March 13, 2017

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

Re: **Notice of Exempt Modification remote radio swap**
Property Address: **1 Willis St Bristol, CT 06010**
Applicant: **AT&T Mobility, LLC**

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 consisting of nine (9) wireless telecommunication antennas at an antenna center line height of 124-feet on an existing 120 -foot monopole tower, owned by American Tower Corporation located at 1 Willis St, Bristol, Ct 06010. AT&T will keep all of their current equipment with the exception of the following changes. AT&T now intends to remove (3) RRUS-11 w/A2 Module and replace them with (3) RRUS-32. A platform reinforcement kit will be installed on the underside of the platform mount. Inside AT&T's shelter (3) RRUS-11, (1) DUS, (1) Surge Arrestor, (1) XMU, and (1) Equipment rack will be installed.

This facility was unanimously approved by the Connecticut Siting Council at public meeting on December 15, 1993 (refer to petition no. 314) for the proposed construction of a 120- foot replacement telecommunications tower, equipment building, security fence and access road improvements and the removal of two existing 80-foot towers and a portable equipment building, located off Willis Street in Bristol, Connecticut.

The following is a list of subsequent decisions by the Connecticut Siting Council:

Springwich Cellular Ltd. Partnership notice of intent to modify an existing telecommunications facility owned by SNET located off Willis

EM-AT&T-017-160302 – AT&T notice of intent to modify an existing telecommunications facility located at 790 Willis Street, Bristol, Connecticut.

EM-CING-033-017-060728 - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 179 Shunpike Road, Cromwell; and Willis Street, **Bristol**,Connecticut.

EM-CLEARWIRE-017-090923 – Clearwire Corporation notice of intent to modify an existing telecommunications facility located at 760 Beecher Road aka Willis Street, **Bristol**, Connecticut.

EM-AT&T-017-120507 – AT&T Mobility notice of intent to modify an existing telecommunications facility located at 790 Willis Street, **Bristol**, Connecticut.

EM-CING-017-140818 – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 790 Willis Street, **Bristol**, Connecticut

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 Ken Cockayne-Mayor –City of Bristol 36 Allen Street Bristol, CT. A copy of this letter is also being sent to American Tower Corporation-Tower Owner- at 116 Huntington Ave., 11th floor, Boston, MA 02116 and Conn Light + Power 107 Now Eversource Selden St Berlin, CT 06037. A copy of this letter is also being sent to the New Britain Zoning Board at 27 West Main Street, Rm. 4311, New Britain, CT 06051.

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 124-foot level of the 120-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 in Tab 2.
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 in Tab 3).

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,

Michael Pattison

Enclosures
CC w/enclosures:

Ken Cockayne-Mayor –City of Bristol
American Tower Corporation-Tower Owner
Conn Light +Power Co- Land owner Now Eversource
New Britain Zoning Board

City of Bristol, CT

Property Listing Report

Map Block Lot 06-8A

Account 0034800

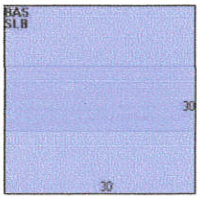
Property Information

Property Location	790 WILLIS ST
Owner	CONN LIGHT + POWER CO
Co-Owner	
Mailing Address	107 SELDEN ST BERLIN CT 06037
Land Use	436 Public Utility
Land Class	I
Zoning Code	R-25
Census Tract	04055

Neighborhood	50
Acreage	6.9
Utilities	
Lot Setting/Desc	Above
Additional Info	

Photo

Sketch



Primary Construction Details

Year Built	1950
Stories	1
Building Style	Warehouse
Building Use	Ind/Comm
Building Condition	
Floors	Concr-Finished
Total Rooms	

Bedrooms	
Full Bathrooms	
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	Gable
Roof Cover	Asphalt Shingl

Exterior Walls	Concr/Cinder
Interior Walls	Minim/Masonry
Heating Type	Hot Air-no Duc
Heating Fuel	Electric
AC Type	Unit/AC
Gross Bldg Area	1800
Total Living Area	900

City of Bristol, CT

Property Listing Report | Map Block Lot 06-8A | Account 0034800

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	25500	17850
Extras	0	0
Improvements	377000	263900
Outbuildings	351500	246050
Land	256400	179480
Total	633400	443380

Outbuilding and Extra Items

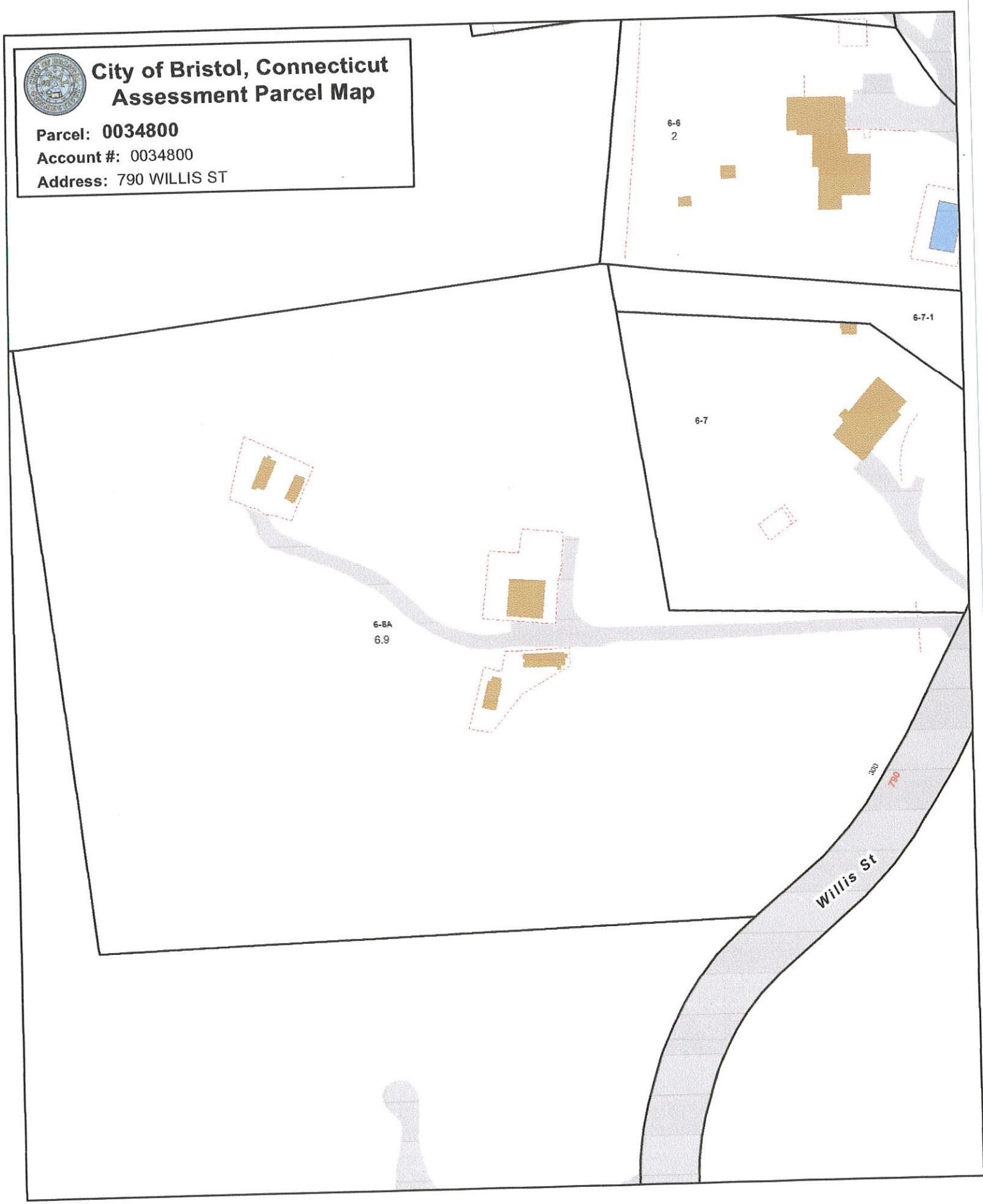
Type	Description
PreCastConcCel	300 S.F.
PreCastConcCel	300 S.F.
Carport	900 S.F.
Garage	420 S.F.
PreCastConcCel	200 S.F.
Cell Tower/Site	2 UNITS

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	900	900
Slab	900	0
Total Area	1800	900

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
CONN LIGHT + POWER CO	277/ 293	1/25/1952	0



Map Produced Feb 2016

City of Bristol GIS - ArcGIS Server Parcel Application

790 WILLIS ST

Location 790 WILLIS ST
Mblu 06/ / 8A/ /
Acct# 0034800
Owner CONN LIGHT + POWER CO

Assessment $443,380
Appraisal $633,400
PID 5681
Building Count 1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$377,000	$256,400	$633,400

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$263,900	$179,480	$443,380

Owner of Record

Owner CONN LIGHT + POWER CO
Co-Owner
Address 107 SELDEN ST
BERLIN, CT 06037

Sale Price $0
Certificate 1
Book & Page 277/ 293
Sale Date 01/25/1952

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
CONN LIGHT + POWER CO	$0	1	277/ 293	01/25/1952

Building Information

Building 1 : Section 1

Year Built: 1950
Living Area: 900
Replacement Cost: $39,240
Building Percent Good: 65
Replacement Cost Less Depreciation: $25,500

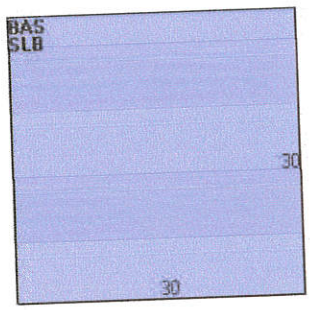
Building Attributes	
Field	**Description**
STYLE	Warehouse

Stories:	1
Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Hot Air-no Duc
AC Type	Unit/AC
Bldg Use	Public Utility
Bedrooms	
Full Baths	
Half Baths	
1st Floor Use:	
Heat/AC	Heat/AC Pkgs
Frame Type	Masonry
Baths/Plumbing	Light
Ceiling/Wall	None
Rooms/Prtns	Light
Wall Height	8
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos/BristolCTPhotos//\00\02\16/96

Building Layout



Building Sub-Areas			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	900	900
SLB	Slab	900	0
		1800	900

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 436

Land Line Valuation

Size (Acres) 6.9

Neighborhood 50
Alt Land Appr No
Category

Assessed Value $179,480
Appraised Value $256,400

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
CELL	Cell Tower/Site			2 UNITS	$200,000	1
CB3	PreCastConcCel			300 S.F.	$52,500	1
CB3	PreCastConcCel			300 S.F.	$52,500	1
FCP	Carport			900 S.F.	$5,400	1
GAR1	Garage	FR	Frame	420 S.F.	$6,100	1
CB3	PreCastConcCel			200 S.F.	$35,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$377,000	$256,400	$633,400
2014	$377,000	$256,400	$633,400
2013	$377,000	$256,400	$633,400

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$263,900	$179,480	$443,380
2014	$263,900	$179,480	$443,380
2013	$263,900	$179,480	$443,380

SITESAFE
RF COMPLIANCE EXPERTS
A BUSINESS OF FDH VELOCITEL

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

Smartlink LLC on behalf of AT&T Mobility, LLC
Site FA – 10035029
Site ID – CT1055 (4C)
USID – 59357
Site Name – Bristol
Site Compliance Report

1 Willis Street
Bristol, CT 06010

Latitude: N41-38-56.65
Longitude: W72-56-52.87
Structure Type: Monopole

Report generated date: February 28, 2017
Report by: Kevin Bernstetter II, EI
Customer Contact: Romina Kirchmaier

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

SITESAFE

Table of Contents

SITESAFE

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Unknown
RF Sign(s) @ access point(s)	Unknown
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated RFE level on the Ground	<1% General Public Limit at Ground Level
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_CT1055_2017-LTE-Next-Carrier_LTE_mm093q_PTN_10035029_59357_07-21-2016_Preliminary-Approved_v1.00

CD's: 10035029_AE201_170217_CTL01055_REV1

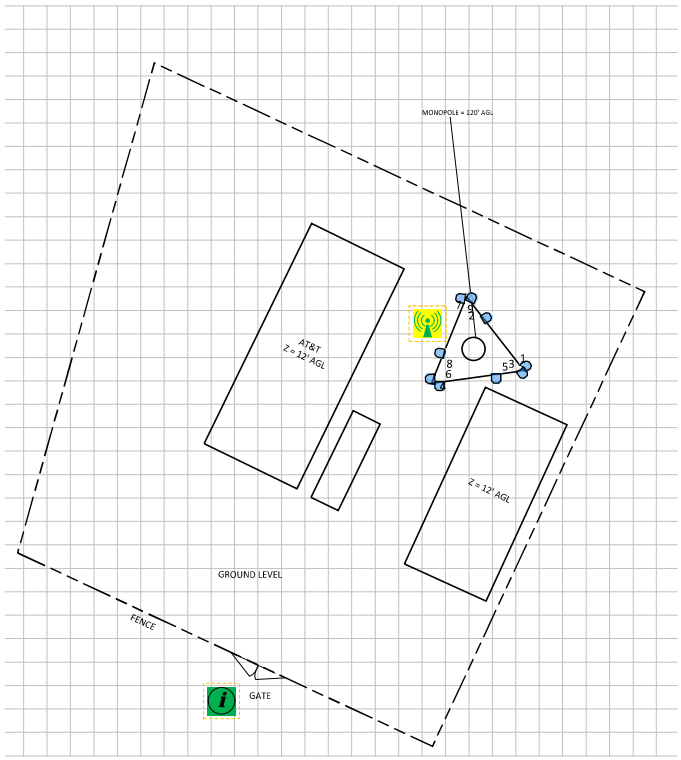
SITESAFE

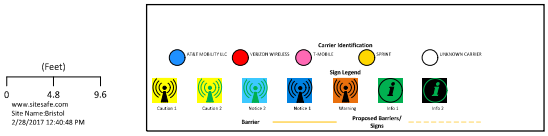
2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- Elevation View

Site Scale Map For: Bristol





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
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	143	82	4.6	11.51	0	2	0	601.2	65.7'	55.7'	121.7'
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	143	86	4.6	13.41	0	2	0	925.5	65.7'	55.7'	121.7'
2	AT&T MOBILITY LLC	CCI Antennas TPA-65R-LCUUUU-H8	Panel	2300	60	65	8	14.36	0	0	1	1145.5	61.9'	61.2'	120'
2	AT&T MOBILITY LLC	CCI Antennas TPA-65R-LCUUUU-H8	Panel	1900	60	68.2	8	13.86	0	0	1	3664.4	61.9'	61.2'	120'
2	AT&T MOBILITY LLC (Proposed)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	850	60	63	8	13.56	0	0	1	539.5	61.9'	61.2'	120'
3	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	737	60	71	8	13.733	0	0	1	1475.7	66.1'	56.5'	120'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	263	86	4.6	13.41	0	2	0	925.5	55.9'	55.1'	121.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	263	82	4.6	11.51	0	2	0	601.2	55.9'	55.1'	121.7'
5	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	1900	180	68	6	14.16	0	0	1	3303.7	62.9'	55.2'	121'
5	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	2300	180	64	6	14.56	0	0	1	975	62.9'	55.2'	121'
5	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	850	180	63	6	10.96	0	0	1	539.5	62.9'	55.2'	121'
6	AT&T MOBILITY LLC	Kmw AM-X-CD-16-65-00T	Panel	737	180	65	6	13.36	0	0	1	1119.4	56.9'	54.4'	121'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	23	86	4.6	13.41	0	2	0	925.5	60.3'	63.8'	121.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	23	82	4.6	11.51	0	2	0	601.2	60.3'	63.8'	121.7'
8	AT&T MOBILITY LLC (Proposed)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	850	280	63	8	13.56	0	0	1	539.5	56.9'	57.9'	120'
8	AT&T MOBILITY LLC	CCI Antennas TPA-65R-LCUUUU-H8	Panel	1900	280	68.2	8	13.86	0	0	1	3664.4	56.9'	57.9'	120'
8	AT&T MOBILITY LLC	CCI Antennas TPA-65R-LCUUUU-H8	Panel	2300	280	65	8	14.36	0	0	1	1145.5	56.9'	57.9'	120'
9	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	737	280	71	8	13.733	0	0	1	1475.7	59.1'	63.7'	120'

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 the main site level unless otherwise indicated. 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.

Note: The 850 MHz LTE technology is being added to an existing antenna.

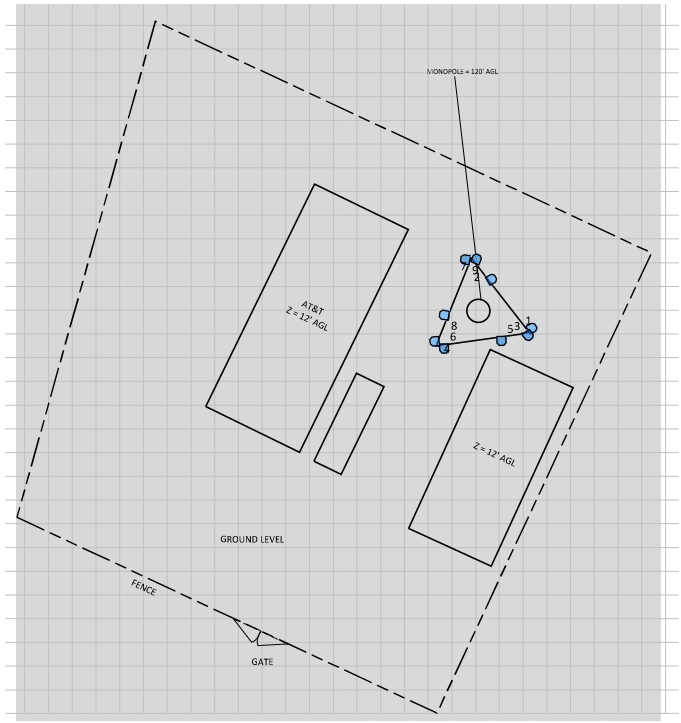
Note: Other operators exist on site but were not considered for this modeling as Sitesafe did not have information on them.

4 Emission Predictions

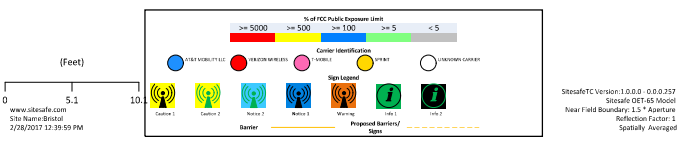
In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main 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: Bristol

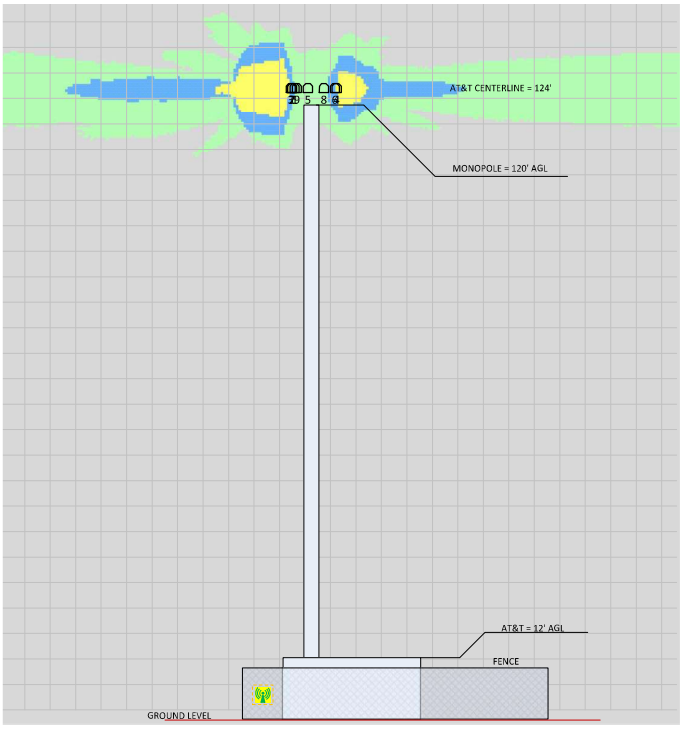


% of FCC Public Exposure Limit
Spatial average 0' - 6'

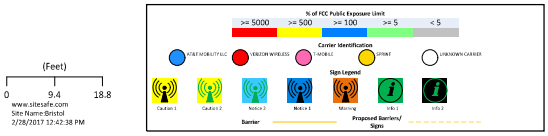


SitesafeTC Version:1.0.0.0 - 0.0.0.257
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Bristol
Elevation View



% of FCC Public Exposure Limit



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:

Site Access Location
Yellow caution 2 sign required.

Gate Location
Information 1 sign required.

Notes:

- Signage may already exist on site. Sitesafe is recommending as a worst case scenario.

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 Kevin Bernstetter II, EI.

February 28, 2017

Donna Guevarra

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 Communication 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.

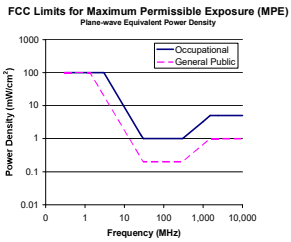
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* 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?sitearea=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

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**120 ft Monopole**
ATC Site Name	:	**Brst - Bristol, CT**
ATC Site Number	:	**302500**
Engineering Number	:	**OAA686853_C3_02**
Proposed Carrier	:	**AT&T Mobility**
Carrier Site Name	:	**Bristol**
Carrier Site Number	:	**CTL01055 / 10035029**
Site Location	:	**790 Willis Street** **Bristol, CT 06010-7269** **41.649083,-72.948000**
County	:	**Hartford**
Date	:	**December 27, 2016**
Max Usage	:	**85%**
Result	:	**Pass**

Prepared By:
Christopher Clark Poe, E.I.
Structural Engineer II

Reviewed By:

STATE OF CONNECTICUT
WILLIAM GARFIELD
No. 23235
LICENSED
PROFESSIONAL ENGINEER

Dec 27 2016 4:46 PM

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COA: PEC.0001553

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A.T. Engineering Service, PLLC - 3500 Regency Parkway, Suite 100 - Cary, NC 27518 - 919-468-0112 Office - 919-466-5414 Fax - www.americantower.com

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 120 ft monopole to reflect the change in loading by AT&T Mobility.

Supporting Documents

Tower Drawings	Valmont Drawing #DC1671Z, dated December 29, 1995
Foundation Drawing	FDH Project #01-0612, dated June 23, 2001
Geotechnical Report	Johnson Soils Job #15220-B, dated May 21, 2002
Modifications	Spectrasite Site #CT-0036, dated June 12, 2002 ATC Project #64490338, dated May 5, 2016

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	93 mph (3-Second Gust, V_{ASD}) / 120 mph (3-Second Gust, V_{ULT})
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 1" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	3
Crest Height:	198 ft
Spectral Response:	S_s = 0.19, S_1 = 0.06
Site Class:	D - Stiff Soil

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

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Existing and Reserved Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
124.0	124.0	2	Raycap DC6-48-60-18-8F	Platform w/ Handrails	(6) 1 1/4" Coax (4) 0.78" 8 AWG 6 (2) 0.39" Fiber Trunk (1) 3" Conduit (1) 7/8" Coax	AT&T Mobility
		3	Ericsson RRUS A2			
		3	Ericsson RRUS-11 1900MHz			
		3	Ericsson RRUS 32 (50.8 lbs)			
		1	2' Std. Dish			
		3	Powerwave 7770.00			
		1	KMW AM-X-CD-16-65-00T-RET			
		1	Quintel QS66512-3 (112 lbs.)			
		2	Andrew SBNH-1D6565C (60.8 lbs)			
		2	CCI TPA-65R-LCUUUU-H8			
101.0	101.0	3	RFS APXV18-206517S-C	Flush	(6) 1 5/8" Coax	Metro PCS
93.0	93.0	3	Argus LLPX310R	Side Arms	-	Clearwire
91.0	91.0	4	Horizon Compact		(4) 1/2" Coax	
		3	NextNet BTS-2500			
		1	DragonWave A-ANT-18G-2-C			
		3	DragonWave A-ANT-11G-2.5-C			
90.0	-	-	-		(6) 5/16" Coax (2) 2" Conduit	

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
124.0	124.0	3	Ericsson RRUS-11 1900MHz	-	-	AT&T Mobility
		3	CCI DTMABP7819VG12A			

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
124.0	124.0	6	CCI TPX-070821	Platform w/ Handrails	-	AT&T Mobility
		6	Powerwave LGP21401			
		3	Ericsson RRUS 32 B2			

[1]Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

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Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	47%	Pass
Shaft	72%	Pass
Base Plate	35%	Pass
Reinforcement	85%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	1,824.9	77%
Axial (Kips)	54.5	13%
Shear (Kips)	24.2	14%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
120.0	CCI TPX-070821	AT&T Mobility	1.905	1.769
	Powerwave LGP21401			
	Ericsson RRUS 32 B2			
	2' Std. Dish			
91.0	DragonWave A-ANT-18G-2-C	Clearwire	1.120	1.319
	DragonWave A-ANT-11G-2.5-C			

*Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G

Standard Conditions

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

-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

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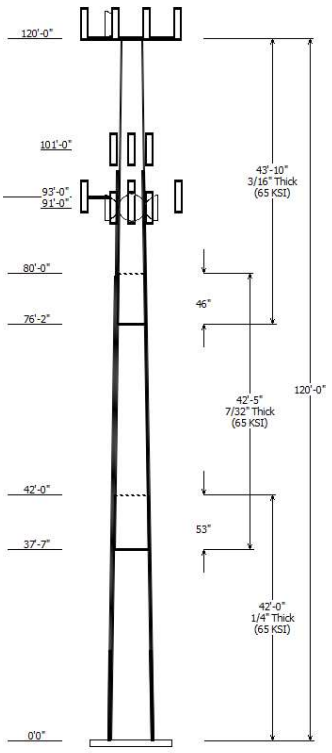


Job Information

Pole :	302500	Code:	ANSI/TIA-222-G
Description :	120' Valmont Monopole		
Client :	AT&T Mobility	Struct Class :	II
Location :	Brst - Bristol, CT		
Shape :	12 Sides	Exposure :	B
Height :	120.00 (ft)	Topo :	3
Base Elev (ft):	0.00		
Taper:	0.145033(in/ft)		

Sections Properties

Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
1	42.000	24.90	31.00	0.250		0.000	0.145000	65
2	42.417	19.83	25.98	0.219	Slip Joint	53.000	0.145000	65
3	43.833	14.41	20.76	0.188	Slip Joint	46.000	0.145000	65

Discrete Appurtenance

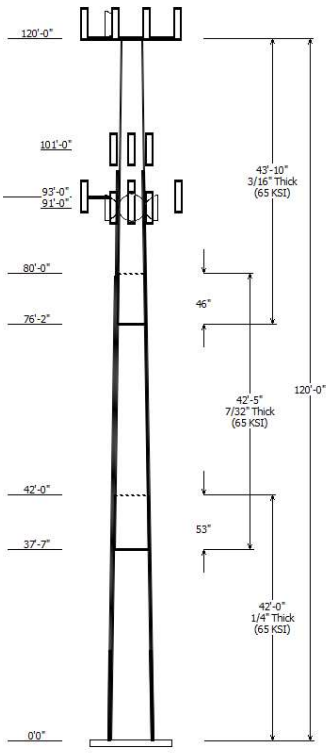
Attach Elev (ft)	Force Elev (ft)	Qty	Description
120.000	124.000	3	Ericsson RRUS 32 B2
120.000	124.000	6	Powerwave LGP21401
120.000	124.000	6	CCI TPX-070821
120.000	124.000	3	Powerwave Allgon 7770.00
120.000	124.000	2	CCI TPA-65R-LCUUUU-H8
120.000	124.000	2	Andrew SBNH-1D6565C (60.8
120.000	124.000	1	Quintel QS66512-3 (112 lbs.)
120.000	124.000	1	KMW AM-X-CD-16-65-00T-RET
120.000	124.000	3	Ericsson RRUS 32 (50.8 lbs)
120.000	124.000	3	Ericsson RRUS A2
120.000	124.000	1	2' Std. Dish
120.000	124.000	2	Raycap DC6-48-60-18-8F
120.000	124.000	3	Ericsson RRUS-11 1900 MHz
120.000	120.000	1	Flat Platform w/ Handrails
101.000	101.000	3	RFS APXV18-206517S-C
93.000	93.000	1	Side Arms
93.000	93.000	3	Argus LLPX310R
91.000	91.000	3	DragonWave A-ANT-11G-2.5-C
91.000	91.000	1	DragonWave A-ANT-18G-2-C
91.000	91.000	3	NextNet BTS-2500
91.000	91.000	4	Horizon Compact

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
92.000	102.0	#20	Yes
22.500	92.000	#20	Yes
7.000	101.0	1 5/8" Coax	Yes
7.000	90.000	2" Conduit	Yes
7.000	90.000	5/16" Coax	Yes
7.000	91.000	1/2" Coax	Yes
7.000	120.0	0.39" Fiber Trunk	No
7.000	120.0	0.78" 8 AWG 6	No
7.000	120.0	1 1/4" Coax	No
7.000	120.0	3" Conduit	No
7.000	120.0	7/8" Coax	No
0.000	22.500	#20	Yes

Load Cases

1.2D + 1.6W	93 mph with No Ice
0.9D + 1.6W	93 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

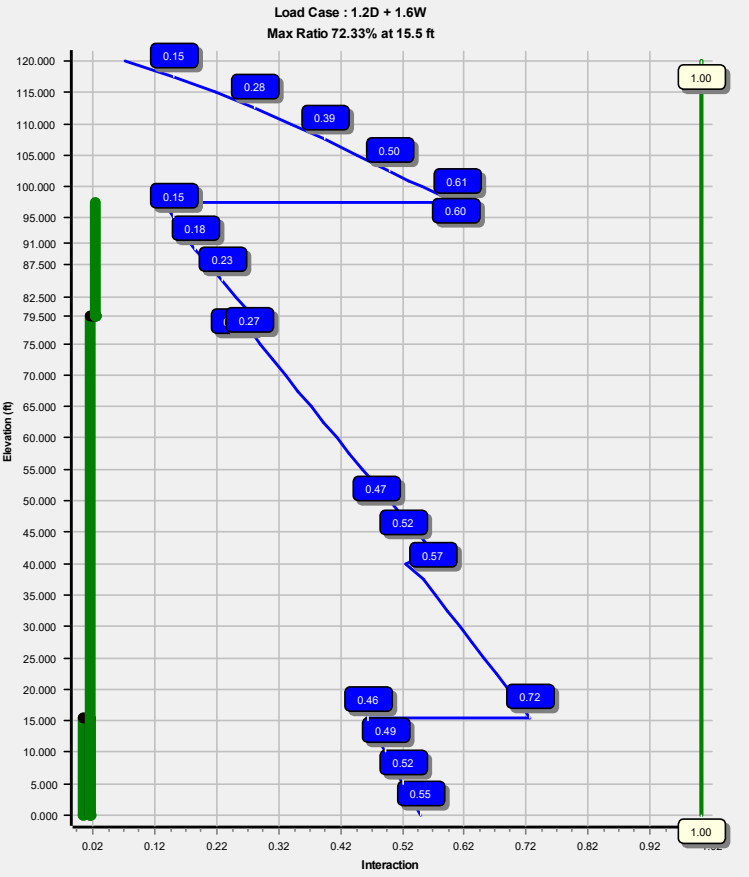


Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	1824.93	24.19	25.92
0.9D + 1.6W	1806.86	24.18	19.43
1.2D + 1.0Di + 1.0Wi	527.98	6.49	54.54
(1.2 + 0.2Sds) * DL + E ELFM	93.60	0.95	26.13
(1.2 + 0.2Sds) * DL + E EMAM	160.25	1.56	26.13
(0.9 - 0.2Sds) * DL + E ELFM	92.38	0.95	18.14
(0.9 - 0.2Sds) * DL + E EMAM	157.98	1.56	18.14
1.0D + 1.0W	482.85	6.49	21.62

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	91.00	13.436	1.319
1.0D + 1.0W	91.00	13.436	1.319
1.0D + 1.0W	120.00	22.858	1.769



Analysis Parameters

Location:	Hartford County, CT		
Code:	ANSI/TIA-222-G	Height (ft):	120
Shape:	12 Sides	Base Diameter (in):	31.00
Pole Type:	Taper	Top Diameter (in):	14.41
Pole Manfacturer:	Valmont	Taper (in/ft) :	0.145

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	93 mph
Exposure Category:	B	Design Wind Speed With Ice:	50 mph
Topographic Category:	3	Operational Wind Speed:	60 mph
Crest Height:	197.5 ft	Design Ice Thickness:	1.00 in

Seismic Parameters

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods				
Site Class:	D - Stiff Soil				
Period Based on Rayleigh Method (sec):	2.02				
T_L (sec):	6	p:	1.3	C_s:	0.034
S_s:	0.185	S_1:	0.064	C_s Max:	0.034
F_a:	1.600	F_v:	2.400	C_s Min:	0.030
S_{ds}:	0.197	S_{d1}:	0.102		

Load Cases

1.2D + 1.6W	93 mph with No Ice
0.9D + 1.6W	93 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice
(1.2 + 0.2Sds) * DL + E ELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E ELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2Sds) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-12	42.000	0.2500	65		0.00	3,187	31.00	0.00	24.75	2987.6	30.55	124.00	24.90	42.00	19.85	1540.6	24.02	99.63	0.145033
2-12	42.417	0.2190	65	Slip	53.00	2,310	25.98	37.58	18.17	1540.1	29.12	118.66	19.83	80.00	13.83	679.4	21.59	90.57	0.145033
3-12	43.833	0.1880	65	Slip	46.00	1,571	20.76	76.17	12.46	673.4	26.92	110.46	14.41	120.00	8.61	222.3	17.86	76.65	0.145033
				Shaft Weight		7,068													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor	Distance From Face (ft)	Vert Ecc (ft)
120.00	2' Std. Dish	1	14.00	5.230	1.00	93.43	7.450	1.00	0.000	4.000
120.00	Andrew SBNH-1D6565C (60.8	2	60.80	11.450	0.70	467.99	13.849	0.70	0.000	4.000
120.00	CCI TPA-65R-LCUUUU-H8	2	82.10	13.300	0.69	559.63	15.717	0.69	0.000	4.000
120.00	CCI TPX-070821	6	7.50	0.550	0.50	47.28	1.096	0.50	0.000	4.000
120.00	Ericsson RRUS 32 (50.8 lbs)	3	50.80	2.690	0.50	186.18	3.763	0.50	0.000	4.000
120.00	Ericsson RRUS 32 B2	3	53.00	2.740	0.50	192.38	3.823	0.50	0.000	4.000
120.00	Ericsson RRUS A2	3	15.00	1.600	0.50	67.04	2.798	0.50	0.000	4.000
120.00	Ericsson RRUS-11 1900 MHz	3	44.00	2.520	0.50	171.68	3.494	0.50	0.000	4.000
120.00	Flat Platform w/ Handrails	1	2000.00	42.400	1.00	4,037.26	72.464	1.00	0.000	0.000
120.00	KMW AM-X-CD-16-65-00T-	1	48.50	8.020	0.67	342.51	9.925	0.67	0.000	4.000
120.00	Powerwave Allgon 7770.00	3	35.00	5.510	0.65	247.71	7.067	0.65	0.000	4.000
120.00	Powerwave LGP21401	6	14.10	1.100	0.50	70.67	1.798	0.50	0.000	4.000
120.00	Quintel QS66512-3 (112 lbs.)	1	112.00	8.130	0.74	461.97	10.041	0.74	0.000	4.000
120.00	Raycap DC6-48-60-18-8F	2	20.00	1.110	1.00	147.78	2.829	1.00	0.000	4.000
101.00	RFS APXV18-206517S-C	3	26.40	5.170	0.68	216.96	6.984	0.68	0.000	0.000
93.00	Argus LLPX310R	3	28.60	4.290	0.63	199.40	5.618	0.63	0.000	0.000
93.00	Side Arms	1	560.00	8.500	1.00	1,231.93	18.699	1.00	0.000	0.000
91.00	DragonWave A-ANT-11G-2.5-	3	47.60	8.670	1.00	230.62	11.149	1.00	0.000	0.000
91.00	DragonWave A-ANT-18G-2-C	1	27.10	4.690	1.00	167.18	6.519	1.00	0.000	0.000
91.00	Horizon Compact	4	10.60	0.430	0.50	61.72	0.826	0.50	0.000	0.000
91.00	NextNet BTS-2500	3	35.00	1.820	0.50	128.67	2.685	0.50	0.000	0.000
	Totals	55	4265.60			14,561.50			Number of Loadings :	21

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Flat	Projected Width (in)	Exposed To Wind	Carrier
7.00	120.00	2	0.39" Fiber Trunk	0.39	0.07	N	0.00	N	AT&T Mobility
7.00	120.00	4	0.78" 8 AWG 6	0.78	0.59	N	0.00	N	AT&T Mobility
7.00	120.00	6	1 1/4" Coax	1.55	0.63	N	0.00	N	AT&T Mobility
7.00	120.00	1	3" Conduit	3.50	7.58	N	0.00	N	AT&T Mobility
7.00	120.00	1	7/8" Coax	1.09	0.33	N	0.00	N	AT&T Mobility
92.00	102.00	4	#20 Reinforcement	2.50	0.00	N	8.00	Y	--
7.00	101.00	6	1 5/8" Coax	1.98	0.82	N	0.00	Y	Metro PCS
22.50	92.00	4	#20 Reinforcement	2.50	0.00	N	8.00	Y	--
7.00	91.00	4	1/2" Coax	0.63	0.15	N	0.00	Y	Clearwire
7.00	90.00	2	2" Conduit	2.38	3.65	N	0.00	Y	Clearwire
7.00	90.00	6	5/16" Coax	0.31	0.05	N	0.00	Y	Clearwire
0.00	22.50	8	#20 Reinforcement	2.50	0.00	N	8.00	Y	--

Additional Steel

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Offset (in)	Intermediate Connections Description	Spacing (in)	Len (in)	Connectors	Continuation?
0.00	15.48	4	SOL #20 All Thread	80	2.19	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	No
0.00	79.50	4	SOL #20 All Thread	80	2.19	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	Yes
79.50	97.44	4	SOL #20 All Thread	80	2.19	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	Yes

Segment Properties (Max Len : 2. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in²)	Ix (in⁴)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in³)	Z (in³)	Weight (lb)	Additional Reinforcing Area (in²)	Additional Reinforcing Ix (in⁴)	Additional Reinforcing Weight (lb)
0.00		0.2500	31.000	24.754	2,987.6	30.55	124.00	71.4	186.2	0.0	0.0	39.28	7,139	0.0
2.50		0.2500	30.637	24.462	2,883.1	30.16	122.55	71.8	181.8	0.0	209.3	39.28	7,001	334.0
5.00		0.2500	30.275	24.170	2,781.1	29.77	121.10	72.2	177.5	0.0	206.9	39.28	6,865	334.0
7.50		0.2500	29.912	23.878	2,681.6	29.38	119.65	72.7	173.2	0.0	204.4	39.28	6,731	334.0
10.00		0.2500	29.550	23.586	2,584.5	28.99	118.20	73.1	169.0	0.0	201.9	39.28	6,597	334.0
12.50		0.2500	29.187	23.294	2,489.7	28.60	116.75	73.5	164.8	0.0	199.4	39.28	6,465	334.0
15.00		0.2500	28.825	23.002	2,397.3	28.21	115.30	73.9	160.7	0.0	196.9	39.28	6,335	334.0
15.48	Reinf. Top	0.2500	28.755	22.947	2,379.8	28.14	115.02	74.0	159.9	0.0	37.5	39.28	6,310	64.0
17.50		0.2500	28.462	22.711	2,307.2	27.83	113.85	74.4	156.6	0.0	157.0	19.64	3,073	135.0
20.00		0.2500	28.099	22.419	2,219.4	27.44	112.40	74.8	152.6	0.0	192.0	19.64	3,010	167.0
22.50		0.2500	27.737	22.127	2,133.8	27.05	110.95	75.2	148.6	0.0	189.5	19.64	2,948	167.0
25.00		0.2500	27.374	21.835	2,050.5	26.66	109.50	75.6	144.7	0.0	187.0	19.64	2,887	167.0
27.50		0.2500	27.012	21.543	1,969.3	26.27	108.05	76.1	140.8	0.0	184.5	19.64	2,826	167.0
30.00		0.2500	26.649	21.251	1,890.4	25.88	106.60	76.5	137.0	0.0	182.0	19.64	2,766	167.0
32.50		0.2500	26.286	20.959	1,813.5	25.49	105.15	76.9	133.3	0.0	179.5	19.64	2,707	167.0
35.00		0.2500	25.924	20.667	1,738.8	25.11	103.70	77.3	129.6	0.0	177.1	19.64	2,648	167.0
37.50		0.2500	25.561	20.376	1,666.2	24.72	102.25	77.8	125.9	0.0	174.6	19.64	2,590	167.0
37.58	Bot - Section 2	0.2500	25.549	20.366	1,663.8	24.70	102.20	77.8	125.8	0.0	5.8	19.64	2,588	5.6
40.00		0.2500	25.199	20.084	1,595.6	24.33	100.79	78.2	122.3	0.0	314.7	19.64	2,602	161.4
42.00	Top - Section 1	0.2190	25.347	17.719	1,428.0	28.33	115.74	73.8	108.8	0.0	257.2	19.64	2,556	133.6
42.50		0.2190	25.274	17.668	1,415.7	28.24	115.41	73.9	108.2	0.0	30.1	19.64	2,545	33.4
45.00		0.2190	24.911	17.413	1,355.1	27.80	113.75	74.4	105.1	0.0	149.2	19.64	2,488	167.0
47.50		0.2190	24.549	17.157	1,296.3	27.36	112.10	74.9	102.0	0.0	147.0	19.64	2,432	167.0
50.00		0.2190	24.186	16.901	1,239.2	26.91	110.44	75.4	99.0	0.0	144.9	19.64	2,376	167.0
52.50		0.2190	23.824	16.646	1,183.8	26.47	108.78	75.8	96.0	0.0	142.7	19.64	2,321	167.0
55.00		0.2190	23.461	16.390	1,130.1	26.03	107.13	76.3	93.1	0.0	140.5	19.64	2,267	167.0
57.50		0.2190	23.099	16.134	1,078.0	25.58	105.47	76.8	90.2	0.0	138.3	19.64	2,213	167.0
60.00		0.2190	22.736	15.879	1,027.6	25.14	103.82	77.3	87.3	0.0	136.2	19.64	2,160	167.0
62.50		0.2190	22.373	15.623	978.7	24.69	102.16	77.8	84.5	0.0	134.0	19.64	2,108	167.0
65.00		0.2190	22.011	15.367	931.5	24.25	100.51	78.3	81.8	0.0	131.8	19.64	2,056	167.0
67.50		0.2190	21.648	15.111	885.7	23.81	98.85	78.7	79.0	0.0	129.6	19.64	2,005	167.0
70.00		0.2190	21.286	14.856	841.5	23.36	97.19	79.2	76.4	0.0	127.5	19.64	1,954	167.0
72.50		0.2190	20.923	14.600	798.8	22.92	95.54	79.7	73.8	0.0	125.3	19.64	1,904	167.0
75.00		0.2190	20.561	14.344	757.6	22.48	93.88	80.2	71.2	0.0	123.1	19.64	1,855	167.0
76.17	Bot - Section 3	0.2190	20.391	14.225	738.8	22.27	93.11	80.4	70.0	0.0	56.7	19.64	1,833	77.9
77.50		0.2190	20.198	14.089	717.8	22.03	92.23	80.7	68.7	0.0	120.5	19.64	1,857	89.1
79.50	Reinf. Top Reinf	0.2190	19.908	13.884	687.0	21.68	90.90	81.1	66.7	0.0	178.6	19.64	1,818	133.6
80.00	Top - Section 2	0.1880	20.211	12.121	620.3	26.13	107.51	76.2	59.3	0.0	44.2	19.64	1,809	33.4
82.50		0.1880	19.849	11.902	587.2	25.61	105.58	76.8	57.2	0.0	102.2	19.64	1,761	167.0
85.00		0.1880	19.486	11.682	555.3	25.09	103.65	77.3	55.1	0.0	100.3	19.64	1,713	167.0
87.50		0.1880	19.124	11.463	524.6	24.58	101.72	77.9	53.0	0.0	98.4	19.64	1,667	167.0
90.00		0.1880	18.761	11.243	495.0	24.06	99.79	78.5	51.0	0.0	96.6	19.64	1,621	167.0
91.00		0.1880	18.616	11.156	483.5	23.85	99.02	78.7	50.2	0.0	38.1	19.64	1,603	66.8
92.50		0.1880	18.398	11.024	466.6	23.54	97.86	79.0	49.0	0.0	56.6	19.64	1,575	100.2
93.00		0.1880	18.326	10.980	461.1	23.44	97.48	79.2	48.6	0.0	18.7	19.64	1,566	33.4
95.00		0.1880	18.036	10.804	439.3	23.03	95.94	79.6	47.1	0.0	74.1	19.64	1,531	133.6
97.44	Reinf. Top	0.1880	17.682	10.590	413.7	22.52	94.05	80.2	45.2	0.0	88.7	19.64	1,488	162.8
97.50		0.1880	17.673	10.585	413.1	22.51	94.01	80.2	45.2	0.0	2.3			
100.0		0.1880	17.311	10.365	387.9	21.99	92.08	80.7	43.3	0.0	89.1			
101.0		0.1880	17.166	10.278	378.1	21.79	91.31	81.0	42.6	0.0	35.1			
102.5		0.1880	16.948	10.146	363.8	21.48	90.15	81.3	41.5	0.0	52.1			
105.0		0.1880	16.586	9.926	340.7	20.96	88.22	81.9	39.7	0.0	85.4			
107.5		0.1880	16.223	9.707	318.6	20.44	86.29	81.9	37.9	0.0	83.5			
110.0		0.1880	15.860	9.487	297.4	19.93	84.36	81.9	36.2	0.0	81.6			
112.5		0.1880	15.498	9.268	277.3	19.41	82.43	81.9	34.6	0.0	79.8			
115.0		0.1880	15.135	9.048	258.0	18.89	80.51	81.9	32.9	0.0	77.9			
117.5		0.1880	14.773	8.829	239.7	18.38	78.58	81.9	31.3	0.0	76.0			
120.0		0.1880	14.410	8.609	222.3	17.86	76.65	81.9	29.8	0.0	74.2			

											7,068.1			7,542.8

Load Case: 1.2D + 1.6W — 93 mph with No Ice — 27 Iterations

Gust Response Factor :1.10 — Wind Importance Factor :1.00
Dead Load Factor :1.20
Wind Load Factor :1.60

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		223.6	0.0					0.0	0.0	223.6	0.0	0.0	0.0
2.50		441.1	251.2					56.1	400.8	497.2	652.0	0.0	0.0
5.00		429.0	248.2					55.2	400.8	484.2	649.0	0.0	0.0
7.50		417.3	245.2					54.3	417.2	471.6	662.4	0.0	0.0
10.00		405.9	242.3					53.5	482.7	459.4	725.0	0.0	0.0
12.50		394.9	239.3					52.7	482.7	447.6	722.0	0.0	0.0
15.00		231.5	236.3					51.9	482.7	283.4	719.0	0.0	0.0
15.48	Reinf. Top	189.5	45.0					9.9	92.5	199.4	137.5	0.0	0.0
17.50		337.2	188.4					41.3	228.2	378.5	416.6	0.0	0.0
20.00		363.9	230.3					50.4	282.3	414.3	512.7	0.0	0.0
22.50		354.2	227.4					49.7	282.3	403.9	509.7	0.0	0.0
25.00		344.8	224.4					49.0	282.3	393.8	506.7	0.0	0.0
27.50		335.7	221.4					48.3	282.3	384.0	503.7	0.0	0.0
30.00		328.8	218.4					47.7	282.3	376.5	500.8	0.0	0.0
32.50		325.7	215.4					47.7	282.3	373.3	497.8	0.0	0.0
35.00		323.9	212.5					48.1	282.3	372.0	494.8	0.0	0.0
37.50		166.8	209.5					48.5	282.3	215.3	491.8	0.0	0.0
37.58	Bot - Section 2	162.9	6.9					1.6	9.4	164.5	16.3	0.0	0.0
40.00		286.9	377.7					47.2	272.9	334.1	650.6	0.0	0.0
42.00	Top - Section 1	161.6	308.6					39.2	225.9	200.8	534.5	0.0	0.0
42.50		192.3	36.1					9.8	56.5	202.1	92.6	0.0	0.0
45.00		318.5	179.1					49.3	282.3	367.8	461.4	0.0	0.0
47.50		315.0	176.4					49.5	282.3	364.5	458.8	0.0	0.0
50.00		311.4	173.8					49.7	282.3	361.1	456.2	0.0	0.0
52.50		307.6	171.2					49.8	282.3	357.4	453.6	0.0	0.0
55.00		303.6	168.6					49.9	282.3	353.6	450.9	0.0	0.0
57.50		299.5	166.0					50.1	282.3	349.5	448.3	0.0	0.0
60.00		295.3	163.4					50.1	282.3	345.4	445.7	0.0	0.0
62.50		291.0	160.8					50.2	282.3	341.2	443.1	0.0	0.0
65.00		286.5	158.2					50.3	282.3	336.8	440.5	0.0	0.0
67.50		282.1	155.6					50.3	282.3	332.4	437.9	0.0	0.0
70.00		277.5	153.0					50.4	282.3	327.9	435.3	0.0	0.0
72.50		272.9	150.3					50.4	282.3	323.3	432.7	0.0	0.0
75.00		197.7	147.7					50.4	282.3	248.1	430.1	0.0	0.0
76.17	Bot - Section 3	134.3	68.0					23.5	131.7	157.8	199.8	0.0	0.0
77.50		178.6	144.6					26.9	150.6	205.5	295.2	0.0	0.0
79.50	Reinf. Top Reinf	133.1	214.3					40.3	225.9	173.4	440.2	0.0	0.0
80.00	Top - Section 2	157.2	53.1					10.1	56.5	167.3	109.5	0.0	0.0
82.50		259.1	122.6					50.4	282.3	309.6	405.0	0.0	0.0
85.00		254.4	120.4					50.4	282.3	304.8	402.7	0.0	0.0
87.50		249.6	118.1					50.4	282.3	300.0	400.5	0.0	0.0
90.00		172.4	115.9					50.4	282.3	222.8	398.2	0.0	0.0
91.00	Appertunance(s)	121.2	45.7	1,692.5	0.0	0.0	380.8	20.2	103.8	1,833.9	530.3	0.0	0.0
92.50		96.4	67.9					30.2	154.6	126.6	222.6	0.0	0.0
93.00	Appertunance(s)	118.8	22.5	755.4	0.0	0.0	775.0	10.1	51.5	884.3	849.0	0.0	0.0
95.00		208.4	89.0					40.3	206.2	248.7	295.1	0.0	0.0
97.44	Reinf. Top	116.4	106.5					49.1	251.3	165.5	357.8	0.0	0.0
97.50		116.9	2.7					1.3	1.4	118.2	4.1	0.0	0.0

Load Case: 1.2D + 1.6W — 93 mph with No Ice — 27 Iterations

Gust Response Factor :1.10 — Wind Importance Factor :1.00
Dead Load Factor :1.20
Wind Load Factor :1.60

100.00		159.0	106.9				50.4	57.3	209.3	164.3	0.0	0.0	
101.00	Appertunance(s)	111.6	42.1	531.1	0.0	0.0	95.0	20.1	22.9	662.9	160.1	0.0	0.0
102.50		157.7	62.5					20.1	25.5	177.8	88.1	0.0	0.0
105.00		180.0	102.5					0.0	42.6	180.0	145.0	0.0	0.0
107.50		176.0	100.2					0.0	42.6	176.0	142.8	0.0	0.0
110.00		172.0	98.0					0.0	42.6	172.0	140.5	0.0	0.0
112.50		168.0	95.7					0.0	42.6	168.0	138.3	0.0	0.0
115.00		164.1	93.5					0.0	42.6	164.1	136.1	0.0	0.0
117.50		160.1	91.2					0.0	42.6	160.1	133.8	0.0	0.0
120.00	Appertunance(s)	79.0	89.0	5,328.9	0.0	12,798.1	3,868.0	0.0	42.6	5,408.0	3,999.5	0.0	0.0
								Totals:		24,385.3	25,948.3	0.00	0.00

Load Case: 1.2D + 1.6W — 93 mph with No Ice — 27 Iterations

Gust Response Factor :1.10 — Wind Importance Factor :1.00
Dead Load Factor :1.20
Wind Load Factor :1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-25.92	-24.19	0.00	-1,824.93	0.00	1,824.93	1,590.66	795.33	2,018.74	996.98	0.00	0.00	0.547
2.50	-25.22	-23.75	0.00	-1,764.46	0.00	1,764.46	1,581.24	790.62	1,982.92	979.29	0.04	-0.13	0.533
5.00	-24.52	-23.32	0.00	-1,705.09	0.00	1,705.09	1,571.59	785.80	1,947.12	961.61	0.14	-0.25	0.518
7.50	-23.81	-22.89	0.00	-1,646.80	0.00	1,646.80	1,561.72	780.86	1,911.33	943.93	0.30	-0.37	0.504
10.00	-23.04	-22.48	0.00	-1,589.57	0.00	1,589.57	1,551.63	775.81	1,875.57	926.27	0.53	-0.50	0.489
12.50	-22.28	-22.07	0.00	-1,533.38	0.00	1,533.38	1,541.31	770.66	1,839.85	908.63	0.83	-0.62	0.475
15.00	-21.53	-21.80	0.00	-1,478.21	0.00	1,478.21	1,530.78	765.39	1,804.18	891.02	1.18	-0.74	0.461
15.48	-21.38	-21.62	0.00	-1,467.77	0.00	1,467.77	1,528.73	764.37	1,797.35	887.64	1.26	-0.76	0.459
15.48	-21.38	-21.62	0.00	-1,467.77	0.00	1,467.77	1,528.73	764.37	1,797.35	887.64	1.26	-0.76	0.723
17.50	-20.91	-21.29	0.00	-1,424.07	0.00	1,424.07	1,520.01	760.01	1,768.57	873.43	1.60	-0.86	0.707
20.00	-20.34	-20.93	0.00	-1,370.85	0.00	1,370.85	1,509.03	754.52	1,733.02	855.87	2.10	-1.04	0.688
22.50	-19.77	-20.58	0.00	-1,318.52	0.00	1,318.52	1,497.83	748.91	1,697.56	838.36	2.70	-1.22	0.668
25.00	-19.21	-20.24	0.00	-1,267.06	0.00	1,267.06	1,486.40	743.20	1,662.18	820.89	3.39	-1.40	0.648
27.50	-18.66	-19.90	0.00	-1,216.47	0.00	1,216.47	1,474.74	737.37	1,626.91	803.47	4.17	-1.58	0.629
30.00	-18.11	-19.56	0.00	-1,166.73	0.00	1,166.73	1,462.87	731.44	1,591.74	786.10	5.05	-1.76	0.610
32.50	-17.57	-19.23	0.00	-1,117.82	0.00	1,117.82	1,450.77	725.39	1,556.69	768.79	6.02	-1.93	0.590
35.00	-17.03	-18.89	0.00	-1,069.76	0.00	1,069.76	1,438.45	719.23	1,521.78	751.55	7.08	-2.11	0.571
37.50	-16.52	-18.68	0.00	-1,022.54	0.00	1,022.54	1,425.91	712.96	1,487.00	734.37	8.23	-2.28	0.552
37.58	-16.48	-18.54	0.00	-1,020.98	0.00	1,020.98	1,425.49	712.74	1,485.84	733.80	8.27	-2.28	0.551
40.00	-15.80	-18.22	0.00	-976.18	0.00	976.18	1,413.15	706.57	1,452.37	717.27	9.46	-2.44	0.524
42.00	-15.25	-18.02	0.00	-939.74	0.00	939.74	1,177.15	588.58	1,220.08	602.55	10.52	-2.57	0.566
42.50	-15.13	-17.84	0.00	-930.74	0.00	930.74	1,175.29	587.65	1,214.60	599.85	10.79	-2.61	0.562
45.00	-14.64	-17.49	0.00	-886.15	0.00	886.15	1,165.87	582.93	1,187.28	586.35	12.20	-2.77	0.540
47.50	-14.15	-17.14	0.00	-842.43	0.00	842.43	1,156.22	578.11	1,160.01	572.88	13.69	-2.93	0.518
50.00	-13.67	-16.79	0.00	-799.58	0.00	799.58	1,146.35	573.17	1,132.81	559.45	15.27	-3.09	0.496
52.50	-13.19	-16.45	0.00	-757.60	0.00	757.60	1,136.25	568.13	1,105.70	546.06	16.92	-3.24	0.475
55.00	-12.72	-16.10	0.00	-716.49	0.00	716.49	1,125.94	562.97	1,078.67	532.72	18.66	-3.39	0.453
57.50	-12.26	-15.75	0.00	-676.24	0.00	676.24	1,115.40	557.70	1,051.75	519.42	20.47	-3.53	0.432
60.00	-11.80	-15.41	0.00	-636.86	0.00	636.86	1,104.64	552.32	1,024.94	506.18	22.36	-3.68	0.411
62.50	-11.34	-15.07	0.00	-598.33	0.00	598.33	1,093.65	546.83	998.25	493.00	24.32	-3.81	0.390
65.00	-10.89	-14.73	0.00	-560.66	0.00	560.66	1,082.45	541.22	971.69	479.88	26.35	-3.95	0.369
67.50	-10.44	-14.39	0.00	-523.85	0.00	523.85	1,071.02	535.51	945.28	466.84	28.46	-4.08	0.349
70.00	-10.00	-14.05	0.00	-487.88	0.00	487.88	1,059.36	529.68	919.01	453.87	30.62	-4.20	0.328
72.50	-9.57	-13.72	0.00	-452.75	0.00	452.75	1,047.49	523.74	892.91	440.97	32.85	-4.32	0.308
75.00	-9.14	-13.45	0.00	-418.46	0.00	418.46	1,035.39	517.69	866.98	428.17	35.15	-4.43	0.288
76.17	-8.94	-13.28	0.00	-402.77	0.00	402.77	1,029.67	514.83	854.94	422.22	36.24	-4.49	0.278
77.50	-8.65	-13.07	0.00	-385.06	0.00	385.06	1,023.07	511.53	841.23	415.45	37.50	-4.54	0.263
79.50	-8.21	-12.87	0.00	-358.93	0.00	358.93	1,013.05	506.53	820.77	405.35	39.42	-4.63	0.247
79.50	-8.21	-12.87	0.00	-358.93	0.00	358.93	1,013.05	506.53	820.77	405.35	39.42	-4.63	0.247
80.00	-8.10	-12.70	0.00	-352.50	0.00	352.50	831.49	415.75	686.29	338.93	39.90	-4.65	0.270
82.50	-7.70	-12.37	0.00	-320.75	0.00	320.75	822.47	411.24	666.44	329.13	42.36	-4.74	0.248
85.00	-7.31	-12.04	0.00	-289.83	0.00	289.83	813.23	406.62	646.68	319.37	44.87	-4.84	0.226
87.50	-6.92	-11.72	0.00	-259.72	0.00	259.72	803.77	401.88	627.03	309.67	47.42	-4.92	0.205
90.00	-6.53	-11.47	0.00	-230.41	0.00	230.41	794.08	397.04	607.50	300.02	50.02	-5.00	0.183
91.00	-6.15	-9.60	0.00	-218.94	0.00	218.94	790.14	395.07	599.72	296.18	51.07	-5.03	0.175
92.50	-5.94	-9.46	0.00	-204.54	0.00	204.54	784.17	392.08	588.09	290.43	52.66	-5.08	0.164
93.00	-5.17	-8.51	0.00	-199.81	0.00	199.81	782.16	391.08	584.22	288.52	53.19	-5.09	0.160
95.00	-4.89	-8.24	0.00	-182.80	0.00	182.80	774.04	387.02	568.81	280.91	55.33	-5.14	0.148
97.44	-4.54	-8.04	0.00	-162.73	0.00	162.73	763.94	381.97	550.16	271.70	57.97	-5.20	0.133
97.44	-4.54	-8.04	0.00	-162.73	0.00	162.73	763.94	381.97	550.16	271.70	57.97	-5.20	0.605
97.50	-4.53	-7.93	0.00	-162.22	0.00	162.22	763.68	381.84	549.68	271.47	58.04	-5.21	0.604

Load Case: 1.2D + 1.6W — 93 mph with No Ice — 27 Iterations

Gust Response Factor :1.10 — Wind Importance Factor :1.00
Dead Load Factor :1.20
Wind Load Factor :1.60

100.00	-4.36	-7.72	0.00	-142.39	0.00	142.39	753.10	376.55	530.71	262.10	60.83	-5.47	0.549
101.00	-4.25	-7.06	0.00	-134.67	0.00	134.67	748.81	374.40	523.16	258.37	61.99	-5.57	0.527
102.50	-4.16	-6.89	0.00	-124.08	0.00	124.08	742.30	371.15	511.90	252.81	63.76	-5.72	0.497
105.00	-4.01	-6.71	0.00	-106.86	0.00	106.86	731.28	365.64	493.27	243.61	66.80	-5.94	0.444
107.50	-3.86	-6.53	0.00	-90.09	0.00	90.09	715.50	357.75	471.83	233.02	69.97	-6.15	0.392
110.00	-3.72	-6.36	0.00	-73.77	0.00	73.77	699.32	349.66	450.61	222.54	73.23	-6.33	0.337
112.50	-3.59	-6.18	0.00	-57.88	0.00	57.88	683.14	341.57	429.88	212.30	76.58	-6.49	0.278
115.00	-3.46	-6.01	0.00	-42.42	0.00	42.42	666.96	333.48	409.64	202.31	80.01	-6.62	0.215
117.50	-3.34	-5.84	0.00	-27.40	0.00	27.40	650.78	325.39	389.89	192.55	83.49	-6.71	0.148
120.00	0.00	-5.41	0.00	-12.80	0.00	12.80	634.60	317.30	370.62	183.04	87.02	-6.77	0.070

Load Case: 0.9D + 1.6W — 93 mph with No Ice (Reduced DL) — 27 Iterations

Gust Response Factor :1.10 — Wind Importance Factor :1.00
Dead Load Factor :0.90
Wind Load Factor :1.60

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (ft-lb)	Discrete Forces Moment MZ (ft-lb)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (ft-lb)	Sum of Forces Moment MZ (lb)
0.00		223.6	0.0					0.0	0.0	223.6	0.0	0.0	0.0
2.50		441.1	188.4					56.1	300.6	497.2	489.0	0.0	0.0
5.00		429.0	186.2					55.2	300.6	484.2	486.8	0.0	0.0
7.50		417.3	183.9					54.3	312.9	471.6	496.8	0.0	0.0
10.00		405.9	181.7					53.5	362.0	459.4	543.7	0.0	0.0
12.50		394.9	179.5					52.7	362.0	447.6	541.5	0.0	0.0
15.00		231.5	177.2					51.9	362.0	283.4	539.3	0.0	0.0
15.48	Reinf. Top	189.5	33.7					9.9	69.4	199.4	103.1	0.0	0.0
17.50		337.2	141.3					41.3	171.2	378.5	312.4	0.0	0.0
20.00		363.9	172.8					50.4	211.7	414.3	384.5	0.0	0.0
22.50		354.2	170.5					49.7	211.7	403.9	382.3	0.0	0.0
25.00		344.8	168.3					49.0	211.7	393.8	380.0	0.0	0.0
27.50		335.7	166.1					48.3	211.7	384.0	377.8	0.0	0.0
30.00		328.8	163.8					47.7	211.7	376.5	375.6	0.0	0.0
32.50		325.7	161.6					47.7	211.7	373.3	373.3	0.0	0.0
35.00		323.9	159.4					48.1	211.7	372.0	371.1	0.0	0.0
37.50		166.8	157.1					48.5	211.7	215.3	368.9	0.0	0.0
37.58	Bot - Section 2	162.9	5.2					1.6	7.1	164.5	12.3	0.0	0.0
40.00		286.9	283.3					47.2	204.7	334.1	487.9	0.0	0.0
42.00	Top - Section 1	161.6	231.5					39.2	169.4	200.8	400.9	0.0	0.0
42.50		192.3	27.1					9.8	42.3	202.1	69.4	0.0	0.0
45.00		318.5	134.3					49.3	211.7	367.8	346.0	0.0	0.0
47.50		315.0	132.3					49.5	211.7	364.5	344.1	0.0	0.0
50.00		311.4	130.4					49.7	211.7	361.1	342.1	0.0	0.0
52.50		307.6	128.4					49.8	211.7	357.4	340.2	0.0	0.0
55.00		303.6	126.5					49.9	211.7	353.6	338.2	0.0	0.0
57.50		299.5	124.5					50.1	211.7	349.5	336.3	0.0	0.0
60.00		295.3	122.5					50.1	211.7	345.4	334.3	0.0	0.0
62.50		291.0	120.6					50.2	211.7	341.2	332.3	0.0	0.0
65.00		286.5	118.6					50.3	211.7	336.8	330.4	0.0	0.0
67.50		282.1	116.7					50.3	211.7	332.4	328.4	0.0	0.0
70.00		277.5	114.7					50.4	211.7	327.9	326.5	0.0	0.0
72.50		272.9	112.8					50.4	211.7	323.3	324.5	0.0	0.0
75.00		197.7	110.8					50.4	211.7	248.1	322.5	0.0	0.0
76.17	Bot - Section 3	134.3	51.0					23.5	98.8	157.8	149.8	0.0	0.0
77.50		178.6	108.4					26.9	112.9	205.5	221.4	0.0	0.0
79.50	Reinf. Top Reinf	133.1	160.7					40.3	169.4	173.4	330.1	0.0	0.0
80.00	Top - Section 2	157.2	39.8					10.1	42.3	167.3	82.2	0.0	0.0
82.50		259.1	92.0					50.4	211.8	309.6	303.7	0.0	0.0
85.00		254.4	90.3					50.4	211.7	304.8	302.0	0.0	0.0
87.50		249.6	88.6					50.4	211.7	300.0	300.3	0.0	0.0
90.00		172.4	86.9					50.4	211.7	222.8	298.7	0.0	0.0
91.00	Appertunance(s)	121.2	34.3	1,692.5	0.0	0.0	285.6	20.2	77.9	1,833.9	397.7	0.0	0.0
92.50		96.4	50.9					30.2	116.0	126.6	166.9	0.0	0.0
93.00	Appertunance(s)	118.8	16.8	755.4	0.0	0.0	581.2	10.1	38.7	884.3	636.7	0.0	0.0
95.00		208.4	66.7					40.3	154.6	248.7	221.4	0.0	0.0
97.44	Reinf. Top	116.4	79.9					49.1	188.5	165.5	268.3	0.0	0.0
97.50		116.9	2.0					1.3	1.1	118.2	3.1	0.0	0.0

Load Case: 0.9D + 1.6W — 93 mph with No Ice (Reduced DL) — 27 Iterations

Gust Response Factor :1.10 — Wind Importance Factor :1.00
Dead Load Factor :0.90
Wind Load Factor :1.60

100.00		159.0	80.2					50.4	43.0	209.3	123.2	0.0	0.0
101.00	Appertunance(s)	111.6	31.6	531.1	0.0	0.0	71.3	20.1	17.2	662.9	120.1	0.0	0.0
102.50		157.7	46.9					20.1	19.2	177.8	66.1	0.0	0.0
105.00		180.0	76.8					0.0	31.9	180.0	108.8	0.0	0.0
107.50		176.0	75.2					0.0	31.9	176.0	107.1	0.0	0.0
110.00		172.0	73.5					0.0	31.9	172.0	105.4	0.0	0.0
112.50		168.0	71.8					0.0	31.9	168.0	103.7	0.0	0.0
115.00		164.1	70.1					0.0	31.9	164.1	102.0	0.0	0.0
117.50		160.1	68.4					0.0	31.9	160.1	100.4	0.0	0.0
120.00	Appertunance(s)	79.0	66.8	5,328.9	0.0	12,798.1	2,901.0	0.0	31.9	5,408.0	2,999.7	0.0	0.0
								Totals:		24,385.3	19,461.2	0.00	0.00

Load Case: 0.9D + 1.6W — 93 mph with No Ice (Reduced DL) — 27 Iterations

Gust Response Factor :1.10 — Wind Importance Factor :1.00
Dead Load Factor :0.90
Wind Load Factor :1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-19.43	-24.18	0.00	-1,806.86	0.00	1,806.86	1,590.66	795.33	2,018.74	996.98	0.00	0.00	0.540
2.50	-18.89	-23.73	0.00	-1,746.40	0.00	1,746.40	1,581.24	790.62	1,982.92	979.29	0.03	-0.12	0.526
5.00	-18.36	-23.28	0.00	-1,687.09	0.00	1,687.09	1,571.59	785.80	1,947.12	961.61	0.13	-0.25	0.511
7.50	-17.82	-22.84	0.00	-1,628.89	0.00	1,628.89	1,561.72	780.86	1,911.33	943.93	0.30	-0.37	0.497
10.00	-17.23	-22.42	0.00	-1,571.78	0.00	1,571.78	1,551.63	775.81	1,875.57	926.27	0.53	-0.49	0.483
12.50	-16.65	-22.00	0.00	-1,515.74	0.00	1,515.74	1,541.31	770.66	1,839.85	908.63	0.82	-0.61	0.469
15.00	-16.08	-21.73	0.00	-1,460.74	0.00	1,460.74	1,530.78	765.39	1,804.18	891.02	1.17	-0.73	0.455
15.48	-15.96	-21.54	0.00	-1,450.33	0.00	1,450.33	1,528.73	764.37	1,797.35	887.64	1.25	-0.75	0.452
15.48	-15.96	-21.54	0.00	-1,450.33	0.00	1,450.33	1,528.73	764.37	1,797.35	887.64	1.25	-0.75	0.713
17.50	-15.60	-21.20	0.00	-1,406.79	0.00	1,406.79	1,520.01	760.01	1,768.57	873.43	1.59	-0.85	0.697
20.00	-15.16	-20.83	0.00	-1,353.80	0.00	1,353.80	1,509.03	754.52	1,733.02	855.87	2.08	-1.03	0.677
22.50	-14.72	-20.46	0.00	-1,301.73	0.00	1,301.73	1,497.83	748.91	1,697.56	838.36	2.67	-1.21	0.658
25.00	-14.29	-20.10	0.00	-1,250.58	0.00	1,250.58	1,486.40	743.20	1,662.18	820.89	3.35	-1.39	0.638
27.50	-13.86	-19.75	0.00	-1,200.32	0.00	1,200.32	1,474.74	737.37	1,626.91	803.47	4.12	-1.56	0.619
30.00	-13.44	-19.41	0.00	-1,150.94	0.00	1,150.94	1,462.87	731.44	1,591.74	786.10	4.99	-1.74	0.600
32.50	-13.02	-19.06	0.00	-1,102.42	0.00	1,102.42	1,450.77	725.39	1,556.69	768.79	5.95	-1.91	0.581
35.00	-12.60	-18.71	0.00	-1,054.77	0.00	1,054.77	1,438.45	719.23	1,521.78	751.55	7.00	-2.08	0.561
37.50	-12.22	-18.50	0.00	-1,007.99	0.00	1,007.99	1,425.91	712.96	1,487.00	734.37	8.13	-2.25	0.542
37.58	-12.18	-18.35	0.00	-1,006.45	0.00	1,006.45	1,425.49	712.74	1,485.84	733.80	8.17	-2.25	0.542
40.00	-11.67	-18.03	0.00	-962.10	0.00	962.10	1,413.15	706.57	1,452.37	717.27	9.35	-2.41	0.515
42.00	-11.25	-17.83	0.00	-926.04	0.00	926.04	1,177.15	588.58	1,220.08	602.55	10.39	-2.54	0.556
42.50	-11.16	-17.64	0.00	-917.12	0.00	917.12	1,175.29	587.65	1,214.60	599.85	10.66	-2.57	0.552
45.00	-10.78	-17.29	0.00	-873.02	0.00	873.02	1,165.87	582.93	1,187.28	586.35	12.05	-2.73	0.530
47.50	-10.41	-16.94	0.00	-829.80	0.00	829.80	1,156.22	578.11	1,160.01	572.88	13.52	-2.89	0.509
50.00	-10.04	-16.58	0.00	-787.46	0.00	787.46	1,146.35	573.17	1,132.81	559.45	15.08	-3.05	0.487
52.50	-9.68	-16.23	0.00	-746.00	0.00	746.00	1,136.25	568.13	1,105.70	546.06	16.72	-3.20	0.466
55.00	-9.32	-15.89	0.00	-705.42	0.00	705.42	1,125.94	562.97	1,078.67	532.72	18.43	-3.34	0.445
57.50	-8.97	-15.54	0.00	-665.71	0.00	665.71	1,115.40	557.70	1,051.75	519.42	20.22	-3.49	0.424
60.00	-8.62	-15.19	0.00	-626.86	0.00	626.86	1,104.64	552.32	1,024.94	506.18	22.08	-3.63	0.403
62.50	-8.28	-14.85	0.00	-588.88	0.00	588.88	1,093.65	546.83	998.25	493.00	24.02	-3.76	0.383
65.00	-7.94	-14.51	0.00	-551.75	0.00	551.75	1,082.45	541.22	971.69	479.88	26.02	-3.89	0.362
67.50	-7.60	-14.17	0.00	-515.47	0.00	515.47	1,071.02	535.51	945.28	466.84	28.09	-4.02	0.342
70.00	-7.27	-13.84	0.00	-480.04	0.00	480.04	1,059.36	529.68	919.01	453.87	30.23	-4.14	0.322
72.50	-6.94	-13.51	0.00	-445.44	0.00	445.44	1,047.49	523.74	892.91	440.97	32.43	-4.26	0.302
75.00	-6.62	-13.24	0.00	-411.68	0.00	411.68	1,035.39	517.69	866.98	428.17	34.69	-4.37	0.282
76.17	-6.47	-13.08	0.00	-396.23	0.00	396.23	1,029.67	514.83	854.94	422.22	35.77	-4.42	0.273
77.50	-6.25	-12.87	0.00	-378.79	0.00	378.79	1,023.07	511.53	841.23	415.45	37.01	-4.48	0.257
79.50	-5.93	-12.67	0.00	-353.05	0.00	353.05	1,013.05	506.53	820.77	405.35	38.91	-4.56	0.242
79.50	-5.93	-12.67	0.00	-353.05	0.00	353.05	1,013.05	506.53	820.77	405.35	38.91	-4.56	0.242
80.00	-5.84	-12.51	0.00	-346.72	0.00	346.72	831.49	415.75	686.29	338.93	39.38	-4.58	0.265
82.50	-5.55	-12.18	0.00	-315.45	0.00	315.45	822.47	411.24	666.44	329.13	41.81	-4.68	0.243
85.00	-5.25	-11.86	0.00	-285.00	0.00	285.00	813.23	406.62	646.68	319.37	44.28	-4.77	0.222
87.50	-4.96	-11.54	0.00	-255.35	0.00	255.35	803.77	401.88	627.03	309.67	46.80	-4.85	0.200
90.00	-4.67	-11.30	0.00	-226.49	0.00	226.49	794.08	397.04	607.50	300.02	49.36	-4.93	0.180
91.00	-4.43	-9.44	0.00	-215.19	0.00	215.19	790.14	395.07	599.72	296.18	50.39	-4.96	0.171
92.50	-4.27	-9.30	0.00	-201.03	0.00	201.03	784.17	392.08	588.09	290.43	51.96	-5.00	0.161
93.00	-3.71	-8.37	0.00	-196.38	0.00	196.38	782.16	391.08	584.22	288.52	52.48	-5.02	0.157
95.00	-3.50	-8.11	0.00	-179.64	0.00	179.64	774.04	387.02	568.81	280.91	54.59	-5.07	0.145
97.44	-3.24	-7.92	0.00	-159.88	0.00	159.88	763.94	381.97	550.16	271.70	57.20	-5.13	0.130
97.44	-3.24	-7.92	0.00	-159.88	0.00	159.88	763.94	381.97	550.16	271.70	57.20	-5.13	0.593
97.50	-3.23	-7.81	0.00	-159.39	0.00	159.39	763.68	381.84	549.68	271.47	57.26	-5.13	0.592

Load Case: 0.9D + 1.6W — 93 mph with No Ice (Reduced DL) — 27 Iterations

Gust Response Factor :1.10 — Wind Importance Factor :1.00
Dead Load Factor :0.90
Wind Load Factor :1.60

100.00	-3.11	-7.60	0.00	-139.87	0.00	139.87	753.10	376.55	530.71	262.10	60.02	-5.39	0.538
101.00	-3.04	-6.93	0.00	-132.27	0.00	132.27	748.81	374.40	523.16	258.37	61.15	-5.49	0.516
102.50	-2.97	-6.76	0.00	-121.87	0.00	121.87	742.30	371.15	511.90	252.81	62.90	-5.63	0.486
105.00	-2.85	-6.58	0.00	-104.97	0.00	104.97	731.28	365.64	493.27	243.61	65.90	-5.85	0.435
107.50	-2.74	-6.40	0.00	-88.53	0.00	88.53	715.50	357.75	471.83	233.02	69.02	-6.06	0.384
110.00	-2.64	-6.23	0.00	-72.52	0.00	72.52	699.32	349.66	450.61	222.54	72.23	-6.24	0.330
112.50	-2.54	-6.06	0.00	-56.95	0.00	56.95	683.14	341.57	429.88	212.30	75.54	-6.39	0.272
115.00	-2.44	-5.89	0.00	-41.81	0.00	41.81	666.96	333.48	409.64	202.31	78.91	-6.52	0.211
117.50	-2.35	-5.72	0.00	-27.10	0.00	27.10	650.78	325.39	389.89	192.55	82.34	-6.61	0.145
120.00	0.00	-5.41	0.00	-12.80	0.00	12.80	634.60	317.30	370.62	183.04	85.82	-6.67	0.070

Load Case: 1.2D + 1.0Di + 1.0Wi — 50 mph with 1.00 in Radial Ice — 26 Iterations

Gust Response Factor :1.10 — Ice Dead Load Factor :1.00 — Wind Importance Factor :1.00
Dead Load Factor :1.20 — Ice Importance Factor :1.00
Wind Load Factor :1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		45.2	0.0				0.0	0.0	45.2	0.0	0.0	0.0
2.50		89.7	449.9				29.8	495.6	119.5	945.5	0.0	0.0
5.00		88.1	467.7				30.4	506.2	118.5	973.9	0.0	0.0
7.50		86.2	473.0				30.4	558.9	116.6	1,031.9	0.0	0.0
10.00		84.3	474.4				30.2	758.8	114.5	1,233.2	0.0	0.0
12.50		82.4	473.6				30.0	765.5	112.3	1,239.2	0.0	0.0
15.00		48.3	471.7				29.7	770.7	78.0	1,242.4	0.0	0.0
15.48	Reinf. Top	39.7	90.3				5.7	148.2	45.4	238.5	0.0	0.0
17.50		70.8	378.9				23.7	464.6	94.5	843.6	0.0	0.0
20.00		76.6	465.4				29.1	577.8	105.6	1,043.2	0.0	0.0
22.50		74.7	461.5				28.7	580.6	103.5	1,042.1	0.0	0.0
25.00		72.9	457.3				28.4	530.6	101.4	987.9	0.0	0.0
27.50		71.2	452.8				28.1	532.3	99.3	985.1	0.0	0.0
30.00		69.9	448.0				27.7	533.8	97.7	981.8	0.0	0.0
32.50		69.5	443.1				27.8	535.0	97.2	978.1	0.0	0.0
35.00		69.2	438.0				28.1	536.1	97.3	974.0	0.0	0.0
37.50		35.7	432.8				28.3	537.0	64.0	969.7	0.0	0.0
37.58	Bot - Section 2	34.9	14.4				0.9	17.9	35.8	32.3	0.0	0.0
40.00		61.5	594.6				27.6	519.8	89.1	1,114.5	0.0	0.0
42.00	Top - Section 1	34.7	486.7				22.9	430.7	57.6	917.3	0.0	0.0
42.50		41.4	80.6				5.8	107.7	47.1	188.3	0.0	0.0
45.00		68.6	398.6				28.9	539.0	97.5	937.5	0.0	0.0
47.50		68.0	393.4				29.0	539.4	97.0	932.8	0.0	0.0
50.00		67.4	388.1				29.1	539.9	96.5	928.0	0.0	0.0
52.50		66.8	382.9				29.2	540.2	96.0	923.1	0.0	0.0
55.00		66.1	377.5				29.3	540.5	95.4	918.0	0.0	0.0
57.50		65.4	372.1				29.4	540.8	94.8	912.9	0.0	0.0
60.00		64.7	366.7				29.4	541.0	94.1	907.7	0.0	0.0
62.50		63.9	361.3				29.5	541.2	93.4	902.5	0.0	0.0
65.00		63.1	355.9				29.5	541.3	92.6	897.2	0.0	0.0
67.50		62.3	350.4				29.5	541.4	91.9	891.8	0.0	0.0
70.00		61.5	344.9				29.6	541.5	91.1	886.4	0.0	0.0
72.50		60.7	339.4				29.6	541.6	90.3	881.0	0.0	0.0
75.00		44.1	333.9				29.6	541.6	73.7	875.5	0.0	0.0
76.17	Bot - Section 3	30.0	154.3				13.8	252.8	43.8	407.0	0.0	0.0
77.50		39.9	243.9				15.8	288.9	55.7	532.8	0.0	0.0
79.50	Reinf. Top Reinf	29.7	361.4				23.7	433.3	53.4	794.8	0.0	0.0
80.00	Top - Section 2	35.2	89.7				5.9	108.3	41.2	198.1	0.0	0.0
82.50		58.2	303.0				29.6	541.7	87.8	844.7	0.0	0.0
85.00		57.3	297.9				29.6	541.7	87.0	839.5	0.0	0.0
87.50		56.5	292.7				29.6	541.7	86.1	834.3	0.0	0.0
90.00		39.1	287.5				29.6	541.7	68.7	829.1	0.0	0.0
91.00	Appertunance(s)	27.6	113.9	405.4	0.0	0.0 1,319.2	11.8	178.3	444.8	1,611.4	0.0	0.0
92.50		22.0	169.1				17.8	247.4	39.7	416.5	0.0	0.0
93.00	Appertunance(s)	27.2	56.1	247.6	0.0	0.0 1,839.3	5.9	82.5	280.7	1,977.8	0.0	0.0
95.00		47.7	221.5				23.7	329.9	71.4	551.4	0.0	0.0
97.44	Reinf. Top	26.7	265.2				28.8	402.0	55.6	667.2	0.0	0.0
97.50		26.9	6.8				0.7	5.3	27.7	12.1	0.0	0.0

Load Case: 1.2D + 1.0Di + 1.0Wi — 50 mph with 1.00 in Radial Ice — 26 Iterations

Gust Response Factor :1.10 — Ice Dead Load Factor :1.00 — Wind Importance Factor :1.00
Dead Load Factor :1.20 — Ice Importance Factor :1.00
Wind Load Factor :1.00

100.00		36.7	266.7				29.6	211.9	66.2	478.6	0.0	0.0	
101.00	Appertunance(s)	25.8	105.6	129.6	0.0	0.0 666.7	11.8	84.8	167.3	857.1	0.0	0.0	
102.50		40.9	156.6				11.8	54.7	52.7	211.3	0.0	0.0	
105.00		50.4	256.3				0.0	42.6	50.4	298.9	0.0	0.0	
107.50		49.5	251.1				0.0	42.6	49.5	293.7	0.0	0.0	
110.00		48.6	245.9				0.0	42.6	48.6	288.5	0.0	0.0	
112.50		47.8	240.7				0.0	42.6	47.8	283.3	0.0	0.0	
115.00		46.9	235.5				0.0	42.6	46.9	278.1	0.0	0.0	
117.50		46.0	230.3				0.0	42.6	46.0	272.9	0.0	0.0	
120.00	Appertunance(s)	22.8	225.1	1,433.0	0.0	3,102.2 10,736.1	0.0	42.6	1,455.8	11,003.8	0.0	0.0	
								Totals:	6,518.96	54,539.8	0.00	0.00	

Load Case: 1.2D + 1.0Di + 1.0Wi — 50 mph with 1.00 in Radial Ice — 26 Iterations

Gust Response Factor :1.10 — Ice Dead Load Factor :1.00 — Wind Importance Factor :1.00
Dead Load Factor :1.20 — Ice Importance Factor :1.00
Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-54.54	-6.49	0.00	-527.98	0.00	527.98	1,590.66	795.33	2,018.74	996.98	0.00	0.00	0.170
2.50	-53.59	-6.41	0.00	-511.75	0.00	511.75	1,581.24	790.62	1,982.92	979.29	0.01	-0.04	0.165
5.00	-52.61	-6.32	0.00	-495.74	0.00	495.74	1,571.59	785.80	1,947.12	961.61	0.04	-0.07	0.161
7.50	-51.57	-6.23	0.00	-479.94	0.00	479.94	1,561.72	780.86	1,911.33	943.93	0.09	-0.11	0.157
10.00	-50.34	-6.15	0.00	-464.36	0.00	464.36	1,551.63	775.81	1,875.57	926.27	0.15	-0.14	0.153
12.50	-49.10	-6.06	0.00	-449.00	0.00	449.00	1,541.31	770.66	1,839.85	908.63	0.24	-0.18	0.149
15.00	-47.85	-6.00	0.00	-433.84	0.00	433.84	1,530.78	765.39	1,804.18	891.02	0.34	-0.21	0.145
15.48	-47.61	-5.96	0.00	-430.97	0.00	430.97	1,528.73	764.37	1,797.35	887.64	0.37	-0.22	0.145
15.48	-47.61	-5.96	0.00	-430.97	0.00	430.97	1,528.73	764.37	1,797.35	887.64	0.37	-0.22	0.227
17.50	-46.76	-5.90	0.00	-418.92	0.00	418.92	1,520.01	760.01	1,768.57	873.43	0.47	-0.25	0.222
20.00	-45.72	-5.83	0.00	-404.17	0.00	404.17	1,509.03	754.52	1,733.02	855.87	0.61	-0.30	0.217
22.50	-44.67	-5.77	0.00	-389.58	0.00	389.58	1,497.83	748.91	1,697.56	838.36	0.79	-0.36	0.211
25.00	-43.68	-5.70	0.00	-375.17	0.00	375.17	1,486.40	743.20	1,662.18	820.89	0.99	-0.41	0.205
27.50	-42.69	-5.63	0.00	-360.93	0.00	360.93	1,474.74	737.37	1,626.91	803.47	1.22	-0.46	0.200
30.00	-41.70	-5.56	0.00	-346.85	0.00	346.85	1,462.87	731.44	1,591.74	786.10	1.48	-0.52	0.194
32.50	-40.72	-5.49	0.00	-332.95	0.00	332.95	1,450.77	725.39	1,556.69	768.79	1.76	-0.57	0.188
35.00	-39.74	-5.42	0.00	-319.21	0.00	319.21	1,438.45	719.23	1,521.78	751.55	2.07	-0.62	0.183
37.50	-38.77	-5.36	0.00	-305.66	0.00	305.66	1,425.91	712.96	1,487.00	734.37	2.41	-0.67	0.177
37.58	-38.74	-5.34	0.00	-305.22	0.00	305.22	1,425.49	712.74	1,485.84	733.80	2.42	-0.67	0.177
40.00	-37.62	-5.27	0.00	-292.30	0.00	292.30	1,413.15	706.57	1,452.37	717.27	2.78	-0.72	0.168
42.00	-36.70	-5.22	0.00	-281.76	0.00	281.76	1,177.15	588.58	1,220.08	602.55	3.09	-0.76	0.182
42.50	-36.51	-5.19	0.00	-279.16	0.00	279.16	1,175.29	587.65	1,214.60	599.85	3.17	-0.77	0.181
45.00	-35.57	-5.10	0.00	-266.19	0.00	266.19	1,165.87	582.93	1,187.28	586.35	3.58	-0.82	0.174
47.50	-34.63	-5.02	0.00	-253.43	0.00	253.43	1,156.22	578.11	1,160.01	572.88	4.02	-0.87	0.168
50.00	-33.70	-4.94	0.00	-240.87	0.00	240.87	1,146.35	573.17	1,132.81	559.45	4.49	-0.91	0.161
52.50	-32.78	-4.85	0.00	-228.53	0.00	228.53	1,136.25	568.13	1,105.70	546.06	4.98	-0.96	0.155
55.00	-31.86	-4.77	0.00	-216.39	0.00	216.39	1,125.94	562.97	1,078.67	532.72	5.50	-1.01	0.148
57.50	-30.94	-4.68	0.00	-204.47	0.00	204.47	1,115.40	557.70	1,051.75	519.42	6.04	-1.05	0.142
60.00	-30.03	-4.59	0.00	-192.77	0.00	192.77	1,104.64	552.32	1,024.94	506.18	6.60	-1.09	0.135
62.50	-29.13	-4.50	0.00	-181.29	0.00	181.29	1,093.65	546.83	998.25	493.00	7.18	-1.13	0.128
65.00	-28.23	-4.41	0.00	-170.04	0.00	170.04	1,082.45	541.22	971.69	479.88	7.79	-1.17	0.122
67.50	-27.34	-4.32	0.00	-159.01	0.00	159.01	1,071.02	535.51	945.28	466.84	8.41	-1.21	0.116
70.00	-26.45	-4.23	0.00	-148.22	0.00	148.22	1,059.36	529.68	919.01	453.87	9.06	-1.25	0.109
72.50	-25.57	-4.13	0.00	-137.65	0.00	137.65	1,047.49	523.74	892.91	440.97	9.72	-1.29	0.103
75.00	-24.70	-4.05	0.00	-127.32	0.00	127.32	1,035.39	517.69	866.98	428.17	10.41	-1.32	0.096
76.17	-24.29	-4.00	0.00	-122.60	0.00	122.60	1,029.67	514.83	854.94	422.22	10.73	-1.34	0.093
77.50	-23.76	-3.94	0.00	-117.26	0.00	117.26	1,023.07	511.53	841.23	415.45	11.11	-1.36	0.088
79.50	-22.96	-3.88	0.00	-109.38	0.00	109.38	1,013.05	506.53	820.77	405.35	11.68	-1.38	0.083
79.50	-22.96	-3.88	0.00	-109.38	0.00	109.38	1,013.05	506.53	820.77	405.35	11.68	-1.38	0.083
80.00	-22.76	-3.84	0.00	-107.44	0.00	107.44	831.49	415.75	686.29	338.93	11.83	-1.39	0.091
82.50	-21.92	-3.74	0.00	-97.84	0.00	97.84	822.47	411.24	666.44	329.13	12.56	-1.42	0.084
85.00	-21.08	-3.64	0.00	-88.49	0.00	88.49	813.23	406.62	646.68	319.37	13.31	-1.44	0.078
87.50	-20.25	-3.55	0.00	-79.38	0.00	79.38	803.77	401.88	627.03	309.67	14.08	-1.47	0.071
90.00	-19.42	-3.46	0.00	-70.52	0.00	70.52	794.08	397.04	607.50	300.02	14.85	-1.50	0.064
91.00	-17.82	-2.98	0.00	-67.06	0.00	67.06	790.14	395.07	599.72	296.18	15.17	-1.50	0.061
92.50	-17.40	-2.93	0.00	-62.59	0.00	62.59	784.17	392.08	588.09	290.43	15.64	-1.52	0.057
93.00	-15.43	-2.60	0.00	-61.13	0.00	61.13	782.16	391.08	584.22	288.52	15.80	-1.52	0.055
95.00	-14.88	-2.52	0.00	-55.93	0.00	55.93	774.04	387.02	568.81	280.91	16.44	-1.54	0.051
97.44	-14.22	-2.45	0.00	-49.79	0.00	49.79	763.94	381.97	550.16	271.70	17.23	-1.56	0.046
97.44	-14.22	-2.45	0.00	-49.79	0.00	49.79	763.94	381.97	550.16	271.70	17.23	-1.56	0.202
97.50	-14.20	-2.43	0.00	-49.64	0.00	49.64	763.68	381.84	549.68	271.47	17.25	-1.56	0.202

Load Case: 1.2D + 1.0Di + 1.0Wi — 50 mph with 1.00 in Radial Ice — 26 Iterations

Gust Response Factor :1.10 — Ice Dead Load Factor :1.00 — Wind Importance Factor :1.00
Dead Load Factor :1.20 — Ice Importance Factor :1.00
Wind Load Factor :1.00

100.00	-13.73	-2.36	0.00	-43.57	0.00	43.57	753.10	376.55	530.71	262.10	18.09	-1.64	0.185
101.00	-12.87	-2.18	0.00	-41.21	0.00	41.21	748.81	374.40	523.16	258.37	18.44	-1.67	0.177
102.50	-12.66	-2.13	0.00	-37.94	0.00	37.94	742.30	371.15	511.90	252.81	18.97	-1.71	0.167
105.00	-12.36	-2.09	0.00	-32.61	0.00	32.61	731.28	365.64	493.27	243.61	19.89	-1.78	0.151
107.50	-12.07	-2.04	0.00	-27.39	0.00	27.39	715.50	357.75	471.83	233.02	20.84	-1.85	0.134
110.00	-11.78	-1.99	0.00	-22.29	0.00	22.29	699.32	349.66	450.61	222.54	21.82	-1.90	0.117
112.50	-11.49	-1.94	0.00	-17.31	0.00	17.31	683.14	341.57	429.88	212.30	22.83	-1.95	0.098
115.00	-11.22	-1.89	0.00	-12.45	0.00	12.45	666.96	333.48	409.64	202.31	23.86	-1.99	0.078
117.50	-10.95	-1.84	0.00	-7.71	0.00	7.71	650.78	325.39	389.89	192.55	24.90	-2.01	0.057
120.00	0.00	-1.46	0.00	-3.10	0.00	3.10	634.60	317.30	370.62	183.04	25.96	-2.03	0.017

Load Case: 1.0D + 1.0W — Serviceability 60 mph — 25 Iterations

Gust Response Factor :1.10 — Wind Importance Factor :1.00
Dead Load Factor :1.00
Wind Load Factor :1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (ft-lb)	Discrete Forces Moment MZ (ft-lb)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (ft-lb)	Sum of Forces Moment MZ (lb)
0.00		58.2	0.0					0.0	0.0	58.2	0.0	0.0	0.0
2.50		114.8	209.3					19.0	334.0	133.7	543.3	0.0	0.0
5.00		111.6	206.9					18.8	334.0	130.4	540.9	0.0	0.0
7.50		108.6	204.4					18.7	347.7	127.2	552.0	0.0	0.0
10.00		105.6	201.9					18.5	402.3	124.1	604.2	0.0	0.0
12.50		102.7	199.4					18.4	402.3	121.1	601.7	0.0	0.0
15.00		60.2	196.9					18.2	402.3	78.5	599.2	0.0	0.0
15.48	Reinf. Top	49.3	37.5					3.5	77.1	52.8	114.6	0.0	0.0
17.50		87.7	157.0					14.6	190.2	102.4	347.2	0.0	0.0
20.00		94.7	192.0					18.0	235.3	112.7	427.2	0.0	0.0
22.50		92.2	189.5					17.9	235.3	110.0	424.7	0.0	0.0
25.00		89.7	187.0					17.7	235.3	107.4	422.3	0.0	0.0
27.50		87.3	184.5					17.6	235.3	104.9	419.8	0.0	0.0
30.00		85.5	182.0					17.5	235.3	103.0	417.3	0.0	0.0
32.50		84.7	179.5					17.5	235.3	102.2	414.8	0.0	0.0
35.00		84.3	177.1					17.6	235.3	101.8	412.3	0.0	0.0
37.50		43.4	174.6					17.6	235.3	61.0	409.8	0.0	0.0
37.58	Bot - Section 2	42.4	5.8					0.6	7.8	43.0	13.6	0.0	0.0
40.00		74.6	314.7					17.1	227.4	91.7	542.2	0.0	0.0
42.00	Top - Section 1	42.0	257.2					14.2	188.2	56.2	445.4	0.0	0.0
42.50		50.0	30.1					3.6	47.1	53.6	77.2	0.0	0.0
45.00		82.9	149.2					17.8	235.3	100.6	384.5	0.0	0.0
47.50		82.0	147.0					17.8	235.3	99.8	382.3	0.0	0.0
50.00		81.0	144.9					17.8	235.3	98.9	380.1	0.0	0.0
52.50		80.0	142.7					17.9	235.3	97.9	378.0	0.0	0.0
55.00		79.0	140.5					17.9	235.3	96.9	375.8	0.0	0.0
57.50		77.9	138.3					17.9	235.3	95.8	373.6	0.0	0.0
60.00		76.8	136.2					17.9	235.3	94.7	371.4	0.0	0.0
62.50		75.7	134.0					17.9	235.3	93.6	369.3	0.0	0.0
65.00		74.5	131.8					18.0	235.3	92.5	367.1	0.0	0.0
67.50		73.4	129.6					18.0	235.3	91.3	364.9	0.0	0.0
70.00		72.2	127.5					18.0	235.3	90.2	362.7	0.0	0.0
72.50		71.0	125.3					18.0	235.3	89.0	360.6	0.0	0.0
75.00		51.4	123.1					18.0	235.3	69.4	358.4	0.0	0.0
76.17	Bot - Section 3	34.9	56.7					8.4	109.8	43.3	166.5	0.0	0.0
77.50		46.5	120.5					9.6	125.5	56.1	246.0	0.0	0.0
79.50	Reinf. Top Reinf	34.6	178.6					14.4	188.2	49.0	366.8	0.0	0.0
80.00	Top - Section 2	40.9	44.2					3.6	47.0	44.5	91.3	0.0	0.0
82.50		67.4	102.2					18.0	235.3	85.4	337.5	0.0	0.0
85.00		66.2	100.3					18.0	235.3	84.2	335.6	0.0	0.0
87.50		64.9	98.4					18.0	235.3	82.9	333.7	0.0	0.0
90.00		44.8	96.6					18.0	235.3	62.8	331.9	0.0	0.0
91.00	Appertunance(s)	31.5	38.1	440.3	0.0	0.0	317.3	7.2	86.5	479.0	441.9	0.0	0.0
92.50		25.1	56.6					10.8	128.9	35.9	185.5	0.0	0.0
93.00	Appertunance(s)	30.9	18.7	196.5	0.0	0.0	645.8	3.6	43.0	231.0	707.5	0.0	0.0
95.00		54.2	74.1					14.4	171.8	68.6	245.9	0.0	0.0
97.44	Reinf. Top	30.3	88.7					17.5	209.4	47.8	298.1	0.0	0.0
97.50		30.4	2.3					0.4	1.2	30.9	3.4	0.0	0.0

Load Case: 1.0D + 1.0W — Serviceability 60 mph — 25 Iterations

Gust Response Factor :1.10 — Wind Importance Factor :1.00
Dead Load Factor :1.00
Wind Load Factor :1.00

100.00		41.4	89.1					18.0	47.8	59.3	136.9	0.0	0.0
101.00	Appertunance(s)	29.0	35.1	138.2	0.0	0.0	79.2	7.2	19.1	174.4	133.4	0.0	0.0
102.50		41.0	52.1					7.2	21.3	48.2	73.4	0.0	0.0
105.00		46.8	85.4					0.0	35.5	46.8	120.9	0.0	0.0
107.50		45.8	83.5					0.0	35.5	45.8	119.0	0.0	0.0
110.00		44.8	81.6					0.0	35.5	44.8	117.1	0.0	0.0
112.50		43.7	79.8					0.0	35.5	43.7	115.3	0.0	0.0
115.00		42.7	77.9					0.0	35.5	42.7	113.4	0.0	0.0
117.50		41.6	76.0					0.0	35.5	41.6	111.5	0.0	0.0
120.00	Appertunance(s)	20.6	74.2	1,386.3	0.0	3,329.4	3,223.3	0.0	35.5	1,406.9	3,332.9	0.0	0.0
									Totals:	6,542.21	21,623.6	0.00	0.00

Load Case: 1.0D + 1.0W Serviceability 60 mph 25 Iterations
Gust Response Factor :1.10 Wind Importance Factor :1.00
Dead Load Factor :1.00
Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-21.62	-6.49	0.00	-482.85	0.00	482.85	1,590.66	795.33	2,018.74	996.98	0.00	0.00	0.148
2.50	-21.07	-6.37	0.00	-466.63	0.00	466.63	1,581.24	790.62	1,982.92	979.29	0.01	-0.03	0.144
5.00	-20.53	-6.25	0.00	-450.71	0.00	450.71	1,571.59	785.80	1,947.12	961.61	0.04	-0.07	0.140
7.50	-19.97	-6.13	0.00	-435.09	0.00	435.09	1,561.72	780.86	1,911.33	943.93	0.08	-0.10	0.136
10.00	-19.37	-6.02	0.00	-419.76	0.00	419.76	1,551.63	775.81	1,875.57	926.27	0.14	-0.13	0.132
12.50	-18.76	-5.90	0.00	-404.72	0.00	404.72	1,541.31	770.66	1,839.85	908.63	0.22	-0.16	0.128
15.00	-18.16	-5.83	0.00	-389.96	0.00	389.96	1,530.78	765.39	1,804.18	891.02	0.31	-0.19	0.125
15.48	-18.05	-5.78	0.00	-387.17	0.00	387.17	1,528.73	764.37	1,797.35	887.64	0.33	-0.20	0.124
15.48	-18.05	-5.78	0.00	-387.17	0.00	387.17	1,528.73	764.37	1,797.35	887.64	0.33	-0.20	0.195
17.50	-17.70	-5.69	0.00	-375.48	0.00	375.48	1,520.01	760.01	1,768.57	873.43	0.42	-0.23	0.191
20.00	-17.26	-5.59	0.00	-361.26	0.00	361.26	1,509.03	754.52	1,733.02	855.87	0.56	-0.27	0.185
22.50	-16.84	-5.49	0.00	-347.28	0.00	347.28	1,497.83	748.91	1,697.56	838.36	0.71	-0.32	0.180
25.00	-16.41	-5.40	0.00	-333.55	0.00	333.55	1,486.40	743.20	1,662.18	820.89	0.89	-0.37	0.175
27.50	-15.99	-5.30	0.00	-320.07	0.00	320.07	1,474.74	737.37	1,626.91	803.47	1.10	-0.42	0.169
30.00	-15.57	-5.21	0.00	-306.81	0.00	306.81	1,462.87	731.44	1,591.74	786.10	1.33	-0.46	0.164
32.50	-15.15	-5.11	0.00	-293.80	0.00	293.80	1,450.77	725.39	1,556.69	768.79	1.59	-0.51	0.159
35.00	-14.73	-5.02	0.00	-281.01	0.00	281.01	1,438.45	719.23	1,521.78	751.55	1.87	-0.56	0.153
37.50	-14.32	-4.96	0.00	-268.47	0.00	268.47	1,425.91	712.96	1,487.00	734.37	2.17	-0.60	0.148
37.58	-14.31	-4.92	0.00	-268.05	0.00	268.05	1,425.49	712.74	1,485.84	733.80	2.18	-0.60	0.148
40.00	-13.76	-4.83	0.00	-256.16	0.00	256.16	1,413.15	706.57	1,452.37	717.27	2.50	-0.64	0.141
42.00	-13.32	-4.78	0.00	-246.49	0.00	246.49	1,177.15	588.58	1,220.08	602.55	2.77	-0.68	0.152
42.50	-13.24	-4.73	0.00	-244.10	0.00	244.10	1,175.29	587.65	1,214.60	599.85	2.85	-0.69	0.151
45.00	-12.85	-4.63	0.00	-232.28	0.00	232.28	1,165.87	582.93	1,187.28	586.35	3.22	-0.73	0.145
47.50	-12.47	-4.54	0.00	-220.70	0.00	220.70	1,156.22	578.11	1,160.01	572.88	3.61	-0.77	0.139
50.00	-12.08	-4.44	0.00	-209.36	0.00	209.36	1,146.35	573.17	1,132.81	559.45	4.03	-0.81	0.133
52.50	-11.70	-4.35	0.00	-198.25	0.00	198.25	1,136.25	568.13	1,105.70	546.06	4.46	-0.85	0.127
55.00	-11.33	-4.25	0.00	-187.39	0.00	187.39	1,125.94	562.97	1,078.67	532.72	4.92	-0.89	0.122
57.50	-10.95	-4.16	0.00	-176.76	0.00	176.76	1,115.40	557.70	1,051.75	519.42	5.40	-0.93	0.116
60.00	-10.58	-4.06	0.00	-166.37	0.00	166.37	1,104.64	552.32	1,024.94	506.18	5.89	-0.97	0.110
62.50	-10.21	-3.97	0.00	-156.21	0.00	156.21	1,093.65	546.83	998.25	493.00	6.41	-1.00	0.105
65.00	-9.84	-3.88	0.00	-146.29	0.00	146.29	1,082.45	541.22	971.69	479.88	6.94	-1.04	0.099
67.50	-9.48	-3.78	0.00	-136.60	0.00	136.60	1,071.02	535.51	945.28	466.84	7.50	-1.07	0.094
70.00	-9.11	-3.69	0.00	-127.14	0.00	127.14	1,059.36	529.68	919.01	453.87	8.07	-1.10	0.088
72.50	-8.75	-3.60	0.00	-117.91	0.00	117.91	1,047.49	523.74	892.91	440.97	8.65	-1.13	0.083
75.00	-8.39	-3.53	0.00	-108.91	0.00	108.91	1,035.39	517.69	866.98	428.17	9.25	-1.16	0.077
76.17	-8.23	-3.48	0.00	-104.80	0.00	104.80	1,029.67	514.83	854.94	422.22	9.54	-1.18	0.075
77.50	-7.98	-3.42	0.00	-100.15	0.00	100.15	1,023.07	511.53	841.23	415.45	9.87	-1.19	0.070
79.50	-7.62	-3.37	0.00	-93.31	0.00	93.31	1,013.05	506.53	820.77	405.35	10.38	-1.21	0.066
79.50	-7.62	-3.37	0.00	-93.31	0.00	93.31	1,013.05	506.53	820.77	405.35	10.38	-1.21	0.066
80.00	-7.52	-3.32	0.00	-91.62	0.00	91.62	831.49	415.75	686.29	338.93	10.50	-1.22	0.073
82.50	-7.19	-3.23	0.00	-83.31	0.00	83.31	822.47	411.24	666.44	329.13	11.15	-1.24	0.067
85.00	-6.85	-3.15	0.00	-75.22	0.00	75.22	813.23	406.62	646.68	319.37	11.81	-1.27	0.061
87.50	-6.52	-3.06	0.00	-67.36	0.00	67.36	803.77	401.88	627.03	309.67	12.48	-1.29	0.055
90.00	-6.19	-2.99	0.00	-59.71	0.00	59.71	794.08	397.04	607.50	300.02	13.16	-1.31	0.049
91.00	-5.76	-2.50	0.00	-56.72	0.00	56.72	790.14	395.07	599.72	296.18	13.44	-1.32	0.047
92.50	-5.57	-2.46	0.00	-52.97	0.00	52.97	784.17	392.08	588.09	290.43	13.85	-1.33	0.044
93.00	-4.87	-2.22	0.00	-51.74	0.00	51.74	782.16	391.08	584.22	288.52	13.99	-1.33	0.043
95.00	-4.63	-2.14	0.00	-47.31	0.00	47.31	774.04	387.02	568.81	280.91	14.55	-1.35	0.040
97.44	-4.33	-2.09	0.00	-42.09	0.00	42.09	763.94	381.97	550.16	271.70	15.25	-1.36	0.036
97.44	-4.33	-2.09	0.00	-42.09	0.00	42.09	763.94	381.97	550.16	271.70	15.25	-1.36	0.161
97.50	-4.32	-2.06	0.00	-41.96	0.00	41.96	763.68	381.84	549.68	271.47	15.27	-1.36	0.160

Load Case: 1.0D + 1.0W Serviceability 60 mph 25 Iterations
Gust Response Factor :1.10 Wind Importance Factor :1.00
Dead Load Factor :1.00
Wind Load Factor :1.00

100.00	-4.19	-2.00	0.00	-36.81	0.00	36.81	753.10	376.55	530.71	262.10	16.00	-1.43	0.146
101.00	-4.06	-1.83	0.00	-34.81	0.00	34.81	748.81	374.40	523.16	258.37	16.30	-1.46	0.140
102.50	-3.98	-1.78	0.00	-32.07	0.00	32.07	742.30	371.15	511.90	252.81	16.76	-1.50	0.132
105.00	-3.86	-1.73	0.00	-27.62	0.00	27.62	731.28	365.64	493.27	243.61	17.56	-1.55	0.119
107.50	-3.74	-1.69	0.00	-23.29	0.00	23.29	715.50	357.75	471.83	233.02	18.39	-1.61	0.105
110.00	-3.63	-1.64	0.00	-19.08	0.00	19.08	699.32	349.66	450.61	222.54	19.25	-1.65	0.091
112.50	-3.51	-1.60	0.00	-14.97	0.00	14.97	683.14	341.57	429.88	212.30	20.13	-1.70	0.076
115.00	-3.40	-1.55	0.00	-10.98	0.00	10.98	666.96	333.48	409.64	202.31	21.02	-1.73	0.059
117.50	-3.29	-1.51	0.00	-7.10	0.00	7.10	650.78	325.39	389.89	192.55	21.93	-1.75	0.042
120.00	0.00	-1.41	0.00	-3.33	0.00	3.33	634.60	317.30	370.62	183.04	22.86	-1.77	0.018

Equivalent Lateral Forces Method Analysis

(Based on ASCE7-10 Chapters 11, 12, 15)

Spectral Response Acceleration for Short Period (S_s):	0.19
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Long-Period Transition Period (T_L):	6
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coeffiecient F_v:	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.20
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Seismic Response Coefficient (C_s):	0.03
Upper Limit C_s	0.03
Lower Limit C_s	0.03
Period based on Rayleigh Method (sec):	2.02
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.76
Total Unfactored Dead Load:	21.62 k
Seismic Base Shear (E):	0.95 k

Load Case (1.2 + 0.2Sds) * DL + E ELFM — Seismic Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
57	118.75	110	489	0.013	12	136
56	116.25	112	479	0.013	12	138
55	113.75	113	469	0.012	12	141
54	111.25	115	459	0.012	11	143
53	108.75	117	448	0.012	11	145
52	106.25	119	437	0.011	11	147
51	103.75	121	425	0.011	11	150
50	101.75	73	250	0.007	6	91
49	90.50	54	180	0.005	5	67
48	98.75	137	442	0.012	11	170
47	97.47	3	11	0.000	0	4
46	96.22	298	919	0.024	23	370
45	94.00	246	728	0.019	18	305
44	92.75	62	178	0.005	4	76
43	91.75	185	526	0.014	13	230
42	90.50	125	345	0.009	9	154
41	88.75	332	887	0.023	22	411
40	86.25	334	849	0.022	21	414
39	83.75	336	810	0.021	20	416
38	81.25	337	773	0.020	19	418
37	79.75	91	202	0.005	5	113
36	78.50	367	790	0.021	20	455
35	76.83	246	510	0.013	13	305

34	75.58	166	336	0.009	8	206
33	73.75	358	692	0.018	17	444
32	71.25	361	655	0.017	16	447
31	68.75	363	619	0.016	15	450
30	66.25	365	583	0.015	15	452
29	63.75	367	549	0.014	14	455
28	61.25	369	514	0.014	13	458
27	58.75	371	481	0.013	12	460
26	56.25	374	448	0.012	11	463
25	53.75	376	416	0.011	10	466
24	51.25	378	385	0.010	10	468
23	48.75	380	354	0.009	9	471
22	46.25	382	325	0.009	8	474
21	43.75	384	296	0.008	7	477
20	42.25	77	56	0.001	1	96
19	41.00	445	306	0.008	8	552
18	38.79	542	338	0.009	8	672
17	37.54	14	8	0.000	0	17
16	36.25	410	227	0.006	6	508
15	33.75	412	201	0.005	5	511
14	31.25	415	177	0.005	4	514
13	28.75	417	154	0.004	4	517
12	26.25	420	132	0.003	3	520
11	23.75	422	111	0.003	3	523
10	21.25	425	92	0.002	2	526
9	18.75	427	74	0.002	2	530
8	16.49	347	48	0.001	1	430
7	15.24	115	14	0.000	0	142
6	13.75	599	60	0.002	2	743
5	11.25	602	43	0.001	1	746
4	8.75	604	27	0.001	1	749
3	6.25	552	14	0.000	0	684
2	3.75	541	6	0.000	0	670
1	1.25	543	1	0.000	0	673
CCI TPX-070821	120.00	45	205	0.005	5	56
Powerwave LGP21401	120.00	85	385	0.010	10	105
Raycap DC6-48-60-18-	120.00	40	182	0.005	5	50
Ericsson RRUS A2	120.00	45	205	0.005	5	56
Ericsson RRUS-11 190	120.00	132	600	0.016	15	164
Ericsson RRUS 32 (50	120.00	152	693	0.018	17	189
Ericsson RRUS 32 B2	120.00	159	723	0.019	18	197
2' Std. Dish	120.00	14	64	0.002	2	17
Powerwave Allgon 777	120.00	105	477	0.013	12	130
KMW AM-X-CD-16-65-00	120.00	49	221	0.006	6	60
Quintel QS66512-3 (1	120.00	112	509	0.013	13	139
Andrew SBNH-1D6565C	120.00	122	553	0.015	14	151
CCI TPA-65R-LCUUUU-H	120.00	164	747	0.020	19	204
Flat Platform w/ Han	120.00	2,000	9,093	0.239	227	2,479
RFS APXV18-206517S-C	101.00	79	266	0.007	7	98
Argus LLPX310R	93.00	86	249	0.007	6	106
Side Arms	93.00	560	1,626	0.043	41	694
Horizon Compact	91.00	42	118	0.003	3	53
NextNet BTS-2500	91.00	105	293	0.008	7	130
DragonWave A-ANT-18G	91.00	27	76	0.002	2	34
DragonWave A-ANT-11G	91.00	143	399	0.010	10	177
		21,624	38,032	1.000	951	26,802

Load Case (0.9 - 0.2Sds) * DL + E ELFM — Seismic (Reduced DL) Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
57	118.75	110	489	0.013	12	94
56	116.25	112	479	0.013	12	96
55	113.75	113	469	0.012	12	98
54	111.25	115	459	0.012	11	99
53	108.75	117	448	0.012	11	101
52	106.25	119	437	0.011	11	102
51	103.75	121	425	0.011	11	104
50	101.75	73	250	0.007	6	63
49	100.50	54	180	0.005	5	47
48	98.75	137	442	0.012	11	118
47	97.47	3	11	0.000	0	3
46	96.22	298	919	0.024	23	257
45	94.00	246	728	0.019	18	212
44	92.75	62	178	0.005	4	53
43	91.75	185	526	0.014	13	160
42	90.50	125	345	0.009	9	107
41	88.75	332	887	0.023	22	286
40	86.25	334	849	0.022	21	287
39	83.75	336	810	0.021	20	289
38	81.25	337	773	0.020	19	290
37	79.75	91	202	0.005	5	79
36	78.50	367	790	0.021	20	316
35	76.83	246	510	0.013	13	212
34	75.58	166	336	0.009	8	143
33	73.75	358	692	0.018	17	308
32	71.25	361	655	0.017	16	310
31	68.75	363	619	0.016	15	312
30	66.25	365	583	0.015	15	314
29	63.75	367	549	0.014	14	316
28	61.25	369	514	0.014	13	318
27	58.75	371	481	0.013	12	320
26	56.25	374	448	0.012	11	322
25	53.75	376	416	0.011	10	323
24	51.25	378	385	0.010	10	325
23	48.75	380	354	0.009	9	327
22	46.25	382	325	0.009	8	329
21	43.75	384	296	0.008	7	331
20	42.25	77	56	0.001	1	66
19	41.00	445	306	0.008	8	383
18	38.79	542	338	0.009	8	467
17	37.54	14	8	0.000	0	12
16	36.25	410	227	0.006	6	353
15	33.75	412	201	0.005	5	355
14	31.25	415	177	0.005	4	357
13	28.75	417	154	0.004	4	359
12	26.25	420	132	0.003	3	361
11	23.75	422	111	0.003	3	363
10	21.25	425	92	0.002	2	366
9	18.75	427	74	0.002	2	368
8	16.49	347	48	0.001	1	299
7	15.24	115	14	0.000	0	99
6	13.75	599	60	0.002	2	516
5	11.25	602	43	0.001	1	518
4	8.75	604	27	0.001	1	520
3	6.25	552	14	0.000	0	475
2	3.75	541	6	0.000	0	465
1	1.25	543	1	0.000	0	468

CCI TPX-070821	120.00	45	205	0.005	5	39
Powerwave LGP21401	120.00	85	385	0.010	10	73
Raycap DC6-48-60-18-	120.00	40	182	0.005	5	34
Ericsson RRUS A2	120.00	45	205	0.005	5	39
Ericsson RRUS-11 190	120.00	132	600	0.016	15	114
Ericsson RRUS 32 (50	120.00	152	693	0.018	17	131
Ericsson RRUS 32 B2	120.00	159	723	0.019	18	137
2' Std. Dish	120.00	14	64	0.002	2	12
Powerwave Allgon 777	120.00	105	477	0.013	12	90
KMW AM-X-CD-16-65-00	120.00	49	221	0.006	6	42
Quintel QS66512-3 (1	120.00	112	509	0.013	13	96
Andrew SBNH-1D6565C	120.00	122	553	0.015	14	105
CCI TPA-65R-LCUUUU-H	120.00	164	747	0.020	19	141
Flat Platform w/ Han	120.00	2,000	9,093	0.239	227	1,721
RFS APXV18-206517S-C	101.00	79	266	0.007	7	68
Argus LLPX310R	93.00	86	249	0.007	6	74
Side Arms	93.00	560	1,626	0.043	41	482
Horizon Compact	91.00	42	118	0.003	3	36
NextNet BTS-2500	91.00	105	293	0.008	7	90
DragonWave A-ANT-18G	91.00	27	76	0.002	2	23
DragonWave A-ANT-11G	91.00	143	399	0.010	10	123
		21,624	38,032	1.000	951	18,608

Load Case (1.2 + 0.2Sds) * DL + E ELFM — Seismic Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-26.13	-0.95	0.00	-93.60	0.00	93.60	1,590.66	795.33	2,018.74	996.98	0.00	0.00	0.034
2.50	-25.46	-0.95	0.00	-91.22	0.00	91.22	1,581.24	790.62	1,982.92	979.29	0.00	-0.01	0.033
5.00	-24.77	-0.96	0.00	-88.83	0.00	88.83	1,571.59	785.80	1,947.12	961.61	0.01	-0.01	0.033
7.50	-24.02	-0.96	0.00	-86.44	0.00	86.44	1,561.72	780.86	1,911.33	943.93	0.02	-0.02	0.032
10.00	-23.28	-0.96	0.00	-84.05	0.00	84.05	1,551.63	775.81	1,875.57	926.27	0.03	-0.03	0.031
12.50	-22.54	-0.96	0.00	-81.65	0.00	81.65	1,541.31	770.66	1,839.85	908.63	0.04	-0.03	0.030
15.00	-22.39	-0.96	0.00	-79.25	0.00	79.25	1,530.78	765.39	1,804.18	891.02	0.06	-0.04	0.030
15.48	-21.96	-0.96	0.00	-78.79	0.00	78.79	1,528.73	764.37	1,797.35	887.64	0.07	-0.04	0.030
15.48	-21.96	-0.96	0.00	-78.79	0.00	78.79	1,528.73	764.37	1,797.35	887.64	0.07	-0.04	0.046
17.50	-21.43	-0.96	0.00	-76.84	0.00	76.84	1,520.01	760.01	1,768.57	873.43	0.08	-0.05	0.045
20.00	-20.91	-0.96	0.00	-74.44	0.00	74.44	1,509.03	754.52	1,733.02	855.87	0.11	-0.06	0.044
22.50	-20.38	-0.96	0.00	-72.04	0.00	72.04	1,497.83	748.91	1,697.56	838.36	0.14	-0.07	0.043
25.00	-19.86	-0.96	0.00	-69.63	0.00	69.63	1,486.40	743.20	1,662.18	820.89	0.18	-0.07	0.042
27.50	-19.35	-0.96	0.00	-67.22	0.00	67.22	1,474.74	737.37	1,626.91	803.47	0.22	-0.08	0.041
30.00	-18.83	-0.96	0.00	-64.82	0.00	64.82	1,462.87	731.44	1,591.74	786.10	0.27	-0.09	0.040
32.50	-18.32	-0.96	0.00	-62.43	0.00	62.43	1,450.77	725.39	1,556.69	768.79	0.32	-0.10	0.039
35.00	-17.81	-0.95	0.00	-60.04	0.00	60.04	1,438.45	719.23	1,521.78	751.55	0.38	-0.11	0.038
37.50	-17.80	-0.95	0.00	-57.65	0.00	57.65	1,425.91	712.96	1,487.00	734.37	0.44	-0.12	0.037
37.58	-17.12	-0.95	0.00	-57.57	0.00	57.57	1,425.49	712.74	1,485.84	733.80	0.44	-0.12	0.037
40.00	-16.57	-0.94	0.00	-55.29	0.00	55.29	1,413.15	706.57	1,452.37	717.27	0.51	-0.13	0.035
42.00	-16.48	-0.94	0.00	-53.41	0.00	53.41	1,177.15	588.58	1,220.08	602.55	0.56	-0.14	0.038
42.50	-16.00	-0.93	0.00	-52.94	0.00	52.94	1,175.29	587.65	1,214.60	599.85	0.58	-0.14	0.038
45.00	-15.52	-0.92	0.00	-50.62	0.00	50.62	1,165.87	582.93	1,187.28	586.35	0.66	-0.15	0.037
47.50	-15.05	-0.92	0.00	-48.31	0.00	48.31	1,156.22	578.11	1,160.01	572.88	0.74	-0.16	0.035
50.00	-14.58	-0.91	0.00	-46.01	0.00	46.01	1,146.35	573.17	1,132.81	559.45	0.82	-0.17	0.034
52.50	-14.12	-0.90	0.00	-43.74	0.00	43.74	1,136.25	568.13	1,105.70	546.06	0.91	-0.18	0.033
55.00	-13.66	-0.89	0.00	-41.50	0.00	41.50	1,125.94	562.97	1,078.67	532.72	1.01	-0.19	0.031
57.50	-13.20	-0.88	0.00	-39.28	0.00	39.28	1,115.40	557.70	1,051.75	519.42	1.11	-0.20	0.030
60.00	-12.74	-0.86	0.00	-37.09	0.00	37.09	1,104.64	552.32	1,024.94	506.18	1.22	-0.20	0.029
62.50	-12.28	-0.85	0.00	-34.93	0.00	34.93	1,093.65	546.83	998.25	493.00	1.32	-0.21	0.027
65.00	-11.83	-0.84	0.00	-32.80	0.00	32.80	1,082.45	541.22	971.69	479.88	1.44	-0.22	0.026
67.50	-11.38	-0.82	0.00	-30.72	0.00	30.72	1,071.02	535.51	945.28	466.84	1.55	-0.23	0.025
70.00	-10.93	-0.80	0.00	-28.67	0.00	28.67	1,059.36	529.68	919.01	453.87	1.68	-0.23	0.023
72.50	-10.49	-0.78	0.00	-26.66	0.00	26.66	1,047.49	523.74	892.91	440.97	1.80	-0.24	0.022
75.00	-10.28	-0.78	0.00	-24.70	0.00	24.70	1,035.39	517.69	866.98	428.17	1.93	-0.25	0.021
76.17	-9.98	-0.76	0.00	-23.79	0.00	23.79	1,029.67	514.83	854.94	422.22	1.99	-0.25	0.020
77.50	-9.52	-0.74	0.00	-22.78	0.00	22.78	1,023.07	511.53	841.23	415.45	2.06	-0.25	0.019
79.50	-9.41	-0.74	0.00	-21.29	0.00	21.29	1,013.05	506.53	820.77	405.35	2.17	-0.26	0.018
79.50	-9.41	-0.74	0.00	-21.29	0.00	21.29	1,013.05	506.53	820.77	405.35	2.17	-0.26	0.018
80.00	-8.99	-0.72	0.00	-20.93	0.00	20.93	831.49	415.75	686.29	338.93	2.20	-0.26	0.020
82.50	-8.58	-0.69	0.00	-19.13	0.00	19.13	822.47	411.24	666.44	329.13	2.33	-0.27	0.018
85.00	-8.16	-0.67	0.00	-17.40	0.00	17.40	813.23	406.62	646.68	319.37	2.47	-0.27	0.017
87.50	-7.75	-0.65	0.00	-15.72	0.00	15.72	803.77	401.88	627.03	309.67	2.62	-0.28	0.016
90.00	-7.60	-0.64	0.00	-14.09	0.00	14.09	794.08	397.04	607.50	300.02	2.77	-0.28	0.014
91.00	-6.97	-0.60	0.00	-13.45	0.00	13.45	790.14	395.07	599.72	296.18	2.82	-0.28	0.014
92.50	-6.90	-0.60	0.00	-12.55	0.00	12.55	784.17	392.08	588.09	290.43	2.91	-0.29	0.013
93.00	-5.79	-0.53	0.00	-12.25	0.00	12.25	782.16	391.08	584.22	288.52	2.94	-0.29	0.012
95.00	-5.42	-0.50	0.00	-11.20	0.00	11.20	774.04	387.02	568.81	280.91	3.07	-0.29	0.011
97.44	-5.42	-0.50	0.00	-9.97	0.00	9.97	763.94	381.97	550.16	271.70	3.22	-0.29	0.010
97.44	-5.42	-0.50	0.00	-9.97	0.00	9.97	763.94	381.97	550.16	271.70	3.22	-0.29	0.044
97.50	-5.25	-0.49	0.00	-9.94	0.00	9.94	763.68	381.84	549.68	271.47	3.22	-0.29	0.044
100.00	-5.18	-0.49	0.00	-8.71	0.00	8.71	753.10	376.55	530.71	262.10	3.38	-0.31	0.040
101.00	-4.99	-0.47	0.00	-8.23	0.00	8.23	748.81	374.40	523.16	258.37	3.44	-0.32	0.039
102.50	-4.84	-0.46	0.00	-7.52	0.00	7.52	742.30	371.15	511.90	252.81	3.54	-0.33	0.036
105.00	-4.70	-0.45	0.00	-6.36	0.00	6.36	731.28	365.64	493.27	243.61	3.72	-0.34	0.033
107.50	-4.55	-0.44	0.00	-5.22	0.00	5.22	715.50	357.75	471.83	233.02	3.90	-0.35	0.029

110.00	-4.41	-0.43	0.00	-4.12	0.00	4.12	699.32	349.66	450.61	222.54	4.09	-0.36	0.025
112.50	-4.27	-0.42	0.00	-3.04	0.00	3.04	683.14	341.57	429.88	212.30	4.28	-0.37	0.021
115.00	-4.13	-0.41	0.00	-2.00	0.00	2.00	666.96	333.48	409.64	202.31	4.47	-0.38	0.016
117.50	-3.99	-0.39	0.00	-0.98	0.00	0.98	650.78	325.39	389.89	192.55	4.67	-0.38	0.011
120.00	0.00	-0.37	0.00	0.00	0.00	0.00	634.60	317.30	370.62	183.04	4.87	-0.38	0.000

Load Case (0.9 - 0.2Sds) * DL + E ELFM — Seismic (Reduced DL) Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-18.14	-0.95	0.00	-92.38	0.00	92.38	1,590.66	795.33	2,018.74	996.98	0.00	0.00	0.032
2.50	-17.67	-0.95	0.00	-90.00	0.00	90.00	1,581.24	790.62	1,982.92	979.29	0.00	-0.01	0.031
5.00	-17.20	-0.95	0.00	-87.62	0.00	87.62	1,571.59	785.80	1,947.12	961.61	0.01	-0.01	0.030
7.50	-16.68	-0.96	0.00	-85.23	0.00	85.23	1,561.72	780.86	1,911.33	943.93	0.02	-0.02	0.030
10.00	-16.16	-0.96	0.00	-82.85	0.00	82.85	1,551.63	775.81	1,875.57	926.27	0.03	-0.03	0.029
12.50	-15.65	-0.96	0.00	-80.46	0.00	80.46	1,541.31	770.66	1,839.85	908.63	0.04	-0.03	0.028
15.00	-15.55	-0.96	0.00	-78.07	0.00	78.07	1,530.78	765.39	1,804.18	891.02	0.06	-0.04	0.028
15.48	-15.25	-0.96	0.00	-77.61	0.00	77.61	1,528.73	764.37	1,797.35	887.64	0.06	-0.04	0.028
15.48	-15.25	-0.96	0.00	-77.61	0.00	77.61	1,528.73	764.37	1,797.35	887.64	0.06	-0.04	0.043
17.50	-14.88	-0.96	0.00	-75.68	0.00	75.68	1,520.01	760.01	1,768.57	873.43	0.08	-0.04	0.042
20.00	-14.52	-0.96	0.00	-73.29	0.00	73.29	1,509.03	754.52	1,733.02	855.87	0.11	-0.05	0.041
22.50	-14.15	-0.95	0.00	-70.90	0.00	70.90	1,497.83	748.91	1,697.56	838.36	0.14	-0.06	0.041
25.00	-13.79	-0.95	0.00	-68.51	0.00	68.51	1,486.40	743.20	1,662.18	820.89	0.18	-0.07	0.040
27.50	-13.43	-0.95	0.00	-66.13	0.00	66.13	1,474.74	737.37	1,626.91	803.47	0.22	-0.08	0.039
30.00	-13.07	-0.95	0.00	-63.75	0.00	63.75	1,462.87	731.44	1,591.74	786.10	0.26	-0.09	0.038
32.50	-12.72	-0.94	0.00	-61.38	0.00	61.38	1,450.77	725.39	1,556.69	768.79	0.31	-0.10	0.037
35.00	-12.37	-0.94	0.00	-59.02	0.00	59.02	1,438.45	719.23	1,521.78	751.55	0.37	-0.11	0.036
37.50	-12.35	-0.94	0.00	-56.67	0.00	56.67	1,425.91	712.96	1,487.00	734.37	0.43	-0.12	0.035
37.58	-11.89	-0.93	0.00	-56.59	0.00	56.59	1,425.49	712.74	1,485.84	733.80	0.43	-0.12	0.034
40.00	-11.50	-0.93	0.00	-54.33	0.00	54.33	1,413.15	706.57	1,452.37	717.27	0.50	-0.13	0.033
42.00	-11.44	-0.93	0.00	-52.48	0.00	52.48	1,177.15	588.58	1,220.08	602.55	0.55	-0.14	0.036
42.50	-11.11	-0.92	0.00	-52.02	0.00	52.02	1,175.29	587.65	1,214.60	599.85	0.57	-0.14	0.035
45.00	-10.78	-0.91	0.00	-49.72	0.00	49.72	1,165.87	582.93	1,187.28	586.35	0.65	-0.15	0.034
47.50	-10.45	-0.90	0.00	-47.44	0.00	47.44	1,156.22	578.11	1,160.01	572.88	0.73	-0.16	0.033
50.00	-10.13	-0.89	0.00	-45.19	0.00	45.19	1,146.35	573.17	1,132.81	559.45	0.81	-0.17	0.032
52.50	-9.80	-0.88	0.00	-42.95	0.00	42.95	1,136.25	568.13	1,105.70	546.06	0.90	-0.18	0.031
55.00	-9.48	-0.87	0.00	-40.74	0.00	40.74	1,125.94	562.97	1,078.67	532.72	0.99	-0.18	0.029
57.50	-9.16	-0.86	0.00	-38.56	0.00	38.56	1,115.40	557.70	1,051.75	519.42	1.09	-0.19	0.028
60.00	-8.84	-0.85	0.00	-36.40	0.00	36.40	1,104.64	552.32	1,024.94	506.18	1.20	-0.20	0.027
62.50	-8.53	-0.84	0.00	-34.28	0.00	34.28	1,093.65	546.83	998.25	493.00	1.30	-0.21	0.026
65.00	-8.21	-0.82	0.00	-32.19	0.00	32.19	1,082.45	541.22	971.69	479.88	1.41	-0.22	0.024
67.50	-7.90	-0.80	0.00	-30.14	0.00	30.14	1,071.02	535.51	945.28	466.84	1.53	-0.22	0.023
70.00	-7.59	-0.79	0.00	-28.13	0.00	28.13	1,059.36	529.68	919.01	453.87	1.65	-0.23	0.022
72.50	-7.28	-0.77	0.00	-26.16	0.00	26.16	1,047.49	523.74	892.91	440.97	1.77	-0.24	0.020
75.00	-7.14	-0.76	0.00	-24.23	0.00	24.23	1,035.39	517.69	866.98	428.17	1.90	-0.24	0.019
76.17	-6.93	-0.75	0.00	-23.34	0.00	23.34	1,029.67	514.83	854.94	422.22	1.96	-0.25	0.019
77.50	-6.61	-0.73	0.00	-22.34	0.00	22.34	1,023.07	511.53	841.23	415.45	2.03	-0.25	0.018
79.50	-6.53	-0.72	0.00	-20.89	0.00	20.89	1,013.05	506.53	820.77	405.35	2.13	-0.26	0.017
79.50	-6.53	-0.72	0.00	-20.89	0.00	20.89	1,013.05	506.53	820.77	405.35	2.13	-0.26	0.017
80.00	-6.24	-0.70	0.00	-20.53	0.00	20.53	831.49	415.75	686.29	338.93	2.16	-0.26	0.018
82.50	-5.95	-0.68	0.00	-18.77	0.00	18.77	822.47	411.24	666.44	329.13	2.30	-0.26	0.017
85.00	-5.67	-0.66	0.00	-17.06	0.00	17.06	813.23	406.62	646.68	319.37	2.43	-0.27	0.016
87.50	-5.38	-0.64	0.00	-15.41	0.00	15.41	803.77	401.88	627.03	309.67	2.58	-0.27	0.014
90.00	-5.27	-0.63	0.00	-13.82	0.00	13.82	794.08	397.04	607.50	300.02	2.72	-0.28	0.013
91.00	-4.84	-0.59	0.00	-13.19	0.00	13.19	790.14	395.07	599.72	296.18	2.78	-0.28	0.013
92.50	-4.79	-0.59	0.00	-12.31	0.00	12.31	784.17	392.08	588.09	290.43	2.87	-0.28	0.012
93.00	-4.02	-0.52	0.00	-12.01	0.00	12.01	782.16	391.08	584.22	288.52	2.90	-0.28	0.011
95.00	-3.76	-0.49	0.00	-10.98	0.00	10.98	774.04	387.02	568.81	280.91	3.02	-0.29	0.010
97.44	-3.76	-0.49	0.00	-9.77	0.00	9.77	763.94	381.97	550.16	271.70	3.16	-0.29	0.010
97.44	-3.76	-0.49	0.00	-9.77	0.00	9.77	763.94	381.97	550.16	271.70	3.16	-0.29	0.041
97.50	-3.64	-0.48	0.00	-9.74	0.00	9.74	763.68	381.84	549.68	271.47	3.17	-0.29	0.041
100.00	-3.60	-0.48	0.00	-8.54	0.00	8.54	753.10	376.55	530.71	262.10	3.32	-0.31	0.037
101.00	-3.47	-0.47	0.00	-8.06	0.00	8.06	748.81	374.40	523.16	258.37	3.39	-0.31	0.036
102.50	-3.36	-0.45	0.00	-7.36	0.00	7.36	742.30	371.15	511.90	252.81	3.49	-0.32	0.034
105.00	-3.26	-0.44	0.00	-6.22	0.00	6.22	731.28	365.64	493.27	243.61	3.66	-0.33	0.030
107.50	-3.16	-0.43	0.00	-5.11	0.00	5.11	715.50	357.75	471.83	233.02	3.84	-0.35	0.026

110.00	-3.06	-0.42	0.00	-4.03	0.00	4.03	699.32	349.66	450.61	222.54	4.02	-0.36	0.022
112.50	-2.96	-0.41	0.00	-2.98	0.00	2.98	683.14	341.57	429.88	212.30	4.21	-0.36	0.018
115.00	-2.87	-0.40	0.00	-1.95	0.00	1.95	666.96	333.48	409.64	202.31	4.40	-0.37	0.014
117.50	-2.77	-0.38	0.00	-0.96	0.00	0.96	650.78	325.39	389.89	192.55	4.59	-0.37	0.009
120.00	0.00	-0.37	0.00	0.00	0.00	0.00	634.60	317.30	370.62	183.04	4.79	-0.38	0.000

Equivalent Modal Forces Analysis

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period (S_s):	0.19
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.20
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Period Based on Rayleigh Method (sec):	2.02
Redundancy Factor (p):	1.30

Load Case (1.2 + 0.2Sds) * DL + E EMAM — Seismic Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
57	118.75	110	1.851	1.780	1.067	0.353	34	136
56	116.25	112	1.774	1.422	0.933	0.304	29	138
55	113.75	113	1.698	1.116	0.812	0.259	25	141
54	111.25	115	1.624	0.856	0.704	0.217	22	143
53	108.75	117	1.552	0.638	0.607	0.178	18	145
52	106.25	119	1.482	0.457	0.521	0.143	15	147
51	103.75	121	1.413	0.308	0.445	0.111	12	150
50	101.75	73	1.359	0.210	0.391	0.088	6	91
49	100.50	54	1.326	0.158	0.359	0.074	3	67
48	98.75	137	1.280	0.094	0.319	0.057	7	170
47	97.47	3	1.247	0.054	0.291	0.045	0	4
46	96.22	298	1.215	0.019	0.266	0.034	9	370
45	94.00	246	1.160	-0.030	0.226	0.017	4	305
44	92.75	62	1.129	-0.052	0.205	0.009	0	76
43	91.75	185	1.105	-0.067	0.190	0.002	0	230
42	90.50	125	1.075	-0.083	0.172	-0.005	-1	154
41	88.75	332	1.034	-0.100	0.149	-0.013	-4	411
40	86.25	334	0.976	-0.115	0.120	-0.023	-7	414
39	83.75	336	0.921	-0.121	0.096	-0.030	-9	416
38	81.25	337	0.866	-0.121	0.075	-0.033	-10	418
37	79.75	91	0.835	-0.117	0.064	-0.034	-3	113
36	78.50	367	0.809	-0.113	0.056	-0.034	-11	455
35	76.83	246	0.775	-0.107	0.047	-0.033	-7	305
34	75.58	166	0.750	-0.101	0.041	-0.031	-4	206
33	73.75	358	0.714	-0.091	0.033	-0.028	-9	444
32	71.25	361	0.666	-0.076	0.024	-0.021	-7	447
31	68.75	363	0.620	-0.060	0.017	-0.013	-4	450
30	66.25	365	0.576	-0.044	0.012	-0.004	-1	452
29	63.75	367	0.533	-0.028	0.009	0.005	2	455
28	61.25	369	0.492	-0.013	0.007	0.014	4	458
27	58.75	371	0.453	0.001	0.006	0.022	7	460
26	56.25	374	0.415	0.013	0.006	0.030	10	463
25	53.75	376	0.379	0.024	0.007	0.036	12	466
24	51.25	378	0.345	0.034	0.009	0.041	13	468

23	48.75	380	0.312	0.043	0.011	0.045	15	471
22	46.25	382	0.281	0.049	0.014	0.047	16	474
21	43.75	384	0.251	0.055	0.017	0.049	16	477
20	42.25	77	0.234	0.058	0.019	0.050	3	96
19	41.00	445	0.221	0.060	0.021	0.050	19	552
18	38.79	542	0.198	0.063	0.024	0.050	24	672
17	37.54	14	0.185	0.065	0.025	0.050	1	17
16	36.25	410	0.172	0.066	0.027	0.050	18	508
15	33.75	412	0.150	0.068	0.030	0.049	18	511
14	31.25	415	0.128	0.069	0.033	0.049	18	514
13	28.75	417	0.108	0.071	0.036	0.048	17	517
12	26.25	420	0.090	0.071	0.038	0.047	17	520
11	23.75	422	0.074	0.072	0.040	0.046	17	523
10	21.25	425	0.059	0.072	0.041	0.045	17	526
9	18.75	427	0.046	0.071	0.042	0.044	16	530
8	16.49	347	0.036	0.069	0.041	0.043	13	430
7	15.24	115	0.030	0.068	0.041	0.042	4	142
6	13.75	599	0.025	0.066	0.039	0.041	21	743
5	11.25	602	0.017	0.062	0.036	0.039	20	746
4	8.75	604	0.010	0.055	0.032	0.035	18	749
3	6.25	552	0.005	0.045	0.025	0.030	14	684
2	3.75	541	0.002	0.031	0.017	0.021	10	670
1	1.25	543	0.000	0.012	0.006	0.009	4	673
CCI TPX-070821	120.00	45	1.890	1.980	1.140	0.378	15	56
Powerwave LGP21401	120.00	85	1.890	1.980	1.140	0.378	28	105
Raycap DC6-48-60-18-	120.00	40	1.890	1.980	1.140	0.378	13	50
Ericsson RRUS A2	120.00	45	1.890	1.980	1.140	0.378	15	56
Ericsson RRUS-11 190	120.00	132	1.890	1.980	1.140	0.378	43	164
Ericsson RRUS 32 (50	120.00	152	1.890	1.980	1.140	0.378	50	189
Ericsson RRUS 32 B2	120.00	159	1.890	1.980	1.140	0.378	52	197
2' Std. Dish	120.00	14	1.890	1.980	1.140	0.378	5	17
Powerwave Allgon 777	120.00	105	1.890	1.980	1.140	0.378	34	130
KMW AM-X-CD-16-65-00	120.00	49	1.890	1.980	1.140	0.378	16	60
Quintel QS66512-3 (1	120.00	112	1.890	1.980	1.140	0.378	37	139
Andrew SBNH-1D6565C	120.00	122	1.890	1.980	1.140	0.378	40	151
CCI TPA-65R-LCUUUU-H	120.00	164	1.890	1.980	1.140	0.378	54	204
Flat Platform w/ Han	120.00	2,000	1.890	1.980	1.140	0.378	656	2,479
RFS APXV18-206517S-C	101.00	79	1.339	0.178	0.372	0.079	5	98
Argus LLPX310R	93.00	86	1.135	-0.048	0.209	0.010	1	106
Side Arms	93.00	560	1.135	-0.048	0.209	0.010	5	694
Horizon Compact	91.00	42	1.087	-0.077	0.179	-0.002	0	53
NextNet BTS-2500	91.00	105	1.087	-0.077	0.179	-0.002	0	130
DragonWave A-ANT-18G	91.00	27	1.087	-0.077	0.179	-0.002	0	34
DragonWave A-ANT-11G	91.00	143	1.087	-0.077	0.179	-0.002	0	177
		21,624	71.500	34.598	26.407	8.104	1,561	26,802

Load Case (0.9 - 0.2Sds) * DL + E EMAM — Seismic (Reduced DL) Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
57	118.75	110	1.851	1.780	1.067	0.353	34	94
56	116.25	112	1.774	1.422	0.933	0.304	29	96
55	113.75	113	1.698	1.116	0.812	0.259	25	98
54	111.25	115	1.624	0.856	0.704	0.217	22	99
53	108.75	117	1.552	0.638	0.607	0.178	18	101
52	106.25	119	1.482	0.457	0.521	0.143	15	102
51	103.75	121	1.413	0.308	0.445	0.111	12	104
50	101.75	73	1.359	0.210	0.391	0.088	6	63
49	100.50	54	1.326	0.158	0.359	0.074	3	47

48		98.75	137	1.280	0.094	0.319	0.057	7	118
47		97.47	3	1.247	0.054	0.291	0.045	0	3
46		96.22	298	1.215	0.019	0.266	0.034	9	257
45		94.00	246	1.160	-0.030	0.226	0.017	4	212
44		92.75	62	1.129	-0.052	0.205	0.009	0	53
43		91.75	185	1.105	-0.067	0.190	0.002	0	160
42		90.50	125	1.075	-0.083	0.172	-0.005	-1	107
41		88.75	332	1.034	-0.100	0.149	-0.013	-4	286
40		86.25	334	0.976	-0.115	0.120	-0.023	-7	287
39		83.75	336	0.921	-0.121	0.096	-0.030	-9	289
38		81.25	337	0.866	-0.121	0.075	-0.033	-10	290
37		79.75	91	0.835	-0.117	0.064	-0.034	-3	79
36		78.50	367	0.809	-0.113	0.056	-0.034	-11	316
35		76.83	246	0.775	-0.107	0.047	-0.033	-7	212
34		75.58	166	0.750	-0.101	0.041	-0.031	-4	143
33		73.75	358	0.714	-0.091	0.033	-0.028	-9	308
32		71.25	361	0.666	-0.076	0.024	-0.021	-7	310
31		68.75	363	0.620	-0.060	0.017	-0.013	-4	312
30		66.25	365	0.576	-0.044	0.012	-0.004	-1	314
29		63.75	367	0.533	-0.028	0.009	0.005	2	316
28		61.25	369	0.492	-0.013	0.007	0.014	4	318
27		58.75	371	0.453	0.001	0.006	0.022	7	320
26		56.25	374	0.415	0.013	0.006	0.030	10	322
25		53.75	376	0.379	0.024	0.007	0.036	12	323
24		51.25	378	0.345	0.034	0.009	0.041	13	325
23		48.75	380	0.312	0.043	0.011	0.045	15	327
22		46.25	382	0.281	0.049	0.014	0.047	16	329
21		43.75	384	0.251	0.055	0.017	0.049	16	331
20		42.25	77	0.234	0.058	0.019	0.050	3	66
19		41.00	445	0.221	0.060	0.021	0.050	19	383
18		38.79	542	0.198	0.063	0.024	0.050	24	467
17		37.54	14	0.185	0.065	0.025	0.050	1	12
16		36.25	410	0.172	0.066	0.027	0.050	18	353
15		33.75	412	0.150	0.068	0.030	0.049	18	355
14		31.25	415	0.128	0.069	0.033	0.049	18	357
13		28.75	417	0.108	0.071	0.036	0.048	17	359
12		26.25	420	0.090	0.071	0.038	0.047	17	361
11		23.75	422	0.074	0.072	0.040	0.046	17	363
10		21.25	425	0.059	0.072	0.041	0.045	17	366
9		18.75	427	0.046	0.071	0.042	0.044	16	368
8		16.49	347	0.036	0.069	0.041	0.043	13	299
7		15.24	115	0.030	0.068	0.041	0.042	4	99
6		13.75	599	0.025	0.066	0.039	0.041	21	516
5		11.25	602	0.017	0.062	0.036	0.039	20	518
4		8.75	604	0.010	0.055	0.032	0.035	18	520
3		6.25	552	0.005	0.045	0.025	0.030	14	475
2		3.75	541	0.002	0.031	0.017	0.021	10	465
1		1.25	543	0.000	0.012	0.006	0.009	4	468
CCI TPX-070821		120.00	45	1.890	1.980	1.140	0.378	15	39
Powerwave LGP21401		120.00	85	1.890	1.980	1.140	0.378	28	73
Raycap DC6-48-60-18-		120.00	40	1.890	1.980	1.140	0.378	13	34
Ericsson RRUS A2		120.00	45	1.890	1.980	1.140	0.378	15	39
Ericsson RRUS-11 190		120.00	132	1.890	1.980	1.140	0.378	43	114
Ericsson RRUS 32 (50		120.00	152	1.890	1.980	1.140	0.378	50	131
Ericsson RRUS 32 B2		120.00	159	1.890	1.980	1.140	0.378	52	137
2' Std. Dish		120.00	14	1.890	1.980	1.140	0.378	5	12
Powerwave Allgon 777		120.00	105	1.890	1.980	1.140	0.378	34	90
KMW AM-X-CD-16-65-00		120.00	49	1.890	1.980	1.140	0.378	16	42
Quintel QS66512-3 (1		120.00	112	1.890	1.980	1.140	0.378	37	96
Andrew SBNH-1D6565C		120.00	122	1.890	1.980	1.140	0.378	40	105
CCI TPA-65R-LCUUUU-H		120.00	164	1.890	1.980	1.140	0.378	54	141
Flat Platform w/ Han		120.00	2,000	1.890	1.980	1.140	0.378	656	1,721
RFS APXV18-206517S-C		101.00	79	1.339	0.178	0.372	0.079	5	68
Argus LLPX310R		93.00	86	1.135	-0.048	0.209	0.010	1	74

Side Arms	93.00	560	1.135	-0.048	0.209	0.010	5	482
Horizon Compact	91.00	42	1.087	-0.077	0.179	-0.002	0	36
NextNet BTS-2500	91.00	105	1.087	-0.077	0.179	-0.002	0	90
DragonWave A-ANT-18G	91.00	27	1.087	-0.077	0.179	-0.002	0	23
DragonWave A-ANT-11G	91.00	143	1.087	-0.077	0.179	-0.002	0	123
		21,624	71.500	34.598	26.407	8.104	1,561	18,608

Load Case (1.2 + 0.2Sds) * DL + E EMAM Seismic Equivalent Modal Analysis Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-26.13	-1.56	0.00	-160.25	0.00	160.25	1,590.66	795.33	2,018.74	996.98	0.00	0.00	0.054
2.50	-25.46	-1.55	0.00	-156.36	0.00	156.36	1,581.24	790.62	1,982.92	979.29	0.00	-0.01	0.053
5.00	-24.77	-1.54	0.00	-152.48	0.00	152.48	1,571.59	785.80	1,947.12	961.61	0.01	-0.02	0.052
7.50	-24.02	-1.53	0.00	-148.62	0.00	148.62	1,561.72	780.86	1,911.33	943.93	0.03	-0.03	0.051
10.00	-23.28	-1.51	0.00	-144.80	0.00	144.80	1,551.63	775.81	1,875.57	926.27	0.05	-0.04	0.050
12.50	-22.53	-1.49	0.00	-141.02	0.00	141.02	1,541.31	770.66	1,839.85	908.63	0.07	-0.06	0.049
15.00	-22.39	-1.49	0.00	-137.28	0.00	137.28	1,530.78	765.39	1,804.18	891.02	0.11	-0.07	0.048
15.48	-21.96	-1.48	0.00	-136.57	0.00	136.57	1,528.73	764.37	1,797.35	887.64	0.11	-0.07	0.047
15.48	-21.96	-1.48	0.00	-136.57	0.00	136.57	1,528.73	764.37	1,797.35	887.64	0.11	-0.07	0.074
17.50	-21.43	-1.47	0.00	-133.57	0.00	133.57	1,520.01	760.01	1,768.57	873.43	0.14	-0.08	0.073
20.00	-20.91	-1.46	0.00	-129.90	0.00	129.90	1,509.03	754.52	1,733.02	855.87	0.19	-0.10	0.072
22.50	-20.38	-1.45	0.00	-126.26	0.00	126.26	1,497.83	748.91	1,697.56	838.36	0.24	-0.11	0.070
25.00	-19.86	-1.43	0.00	-122.64	0.00	122.64	1,486.40	743.20	1,662.18	820.89	0.31	-0.13	0.069
27.50	-19.34	-1.42	0.00	-119.05	0.00	119.05	1,474.74	737.37	1,626.91	803.47	0.38	-0.15	0.068
30.00	-18.83	-1.41	0.00	-115.50	0.00	115.50	1,462.87	731.44	1,591.74	786.10	0.46	-0.16	0.066
32.50	-18.32	-1.39	0.00	-111.98	0.00	111.98	1,450.77	725.39	1,556.69	768.79	0.55	-0.18	0.065
35.00	-17.81	-1.38	0.00	-108.49	0.00	108.49	1,438.45	719.23	1,521.78	751.55	0.65	-0.20	0.064
37.50	-17.79	-1.38	0.00	-105.04	0.00	105.04	1,425.91	712.96	1,487.00	734.37	0.76	-0.22	0.062
37.58	-17.12	-1.36	0.00	-104.93	0.00	104.93	1,425.49	712.74	1,485.84	733.80	0.77	-0.22	0.062
40.00	-16.57	-1.34	0.00	-101.64	0.00	101.64	1,413.15	706.57	1,452.37	717.27	0.88	-0.23	0.060
42.00	-16.47	-1.34	0.00	-98.96	0.00	98.96	1,177.15	588.58	1,220.08	602.55	0.98	-0.25	0.065
42.50	-16.00	-1.33	0.00	-98.29	0.00	98.29	1,175.29	587.65	1,214.60	599.85	1.01	-0.25	0.065
45.00	-15.52	-1.31	0.00	-94.98	0.00	94.98	1,165.87	582.93	1,187.28	586.35	1.14	-0.27	0.063
47.50	-15.05	-1.30	0.00	-91.70	0.00	91.70	1,156.22	578.11	1,160.01	572.88	1.29	-0.29	0.062
50.00	-14.58	-1.29	0.00	-88.45	0.00	88.45	1,146.35	573.17	1,132.81	559.45	1.44	-0.30	0.060
52.50	-14.11	-1.28	0.00	-85.23	0.00	85.23	1,136.25	568.13	1,105.70	546.06	1.61	-0.32	0.058
55.00	-13.65	-1.27	0.00	-82.03	0.00	82.03	1,125.94	562.97	1,078.67	532.72	1.78	-0.34	0.057
57.50	-13.19	-1.26	0.00	-78.86	0.00	78.86	1,115.40	557.70	1,051.75	519.42	1.96	-0.35	0.055
60.00	-12.73	-1.26	0.00	-75.70	0.00	75.70	1,104.64	552.32	1,024.94	506.18	2.15	-0.37	0.053
62.50	-12.28	-1.26	0.00	-72.55	0.00	72.55	1,093.65	546.83	998.25	493.00	2.35	-0.39	0.052
65.00	-11.82	-1.26	0.00	-69.40	0.00	69.40	1,082.45	541.22	971.69	479.88	2.55	-0.40	0.050
67.50	-11.37	-1.26	0.00	-66.25	0.00	66.25	1,071.02	535.51	945.28	466.84	2.77	-0.42	0.048
70.00	-10.93	-1.27	0.00	-63.09	0.00	63.09	1,059.36	529.68	919.01	453.87	2.99	-0.44	0.046
72.50	-10.48	-1.28	0.00	-59.91	0.00	59.91	1,047.49	523.74	892.91	440.97	3.23	-0.45	0.044
75.00	-10.28	-1.28	0.00	-56.71	0.00	56.71	1,035.39	517.69	866.98	428.17	3.47	-0.47	0.043
76.17	-9.97	-1.29	0.00	-55.22	0.00	55.22	1,029.67	514.83	854.94	422.22	3.58	-0.47	0.042
77.50	-9.52	-1.30	0.00	-53.50	0.00	53.50	1,023.07	511.53	841.23	415.45	3.71	-0.48	0.040
79.50	-9.40	-1.30	0.00	-50.90	0.00	50.90	1,013.05	506.53	820.77	405.35	3.92	-0.49	0.038
79.50	-9.40	-1.30	0.00	-50.90	0.00	50.90	1,013.05	506.53	820.77	405.35	3.92	-0.49	0.038
80.00	-8.98	-1.31	0.00	-50.25	0.00	50.25	831.49	415.75	686.29	338.93	3.97	-0.50	0.042
82.50	-8.57	-1.32	0.00	-46.98	0.00	46.98	822.47	411.24	666.44	329.13	4.23	-0.51	0.040
85.00	-8.15	-1.32	0.00	-43.69	0.00	43.69	813.23	406.62	646.68	319.37	4.50	-0.52	0.037
87.50	-7.74	-1.32	0.00	-40.39	0.00	40.39	803.77	401.88	627.03	309.67	4.78	-0.54	0.035
90.00	-7.59	-1.32	0.00	-37.08	0.00	37.08	794.08	397.04	607.50	300.02	5.07	-0.55	0.032
91.00	-6.96	-1.32	0.00	-35.76	0.00	35.76	790.14	395.07	599.72	296.18	5.18	-0.55	0.031
92.50	-6.89	-1.32	0.00	-33.78	0.00	33.78	784.17	392.08	588.09	290.43	5.36	-0.56	0.030
93.00	-5.78	-1.30	0.00	-33.12	0.00	33.12	782.16	391.08	584.22	288.52	5.42	-0.56	0.029
95.00	-5.41	-1.29	0.00	-30.53	0.00	30.53	774.04	387.02	568.81	280.91	5.65	-0.57	0.027
97.44	-5.41	-1.29	0.00	-27.39	0.00	27.39	763.94	381.97	550.16	271.70	5.95	-0.58	0.024
97.44	-5.41	-1.29	0.00	-27.39	0.00	27.39	763.94	381.97	550.16	271.70	5.95	-0.58	0.108
97.50	-5.24	-1.28	0.00	-27.31	0.00	27.31	763.68	381.84	549.68	271.47	5.96	-0.58	0.107
100.00	-5.17	-1.28	0.00	-24.11	0.00	24.11	753.10	376.55	530.71	262.10	6.27	-0.63	0.099
101.00	-4.98	-1.27	0.00	-22.83	0.00	22.83	748.81	374.40	523.16	258.37	6.41	-0.64	0.095
102.50	-4.83	-1.26	0.00	-20.93	0.00	20.93	742.30	371.15	511.90	252.81	6.61	-0.67	0.089
105.00	-4.68	-1.24	0.00	-17.79	0.00	17.79	731.28	365.64	493.27	243.61	6.98	-0.71	0.079
107.50	-4.54	-1.23	0.00	-14.68	0.00	14.68	715.50	357.75	471.83	233.02	7.36	-0.74	0.069

110.00	-4.39	-1.20	0.00	-11.62	0.00	11.62	699.32	349.66	450.61	222.54	7.75	-0.77	0.058
112.50	-4.25	-1.18	0.00	-8.60	0.00	8.60	683.14	341.57	429.88	212.30	8.16	-0.79	0.047
115.00	-4.12	-1.15	0.00	-5.66	0.00	5.66	666.96	333.48	409.64	202.31	8.58	-0.81	0.034
117.50	-3.98	-1.11	0.00	-2.79	0.00	2.79	650.78	325.39	389.89	192.55	9.01	-0.82	0.021
120.00	0.00	-1.06	0.00	0.00	0.00	0.00	634.60	317.30	370.62	183.04	9.45	-0.83	0.000

Load Case (0.9 - 0.2Sds) * DL + E EMAM — Seismic (Reduced DL) Equivalent Modal Analysis Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-18.14	-1.56	0.00	-157.98	0.00	157.98	1,590.66	795.33	2,018.74	996.98	0.00	0.00	0.051
2.50	-17.67	-1.55	0.00	-154.08	0.00	154.08	1,581.24	790.62	1,982.92	979.29	0.00	-0.01	0.050
5.00	-17.20	-1.54	0.00	-150.21	0.00	150.21	1,571.59	785.80	1,947.12	961.61	0.01	-0.02	0.049
7.50	-16.68	-1.52	0.00	-146.36	0.00	146.36	1,561.72	780.86	1,911.33	943.93	0.03	-0.03	0.048
10.00	-16.16	-1.51	0.00	-142.55	0.00	142.55	1,551.63	775.81	1,875.57	926.27	0.05	-0.04	0.047
12.50	-15.64	-1.49	0.00	-138.79	0.00	138.79	1,541.31	770.66	1,839.85	908.63	0.07	-0.05	0.046
15.00	-15.55	-1.48	0.00	-135.07	0.00	135.07	1,530.78	765.39	1,804.18	891.02	0.10	-0.07	0.045
15.48	-15.25	-1.47	0.00	-134.36	0.00	134.36	1,528.73	764.37	1,797.35	887.64	0.11	-0.07	0.045
15.48	-15.25	-1.47	0.00	-134.36	0.00	134.36	1,528.73	764.37	1,797.35	887.64	0.11	-0.07	0.071
17.50	-14.88	-1.46	0.00	-131.38	0.00	131.38	1,520.01	760.01	1,768.57	873.43	0.14	-0.08	0.070
20.00	-14.51	-1.45	0.00	-127.73	0.00	127.73	1,509.03	754.52	1,733.02	855.87	0.19	-0.09	0.068
22.50	-14.15	-1.43	0.00	-124.12	0.00	124.12	1,497.83	748.91	1,697.56	838.36	0.24	-0.11	0.067
25.00	-13.79	-1.42	0.00	-120.54	0.00	120.54	1,486.40	743.20	1,662.18	820.89	0.30	-0.13	0.066
27.50	-13.43	-1.40	0.00	-116.99	0.00	116.99	1,474.74	737.37	1,626.91	803.47	0.37	-0.14	0.065
30.00	-13.07	-1.39	0.00	-113.48	0.00	113.48	1,462.87	731.44	1,591.74	786.10	0.45	-0.16	0.063
32.50	-12.72	-1.38	0.00	-110.00	0.00	110.00	1,450.77	725.39	1,556.69	768.79	0.54	-0.18	0.062
35.00	-12.36	-1.36	0.00	-106.56	0.00	106.56	1,438.45	719.23	1,521.78	751.55	0.64	-0.20	0.061
37.50	-12.35	-1.36	0.00	-103.16	0.00	103.16	1,425.91	712.96	1,487.00	734.37	0.75	-0.21	0.059
37.58	-11.88	-1.34	0.00	-103.05	0.00	103.05	1,425.49	712.74	1,485.84	733.80	0.75	-0.21	0.059
40.00	-11.50	-1.32	0.00	-99.82	0.00	99.82	1,413.15	706.57	1,452.37	717.27	0.87	-0.23	0.057
42.00	-11.43	-1.32	0.00	-97.18	0.00	97.18	1,177.15	588.58	1,220.08	602.55	0.96	-0.24	0.062
42.50	-11.10	-1.30	0.00	-96.52	0.00	96.52	1,175.29	587.65	1,214.60	599.85	0.99	-0.25	0.062
45.00	-10.77	-1.29	0.00	-93.26	0.00	93.26	1,165.87	582.93	1,187.28	586.35	1.12	-0.26	0.060
47.50	-10.45	-1.28	0.00	-90.04	0.00	90.04	1,156.22	578.11	1,160.01	572.88	1.27	-0.28	0.059
50.00	-10.12	-1.26	0.00	-86.85	0.00	86.85	1,146.35	573.17	1,132.81	559.45	1.42	-0.30	0.057
52.50	-9.80	-1.25	0.00	-83.70	0.00	83.70	1,136.25	568.13	1,105.70	546.06	1.58	-0.31	0.056
55.00	-9.48	-1.24	0.00	-80.56	0.00	80.56	1,125.94	562.97	1,078.67	532.72	1.75	-0.33	0.054
57.50	-9.16	-1.24	0.00	-77.46	0.00	77.46	1,115.40	557.70	1,051.75	519.42	1.93	-0.35	0.053
60.00	-8.84	-1.23	0.00	-74.36	0.00	74.36	1,104.64	552.32	1,024.94	506.18	2.11	-0.36	0.051
62.50	-8.52	-1.23	0.00	-71.28	0.00	71.28	1,093.65	546.83	998.25	493.00	2.31	-0.38	0.049
65.00	-8.21	-1.23	0.00	-68.20	0.00	68.20	1,082.45	541.22	971.69	479.88	2.51	-0.40	0.048
67.50	-7.89	-1.24	0.00	-65.12	0.00	65.12	1,071.02	535.51	945.28	466.84	2.72	-0.41	0.046
70.00	-7.58	-1.24	0.00	-62.02	0.00	62.02	1,059.36	529.68	919.01	453.87	2.94	-0.43	0.044
72.50	-7.28	-1.25	0.00	-58.91	0.00	58.91	1,047.49	523.74	892.91	440.97	3.17	-0.44	0.042
75.00	-7.13	-1.26	0.00	-55.78	0.00	55.78	1,035.39	517.69	866.98	428.17	3.41	-0.46	0.041
76.17	-6.92	-1.26	0.00	-54.31	0.00	54.31	1,029.67	514.83	854.94	422.22	3.52	-0.47	0.040
77.50	-6.60	-1.27	0.00	-52.63	0.00	52.63	1,023.07	511.53	841.23	415.45	3.65	-0.47	0.038
79.50	-6.52	-1.28	0.00	-50.08	0.00	50.08	1,013.05	506.53	820.77	405.35	3.85	-0.48	0.037
79.50	-6.52	-1.28	0.00	-50.08	0.00	50.08	1,013.05	506.53	820.77	405.35	3.85	-0.48	0.037
80.00	-6.23	-1.28	0.00	-49.45	0.00	49.45	831.49	415.75	686.29	338.93	3.90	-0.49	0.040
82.50	-5.95	-1.29	0.00	-46.24	0.00	46.24	822.47	411.24	666.44	329.13	4.16	-0.50	0.038
85.00	-5.66	-1.30	0.00	-43.01	0.00	43.01	813.23	406.62	646.68	319.37	4.43	-0.51	0.036
87.50	-5.37	-1.30	0.00	-39.77	0.00	39.77	803.77	401.88	627.03	309.67	4.70	-0.53	0.033
90.00	-5.26	-1.30	0.00	-36.52	0.00	36.52	794.08	397.04	607.50	300.02	4.98	-0.54	0.031
91.00	-4.83	-1.30	0.00	-35.22	0.00	35.22	790.14	395.07	599.72	296.18	5.09	-0.54	0.030
92.50	-4.78	-1.30	0.00	-33.27	0.00	33.27	784.17	392.08	588.09	290.43	5.27	-0.55	0.028
93.00	-4.01	-1.28	0.00	-32.63	0.00	32.63	782.16	391.08	584.22	288.52	5.33	-0.55	0.028
95.00	-3.75	-1.27	0.00	-30.07	0.00	30.07	774.04	387.02	568.81	280.91	5.56	-0.56	0.026
97.44	-3.75	-1.27	0.00	-26.97	0.00	26.97	763.94	381.97	550.16	271.70	5.85	-0.57	0.023
97.44	-3.75	-1.27	0.00	-26.97	0.00	26.97	763.94	381.97	550.16	271.70	5.85	-0.57	0.104
97.50	-3.63	-1.26	0.00	-26.90	0.00	26.90	763.68	381.84	549.68	271.47	5.86	-0.57	0.104
100.00	-3.59	-1.26	0.00	-23.74	0.00	23.74	753.10	376.55	530.71	262.10	6.17	-0.62	0.095
101.00	-3.45	-1.25	0.00	-22.48	0.00	22.48	748.81	374.40	523.16	258.37	6.30	-0.63	0.092
102.50	-3.35	-1.24	0.00	-20.60	0.00	20.60	742.30	371.15	511.90	252.81	6.50	-0.66	0.086
105.00	-3.25	-1.22	0.00	-17.51	0.00	17.51	731.28	365.64	493.27	243.61	6.86	-0.70	0.076
107.50	-3.15	-1.21	0.00	-14.45	0.00	14.45	715.50	357.75	471.83	233.02	7.23	-0.73	0.066

110.00	-3.05	-1.19	0.00	-11.43	0.00	11.43	699.32	349.66	450.61	222.54	7.62	-0.76	0.056
112.50	-2.95	-1.16	0.00	-8.46	0.00	8.46	683.14	341.57	429.88	212.30	8.02	-0.78	0.044
115.00	-2.85	-1.13	0.00	-5.56	0.00	5.56	666.96	333.48	409.64	202.31	8.44	-0.80	0.032
117.50	-2.76	-1.10	0.00	-2.74	0.00	2.74	650.78	325.39	389.89	192.55	8.86	-0.81	0.018
120.00	0.00	-1.06	0.00	0.00	0.00	0.00	634.60	317.30	370.62	183.04	9.29	-0.81	0.000

Analysis Summary

Load Case	Shear FX (kips)	Shear FZ (kips)	Reactions Axial FY (kips)	Reactions Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Max Usage Elev (ft)	Max Usage Interaction Ratio
1.2D + 1.6W	24.19	0.00	25.92	0.00	0.00	1824.93	15.48	0.72
0.9D + 1.6W	24.18	0.00	19.43	0.00	0.00	1806.86	15.48	0.71
1.2D + 1.0Di + 1.0Wi	6.49	0.00	54.54	0.00	0.00	527.98	15.48	0.23
(1.2 + 0.2Sds) * DL + E ELFM	0.95	0.00	26.13	0.00	0.00	93.60	15.48	0.05
(1.2 + 0.2Sds) * DL + E EMAM	1.56	0.00	26.13	0.00	0.00	160.25	97.44	0.11
(0.9 - 0.2Sds) * DL + E ELFM	0.95	0.00	18.14	0.00	0.00	92.38	15.48	0.04
(0.9 - 0.2Sds) * DL + E EMAM	1.56	0.00	18.14	0.00	0.00	157.98	97.44	0.10
1.0D + 1.0W	6.49	0.00	21.62	0.00	0.00	482.85	15.48	0.20

Additional Steel Summary

Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors VQ/I (lb/in)	Intermediate Connectors Shear Applied (kips)	Intermediate Connectors Shear phiVn (kips)	Upper Termination Connectors MQ/I (kips)	Upper Termination Connectors phiVn (kips)	Upper Termination Connectors Num Reqd	Upper Termination Connectors Num Actual	Lower Termination Connectors MQ/I (kips)	Lower Termination Connectors phiVn (kips)	Lower Termination Connectors Num Reqd	Lower Termination Connectors Num Actual	Max Member Pu (kip)	Max Member phiPn (kip)	Ratio
0.00	15.4	(4) SOL-#20 All Thre	224.6	6.7	16.8	179.0	12.0	15	20	0.0	12.0	0	0	205.3	330.5	0.621
0.00	79.5	(4) SOL-#20 All Thre	355.4	10.7	16.8	0.0	12.0	0	12	0.0	12.0	0	0	282.4	330.5	0.854
79.5	97.4	(4) SOL-#20 All Thre	345.6	10.4	16.8	61.9	12.0	6	12	0.0	12.0	0	0	115.8	330.5	0.350

Base/Flange Plate		
Plate Type	*Baseplate*	
Pole Diameter	31	in
Pole Thickness	0.25	in
Plate Diameter	44.59	in
Plate Thickness	2.125	in
Plate Fy	60	ksi
Weld Length	0.25	in
ϕ_s Resistance	787.68	k-in
Applied	271.83	k-in

Stiffeners		
#	*8*	*Show*
Thickness	0.375	in
Length	3	in
Height	3	in
Chamfer	0	in
Offset Angle	12.5	°
Fy	36	ksi

Bolts		
#	*8*	
Bolt Circle	38.59	in
(R)adial / (S)quare	R	
Diameter	2.25	in
Hole Diameter	2.625	in
Type	18J	
Fy	75	ksi
Fu	100	ksi
ϕ_s Resistance	259.82	k
Applied	121.76	k

Reinforcement		
#	*8*	
DYW. Circle	37	in
Offset Angle	22.5	°
Type	#20	
Diameter	2.5	in
Fu	100	ksi
ϕ_s Resistance	269.98	k
Applied	158.68	k

Extra Bolts O		
#	*0*	

Code Rev.	*G*
Moment	1824.9 k-ft
Axial	25.9 k

Date	12/27/2016
Engineer	C. Poe
Site #	302500
Carrier	AT&T Mobility

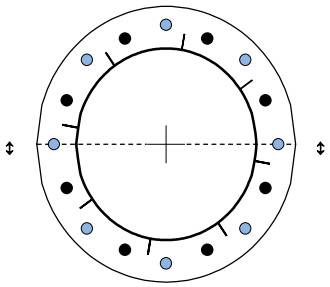
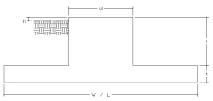


Plate Stress Ratio: 0.35 (Pass)

Bolt Stress Ratio: 0.47 (Pass)

Reinforcement Stress Ratio: 0.59 (Pass)

Site Name:	Brst - Bristol	*Program Last Updated:*	*11/15/2012*
Site Number:	302500		
Engineering Number:	OAA686853_C3_02		
Engineer:	C. Poe		
Date:	12/27/16		
Tower Type:	MP		



Design Loads (Factored) - Analysis per TIA-222-G Standards

Design / Analysis / Mapping:	Mapping	
Compression/Leg:	25.9	k
Uplift/Leg:		k
Total Shear:	24.2	k
Moment:	1824.9	k-ft
Tower + Appurtenance Weight:	21.6	k
Depth to Base of Foundation (l + t - h):	6.50	ft
Diameter of Pier (d):	6.00	ft
Height of Pier above Ground (h):	2.70	
Width of Pad (W):	17.50	ft
Length of Pad (L):	18.40	ft
Thickness of Pad (t):	2.50	ft
Tower Leg Center to Center:	0.00	ft
Number of Tower Legs:	1.0	(1 if MP or GT)
Tower Center from Mat Center:	0.00	ft
Depth Below Ground Surface to Water Table:	99.00	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil Above Water Table:	115.0	pcf
Unit Weight of Water:	62.4	pcf
Unit Weight of Soil Below Water Table:	50.0	pcf
Friction Angle of Uplift:	15.0	Degrees
Ultimate Coefficient of Shear Friction:	0.50	
Ultimate Compressive Bearing Pressure:	40000.0	psf
Ultimate Passive Pressure on Pad Face:	2000.0	psf
$\phi_{Soil\ and\ Concrete\ Weight}$:	0.9	
ϕ_{Soil}:	0.75	

Overturning Moment Usage

Design OTM:	2047.5	k-ft	
OTM Resistance:	2668.6	k-ft	
Design OTM / OTM Resistance:	0.77	Result:	OK

Soil Bearing Pressure Usage

Net Bearing Pressure:	3866	psf	
Factored Nominal Bearing Pressure:	30000	psf	
Net Bearing Pressure/Factored Nominal Bearing Pressure:	0.13	Result:	OK
Load Direction Controling Design Bearing Pressure:	Diagonal to Pad Edge		

Sliding Factor of Safety

Total Factored Sliding Resistance:	175.5	k	
Sliding Design / Sliding Resistance:	0.14	Result:	OK

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING TOWER:
(3) RRUS-32 TO REPLACE EXISTING (3) RRUS-11 & (3) A2 MODULES

ITEMS TO BE INSTALLED INSIDE THE EXISTING AT&T EQUIPMENT AREA:
(1) XMU, (1) IDL2, (3) RRUS-11, (1) DUS, (1) SURGE ARRESTOR & (1) EQUIPMENT RACK

ITEMS TO REMAIN:
(9) AT&T ANTENNAS, (6) RRH'S, (3) TMA'S, (2) SURGE SUPPRESSORS, (4) DC POWER, (2) FIBER LINE, & (12) LINES 1-5/8" COAX

ITEMS TO BE REMOVED:
(3) RRUS-11, & (3) A2 MODULES

PTN(4C): 2051A070X1 PTN(MULTI): 2051A06YA2
RFDS REVISION(4C): FINAL DATE: 07/21/2016
RFDS REVISION (MULTI): FINAL DATE: 10/04/2016

SITE ADDRESS:	1 WILLIS STREET BRISTOL, CT 06010
LATITUDE:	41.649075° N, 41° 38' 56.67" N
LONGITUDE:	72.948027° W, 72° 56' 52.89" W
USID:	59357
LANDLORD:	AMERICAN TOWER CORP.
TYPE OF SITE:	MONOPOLE
TOWER HEIGHT:	120'-0"
RAD CENTER:	124'-0"
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

FA NUMBER: 10035029
SITE NUMBER: CTL01055
SITE NAME: BRISTOL
AMERICAN TOWER SITE ID: 302500
1 WILLIS STREET
BRISTOL, CT 06010
PACE ID(4C): MRCTB019449
PACE ID(MULTI): MRCTB019367
PROJECT: LTE 4C/MULTI CARRIER

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY:	SMARTLINK, LLC
ADDRESS:	1997 ANNAPOLIS EXCHANGE PARKWAY, SUITE 200
CITY, STATE, ZIP:	ANNAPOLIS, MD 21401
CONTACT:	TIM BOYCE
PHONE:	(908) 333-3640
E-MAIL:	tboyce@smartlinkllc.com

RF ENGINEER

COMPANY:	AT&T MOBILITY - NEW ENGLAND
ADDRESS:	550 COCHITUATE ROAD SUITE 550 13 AND 14
CITY, STATE, ZIP:	FRAMINGHAM, MA 01701
CONTACT:	CAMERON SYME
PHONE:	(508) 596-7146
E-MAIL:	cs6970@att.com

SITE ACQUISITION

COMPANY:	SMARTLINK, LLC
ADDRESS:	85 RANGEWAY RD, SUITE 102
CITY, STATE, ZIP:	BILLERICA, MA 01862
CONTACT:	SHARON R. KEEFE
PHONE:	(978) 930-3918
E-MAIL:	sharon.keefe@smartlinkllc.com

CONSTRUCTION MANAGER

COMPANY:	SMARTLINK, LLC.
ADDRESS:	85 RANGEWAY RD, SUITE 102
CITY, STATE, ZIP:	BILLERICA, MA 01862
CONTACT:	MARK J. DONNELLY
PHONE:	(617) 515-2080
E-MAIL:	mark.donnelly@smartlinkllc.com

ENGINEERING

COMPANY:	HUDSON DESIGN GROUP, LLC.
ADDRESS:	1600 OSGOOD STREET BUILDING 20 NORTH, SUITE 3090
CITY, STATE, ZIP:	NORTH ANDOVER, MA 01845
CONTACT:	DANIEL P. HAMM, PE
PHONE:	(978) 557-5553
E-MAIL:	info@hudsondesigngroupllc.com

DRAWING INDEX

VICINITY MAP

DIRECTIONS TO SITE:

DEPART ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI. TURN LEFT ONTO CAPITOL BLVD. 0.2 MI. TURN LEFT ONTO WEST ST. 0.3 MI. TAKE RAMP LEFT FOR I-91 S. 1.7 MI. AT EXIT 22N, TAKE RAMP RIGHT FOR CT-9 NORTH TOWARD NEW BRITAIN. 6.6 MI. AT EXIT 28, TAKE RAMP LEFT FOR CT-72 WEST TOWARD BRISTOL. 3.2 MI. KEEP STRAIGHT ONTO I-84 W / CT-72 W. 0.3 MI. AT EXIT 33, TAKE RAMP RIGHT FOR CT-72 WEST TOWARD BRISTOL. 2.7 MI. KEEP STRAIGHT TO STAY ON CT-72 W. 1.8 MI. KEEP STRAIGHT ONTO PINE ST. 0.1 MI. ROAD NAME CHANGES TO MOUNTAIN RD. 0.3 MI. KEEP STRAIGHT ONTO SOUTH ST. 0.6 MI. TURN LEFT ONTO WILLIS ST. 1.5 MI.

ARRIVE AT ENTRANCE TO SITE ON THE RIGHT.

GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

APPROVALS

DISCIPLINE:	SIGNATURE:	DATE:
THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS & AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT & MAY IMPOSE CHANGES OR MODIFICATIONS.		
SMARTLINK SITE ACQUISITION:		
SMARTLINK CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

72 HOURS

CALL BEFORE YOU DIG
CALL TOLL FREE 1-800-922-4455
OR CALL 811

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

smartlink
1997 ANNAPOLIS EXCHANGE PKWY
SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01055
SITE NAME: BRISTOL
AMERICAN TOWER SITE ID: 302500
1 WILLIS STREET
BRISTOL, CT 06010
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	02/17/17	ISSUED FOR REVIEW	RP	JC	DPH
0	01/13/17	ISSUED FOR REVIEW	SB	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: RP

STATE OF CONNECTICUT — REGISTERED — LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
4C / MULTI CARRIER

SITE NUMBER	DRAWING NUMBER	REV
CTL01055	T-1	1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – SMARTLINK
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:
    SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
    BUILDING CODE: IBC 2012 WITH 2016 CT STATE BUILDING CODE AMENDMENTS
    ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
    LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

    SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

    AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

    AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

    MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

    TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-G, STRUCTURAL STANDARDS FOR STEEL

    EQUIPMENT AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

    FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

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SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01055
SITE NAME: BRISTOL
AMERICAN TOWER SITE ID: 302500
1 WILLIS STREET
BRISTOL, CT 06010
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	02/17/17	ISSUED FOR REVIEW	RP	JC	DPH
0	01/13/17	ISSUED FOR REVIEW	SB	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: RP

STATE OF CONNECTICUT – DEREK J. CREASER – LICENSED PROFESSIONAL ENGINEER

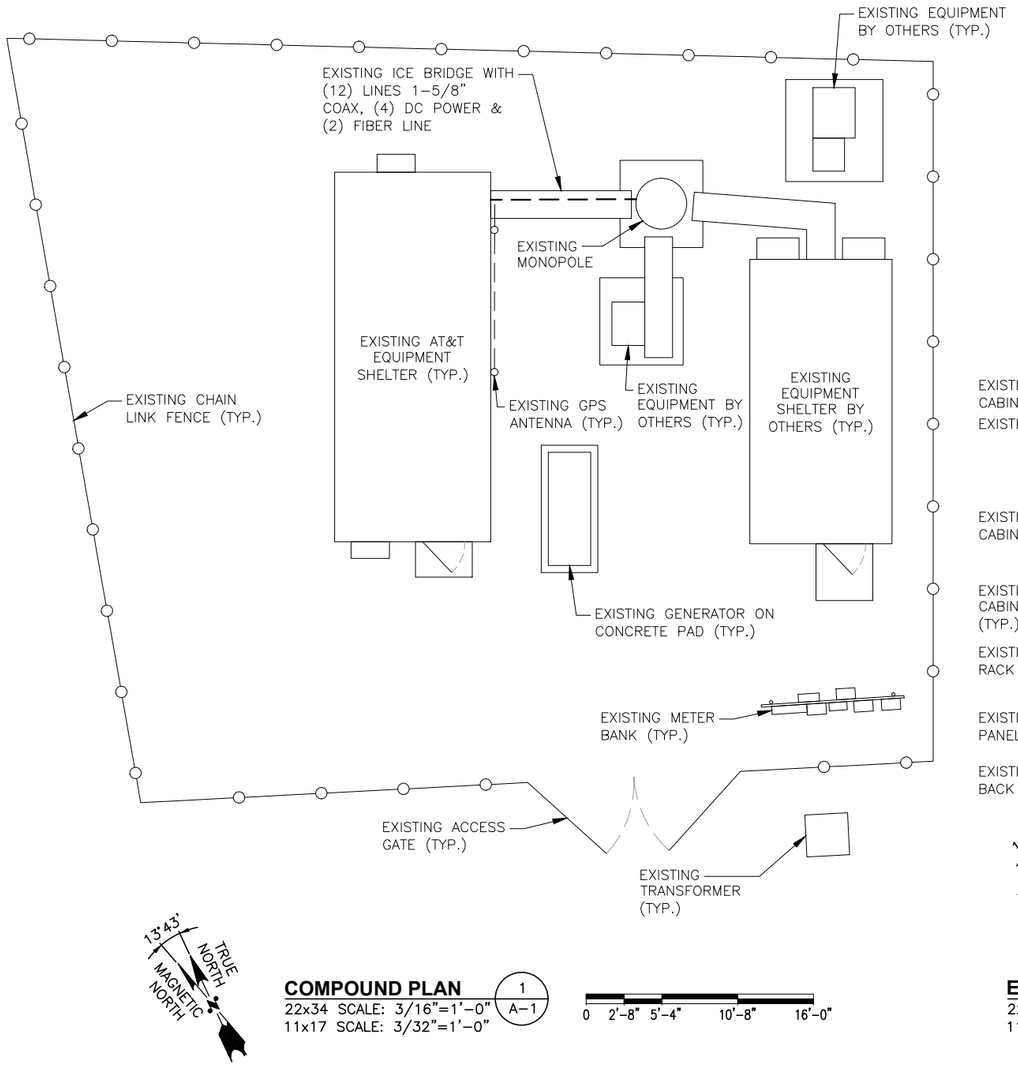
AT&T
GENERAL NOTES
4C / MULTI CARRIER

SITE NUMBER	DRAWING NUMBER	REV
CTL01055	GN-1	1

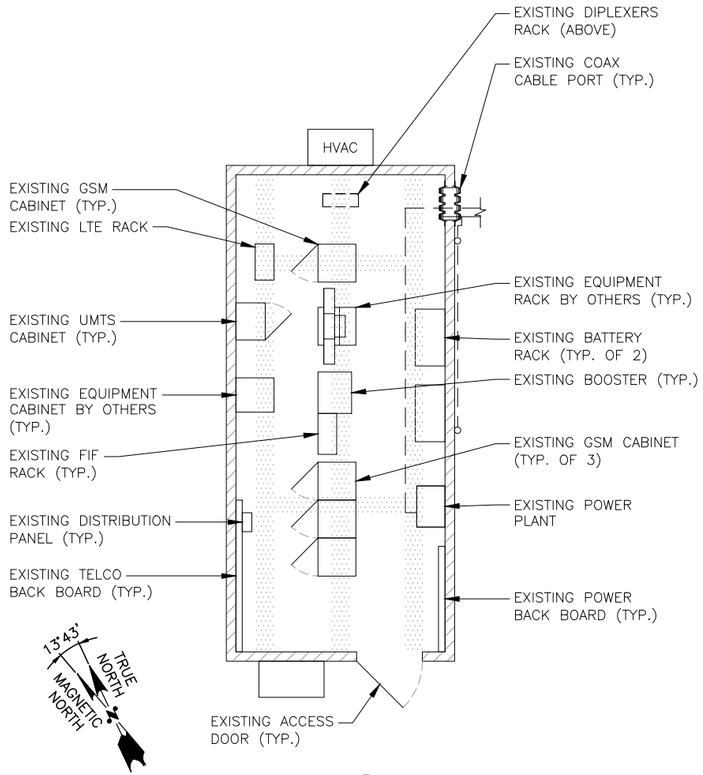
NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

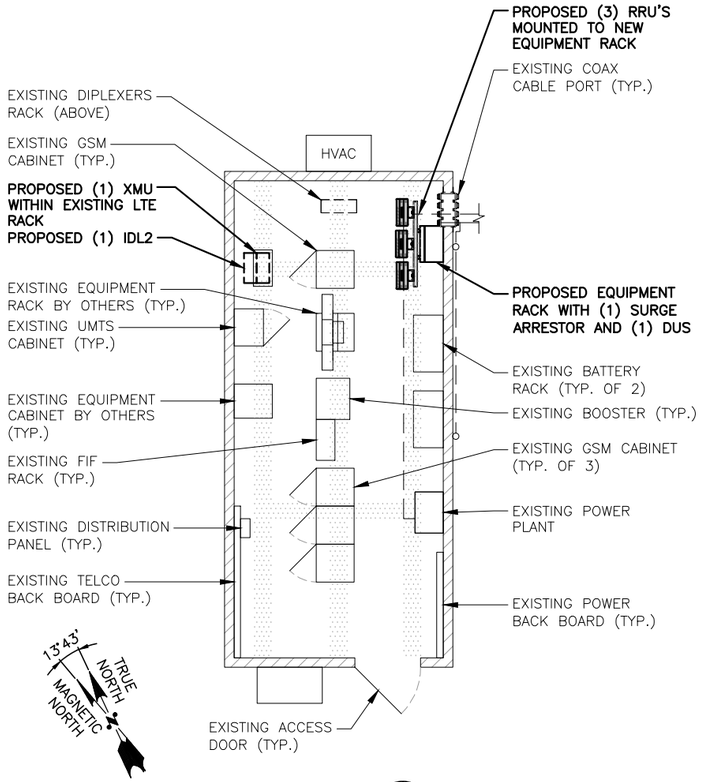
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.



COMPOUND PLAN 1 A-1
22x34 SCALE: 3/16"=1'-0"
11x17 SCALE: 3/32"=1'-0"
0 2'-8" 5'-4" 10'-8" 16'-0"



EXISTING EQUIPMENT PLAN 2 A-1
22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"
0 2'-0" 4'-0" 8'-0" 12'-0"



PROPOSED EQUIPMENT PLAN 3 A-1
22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"
0 2'-0" 4'-0" 8'-0" 12'-0"

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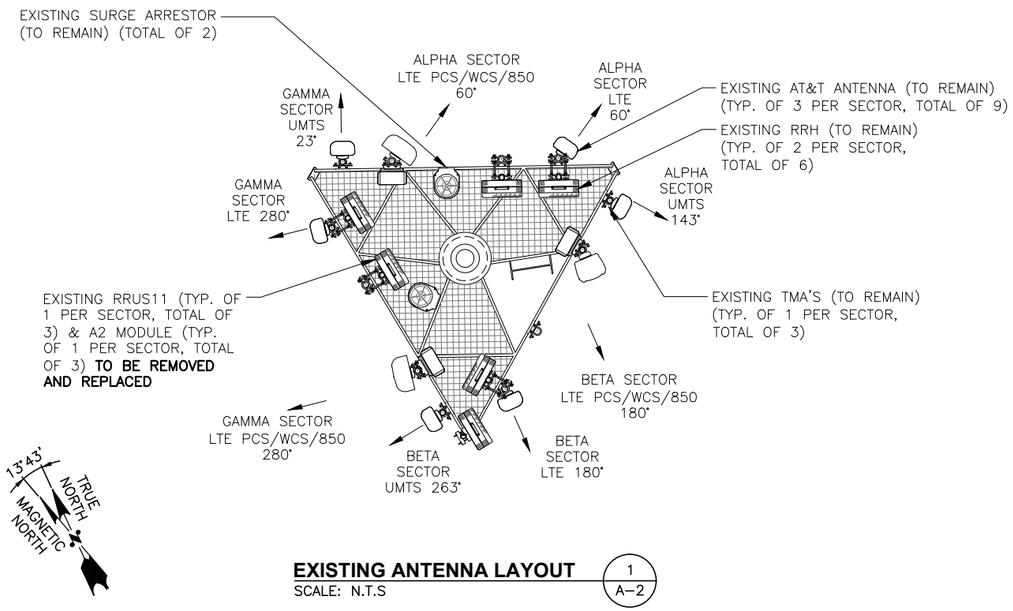
0	01/13/17	ISSUED FOR REVIEW	SB	HC	DPM

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: RP

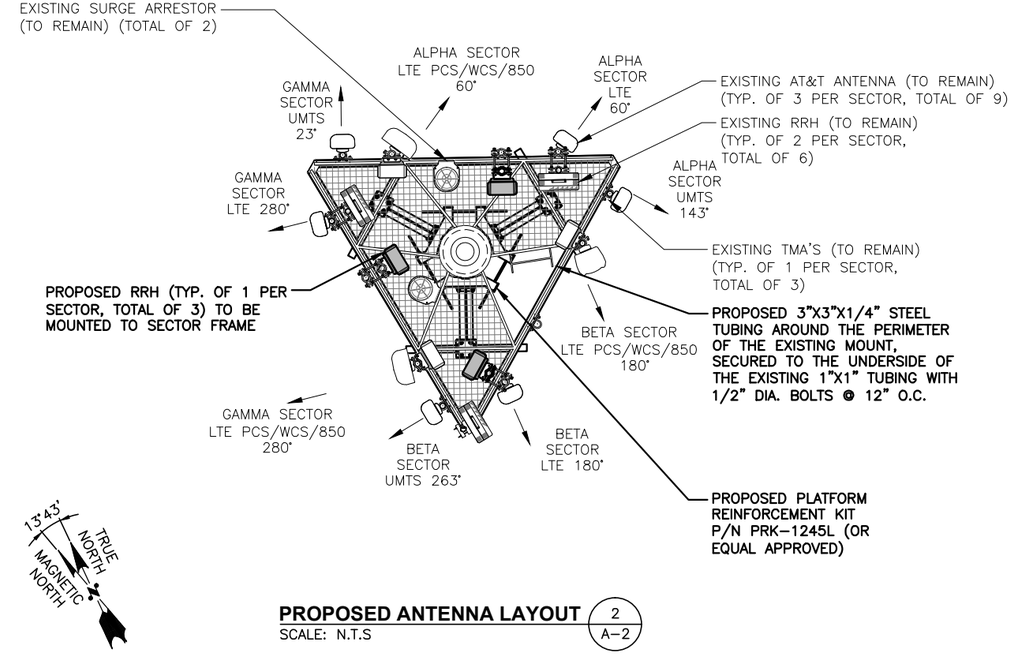
STATE OF CONNECTICUT
DEREK J. CREASEY
No. 23858
LICENSED PROFESSIONAL ENGINEER

AT&T
COMPOUND & EQUIPMENT PLANS
4C / MULTI CARRIER

SITE NUMBER	DRAWING NUMBER	REV
CTL01055	A-1	1



EXISTING ANTENNA LAYOUT (1 / A–2)
SCALE: N.T.S

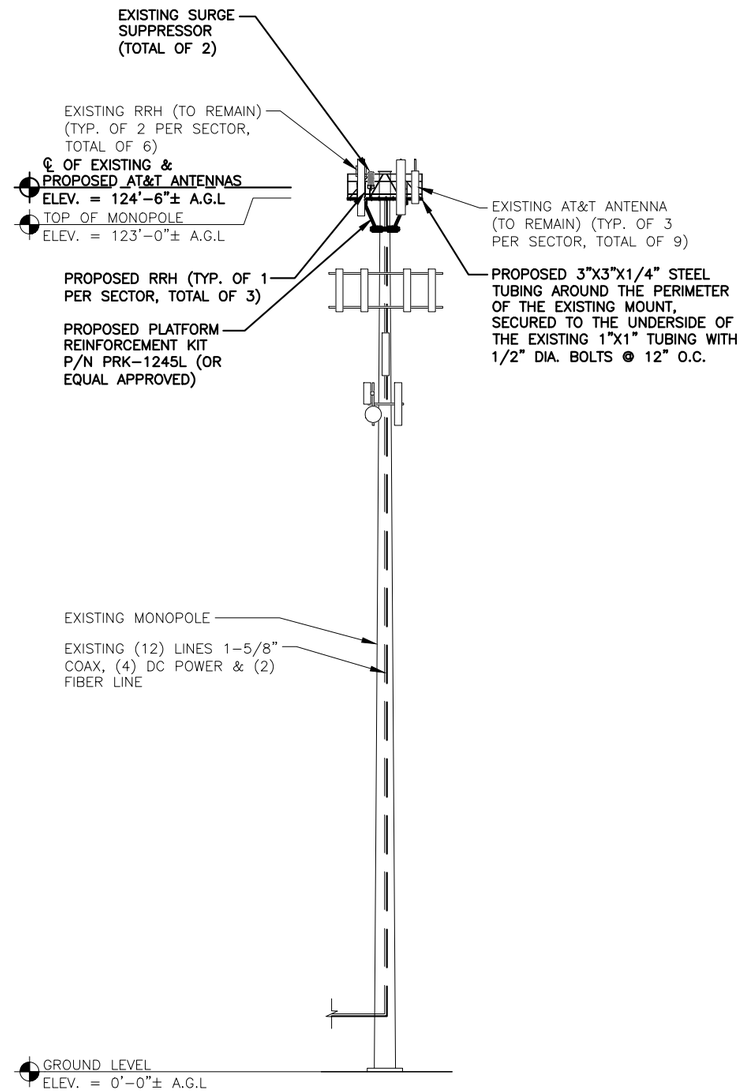


PROPOSED ANTENNA LAYOUT (2 / A–2)
SCALE: N.T.S

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY HUDSON DESIGN GROUP, LLC. DATED: JANUARY 12, 2017

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.



PROPOSED NORTH ELEVATION (3 / A–2)
22x34 SCALE: 3/16"=1'–0"
11x17 SCALE: 3/32"=1'–0"

0 5'–4" 10'–8" 21'–4" 32'–0"

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at&t
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ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
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0	01/13/17	ISSUED FOR REVIEW	SB	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: RP

STATE OF CONNECTICUT · DEREK J. CREASEY · No. 23567 · LICENSED PROFESSIONAL ENGINEER

AT&T
ANTENNA LAYOUTS & ELEVATION
4C / MULTI CARRIER

SITE NUMBER	DRAWING NUMBER	REV
CTL01055	A–2	1

NOTE:
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NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

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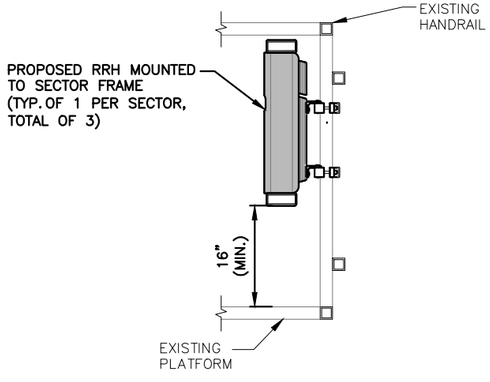
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY HUDSON DESIGN GROUP, LLC. DATED: JANUARY 12, 2017

EXISTING & EXISTING ANTENNA SCHEDULE

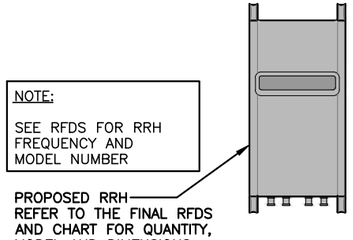
SECTOR	TECHNOLOGY	EXISTING/EXISTING	RAD CENTER	AZIMUTH	MAKE	MODEL#	SIZE (INCHES) (L x W x D)
ALPHA	UMTS	EXISTING	124'-0"±	143°	POWERWAVE	7770	55.0x11.0x5.0
	LTE 3C	EXISTING	124'-0"±	60°	CCI	TPA-65R-LCUUUU-H8	96.0x14.4x8.6
	LTE 2C	EXISTING	124'-0"±	60°	ANDREW	SBNH-1D6565C	96.4x11.9x7.1
BETA	UMTS	EXISTING	124'-0"±	263°	POWERWAVE	7770	55.0x11.0x5.0
	LTE 3C	EXISTING	124'-0"±	180°	QUINTEL	QS66512-3	72.0x12.0x9.6
	LTE 2C	EXISTING	124'-0"±	180°	KMW	AM-X-CD-16-65-00T-RET	72.0x11.8x5.9
GAMMA	UMTS	EXISTING	124'-0"±	23°	POWERWAVE	7770	55.0x11.0x5.0
	LTE 3C	EXISTING	124'-0"±	280°	CCI	TPA-65R-LCUUUU-H8	96.0x14.4x8.6
	LTE 2C	EXISTING	124'-0"±	280°	ANDREW	SBNH-1D6565C	96.4x11.9x7.1

EXISTING & PROPOSED RRU SCHEDULE

SECTOR	EXISTING/PROPOSED	MAKE	MODEL#	SIZE (INCHES) (L x W x D)
ALPHA				
	EXISTING PROPOSED (ON TOWER) PROPOSED (IN EQUIPMENT ROOM)	ERICSSON	RRUS-32 RRUS-32 RRUS-11	27.2x12.1x7.0 27.2x12.1x7.0 19.7x17.0x7.2
	EXISTING	ERICSSON	RRUS-11	19.7x17.0x7.2
BETA				
	EXISTING PROPOSED (ON TOWER) PROPOSED (IN EQUIPMENT ROOM)	ERICSSON	RRUS-32 RRUS-32 RRUS-11	27.2x12.1x7.0 27.2x12.1x7.0 19.7x17.0x7.2
	EXISTING	ERICSSON	RRUS-11	19.7x17.0x7.2
GAMMA				
	EXISTING PROPOSED (ON TOWER) PROPOSED (IN EQUIPMENT ROOM)	ERICSSON	RRUS-32 RRUS-32 RRUS-11	27.2x12.1x7.0 27.2x12.1x7.0 19.7x17.0x7.2
	EXISTING	ERICSSON	RRUS-11	19.7x17.0x7.2

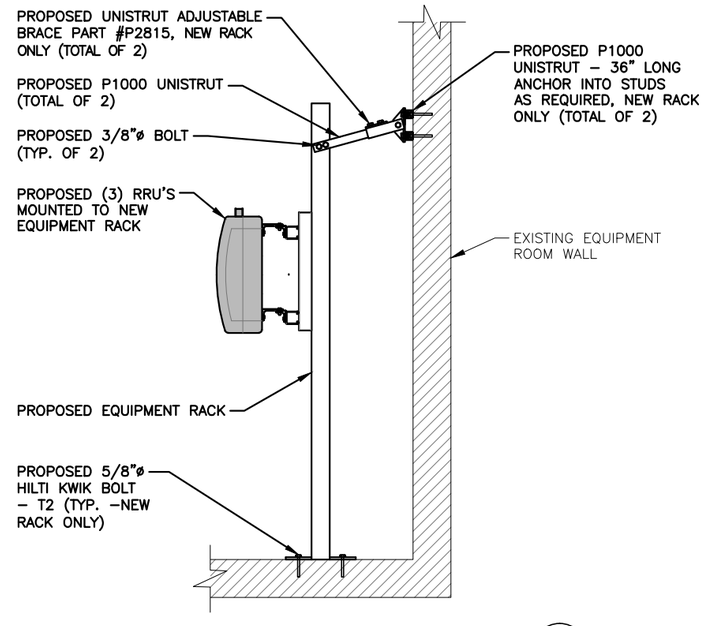


PROPOSED RRH MOUNTING DETAIL 1 / A-3
SCALE: N.T.S



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRH DETAIL 2 / A-3
SCALE: N.T.S



PROPOSED EQUIPMENT RACK DETAIL 3 / A-3
SCALE: N.T.S

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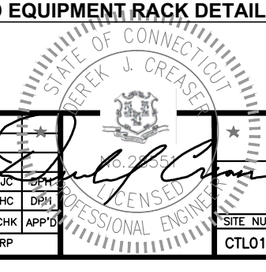
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: RP



AT&T

DETAILS
4C / MULTI CARRIER

SITE NUMBER	DRAWING NUMBER	REV
CTL01055	A-3	1

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER MA STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, IBC 2009, ASCE 7-05, EIA/TIA-222-G STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.

2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.

3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".

4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.

5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.

6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.

7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.

8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.

9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.

10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND DI.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". 9TH EDITION.

11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.

12. UNISTRUTS SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.

13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-20 AND OR HY-150 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.

14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

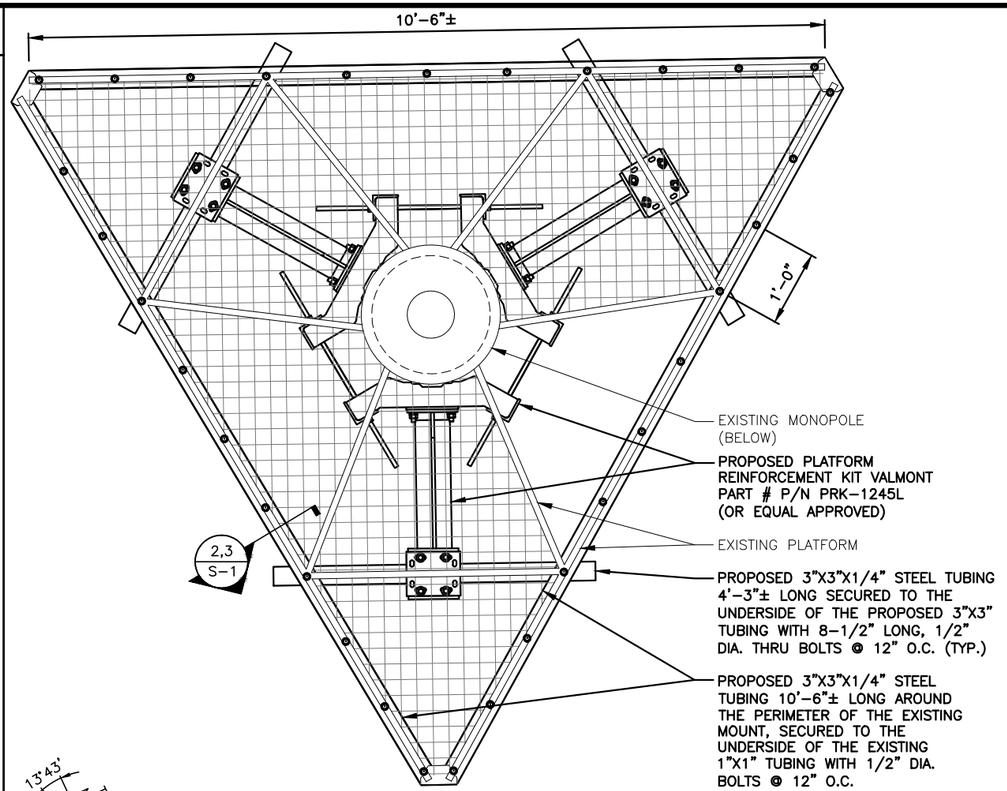
15. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.

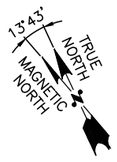
16. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.

17. ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.

18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.

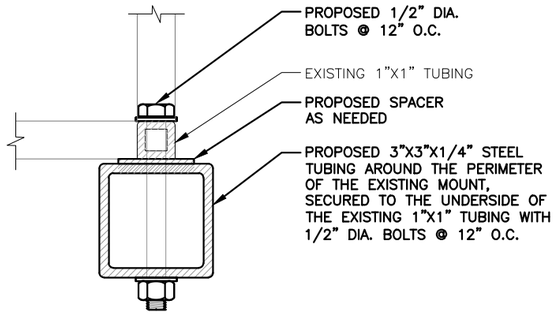
19. SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.





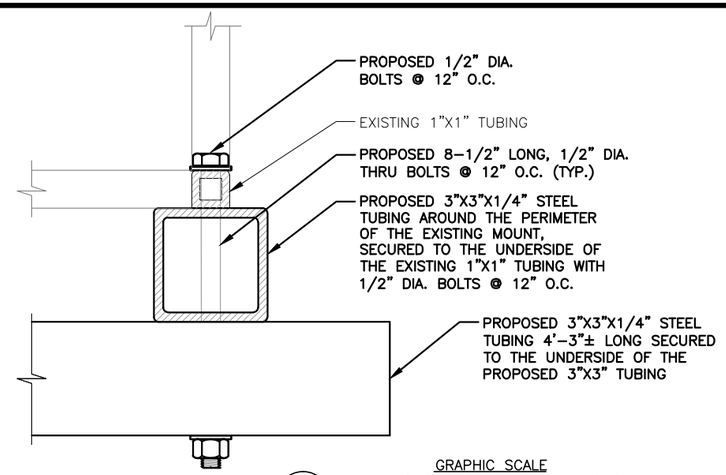
PROPOSED PLATFORM REINFORCEMENT DETAIL (1 / S-1)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

GRAPHIC SCALE
0 .5 1 2 3 FEET



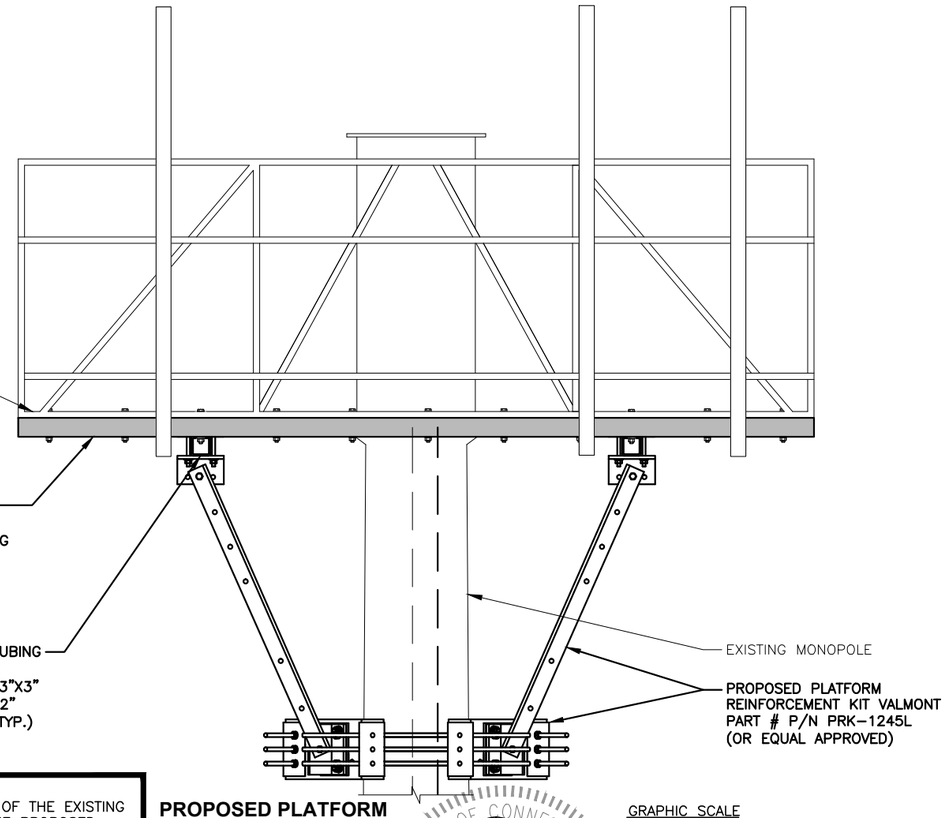
PROPOSED CONNECTION DETAIL (2 / S-1)
22x34 SCALE: 6"=1'-0"
11x17 SCALE: 3"=1'-0"

GRAPHIC SCALE
0 0'-1" 0'-2" 0'-4" 0'-6"



PROPOSED CONNECTION DETAIL (3 / S-1)
22x34 SCALE: 6"=1'-0"
11x17 SCALE: 3"=1'-0"

GRAPHIC SCALE
0 0'-1" 0'-2" 0'-4" 0'-6"



PROPOSED PLATFORM REINFORCEMENT DETAIL (4 / S-1)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

GRAPHIC SCALE
0 .5 1 2 3 FEET

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY HUDSON DESIGN GROUP, LLC. DATED: JANUARY 12, 2017

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smartlink
1997 ANNAPOLIS EXCHANGE PKWY
SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01055
SITE NAME: BRISTOL
AMERICAN TOWER SITE ID: 302500
1 WILLIS STREET
BRISTOL, CT 06010
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

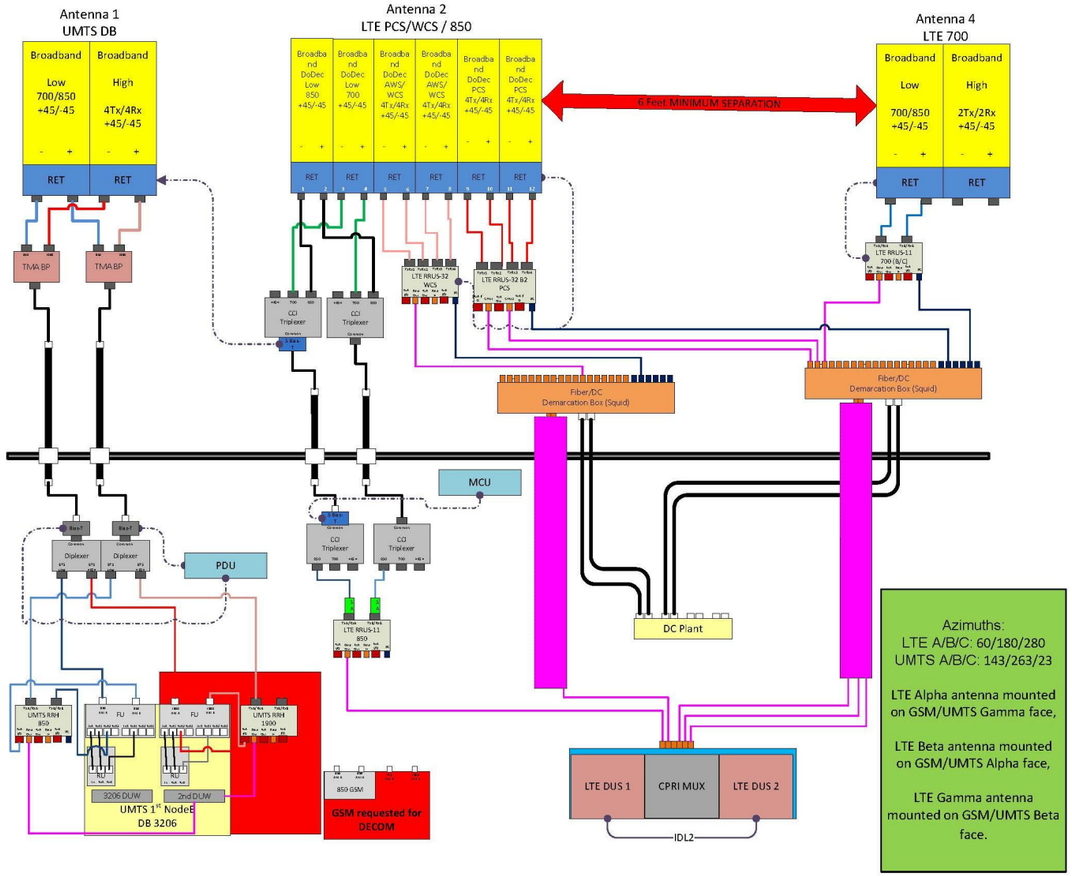
NO.	DATE	REVISIONS	BY	CHK	APP'D
1	02/17/17	ISSUED FOR REVIEW	RP	JC	DPM
0	01/13/17	ISSUED FOR REVIEW	SB	HC	DPM

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: RP

STATE OF CONNECTICUT — THESE PLANS RELEASED FOR CONSTRUCTION — 10.2.2017 — LICENSED PROFESSIONAL ENGINEER

AT&T
MOUNT MODIFICATION DETAILS
4C / MULTI CARRIER

SITE NUMBER	DRAWING NUMBER	REV
CTL01055	S-1	1



RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

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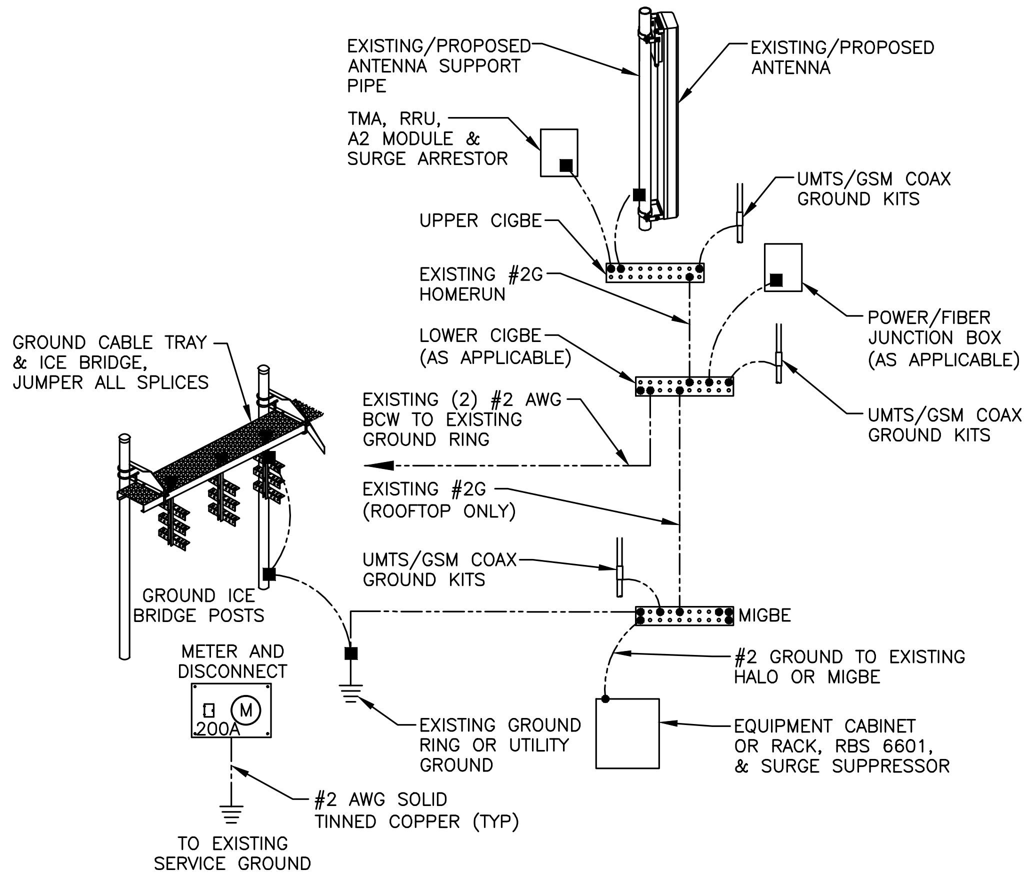
STATE OF CONNECTICUT
DEREK J. CREASEY
LICENSED PROFESSIONAL ENGINEER

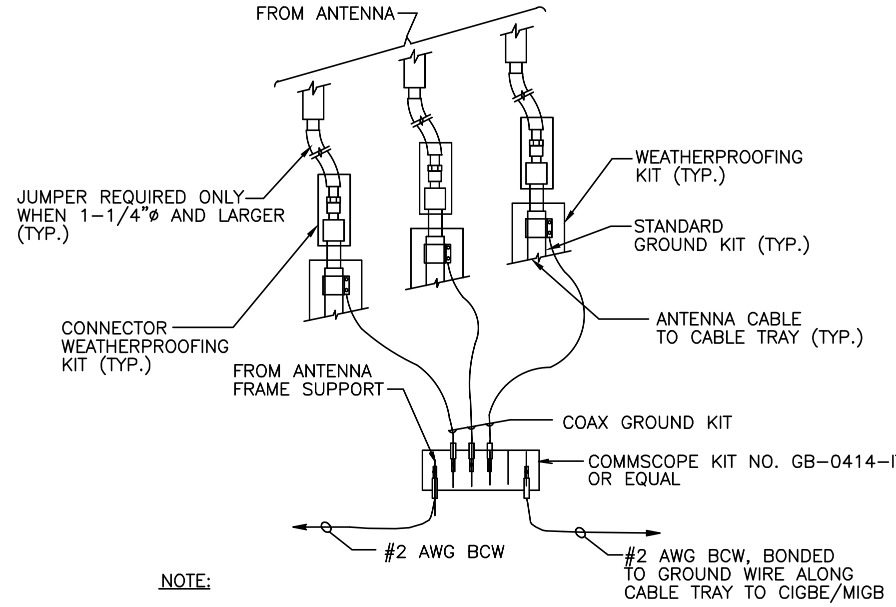
AT&T
RF PLUMBING DIAGRAM
4C / MULTI CARRIER

SITE NUMBER	DRAWING NUMBER	REV
CTL01055	RF–1	1



GROUNDING RISER DIAGRAM (1 / G−1)

SCALE: N.T.S

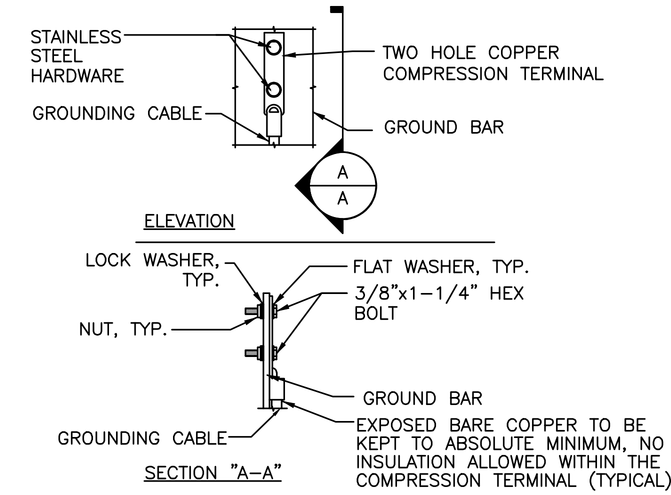


NOTE:

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

GROUND WIRE TO GROUND BAR CONNECTION DETAIL (2 / G−1)

SCALE: N.T.S

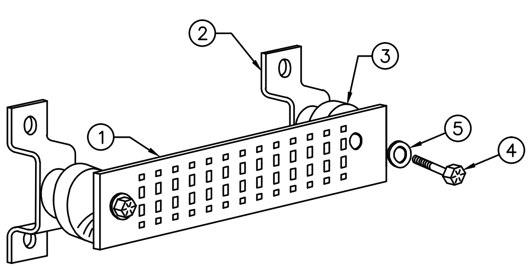


NOTE:

1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATION.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB

TYPICAL GROUND BAR CONNECTION DETAIL (3 / G−1)

SCALE: N.T.S



GROUND BAR - DETAIL (4 / G−1)

SCALE: N.T.S

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
−48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

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GROUNDING DETAILS
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