6	11.51	0	1	0	310.1	57.4'	92.7'	127.7'
2	AT&T MOBILITY LLC (Proposed)	Cci Antennas HPA-65R-BUU-H6	Panel	1900	30	61.1	6	14.53	0	0	1	4842	63.6'	91.1'	127'
2	AT&T MOBILITY LLC (Proposed)	Cci Antennas HPA-65R-BUU-H6	Panel	737	30	66.2	6	11.68	0	0	1	2951.4	63.6'	91.1'	127'
3	AT&T MOBILITY LLC	KMW AM-X-CD-16-65-00T	Panel	737	30	65	6	13.36	0	0	1	1475.7	66.7'	90.1'	127'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	150	82	4.6	11.51	0	1	0	310.1	67.1'	87.9'	127.7'
5	AT&T MOBILITY LLC (Proposed)	Cci Antennas HPA-65R-BUU-H6	Panel	737	150	66.2	6	11.68	0	0	1	2951.4	62.7'	84.1'	127'
5	AT&T MOBILITY LLC (Proposed)	Cci Antennas HPA-65R-BUU-H6	Panel	1900	150	61.1	6	14.53	0	0	1	4842	62.7'	84.1'	127'
6	AT&T MOBILITY LLC	KMW AM-X-CD-16-65-00T	Panel	737	150	65	6	13.36	0	0	1	1475.7	60'	81.4'	127'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	270	82	4.6	11.51	0	1	0	310.1	57.9'	82.1'	127.7'
8	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	737	270	66	4.6	11.29	0	0	1	2951.4	56.9'	86.9'	127.7'
8	AT&T MOBILITY LLC (Proposed)	Andrew SBNHH-1D65A	Panel	1900	270	65	4.6	14.65	0	0	1	4842	56.9'	86.9'	127.7'
9	AT&T MOBILITY LLC	Kathrein-Scala 800-10764	Panel	737	270	68	4.6	12.14	0	0	1	1475.7	55.7'	90.5'	127.7'
10	UNKNOWN CARRIER	Generic Panel	Panel	850	30	65	4.6	12.77	-	-	-	1513.9	58.4'	91.5'	137.7'
11	UNKNOWN CARRIER	Generic Panel	Panel	1900	30	65	4.6	15.43	-	-	-	2094.8	60.1'	91'	137.7'
12	UNKNOWN CARRIER	Generic Panel	Panel	2100	30	65	4.6	15.23	-	-	-	2000.6	63'	89.9'	137.7'
13	UNKNOWN CARRIER	Generic Panel	Panel	751	30	65	4.6	12.14	-	-	-	982.1	65.3'	89.4'	137.7'
14	UNKNOWN CARRIER	Generic Panel	Panel	850	150	65	4.6	12.77	-	-	-	1513.9	65.3'	87.6'	137.7'
15	UNKNOWN CARRIER	Generic Panel	Panel	1900	150	65	4.6	15.43	-	-	-	2094.8	63.8'	86.5'	137.7'
16	UNKNOWN CARRIER	Generic Panel	Panel	2100	150	65	4.6	15.23	-	-	-	2000.6	61.6'	84.3'	137.7'
17	UNKNOWN CARRIER	Generic Panel	Panel	751	150	65	4.6	12.14	-	-	-	982.1	60.2'	83.1'	137.7'
18	UNKNOWN CARRIER	Generic Panel	Panel	850	270	65	4.6	12.77	-	-	-	1513.9	59'	83.2'	137.7'
19	UNKNOWN CARRIER	Generic Panel	Panel	1900	270	65	4.6	15.43	-	-	-	2094.8	58.5'	85.3'	137.7'
20	UNKNOWN CARRIER	Generic Panel	Panel	2100	270	65	4.6	15.23	-	-	-	2000.6	58.2'	87'	137.7'
21	UNKNOWN CARRIER	Generic Panel	Panel	751	270	65	4.6	12.14	-	-	-	982.1	57'	90.4'	137.7'
22	UNKNOWN CARRIER	Generic Panel	Panel	1900	30	65	4.6	15.43	-	-	-	2094.8	58.8'	90.8'	147.7'
23	UNKNOWN CARRIER	Generic Panel	Panel	2100	30	65	4.6	15.23	-	-	-	2000.6	63.9'	89.1'	147.7'
24	UNKNOWN CARRIER	Generic Panel	Panel	1900	150	65	4.6	15.43	-	-	-	2094.8	64.4'	87.9'	147.7'

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
25	UNKNOWN CARRIER	Generic Panel	Panel	2100	150	65	4.6	15.23	-	-	-	2000.6	61'	84.2'	147.7'
26	UNKNOWN CARRIER	Generic Panel	Panel	1900	270	65	4.6	15.43	-	-	-	2094.8	59.3'	84.6'	147.7'
27	UNKNOWN CARRIER	Generic Panel	Panel	2100	270	65	4.6	15.23	-	-	-	2000.6	57.7'	88.8'	147.7'
28	UNKNOWN CARRIER	Generic Panel	Panel	850	30	65	4.6	12.77	-	-	-	1135.4	60.6'	89.5'	157.7'
28	UNKNOWN CARRIER	Generic Panel	Panel	1900	30	65	4.6	15.43	-	-	-	2094.8	60.6'	89.5'	157.7'
29	UNKNOWN CARRIER	Generic Panel	Panel	850	150	65	4.6	12.77	-	-	-	1135.4	62.2'	86.3'	157.7'
29	UNKNOWN CARRIER	Generic Panel	Panel	1900	150	65	4.6	15.43	-	-	-	2094.8	62.2'	86.3'	157.7'
30	UNKNOWN CARRIER	Generic Panel	Panel	850	270	65	4.6	12.77	-	-	-	1135.4	59.1'	86.6'	157.7'
30	UNKNOWN CARRIER	Generic Panel	Panel	1900	270	65	4.6	15.43	-	-	-	2094.8	59.1'	86.6'	157.7'

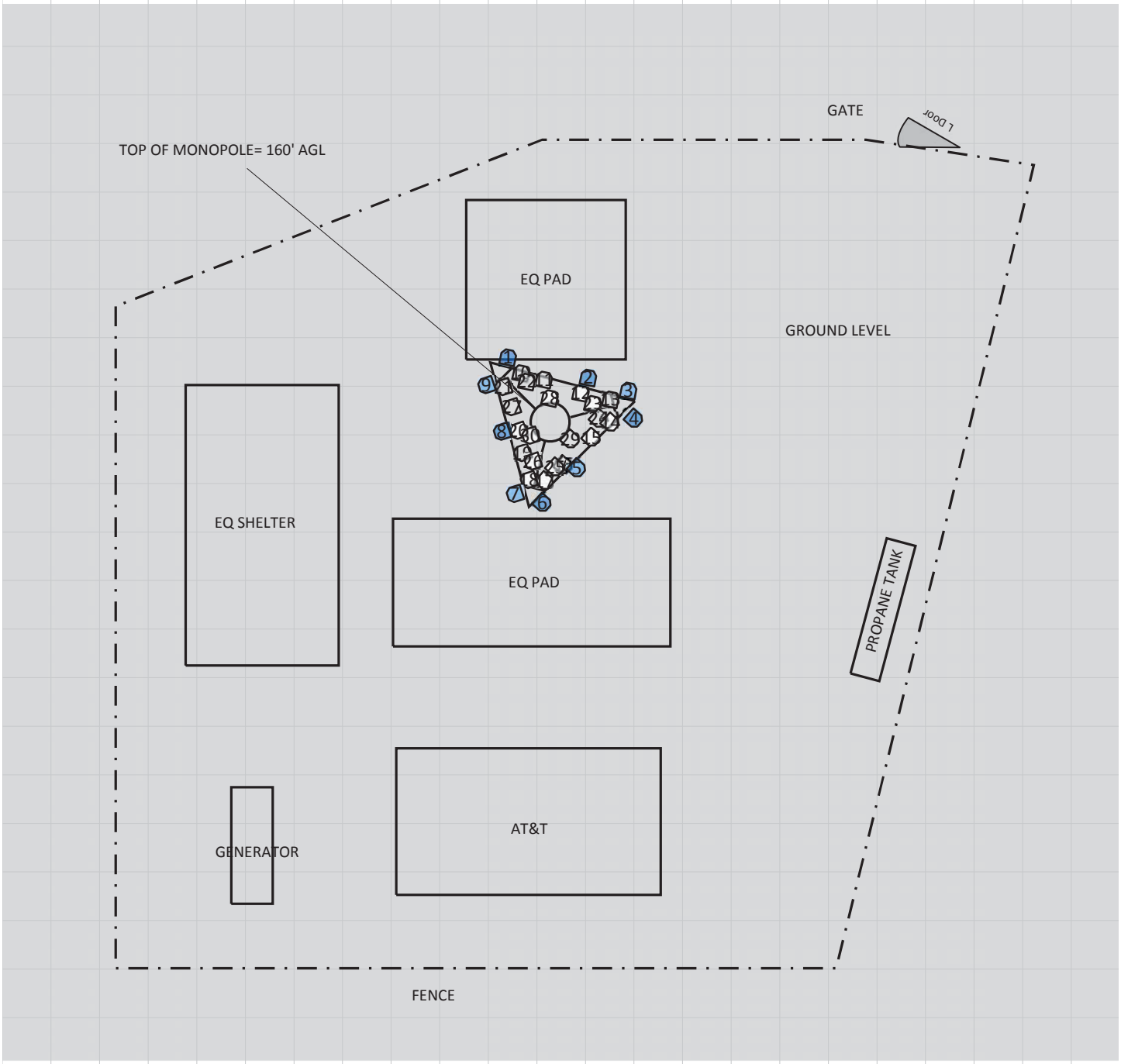
NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height **above ground level (AGL).** The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline. Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

4 Emission Predictions

In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas.

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: Torrington CT Wheeler Rd



% of FCC Public Exposure Limit
Spatial average 0' - 6'

% of FCC Public Exposure Limit

>= 5000	>= 500	>= 100	>= 5	< 5

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Barrier

Proposed Barriers/ Signs

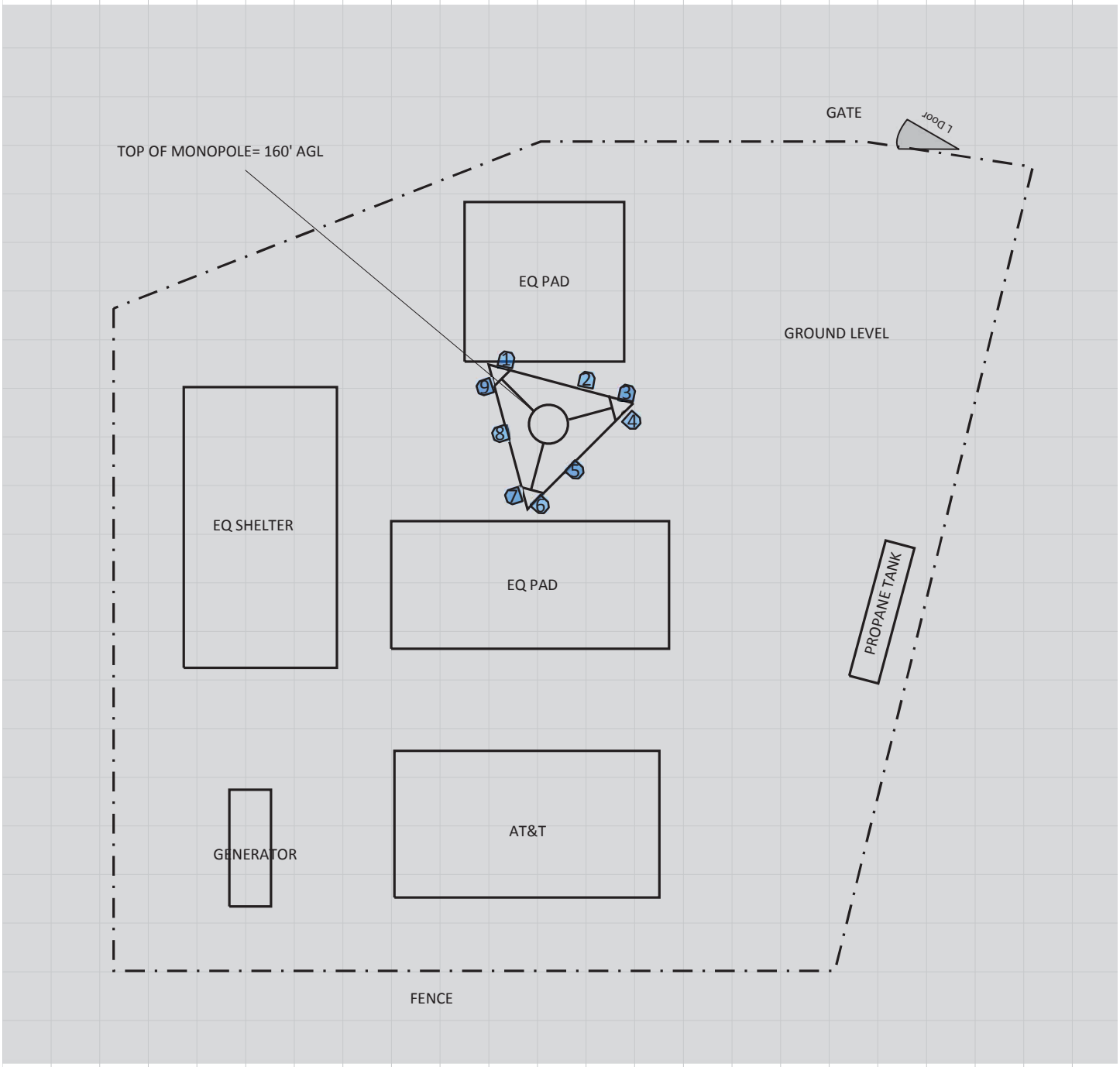
(Feet)

0 5.7 11.5

www.sitesafe.com
Site Name:Torrington CT Wheeler Rd
3/1/2018 3:31:56 PM

SitesafeTC Version:1.0.0.0 - 0.0.0.268
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Torrington CT Wheeler Rd
AT&T Mobility, LLC Contribution



% of FCC Public Exposure Limit
Spatial average 0' - 6'

% of FCC Public Exposure Limit

>= 5000	>= 500	>= 100	>= 5	< 5

Carrier Identification

AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Barrier

Proposed Barriers/ Signs

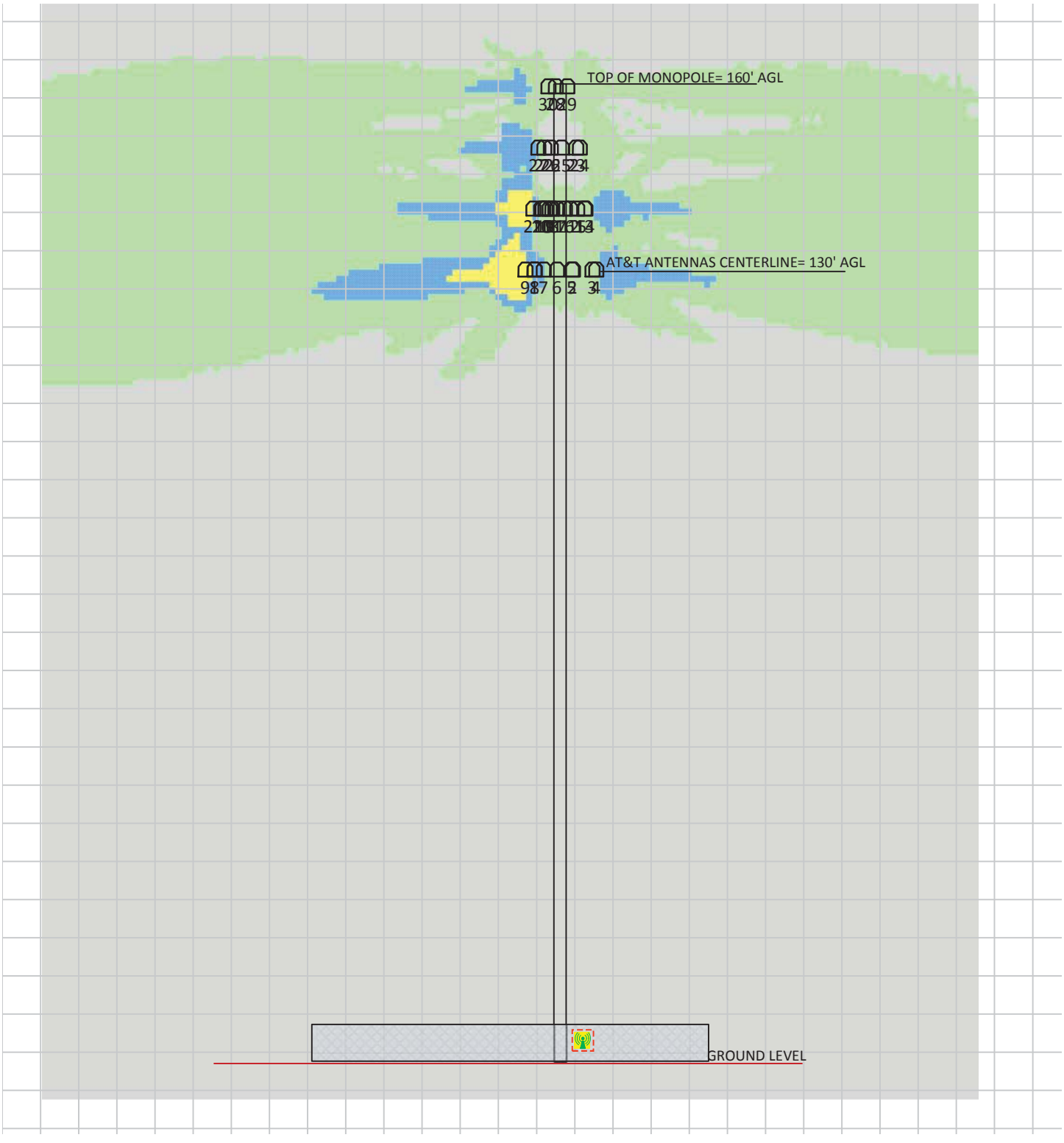
(Feet)

0 5.7 11.5

www.sitesafe.com
Site Name:Torrington CT Wheeler Rd
3/1/2018 3:33:00 PM

SitesafeTC Version:1.0.0.0 - 0.0.0.268
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Torrington CT Wheeler Rd
Elevation View



% of FCC Public Exposure Limit

% of FCC Public Exposure Limit
>= 5000 | >= 500 | >= 100 | >= 5 | < 5

Carrier Identification
AT&T MOBILITY LLC | VERIZON WIRELESS | T-MOBILE | SPRINT | UNKNOWN CARRIER

Sign Legend
Caution 1 | Caution 2 | Notice 2 | Notice 1 | Warning | Info 1 | Info 2

Barrier | Proposed Barriers/ Signs

(Feet)
0 12.3 24.6

www.sitesafe.com
Site Name:Torrington CT Wheeler Rd
3/1/2018 3:41:53 PM

SitesafeTC Version:1.0.0.0 - 0.0.0.268
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Single Level (0)

5 Site Compliance

5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility, LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

AT&T Mobility, LLC will be made compliant if the following changes are implemented:

Base of Tower

Caution 2 sign required.

6 Reviewer Certification

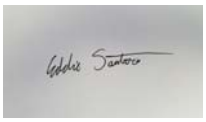
The reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Sitesafe, Inc., in Arlington, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Leo Romero.

March 1, 2018



Eddie Santoro

Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.

Appendix B – Regulatory Background Information

FCC Rules and Regulations

In 1996, the Federal Communications Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

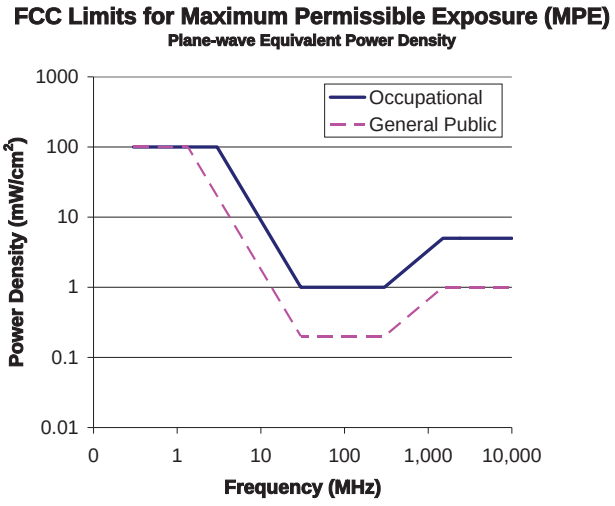
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:



Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Areas indicated as Gray are predicted to be below 5% of the MPE limits. **Gray represents areas more than 20 times below the most conservative exposure limit**.
- Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone**.
- Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers**.
- Yellow represents areas predicted to exceed Occupational MPE limits. **Yellow areas should be accessible only to RF trained workers able to assess current exposure levels**.
- Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

Appendix E – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The modeling is based on recommendations from the FCC's OET-65 bulletin with the following variances per AT&T guidance. Reflection has not been considered in the modeling, i.e. the reflection factor is 1.0. The near / far field boundary has been set to 1.5 times the aperture height of the antenna and modeling beyond that point is the lesser of the near field cylindrical model and the far field model taking into account the gain of the antenna.

The site has been modeled with these assumptions to show the maximum RF energy density. Areas modeled with exposure greater than 100% of the General Public MPE level may not actually occur, but are shown as a prediction that could be realized. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

Gain (of an antenna) – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

General Population/Uncontrolled Environment – Defined by the FCC, as an area where exposure to RF energy may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The maximum levels of RF exposure a person may be exposed to without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the

potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency (RF) – The frequencies of electromagnetic waves which are used for radio communications. Approximately 3 kHz to 300 GHz.

Radio Frequency Exposure (RFE) – The amount of RF power density that a person is or might be exposed to.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average power density an average sized human will be exposed to at a location.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

Appendix F – References

The following references can be followed for further information about RF Health and Safety.

Sitesafe, Inc.
http://www.sitesafe.com
FCC Radio Frequency Safety
http://www.fcc.gov/encyclopedia/radio-frequency-safety
National Council on Radiation Protection and Measurements (NCRP)
http://www.ncrponline.org
Institute of Electrical and Electronics Engineers, Inc., (IEEE)
http://www.ieee.org
American National Standards Institute (ANSI)
http://www.ansi.org
Environmental Protection Agency (EPA)
http://www.epa.gov/radtown/wireless-tech.html
National Institutes of Health (NIH)
http://www.niehs.nih.gov/health/topics/agents/emf/
Occupational Safety and Health Agency (OSHA)
http://www.osha.gov/SLTC/radiofrequencyradiation/
International Commission on Non-Ionizing Radiation Protection (ICNIRP)
http://www.icnirp.org
World Health Organization (WHO)
http://www.who.int/peh-emf/en/
National Cancer Institute
http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones
American Cancer Society (ACS)
http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?siteareа=PED
European Commission Scientific Committee on Emerging and Newly Identified Health Risks
http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_022.pdf
Fairfax County, Virginia Public School Survey
http://www.fcps.edu/fts/safety-security/RFEESurvey/
UK Health Protection Agency Advisory Group on Non-ionising Radiation
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368
Norwegian Institute of Public Health
http://www.fhi.no/dokumenter/545eea7147.pdf

Date: **November 06, 2017**

Charles McGuirt
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

JACOBS
Jacobs Engineering Group, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
770-701-2500

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL01267
	Carrier Site Name:	Torrington CT Wheeler RD.
Crown Castle Designation:	**Crown Castle BU Number:**	828540
	Crown Castle Site Name:	TORRINGTON/RT 8
	Crown Castle JDE Job Number:	469999
	Crown Castle Work Order Number:	1484877
	Crown Castle Application Number:	414512 Rev. 0
Engineering Firm Designation:	**Jacobs Engineering Group Inc. Project Number:**	1484877
Site Data:	**218 Wheeler Road, Torrington, Litchfield County, CT** **Latitude *41° 46' 50.33"*, Longitude *-73° 8' 10.02"*** **160 Foot - Monopole Tower**	

Dear Charles McGuirt,

Jacobs Engineering Group Inc. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1103344, in accordance with application 414512, revision 0.

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

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at *Jacobs Engineering Group Inc.* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by:

Dustin Virgil M. Daulo
Structural Engineer

11/06/17

Reviewed by:

Matthew E. Watkins, P.E.
Engineering Project Manager

tnxTower Report - version 7.0.7.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by PIROD INC. in November of 2000. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 93 mph with no ice, 40 mph with 1 inch ice thickness and 60 mph under service loads, exposure category B.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
130.0	130.0	1	andrew	SBNHH-1D65A w/ Mount Pipe	-	-	-
		2	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe			
		3	ericsson	RRUS 32 B2			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	170.0	1	rfi antennas	OA40-41	9 4 1	1-5/8 1-1/4 7/8	1
	160.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		3	ericsson	RRUS 11 B12			
		1	tower mounts	Platform Mount [LP 405-1]			
150.0	150.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	3	1-1/4	1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		1	tower mounts	Miscellaneous [NA 510-1]			
		1	tower mounts	Platform Mount [LP 1201-1]			
		3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	2
		3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
140.0	140.0	3	antel	BXA-171063/12CF w/ Mount Pipe	12 1	1-5/8 7/8	1
		2	antel	LPA-80063/6CF w/ Mount Pipe			
		1	gps	GPS_A			
		6	rfs celwave	FD9R6004/2C-3L			
		4	swedcom	SC-E 6014 rev2 w/ Mount Pipe			
		3	swedcom	SLXW 5512 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 304-1]			
130.0	130.0	3	ericsson	RRUS 11	12 2 1	1-5/8 3/4 3/8	1
		1	kathrein	800 10764 w/ Mount Pipe			
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 304-1]			
		3	ericsson	RRUS 11	-	-	3
		2	kathrein	800 10764 w/ Mount Pipe			
		1	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	LGP 21403			
		6	powerwave technologies	LGP21903			
120.0	120.0	3	rfs celwave	APXV18-206517-C w/ Mount Pipe	6	1-5/8	4
100.0	100.0	2	maxrad	MPRC2449	4	1/4	1
		2	tower mounts	Side Arm Mount [SO 202-1]			
79.0	79.0	1	gps	GPS_A	1	1/2	1
		1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment to be Removed; Not Considered in this Analysis
4) Abandoned Equipment; Considered in this Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
185.0	185.0	12	ems wireless	RR65-19	12	1-5/8
175.0	175.0	12	ems wireless	RR65-19	12	1-5/8
160.0	160.0	12	ems wireless	RR65-19	12	1-5/8
150.0	150.0	12	ems wireless	RR65-19	12	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Jaworski Geotech, Inc.	3463255	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PiRod, Inc.	3464896	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PiRod, Inc.	3463264	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Crown Castle	5123281	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.7.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Base and flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.
5) Specifications of the weld connecting the tower shaft to the base plate have not been provided to Jacobs prior to this analysis and as a result are outside the scope of this report.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	160 - 140	Pole	P36x3/8	1	-11.42	1490.10	11.6	Pass
L2	140 - 120	Pole	P42x3/8	2	-21.17	1668.87	26.3	Pass
L3	120 - 100	Pole	P48x3/8	3	-27.09	1847.49	37.4	Pass
L4	100 - 80	Pole	P54x3/8	4	-33.76	2026.00	44.9	Pass
L5	80 - 60	Pole	P60x3/8	5	-40.80	2204.43	50.3	Pass
L6	60 - 40	Pole	P60x1/2	6	-49.68	3125.69	47.5	Pass
L7	40 - 20	Pole	P60x1/2	7	-58.62	3125.69	58.8	Pass
L8	20 - 0	Pole	P60x5/8	8	-69.46	4139.15	55.3	Pass
							Summary	
						Pole (L7)	58.8	Pass
						Rating =	58.8	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Flange Connection	140	11.6	Pass
1,2	Flange Connection	120	26.3	Pass
1,2	Flange Connection	100	38.5	Pass
1,2	Flange Connection	80	44.9	Pass
1,2	Flange Connection	60	50.3	Pass
1,2	Flange Connection	40	47.5	Pass
1,2	Flange Connection	20	58.8	Pass
1	Anchor Rods	0	41.5	Pass
1,2	Base Plate	0	55.3	Pass
1	Base Foundation Structural	0	51.2	Pass
1	Base Foundation Soil Interaction	0	46.6	Pass

Structure Rating (max from all components) =	**58.8%**

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Flange plates have the same capacity as their respective splice bolts or shaft (greater of the 2).

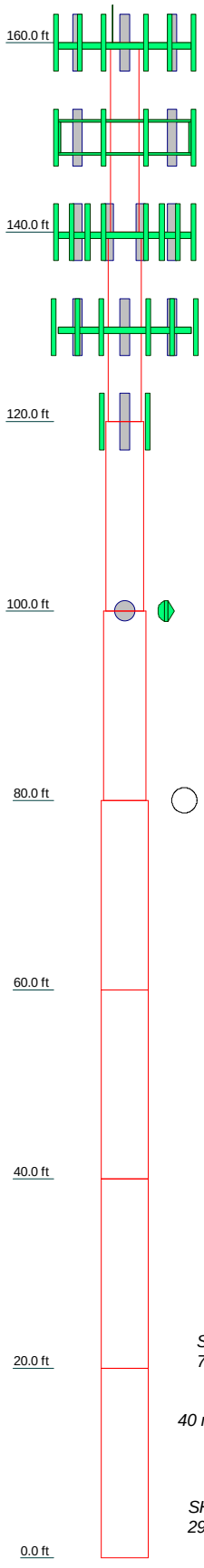
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (K)
1	P36x3/8	20.00	A53-B-42	2.9
2	P42x3/8	20.00		3.3
3	P48x3/8	20.00		3.8
4	P54x3/8	20.00		4.3
5	P60x3/8	20.00		4.8
6	P60x1/2	20.00		6.4
7	P60x1/2	20.00		6.4
8	P60x5/8	20.00		7.9
				39.7



ALL REACTIONS ARE FACTORED

AXIAL 134 K

SHEAR 7 K *MOMENT 802 kip-ft*

TORQUE 1 kip-ft
40 mph WIND - 1.0000 in ICE

AXIAL 69 K

SHEAR 29 K *MOMENT 3324 kip-ft*

TORQUE 2 kip-ft
REACTIONS - 93 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 3/4"x4'	160	SLXW 5512 w/ Mount Pipe	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	GPS_A	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	SC-E 6014 rev2 w/ Mount Pipe	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	(2) SC-E 6014 rev2 w/ Mount Pipe	140
LNX-6515DS-VTM w/ Mount Pipe	160	SC-E 6014 rev2 w/ Mount Pipe	140
LNX-6515DS-VTM w/ Mount Pipe	160	BXA-171063/12CF w/ Mount Pipe	140
LNX-6515DS-VTM w/ Mount Pipe	160	BXA-171063/12CF w/ Mount Pipe	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	BXA-171063/12CF w/ Mount Pipe	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	LPA-80063/6CF w/ Mount Pipe	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	LPA-80063/6CF w/ Mount Pipe	140
OA40-41	160	(2) FD9R6004/2C-3L	140
KRY 112 144/1	160	(2) FD9R6004/2C-3L	140
KRY 112 144/1	160	(2) FD9R6004/2C-3L	140
KRY 112 144/1	160	Platform Mount [LP 304-1]	140
RRUS 11 B12	160	7770.00 w/ Mount Pipe	130
RRUS 11 B12	160	7770.00 w/ Mount Pipe	130
RRUS 11 B12	160	7770.00 w/ Mount Pipe	130
5' x 2" Mount Pipe	160	SBNHH-1D65A w/ Mount Pipe	130
Platform Mount [LP 405-1]	160	HPA-65R-BUU-H6 w/ Mount Pipe	130
APXVSPP18-C-A20 w/ Mount Pipe	150	HPA-65R-BUU-H6 w/ Mount Pipe	130
APXVSPP18-C-A20 w/ Mount Pipe	150	800 10764 w/ Mount Pipe	130
APXVSPP18-C-A20 w/ Mount Pipe	150	AM-X-CD-16-65-00T-RET w/ Mount Pipe	130
APXVTM14-ALU-I20 w/ Mount Pipe	150	AM-X-CD-16-65-00T-RET w/ Mount Pipe	130
APXVTM14-ALU-I20 w/ Mount Pipe	150	(2) LGP21401	130
APXVTM14-ALU-I20 w/ Mount Pipe	150	(2) LGP21401	130
PCS 1900MHz 4x45W-65MHz	150	(2) LGP21401	130
PCS 1900MHz 4x45W-65MHz	150	RRUS 32 B2	130
PCS 1900MHz 4x45W-65MHz	150	RRUS 32 B2	130
800MHz 2X50W RRH W/FILTER	150	RRUS 32 B2	130
800MHz 2X50W RRH W/FILTER	150	RRUS 11	130
800MHz 2X50W RRH W/FILTER	150	RRUS 11	130
(3) TD-RRH8x20-25	150	RRUS 11	130
(2) 5' x 2" Mount Pipe	150	DC6-48-60-18-8F	130
(2) 5' x 2" Mount Pipe	150	Platform Mount [LP 304-1]	130
(2) 5' x 2" Mount Pipe	150	APXV18-206517-C w/ Mount Pipe	120
Miscellaneous [NA 510-1]	150	APXV18-206517-C w/ Mount Pipe	120
Platform Mount [LP 1201-1]	150	APXV18-206517-C w/ Mount Pipe	120
SLXW 5512 w/ Mount Pipe	140	Side Arm Mount [SO 202-1]	100
SLXW 5512 w/ Mount Pipe	140	Side Arm Mount [SO 202-1]	100
		MPRC2449	100
		MPRC2449	100
		GPS_A	79
		Side Arm Mount [SO 701-1]	79

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	60 ksi			

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 58.8%

Jacobs Engineering Group Inc.
5449 Bells Ferry Road
Acworth, GA 30102
Phone: 770-701-2500
FAX: 770-701-2501

Job: ***TORRINGTON/RT 8***			
Project: ***BU#828540 WO#1484877***			
Client: Crown Castle	Drawn by: Dustin Daulo		App'd:
Code: TIA-222-G	Date: 11/06/17		Scale: NTS
Path:			Dwg No. E-1

Tower Input Data

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

1) Tower is located in Litchfield County, Connecticut.
2) Basic wind speed of 93 mph.
3) Structure Class II.
4) Exposure Category B.
5) Topographic Category 1.
6) Crest Height 0.00 ft.
7) Nominal ice thickness of 1.0000 in.
8) Ice thickness is considered to increase with height.
9) Ice density of 56 pcf.
10) A wind speed of 40 mph is used in combination with ice.
11) Temperature drop of 50 °F.
12) Deflections calculated using a wind speed of 60 mph.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in pole design is 1.
16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		

Pole Section Geometry

Section	*Elevation* ft	*Section Length* ft	*Pole Size*	*Pole Grade*	*Socket Length* ft
L1	160.00-140.00	20.00	P36x3/8	A53-B-42 (42 ksi)	
L2	140.00-120.00	20.00	P42x3/8	A53-B-42 (42 ksi)	
L3	120.00-100.00	20.00	P48x3/8	A53-B-42 (42 ksi)	
L4	100.00-80.00	20.00	P54x3/8	A53-B-42 (42 ksi)	
L5	80.00-60.00	20.00	P60x3/8	A53-B-42 (42 ksi)	
L6	60.00-40.00	20.00	P60x1/2	A53-B-42 (42 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L7	40.00-20.00	20.00	P60x1/2	A53-B-42 (42 ksi)	
L8	20.00-0.00	20.00	P60x5/8	A53-B-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 160.00-140.00				1	1	1			
L2 140.00-120.00				1	1	1			
L3 120.00-100.00				1	1	1			
L4 100.00-80.00				1	1	1			
L5 80.00-60.00				1	1	1			
L6 60.00-40.00				1	1	1			
L7 40.00-20.00				1	1	1			
L8 20.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***									
Safety Line 3/8	B	Surface Ar (CaAa)	160.00 - 0.00	1	1	-0.300 -0.300	0.3750		0.22
Climbing Ladder	B	Surface Af (CaAa)	160.00 - 0.00	1	1	-0.350 -0.350	2.5000	10.0000	7.90
810921-001(7/8)	C	Surface Ar (CaAa)	160.00 - 0.00	1	1	-0.350 -0.350	1.1120		0.40
level 140									
LDF5-50A(7/8)	C	Surface Ar (CaAa)	140.00 - 0.00	1	1	0.430 0.430	1.0300		0.33
LDF7-50A(1-5/8)	C	Surface Ar (CaAa)	140.00 - 0.00	12	12	0.100 0.425	1.9800		0.82
level 120									
LDF7-50A(1-5/8)	A	Surface Ar (CaAa)	120.00 - 0.00	6	6	0.400 0.500	1.9800		0.82
level 100									
CAT5E(1/4)	C	Surface Ar (CaAa)	100.00 - 0.00	4	4	-0.345 -0.340	0.2500		0.10
level 79									
LDF4-50A(1/2)	B	Surface Ar (CaAa)	79.00 - 0.00	1	1	-0.080 -0.080	0.6250		0.15

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C_AA_A ft²/ft	Weight plf
level 160							

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
LDF6-50A(1-1/4)	A	No	Inside Pole	160.00 - 0.00	4	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
LDF7-50A(1-5/8)	A	No	Inside Pole	160.00 - 0.00	9	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
level 150								
HB114-1-08U4-M5J(1-1/4)	C	No	Inside Pole	150.00 - 0.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
HB114-21U3M12-XXXF(1-1/4)	C	No	Inside Pole	150.00 - 0.00	1	No Ice	0.00	1.22
						1/2" Ice	0.00	1.22
						1" Ice	0.00	1.22
level 130								
2" Flex Conduit	A	No	Inside Pole	130.00 - 0.00	1	No Ice	0.00	0.34
						1/2" Ice	0.00	0.34
						1" Ice	0.00	0.34
AVA7-50(1-5/8)	A	No	Inside Pole	130.00 - 0.00	12	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
FB-L98-002-XXX(3/8)	A	No	Inside Pole	130.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86T(3/4)	A	No	Inside Pole	130.00 - 0.00	2	No Ice	0.00	0.53
						1/2" Ice	0.00	0.53
						1" Ice	0.00	0.53

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	160.00-140.00	A	0.000	0.000	0.000	0.000	0.20
		B	0.000	0.000	9.083	0.000	0.16
		C	0.000	0.000	2.224	0.000	0.05
L2	140.00-120.00	A	0.000	0.000	0.000	0.000	0.29
		B	0.000	0.000	9.083	0.000	0.16
		C	0.000	0.000	51.804	0.000	0.30
L3	120.00-100.00	A	0.000	0.000	23.760	0.000	0.49
		B	0.000	0.000	9.083	0.000	0.16
		C	0.000	0.000	51.804	0.000	0.30
L4	100.00-80.00	A	0.000	0.000	23.760	0.000	0.49
		B	0.000	0.000	9.083	0.000	0.16
		C	0.000	0.000	53.804	0.000	0.31
L5	80.00-60.00	A	0.000	0.000	23.760	0.000	0.49
		B	0.000	0.000	10.271	0.000	0.17
		C	0.000	0.000	53.804	0.000	0.31
L6	60.00-40.00	A	0.000	0.000	23.760	0.000	0.49
		B	0.000	0.000	10.333	0.000	0.17
		C	0.000	0.000	53.804	0.000	0.31
L7	40.00-20.00	A	0.000	0.000	23.760	0.000	0.49
		B	0.000	0.000	10.333	0.000	0.17
		C	0.000	0.000	53.804	0.000	0.31
L8	20.00-0.00	A	0.000	0.000	23.760	0.000	0.49
		B	0.000	0.000	10.333	0.000	0.17
		C	0.000	0.000	53.804	0.000	0.31

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L1	160.00-140.00	A	2.327	0.000	0.000	0.000	0.000	0.20

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	27.699	0.000	0.66
		C		0.000	0.000	11.532	0.000	0.25
L2	140.00-120.00	A	2.294	0.000	0.000	0.000	0.000	0.29
		B		0.000	0.000	27.434	0.000	0.65
		C		0.000	0.000	93.505	0.000	1.77
L3	120.00-100.00	A	2.256	0.000	0.000	40.979	0.000	1.10
		B		0.000	0.000	27.130	0.000	0.63
		C		0.000	0.000	93.011	0.000	1.74
L4	100.00-80.00	A	2.211	0.000	0.000	40.755	0.000	1.09
		B		0.000	0.000	26.772	0.000	0.62
		C		0.000	0.000	105.983	0.000	1.87
L5	80.00-60.00	A	2.156	0.000	0.000	40.481	0.000	1.07
		B		0.000	0.000	35.714	0.000	0.74
		C		0.000	0.000	104.996	0.000	1.82
L6	60.00-40.00	A	2.085	0.000	0.000	40.124	0.000	1.05
		B		0.000	0.000	35.352	0.000	0.72
		C		0.000	0.000	103.711	0.000	1.76
L7	40.00-20.00	A	1.981	0.000	0.000	39.605	0.000	1.02
		B		0.000	0.000	34.106	0.000	0.68
		C		0.000	0.000	101.843	0.000	1.67
L8	20.00-0.00	A	1.775	0.000	0.000	38.575	0.000	0.96
		B		0.000	0.000	31.632	0.000	0.59
		C		0.000	0.000	98.133	0.000	1.50

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	160.00-140.00	-0.0600	-0.5848	0.2597	-0.9341
L2	140.00-120.00	-1.1487	1.3856	-1.0211	1.1853
L3	120.00-100.00	-1.1332	0.3553	-0.9817	0.1233
L4	100.00-80.00	-1.1336	0.4290	-0.7881	0.3472
L5	80.00-60.00	-1.1441	0.4165	-0.6634	0.2289
L6	60.00-40.00	-1.1418	0.4147	-0.6661	0.2280
L7	40.00-20.00	-1.1418	0.4147	-0.6847	0.2379
L8	20.00-0.00	-1.1418	0.4147	-0.7237	0.2586

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	Safety Line 3/8	140.00 - 160.00	1.0000	1.0000
L1	3	Climbing Ladder	140.00 - 160.00	1.0000	1.0000
L1	7	810921-001(7/8)	140.00 - 160.00	1.0000	1.0000
L2	2	Safety Line 3/8	120.00 - 140.00	1.0000	1.0000
L2	3	Climbing Ladder	120.00 - 140.00	1.0000	1.0000
L2	7	810921-001(7/8)	120.00 - 140.00	1.0000	1.0000
L2	12	LDF5-50A(7/8)	120.00 - 140.00	1.0000	1.0000
L2	13	LDF7-50A(1-5/8)	120.00 - 140.00	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
L3	2	Safety Line 3/8	100.00 - 120.00	1.0000	1.0000
L3	3	Climbing Ladder	100.00 - 120.00	1.0000	1.0000
L3	7	810921-001(7/8)	100.00 - 120.00	1.0000	1.0000
L3	12	LDF5-50A(7/8)	100.00 - 120.00	1.0000	1.0000
L3	13	LDF7-50A(1-5/8)	100.00 - 120.00	1.0000	1.0000
L3	20	LDF7-50A(1-5/8)	100.00 - 120.00	1.0000	1.0000
L4	2	Safety Line 3/8	80.00 - 100.00	1.0000	1.0000
L4	3	Climbing Ladder	80.00 - 100.00	1.0000	1.0000
L4	7	810921-001(7/8)	80.00 - 100.00	1.0000	1.0000
L4	12	LDF5-50A(7/8)	80.00 - 100.00	1.0000	1.0000
L4	13	LDF7-50A(1-5/8)	80.00 - 100.00	1.0000	1.0000
L4	20	LDF7-50A(1-5/8)	80.00 - 100.00	1.0000	1.0000
L4	22	CAT5E(1/4)	80.00 - 100.00	1.0000	1.0000
L5	2	Safety Line 3/8	60.00 - 80.00	1.0000	1.0000
L5	3	Climbing Ladder	60.00 - 80.00	1.0000	1.0000
L5	7	810921-001(7/8)	60.00 - 80.00	1.0000	1.0000
L5	12	LDF5-50A(7/8)	60.00 - 80.00	1.0000	1.0000
L5	13	LDF7-50A(1-5/8)	60.00 - 80.00	1.0000	1.0000
L5	20	LDF7-50A(1-5/8)	60.00 - 80.00	1.0000	1.0000
L5	22	CAT5E(1/4)	60.00 - 80.00	1.0000	1.0000
L5	24	LDF4-50A(1/2)	60.00 - 79.00	1.0000	1.0000
L6	2	Safety Line 3/8	40.00 - 60.00	1.0000	1.0000
L6	3	Climbing Ladder	40.00 - 60.00	1.0000	1.0000
L6	7	810921-001(7/8)	40.00 - 60.00	1.0000	1.0000
L6	12	LDF5-50A(7/8)	40.00 - 60.00	1.0000	1.0000
L6	13	LDF7-50A(1-5/8)	40.00 - 60.00	1.0000	1.0000
L6	20	LDF7-50A(1-5/8)	40.00 - 60.00	1.0000	1.0000
L6	22	CAT5E(1/4)	40.00 - 60.00	1.0000	1.0000
L6	24	LDF4-50A(1/2)	40.00 - 60.00	1.0000	1.0000
L7	2	Safety Line 3/8	20.00 - 40.00	1.0000	1.0000
L7	3	Climbing Ladder	20.00 - 40.00	1.0000	1.0000
L7	7	810921-001(7/8)	20.00 - 40.00	1.0000	1.0000
L7	12	LDF5-50A(7/8)	20.00 - 40.00	1.0000	1.0000
L7	13	LDF7-50A(1-5/8)	20.00 - 40.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L7	20	LDF7-50A(1-5/8)	20.00 - 40.00	1.0000	1.0000
L7	22	CAT5E(1/4)	20.00 - 40.00	1.0000	1.0000
L7	24	LDF4-50A(1/2)	20.00 - 40.00	1.0000	1.0000
L8	2	Safety Line 3/8	0.00 - 20.00	1.0000	1.0000
L8	3	Climbing Ladder	0.00 - 20.00	1.0000	1.0000
L8	7	810921-001(7/8)	0.00 - 20.00	1.0000	1.0000
L8	12	LDF5-50A(7/8)	0.00 - 20.00	1.0000	1.0000
L8	13	LDF7-50A(1-5/8)	0.00 - 20.00	1.0000	1.0000
L8	20	LDF7-50A(1-5/8)	0.00 - 20.00	1.0000	1.0000
L8	22	CAT5E(1/4)	0.00 - 20.00	1.0000	1.0000
L8	24	LDF4-50A(1/2)	0.00 - 20.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 3/4"x4'	C	From Leg	0.00 0.00 2.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	0.30 0.71 1.00	0.30 0.71 1.00	0.02 0.02 0.03
level 160									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	160.00	No Ice	6.33 6.78	5.64 6.43	0.11 0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	7.21	7.13	0.23
						1" Ice			
OA40-41	A	From Leg	4.00	0.0000	160.00	No Ice	9.55	9.55	0.07
			0.00			1/2" Ice	14.83	14.83	0.11
			10.00			1" Ice	20.11	20.11	0.15
KRY 112 144/1	A	From Leg	4.00	0.0000	160.00	No Ice	0.35	0.16	0.01
			0.00			1/2" Ice	0.43	0.22	0.01
			0.00			1" Ice	0.51	0.28	0.02
KRY 112 144/1	B	From Leg	4.00	0.0000	160.00	No Ice	0.35	0.16	0.01
			0.00			1/2" Ice	0.43	0.22	0.01
			0.00			1" Ice	0.51	0.28	0.02
KRY 112 144/1	C	From Leg	4.00	0.0000	160.00	No Ice	0.35	0.16	0.01
			0.00			1/2" Ice	0.43	0.22	0.01
			0.00			1" Ice	0.51	0.28	0.02
RRUS 11 B12	A	From Leg	4.00	0.0000	160.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
RRUS 11 B12	B	From Leg	4.00	0.0000	160.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
RRUS 11 B12	C	From Leg	4.00	0.0000	160.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
5' x 2" Mount Pipe	B	From Leg	4.00	0.0000	160.00	No Ice	1.19	1.19	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			0.00			1" Ice	1.81	1.81	0.04
Platform Mount [LP 405-1]	C	None		0.0000	160.00	No Ice	20.80	20.80	1.80
						1/2" Ice	28.10	28.10	2.07
						1" Ice	35.40	35.40	2.33
level 150									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	8.26	6.95	0.08
			0.00			1/2" Ice	8.82	8.13	0.15
			0.00			1" Ice	9.35	9.02	0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	8.26	6.95	0.08
			0.00			1/2" Ice	8.82	8.13	0.15
			0.00			1" Ice	9.35	9.02	0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	8.26	6.95	0.08
			0.00			1/2" Ice	8.82	8.13	0.15
			0.00			1" Ice	9.35	9.02	0.23
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00	0.0000	150.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00	0.0000	150.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00	0.0000	150.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		*C_AA_A Front* ft^2	*C_AA_A Side* ft^2	*Weight* K
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
800MHz 2X50W RRH W/FILTER	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
800MHz 2X50W RRH W/FILTER	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
800MHz 2X50W RRH W/FILTER	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
(3) TD-RRH8x20-25	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
(2) 5' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	1.19 1.50 1.81	1.19 1.50 1.81	0.02 0.03 0.04
(2) 5' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	1.19 1.50 1.81	1.19 1.50 1.81	0.02 0.03 0.04
(2) 5' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	1.19 1.50 1.81	1.19 1.50 1.81	0.02 0.03 0.04
Miscellaneous [NA 510-1]	C	None		0.0000	150.00	No Ice 1/2" Ice 1" Ice	6.00 8.50 8.60	6.00 8.50 8.60	0.26 0.34 0.34
Platform Mount [LP 1201-1]	C	None		0.0000	150.00	No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50	23.10 26.80 30.50	2.10 2.50 2.90
level 140									
SLXW 5512 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	7.13 7.59 8.04	6.12 6.91 7.62	0.05 0.11 0.18
SLXW 5512 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	7.13 7.59 8.04	6.12 6.91 7.62	0.05 0.11 0.18
SLXW 5512 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	7.13 7.59 8.04	6.12 6.91 7.62	0.05 0.11 0.18
GPS_A	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.26 0.32 0.39	0.26 0.32 0.39	0.00 0.00 0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
SC-E 6014 rev2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.56 3.91 4.26	4.22 4.78 5.35	0.03 0.07 0.12
(2) SC-E 6014 rev2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.56 3.91 4.26	4.22 4.78 5.35	0.03 0.07 0.12
SC-E 6014 rev2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.56 3.91 4.26	4.22 4.78 5.35	0.03 0.07 0.12
BXA-171063/12CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	5.03 5.58 6.10	5.29 6.46 7.35	0.04 0.09 0.14
BXA-171063/12CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	5.03 5.58 6.10	5.29 6.46 7.35	0.04 0.09 0.14
BXA-171063/12CF w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	5.03 5.58 6.10	5.29 6.46 7.35	0.04 0.09 0.14
LPA-80063/6CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	9.83 10.40 10.93	10.22 11.38 12.27	0.05 0.14 0.25
LPA-80063/6CF w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	9.83 10.40 10.93	10.22 11.38 12.27	0.05 0.14 0.25
(2) FD9R6004/2C-3L	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01
(2) FD9R6004/2C-3L	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01
(2) FD9R6004/2C-3L	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01
Platform Mount [LP 304-1]	C	None		0.0000	140.00	No Ice 1/2" Ice 1" Ice	17.46 22.44 27.42	17.46 22.44 27.42	1.35 1.62 1.90
level 130									
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	5.97 6.36 6.76	5.19 5.85 6.52	0.07 0.12 0.19

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		*C_AA_A Front* *ft²*	*C_AA_A Side* *ft²*	*Weight* *K*
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
800 10764 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	5.71 6.13 6.54	4.29 4.99 5.66	0.06 0.11 0.17
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.30 7.48 8.37	0.07 0.14 0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.30 7.48 8.37	0.07 0.14 0.21
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
RRUS 32 B2	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B2	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B2	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 11	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.10
RRUS 11	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.10
RRUS 11	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.10
DC6-48-60-18-8F	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.03 0.05 0.07
Platform Mount [LP 304-1]	C	None		0.0000	130.00	No Ice 1/2" Ice 1" Ice	17.46 22.44 27.42	17.46 22.44 27.42	1.35 1.62 1.90
*** 120 ft ***									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXV18-206517-C w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	5.40 5.96 6.48	4.70 5.86 6.73	0.05 0.10 0.15
APXV18-206517-C w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	5.40 5.96 6.48	4.70 5.86 6.73	0.05 0.10 0.15
APXV18-206517-C w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	5.40 5.96 6.48	4.70 5.86 6.73	0.05 0.10 0.15
*** 100 ft ***									
Side Arm Mount [SO 202-1]	A	From Leg	1.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.96 4.10 5.24	2.53 3.51 4.49	0.11 0.13 0.16
Side Arm Mount [SO 202-1]	B	From Leg	1.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.96 4.10 5.24	2.53 3.51 4.49	0.11 0.13 0.16
*** 79 ft ***									
GPS_A	A	From Leg	3.00 0.00 0.00	0.0000	79.00	No Ice 1/2" Ice 1" Ice	0.26 0.32 0.39	0.26 0.32 0.39	0.00 0.00 0.01
Side Arm Mount [SO 701-1]	A	From Leg	1.50 0.00 0.00	0.0000	79.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
MPRC2449	A	Paraboloid w/Radome	From Leg	2.00 0.00 0.00	-57.0000		100.00	2.17	No Ice 1/2" Ice 1" Ice	3.69 3.98 4.27	0.02 0.04 0.06
MPRC2449	B	Paraboloid w/Radome	From Leg	2.00 0.00 0.00	-90.0000		100.00	2.17	No Ice 1/2" Ice 1" Ice	3.69 3.98 4.27	0.02 0.04 0.06

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice

Comb. No.	Description
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 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	160 - 140	Pole	Max Tension	26	0.00	-0.00	0.00
			Max. Compression	26	-26.38	3.19	0.06
			Max. Mx	20	-11.43	143.98	-1.15
			Max. My	14	-11.43	2.30	-141.49
			Max. Vy	20	-9.58	143.98	-1.15
			Max. Vx	14	9.46	2.30	-141.49
			Max. Torque	20			-2.10
L2	140 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.86	6.90	-2.32
			Max. Mx	20	-21.18	447.96	-3.56
			Max. My	14	-21.19	5.21	-442.02
			Max. Vy	20	-17.64	447.96	-3.56
			Max. Vx	14	17.46	5.21	-442.02
			Max. Torque	6			2.59
L3	120 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.91	8.97	-2.16
			Max. Mx	20	-27.09	829.33	-5.57

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-27.10	-3.43	819.44
			Max. Vy	20	-19.98	829.33	-5.57
			Max. Vx	14	19.80	7.94	-819.21
			Max. Torque	4			1.95
L4	100 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.60	9.91	-1.65
			Max. Mx	20	-33.76	1255.61	-7.42
			Max. My	14	-33.77	9.95	-1242.51
			Max. Vy	8	22.27	-1251.04	8.34
			Max. Vx	14	22.15	9.95	-1242.51
			Max. Torque	4			1.95
L5	80 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89.61	11.74	-0.79
			Max. Mx	20	-40.80	1722.26	-9.17
			Max. My	14	-40.81	12.40	-1705.07
			Max. Vy	8	24.28	-1716.76	10.97
			Max. Vx	14	24.13	12.40	-1705.07
			Max. Torque	6			2.11
L6	60 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-104.13	13.36	-0.64
			Max. Mx	20	-49.69	2225.48	-11.21
			Max. My	14	-49.69	14.84	-2204.51
			Max. Vy	8	25.99	-2219.06	13.28
			Max. Vx	14	25.84	14.84	-2204.51
			Max. Torque	6			2.11
L7	40 - 20	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-118.32	14.94	-0.50
			Max. Mx	20	-58.62	2758.98	-13.25
			Max. My	14	-58.62	17.26	-2734.26
			Max. Vy	8	27.30	-2751.64	15.56
			Max. Vx	14	27.16	17.26	-2734.26
			Max. Torque	6			2.11
L8	20 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-133.77	16.42	-0.37
			Max. Mx	20	-69.46	3317.72	-15.25
			Max. My	14	-69.46	19.63	-3289.30
			Max. Vy	8	28.52	-3309.48	17.81
			Max. Vx	14	28.37	19.63	-3289.30
			Max. Torque	6			2.11

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	133.77	0.00	-0.00
	Max. H_x	20	69.46	28.50	-0.12
	Max. H_z	2	69.46	-0.11	28.28
	Max. M_x	2	3286.24	-0.11	28.28
	Max. M_z	8	3309.48	-28.51	0.10
	Max. Torsion	6	2.11	-24.74	14.23
	Min. Vert	25	52.10	14.15	24.44
	Min. H_x	8	69.46	-28.51	0.10
	Min. H_z	14	69.46	0.09	-28.36
	Min. M_x	14	-3289.30	0.09	-28.36
	Min. M_z	20	-3317.72	28.50	-0.12
	Min. Torsion	18	-1.82	24.74	-14.26

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	57.89	0.00	0.00	-1.89	3.49	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	69.46	0.11	-28.28	-3286.24	-12.62	-1.07
0.9 Dead+1.6 Wind 0 deg - No Ice	52.10	0.11	-28.28	-3264.01	-13.60	-1.07
1.2 Dead+1.6 Wind 30 deg - No Ice	69.46	14.35	-24.55	-2854.89	-1667.26	-1.78
0.9 Dead+1.6 Wind 30 deg - No Ice	52.10	14.35	-24.55	-2835.49	-1657.34	-1.78
1.2 Dead+1.6 Wind 60 deg - No Ice	69.46	24.74	-14.23	-1658.78	-2873.98	-2.11
0.9 Dead+1.6 Wind 60 deg - No Ice	52.10	24.74	-14.23	-1647.27	-2856.10	-2.11
1.2 Dead+1.6 Wind 90 deg - No Ice	69.46	28.51	-0.10	-17.81	-3309.48	-2.00
0.9 Dead+1.6 Wind 90 deg - No Ice	52.10	28.51	-0.10	-17.10	-3288.75	-2.00
1.2 Dead+1.6 Wind 120 deg - No Ice	69.46	24.63	14.09	1629.00	-2856.83	-1.25
0.9 Dead+1.6 Wind 120 deg - No Ice	52.10	24.63	14.09	1618.85	-2839.08	-1.25
1.2 Dead+1.6 Wind 150 deg - No Ice	69.46	14.17	24.51	2840.35	-1639.14	-0.16
0.9 Dead+1.6 Wind 150 deg - No Ice	52.10	14.17	24.51	2822.22	-1629.43	-0.17
1.2 Dead+1.6 Wind 180 deg - No Ice	69.46	-0.09	28.36	3289.30	19.63	0.87
0.9 Dead+1.6 Wind 180 deg - No Ice	52.10	-0.09	28.36	3268.21	18.41	0.87
1.2 Dead+1.6 Wind 210 deg - No Ice	69.46	-14.33	24.59	2854.43	1674.15	1.57
0.9 Dead+1.6 Wind 210 deg - No Ice	52.10	-14.33	24.59	2836.20	1662.02	1.56
1.2 Dead+1.6 Wind 240 deg - No Ice	69.46	-24.74	14.26	1656.44	2882.00	1.82
0.9 Dead+1.6 Wind 240 deg - No Ice	52.10	-24.74	14.26	1646.09	2861.92	1.82
1.2 Dead+1.6 Wind 270 deg - No Ice	69.46	-28.50	0.12	15.25	3317.72	1.71
0.9 Dead+1.6 Wind 270 deg - No Ice	52.10	-28.50	0.12	15.72	3294.77	1.71
1.2 Dead+1.6 Wind 300 deg - No Ice	69.46	-24.63	-14.04	-1629.11	2865.20	1.03
0.9 Dead+1.6 Wind 300 deg - No Ice	52.10	-24.63	-14.04	-1617.80	2845.24	1.04
1.2 Dead+1.6 Wind 330 deg - No Ice	69.46	-14.15	-24.44	-2837.79	1645.87	-0.04
0.9 Dead+1.6 Wind 330 deg - No Ice	52.10	-14.15	-24.44	-2818.52	1633.96	-0.03
1.2 Dead+1.0 Ice+1.0 Temp	133.77	-0.00	0.00	0.37	16.42	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	133.77	0.01	-6.42	-753.34	14.78	-0.16
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	133.77	3.24	-5.57	-653.37	-363.80	-0.56
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	133.77	5.60	-3.22	-378.17	-640.40	-0.82
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	133.77	6.57	-0.01	-1.37	-754.51	-0.88
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	133.77	5.81	3.34	392.78	-667.14	-0.69
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	133.77	3.22	5.57	653.28	-360.56	-0.31
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	133.77	-0.01	6.44	755.34	18.48	0.13
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	133.77	-3.23	5.58	654.81	397.04	0.53
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	133.77	-5.59	3.23	379.30	673.83	0.78

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	133.77	-6.57	0.01	2.47	787.97	0.84
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	133.77	-5.81	-3.33	-391.28	700.62	0.66
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	133.77	-3.22	-5.56	-651.36	393.78	0.28
Dead+Wind 0 deg - Service	57.89	0.03	-6.58	-763.07	-0.34	-0.25
Dead+Wind 30 deg - Service	57.89	3.34	-5.71	-663.09	-383.85	-0.41
Dead+Wind 60 deg - Service	57.89	5.76	-3.31	-385.86	-663.55	-0.49
Dead+Wind 90 deg - Service	57.89	6.63	-0.02	-5.52	-764.49	-0.47
Dead+Wind 120 deg - Service	57.89	5.73	3.28	376.18	-659.57	-0.29
Dead+Wind 150 deg - Service	57.89	3.30	5.70	656.94	-377.34	-0.04
Dead+Wind 180 deg - Service	57.89	-0.02	6.60	761.00	7.13	0.20
Dead+Wind 210 deg - Service	57.89	-3.34	5.72	660.21	390.61	0.36
Dead+Wind 240 deg - Service	57.89	-5.76	3.32	382.54	670.57	0.42
Dead+Wind 270 deg - Service	57.89	-6.63	0.03	2.14	771.56	0.40
Dead+Wind 300 deg - Service	57.89	-5.73	-3.27	-378.98	666.67	0.24
Dead+Wind 330 deg - Service	57.89	-3.29	-5.69	-659.13	384.06	-0.01

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-57.89	0.00	0.00	57.89	0.00	0.000%
2	0.11	-69.46	-28.28	-0.11	69.46	28.28	0.000%
3	0.11	-52.10	-28.28	-0.11	52.10	28.28	0.000%
4	14.35	-69.46	-24.55	-14.35	69.46	24.55	0.000%
5	14.35	-52.10	-24.55	-14.35	52.10	24.55	0.000%
6	24.74	-69.46	-14.23	-24.74	69.46	14.23	0.000%
7	24.74	-52.10	-14.23	-24.74	52.10	14.23	0.000%
8	28.51	-69.46	-0.10	-28.51	69.46	0.10	0.000%
9	28.51	-52.10	-0.10	-28.51	52.10	0.10	0.000%
10	24.63	-69.46	14.09	-24.63	69.46	-14.09	0.000%
11	24.63	-52.10	14.09	-24.63	52.10	-14.09	0.000%
12	14.17	-69.46	24.51	-14.17	69.46	-24.51	0.000%
13	14.17	-52.10	24.51	-14.17	52.10	-24.51	0.000%
14	-0.09	-69.46	28.36	0.09	69.46	-28.36	0.000%
15	-0.09	-52.10	28.36	0.09	52.10	-28.36	0.000%
16	-14.33	-69.46	24.59	14.33	69.46	-24.59	0.000%
17	-14.33	-52.10	24.59	14.33	52.10	-24.59	0.000%
18	-24.74	-69.46	14.26	24.74	69.46	-14.26	0.000%
19	-24.74	-52.10	14.26	24.74	52.10	-14.26	0.000%
20	-28.50	-69.46	0.12	28.50	69.46	-0.12	0.000%
21	-28.50	-52.10	0.12	28.50	52.10	-0.12	0.000%
22	-24.63	-69.46	-14.04	24.63	69.46	14.04	0.000%
23	-24.63	-52.10	-14.04	24.63	52.10	14.04	0.000%
24	-14.15	-69.46	-24.44	14.15	69.46	24.44	0.000%
25	-14.15	-52.10	-24.44	14.15	52.10	24.44	0.000%
26	0.00	-133.77	0.00	0.00	133.77	-0.00	0.000%
27	0.01	-133.77	-6.42	-0.01	133.77	6.42	0.000%
28	3.24	-133.77	-5.57	-3.24	133.77	5.57	0.000%
29	5.60	-133.77	-3.22	-5.60	133.77	3.22	0.000%
30	6.57	-133.77	-0.01	-6.57	133.77	0.01	0.000%
31	5.81	-133.77	3.34	-5.81	133.77	-3.34	0.000%
32	3.22	-133.77	5.57	-3.22	133.77	-5.57	0.000%
33	-0.01	-133.77	6.44	0.01	133.77	-6.44	0.000%
34	-3.23	-133.77	5.58	3.23	133.77	-5.58	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
35	-5.59	-133.77	3.23	5.59	133.77	-3.23	0.000%
36	-6.57	-133.77	0.01	6.57	133.77	-0.01	0.000%
37	-5.81	-133.77	-3.33	5.81	133.77	3.33	0.000%
38	-3.22	-133.77	-5.56	3.22	133.77	5.56	0.000%
39	0.03	-57.89	-6.58	-0.03	57.89	6.58	0.000%
40	3.34	-57.89	-5.71	-3.34	57.89	5.71	0.000%
41	5.76	-57.89	-3.31	-5.76	57.89	3.31	0.000%
42	6.63	-57.89	-0.02	-6.63	57.89	0.02	0.000%
43	5.73	-57.89	3.28	-5.73	57.89	-3.28	0.000%
44	3.30	-57.89	5.70	-3.30	57.89	-5.70	0.000%
45	-0.02	-57.89	6.60	0.02	57.89	-6.60	0.000%
46	-3.34	-57.89	5.72	3.34	57.89	-5.72	0.000%
47	-5.76	-57.89	3.32	5.76	57.89	-3.32	0.000%
48	-6.63	-57.89	0.03	6.63	57.89	-0.03	0.000%
49	-5.73	-57.89	-3.27	5.73	57.89	3.27	0.000%
50	-3.29	-57.89	-5.69	3.29	57.89	5.69	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00053225
3	Yes	4	0.00000001	0.00033066
4	Yes	5	0.00000001	0.00016002
5	Yes	5	0.00000001	0.00007988
6	Yes	5	0.00000001	0.00018327
7	Yes	5	0.00000001	0.00009199
8	Yes	4	0.00000001	0.00084604
9	Yes	4	0.00000001	0.00056403
10	Yes	5	0.00000001	0.00015858
11	Yes	5	0.00000001	0.00007928
12	Yes	5	0.00000001	0.00016365
13	Yes	5	0.00000001	0.00008204
14	Yes	4	0.00000001	0.00059048
15	Yes	4	0.00000001	0.00037321
16	Yes	5	0.00000001	0.00018067
17	Yes	5	0.00000001	0.00009052
18	Yes	5	0.00000001	0.00016111
19	Yes	5	0.00000001	0.00008026
20	Yes	4	0.00000001	0.00066135
21	Yes	4	0.00000001	0.00043055
22	Yes	5	0.00000001	0.00017095
23	Yes	5	0.00000001	0.00008560
24	Yes	5	0.00000001	0.00016616
25	Yes	5	0.00000001	0.00008308
26	Yes	4	0.00000001	0.00015206
27	Yes	5	0.00000001	0.00033331
28	Yes	5	0.00000001	0.00033767
29	Yes	5	0.00000001	0.00033610
30	Yes	5	0.00000001	0.00033120
31	Yes	5	0.00000001	0.00034988
32	Yes	5	0.00000001	0.00033802
33	Yes	5	0.00000001	0.00033573
34	Yes	5	0.00000001	0.00035192
35	Yes	5	0.00000001	0.00035513
36	Yes	5	0.00000001	0.00035140
37	Yes	5	0.00000001	0.00036738
38	Yes	5	0.00000001	0.00034769
39	Yes	4	0.00000001	0.00006771
40	Yes	4	0.00000001	0.00011117
41	Yes	4	0.00000001	0.00013283
42	Yes	4	0.00000001	0.00007378
43	Yes	4	0.00000001	0.00010860
44	Yes	4	0.00000001	0.00011183
45	Yes	4	0.00000001	0.00006712
46	Yes	4	0.00000001	0.00012967
47	Yes	4	0.00000001	0.00011256
48	Yes	4	0.00000001	0.00007190
49	Yes	4	0.00000001	0.00012091
50	Yes	4	0.00000001	0.00011574

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 140	9.032	47	0.4462	0.0014
L2	140 - 120	7.179	47	0.4338	0.0010
L3	120 - 100	5.424	47	0.3978	0.0006
L4	100 - 80	3.858	47	0.3446	0.0004
L5	80 - 60	2.533	47	0.2840	0.0003
L6	60 - 40	1.469	47	0.2210	0.0002
L7	40 - 20	0.669	47	0.1579	0.0001
L8	20 - 0	0.169	47	0.0782	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	Lightning Rod 3/4"x4'	47	9.032	0.4462	0.0015	195470
150.00	APXVSPP18-C-A20 w/ Mount Pipe	47	8.100	0.4419	0.0013	97735
140.00	SLXW 5512 w/ Mount Pipe	47	7.179	0.4338	0.0011	48863
130.00	7770.00 w/ Mount Pipe	47	6.283	0.4188	0.0009	32507
120.00	APXV18-206517-C w/ Mount Pipe	47	5.424	0.3978	0.0007	24595
100.00	MPRC2449	47	3.858	0.3446	0.0005	19624
79.00	GPS_A	47	2.473	0.2808	0.0004	18221

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 140	38.877	18	1.9190	0.0061
L2	140 - 120	30.910	18	1.8659	0.0042
L3	120 - 100	23.361	18	1.7126	0.0027
L4	100 - 80	16.618	18	1.4845	0.0018
L5	80 - 60	10.911	18	1.2234	0.0013
L6	60 - 40	6.325	18	0.9519	0.0009
L7	40 - 20	2.883	18	0.6802	0.0006
L8	20 - 0	0.727	18	0.3369	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	Lightning Rod 3/4"x4'	18	38.877	1.9190	0.0064	46399
150.00	APXVSPP18-C-A20 w/ Mount Pipe	18	34.868	1.9007	0.0054	23199
140.00	SLXW 5512 w/ Mount Pipe	18	30.910	1.8659	0.0045	11582
130.00	7770.00 w/ Mount Pipe	18	27.057	1.8021	0.0037	7642
120.00	APXV18-206517-C w/ Mount Pipe	18	23.361	1.7126	0.0030	5759
100.00	MPRC2449	18	16.618	1.4845	0.0021	4572
79.00	GPS_A	18	10.654	1.2098	0.0015	4234

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	160 - 140 (1)	P36x3/8	20.00	0.00	0.0	41.9697	-11.42	1490.10	0.008

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L2	140 - 120 (2)	P42x3/8	20.00	0.00	0.0	49.0383	-21.17	1668.87	0.013
L3	120 - 100 (3)	P48x3/8	20.00	0.00	0.0	56.1069	-27.09	1847.49	0.015
L4	100 - 80 (4)	P54x3/8	20.00	0.00	0.0	63.1755	-33.76	2026.00	0.017
L5	80 - 60 (5)	P60x3/8	20.00	0.00	0.0	70.2440	-40.80	2204.43	0.019
L6	60 - 40 (6)	P60x1/2	20.00	0.00	0.0	93.4624	-49.68	3125.69	0.016
L7	40 - 20 (7)	P60x1/2	20.00	0.00	0.0	93.4624	-58.62	3125.69	0.019
L8	20 - 0 (8)	P60x5/8	20.00	0.00	0.0	116.5830	-69.46	4139.15	0.017

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	160 - 140 (1)	P36x3/8	144.45	1338.81	0.108	0.00	1338.81	0.000
L2	140 - 120 (2)	P42x3/8	449.66	1796.56	0.250	0.00	1796.56	0.000
L3	120 - 100 (3)	P48x3/8	831.96	2321.11	0.358	0.00	2321.11	0.000
L4	100 - 80 (4)	P54x3/8	1259.11	2912.46	0.432	0.00	2912.46	0.000
L5	80 - 60 (5)	P60x3/8	1726.38	3570.61	0.483	0.00	3570.61	0.000
L6	60 - 40 (6)	P60x1/2	2230.37	4860.41	0.459	0.00	4860.41	0.000
L7	40 - 20 (7)	P60x1/2	2764.63	4860.41	0.569	0.00	4860.41	0.000
L8	20 - 0 (8)	P60x5/8	3324.11	6198.18	0.536	0.00	6198.18	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	160 - 140 (1)	P36x3/8	9.65	745.05	0.013	1.71	2189.07	0.001
L2	140 - 120 (2)	P42x3/8	17.69	834.44	0.021	1.81	2868.84	0.001
L3	120 - 100 (3)	P48x3/8	20.03	923.75	0.022	1.81	3637.70	0.000
L4	100 - 80 (4)	P54x3/8	22.33	1013.00	0.022	1.58	4495.63	0.000
L5	80 - 60 (5)	P60x3/8	24.33	1102.21	0.022	1.82	5442.62	0.000
L6	60 - 40 (6)	P60x1/2	26.04	1562.84	0.017	1.82	7685.07	0.000
L7	40 - 20 (7)	P60x1/2	27.35	1562.84	0.018	1.82	7685.07	0.000
L8	20 - 0 (8)	P60x5/8	28.56	2069.58	0.014	1.82	10134.58	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	160 - 140 (1)	0.008	0.108	0.000	0.013	0.001	0.116	1.000	4.8.2
L2	140 - 120 (2)	0.013	0.250	0.000	0.021	0.001	0.263	1.000	4.8.2
L3	120 - 100 (3)	0.015	0.358	0.000	0.022	0.000	0.374	1.000	4.8.2
L4	100 - 80 (4)	0.017	0.432	0.000	0.022	0.000	0.449	1.000	4.8.2
L5	80 - 60 (5)	0.019	0.483	0.000	0.022	0.000	0.503	1.000	4.8.2
L6	60 - 40 (6)	0.016	0.459	0.000	0.017	0.000	0.475	1.000	4.8.2
L7	40 - 20 (7)	0.019	0.569	0.000	0.018	0.000	0.588	1.000	4.8.2

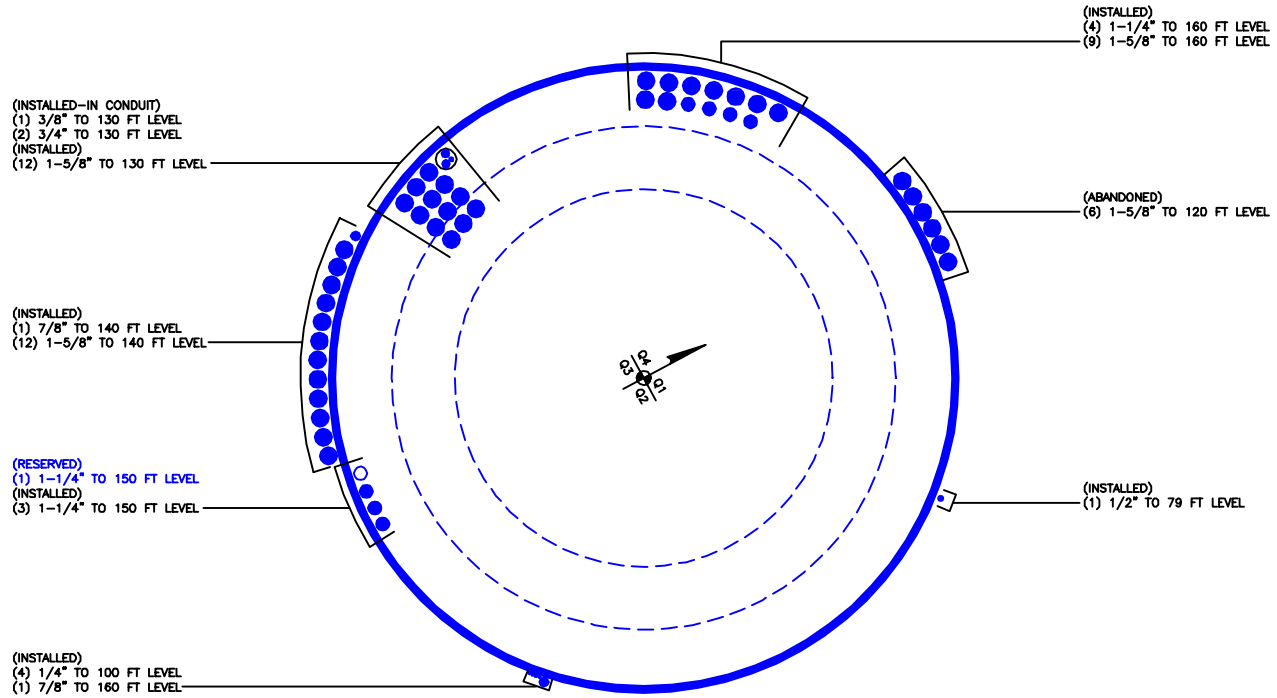
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L8	20 - 0 (8)	0.017	0.536	0.000	0.014	0.000	0.553	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	160 - 140	Pole	P36x3/8	1	-11.42	1490.10	11.6	Pass
L2	140 - 120	Pole	P42x3/8	2	-21.17	1668.87	26.3	Pass
L3	120 - 100	Pole	P48x3/8	3	-27.09	1847.49	37.4	Pass
L4	100 - 80	Pole	P54x3/8	4	-33.76	2026.00	44.9	Pass
L5	80 - 60	Pole	P60x3/8	5	-40.80	2204.43	50.3	Pass
L6	60 - 40	Pole	P60x1/2	6	-49.68	3125.69	47.5	Pass
L7	40 - 20	Pole	P60x1/2	7	-58.62	3125.69	58.8	Pass
L8	20 - 0	Pole	P60x5/8	8	-69.46	4139.15	55.3	Pass
							Summary	
						Pole (L7)	58.8	Pass
						RATING =	**58.8**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 828540 TOWER ID: C_BASELEVEL

CROWN REGION ADDRESS

USA

12/06/14	UPDATED PER WORK ORDER # 910305	BDH
10/11/14	UPDATED PER WORK ORDER # 909912	CJR
12/12/14	UPDATED PER WORK ORDER # 978646	CJR
16/7/2015	UPDATED PER WORK ORDER 1094691	DMB
17/12/2015	UPDATED PER WORK ORDER 1154650	CJR
25/02/16	UPDATED PER WORK ORDER 1186475	CRM
22/09/16	UPDATED PER WORK ORDER 1260031	ABE
14/07/17	UPDATED PER WORK ORDER 1435539	AT
01/11/17	UPDATED PER WORK ORDER 1494666	AMT

DRAWN BY: AGT
CHECKED BY:
DRAWING DATE: 02/07/2013

SITE NUMBER:
SITE NAME:

SITE NAME

TORRINGTON/RT 8

BUSINESS UNIT NUMBER

828540

SITE ADDRESS

218 WHEELER ROAD
TORRINGTON, CT 06790
LITCHFIELD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING | 1" = 1'-0" | 1

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *828540*
Site Name: *TORRINGTON/RT 8*
App #: *414512 Rev. 0*

Reactions		
Mu	144.45	ft-kips
Axial, Pu:	11.42	kips
Shear, Vu:	9.65	kips
Elevation:	140	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Pirod

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	28		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	39		

Plate Data		
Diam:	42	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.04	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

Bolt Tension Capacity, φ*Tn, **B1**:	54.54	kips	Rigid: φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	5.94	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.017	in	
Min PL "treq" for actual **T w/ Pry**:	0.255	in	
Min PL "t1" for actual **T w/o Pry**:	0.336	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	5.94	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	10.9%	**Pass**	

Exterior Flange Plate Results — Flexural Check

Compression Side Plate Stress:	Rohn/Piroc	OK	Rigid: TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	Rohn/Piroc	OK	Comp. Y.L. Length: 15.00

No Prying

Tension Side Stress Ratio, (treq/t)^2: Rohn/Pirod OK

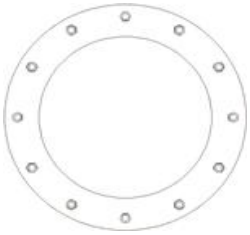
n/a

Stiffener Results — N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *828540*
Site Name: *TORRINGTON/RT 8*
App #: *414512 Rev. 0*

Reactions		
Mu	449.66	ft-kips
Axial, Pu:	21.17	kips
Shear, Vu:	17.69	kips
Elevation:	120	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Pirod

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data

Qty:	32		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	45		

Plate Data

Diam:	48	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.12	in

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn, **B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.53	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	14.33	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.006	in	
Min PL "treq" for actual **T w/ Pry**:	0.391	in	
Min PL "t1" for actual **T w/o Pry**:	0.516	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	14.33	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	26.3%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	Rohn/Piroc	OK	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	Rohn/Piroc	OK	Comp. Y.L. Length:
No Prying			16.16
Tension Side Stress Ratio, (treq/t)^2:	Rohn/Pirod	OK	

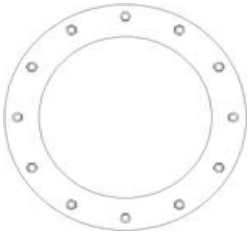
n/a

Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *828540*
Site Name: *TORRINGTON/RT 8*
App #: *414512 Rev. 0*

Reactions		
Mu	831.96	ft-kips
Axial, Pu:	27.09	kips
Shear, Vu:	20.03	kips
Elevation:	100	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Pirod

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	36		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	51		

Plate Data		
Diam:	54	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.19	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	48	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn, **B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.53	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	21.00	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	0.998	in	
Min PL "treq" for actual **T w/ Pry**:	0.469	in	
Min PL "t1" for actual **T w/o Pry**:	0.619	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	21.00	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	38.5%	**Pass**	

Exterior Flange Plate Results

			Rigid
	Flexural Check		TIA G
Compression Side Plate Stress:	Rohn/Piroc	OK	φ*Fy
Allowable Plate Stress:	32.4	ksi	Comp. Y.L. Length:
Compression Plate Stress Ratio:	Rohn/Piroc	OK	17.23

No Prying

Tension Side Stress Ratio, (treq/t)^2: Rohn/Pirod OK

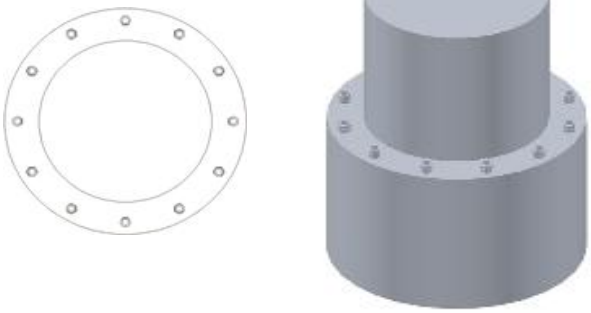
n/a

Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *828540*
Site Name: *TORRINGTON/RT 8*
App #: *414512 Rev. 0*

Reactions		
Mu	1259.11	ft-kips
Axial, Pu:	33.76	kips
Shear, Vu:	22.33	kips
Elevation:	80	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Pirod

If No stiffeners, Criteria:	TIA G	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	48		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	57		

Plate Data		
Diam:	60	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.53	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	54	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn, **B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	21.39	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.087	in	
Min PL "treq" for actual **T w/ Pry**:	0.522	in	
Min PL "t1" for actual **T w/o Pry**:	0.681	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	21.39	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	39.2%	**Pass**	

Exterior Flange Plate Results

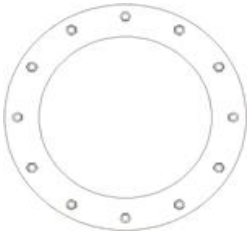
		Rigid
Flexural Check		TIA G
Compression Side Plate Stress:	Rohn/Piroc OK	φ*Fy
Allowable Plate Stress:	32.4 ksi	Comp. Y.L. Length:
Compression Plate Stress Ratio:	Rohn/Piroc OK	18.25

No Prying

Tension Side Stress Ratio, (treq/t)^2: Rohn/Pirod OK

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Project Name:	TORRINGTON/RT 8	JACOBS® Jacobs Engineering Group, Inc.	Created On: 8/13/2014
Project Number:	BU#828540		Checked By:
Job Number:	WO#1484877		Revised On:
Date:	11/6/2017		Revision No.: 0

Moment Distribution at 60 ft

Anchor Bolts?	Yes	
Code:	G	

Total Moment of Inertia	19449.77	in^4

Moment (M)	**Axial (P)**	**Shear (V)**
1726.38	40.8	24.33
kip-ft	kips	kips

Outer Bolts		
Number of Bolts	32	
Bolt Circle	53	in
y	26.5	in
Moment of Inertia (I)	10887.684	in^4
Diameter (d)	1.25	in
Ag	1.23	in^2
Ae	0.969	in^2
Total Moment	966.4	kips-ft
Total Axial	20.40	kips
Total Shear	12.17	kips

Inner Bolts		
Number of Bolts	32	
Bolt Circle	47	in
y	23.5	in
Moment of Inertia (I)	8,562	in^4
Diameter (d)	1.25	
Ag	1.23	in^2
Ae	0.969	in^2
Total Moment	760.0	kips-ft
Total Axial	20.40	kips
Total Shear	12.17	kips

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *828540*
Site Name: *TORRINGTON/RT 8*
App #: *414512 Rev. 0 (Outer)*

Manufacturer:	Pirod

Reactions		
Moment:	966.40	ft-kips
Axial:	20.40	kips
Shear:	12.17	kips
Exterior Flange Run, T+q:	0.00	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
53.15

Elevation: 60 feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	53	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	26.7	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty)	76.3	Kips
Bolt Stress Ratio:	35.0%	**Pass**

Plate Data		
Plate Outer Diam:	59.25	in
Plate Inner Diam:	43	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.82	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	28.0	Kips, Ext. Cu=Interior Cu
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

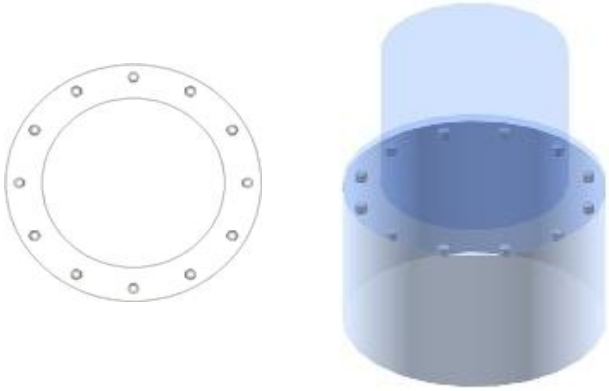
Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.375	in
Pole Inner Diam:	59.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *828540*
Site Name: *TORRINGTON/RT 8*
App #: *414512 Rev. 0 (Inner)*

Manufacturer:	Pirod

Reactions		
Moment:	760.00	ft-kips
Axial:	20.40	kips
Shear:	12.17	kips
Exterior Flange Run, T+q:	0.00	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
53.15

Elevation: 60 feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	47	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	23.6	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty)	76.3	Kips
Bolt Stress Ratio:	31.0%	**Pass**

Plate Data		
Plate Outer Diam:	59.25	in
Plate Inner Diam:	43	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.82	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	24.9	Kips, Ext. Cu=Interior Cu
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

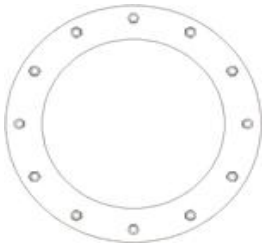
Stiffener Results N/A for Rohn / Pirod

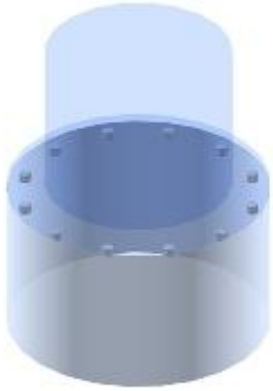
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.375	in
Pole Inner Diam:	59.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Project Name:	TORRINGTON/RT 8	JACOBS® Jacobs Engineering Group, Inc.	Created On: 8/13/2014
Project Number:	BU#828540		Checked By:
Job Number:	WO#1484877		Revised On:
Date:	11/6/2017		Revision No.: 0

Moment Distribution at 40 ft

Anchor Bolts?	Yes	
Code:	G	

Total Moment of Inertia	19449.77	in^4

Moment (M)	**Axial (P)**	**Shear (V)**
2230.37	49.68	26.04
kip-ft	kips	kips

Outer Bolts		
Number of Bolts	32	
Bolt Circle	53	in
y	26.5	in
Moment of Inertia (I)	10887.684	in^4
Diameter (d)	1.25	in
Ag	1.23	in^2
Ae	0.969	in^2
Total Moment	1248.5	kips-ft
Total Axial	24.84	kips
Total Shear	13.02	kips

Inner Bolts		
Number of Bolts	32	
Bolt Circle	47	in
y	23.5	in
Moment of Inertia (I)	8,562	in^4
Diameter (d)	1.25	
Ag	1.23	in^2
Ae	0.969	in^2
Total Moment	981.8	kips-ft
Total Axial	24.84	kips
Total Shear	13.02	kips

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *828540*
Site Name: *TORRINGTON/RT 8*
App #: *414512 Rev. 0 (Outer)*

Manufacturer:	Pirod

Reactions		
Moment:	1248.50	ft-kips
Axial:	24.84	kips
Shear:	13.02	kips
Exterior Flange Run, T+q:	0.00	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
53.15

Elevation: 40 feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	53	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	34.6	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty)	76.3	Kips
Bolt Stress Ratio:	45.3%	**Pass**

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	43	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.79	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	36.1	Kips, Ext. Cu=Interior Cu
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

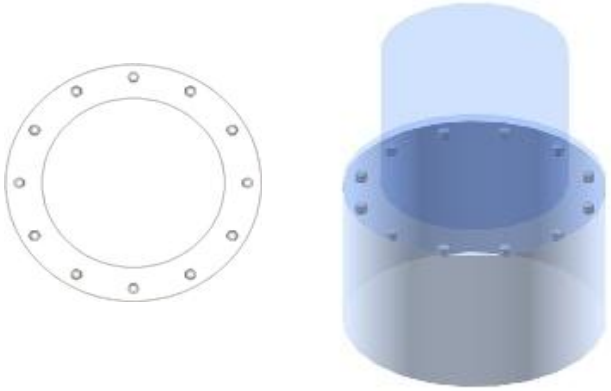
Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *828540*
Site Name: *TORRINGTON/RT 8*
App #: *414512 Rev. 0 (Inner)*

Manufacturer:	Pirod

Reactions		
Moment:	981.80	ft-kips
Axial:	24.84	kips
Shear:	13.02	kips
Exterior Flange Run, T+q:	0.00	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
53.15

Elevation: 40 feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	47	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	30.6	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty)	76.3	Kips
Bolt Stress Ratio:	40.0%	**Pass**

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	43	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.79	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	32.1	Kips, Ext. Cu=Interior Cu
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

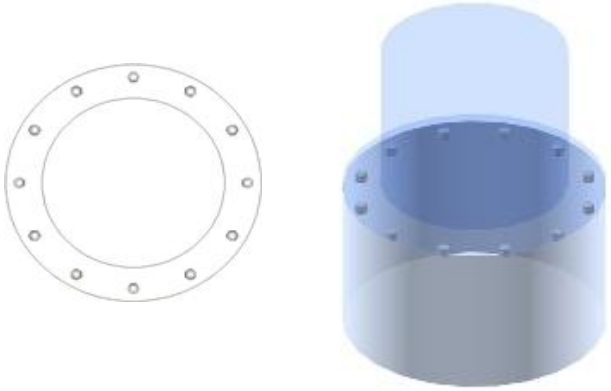
Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Project Name:	TORRINGTON/RT 8	JACOBS® Jacobs Engineering Group, Inc.	Created On: 8/13/2014
Project Number:	BU#828540		Checked By:
Job Number:	WO#1484877		Revised On:
Date:	11/6/2017		Revision No.: 0

Moment Distribution at 20 ft

Anchor Bolts?	Yes	
Code:	G	

Total Moment of Inertia	19449.77	in^4

Moment (M)	**Axial (P)**	**Shear (V)**
2764.63	58.62	27.35
kip-ft	kips	kips

Outer Bolts		
Number of Bolts	32	
Bolt Circle	53	in
y	26.5	in
Moment of Inertia (I)	10887.684	in^4
Diameter (d)	1.25	in
Ag	1.23	in^2
Ae	0.969	in^2
Total Moment	1547.6	kips-ft
Total Axial	29.31	kips
Total Shear	13.68	kips

Inner Bolts		
Number of Bolts	32	
Bolt Circle	47	in
y	23.5	in
Moment of Inertia (I)	8,562	in^4
Diameter (d)	1.25	
Ag	1.23	in^2
Ae	0.969	in^2
Total Moment	1217.0	kips-ft
Total Axial	29.31	kips
Total Shear	13.68	kips

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *828540*
Site Name: *TORRINGTON/RT 8*
App #: *414512 Rev. 0 (Outer)*

Manufacturer:	Pirod

Reactions		
Moment:	1547.60	ft-kips
Axial:	29.31	kips
Shear:	13.68	kips
Exterior Flange Run, T+q:	0.00	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
53.15

Elevation: 20 feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	53	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	42.9	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty)	76.3	Kips
Bolt Stress Ratio:	56.2%	**Pass**

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	43	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.79	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	44.7	Kips, Ext. Cu=Interior Cu
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

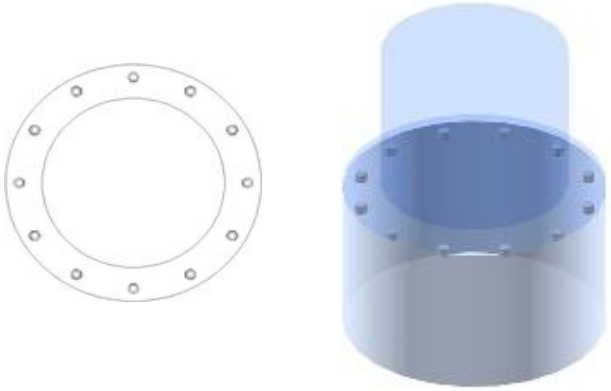
Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *828540*
Site Name: *TORRINGTON/RT 8*
App #: *414512 Rev. 0 (Inner)*

Manufacturer:	Pirod

Reactions		
Moment:	1217.00	ft-kips
Axial:	29.31	kips
Shear:	13.68	kips
Exterior Flange Run, T+q:	0.00	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
53.15

Elevation: 20 feet

Bolt Data			
Qty:	32		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	47	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	37.9	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty)	76.3	Kips
Bolt Stress Ratio:	49.7%	**Pass**

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	43	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.79	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	39.8	Kips, Ext. Cu=Interior Cu
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

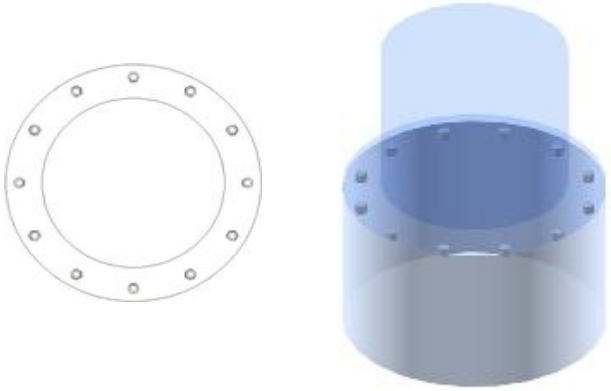
Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#:	*828540*
Site Name:	*TORRINGTON/RT 8*
App #:	*414512 Rev. 0*
Pole Manufacturer:	*Pirod*

Reactions		
Mu:	3324	ft-kips
Axial, Pu:	69	kips
Shear, Vu:	29	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria:	AISC LRFD	<-Only Applcable to Unstiffened Cases

Anchor Rod Data		
Qty:	52	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	67	in

Anchor Rod Results

		Rigid
Max Rod (Cu+ Vu/ń):	48.2 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	116.3 Kips	φ*Tn
Anchor Rod Stress Ratio:	41.5% **Pass**	

Plate Data		
Diam:	70	in
Thick:	1.25	in
Grade:	36	ksi
Single-Rod B-eff:	3.62	in

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	Rohn/Pirod, OK	AISC LRFD
Allowable Plate Stress:	32.4 ksi	φ*Fy
Base Plate Stress Ratio:	Rohn/Pirod, OK	Y.L. Length: 29.82

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

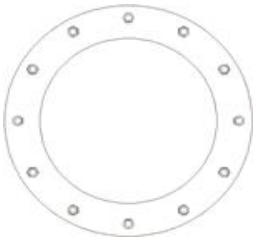
Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Diam:	60	in
Thick:	0.625	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Pier and Pad Foundation

BU # :	828540
Site Name:	TORRINGTON/RT 8
App. Number:	414512 Rev. 0

TIA-222 Revision:	G
Tower Type:	Monopole

Block Foundation?: ☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	69	kips
Base Shear, Vu_comp:	29	kips
Moment, M_u:	3324	ft-kips
Tower Height, **H**:	160	ft
BP Dist. Above Fdn, bp_{dist}:	0	in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	7.0	ft
Ext. Above Grade, **E**:	2.5	ft
Pier Rebar Size, **Sc**:	9	
Pier Rebar Quantity, **mc**:	42	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	8	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	5.0	ft
Pad Width, **W**:	28.0	ft
Pad Thickness, **T**:	3.0	ft
Pad Rebar Size, **Sp**:	7	
Pad Rebar Quantity, **mp**:	45	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	4000	psi
Dry Concrete Density, δc:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	125	pcf
Ultimate Gross Bearing, Qult:	16.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	30	degrees
SPT Blow Count, N_{blows}:	6	
Base Friction, μ:	0.5	
Neglected Depth, **N**:	3.5	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	None	ft

<--Toggle between Gross and Net

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Lateral (Sliding) (kips)	260.35	29.00	**11.1%**	**Pass**
Bearing Pressure (ksf)	12.00	1.63	**13.6%**	**Pass**
*Overturning (kip*ft)*	7606.02	3541.50	**46.6%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	6747.32	3454.50	**51.2%**	**Pass**
Pier Compression (kip)	24494.62	100.17	**0.4%**	**Pass**
*Pad Flexure (kip*ft)*	3763.88	1301.72	**34.6%**	**Pass**
Pad Shear - 1-way (kips)	1010.06	178.46	**17.7%**	**Pass**
Pad Shear - 2-way (ksi)	0.19	0.04	**19.4%**	**Pass**

Soil Rating:	**46.6%**
Structural Rating:	**51.2%**

SHEET INDEX

NO.	DESCRIPTION
T1	TITLE SHEET
C1	GENERAL NOTES
C2	OVERALL & ENLARGED SITE PLAN
C3	ELEVATION VIEW
C4	ANTENNA ORIENTATION PLAN
C5	EQUIPMENT DETAILS
C6	PLUMBING DIAGRAM
C7	GROUNDING DETAILS

DRIVING DIRECTIONS

FROM 550 COCHITUATE RD.:

GET ON I-90 WEST/MASSACHUSETTS TURNPIKE. HEAD NORTHEAST TOWARD LEGGATT MCCALL CONN. TURN LEFT ONTO LEGGATT MCCALL CONN. TURN LEFT ONTO LEGGATT MCCALL CONN. CONTINUE ONTO BURR STREET. TURN LEFT ONTO COCHITUATE ROAD. USE THE RIGHT LANE TO TAKE RAMP TO I-90 EAST/MASSPIKE WEST/SPRINGFIELD/BOSTON. KEEP LEFT AT THE FORK, FOLLOW SIGHNS FO I-90 WEST/MASSACHUSETTS TIURNPIKE/WORCHESTER/SPRINGFIELD AND MERGE ONTO I-90 WEST/MASSACHUSETTS TURNPIKE. FOLLOW I-90 WEST/MASSACHUSETTS TURNPIKE AND I-84 TO STATE HIGHWAY 508 IN FARMINGTON. TAKE EXIT 39 FROM I-84. MERGE ONTO I-90 WEST/MASSACHUSETTS TURNPIKE. USE THE RIGHT 2 LANES TO TAKE EXIT 9 FOR I-84 TOWARD US-20/HARTFORD/NEW YORK CITY. CONTINUE ONTO I-84. KEEP RIGHT TO STAY ON I-84. KEEP LEFT TO STAY ON I-84. USE THE RIGHT 2 LANES TO TAKE EXIT 39 TOWARD FARMINGTON/CT-4. TAKE CT-4 WEST AND CT-118 WEST/LITCHFIELD ROAD TO RICHARD ROAD IN TORRINGTON. CONTINUE ONTO STATE HIGHWAY 508. STATE HIGHWAY 508 TURNS SLIGHTLY RIGHT AND BECOMES CT-4 WEST. CONTINUE STRAIGHT TO STAY ON CT-4 WEST. SLIGHT RIGHT TO STAY ON CT-4 WEST. TURN LEFT ONTO CT-4. CONTINUE ONTO CT-118 WEST/LITCHFIELD ROAD. CT-118 WEST/LITCHFIELD ROAD TURNS SLIGHTLY RIGHT AND BECOMES THOMASTON ROAD. TURN LEFT ONTO CT-118 WEST. TURN RIGHT ONTO WHEELER ROAD. CONTINUE ONTO RICHARD ROAD.

PROJECT

LTE 2C/3C

SITE NAME

TORRINGTON CT WHEELER ROAD

CELL SITE ID

CTL01267

FA SITE NUMBER

10128238

PACE ID

MRCTB024498/MRCTB024413

SITE ADDRESS

2 RICHARD ROAD
TORRINGTON, CT 06790

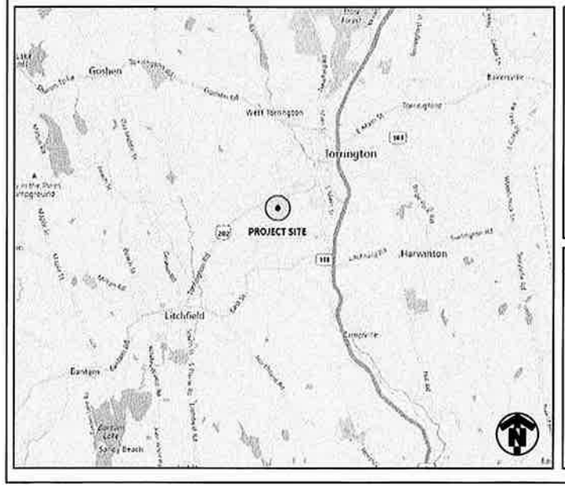
STRUCTURE TYPE

MONOPOLE

PROJECT SUMMARY

SITE NAME:	TORRINGTON CT WHEELER ROAD	
CELL SITE ID:	CTL01267	
FA SITE #:	10128238	
SITE ADDRESS:	2 RICHARD ROAD TORRINGTON, CT 06790	
COUNTY:	LITCHFIELD	
SITE COORDINATES: LATITUDE:	41.7806000° N	(NAD 83)
LONGITUDE:	73.1362000° W	(NAD 83)
ELEVATION:	±1030'	(AMSL)
RAD CENTER	±130'	(AGL)
LANDLORD:	CROWN CASTLE	
APPLICANT:	AT&T MOBILITY 550 COCHITUATE RD. FRAMINGHAM, MA 01701	
CLIENT REPRESENTATIVE:	SMARTLINK, LLC 85 RANGEWAY RD., BUILDING 3, SUITE 102 NORTH BILLERICA, MA 01862	
CONTACT:	EDWARD WEISSMAN (917)528-1857	
ENGINEER:	INFINIGY 1033 WATERVLIET SHAKER ROAD ALBANY, NY 12205	
CONTACT:	ALEX WELLER (518) 690-0790	
BUILDING CODE:	CT BUILDING CODE UNIFORM BUILDING CODE BUILDING OFFICIALS & CODE ADMINISTRATORS UNIFORM MECHANICAL CODE UNIFORM PLUMBING CODE LOCAL BUILDING CODE CITY/COUNTY ORDINANCES	
ELECTRICAL CODE:	NATIONAL ELECTRICAL CODE (LATEST EDITION)	

LOCATION MAP



PROJECT TEAM

smartlink

PROJECT MANAGER

INFINIGY

1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

ENGINEER

SCOPE OF WORK (PER LTE 2C/3C RFDS, DATED 09/12/2017, V1.00):

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- FACILITY HAS NO PLUMBING OR REFRIGERANTS.
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRU AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.

TOWER

- REPLACE (3) EXISTING ANTENNAS WITH (3) PROPOSED ANTENNAS (TYP. OF (1) PER SECTOR, (3) SECTORS TOTAL)
- INSTALL (3) RRUS-32 B2 BEHIND PROPOSED ANTENNA (TYP. OF (1) PER SECTOR, (3) SECTORS TOTAL)

GROUND

- INSTALL NEW FIF RACK WITH (2) B14 4478 RADIOS
- REPLACE DUL WITH 5126 AND ADD XMU WITH EXISTING LTE FIF RACK

811 Know what's below. Call before you dig.

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN CONNECTICUT, CONTACT CALL BEFORE YOU DIG
TOLL FREE: 1-800-922-4455 OR www.cbyd.com
CONNECTICUT STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

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1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

STATE OF CONNECTICUT
JOHN S. STEVENS
LICENSED PROFESSIONAL ENGINEER
OCT. 24, 2017

ANY UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND LOCAL LAWS

No	Submittal / Revision	App'd	Date
1	ISSUED FOR PERMIT	ASW	10/19/17
0	ISSUED FOR REVIEW	BWM	10/06/17

Drawn: BWM Date: 10/06/17
Designed: ASW Date: 10/06/17
Checked: AJD Date: 10/06/17

Project Number: 499-006

Project Title:
TORRINGTON CT WHEELER ROAD
CTL01267
FA# 10128238
2 RICHARD ROAD
TORRINGTON, CT 06790

Prepared For: smartlink

Drawing Scale: AS NOTED
Date: 10/19/17
CD

Drawing Title
TITLE PAGE

Drawing Number
T1

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
- B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
- C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
- D. AND NFPA 101 (LIFE SAFETY CODE).
- E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
- F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:
A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B: COMPANY: AT&T CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.

1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.7 NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE AT&T WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY AT&T TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR AT&T PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
- A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
- B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
- C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
- D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO AT&T OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
- E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
- F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:
- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
- B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
- C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
- D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
- E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
- F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
- G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.

B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.

C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.

E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.

F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.

G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
T	TRANSFORMER
M	KILOWATT HOUR METER
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
	UNDERGROUND UTILITIES
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION
OR	GROUND ROD
OR	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	120AC DUPLEX RECEPTACLE
G	GROUND CONDUCTOR
	DC POWER AND FIBER OPTIC TRUNK CABLES
	DC POWER CABLES
# / #	REPRESENTS DETAIL NUMBER / REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

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STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24908
OCT 19 2017
LICENSED PROFESSIONAL ENGINEER

No.	Submittal / Revision	App'd	Date
1	ISSUED FOR PERMIT	ASW	10/19/17
0	ISSUED FOR REVIEW	BMM	10/06/17

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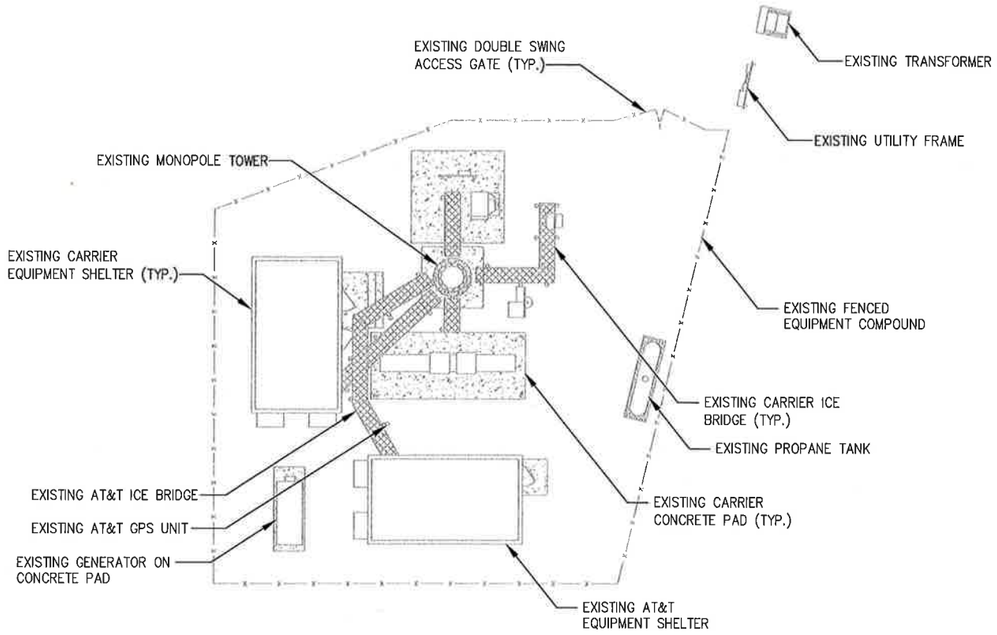
WHEELER ROAD
CTL01267
FA# 10128238
2 RICHARD ROAD
TORRINGTON, CT 06790

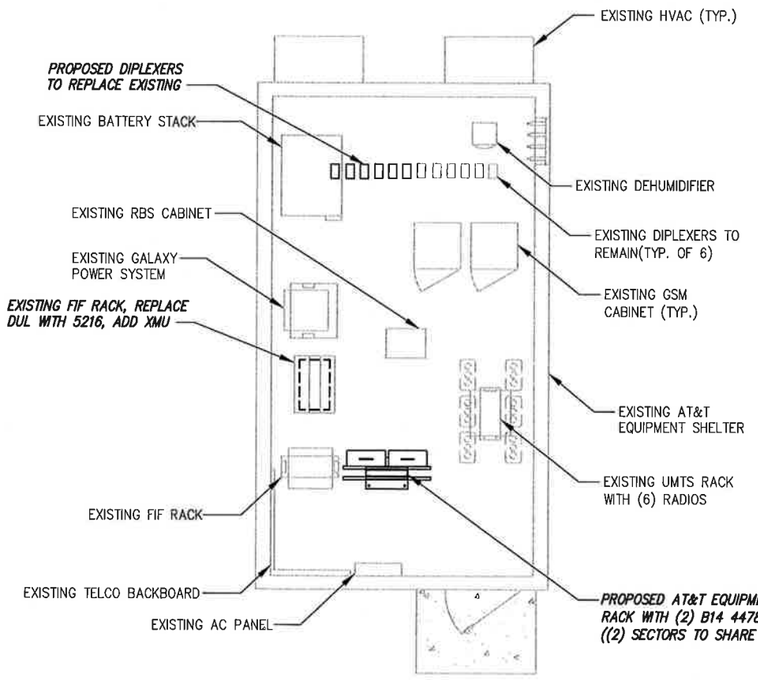
Prepared For: smartlink

Drawing Scale: AS NOTED
Date: 10/19/17
CD

Drawing Title
GENERAL NOTES

Drawing Number
C1





TRUE NORTH

1 SITE PLAN
SCALE: AS NOTED

GRAPHIC SCALE:
20' 10' 0 10' 20'
SCALE (11x17): 1" = 20'-0"
SCALE (22x34): 1" = 10'-0"

TRUE NORTH

2 ENLARGED EQUIPMENT PLAN
SCALE: AS NOTED

GRAPHIC SCALE:
6' 3' 0 3' 6'
SCALE (11x17): 1" = 6'-0"
SCALE (22x34): 1" = 3'-0"

BASEMAPPING PREPARED FROM A SITE WALK PERFORMED BY INFINIGY ENGINEERING ON 08/06/17 AND PROVIDED INFORMATION, AND DOES NOT REPRESENT AN ACTUAL FIELD SURVEY.

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LICENSED PROFESSIONAL ENGINEER
OCT 19 2017

No.	Submittal / Revision	App'd	Date
1	ISSUED FOR PERMIT	ASW	10/19/17
0	ISSUED FOR REVEW	BMM	10/06/17

Drawn: BMM Date: 10/06/17
Designed: ASW Date: 10/06/17
Checked: AJD Date: 10/06/17

Project Number:
499-006

Project Title:
TORRINGTON CT
WHEELER ROAD
CTL01267
FA# 10128238
2 RICHARD ROAD
TORRINGTON, CT 06790

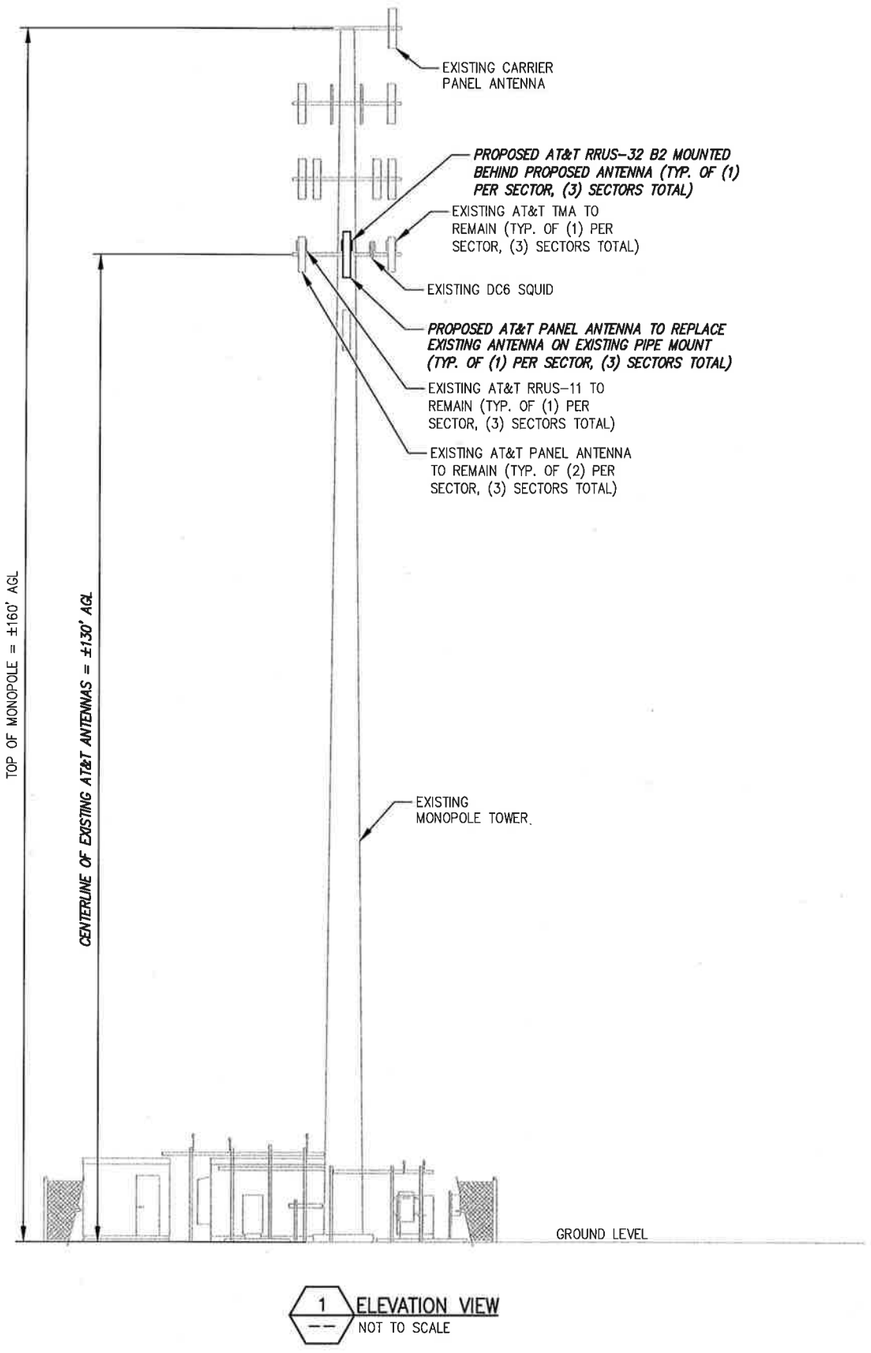
Prepared For:
smartlink

Drawing Scale:
AS NOTED
Date:
10/19/17

CD

Drawing Title
OVERALL & ENLARGED SITE PLAN

Drawing Number
C2



1 ELEVATION VIEW
NOT TO SCALE

NOTE:
INFINIGY ENGINEERING HAS NOT EVALUATED THE TOWER LOADING FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY REGARDING ITS EXISTING OR PROPOSED LOADING. FINAL INSTALLATION TO COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSIS.

FOR ADDITIONAL STRUCTURAL INFORMATION, SEE 'AT&T MOUNT ANALYSIS' COMPLETED BY INFINIGY, DATED 10/6/17.

FINAL ANTENNA CONFIGURATION & CABLE SCHEDULE BASED ON LTE 3C RFDS DATED 09/12/17, V 1.00

SECTOR	ANTENNA POSITION	ANTENNA STATUS & TECHNOLOGY	ANTENNA MANF/MODEL	TMA/ DIPLEXER	RRUS	AZIMUTH	ANTENNA ℄ HEIGHT	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A-1	(E) UMTS 850	POWERWAVE 7770	--	--	30°	±130'	(2) (E) 1-5/8" COAX	±150'	(1) (E) DC6 SQUID
	A-3	*(P) LTE 700/1900*	*CCI HPA-65R-BUU-H6*	--	*(P) RRUS-32 B2*	30°	±130'	SEE ANTENNA A-4 FOR CABLE INFORMANTION	--	
	A-4	(E) LTE 700	KMW AM-X-CD-16-65-00T-RET	--	(E) RRUS-11	30°	±130'	(1) (E) FIBER (2) (E) DC CABLES	±150'	
BETA	B-1	(E) UMTS 850	POWERWAVE 7770	--	--	150°	±130'	(2) (E) 1-5/8" COAX	±150'	
	B-3	*(P) LTE 700/1900*	*CCI HPA-65R-BUU-H6*	--	*(P) RRUS-32 B2*	150°	±130'	SEE ANTENNA A-4 FOR CABLE INFORMANTION	--	
	B-4	(E) LTE 700	KMW AM-X-CD-16-65-00T-RET	--	(E) RRUS-11	150°	±130'	SEE ANTENNA A-4 FOR CABLE INFORMANTION	--	
GAMMA	G-1	(E) UMTS 850	POWERWAVE 7770	--	--	270°	±130'	(2) (E) 1-5/8" COAX	±150'	
	G-3	*(P) LTE 700/1900*	*ANDREW SBNHH-1D65A*	--	*(P) RRUS-32 B2*	270°	±130'	SEE ANTENNA A-4 FOR CABLE INFORMANTION	--	
	G-4	(E) LTE 700	KATHREIN 80010764	--	(E) RRUS-11	270°	±130'	SEE ANTENNA A-4 FOR CABLE INFORMANTION	--	

2 AT&T ANTENNA SCHEDULE
NOT TO SCALE

INFINIGY
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at&t

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
DEC 19 2017
LICENSED PROFESSIONAL ENGINEER

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1	ISSUED FOR PERMIT	ASW	10/19/17
0	ISSUED FOR REVIEW	BMM	10/06/17

Drawn: BMM Date: 10/06/17
Designed: ASW Date: 10/06/17
Checked: AJD Date: 10/26/17

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TORRINGTON CT
WHEELER ROAD
CTL01267
FA# 10128238
2 RICHARD ROAD
TORRINGTON, CT 06790

Prepared For: smartlink

Drawing Scale: AS NOTED
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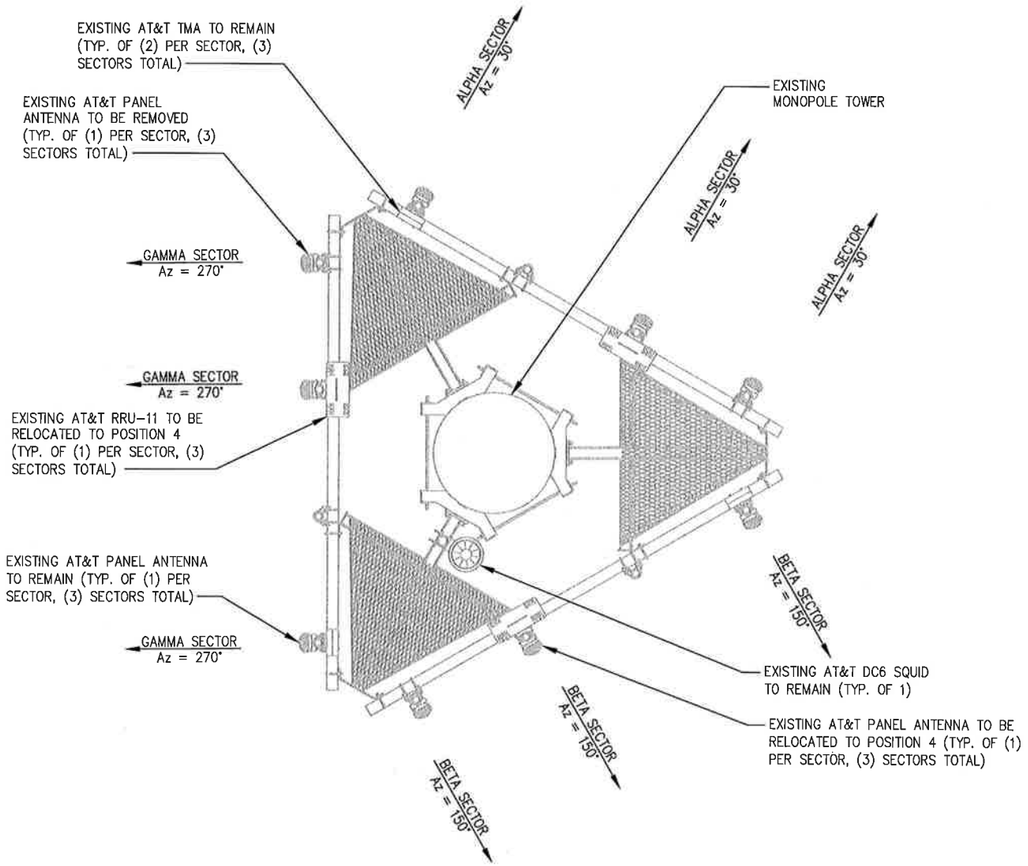
CD

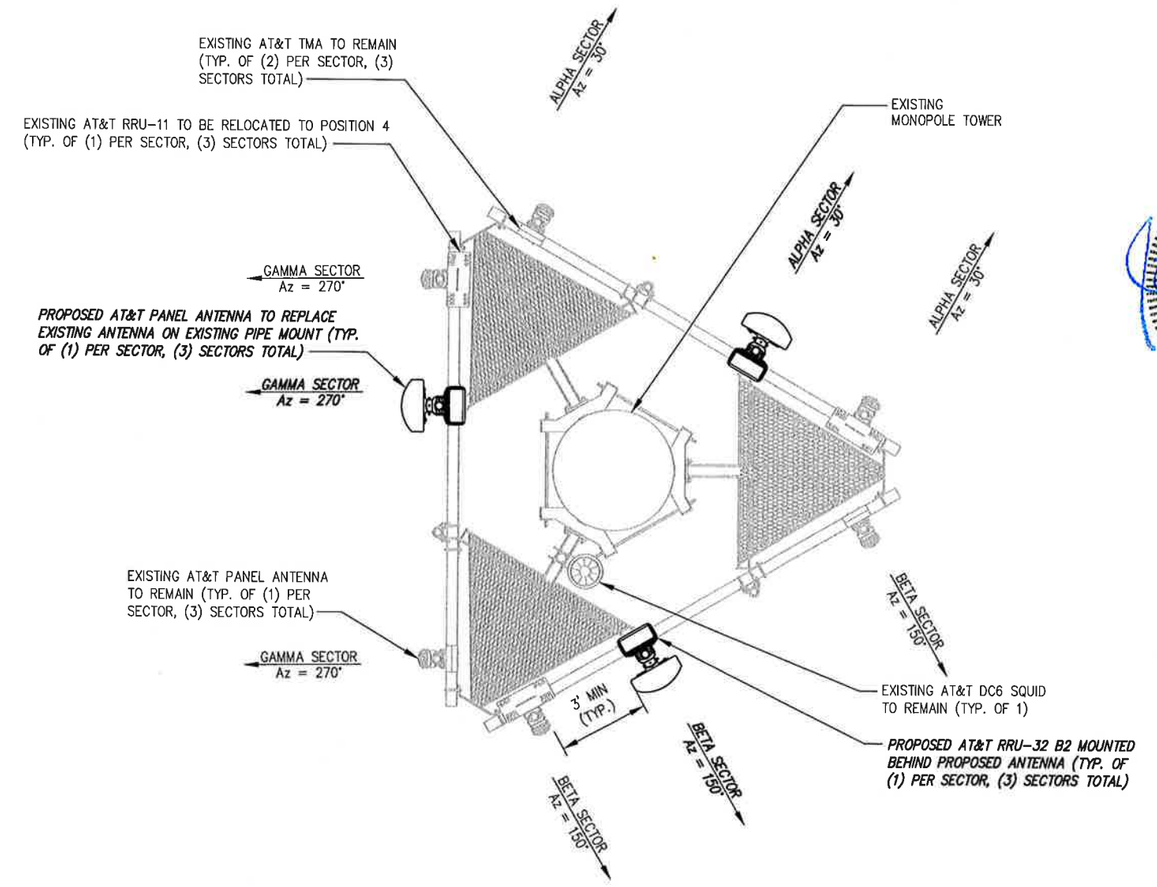
Drawing Title
ELEVATION VIEW

Drawing Number
C3



N
TRUE NORTH

1 EXISTING ANTENNA ORIENTATION PLAN
NOT TO SCALE



N
TRUE NORTH

1 PROPOSED ANTENNA ORIENTATION PLAN
NOT TO SCALE

NOTE:
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FOR ADDITIONAL STRUCTURAL INFORMATION, SEE 'AT&T MOUNT ANALYSIS' COMPLETED BY INFINIGY, DATED 10/6/17.

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STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24037
OCT 19 2017
REGISTERED PROFESSIONAL ENGINEER
LICENSED

UNAUTHORIZED ALTERATION OR ADDITION TO THESE PLANS IS A VIOLATION OF APPLICABLE STATE AND LOCAL LAWS

No.	Submittal / Revision	Appd.	Date
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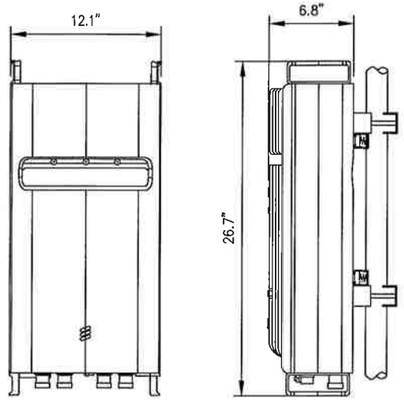
CD

Drawing Title
ANTENNA ORIENTATION PLAN

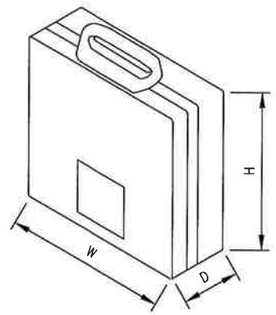
Drawing Number
C4



FRONT SIDE

RRUS-32 SPECIFICATIONS

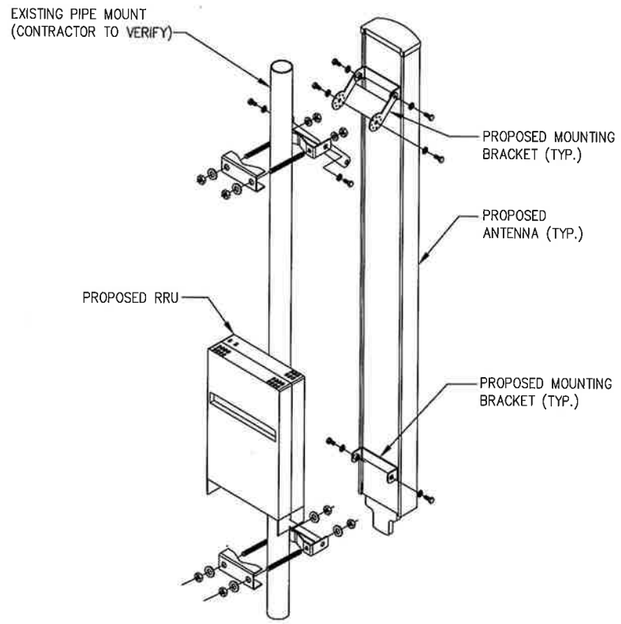
- HXWXD, (INCHES) : 26.7"X12.1"X6.8"
- WEIGHT (LBS) : 50.8
- COLOR : GRAY



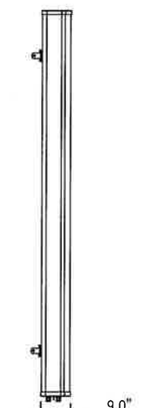
RADIO 4478 SPECIFICATIONS

- HXWXD, (INCHES) : TBD
- WEIGHT (LBS) : 59.5
- COLOR : GRAY

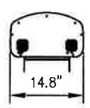
1 ERICSSON RRUS DETAIL
NOT TO SCALE



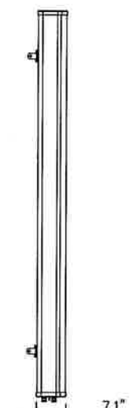
2 MOUNTING DETAIL
NOT TO SCALE



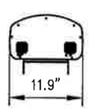
SIDE REAR



TOP



SIDE REAR

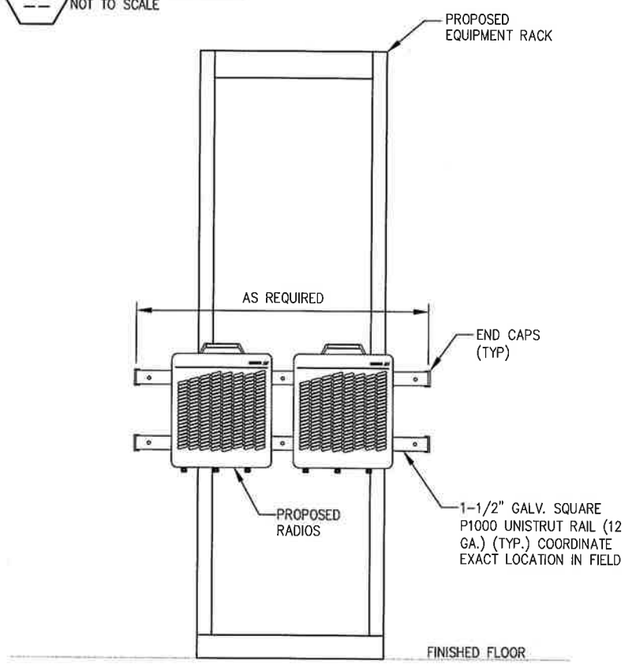


TOP

CCI PRODUCTS MODEL NO.:	HPA-65R-BUU-H6
RADOME MATERIAL:	FIBERGLASS
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	(72.0"x14.8"x9.0")
WEIGHT, W/ PRE-MOUNTED BRACKETS:	51 LBS
CONNECTOR:	7-16 DIN FEMALE

ANDREW MODEL NO.:	SBNHH-1D65A
RADOME MATERIAL:	FIBERGLASS
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	(55.0"x11.9"x7.1")
WEIGHT, W/ PRE-MOUNTED BRACKETS:	33.5 LBS
CONNECTOR:	7-16 DIN FEMALE

3 ANTENNA DETAIL
NOT TO SCALE



4 RRUS MOUNTING DETAIL
NOT TO SCALE

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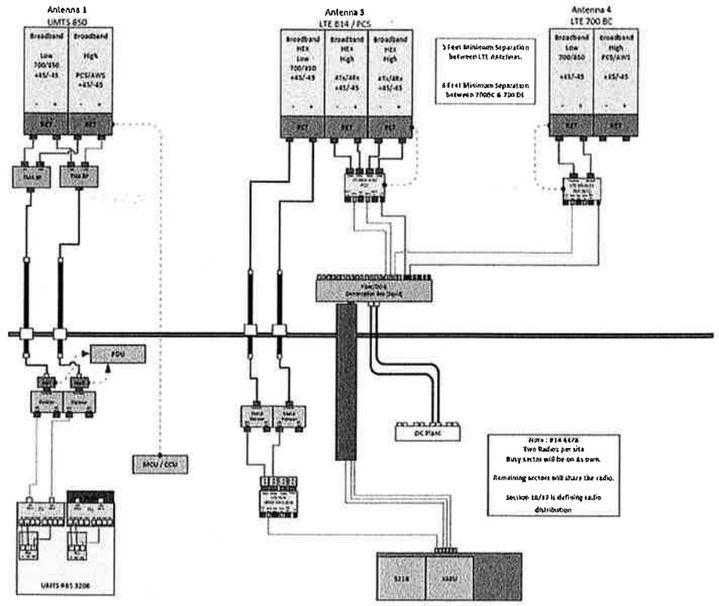
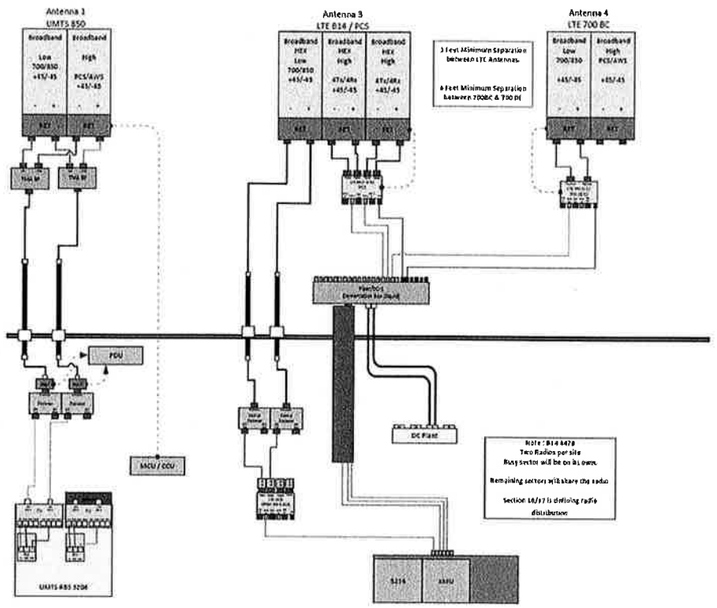
Drawing Title
EQUIPMENT DETAILS

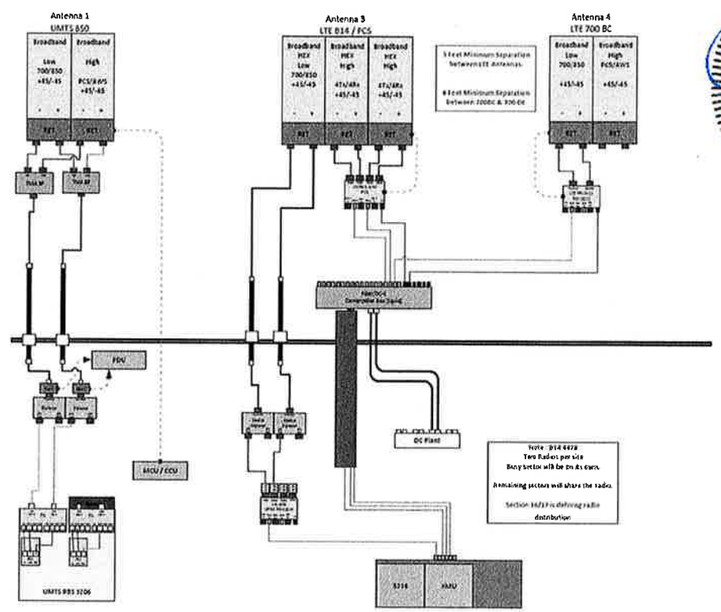
Drawing Number
C5



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR

1 PLUMBING DIAGRAM (FINAL CONFIGURATION)
NOT TO SCALE

*BASED ON LTE 1C RFDS, DATED 09/12/2017, V1.00

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LICENSED PROFESSIONAL ENGINEER
OCT 19 2017

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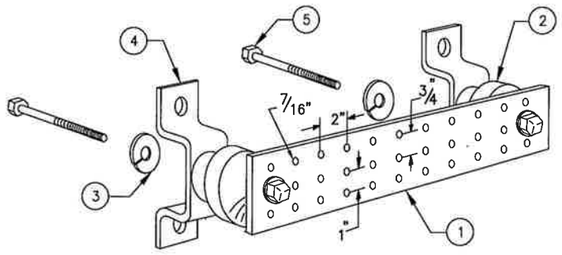
Drawing Title
PLUMBING DIAGRAM

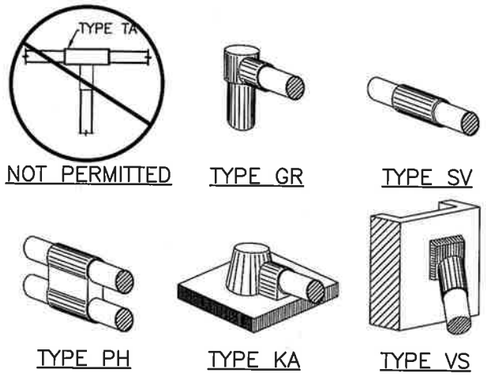
Drawing Number
C6



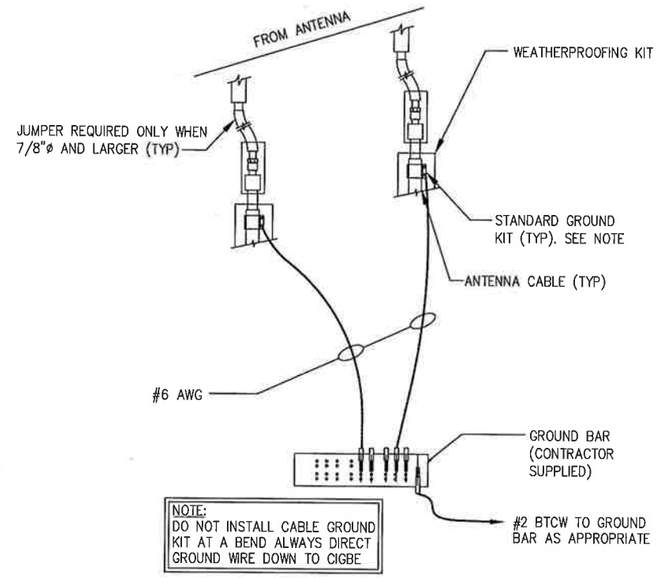
LEGEND

1 – SOLID TINNED COPPER GROUND BAR, 1/4"x 4"x 20" MIN., NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2 – INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061–4
3 – 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015–8
4 – WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A–6056
5 – 5/8–11 X 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012–1
6 – GROUND BAR SHALL BE SIZED TO ACCOMODATE ALL GROUNDING CONNECTIONS REQUIRED PLUS PROVIDE 50% SPARE CAPACITY
7 – GROUND BARS SHALL NEITHER BE FIELD FABRICATED NOR NEW HOLES DRILLED
8 – GROUND LUGS SHALL MATCH THE HOLE SPACING ON THE BAR
9 – HARDWARE DIAMETER SHALL BE MINIMUM 3/8"

1 GROUND BAR
NOT TO SCALE



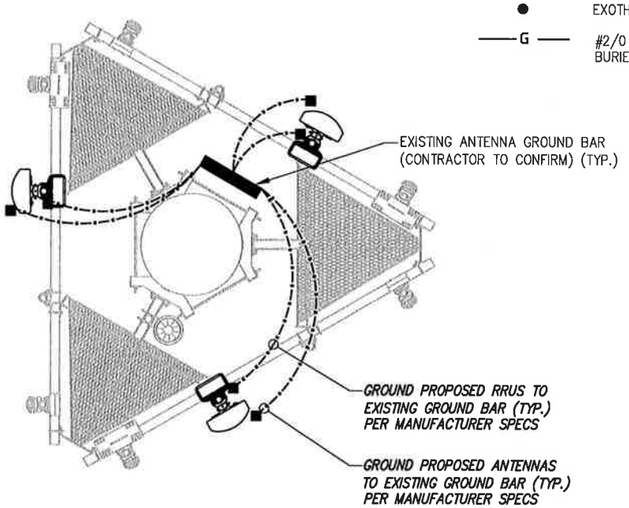
2 CADWELDS (TYPICAL)
NOT TO SCALE



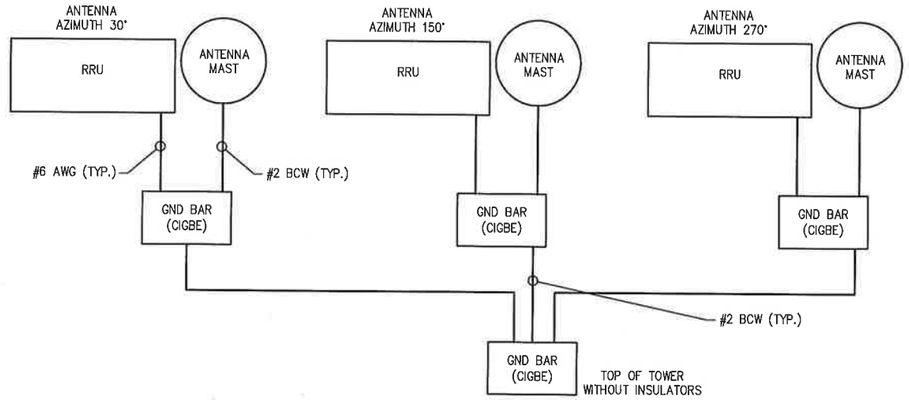
3 CONNECTION OF GROUND WIRES TO GROUNDING BARS @ ANTENNAS
NOT TO SCALE

GROUNDING SYMBOLS

■ COMPRESSION TYPE CONNECTION
● EXOTHERMIC WELD TYPE CONNECTION
—G— #2/0 BTS COPPER CONDUCTOR BURIED GROUND CABLE



4 GROUNDING DETAIL
NOT TO SCALE



5 SCHEMATIC DIAGRAM GROUNDING SYSTEM
NOT TO SCALE

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Drawing Title
GROUNDING DETAILS

Drawing Number
C7