smartlink

January 14, 2019

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

Re:	**Notice of Exempt Modification – Antenna Swap**
Property Address:	**200 Oronoque Lane Stratford, Ct 06614**
Applicant:	**AT&T Mobility, LLC**

Dear Ms. Bachman:

On behalf of AT&T, please accept this **re- application** (due to an incomplete structural analysis) 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 (12) wireless telecommunication antennas at an antenna center line height of 121-feet on an existing 150 foot –monopole, owned By the Town of Stratford. AT&T now intends to · Remove (3) Panel Antennas, install (3) panel antennas, Remove (3) RRUS-11, Install (3) RRUS-32 and install (3) RRUS-B5/B12-4449

At a Public Hearing held on June 26th, 2014, the Connecticut Siting Council ruled that the shared use of this existing tower site is technically, legally, and economically feasible and meets public safety concerns, and therefore, in compliance with the General Statutes 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures conditions. SEE ATTACHED:

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

TS-CING-138-140509 - New Cingular Wireless PCS, LLC request for an order to approve tower sharing at an existing telecommunications facility located at 200 Oronoque Lane, **Stratford**, Connecticut. TS Rejection. Statutory Authority. Additional Information. Decision. Completion Letter.

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. § 16-5l0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent Laura R. Hoydick, Mayor, Stratford Town Hall and the Office of Planning and Zoning Room 113

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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 180-foot level of the 193-foot guyed tower.
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,

David Barbagallo

CC w/enclosures:

Honorable Laura R. Hoydick, Mayor and
the Office of Planning and Zoning, Stratford Town Hall

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[illegible]

[illegible]

[illegible]

Re: **Notice of Exempt Modification – Antenna Swap**
Property Address: **200 Oronoque Lane Stratford, Ct 06614**
Applicant: **AT&T Mobility, LLC**

[illegible]

[illegible] **re- application** [illegible]

[illegible]

[illegible]

[illegible]

[TS-CING-138-140509](#) - New Cingular Wireless PCS, LLC request for an order to approve tower sharing at an existing telecommunications facility located at 200 Oronoque Lane, **Stratford**, Connecticut. [TS Rejection](#). [Statutory Authority](#). [Additional Information](#). [Decision](#). [Completion Letter](#).

[illegible]

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).

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

June 27, 2014

Christopher B. Fisher, Esq.
Cuddy & Feder LLP
445 Hamilton Avenue, 14th Floor
White Plains, NY 10601

RE: **TS-CING-138-140509 -** New Cingular Wireless PCS, LLC request for an order to approve tower sharing at an existing telecommunications facility located at 200 Oronoque Lane, Stratford, Connecticut.

Dear Attorney Fisher:

At a public meeting held June 26, 2014, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures with the following conditions:

- Any deviation from the proposed installation as specified in the original tower share request and supporting materials with the Council shall render this decision invalid;
- Any material changes to the proposed installation as specified in the original tower share request and supporting materials filed with the Council shall require an explicit request for modification to the Council pursuant to Connecticut General Statutes § 16-50aa, including all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65;
- Not less than 45 days after completion of the proposed installation, the Council shall be notified in writing that the installation has been completed;
- Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by New Cingular Wireless PCS, LLC shall be removed within 60 days of the date the antenna ceased to function.
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

This decision is under the exclusive jurisdiction of the Council and applies only to this request for tower sharing dated May 1, 2014. This facility has been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower. Any deviation from the approved tower sharing request is enforceable under the provisions of Connecticut General Statutes § 16-50u.

The proposed shared use is to be implemented as specified in your letter dated May 1, 2014, including the placement of all necessary equipment and shelters within the tower compound.

Please be advised that the validity of this action shall expire one year from the date of this letter.

Thank you for your attention and cooperation.

Very truly yours,

Robert Stein MAB

Robert Stein
Chairman

RS/DM/cm

c: The Honorable John A. Harkins, Mayor, Town of Stratford
Gary Lorentson, Planning & Zoning Administrator

TOWN OF STRATFORD

Recent Sales in Neighborhood | Previous Parcel | Next Parcel | Field Definitions | Return to Main Search | Stratford Home

Owner and Parcel Information

Owner Name	TOWN OF STRATFORD FIRE HOUSE	**Today's Date**	January 23, 2019
Mailing Address	200 ORONOQUE LN	**Account #**	1289400
	STRATFORD, CT 06614-1357		
Location Address	200 ORONOQUE LN	**Census Tract**	0813
Map / Block / Lot	60 /20 / 2 / 1/ Dev Lot:	**Acreage**	0.98
Use Class / Description	932 Fire Dept	**Parcel Map**	Show Parcel Map Owner List By Radius

Current Appraised Value Information

Building Value	OB Value	Land Value	Special Land Value	Total Appraised Value	Net Appraised Value	Current Assessment
No Apprasial Information available for this parcel						

Assessment History

Year	Building	OB/Misc	Land	Total Assessment
2017	$ 536,900	$ 18,410	$ 208,600	$ 763,910
2016	$ 536,900	$ 18,410	$ 208,600	$ 763,910

Land Information

Use	Class	Zoning	Area	Value
Fire Dept	E	RS-1	0.98 AC	$ 298,000

Commercial Building Information

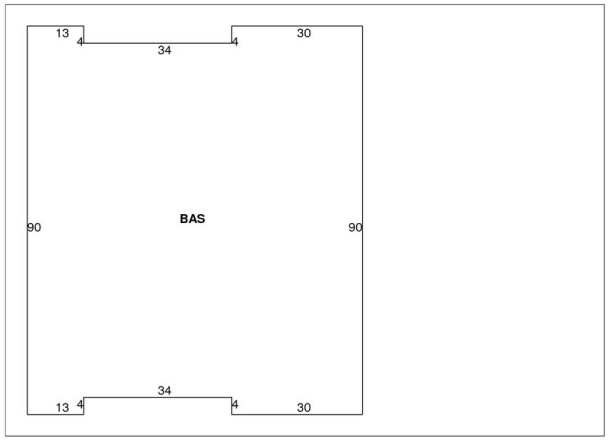
Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
Fire Station	1978	1996	6,658	1.00	B-	Cedar or Redwd	Drywall/Sheet	16	1
Roof Cover	**Roof Structure**	**Floor Type**	**Heat Type**	**Heat Fuel**	**AC Type**	**Sprinkler**	**Construction**	**Plumbing**	**Comm Walls**
T&G/Rubber	Flat	Concr-Finished	Oil	Hot Water	Heat/AC Split	%	Masonry	Average	0%

Building Sub Areas

Code	Description	Living Area	Gross Area	Effective Area
BAS	First Floor	6,658	6,658	
	Totals	**6,658**	**6,658**	**6,658**

Building Sketch Enlarge

Building Photo Enlarge



Out Buildings / Extra Features				
Description	**Sub Description**	**Area**	**Year Built**	**Value**
Paving	Asphalt	3,000 S.F.	1978	$ 2,500
Shed	ConBlkFrm	180 S.F.	2009	$ 3,100
Guyed Tower	Radio	100 L.F.	2009	$ 12,800
Lights in with pole		6 Units	2009	$ 7,900

Sale Information						
Sale Date	**Sale Price**	**Deed Book/Page**	**Sale Qualification**	**Reason**	**Vacant or Improved**	**Owner**
07/23/1974	$ 30,000	0493/ 058	Unqualified		Improved	TOWN OF STRATFORD FIRE HOUSE
03/27/1973		0460/1124	Unqualified		Improved	POWELL EFFIE V

Permit Information								
Permit ID	**Issue Date**	**Type**	**Description**	**Amount**	**Inspection Date**	**% Complete**	**Date Complete**	**Comments**
21377	06/03/2015	EL	Electrical Per	$ 17,800		100		NEW METER
21956	02/17/2015	BP	Building Permi	$ 170,000		100		REPLACE TOWER(SAI COMMUNICATION)
20416	03/19/2013	EL	Electrical Per	$ 1,100		100		MAIN BREAKER
20217	11/17/2012	EL	Electrical Per	$ 77,000		100		DIESAL GENERATOR
19260	02/29/2012	EL	Electrical Per	$ 2,200		100		WIRING
19067	10/11/2011	EL	Electrical Per	$ 50		100		UPGRD SERV
12471	01/10/2007	EL	Electrical Per	$ 4,000		100		ELECTRICAL
16111	11/21/2006	BP	Building Permi	$ 22,000		100		PREFAB SHELTER FOR TELECOM

8861	02/01/2005	HA	HVAC Permit	$ 25,800		100		EXHAUST SYSTEM FOR FIRE TRUCKS
13736	03/25/2004	RF		$ 37,495		100		Reroof firehouse

Recent Sales in Neighborhood	Previous Parcel	Next Parcel	Field Definitions	Return to Main Search Page	Stratford Home

774217770692

Delivered
Tuesday 1/22/2019 at 10:39 am

DELIVERED

Signed for by: S.SHANON

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Smartlink LLC
Dave Barbagallo
265 Lincoln St
KENSINGTON, CT US 06037
860 681-7708

TO

Town of Stratford Mayor's Office
Mayor Laura R. Hoydick
STRATFORD, CT US 06615
203 385-4001

Shipment Facts

DELIVERY ATTEMPTS
1

DELIVERED TO
Receptionist/Front Desk

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
1 lbs / 0.45 kgs

TERMS
Shipper

PACKAGING
FedEx Pak

SPECIAL HANDLING SECTION
Deliver Weekday

STANDARD TRANSIT
1/22/2019 by 4:30 pm

SHIP DATE
Thu 1/17/2019

ACTUAL DELIVERY
Tue 1/22/2019 10:39 am

Travel History

Local Scan Time

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774217835443

Delivered
Tuesday 1/22/2019 at 10:39 am

DELIVERED

Signed for by: S.SHANON

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FROM

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KENSINGTON, CT US 06037
860 681-7708

TO

Town of Stratford
Planning and Zoning Official
STRATFORD, CT US 06615
203 385-4017

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LANGUAGE

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SITESAFE
RF COMPLIANCE EXPERTS

8618 Westwood Center Drive, Suite 315, Vienna, VA 22182
703.276.1100 ● 703.276.1169 fax
info@sitesafe.com ● www.sitesafe.com

Smartlink on behalf of AT&T Mobility, LLC Site FA – 10152336 Site ID – CT2638 (MRCTB033568-MRCTB033568) USID – 163489 Site Name – Stratford Oronoque Road

200 ORONOQUE LANE STRATFORD, CT 06614

Latitude: N41-15-05.08
Longitude: W73-7-01.74
Structure Type: Monopole

Report generated date: January 9, 2019
Report by: Zyotty Thamsil
Customer Contact: David Barbagallo

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

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	No
Max Cumulative Simulated RFE Level on the Ground	<1% General Public Limit
Max Cumulative Simulated RFE Level on the Rooftop	<1% General Public Limit
FCC & AT&T Compliant?	Will Be Compliant
Optional AT&T Mitigation Items?	No

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

RFDS: NEW-ENGLAND_CONNECTICUT_CT2638_2019-LTE-Next-Carrier_LTE_mr673a_PTN_10152336_163489_07-02-2018_Final-Approved_v2.00

CD's: 10152336_AE201_181218_CTL02638_REV0.JMRL (002)

RF Powers Used: Max RRH Power

1.2 Signage Summary

AT&T Signage Locations									
	Information 1	Information 2	Notice	Notice 2	Caution	Caution 2	Warning	Warning 2	Barriers
Access Point(s)									
Alpha									
Beta									
Gamma									
Delta									
Epsilon									

1.3 Fall Arrest Anchor Point Summary

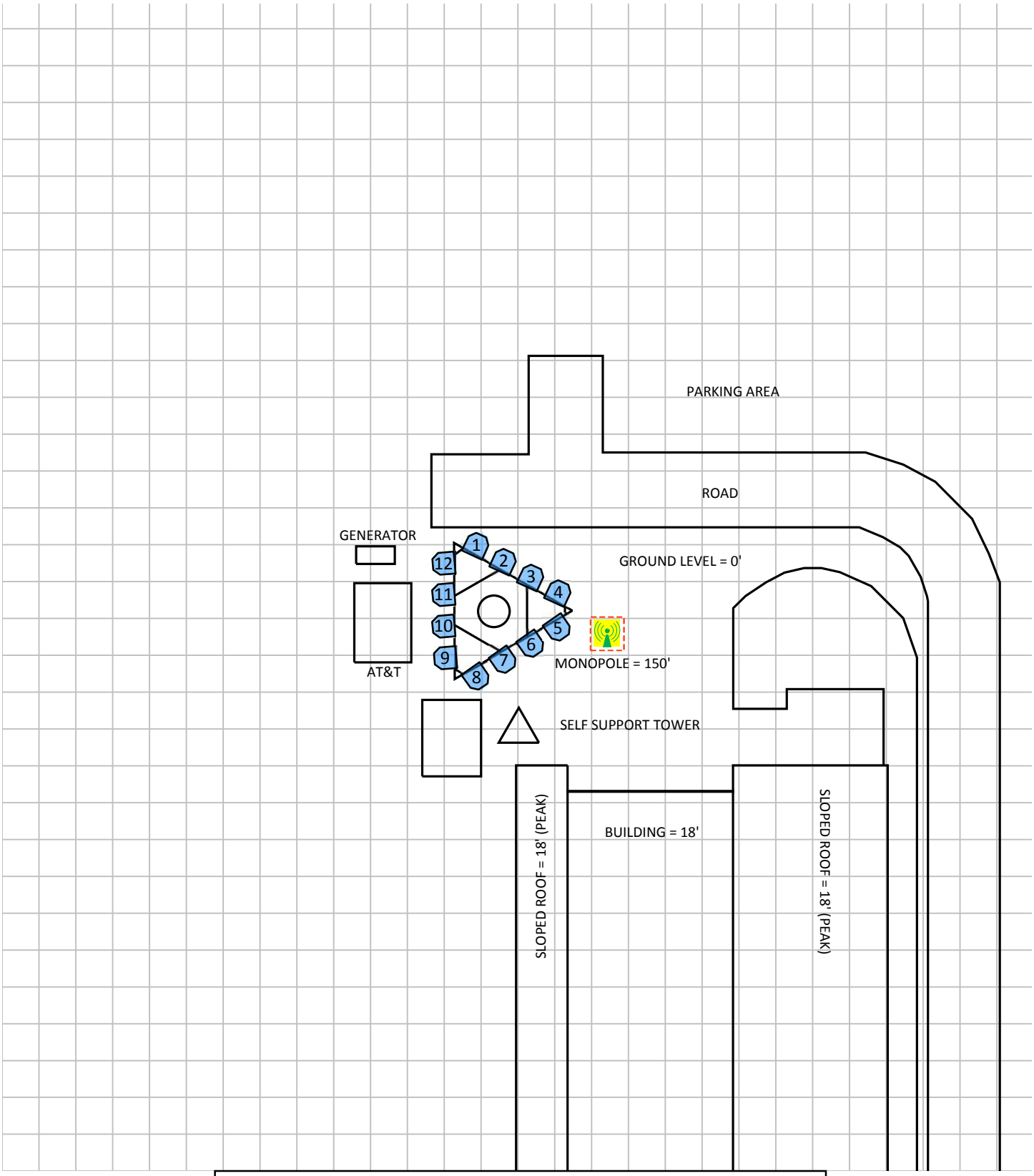
Fall Arrest Anchor & Parapet Info	Parapet Available (Y/N)	Parapet Height (inches)	Fall Arrest Anchor Available (Y/N)
Roof Safety Info	N	N/A	N

2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- RF Exposure Diagram – Elevation View

Site Scale Map For: Stratford Oronoque Road



(Feet)

0 7 14

www.sitesafe.com
Site Name:Stratford Oronoque Road
1/9/2019 10:32:52 AM

Carrier Identification

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

Sign Legend

Caution 1 | Caution 2 | Notice 2 | Notice 1 | Warning | Warning 2 | Info 1 | Info 2 | RF Safety Plan

Barrier

Proposed Barriers/ Signs

3 Antenna Inventory

The following antenna inventory was obtained by the customer and was utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Technology	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Power	Power Type	Power Unit	Radio Count	Total ERP (Watts)	Ant Gain (dBd)	Z (AGL)	MDT	EDT
1	AT&T MOBILITY LLC	CCI Antennas HPA-65R-BUU-H8	Panel	850	UMTS	30	58.1	7.7	40	TPO	Watt	2	2234	14.46	117.2'	0'	2'
2	AT&T MOBILITY LLC	CCI Antennas HPA-65R-BUU-H8	Panel	2300	LTE	30	63.3	7.7	100	TPO	Watt	1	3357.4	15.26	117.2'	0'	2'
3	AT&T MOBILITY LLC	CCI Antennas HPA-65R-BUU-H8	Panel	1900	LTE	30	63.1	7.7	120	TPO	Watt	1	3590.7	14.76	117.2'	0'	2'
4	AT&T MOBILITY LLC	Kathrein-Scala 800-10966	Panel	737	LTE	30	67.9	8	160	TPO	Watt	1	3623.4	13.55	117'	0'	2'
4	AT&T MOBILITY LLC	Kathrein-Scala 800-10966	Panel	850	LTE	30	66	8	80	TPO	Watt	1	2128.6	14.25	117'	0'	2'
4	AT&T MOBILITY LLC	Kathrein-Scala 800-10966	Panel	5G 850	LTE	30	66	8	80	TPO	Watt	1	2128.6	14.25	117'	0'	2'
5	AT&T MOBILITY LLC	CCI Antennas HPA-65R-BUU-H8	Panel	850	UMTS	150	58.1	7.7	40	TPO	Watt	2	2234	14.46	117.2'	0'	2'
6	AT&T MOBILITY LLC	CCI Antennas HPA-65R-BUU-H8	Panel	2300	LTE	150	63.3	7.7	100	TPO	Watt	1	3357.4	15.26	117.2'	0'	2'
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8	AT&T MOBILITY LLC	Kathrein-Scala 800-10966	Panel	737	LTE	150	67.9	8	160	TPO	Watt	1	3623.4	13.55	117'	0'	2'
8	AT&T MOBILITY LLC	Kathrein-Scala 800-10966	Panel	850	LTE	150	66	8	80	TPO	Watt	1	2128.6	14.25	117'	0'	2'
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9	AT&T MOBILITY LLC	CCI Antennas HPA-65R-BUU-H8	Panel	850	UMTS	270	58.1	7.7	40	TPO	Watt	2	2234	14.46	117.2'	0'	2'
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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. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

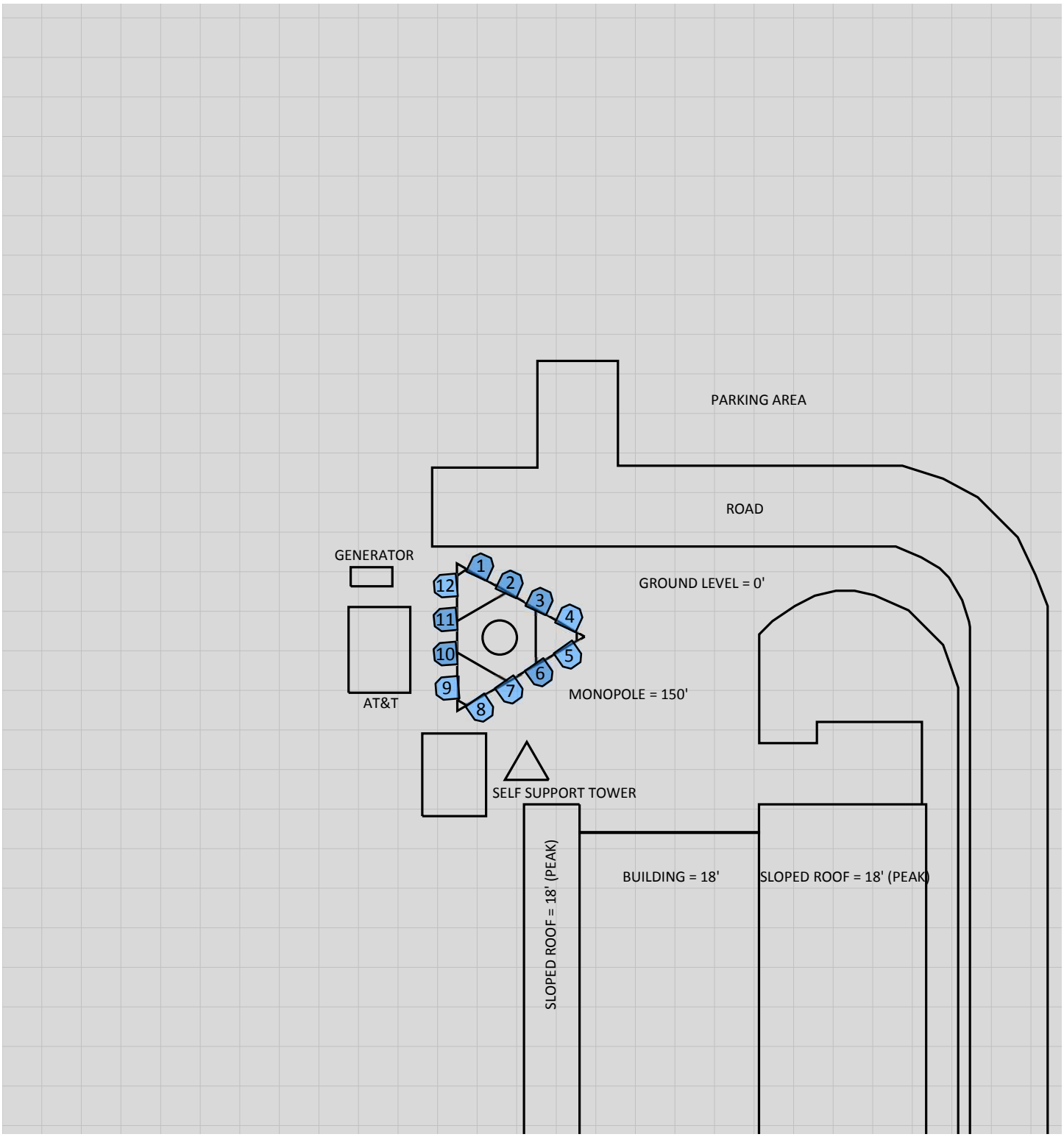
4 Emission Predictions

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

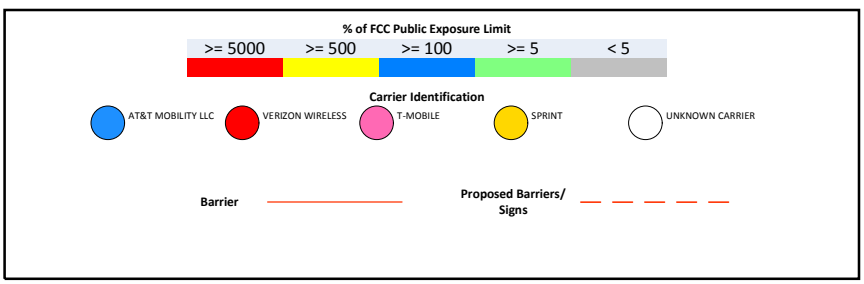
- Ground Level = 0'
- Building = 18'

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: Stratford Oronoque Road



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



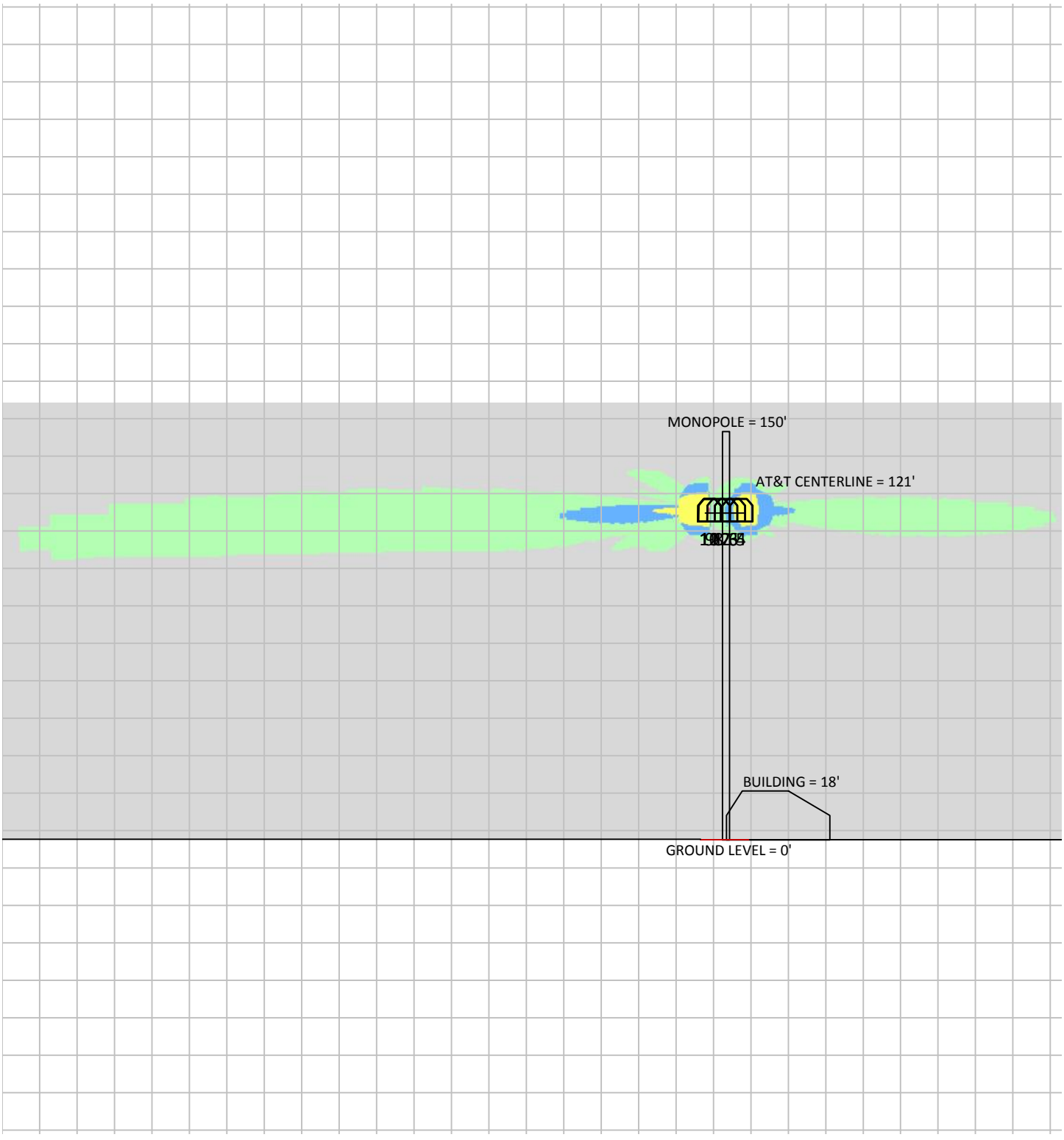
(Feet)

0 7.1 14.2

www.sitesafe.com
Site Name:Stratford Oronoque Road
1/9/2019 9:49:54 AM

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

RF Exposure Simulation For: Stratford Oronoque Road
Elevation View



% of FCC Public Exposure Limit

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

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

Barrier

Proposed Barriers/ Signs

(Feet)
0 26 51.9

www.sitesafe.com
Site Name:Stratford Oronoque Road
1/9/2019 10:31:19 AM

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

5 Site Compliance

5.1 Site Compliance Statement

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

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

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

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

5.2 Actions for Site Compliance

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

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

Site Access Location

(1) Yellow Caution 2B sign(s) required at the base of the monopole.

Notes:

- Data concerning all other carriers on site was unavailable and therefore not included in this report.
- Signage may already be in place. Sitesafe does not have record of any existing signage because there were no previous visits or data supplied regarding them. All remediation is based on a worst-case scenario.

6 Reviewer Certification

The reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Sitesafe, LLC., in Vienna, 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 Zyotty Thamsil.

January 9, 2019

Appendix A – Statement of Limiting Conditions

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

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

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

Appendix B – Regulatory Background Information

FCC Rules and Regulations

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

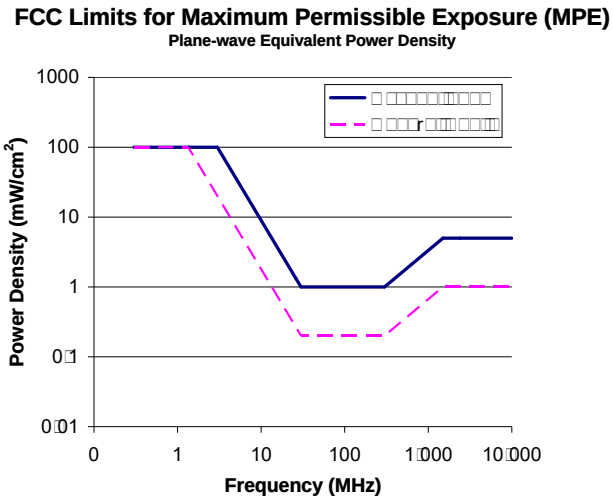
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible*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

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

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

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

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



Limits for Occupational/Controlled Exposure (MPE)

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

Limits for General Population/Uncontrolled Exposure (MPE)

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

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

OSHA Statement

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

(a) Each employer –
- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.

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

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

Appendix C – Safety Plan and Procedures

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

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

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

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

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

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

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

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

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

Appendix D – RF Emissions

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

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

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

Appendix E – Assumptions and Definitions

General Model Assumptions

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

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

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

Use of Generic Antennas

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

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

Definitions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix F – References

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

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

SHEET INDEX

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

DRIVING DIRECTIONS

FROM 550 COCHITUATE RD.:

GET ON I-90 WEST/MASSACHUSETTS TURNPIKE. HEAD NORTHEAST TOWARD LEGGATT MCCALL CONN. TURN LEFT ONTO LEGGATT MCCALL CONN. CONTINUE ONTO BURR STREET. TURN LEFT ONTO COCHITUATE ROAD. USE THE RIGHT LANE TO TAKE THE RAMP TO I-90 EAST/MASSPIKE WEST/SPRINGFIELD/BOSTON. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR I-90 WEST/MASSACHUSETTS TURNPIKE - TURNPIKE/WORCESTER/SPRINGFIELD AND MERGE ONTO I-90 WEST/MASSACHUSETTS TURNPIKE. CONTINUE ON I-90 WEST/MASSACHUSETTS TURNPIKE. TAKE I-84, I-91 SOUTH AND CT-15 SOUTH TO MAIN STREET IN STRATFORD. TAKE EXIT 53 FROM CT-15 SOUTH. MERGE ONTO I-90 WEST/MASSACHUSETTS TURNPIKE. USE THE RIGHT 2 LANES TO TAKE EXIT 9 FOR I-84 TOWARD US-20/HARTFORD/NEW YORK CITY. CONTINUE ONTO I-84. USE THE LEFT 2 LANES TO TAKE EXIT 57 FOR CT-15 SOUTH TOWARD I-91 SOUTH/CHARTER OAK BRIDGE/NEW YORK CITY. CONTINUE ONTO CT-15 SOUTH. CONTINUE ONTO CT-15 SOUTH/US-5 SOUTH. TAKE EXIT 86 TO MERGE ONTO I-91 SOUTH TOWARD NEW HAVEN/NEW YORK CITY. TAKE EXIT 17 TO MERGE ONTO CT-15 SOUTH/WILBUR CROSS PKWY. TAKE EXIT 53 FOR STATE ROUTE 110 TOWARD STRATFORD SHELTON. DRIVE TO ORONOQUE LANE. USE THE MIDDLE LANE TO TURN RIGHT ONTO MAIN STREET. TURN LEFT ONTO ORONOQUE LANE.

at&t

PROJECT

LTE 3C/4C/RETROFIT

SITE NAME

STRATFORD ORONOQUE ROAD

CELL SITE ID

CTL02638

FA SITE NUMBER

10152336

PACE ID

MRCTB033626/MRCTB033568/MRCTB033826

SITE ADDRESS

200 ORONOQUE LANE
STRATFORD, CT 06614

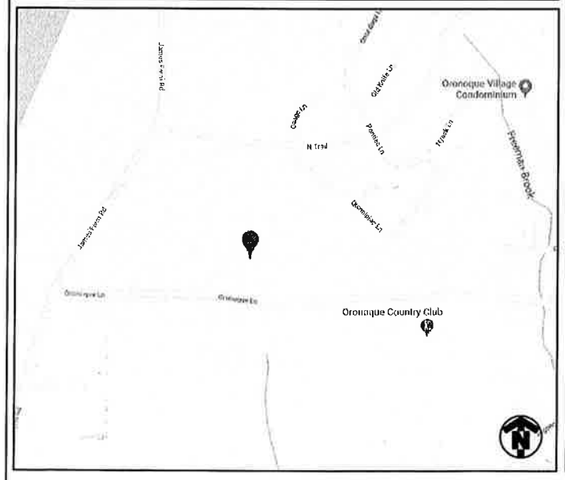
STRUCTURE TYPE

MONOPOLE

PROJECT SUMMARY

SITE NAME:	STRATFORD ORONOQUE ROAD	
CELL SITE ID:	CTL02638	
FA SITE #:	10152336	
SITE ADDRESS:	200 ORONOQUE LANE STRATFORD, CT 06614	
COUNTY:	FAIRFIELD	
SITE COORDINATES: LATITUDE:	41.2514110° N	(NAD 83)
LONGITUDE:	73.1171510° W	(NAD 83)
ELEVATION:	±264'	(AMSL)
RAD CENTER	±121'	(AGL)
LANDLORD:	TOWN OF STRATFORD 200 ORONOQUE LANE STRATFORD, CT 06614	
APPLICANT:	AT&T MOBILITY 550 COCHITUATE RD. FRAMINGHAM, MA 01701	
CLIENT REPRESENTATIVE:	SMARTLINK, LLC 85 RANGEWAY RD., BUILDING 3, SUITE 102 NORTH BILLERICA, MA 01862	
CONTACT:	EDWARD WEISSMAN (917)528-1857	
ENGINEER:	INFINIGY 1033 WATERVLIET SHAKER ROAD ALBANY, NY 12205	
CONTACT:	ALEX WELLER (518) 690-0790	
BUILDING CODE:	CT BUILDING CODE UNIFORM BUILDING CODE BUILDING OFFICIALS & CODE ADMINISTRATORS UNIFORM MECHANICAL CODE UNIFORM PLUMBING CODE LOCAL BUILDING CODE CITY/COUNTY ORDINANCES	
ELECTRICAL CODE:	NATIONAL ELECTRICAL CODE (LATEST EDITION)	

LOCATION MAP



PROJECT TEAM

smartlink

PROJECT MANAGER

INFINIGY

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

ENGINEER

SCOPE OF WORK (PER LTE RFDS, DATED 12/17/2018, V3.00):

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

TOWER SCOPE
- REMOVE (3) PANEL ANTENNAS
- INSTALL (3) PANEL ANTENNAS
- REMOVE (3) RRUS-11
- INSTALL (3) RRUS-32
- INSTALL (3) B5/B12 4449

GROUND SCOPE
- SWAP BB WITH 5216
- ADD RBS 6630

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

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

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

at&t

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
JAN 15 2019

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

No	Submittal / Revision	App'd	Date
1	ISSUED FOR PERMIT	BMW	01/15/19
0	ISSUED FOR REVIEW	BMW	12/18/18

Drawn: BMW Date: 12/18/18
Designed: ASW Date: 12/18/18
Checked: ASW Date: 12/18/18

Project Number: 1106-A0001-C

Project Title:
STRFTFORD ORONOQUE ROAD
CTL02638
FA# 10152336
200 ORNOQUE LANE
STRATFORD, CT 06614

Prepared For: smartlink

Drawing Scale: AS NOTED
Date: 01/15/19

CD

Drawing Title
TITLE PAGE

Drawing Number
T1

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

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

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

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

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

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

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

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

PART 2 – EXECUTION

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

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

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

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

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

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

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

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

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

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

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

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

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

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

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

PART 6 – TRENCHING AND BACKFILLING

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

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

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

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

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

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

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

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

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

ABBREVIATIONS

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

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STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
JAN 15 2019
PROFESSIONAL ENGINEER

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Project Number: 1106-A0001-C

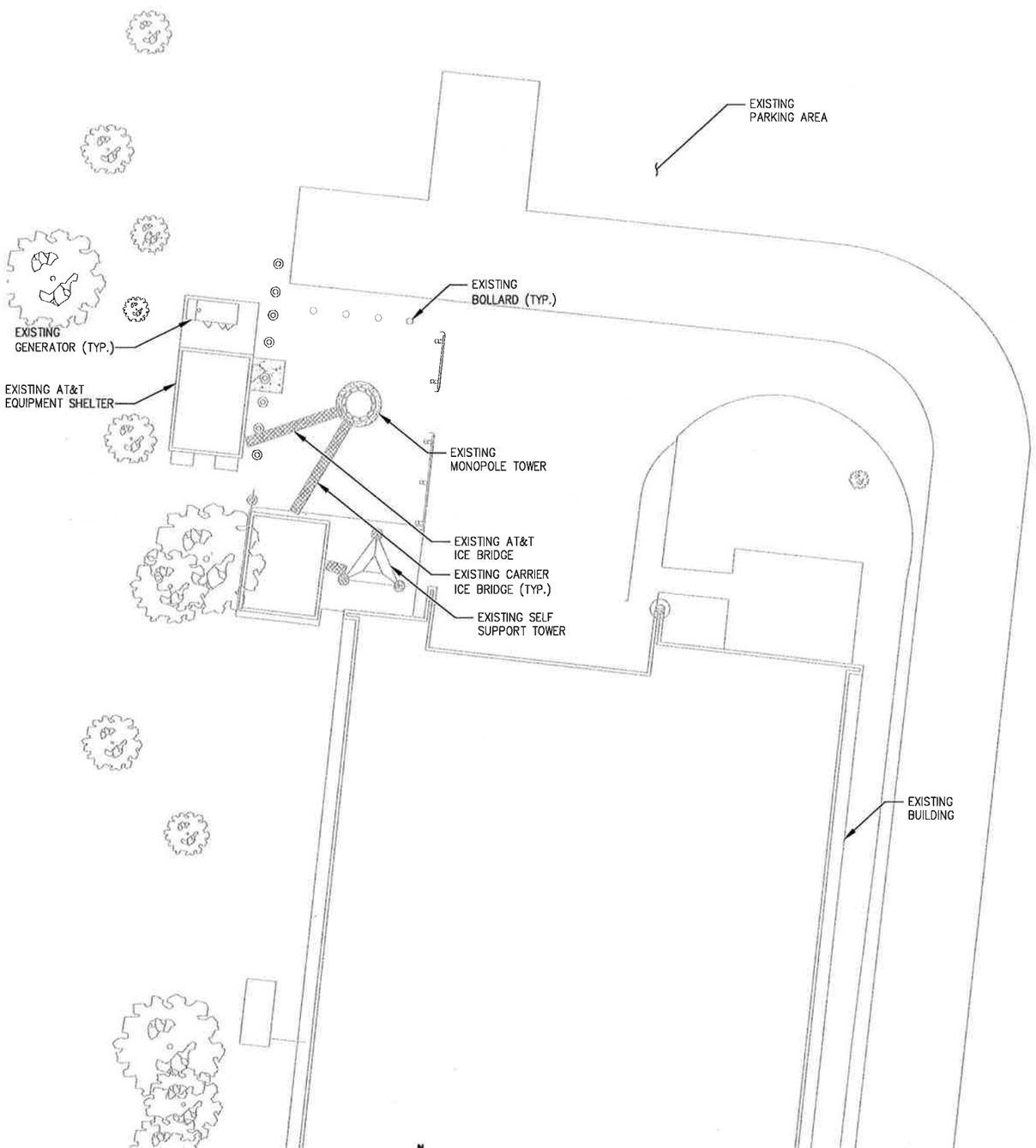
Project Title:
STRFTFORD
ORONOQUE ROAD
CTL02638
FA# 10152336
200 ORNOOQUE LANE
STRATFORD, CT 06614

Prepared For: smartlink

Drawing Scale: AS NOTED
Date: 01/15/19
CD

Drawing Title
GENERAL NOTES

Drawing Number
C1

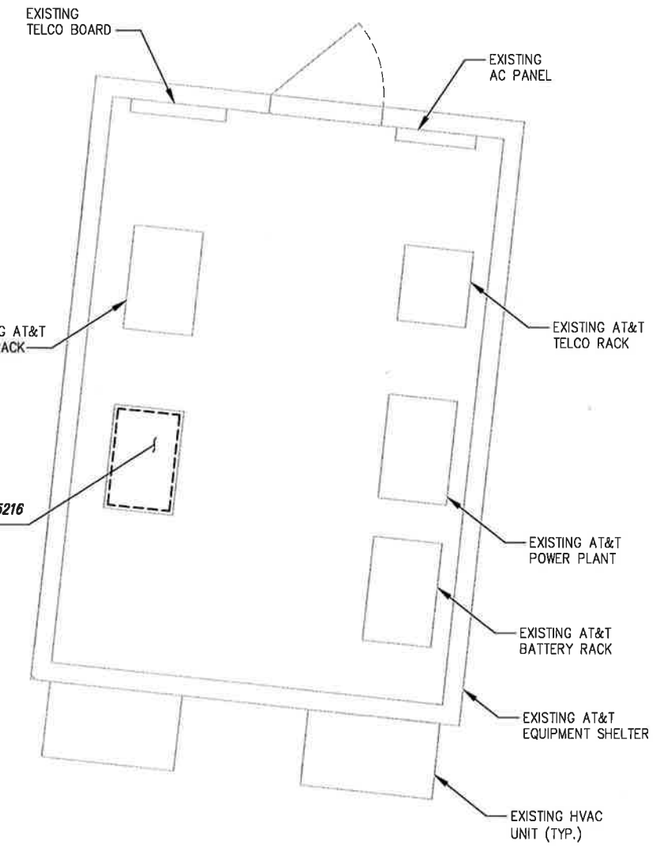


TRUE NORTH

1 SITE PLAN
SCALE: AS NOTED

GRAPHIC SCALE:
10' 5' 0 5' 10'
SCALE (11x17): 1" = 10'-0"
SCALE (22x34): 1" = 5'-0"

BASEMAPPING PREPARED FROM A SITE WALK PERFORMED BY OTHERS AND PROVIDED INFORMATION, AND DOES NOT REPRESENT AN ACTUAL FIELD SURVEY.



TRUE NORTH

2 ENLARGED EQUIPMENT PLAN
SCALE: AS NOTED

GRAPHIC SCALE:
4' 2' 0 2' 4'
SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

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smartlink

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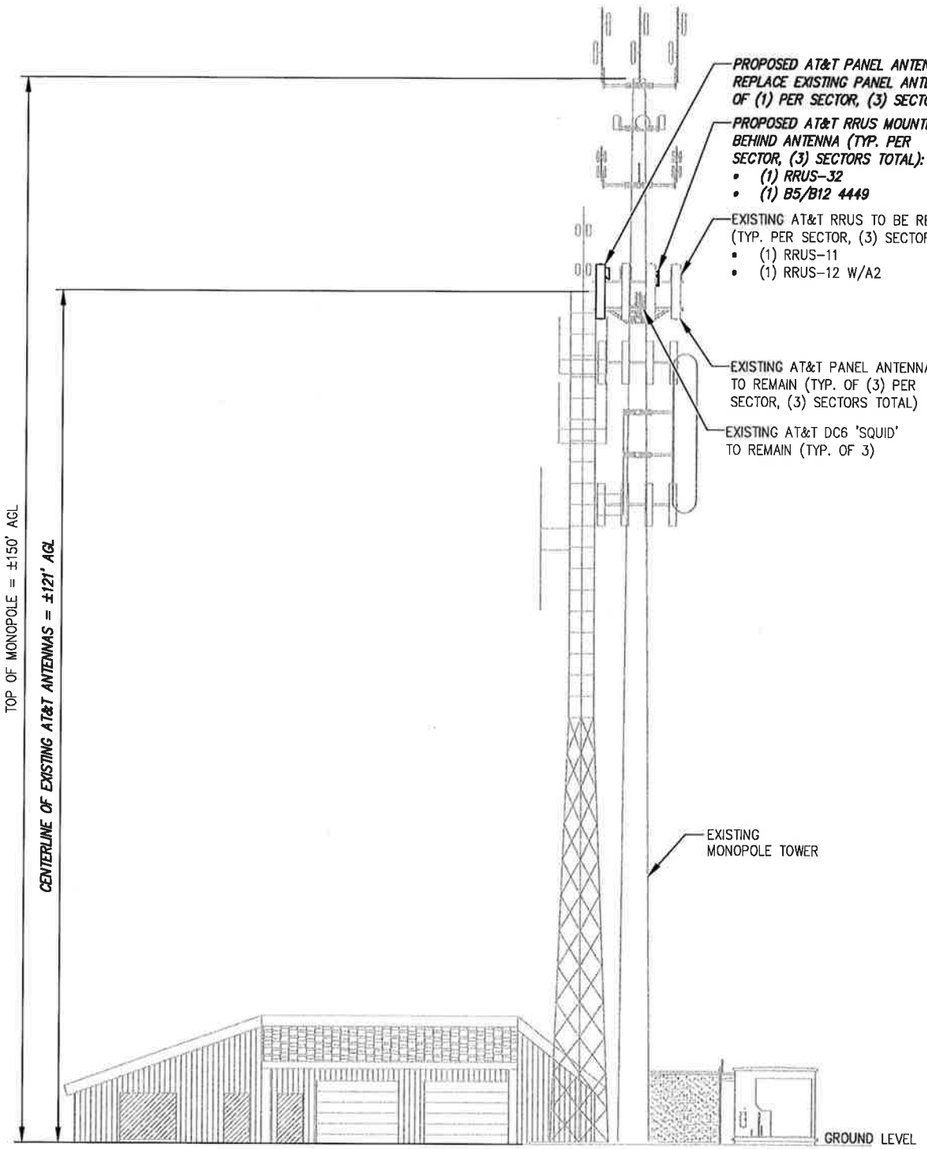
AS NOTED
Date:
01/15/19

CD

Drawing Title
OVERALL & ENLARGED SITE PLAN

Drawing Number
C2



1 ELEVATION VIEW
NOT TO SCALE

NOTE:
- FOR ADDITIONAL STRUCTURAL INFORMATION PERTAINING TO THE TOWER, SEE 'STRUCTURAL ANALYSIS REPORT' COMPLETED BY INFINIGY, DATED 12/20/18.
- FOR ADDITIONAL STRUCTURAL INFORMATION PERTAINING TO THE ANTENNA MOUNT, SEE 'MOUNT ANALYSIS REPORT' COMPLETED BY INFINIGY, DATED 12/19/18.

SEPARATION NOTE:
- 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
- 6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE

FINAL ANTENNA CONFIGURATION & CABLE SCHEDULE BASED ON RFDS DATED 12/17/18, V 3.00

SECTOR	ANTENNA POSITION	ANTENNA STATUS & TECHNOLOGY	ANTENNA MANF/MODEL	TMA/ DIPLEXER	RRUS	AZIMUTH	ANTENNA ℄ HEIGHT	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A-1	(E) UMTS 850	CCI HPA-65R-BUU-H8	--	(1) (E) RRUS-11	30°	±121'	(1) (E) FIBER (2) (E) DC CABLES	--	(3) (E) DC6 'SQUID'
	A-2	(E) LTE WCS	CCI HPA-65R-BUU-H8	--	***(1) (P) RRUS-32***	30°	±121'	SEE A-1 FOR CABLE INFORMATION	--	
	A-3	(E) LTE 1900	CCI HPA-65R-BUU-H8	--	(1) (E) RRUS-12 W/A2	30°	±121'	SEE A-1 FOR CABLE INFORMATION	--	
	A-4	***(P) LTE 700/ 850/5G 850***	***KATHREIN 800-10966***	--	***(1) (P) B5/B12 4449***	***30°***	***±121'***	SEE A-1 FOR CABLE INFORMATION	--	
BETA	B-1	(E) UMTS 850	CCI HPA-65R-BUU-H8	--	(1) (E) RRUS-11	150°	±121'	(1) (E) FIBER (2) (E) DC CABLES	--	
	B-2	(E) LTE WCS	CCI HPA-65R-BUU-H8	--	***(1) (P) RRUS-32***	150°	±121'	SEE B-1 FOR CABLE INFORMATION	--	
	B-3	(E) LTE 1900	CCI HPA-65R-BUU-H8	--	(1) (E) RRUS-12 W/A2	150°	±121'	SEE B-1 FOR CABLE INFORMATION	--	
	B-4	***(P) LTE 700/ 850/5G 850***	***KATHREIN 800-10966***	--	***(1) (P) B5/B12 4449***	***150°***	***±121'***	SEE B-1 FOR CABLE INFORMATION	--	
GAMMA	C-1	(E) UMTS 850	CCI HPA-65R-BUU-H8	--	(1) (E) RRUS-11	270°	±121'	(1) (E) FIBER (2) (E) DC CABLES	--	
	G-2	(E) LTE WCS	CCI HPA-65R-BUU-H8	--	***(1) (P) RRUS-32***	270°	±121'	SEE G-1 FOR CABLE INFORMATION	--	
	G-3	(E) LTE 1900	CCI HPA-65R-BUU-H8	--	(1) (E) RRUS-12 W/A2	270°	±121'	SEE G-1 FOR CABLE INFORMATION	--	
	G-4	***(P) LTE 700/ 850/5G 850***	***KATHREIN 800-10966***	--	***(1) (P) B5/B12 4449***	***270°***	***±121'***	SEE G-1 FOR CABLE INFORMATION	--	

2 AT&T ANTENNA SCHEDULE
NOT TO SCALE

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STATE OF CONNECTICUT
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No. 24705
LICENSED PROFESSIONAL ENGINEER
JAN 15 2019

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Project Number: 1106-A0001-C

Project Title:
STRFTFORD
ORONOQUE ROAD
CTL02638
FA# 10152336
200 ORNOQUE LANE
STRATFORD, CT 06614

Prepared For: smartlink

Drawing Scale: AS NOTED
Date: 01/15/19
CD

Drawing Title
ELEVATION VIEW

Drawing Number
C3

SEPARATION NOTE:
- 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
- 6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE

NOTE:
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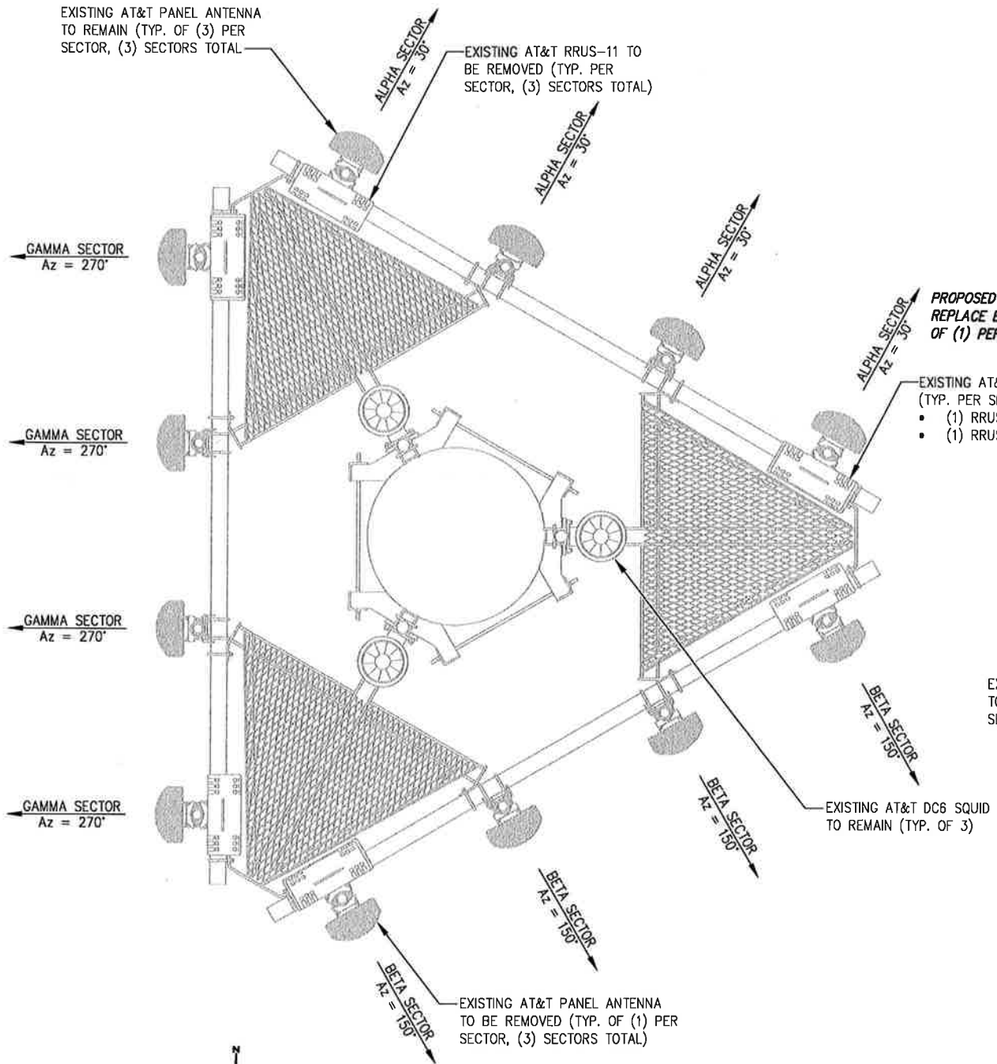
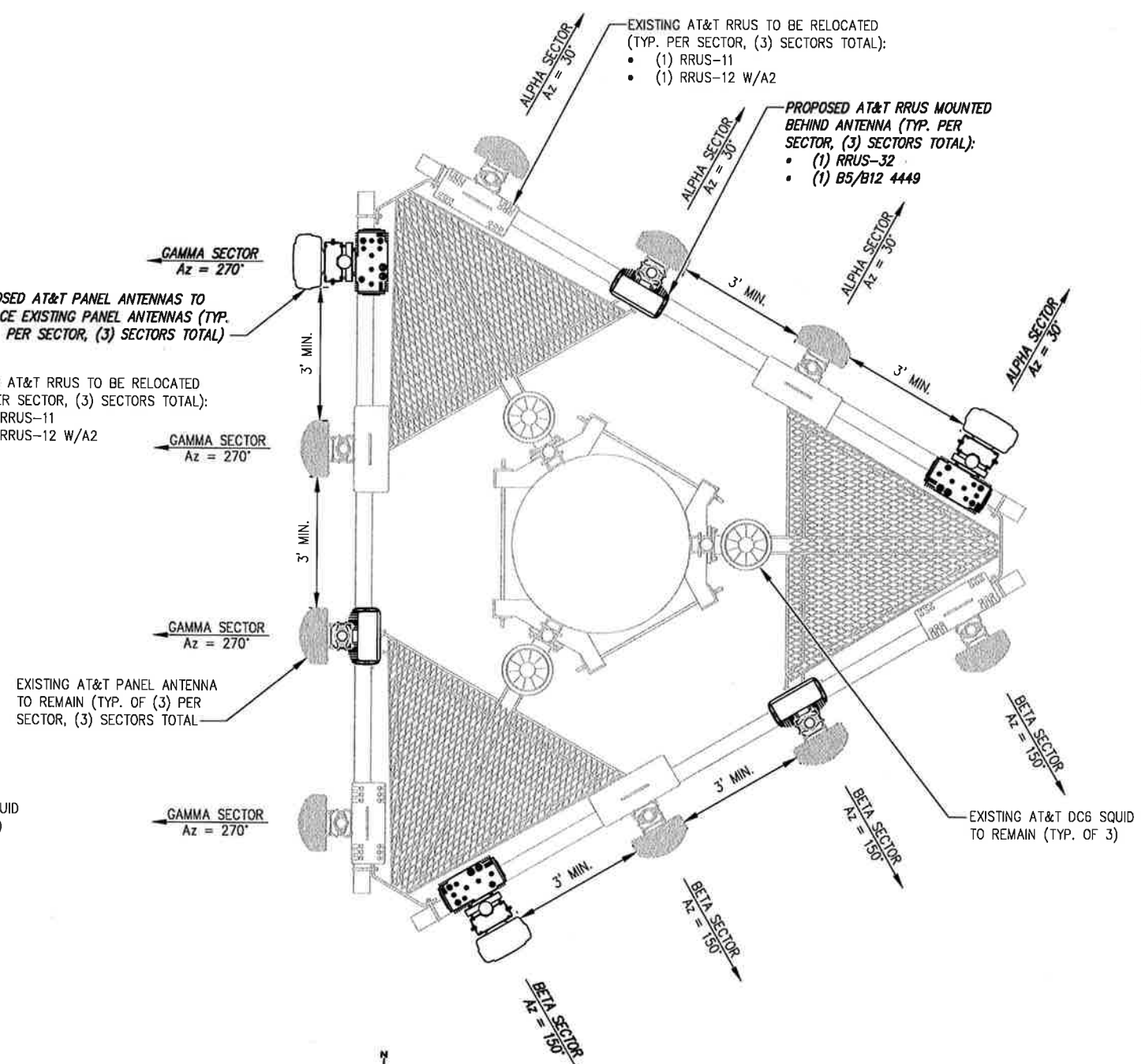
- FOR ADDITIONAL STRUCTURAL INFORMATION PERTAINING TO THE ANTENNA MOUNT, SEE 'MOUNT ANALYSIS REPORT' COMPLETED BY INFINIGY, DATED 12/19/18.



1 EXISTING ANTENNA ORIENTATION PLAN
NOT TO SCALE



2 PROPOSED ANTENNA ORIENTATION PLAN
NOT TO SCALE

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Albany, NY 12205
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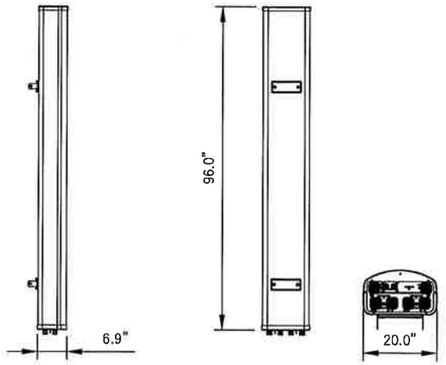
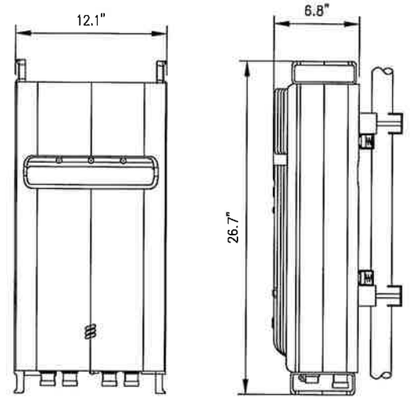
Drawing Title
ANTENNA ORIENTATION PLAN

Drawing Number
C4



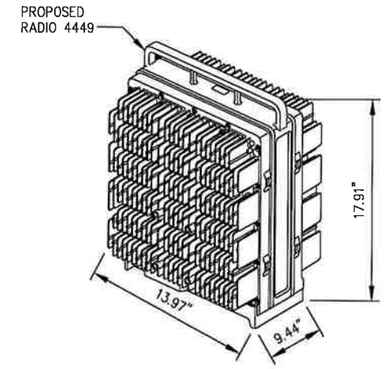
KATHREIN MODEL NO.:	800-10966
RADOME MATERIAL:	FIBERGLASS,
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	96.0"x20.0"x6.9"
WEIGHT, W/ PRE-MOUNTED BRACKETS:	114.6 LBS
CONNECTOR:	7-16 DIN FEMALE

1 ANTENNA DETAIL
NOT TO SCALE



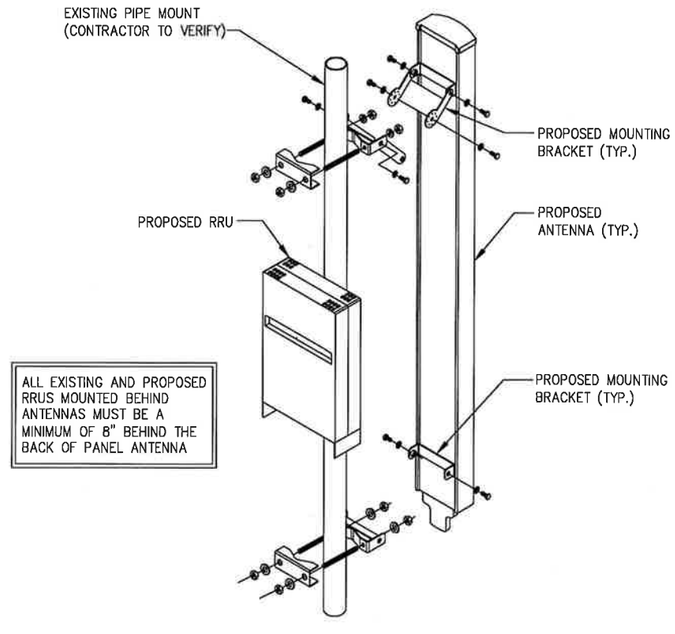
RRUS-32 SPECIFICATIONS
- HXWXD, (INCHES) : 26.7"X12.1"X6.8"
- WEIGHT (LBS) : 50.8
- COLOR : GRAY

2 ERICSSON RRUS-32 DETAIL
NOT TO SCALE



RADIO 4449 SPECIFICATIONS
- HxWxD, (INCHES) : 17.91"x13.97"x9.44"
- WEIGHT (LBS) : 70.54
- COLOR : GRAY

3 ERICSSON RADIO 4449 DETAIL
NOT TO SCALE



4 MOUNTING DETAIL
NOT TO SCALE

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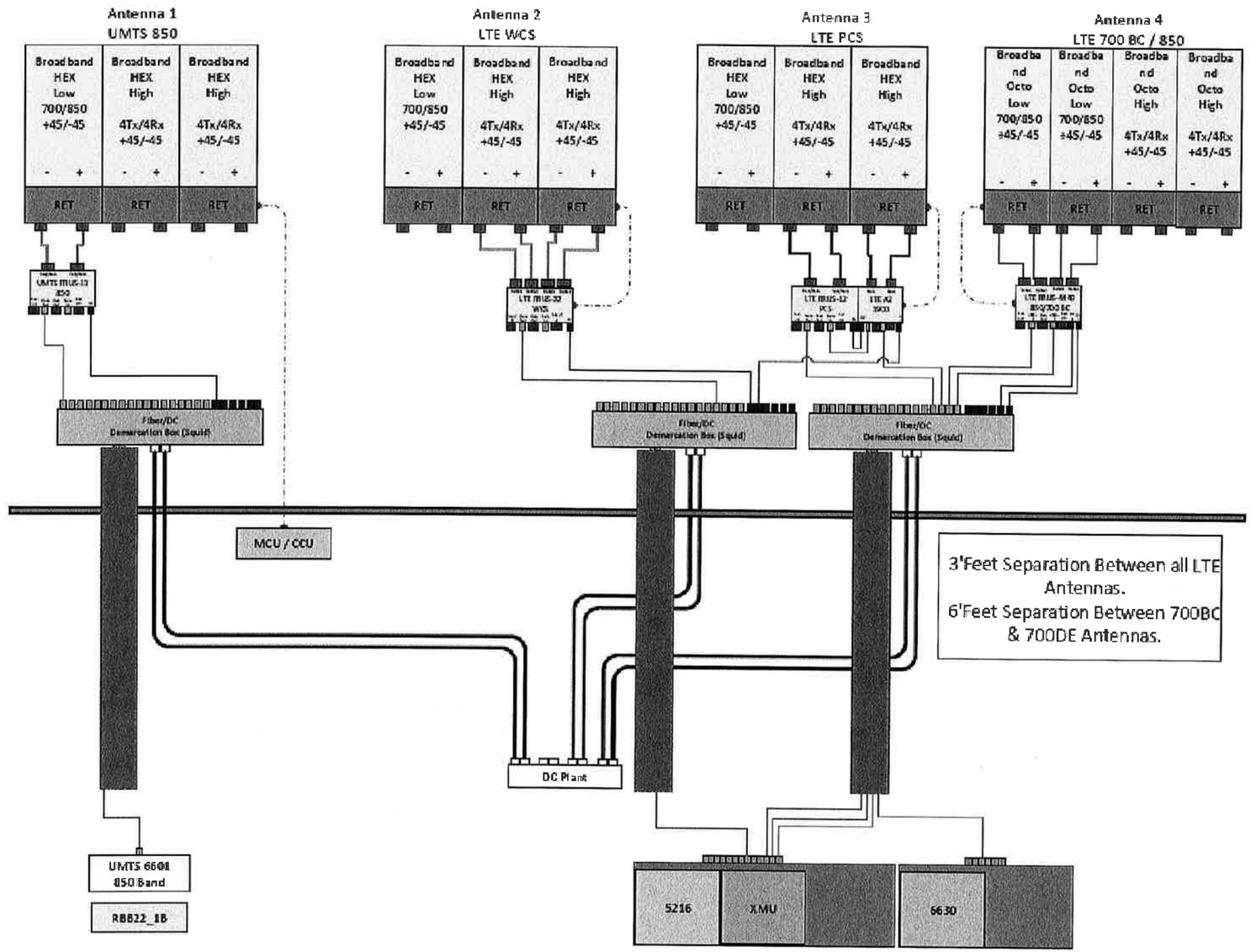
Drawing Title
EQUIPMENT DETAILS

Drawing Number
C5



1 PLUMBING DIAGRAM (FINAL CONFIGURATION)
NOT TO SCALE

*BASED ON LTE RFDS, DATED 12/17/2018, V3.00

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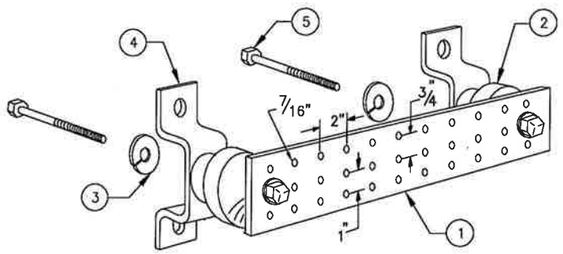
Drawing Title
PLUMBING DIAGRAM

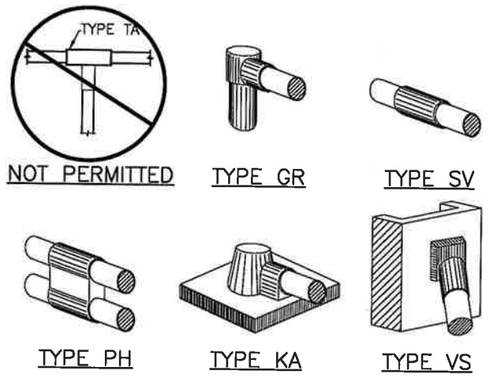
Drawing Number
C6



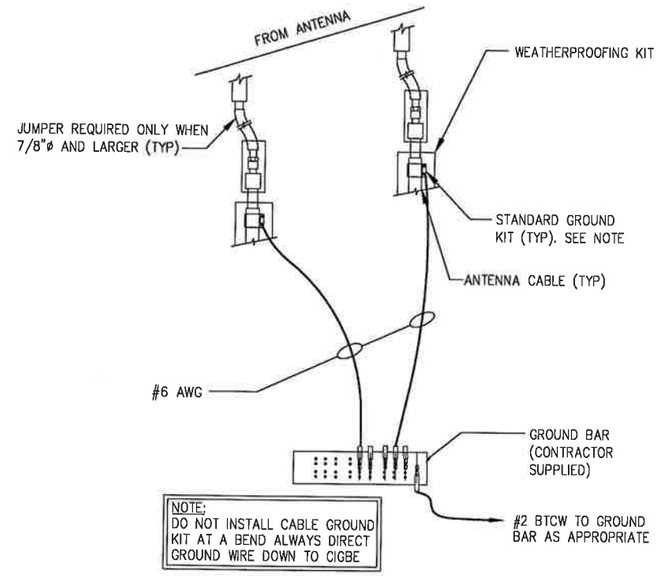
LEGEND

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

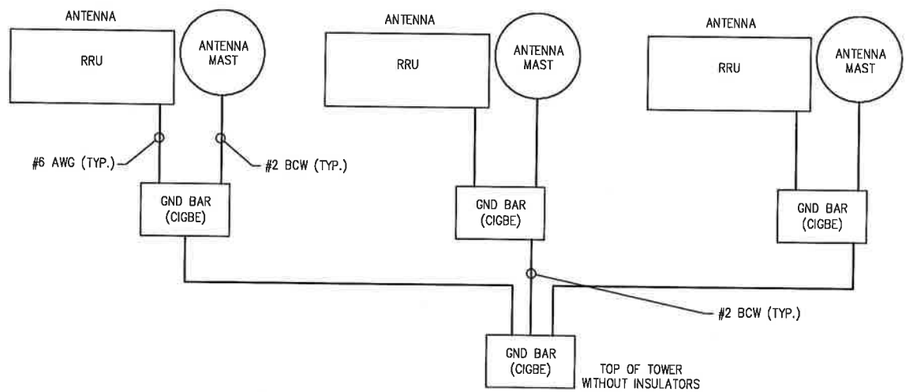
1 — GROUND BAR
NOT TO SCALE



2 — CADWELDS (TYPICAL)
NOT TO SCALE



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



4 — SCHEMATIC DIAGRAM GROUNDING SYSTEM
NOT TO SCALE

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
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at&t

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
01/15/19
UNDER MY SUPERVISION OR DIRECTION ACCORDING TO MY KNOWLEDGE AND EXPERIENCE THE DATA AND INFORMATION CONTAINED IN THIS SET OF PLANS IS IN COMPLIANCE WITH APPLICABLE STATE AND LOCAL LAWS.

No.	Submittal / Revision	Appd	Date
1	ISSUED FOR PERMIT	BMM	01/15/19
0	ISSUED FOR REVIEW	BMM	12/18/18

Drawn: BMM Date: 12/18/18
Designed: ASW Date: 12/18/18
Checked: ASW Date: 12/18/18

Project Number: 1106-A0001-C

Project Title:
STRFTFORD
ORONOQUE ROAD
CTL02638
FA# 10152336
200 ORNOQUE LANE
STRATFORD, CT 06614

Prepared For: smartlink

Drawing Scale: AS NOTED
Date: 01/15/19
CD

Drawing Title
GROUNDING DETAILS

Drawing Number
C7

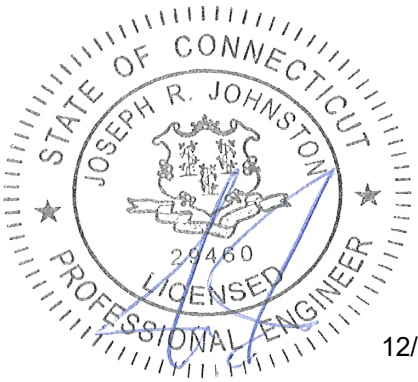
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

1033 WATERVLIET SHAKER RD, ALBANY, NY 12205

Structural Analysis Report

December 20, 2018

Site Name	Stratford Oronoque Road
Site Number	CTL02638
FA Number	10152336
PACE Number	MRCTB033626/ MRCTB033568/ MRCTB033826
PTN Number	2051A0JDGY / 2051A0JD9X / 2051A0JD4S
Infinigy Job Number	499-006
Client	Smartlink
Proposed Carrier	AT&T
Site Location	200 Oronoque Lane, Stratford, CT, 06614 41° 15' 5.07" N NAD83 73° 07' 1.74" W NAD83
Structure Type	150' Monopole
Structural Usage Ratio	**57.6%**
Overall Result	**Pass**



12/20/18

Ishan Patel, E.I.T
Project Engineer I | INFINIGY

Contents

Introduction

Infinigy Engineering has been requested to perform a structural analysis on the existing 150' Monopole. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The tower was analyzed using tnxTower version 8.0.4.0 tower analysis software.

Supporting Documentation

Previous Analysis	Sabre Communications Corporation, dated May 1, 2014
RFDS	AT&T RFDS ID #2455202, dated December 17, 2018
Construction Drawings	Pro Terra Design Group, LLC, dated September 12, 2014

Analysis Code Requirements

Wind Speed	97 mph (3-Second Gust, V_{ASD}) / 125 mph (3-Second Gust, V_{ULT})
Wind Speed w/ ice	50 mph (3-Second Gust, V_{ASD}) w/ 0.75" ice
TIA Revision	ANSI/TIA-222-G
Adopted IBC	2015 IBC/ 2018 Connecticut State Building Code
Structure Class	II
Exposure Category	B
Topographic Category	1
Calculated Crest Height	0 feet

Conclusion

Upon reviewing the results of this analysis, it is our opinion that the structure meets the specified TIA code requirements. The tower and foundations are therefore deemed adequate to support the final loading as listed in this report.

If you have any questions, require additional information, or actual conditions differ from those as detailed in this report please contact me via the information below:

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Existing and Reserved Loading

Mount Height (ft)	Qty.	Appurtenance	Mount Type	Coax & Lines	Carrier
160.0	4	20’ x 3” Whips	Side Arm	(2) 5/8”	-
150.0	2	20’ x 3” Whips	Side Arm	(4) 5/8”	-
	1	6’ Solid Dishes w/ Radome			
140.0	4	Omni’s	Side Arm	(2) 5/8”	-
121.0	12	CCI HPA-65R-BUU-H8	Platform w/ Handrails	(3) 1/2” (6) DC/ Fiber	AT&T
	6	Ericsson RRUS-11			
	3	Ericsson RRUS-12 w/A2			
	3	Raycap DC6-48-60-18-8F			

To Be Removed Loading

Mount Height (ft)	Qty.	Appurtenance	Mount Type	Coax & Lines	Carrier
121.0	3	CCI HPA-65R-BUU-H8	--	--	AT&T
	3	Ericsson RRUS-11			

Proposed Loading

Mount Height (ft)	Qty.	Appurtenance	Mount Type	Coax& Lines	Carrier
121.0	3	Kathrein 800-10966	--	--	AT&T
	3	Ericsson RRUS-32			
	3	Ericsson RRUS-4449 B5/B12			

Final Configuration

Mount Height (ft)	Qty.	Appurtenance	Mount Type	Coax & Lines	Carrier
160.0	4	20’ x 3” Whips	Direct	(2) 5/8”	-
150.0	2	20’ x 3” Whips	Direct	(4) 5/8”	-
	1	6’ Solid Dishes w/ Radome			
140.0	4	Omni’s	Direct	(2) 5/8”	-
121.0	9	CCI HPA-65R-BUU-H8	Platform w/ Handrails	(3) 1/2” (6) DC/ Fiber	AT&T
	3	Kathrein 800-10966			
	3	Ericsson RRUS-32			
	3	Ericsson RRUS-4449 B5/B12			
	3	Ericsson RRUS-11			
	3	Ericsson RRUS-12 w/A2			
	3	Raycap DC6-48-60-18-8F			

Structure Usages

Pole (L3)	57.6%	Pass
Base Plate	52.9%	Pass
RATING =	**57.6%**	**Pass**

Foundation Reactions

Reaction Data	Design Reactions	Analysis Reactions	Result
Axial (kip)	--	35.0	--
Shear (kip)	--	21.9	--
Moment (kip-ft)	--	2333.33	--

- Tower base reactions are acceptable when compared to the allowable reactions listed in the previous analysis by Sabre. These reactions are assumed to be accurate and applicable to the site.

Deflection, Twist, and Sway

Antenna Elevation (ft)	Deflection (in)	Tilt (º)	Twist (º)
121.0	11.87	0.923	0.020

*Per ANSI/TIA-222-G Section 2.8.2 maximum serviceability structural deflection limit is 3% of structure height.
*Per ANSI/TIA-222-G Section 2.8.2 maximum serviceability structural twist and sway limit is 4 degrees.
*Per ANSI/TIA-222-G Section 2.8.3 deflection, Twist, and sway values were calculated using a basic 3-second gust wind speed of 60 mph.
*It is the responsibility of the client to ensure their proposed and/or existing equipment will meet ANSI/TIA-222-G Annex D or other appropriate microwave signal degradation limits based on the provided values above.

Assumptions and Limitations

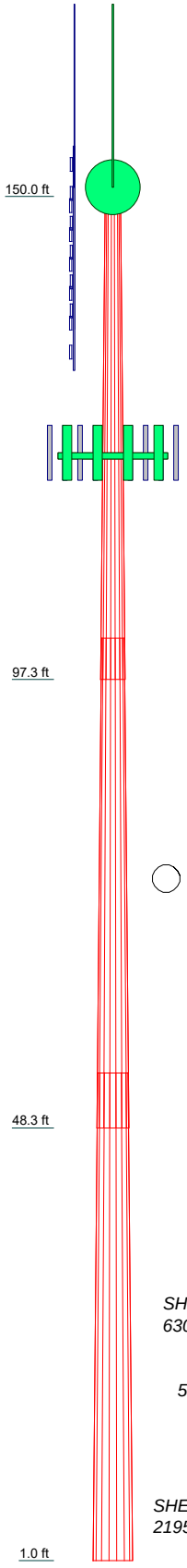
Our structural calculations are completed assuming all information provided to Infinigy Engineering is accurate and applicable to this site. For the purposes of calculations, we assume

an overall structure condition of “like new” and all members and connections to be free of corrosion and/or structural defects. The structure owner and/or contractor shall verify the structure’s condition prior to installation of any proposed equipment. If actual conditions differ from those described in this report Infinigy Engineering should be notified immediately to complete a revised evaluation.

Our evaluation is completed using standard TIA, AISC, ACI, and ASCE methods and procedures. Our structural results are proprietary and should not be used by others as their own. Infinigy Engineering is not responsible for decisions made by others that are or are not based on our supplied assumptions and conclusions.

This report is an evaluation of the tower structure only and does not reflect adequacy of any existing antenna mounts, mount connections, or cable mounting attachments. These elements are assumed to be adequate for the purposes of this analysis and are assumed to have been installed per their manufacturer requirements.

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	52.75	18	0.2500	4.50	20.0000	31.7600		3650.5
2	53.50	18	0.3125	6.00	30.2568	42.1900	A572-65	6484.4
3	53.25	18	0.3750		40.2267	52.1000		9875.3
								20010.2



ALL REACTIONS ARE FACTORED

AXIAL 56277 lb

SHEAR 6309 lb

MOMENT 685532 lb-ft

TORQUE 3705 lb-ft
50 mph WIND - 0.7500 in ICE

AXIAL 35087 lb

SHEAR 21958 lb

MOMENT 2333351 lb-ft

TORQUE 12581 lb-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) 10' Omni (Verizon)	161	RRUS-11 (ATI)	122
(2) 10' Omni (Verizon)	161	HPA-65R-BUU-H8 (ATI)	122
6' Dish	151	RRUS- 32 (ATI)	122
(2) 20' Dipole (Verizon)	150 - 141	HPA-65R-BUU-H8 (ATI)	122
(2) 20' Dipole (Verizon)	150 - 141	RRUS-12 W/ A2 (ATI)	122
(2) 20' Dipole (Verizon)	150 - 132	800-10966 (ATI)	122
(2) 20' Dipole (Verizon)	150 - 132	4449 (ATI)	122
Pipe Platform w/ Handrails (ATI)	122	HPA-65R-BUU-H8 (ATI)	122
HPA-65R-BUU-H8 (ATI)	122	RRUS-11 (ATI)	122
RRUS-11 (ATI)	122	HPA-65R-BUU-H8 (ATI)	122
HPA-65R-BUU-H8 (ATI)	122	RRUS- 32 (ATI)	122
RRUS- 32 (ATI)	122	HPA-65R-BUU-H8 (ATI)	122
HPA-65R-BUU-H8 (ATI)	122	RRUS-12 W/ A2 (ATI)	122
RRUS-12 W/ A2 (ATI)	122	800-10966 (ATI)	122
800-10966 (ATI)	122	4449 (ATI)	122
4449 (ATI)	122	(3) DC6-48-60-18-8F (ATI)	122
HPA-65R-BUU-H8 (ATI)	122		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft

Infinigy Engineering PLLC
1033 Watervliet Shaker Rd.
Albany, NY
Phone: (518) 690-0790
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Job: ***CTL02638***			
Project: ***499-006***			
Client: Smartlink	Drawn by: BArcher	App'd:	
Code: TIA-222-G	Date: 12/19/18	Scale: NTS	
Path: C:\Users\BArcher\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\6MCN7GME\CTL02638.tri		Dwg No. E-1	

tnxTower	Job	Page
Infinigy Engineering 1033 Watervliet Shaker Rd. Albany, NY Phone: (832) 716 7721 FAX: (832) 716 7721	02 8	1 1
	Project 00	Date 12/1 /18
	Client r	Designed by

Tower Input Data

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

- Basic wind speed of 97 mph.
- Structure Class II.
- Exposure Category B.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area	√	SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r	√	All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys	√	Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice		Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity	√	Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
√	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)	√	Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	150.00-97.25	52.75	4.50	18	20.0000	31.7600	0.2500	1.0000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L2	97.25-48.25	53.50	6.00	18	30.2568	42.1900	0.3125	1.2500	A572-65 (65 ksi)
L3	48.25-1.00	53.25		18	40.2267	52.1000	0.3750	1.5000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	20.2700	15.6716	772.2994	7.0112	10.1600	76.0137	1545.6150	7.8373	3.0800	12.32
	32.2114	25.0032	3136.3866	11.1861	16.1341	194.3951	6276.9002	12.5040	5.1498	20.599
L2	31.6945	29.7010	3364.6191	10.6302	15.3704	218.9019	6733.6654	14.8533	4.7752	15.281
	42.7926	41.5372	9203.1529	14.8665	21.4325	429.4013	18418.4155	20.7726	6.8754	22.001
L3	42.1479	47.4335	9517.3496	14.1474	20.4352	465.7340	19047.2224	23.7212	6.4199	17.12
	52.8459	61.5657	20810.2424	18.3624	26.4668	786.2772	41647.8674	30.7887	8.5096	22.692

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.00-97.25				1	1	1			
L2 97.25-48.25				1	1	1			
L3 48.25-1.00				1	1	1			

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A325X
Anchor bolt size	2.2500 in
Number of bolts	14
Embedment length	84.0000 in
f'_c	3 ksi
Grout space	2.0000 in
Base plate grade	A572-50
Base plate thickness	2.5000 in
Bolt circle diameter	58.5000 in
Outer diameter	64.5000 in
Inner diameter	50.5000 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1-5/8" Hybird (AT&T)	C	No	No	Inside Pole	150.00 - 1.00	6	No Ice	0.00	1.00
							1/2" Ice	0.00	1.00
							1" Ice	0.00	1.00
0.51" (13mm) Hybrid (AT&T)	C	No	No	Inside Pole	121.00 - 1.00	3	No Ice	0.00	0.57
							1/2" Ice	0.00	0.57
							1" Ice	0.00	0.57
3/4" DC Power (AT&T)	C	No	No	Inside Pole	121.00 - 1.00	6	No Ice	0.00	5.00
							1/2" Ice	0.00	5.00
							1" Ice	0.00	5.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	150.00-97.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1069.61
L2	97.25-48.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1847.79
L3	48.25-1.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1781.80

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	150.00-97.25	A	1.710	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1069.61
L2	97.25-48.25	A	1.622	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1847.79
L3	48.25-1.00	A	1.453	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1781.80

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-97.25	0.0000	0.0000	0.0000	0.0000
L2	97.25-48.25	0.0000	0.0000	0.0000	0.0000

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L3	48.25-1.00	0.0000	0.0000	0.0000	0.0000

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) 10' Omni (Verizon)	A	From Face	4.00 0.00 0.00		90.0000	161.00	No Ice 1/2" Ice 1" Ice	3.00 4.03 5.03	3.00 4.03 5.03	33.30 55.09 83.44
(2) 10' Omni (Verizon)	C	From Face	4.00 0.00 0.00		30.0000	161.00	No Ice 1/2" Ice 1" Ice	3.00 4.03 5.03	3.00 4.03 5.03	33.30 55.09 83.44
(2) 20' Dipole (Verizon)	A	From Face	4.00 0.00 0.00		90.0000	150.00 - 141.00	No Ice 1/2" Ice 1" Ice	6.00 8.03 10.08	6.00 8.03 10.08	60.00 103.17 159.01
(2) 20' Dipole (Verizon)	C	From Face	4.00 0.00 0.00		90.0000	150.00 - 141.00	No Ice 1/2" Ice 1" Ice	6.00 8.03 10.08	6.00 8.03 10.08	60.00 103.17 159.01
6' Dish	C	From Face	4.00 0.00 0.00		0.0000	151.00	No Ice 1/2" Ice 1" Ice	43.20 44.00 44.81	21.60 22.20 22.81	254.00 595.87 949.59
(2) 20' Dipole (Verizon)	A	From Face	4.00 0.00 0.00		90.0000	150.00 - 132.00	No Ice 1/2" Ice 1" Ice	6.00 8.03 10.08	6.00 8.03 10.08	60.00 103.17 159.01
(2) 20' Dipole (Verizon)	C	From Face	4.00 0.00 0.00		30.0000	150.00 - 132.00	No Ice 1/2" Ice 1" Ice	6.00 8.03 10.08	6.00 8.03 10.08	60.00 103.17 159.01
Pipe Platform w/ Handrails (AT&T)	C	From Face	0.00 0.00 0.00		0.0000	122.00	No Ice 1/2" Ice 1" Ice	27.20 34.20 41.20	27.20 34.20 41.20	2000.00 2400.00 2800.00
HPA-65R-BUU-H8 (AT&T)	A	From Face	4.00 0.00 0.00		0.0000	122.00	No Ice 1/2" Ice 1" Ice	9.66 10.13 10.61	6.45 6.91 7.38	51.00 113.99 183.38
RRUS-11 (AT&T)	A	From Face	4.00 0.00 0.00		0.0000	122.00	No Ice 1/2" Ice 1" Ice	3.79 4.04 4.29	1.46 1.63 1.81	55.00 80.77 109.98
HPA-65R-BUU-H8 (AT&T)	A	From Face	4.00 0.00 0.00		0.0000	122.00	No Ice 1/2" Ice 1" Ice	9.66 10.13 10.61	6.45 6.91 7.38	51.00 113.99 183.38
RRUS- 32	A	From Face	4.00		0.0000	122.00	No Ice	2.69	1.92	67.30

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			0.00				1/2" Ice	2.91	2.23	93.17
			0.00				1" Ice	3.14	2.56	123.05
HPA-65R-BUU-H8	A	From Face	4.00	0.00	0.0000	122.00	No Ice	9.66	6.45	51.00
(AT&T)			0.00				1/2" Ice	10.13	6.91	113.99
			0.00				1" Ice	10.61	7.38	183.38
RRUS-12 W/ A2	A	From Face	4.00	0.00	0.0000	122.00	No Ice	2.49	1.33	79.10
(AT&T)			0.00				1/2" Ice	2.68	1.48	101.12
			0.00				1" Ice	2.89	1.64	126.21
800-10966	A	From Face	4.00	0.00	0.0000	122.00	No Ice	13.61	7.35	81.90
(AT&T)			0.00				1/2" Ice	14.21	7.94	155.92
			0.00				1" Ice	14.82	8.54	237.75
4449	A	From Face	4.00	0.00	0.0000	122.00	No Ice	3.50	2.36	85.00
(AT&T)			0.00				1/2" Ice	3.74	2.57	114.30
			0.00				1" Ice	3.99	2.78	147.22
HPA-65R-BUU-H8	B	From Face	4.00	0.00	0.0000	122.00	No Ice	9.66	6.45	51.00
(AT&T)			0.00				1/2" Ice	10.13	6.91	113.99
			0.00				1" Ice	10.61	7.38	183.38
RRUS-11	B	From Face	4.00	0.00	0.0000	122.00	No Ice	3.79	1.46	55.00
(AT&T)			0.00				1/2" Ice	4.04	1.63	80.77
			0.00				1" Ice	4.29	1.81	109.98
HPA-65R-BUU-H8	B	From Face	4.00	0.00	0.0000	122.00	No Ice	9.66	6.45	51.00
(AT&T)			0.00				1/2" Ice	10.13	6.91	113.99
			0.00				1" Ice	10.61	7.38	183.38
RRUS- 32	B	From Face	4.00	0.00	0.0000	122.00	No Ice	2.69	1.92	67.30
(AT&T)			0.00				1/2" Ice	2.91	2.23	93.17
			0.00				1" Ice	3.14	2.56	123.05
HPA-65R-BUU-H8	B	From Face	4.00	0.00	0.0000	122.00	No Ice	9.66	6.45	51.00
(AT&T)			0.00				1/2" Ice	10.13	6.91	113.99
			0.00				1" Ice	10.61	7.38	183.38
RRUS-12 W/ A2	B	From Face	4.00	0.00	0.0000	122.00	No Ice	2.49	1.33	79.10
(AT&T)			0.00				1/2" Ice	2.68	1.48	101.12
			0.00				1" Ice	2.89	1.64	126.21
800-10966	B	From Face	4.00	0.00	0.0000	122.00	No Ice	13.61	7.35	81.90
(AT&T)			0.00				1/2" Ice	14.21	7.94	155.92
			0.00				1" Ice	14.82	8.54	237.75
4449	B	From Face	4.00	0.00	0.0000	122.00	No Ice	3.50	2.36	85.00
(AT&T)			0.00				1/2" Ice	3.74	2.57	114.30
			0.00				1" Ice	3.99	2.78	147.22
HPA-65R-BUU-H8	C	From Face	4.00	0.00	0.0000	122.00	No Ice	9.66	6.45	51.00
(AT&T)			0.00				1/2" Ice	10.13	6.91	113.99
			0.00				1" Ice	10.61	7.38	183.38
RRUS-11	C	From Face	4.00	0.00	0.0000	122.00	No Ice	3.79	1.46	55.00
(AT&T)			0.00				1/2" Ice	4.04	1.63	80.77
			0.00				1" Ice	4.29	1.81	109.98
HPA-65R-BUU-H8	C	From Face	4.00	0.00	0.0000	122.00	No Ice	9.66	6.45	51.00
(AT&T)			0.00				1/2" Ice	10.13	6.91	113.99
			0.00				1" Ice	10.61	7.38	183.38
RRUS- 32	C	From Face	4.00	0.00	0.0000	122.00	No Ice	2.69	1.92	67.30
(AT&T)			0.00				1/2" Ice	2.91	2.23	93.17
			0.00				1" Ice	3.14	2.56	123.05
HPA-65R-BUU-H8	C	From Face	4.00	0.00	0.0000	122.00	No Ice	9.66	6.45	51.00
(AT&T)			0.00				1/2" Ice	10.13	6.91	113.99
			0.00				1" Ice	10.61	7.38	183.38
RRUS-12 W/ A2	C	From Face	4.00	0.00	0.0000	122.00	No Ice	2.49	1.33	79.10
(AT&T)			0.00				1/2" Ice	2.68	1.48	101.12
			0.00				1" Ice	2.89	1.64	126.21
800-10966	C	From Face	4.00	0.00	0.0000	122.00	No Ice	13.61	7.35	81.90

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Infinigy Engineering 1033 Watervliet Shaker Rd. Albany, NY Phone: (832) 716 7721 FAX: (832) 716 7721	Project □□□□00□□	Date □ 1□□□0□2□□12/1□/18□
	Client □ □□ □r□□□□□□	Designed by □ □□□□

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			0.00				1/2" Ice	14.21	7.94	155.92
			0.00				1" Ice	14.82	8.54	237.75
4449	C	From Face	4.00	0.0000		122.00	No Ice	3.50	2.36	85.00
(AT&T)			0.00				1/2" Ice	3.74	2.57	114.30
			0.00				1" Ice	3.99	2.78	147.22
(3) DC6-48-60-18-8F	C	From Face	4.00	0.0000		122.00	No Ice	2.90	2.90	32.80
(AT&T)			0.00				1/2" Ice	3.13	3.13	60.76
			0.00				1" Ice	3.37	3.37	92.36

Tower Pressures - No Ice □□□

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	122.02	1.046	24	115.350	A	0.000	115.350	115.350	100.00	0.000	0.000
150.00-97.25					B	0.000	115.350		100.00	0.000	0.000
					C	0.000	115.350		100.00	0.000	0.000
L2 97.25-48.25	72.13	0.9	20	152.078	A	0.000	152.078	152.078	100.00	0.000	0.000
					B	0.000	152.078		100.00	0.000	0.000
					C	0.000	152.078		100.00	0.000	0.000
L3 48.25-1.00	24.06	0.7	16	187.019	A	0.000	187.019	187.019	100.00	0.000	0.000
					B	0.000	187.019		100.00	0.000	0.000
					C	0.000	187.019		100.00	0.000	0.000

Tower Pressure - With Ice □□

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 150.00-97.25	122.02	1.046	6	1.7096	130.379	A	0.000	130.379	130.379	100.00	0.000	0.000
						B	0.000	130.379		100.00	0.000	0.000
						C	0.000	130.379		100.00	0.000	0.000
L2 97.25-48.25	72.13	0.9	5	1.6220	166.039	A	0.000	166.039	166.039	100.00	0.000	0.000
						B	0.000	166.039		100.00	0.000	0.000
						C	0.000	166.039		100.00	0.000	0.000
L3 48.25-1.00	24.06	0.7	4	1.4533	199.792	A	0.000	199.792	199.792	100.00	0.000	0.000
						B	0.000	199.792		100.00	0.000	0.000
						C	0.000	199.792		100.00	0.000	0.000

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Infinigy Engineering 1033 Watervliet Shaker Rd. Albany, NY Phone: (832) 716 7721 FAX: (832) 716 7721	02 8	1
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	Client r	Designed by

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	122.02	1.046	8	115.350	A	0.000	115.350	115.350	100.00	0.000	0.000
150.00-97.25					B	0.000	115.350		100.00	0.000	0.000
					C	0.000	115.350		100.00	0.000	0.000
L2 97.25-48.25	72.13	0.9	7	152.078	A	0.000	152.078	152.078	100.00	0.000	0.000
					B	0.000	152.078		100.00	0.000	0.000
					C	0.000	152.078		100.00	0.000	0.000
L3 48.25-1.00	24.06	0.7	6	187.019	A	0.000	187.019	187.019	100.00	0.000	0.000
					B	0.000	187.019		100.00	0.000	0.000
					C	0.000	187.019		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	1069.61	3650.51	A	1	0.65	24	1	1	115.350	1970.04	37.35	C
150.00-97.25			B	1	0.65		1	1	115.350			
			C	1	0.65		1	1	115.350			
L2	1847.79	6484.44	A	1	0.65	20	1	1	152.078	2227.84	45.47	C
97.25-48.25			B	1	0.65		1	1	152.078			
			C	1	0.65		1	1	152.078			
L3 48.25-1.00	1781.80	9875.25	A	1	0.65	16	1	1	187.019	2198.54	46.53	C
			B	1	0.65		1	1	187.019			
			C	1	0.65		1	1	187.019			
Sum Weight:	4699.20	20010.20						OTM	447574.31 lb-ft	6396.41		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	1069.61	3650.51	A	1	0.65	24	1	1	115.350	1970.04	37.35	C
150.00-97.25			B	1	0.65		1	1	115.350			
			C	1	0.65		1	1	115.350			
L2	1847.79	6484.44	A	1	0.65	20	1	1	152.078	2227.84	45.47	C
97.25-48.25			B	1	0.65		1	1	152.078			
			C	1	0.65		1	1	152.078			
L3 48.25-1.00	1781.80	9875.25	A	1	0.65	16	1	1	187.019	2198.54	46.53	C
			B	1	0.65		1	1	187.019			
			C	1	0.65		1	1	187.019			
Sum Weight:	4699.20	20010.20						OTM	447574.31 lb-ft	6396.41		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	1069.61	3650.51	A	1	0.65	24	1	1	115.350	1970.04	37.35	C
150.00-97.25			B	1	0.65		1	1	115.350			
			C	1	0.65		1	1	115.350			
L2	1847.79	6484.44	A	1	0.65	20	1	1	152.078	2227.84	45.47	C
97.25-48.25			B	1	0.65		1	1	152.078			
			C	1	0.65		1	1	152.078			
L3 48.25-1.00	1781.80	9875.25	A	1	0.65	16	1	1	187.019	2198.54	46.53	C
			B	1	0.65		1	1	187.019			
			C	1	0.65		1	1	187.019			
Sum Weight:	4699.20	20010.20						OTM	447574.31 lb-ft	6396.41		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	1069.61	6721.53	A	1	1.2	6	1	1	130.379	1092.27	20.71	C
150.00-97.25			B	1	1.2		1	1	130.379			
			C	1	1.2		1	1	130.379			
L2	1847.79	10246.38	A	1	1.2	5	1	1	166.039	1193.14	24.35	C
97.25-48.25			B	1	1.2		1	1	166.039			
			C	1	1.2		1	1	166.039			
L3 48.25-1.00	1781.80	13968.05	A	1	1.2	4	1	1	199.792	1152.10	24.38	C
			B	1	1.2		1	1	199.792			
			C	1	1.2		1	1	199.792			
Sum Weight:	4699.20	30935.96						OTM	243620.87 lb-ft	3437.52		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	1069.61	6721.53	A	1	1.2	6	1	1	130.379	1092.27	20.71	C
150.00-97.25			B	1	1.2		1	1	130.379			
			C	1	1.2		1	1	130.379			
L2	1847.79	10246.38	A	1	1.2	5	1	1	166.039	1193.14	24.35	C
97.25-48.25			B	1	1.2		1	1	166.039			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	1	1.2		1	1	166.039			
L3 48.25-1.00	1781.80	13968.05	A	1	1.2	4	1	1	199.792	1152.10	24.38	C
			B	1	1.2		1	1	199.792			
			C	1	1.2		1	1	199.792			
Sum Weight:	4699.20	30935.96						OTM	243620.87 lb-ft	3437.52		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	1069.61	6721.53	A	1	1.2	6	1	1	130.379	1092.27	20.71	C
150.00-97.25			B	1	1.2		1	1	130.379			
			C	1	1.2		1	1	130.379			
L2	1847.79	10246.38	A	1	1.2	5	1	1	166.039	1193.14	24.35	C
97.25-48.25			B	1	1.2		1	1	166.039			
			C	1	1.2		1	1	166.039			
L3 48.25-1.00	1781.80	13968.05	A	1	1.2	4	1	1	199.792	1152.10	24.38	C
			B	1	1.2		1	1	199.792			
			C	1	1.2		1	1	199.792			
Sum Weight:	4699.20	30935.96						OTM	243620.87 lb-ft	3437.52		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	1069.61	3650.51	A	1	0.65	8	1	1	115.350	674.42	12.79	C
150.00-97.25			B	1	0.65		1	1	115.350			
			C	1	0.65		1	1	115.350			
L2	1847.79	6484.44	A	1	0.65	7	1	1	152.078	762.67	15.56	C
97.25-48.25			B	1	0.65		1	1	152.078			
			C	1	0.65		1	1	152.078			
L3 48.25-1.00	1781.80	9875.25	A	1	0.65	6	1	1	187.019	752.64	15.93	C
			B	1	0.65		1	1	187.019			
			C	1	0.65		1	1	187.019			
Sum Weight:	4699.20	20010.20						OTM	153221.43 lb-ft	2189.73		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	1069.61	3650.51	A	1	0.65	8	1	1	115.350	674.42	12.79	C
150.00-97.25			B	1	0.65		1	1	115.350			
			C	1	0.65		1	1	115.350			
L2	1847.79	6484.44	A	1	0.65	7	1	1	152.078	762.67	15.56	C
97.25-48.25			B	1	0.65		1	1	152.078			
			C	1	0.65		1	1	152.078			
L3 48.25-1.00	1781.80	9875.25	A	1	0.65	6	1	1	187.019	752.64	15.93	C
			B	1	0.65		1	1	187.019			
			C	1	0.65		1	1	187.019			
Sum Weight:	4699.20	20010.20						OTM	153221.43 lb-ft	2189.73		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	1069.61	3650.51	A	1	0.65	8	1	1	115.350	674.42	12.79	C
150.00-97.25			B	1	0.65		1	1	115.350			
			C	1	0.65		1	1	115.350			
L2	1847.79	6484.44	A	1	0.65	7	1	1	152.078	762.67	15.56	C
97.25-48.25			B	1	0.65		1	1	152.078			
			C	1	0.65		1	1	152.078			
L3 48.25-1.00	1781.80	9875.25	A	1	0.65	6	1	1	187.019	752.64	15.93	C
			B	1	0.65		1	1	187.019			
			C	1	0.65		1	1	187.019			
Sum Weight:	4699.20	20010.20						OTM	153221.43 lb-ft	2189.73		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	20010.20					
Bracing Weight	0.00					
Total Member Self-Weight	20010.20			4664.19	1296.40	
Total Weight	29238.90			4664.19	1296.40	
Wind 0 deg - No Ice		0.00	-13723.62	-1406026.59	1296.40	-3520.72
Wind 30 deg - No Ice		6559.59	-11885.01	-1217029.86	-658716.51	403.06
Wind 60 deg - No Ice		11361.55	-6861.81	-700681.20	-1141879.48	4218.83
Wind 90 deg - No Ice		13119.19	0.00	4664.19	-1318729.41	6904.18
Wind 120 deg - No Ice		11361.55	6861.81	710009.58	-1141879.48	7739.56
Wind 150 deg - No Ice		6559.59	11885.01	1226358.24	-658716.51	6501.13
Wind 180 deg - No Ice		0.00	13723.62	1415354.97	1296.40	3520.72
Wind 210 deg - No Ice		-6559.59	11885.01	1226358.24	661309.30	-403.06

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 240 deg - No Ice		-11361.55	6861.81	710009.58	1144472.27	-4218.83
Wind 270 deg - No Ice		-13119.19	0.00	4664.19	1321322.20	-6904.18
Wind 300 deg - No Ice		-11361.55	-6861.81	-700681.20	1144472.27	-7739.56
Wind 330 deg - No Ice		-6559.59	-11885.01	-1217029.86	661309.30	-6501.13
Member Ice	10925.77					
Total Weight Ice	49564.37			16506.41	5763.36	
Wind 0 deg - Ice		0.00	-6309.20	-607927.58	5763.36	-2010.27
Wind 30 deg - Ice		3071.70	-5463.93	-524269.29	-294019.12	-339.68
Wind 60 deg - Ice		5320.35	-3154.60	-295710.59	-513475.13	1421.93
Wind 90 deg - Ice		6143.41	0.00	16506.41	-593801.60	2802.53
Wind 120 deg - Ice		5320.35	3154.60	328723.41	-513475.13	3432.20
Wind 150 deg - Ice		3071.70	5463.93	557282.12	-294019.12	3142.21
Wind 180 deg - Ice		0.00	6309.20	640940.41	5763.36	2010.27
Wind 210 deg - Ice		-3071.70	5463.93	557282.12	305545.84	339.68
Wind 240 deg - Ice		-5320.35	3154.60	328723.41	525001.84	-1421.93
Wind 270 deg - Ice		-6143.41	0.00	16506.41	605328.31	-2802.53
Wind 300 deg - Ice		-5320.35	-3154.60	-295710.59	525001.84	-3432.20
Wind 330 deg - Ice		-3071.70	-5463.93	-524269.29	305545.84	-3142.21
Total Weight	29238.90			4664.19	1296.40	
Wind 0 deg - Service		0.00	-4698.11	-478268.03	1296.40	-1205.28
Wind 30 deg - Service		2245.59	-4068.68	-413567.38	-224650.71	137.98
Wind 60 deg - Service		3889.48	-2349.05	-236801.92	-390055.47	1444.27
Wind 90 deg - Service		4491.19	0.00	4664.19	-450597.81	2363.56
Wind 120 deg - Service		3889.48	2349.05	246130.30	-390055.47	2649.54
Wind 150 deg - Service		2245.59	4068.68	422895.76	-224650.71	2225.58
Wind 180 deg - Service		0.00	4698.11	487596.41	1296.40	1205.28
Wind 210 deg - Service		-2245.59	4068.68	422895.76	227243.50	-137.98
Wind 240 deg - Service		-3889.48	2349.05	246130.30	392648.26	-1444.27
Wind 270 deg - Service		-4491.19	0.00	4664.19	453190.60	-2363.56
Wind 300 deg - Service		-3889.48	-2349.05	-236801.92	392648.26	-2649.54
Wind 330 deg - Service		-2245.59	-4068.68	-413567.38	227243.50	-2225.58

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice

Comb. No.	Description
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	150 - 97.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-22746.66	6398.61	-18487.36
			Max. Mx	20	-9710.08	394267.38	-5379.36
			Max. My	14	-9569.16	1408.05	-447303.88
			Max. Vy	20	-14197.89	394267.38	-5379.36
			Max. Vx	14	15216.01	1408.05	-447303.88
			Max. Torque	10			-12633.37
L2	97.25 - 48.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35942.82	6727.21	-19436.78
			Max. Mx	20	-19321.39	1149487.81	-5792.29
			Max. My	14	-19250.72	1588.77	-1250888.40
			Max. Vy	20	-17577.72	1149487.81	-5792.29
			Max. Vx	14	18588.51	1588.77	-1250888.40
			Max. Torque	10			-12620.12
L3	48.25 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56277.36	6840.54	-19764.24
			Max. Mx	20	-35072.99	2179010.11	-5875.86
			Max. My	14	-35071.34	1615.56	-2333350.58
			Max. Vy	20	-21013.56	2179010.11	-5875.86
			Max. Vx	14	21982.28	1615.56	-2333350.5

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
							8
			Max. Torque	10			-12590.58

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	33	56277.36	0.00	-6309.20
	Max. H_x	21	26315.01	20990.70	-0.00
	Max. H_z	2	35086.68	0.00	21957.79
	Max. M_x	2	2321540.22	0.00	21957.79
	Max. M_z	8	2175726.07	-20990.70	-0.00
	Max. Torsion	22	12565.45	18178.48	10978.90
	Min. Vert	11	26315.01	-18178.48	-10978.90
	Min. H_x	8	35086.68	-20990.70	-0.00
	Min. H_z	14	35086.68	0.00	-21957.79
	Min. M_x	14	-2333350.58	0.00	-21957.79
	Min. M_z	20	-2179010.11	20990.70	-0.00
	Min. Torsion	10	-12580.96	-18178.48	-10978.90

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	29238.90	-0.00	0.00	4846.96	1348.59	-0.48
1.2 Dead+1.6 Wind 0 deg - No Ice	35086.68	-0.00	-21957.79	-2321540.22	1614.94	-5611.45
0.9 Dead+1.6 Wind 0 deg - No Ice	26315.01	-0.00	-21957.79	-2304456.17	1193.10	-5605.37
1.2 Dead+1.6 Wind 30 deg - No Ice	35086.68	10495.35	-19016.01	-2009800.31	-1086918.26	763.41
0.9 Dead+1.6 Wind 30 deg - No Ice	26315.01	10495.35	-19016.01	-1995209.08	-1078745.30	729.91
1.2 Dead+1.6 Wind 60 deg - No Ice	35086.68	18178.48	-10978.90	-1157970.88	-1883930.22	6947.45
0.9 Dead+1.6 Wind 60 deg - No Ice	26315.01	18178.48	-10978.90	-1150190.75	-1869458.84	6883.15
1.2 Dead+1.6 Wind 90 deg - No Ice	35086.68	20990.70	0.00	5873.91	-2175726.07	11279.42
0.9 Dead+1.6 Wind 90 deg - No Ice	26315.01	20990.70	0.00	4340.82	-2158943.19	11201.54
1.2 Dead+1.6 Wind 120 deg - No Ice	35086.68	18178.48	10978.90	1169734.35	-1883965.58	12580.96
0.9 Dead+1.6 Wind 120 deg - No Ice	26315.01	18178.48	10978.90	1158883.92	-1869484.75	12510.73
1.2 Dead+1.6 Wind 150 deg - No Ice	35086.68	10495.35	19016.01	2021595.07	-1086953.82	10501.28
0.9 Dead+1.6 Wind 150 deg - No Ice	26315.01	10495.35	19016.01	2003925.28	-1078771.30	10457.76
1.2 Dead+1.6 Wind 180 deg - No Ice	35086.68	-0.00	21957.79	2333350.58	1614.37	5609.15

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
0.9 Dead+1.6 Wind 180 deg - No Ice	26315.01	-0.00	21957.79	2313183.87	1192.79	5603.92
1.2 Dead+1.6 Wind 210 deg - No Ice	35086.68	-10495.35	19016.01	2021614.86	1090196.34	-781.89
0.9 Dead+1.6 Wind 210 deg - No Ice	26315.01	-10495.35	19016.01	2003939.88	1081167.00	-747.50
1.2 Dead+1.6 Wind 240 deg - No Ice	35086.68	-18178.48	10978.90	1169754.03	1887235.70	-6964.80
0.9 Dead+1.6 Wind 240 deg - No Ice	26315.01	-18178.48	10978.90	1158898.45	1871900.69	-6899.87
1.2 Dead+1.6 Wind 270 deg - No Ice	35086.68	-20990.70	0.00	5873.63	2179010.11	-11279.88
0.9 Dead+1.6 Wind 270 deg - No Ice	26315.01	-20990.70	0.00	4340.66	2161369.34	-11201.64
1.2 Dead+1.6 Wind 300 deg - No Ice	35086.68	-18178.48	-10978.90	-1157990.98	1887200.79	-12565.45
0.9 Dead+1.6 Wind 300 deg - No Ice	26315.01	-18178.48	-10978.90	-1150205.50	1871875.03	-12494.89
1.2 Dead+1.6 Wind 330 deg - No Ice	35086.68	-10495.35	-19016.01	-2009820.26	1090161.69	-10486.48
0.9 Dead+1.6 Wind 330 deg - No Ice	26315.01	-10495.35	-19016.01	-1995223.75	1081141.49	-10442.40
1.2 Dead+1.0 Ice+1.0 Temp	56277.36	-0.00	0.01	19764.24	6840.54	-9.89
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	56277.36	-0.00	-6309.20	-645903.42	6846.52	-2046.01
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	56277.36	3071.70	-5463.93	-556716.11	-312557.60	-227.80
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	56277.36	5320.35	-3154.60	-313055.07	-546379.84	1649.11
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	56277.36	6143.41	0.00	19794.56	-631967.47	3081.67
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	56277.36	5320.35	3154.60	352645.65	-546384.65	3685.62
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	56277.36	3071.70	5463.93	596309.52	-312563.11	3299.07
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	56277.36	-0.00	6309.20	685497.95	6844.62	2025.90
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	56277.36	-3071.70	5463.93	596313.33	326255.47	207.42
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	56277.36	-5320.35	3154.60	352649.13	560083.43	-1669.18
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	56277.36	-6143.41	0.00	19793.65	645670.05	-3101.16
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	56277.36	-5320.35	-3154.60	-313060.13	560080.51	-3704.84
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	56277.36	-3071.70	-5463.93	-556720.83	326253.24	-3318.60
Dead+Wind 0 deg - Service	29238.90	-0.00	-4698.11	-490887.57	1361.63	-1209.86
Dead+Wind 30 deg - Service	29238.90	2245.59	-4068.68	-424465.64	-230519.89	160.66
Dead+Wind 60 deg - Service	29238.90	3889.48	-2349.05	-242996.84	-400270.51	1488.33
Dead+Wind 90 deg - Service	29238.90	4491.19	0.00	4896.41	-462405.05	2417.35
Dead+Wind 120 deg - Service	29238.90	3889.48	2349.05	252790.45	-400272.21	2698.43
Dead+Wind 150 deg - Service	29238.90	2245.59	4068.68	434260.58	-230521.48	2256.05
Dead+Wind 180 deg - Service	29238.90	-0.00	4698.11	500682.72	1361.54	1208.87
Dead+Wind 210 deg - Service	29238.90	-2245.59	4068.68	434260.95	233244.90	-162.30
Dead+Wind 240 deg - Service	29238.90	-3889.48	2349.05	252791.17	402996.89	-1489.94
Dead+Wind 270 deg - Service	29238.90	-4491.19	0.00	4896.37	465130.29	-2418.27
Dead+Wind 300 deg - Service	29238.90	-3889.48	-2349.05	-242997.83	402995.60	-2698.70
Dead+Wind 330 deg - Service	29238.90	-2245.59	-4068.68	-424466.76	233243.83	-2256.35

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	0.00	-29238.90	0.00	0.00	29238.90	-0.00	0.000%
2	0.00	-35086.68	-21957.79	0.00	35086.68	21957.79	0.000%
3	0.00	-26315.01	-21957.79	0.00	26315.01	21957.79	0.000%
4	10495.35	-35086.68	-19016.01	-10495.35	35086.68	19016.01	0.000%
5	10495.35	-26315.01	-19016.01	-10495.35	26315.01	19016.01	0.000%
6	18178.48	-35086.68	-10978.90	-18178.48	35086.68	10978.90	0.000%
7	18178.48	-26315.01	-10978.90	-18178.48	26315.01	10978.90	0.000%
8	20990.70	-35086.68	0.00	-20990.70	35086.68	-0.00	0.000%
9	20990.70	-26315.01	0.00	-20990.70	26315.01	-0.00	0.000%
10	18178.48	-35086.68	10978.90	-18178.48	35086.68	-10978.90	0.000%
11	18178.48	-26315.01	10978.90	-18178.48	26315.01	-10978.90	0.000%
12	10495.35	-35086.68	19016.01	-10495.35	35086.68	-19016.01	0.000%
13	10495.35	-26315.01	19016.01	-10495.35	26315.01	-19016.01	0.000%
14	0.00	-35086.68	21957.79	0.00	35086.68	-21957.79	0.000%
15	0.00	-26315.01	21957.79	0.00	26315.01	-21957.79	0.000%
16	-10495.35	-35086.68	19016.01	10495.35	35086.68	-19016.01	0.000%
17	-10495.35	-26315.01	19016.01	10495.35	26315.01	-19016.01	0.000%
18	-18178.48	-35086.68	10978.90	18178.48	35086.68	-10978.90	0.000%
19	-18178.48	-26315.01	10978.90	18178.48	26315.01	-10978.90	0.000%
20	-20990.70	-35086.68	0.00	20990.70	35086.68	-0.00	0.000%
21	-20990.70	-26315.01	0.00	20990.70	26315.01	-0.00	0.000%
22	-18178.48	-35086.68	-10978.90	18178.48	35086.68	10978.90	0.000%
23	-18178.48	-26315.01	-10978.90	18178.48	26315.01	10978.90	0.000%
24	-10495.35	-35086.68	-19016.01	10495.35	35086.68	19016.01	0.000%
25	-10495.35	-26315.01	-19016.01	10495.35	26315.01	19016.01	0.000%
26	0.00	-56277.36	0.00	0.00	56277.36	-0.01	0.000%
27	0.00	-56277.36	-6309.20	0.00	56277.36	6309.20	0.000%
28	3071.70	-56277.36	-5463.93	-3071.70	56277.36	5463.93	0.000%
29	5320.35	-56277.36	-3154.60	-5320.35	56277.36	3154.60	0.000%
30	6143.41	-56277.36	0.00	-6143.41	56277.36	-0.00	0.000%
31	5320.35	-56277.36	3154.60	-5320.35	56277.36	-3154.60	0.000%
32	3071.70	-56277.36	5463.93	-3071.70	56277.36	-5463.93	0.000%
33	0.00	-56277.36	6309.20	0.00	56277.36	-6309.20	0.000%
34	-3071.70	-56277.36	5463.93	3071.70	56277.36	-5463.93	0.000%
35	-5320.35	-56277.36	3154.60	5320.35	56277.36	-3154.60	0.000%
36	-6143.41	-56277.36	0.00	6143.41	56277.36	-0.00	0.000%
37	-5320.35	-56277.36	-3154.60	5320.35	56277.36	3154.60	0.000%
38	-3071.70	-56277.36	-5463.93	3071.70	56277.36	5463.93	0.000%
39	0.00	-29238.90	-4698.11	0.00	29238.90	4698.11	0.000%
40	2245.59	-29238.90	-4068.68	-2245.59	29238.90	4068.68	0.000%
41	3889.48	-29238.90	-2349.05	-3889.48	29238.90	2349.05	0.000%
42	4491.19	-29238.90	0.00	-4491.19	29238.90	-0.00	0.000%
43	3889.48	-29238.90	2349.05	-3889.48	29238.90	-2349.05	0.000%
44	2245.59	-29238.90	4068.68	-2245.59	29238.90	-4068.68	0.000%
45	0.00	-29238.90	4698.11	0.00	29238.90	-4698.11	0.000%
46	-2245.59	-29238.90	4068.68	2245.59	29238.90	-4068.68	0.000%
47	-3889.48	-29238.90	2349.05	3889.48	29238.90	-2349.05	0.000%
48	-4491.19	-29238.90	0.00	4491.19	29238.90	-0.00	0.000%
49	-3889.48	-29238.90	-2349.05	3889.48	29238.90	2349.05	0.000%
50	-2245.59	-29238.90	-4068.68	2245.59	29238.90	4068.68	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00004996
3	Yes	5	0.00000001	0.00002312
4	Yes	6	0.00000001	0.00000514
5	Yes	5	0.00000001	0.00006577
6	Yes	6	0.00000001	0.00000441
7	Yes	5	0.00000001	0.00005678
8	Yes	5	0.00000001	0.00009609
9	Yes	5	0.00000001	0.00004505
10	Yes	6	0.00000001	0.00000781
11	Yes	6	0.00000001	0.00000001
12	Yes	6	0.00000001	0.00000425
13	Yes	5	0.00000001	0.00005469
14	Yes	5	0.00000001	0.00005032
15	Yes	5	0.00000001	0.00002322
16	Yes	6	0.00000001	0.00000502
17	Yes	5	0.00000001	0.00006392
18	Yes	6	0.00000001	0.00000636
19	Yes	5	0.00000001	0.00008147
20	Yes	5	0.00000001	0.00009627
21	Yes	5	0.00000001	0.00004509
22	Yes	6	0.00000001	0.00000491
23	Yes	5	0.00000001	0.00006387
24	Yes	6	0.00000001	0.00000763
25	Yes	5	0.00000001	0.00009821
26	Yes	4	0.00000001	0.00009036
27	Yes	6	0.00000001	0.00000871
28	Yes	6	0.00000001	0.00000932
29	Yes	6	0.00000001	0.00000923
30	Yes	6	0.00000001	0.00000940
31	Yes	6	0.00000001	0.00001235
32	Yes	6	0.00000001	0.00001130
33	Yes	6	0.00000001	0.00000994
34	Yes	6	0.00000001	0.00001128
35	Yes	6	0.00000001	0.00001157
36	Yes	6	0.00000001	0.00000990
37	Yes	6	0.00000001	0.00001056
38	Yes	6	0.00000001	0.00001142
39	Yes	4	0.00000001	0.00007462
40	Yes	4	0.00000001	0.00005372
41	Yes	4	0.00000001	0.00007604
42	Yes	5	0.00000001	0.00000001
43	Yes	5	0.00000001	0.00000588
44	Yes	5	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00007785
46	Yes	4	0.00000001	0.00005171
47	Yes	5	0.00000001	0.00000001
48	Yes	5	0.00000001	0.00000001
49	Yes	5	0.00000001	0.00000001
50	Yes	5	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 97.25	17.801	45	1.0602	0.0364
L2	101.75 - 48.25	8.071	45	0.7934	0.0118
L3	54.25 - 1	2.147	45	0.3760	0.0035

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
161.00	(2) 10' Omni	45	17.801	1.0602	0.0368	61002
151.00	6' Dish	45	17.801	1.0602	0.0368	61002
150.00	(2) 20' Dipole	45	17.801	1.0602	0.0368	61002
145.50	(2) 20' Dipole	45	16.826	1.0397	0.0341	61002
144.00	(2) 20' Dipole	45	16.501	1.0328	0.0332	50835
141.00	(2) 20' Dipole	45	15.854	1.0190	0.0314	33890
138.00	(2) 20' Dipole	45	15.209	1.0049	0.0296	25417
132.00	(2) 20' Dipole	45	13.935	0.9759	0.0262	16944
122.00	Pipe Platform w/ Handrails	45	11.871	0.9236	0.0208	10892

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 97.25	82.089	14	4.8345	0.1672
L2	101.75 - 48.25	37.462	14	3.6700	0.0547
L3	54.25 - 1	9.996	14	1.7493	0.0163

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
161.00	(2) 10' Omni	14	82.089	4.8345	0.1740	13806
151.00	6' Dish	14	82.089	4.8345	0.1740	13806
150.00	(2) 20' Dipole	14	82.089	4.8345	0.1740	13806
145.50	(2) 20' Dipole	14	77.623	4.7475	0.1612	13806
144.00	(2) 20' Dipole	14	76.137	4.7183	0.1570	11505
141.00	(2) 20' Dipole	14	73.173	4.6594	0.1485	7669
138.00	(2) 20' Dipole	14	70.223	4.5994	0.1402	5751
132.00	(2) 20' Dipole	14	64.385	4.4751	0.1238	3833
122.00	Pipe Platform w/ Handrails	14	54.926	4.2486	0.0981	2462

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual Allowable Ratio Bolt Tension lb	Actual Allowable Ratio Bolt Compression lb	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
2.5000	14	2.2500	130819.40 268385.28 0.49	135829.59 445519.56 0.30	23.794 45.000 0.53		Plate	0.53 ✔

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 97.25 (1)	TP31.76x20x0.25	52.75	149.00	165.1	24.2071	-9569.16	200631.00	0.048
L2	97.25 - 48.25 (2)	TP42.19x30.2568x0.3125	53.50	149.00	124.2	40.2098	-19250.70	588496.00	0.033
L3	48.25 - 1 (3)	TP52.1x40.2267x0.375	53.25	149.00	97.4	61.5657	-35071.30	1466900.00	0.024

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 97.25 (1)	TP31.76x20x0.25	447305.83	1065716.67	0.420	0.00	1065716.67	0.000
L2	97.25 - 48.25 (2)	TP42.19x30.2568x0.3125	1250891.67	2305450.00	0.543	0.00	2305450.00	0.000
L3	48.25 - 1 (3)	TP52.1x40.2267x0.375	2333350.00	4405741.67	0.530	0.00	4405741.67	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 97.25 (1)	TP31.76x20x0.25	15216.00	849705.00	0.018	5631.32	2136683.33	0.003
L2	97.25 - 48.25 (2)	TP42.19x30.2568x0.3125	18588.50	1382590.00	0.013	5615.35	4621908.33	0.001
L3	48.25 - 1 (3)	TP52.1x40.2267x0.375	21982.30	2069820.00	0.011	5609.14	8831916.67	0.001

tnxTower	Job	Page
Infinigy Engineering 1033 Watervliet Shaker Rd. Albany, NY Phone: (832) 716 7721 FAX: (832) 716 7721	02 8	1 1
	Project 00	Date 12/1 /18
	Client r	Designed by

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 97.25 (1)	0.048	0.420	0.000	0.018	0.003	0.468 ✔	1.000	4.8.2 ✔
L2	97.25 - 48.25 (2)	0.033	0.543	0.000	0.013	0.001	0.576 ✔	1.000	4.8.2 ✔
L3	48.25 - 1 (3)	0.024	0.530	0.000	0.011	0.001	0.554 ✔	1.000	4.8.2 ✔

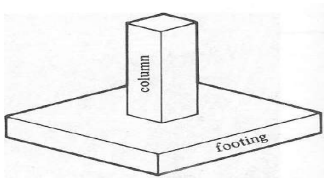
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	150 - 97.25	Pole	TP31.76x20x0.25	1	-9569.16	200631.00	46.8	Pass
L2	97.25 - 48.25	Pole	TP42.19x30.2568x0.3125	2	-19250.70	588496.00	57.6	Pass
L3	48.25 - 1	Pole	TP52.1x40.2267x0.375	3	-35071.30	1466900.00	55.4	Pass
							Summary	
							Pole (L2) 57.6	Pass
							Base Plate 52.9	Pass
							RATING = **57.6**	**Pass**

Element Map

Section No.	Section Elevation ft	Component Type	Element List
L1	150.00-97.25	Pole	1
L2	97.25-48.25	Pole	2
L3	48.25-1.00	Pole	3
			Total number of elements: 3

Date:	12/20/2018
Site Name:	Stratford
Client:	Smartlink
Infinigy Job #:	499-006
Analysis/Design:	Analysis
Column Shape:	Square
Footing Shape:	Rectangle
Tower Type:	Guyed Tower



Infinigy Engineering PLLC
Pad + Pier Calculations
ACI 318-11

Loading Data		
TIA Code Revision:	ANSI/TIA-222-G	
Uplift:	0.0	kips
Axial:	33.9	kips
Shear:	36.7	kips
Moment:	3943	k-ft

Soil Data		
Soil Type:	Sand	
Water Table Depth:	4	ft
Soil Dry Unit Weight:	125.0	pcf
ø Angle:	30	deg
Cohesion:	0	psf
Ultimate Skin Friction:	600	psf
Friction Coefficient:	0.25	
Ultimate Bearing Pressure:	5200	psf

Column Data		
Concrete Strength:	4000	psi
Column Side Width:	7	ft
Column Total Length:	4	ft
Column Height above ground:	0.5	ft
Vertical Rebar Strength:		psi
Vertical Rebar Size:		(#10) max.
Vertical Rebar Quantity:		(4) min.
Tie Rebar Strength:		psi
Tie Rebar Size:		(#3) max.
Tie Rebar Spacing:		in
Rebar Clear Distance:		in

Footing Data		
Concrete Strength:	4000	psi
Footing Length:	25.5	ft
Footing Width:	25.5	ft
Footing Thickness:	2.000	ft
Horizontal Rebar Strength:		psi
Horizontal Rebar Size:		
Horizontal Rebar Quantity:		
Rebar Clear Distance:		in
Dowel Strength:		psi
Dowel Size:		(#11) max.
Dowel Development Length:		in
Dowel Quantity:		

Concrete Strength Check		
Footing One-Way Shear Ratio:	1.84	%
Footing Two-Way Shear Ratio:	1.51	%
Footing Moment Ratio:	#N/A	%

Soil Stability Check		
ϕs Bearing:	0.6	
ϕs Uplift:	0.75	
Uplift Ratio:	0.00	%
Bearing Ratio:	1.67	%
Sliding Ratio:	35.15	%
Toe Pressure Ratio:	62.40	%
Overturning Ratio:	79.75	%