March 13th, 2017

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

Re: **Notice of Exempt Modification – RRU Add**
Property Address: **15 North Granby Rd. Granby, CT 06035**
Applicant: **AT&T Mobility, LLC**

Dear Ms. Bachman:

On behalf of AT&T, please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16- 50j-72(b) (2).

AT&T currently maintains a wireless telecommunications facility consisting of nine (9) wireless telecommunication antennas at an antenna center line height of 140-feet on an existing 150-foot monopole, owned by SBA COMMUNICATIONS CORPORATION at 8051 Congress Ave. Boca Raton, FL 33487. AT&T now intends to retain all existing antennas, and add (3) RRUS-12 Units on position [3] in sectors A, B, and C.

As the telecommunications site is located within the Granby Town Hall property, and therefore is owned by the Town of Granby, this telecommunications facility did not require zoning when it was constructed.

Attached is the e-mail conversation with the Zoning Enforcement Officer of the Town of Granby in regards to the initial zoning permit, a summary of the planned modifications including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-5I0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to William Volovski, Zoning Enforcement Officer for the Town of Granby, 15 North Granby Rd. Granby, CT 06035 and William F. Smith, Jr. Town Manager, 15 North Granby Rd. Granby, CT 06035. A copy of this letter is also being sent to the tower company, SBA Communications Corporation 8051 Congress Avenue Boca Raton, Florida 33487-1307.

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

- **EM-AT&T-056-020328** - AT&T Wireless PCS, LLC d/b/a AT&T Wireless notice of intent to modify an existing telecommunications facility located at 15 North Granby Road, **Granby,** Connecticut.
- **EM-CING-023-131-047-155-056-061130** New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at 14 Canton Spring Road, Canton; Shuttle Meadow Road, Southington; 232 South Main Street, East Windsor; 3114 Albany Avenue, West Hartford; and 15 North Granby Road, **Granby**, Connecticut.

- **EM-CING-056-090519** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 15 North Granby Road, **Granby**, Connecticut.

- **EM-CING-056-120918 –** New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 15 North Granby Road, **Granby**, Connecticut.

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 140-foot level of the 150-foot monopole.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

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

Sincerely,

Romina Kirchmaier

CC with enclosures:
William F. Smith, Town Manager, Town of Granby
William Volovski, Zoning Official, Town of Granby
SBA Communications Corporation, Tower Owner

From: WVolovski
To: Romina Kirchmaier
Subject: RE: Telecommunications Facility at 15 North Granby Rd. - CTL01219
Date: Monday, March 13, 2017 2:30:21 PM
Attachments: image001.png

Good Afternoon,

Per our conversation, the initial construction of the telecommunication tower at 15 North Granby Rd. did not require a zoning approval process as our municipal property is exempt from Granby's Zoning Regulations. If you have any other questions regarding this please feel free to contact me.

William Volovski
Building Official / Zoning Enforcement Officer

From: Romina Kirchmaier [mailto:romina.kirchmaier@smartlinkllc.com]
Sent: Monday, March 13, 2017 2:22 PM
To: WVolovski
Subject: Telecommunications Facility at 15 North Granby Rd. - CTL01219

Good afternoon Bill,

I'm following up on the phone conversation we had regarding the original zoning decision / approval for the construction of the telecommunications facility located at 15 North Granby Rd. Granby, CT. When you have a moment, please let me know whether such document exists.

Thank you for your time,

Romina Kirchmaier | Real Estate Specialist
Smartlink
85 Rangeway Road
Building 3, Suite 102
Billerica, MA 08132
(m) 617.908.4296
smartlinkllc.com

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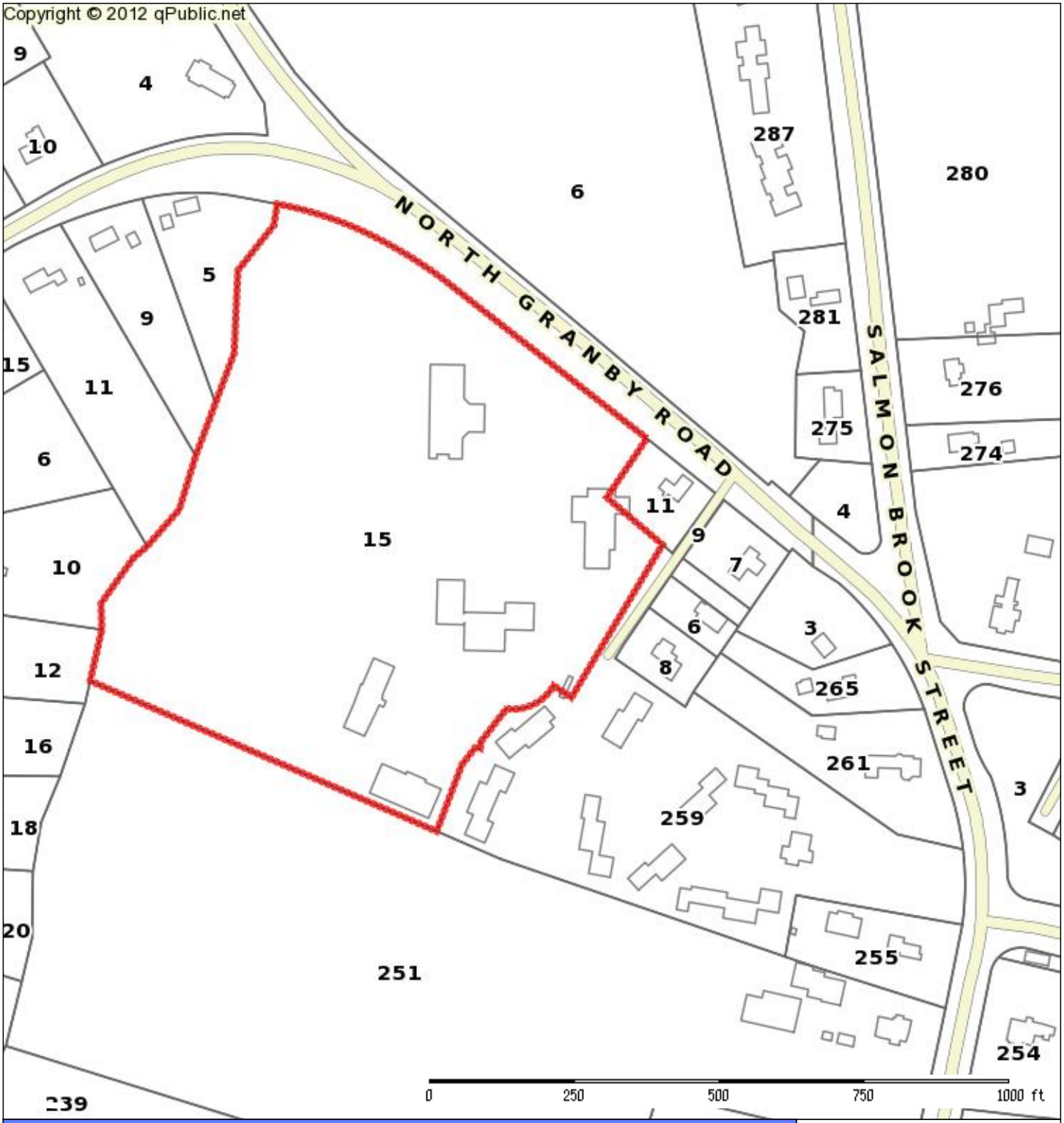
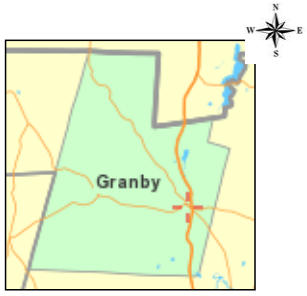


Town of Granby			
Parcel: 3604 Acres: 14.46			
Name:	GRANBY TOWN OF	Land Value:	506700
Site:	15 NORTH GRANBY RD	Improvement Value:	3167300
Sale:	$0 on 1998-09-21 Reason= Qual=U	Accessory Value:	98000
Mail:	15 NORTH GRANBY ROAD GRANBY, CT 06035	Total Value:	3978300



Date printed: 03/16/17 : 12:54:01

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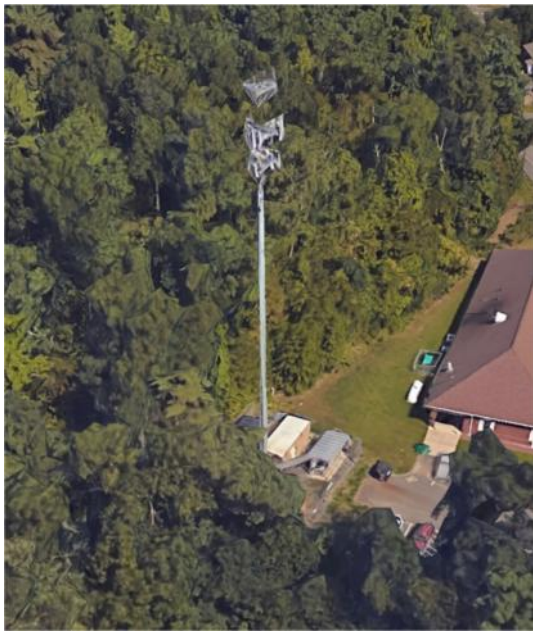
A BUSINESS OF FDH VELOCITEL

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



Smartlink LLC on behalf of AT&T Mobility, LLC
Site FA – 10035127
Site ID – CTV1219 (2C)
USID – 25933
Site Name – Granby East
Site Compliance Report

15 North Granby Road
Granby, CT 06035

Latitude: N41-57-12.85
Longitude: W72-47-37.39
Structure Type: Monopole

Report generated date: February 28, 2017
Report by: Young Kim
Customer Contact: Romina Kirchmaier

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

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	No
RF Sign(s) @ access point(s)	None
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated RFE level on the Ground	<1% General Public Limit
FCC & AT&T Compliant?	will be compliant

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

RFDS: NEW-ENGLAND_CONNECTICUT_CTV1219_2016-LTE-Next-Carrier_LTE-2C_om636a_PTN_10035127_25933_03-09-2016_Preliminary-Approved_v2.00

CD's: 10035127_AE201_161028_CTL01219_REV1

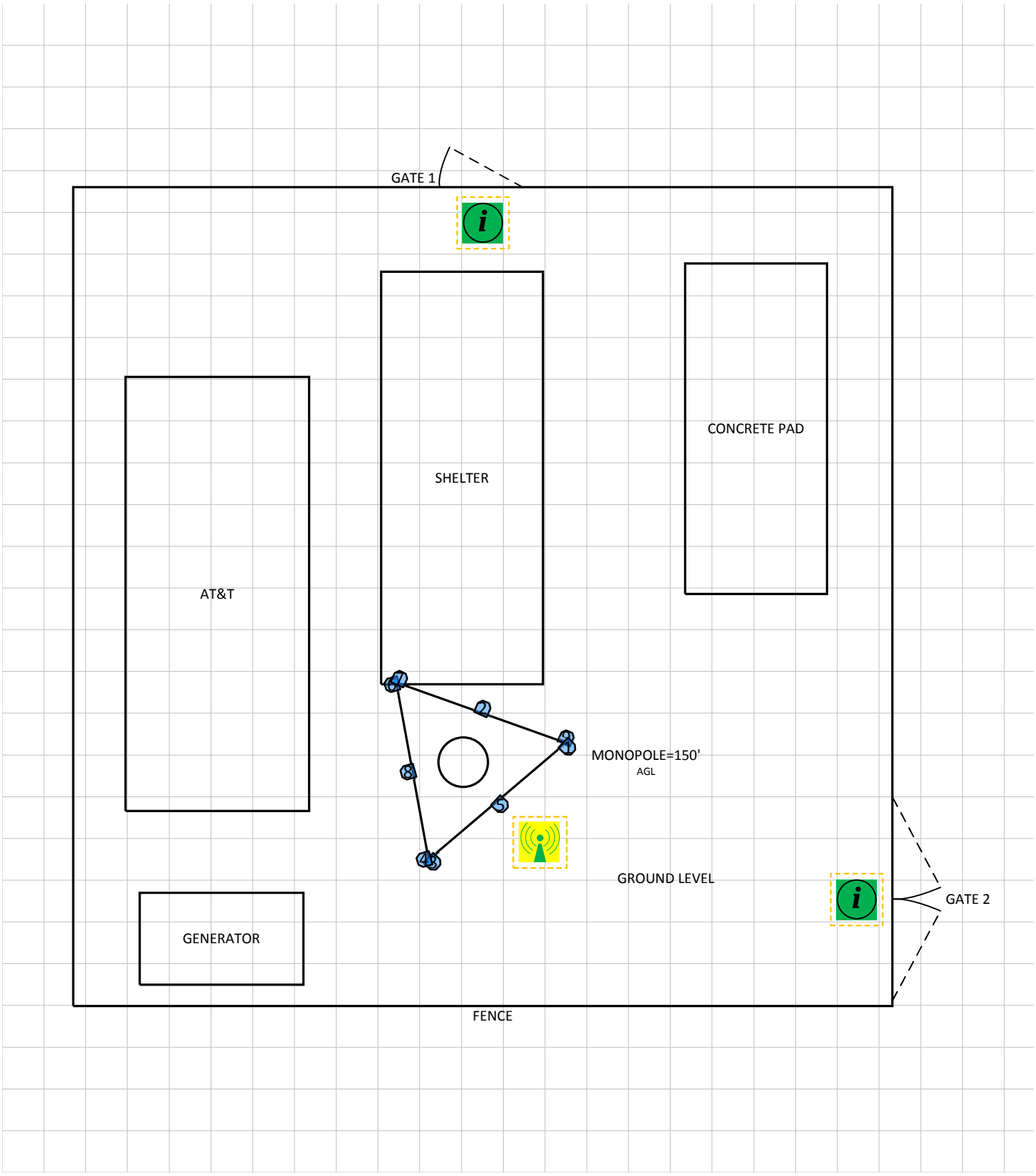
RF Powers Used: AT&T Engineering Defaults

2 Scale Maps of Site

The following diagrams are included:

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

Site Scale Map For: Granby East



(Feet)

0 4.1 8.2

www.sitesafe.com
Site Name:Granby East
2/28/2017 9:51:29 AM

Carrier Identification

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

Sign Legend

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

Barrier

Proposed Barriers/ Signs

3 Antenna Inventory

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

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	160	82	4.6	11.51	0	2	0	1132.6	43'	40'	137.7'
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	160	86	4.6	13.41	0	2	0	1754.2	43'	40'	137.7'
2	AT&T MOBILITY LLC	Powerwave P65-17-XLH-RR	Panel	737	50	70	8	13.41	0	0	1	1315.7	37.9'	42.4'	136'
2	AT&T MOBILITY LLC (Proposed)	Powerwave P65-17-XLH-RR	Panel	1900	50	63	8	14.51	0	0	1	1694.9	37.9'	42.4'	136'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	160	82	4.6	11.51	2	0	0	1132.6	34.9'	33.1'	137.7'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	160	86	4.6	13.41	2	0	0	1754.2	34.9'	33.1'	137.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	280	82	4.6	11.51	0	2	0	1132.6	34.4'	33.3'	137.7'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	280	86	4.6	13.41	0	2	0	1754.2	34.4'	33.3'	137.7'
5	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	737	160	71	8	13.733	0	0	1	1417.3	39'	36.6'	136'
5	AT&T MOBILITY LLC (Proposed)	Andrew SBNH-1D6565C	Panel	1900	160	57	8	15.504	0	0	1	2130.8	39'	36.6'	136'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	280	82	4.6	11.51	2	0	0	1132.6	32.5'	43.8'	137.7'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	280	86	4.6	13.41	2	0	0	1754.2	32.5'	43.8'	137.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	50	82	4.6	11.51	0	2	0	1132.6	32.9'	44.1'	137.7'
7	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	50	86	4.6	13.41	0	2	0	1754.2	32.9'	44.1'	137.7'
8	AT&T MOBILITY LLC	Powerwave P65-17-XLH-RR	Panel	737	280	70	8	13.41	0	0	1	1315.7	33.4'	38.5'	136'
8	AT&T MOBILITY LLC (Proposed)	Powerwave P65-17-XLH-RR	Panel	1900	280	63	8	14.51	0	0	1	1694.9	33.4'	38.5'	136'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	50	82	4.6	11.51	2	0	0	1132.6	42.9'	40.6'	137.7'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	1900	50	86	4.6	13.41	2	0	0	1754.2	42.9'	40.6'	137.7'

NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height above the main site level unless otherwise indicated. The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline. Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed.

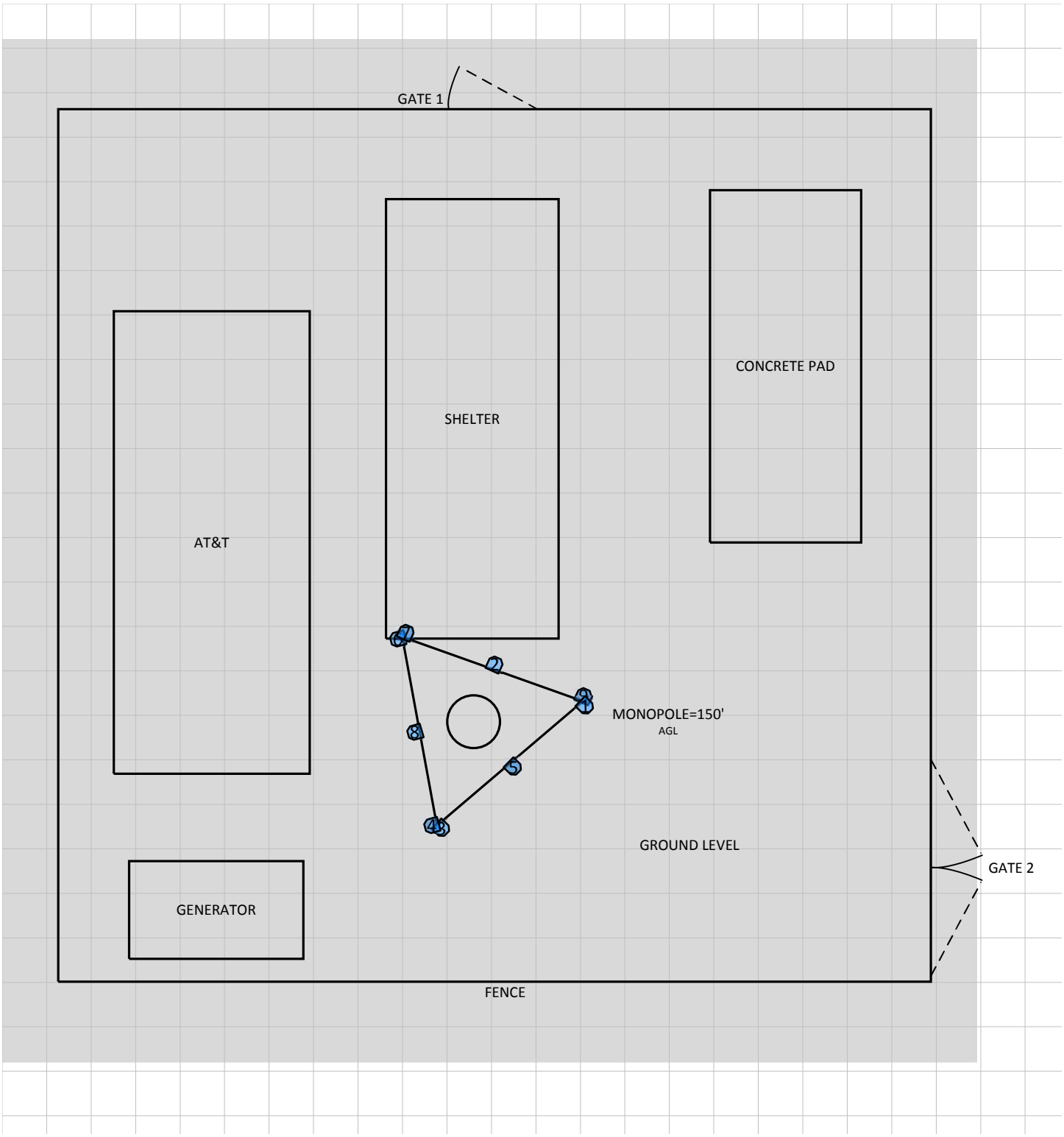
Note: The 1900MHz LTE technology is being added to an existing antenna.

4 Emission Predictions

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

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: Granby East



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

% of FCC Public Exposure Limit

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

Carrier Identification

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

(Feet)

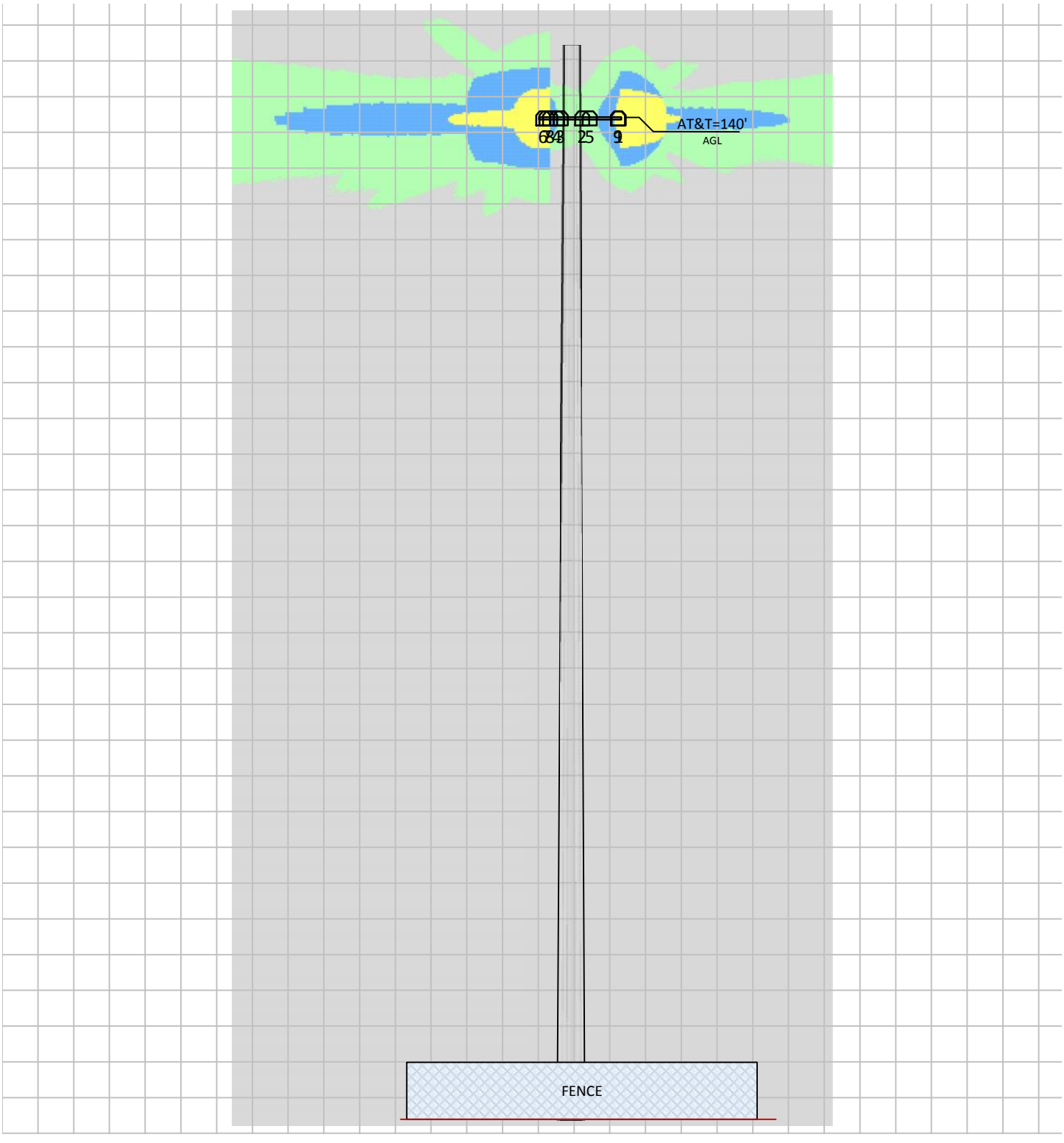
0 4.2 8.4

www.sitesafe.com
Site Name:Granby East
2/28/2017 9:52:36 AM

Barrier **Proposed Barriers/ Signs**

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

RF Exposure Simulation For: Granby East
Elevation View - South



% of FCC Public Exposure Limit

(Feet)

0 10.5 21

www.sitesafe.com
Site Name:Granby East
2/28/2017 10:12:49 AM

% of FCC Public Exposure Limit

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

Carrier Identification

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

Sign Legend

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

Barrier

Proposed Barriers/ Signs

SitesafeTC Version:1.0.0.0 - 0.0.0.257
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:

Monopole Base

Yellow caution 2 sign required.

Gates 1 and 2

Information 1 sign required.

6 Reviewer Certification

The Reviewer whose signature appears below hereby certifies and affirms:

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

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

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

February 28, 2017

Appendix A – Statement of Limiting Conditions

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

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

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

Appendix B – Regulatory Background Information

FCC Rules and Regulations

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

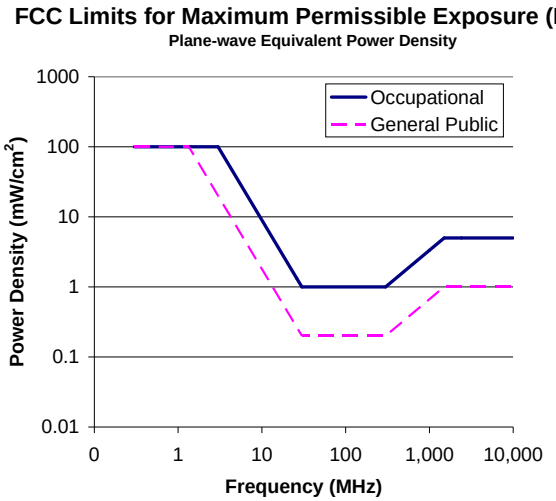
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible*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

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

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

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

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



Limits for Occupational/Controlled Exposure (MPE)

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

Limits for General Population/Uncontrolled Exposure (MPE)

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

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

OSHA Statement

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

(a) Each employer –

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

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

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

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

Appendix C – Safety Plan and Procedures

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

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

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

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

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

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

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

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

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

Appendix D – RF Emissions

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

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

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

Appendix E – Assumptions and Definitions

General Model Assumptions

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

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

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

Use of Generic Antennas

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

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

Definitions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix F – References

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

Sitesafe, Inc.
http://www.sitesafe.com
FCC Radio Frequency Safety
http://www.fcc.gov/encyclopedia/radio-frequency-safety
National Council on Radiation Protection and Measurements (NCRP)
http://www.ncrponline.org
Institute of Electrical and Electronics Engineers, Inc., (IEEE)
http://www.ieee.org
American National Standards Institute (ANSI)
http://www.ansi.org
Environmental Protection Agency (EPA)
http://www.epa.gov/radtown/wireless-tech.html
National Institutes of Health (NIH)
http://www.niehs.nih.gov/health/topics/agents/emf/
Occupational Safety and Health Agency (OSHA)
http://www.osha.gov/SLTC/radiofrequencyradiation/
International Commission on Non-Ionizing Radiation Protection (ICNIRP)
http://www.icnirp.org
World Health Organization (WHO)
http://www.who.int/peh-emf/en/
National Cancer Institute
http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones
American Cancer Society (ACS)
http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?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

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
8445 Freeport Parkway, Suite 375, Irving, Texas 75063

Structural Analysis Report

Existing 150 ft EEI Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT46134-A

Customer Site Name: Granby-n. Granby

Carrier Name: AT&T

Carrier Site ID / Name: CTL01219

Site Location: 15 North Granby Road

Granby, Connecticut

Hartford County

Latitude: 41.953583

Longitude: -72.793722

9/27/16

Analysis Result:

Max Structural Usage: 92.2% [Pass]

Max Foundation Usage: 78.0% [Pass]

Report Prepared by: Matthew Baker

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Analysis Result:

Max Structural Usage: 92.2% [Pass]

Max Foundation Usage: 78.0% [Pass]

Report Prepared by: Matthew Baker

Introduction

The purpose of this report is to summarize the analysis results on the 150 ft EEI Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Engineered Endeavors, Inc. Job #3934, Drawing #GS51005, Dated 06/26/98
Foundation Drawing	Engineered Endeavors, Inc. Job #3934, Drawing #F3934-150, Dated 06/26/98
Geotechnical Report	Tectonic Engineering Consultants Job #1170.C938, Dated 06/18/98
Modification Drawings	Semaan Engineering Solutions Project #CT2010, Dated 02/06/09; Vertical Solutions Project #121657, Dated 09/07/12; FDH Project #1331731400, Dated 09/11/13

Analysis Criteria

The feasibility/rigorous analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-G**.** In accordance with this standard, the structure was analyzed using **TESPoles,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 120 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 93.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.177, S_1 = 0.065

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	150.0	1	UNK - 10' Omni - Omni	Low Profile Platform	(3) 1/2" (1) 7/8"	Town of Granby
2		1	UNK - 18' Omni - Omni			
3		1	UNK - 10' Dipole - Dipole			
4		1	UNK - 3' Yagi - Yagi			
6	138.0	6	Powerwave - 7770 - Panel	Low Profile Platform	(12) 1 1/4" Coax (1) 3" Conduit	AT&T
7		3	Powerwave - P65-17-XLH-RR - Panel			
10		1	Powerwave – 21401 - TMA			
12		6	Ericsson - RRUS-11 700MHz - RRU			
13		6	Powerwave – 21903 - TMA			
15		1	Raycap - DC6-48-60-18-8F - SP			
16	126.0	3	RFS - APXVTM14-C-120 - Panel	Low Profile Platform	(3) 1-1/4"	Sprint
17		3	ALU - 1900MHz - RRU			
18		3	ALU - 800 MHz - RRU			
19		3	ALU - TD-RRH8x20-25 - RRU			
20		3	ALU - 800MHz Filter - Filter			
21		4	ALU - ACU-A20-N - RET			
22		3	RFS - APXVSPP18-C-A20 - Panel			
23	115.0	3	EMS - RR65-18-02DP - Panel	Flush Mount	(6) 1 5/8"	T-Mobile
24		3	UNK – TMA - TMA			
25	100.0	3	Kathrein - 742 213 - Panel	Flush Mount	(6) 1 5/8"	Metro PCS
26	50.0	1	GPS	Stand-Off	---	Sprint

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
5	138.0	1	Andrew - SBNH-1D6565C - Panel	Low Profile Platform	(12) 1 1/4" Coax (3) 3" Conduit	AT&T
6		6	Powerwave - 7770 - Panel			
8		2	Powerwave - P65-17-XLH-RR - Panel			
9		6	Powerwave - TT19-08BP111-001 - TMA			
11		3	Ericsson - RRUS-12 1900 MHz - RRU			
12		6	Ericsson - RRUS-11 700MHz - RRU			
14		6	Powerwave - LGP 21901 - TMA			
15		1	Raycap - DC6-48-60-18-8F - SP			

All transmission lines are considered running inside of the pole shafts.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**92.2%**	**70.0%**	**90.0%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	2908.9	28.9	32.2

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.5304 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found adequate to safely support the existing and proposed equipment per the ANSI/TIA/EIA 222-G standards under a basic wind speed of 93 mph no ice and 50 mph with 1” radial ice.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.

4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.

5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.

6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

7. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

8. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Usage Diagram - Max Ratio 73.75% at 114.8ft

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016
Site Name:	Granby-n. Granby	**Exposure:**	C	
Height:	150.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

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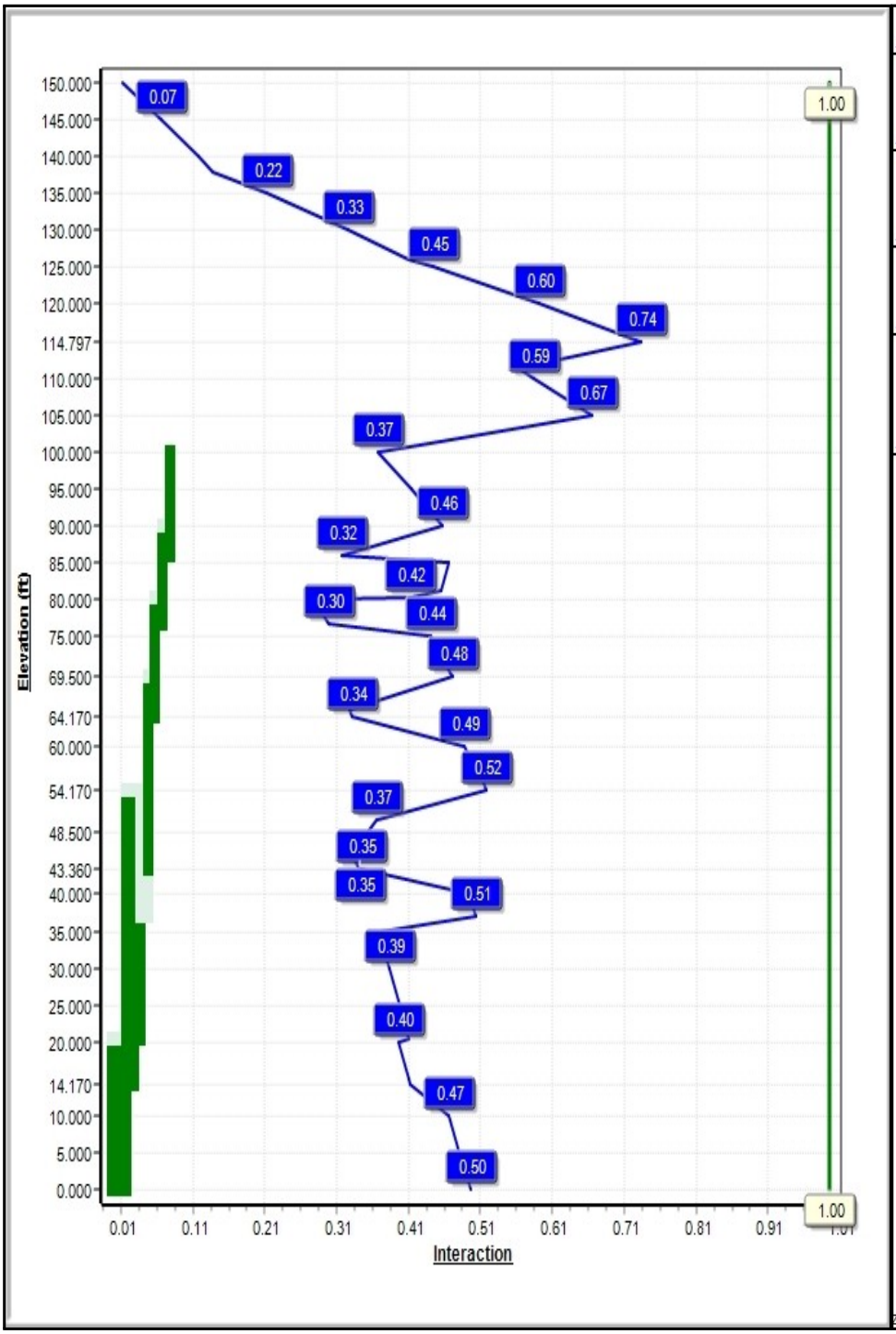
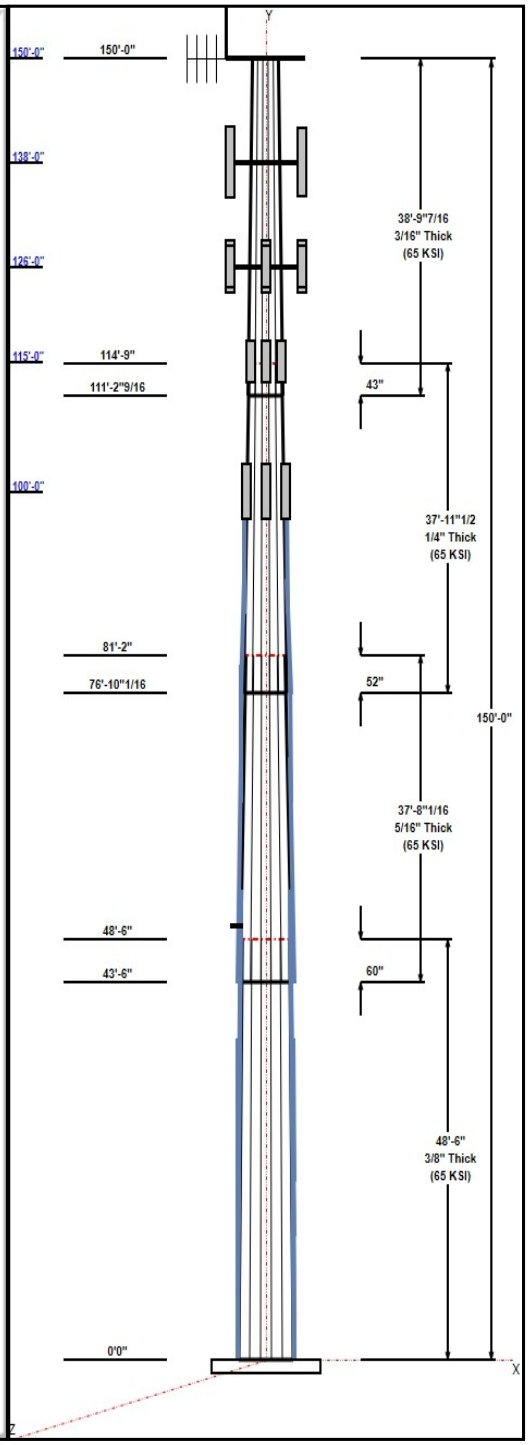
Dead Load Factor:	1.20	**Iterations:**	24
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 93 mph Wind





Structure: CT46134-A-SBA

Type: Tapered
Site Name: Granby-n. Granby
Height: 150.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 12 Sided
Taper: 0.18000

9/27/2016

Tower Engineering Solutions

Shaft Properties

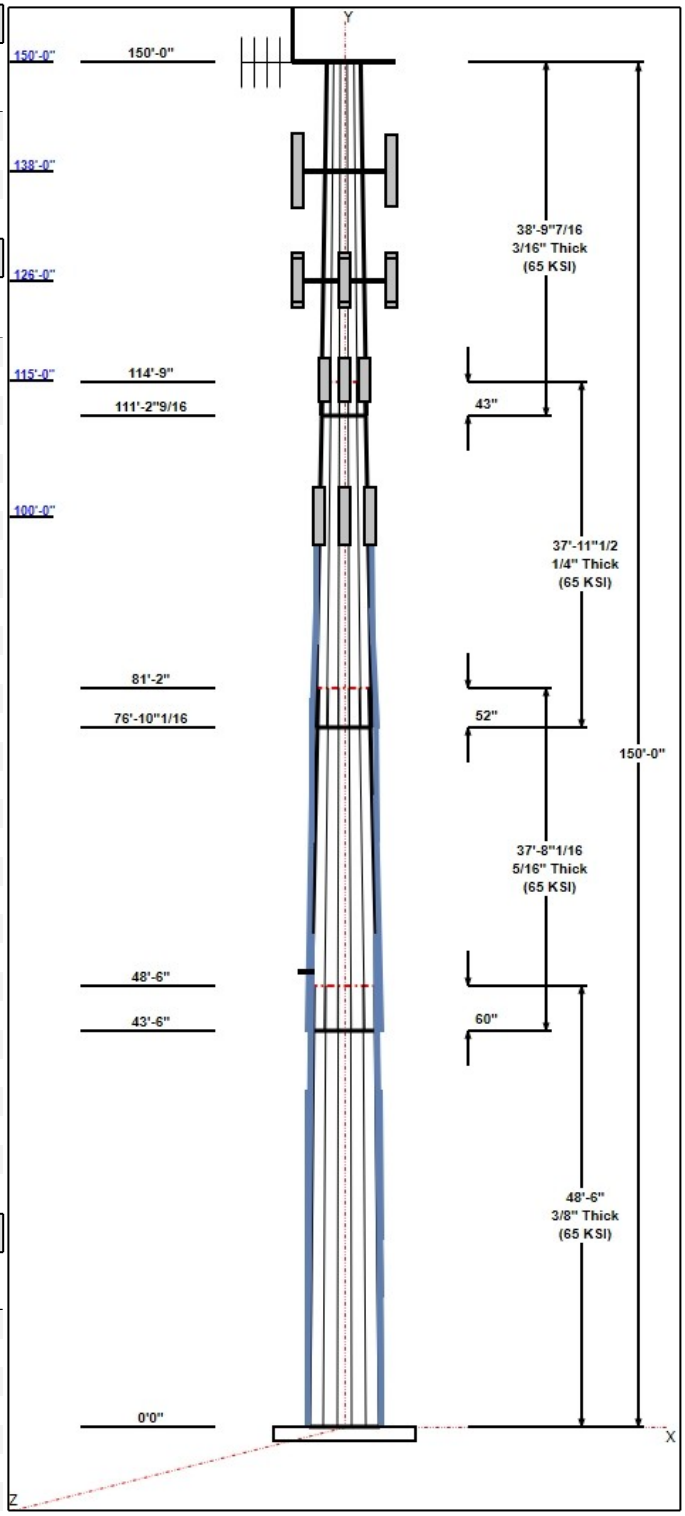
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	48.50	34.27	43.00	0.375		0.18000	65
2	37.67	29.01	35.80	0.313	Slip	0.18000	65
3	37.96	23.46	30.29	0.250	Slip	0.18000	65
4	38.79	17.50	24.48	0.188	Slip	0.18000	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
150.00	150.00	1	Low Profile Platform-flat	Town of Granby
150.00	155.00	1	10' Omni	Town of Granby
150.00	159.00	1	18' Omni	Town of Granby
150.00	155.00	1	10' Dipole	Town of Granby
150.00	150.00	1	3' Yagi	Town of Granby
138.00	138.00	1	Low Profile Platform-flat	AT&T
138.00	138.00	1	SBNH-1D6565C	AT&T
138.00	138.00	6	7770.00	AT&T
138.00	138.00	2	P65-17-XLH-RR	AT&T
138.00	138.00	6	TT19-08BP111-001	AT&T
138.00	138.00	3	RRUS-12 1900 MHz	AT&T
138.00	138.00	6	RRUS-11 700MHz	AT&T
138.00	138.00	6	LGP 21901	AT&T
138.00	138.00	1	DC6-48-60-18-8F	AT&T
126.00	126.00	1	Low Profile Platform-flat	Sprint
126.00	126.00	3	APXVTM14-C-120	Sprint
126.00	126.00	3	1900MHz	Sprint
126.00	126.00	3	800 MHz	Sprint
126.00	126.00	3	TD-RRH8x20-25	Sprint
126.00	126.00	3	800MHz Filter	Sprint
126.00	126.00	4	ACU-A20-N	Sprint
126.00	126.00	3	APXVSPP18-C-A20	Sprint
115.00	115.00	1	Flush Mount	T-Mobile
115.00	115.00	3	RR65-18-02DP	T-Mobile
115.00	115.00	3	TMA	T-Mobile
100.00	100.00	1	Flush Mount	Metro PCS
100.00	100.00	3	742 213	Metro PCS
50.00	50.00	1	Standoff	Sprint
50.00	50.00	1	GPS	Sprint
20.50	20.50	2	Splice Plate	---

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	150.00	Inside	1/2"	Town of Granby
0.00	150.00	Inside	7/8"	Town of Granby
0.00	138.00	Inside	1 1/4" Coax	AT&T
0.00	138.00	Inside	3" Conduit	AT&T
0.00	126.00	Inside	1-1/4" Fiber	Sprint
0.00	115.00	Inside	1 5/8" Coax	T-Mobile
0.00	100.00	Inside	1 5/8" Coax	Metro PCS
76.70	90.00	Outside	1.5" Reinforcing Plate	---
69.50	76.70	Outside	1.25" Reinforcing Plate	---
43.40	69.50	Outside	1.5" Reinforcing Plate	---
37.00	43.40	Outside	1.25" Reinforcing Plate	---
0.50	37.00	Outside	1.5" Reinforcing Plate	---



Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
12	2.25" 18J	75.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
1.7500	57.0	60.0	Round

Reactions

Load Case	Moment	Shear	Axial
1.2D + 1.6W 93 mph Wind	2908.9	28.9	32.3
0.9D + 1.6W 93 mph Wind	2887.6	28.9	24.2
1.2D + 1.0Di + 1.0Wi 50 mph Wind	907.2	8.2	57.3
1.2D + 1.0E	134.2	1.2	32.4
0.9D + 1.0E	133.1	1.2	24.3
1.0D + 1.0W 60 mph Wind	753.8	7.5	27.0

Structure: CT46134-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Granby-n. Granby
Height: 150.00 (ft)

9/27/2016

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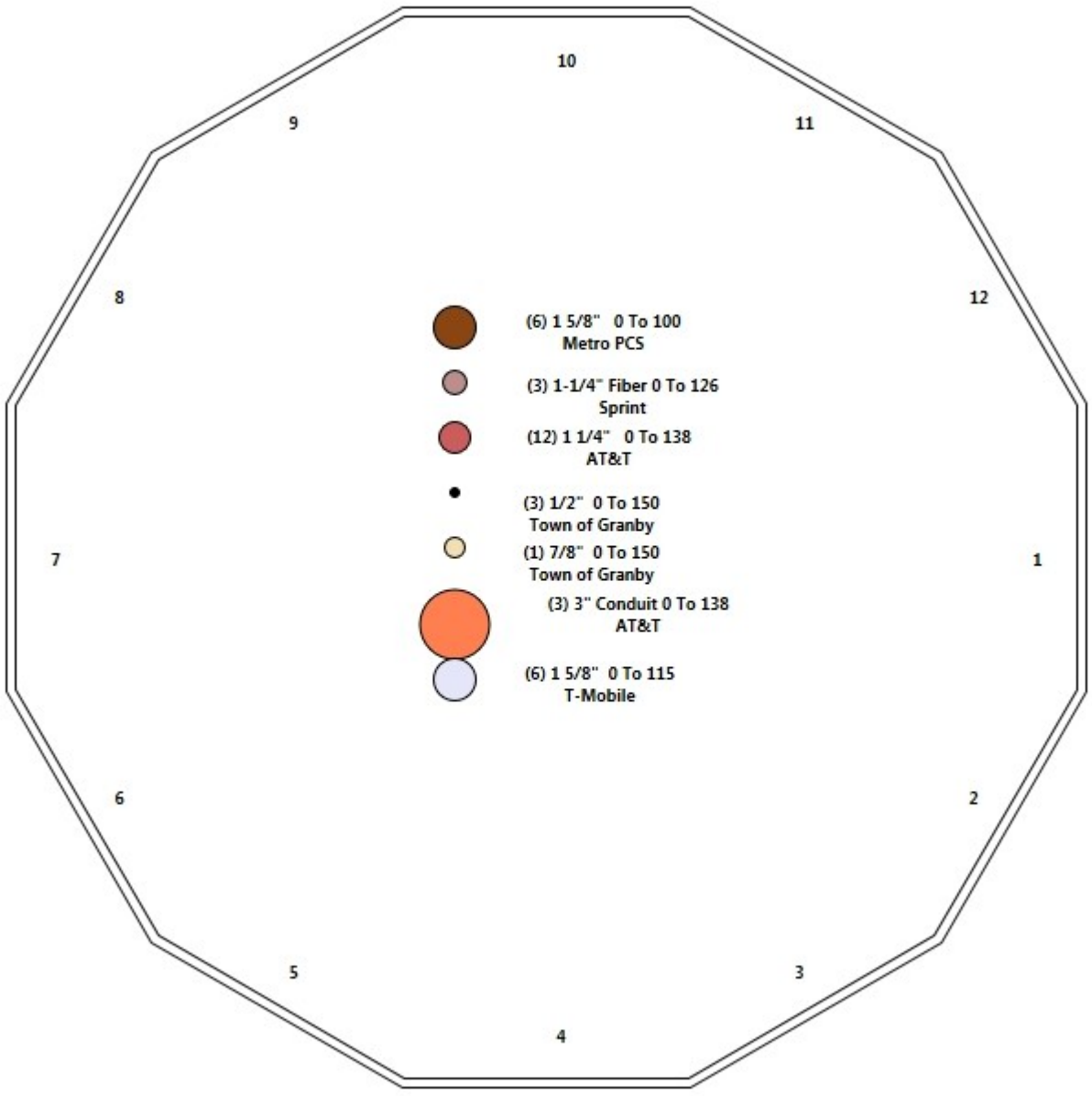

Shaft Properties

Structure:	CT46134-A-SBA		**Code:**	EIA/TIA-222-G	9/27/2016
Site Name:	Granby-n. Granby		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	12	48.500	0.3750	65		0.00	7,624
2	12	37.670	0.3125	65	Slip	60.00	4,139
3	12	37.960	0.2500	65	Slip	52.00	2,769
4	12	38.787	0.1875	65	Slip	43.00	1,658
					Total Shaft Weight:		**16,190**

	Bottom						Top						
Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	43.00	0.00	51.47	11936.20	28.58	114.67	34.27	48.50	40.93	6001.78	22.34	91.39	0.180000
2	35.80	43.50	35.70	5737.66	28.55	114.54	29.01	81.17	28.88	3036.85	22.73	92.85	0.180000
3	30.29	76.84	24.19	2786.59	30.33	121.18	23.46	114.80	18.69	1284.98	23.00	93.85	0.180000
4	24.48	111.2	14.67	1104.96	32.84	130.57	17.50	150.00	10.45	399.87	22.86	93.33	0.180000

Additional Steel

							Intermediate Connectors		Termination Connectors			
Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Fu (ksi)	Offset (in)	Description	Spacing (in)	Description	Spacing (in)	Lower Qty	Upper Qty
0.00	20.50	3	PLT 6.5x1.5(31mm Hole)	50	65	0.00	AJM20&sleeve	15.00	AJM20&sleeve	3.00	12	11
0.00	20.50	1	PLT 7.25"x1.25(1.25hole)	65	80	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00	13	13
0.00	54.17	2	PLT 7.25"x1.25(1.25hole)	65	80	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00	13	13
14.17	54.17	1	PLT 7.25"x1.25(1.25hole)	65	80	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00	13	13
20.50	37.00	3	PLT 5.75x1.5(31mm Hole)	50	65	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00	11	11
43.36	69.50	3	PLT 5.75x1.5(31mm Hole)	50	65	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00	11	9
64.17	80.17	3	PLT 6"X1-1/4"(1.25" Hole	65	80	0.00	AJM20&sleeve	18.00	AJM20&sleeve	3.00	11	11
76.71	90.00	3	PLT 4.75x1.5(31mm Hole)	50	65	0.00	AJM20&sleeve	24.00	AJM20&sleeve	3.00	8	7
85.92	100.0	3	PLT 5"x1-1/4"(1.25"Hole)	65	80	0.00	AJM20&sleeve	24.00	AJM20&sleeve	3.00	9	9

Load Summary

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

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Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	150.00	Low Profile Platform-flat	1	1200.00	34.00	1.00	2596.17	71.976	1.00	0.00	0.00
2	150.00	10' Omni	1	25.00	3.00	1.00	126.41	7.808	1.00	0.00	5.00
3	150.00	18' Omni	1	55.00	5.40	1.00	236.02	13.934	1.00	0.00	9.00
4	150.00	10' Dipole	1	30.00	3.76	1.00	178.78	11.760	1.00	0.00	5.00
5	150.00	3' Yagi	1	10.00	2.98	1.00	130.02	11.351	1.00	0.00	0.00
6	138.00	Low Profile Platform-flat	1	1200.00	34.00	1.00	2584.58	71.661	1.00	0.00	0.00
7	138.00	SBNH-1D6565C	1	66.10	11.47	0.84	370.07	15.768	0.87	0.00	0.00
8	138.00	7770.00	6	35.00	5.50	0.77	228.42	6.962	0.81	0.00	0.00
9	138.00	P65-17-XLH-RR	2	59.00	11.44	0.80	345.41	15.717	0.83	0.00	0.00
10	138.00	TT19-08BP111-001	6	16.00	0.64	0.67	42.76	1.424	0.67	0.00	0.00
11	138.00	RRUS-12 1900 MHz	3	60.00	2.70	0.50	158.25	4.123	0.50	0.00	0.00
12	138.00	RRUS-11 700MHz	6	51.00	2.52	0.50	146.56	3.357	0.50	0.00	0.00
13	138.00	LGP 21901	6	5.50	0.23	0.67	15.67	0.717	0.67	0.00	0.00
14	138.00	DC6-48-60-18-8F	1	31.80	0.92	1.00	113.55	1.499	1.00	0.00	0.00
15	126.00	Low Profile Platform-flat	1	1200.00	34.00	1.00	2572.04	71.320	1.00	0.00	0.00
16	126.00	APXVTM14-C-120	3	56.00	6.34	0.78	278.10	7.854	0.82	0.00	0.00
17	126.00	1900MHz	3	44.00	3.80	0.50	187.04	5.621	0.50	0.00	0.00
18	126.00	800 MHz	3	53.00	2.49	0.50	149.91	3.989	0.50	0.00	0.00
19	126.00	TD-RRH8x20-25	3	70.00	4.05	0.50	207.47	5.173	0.50	0.00	0.00
20	126.00	800MHz Filter	3	8.80	0.78	0.67	31.92	1.628	0.67	0.00	0.00
21	126.00	ACU-A20-N	4	1.00	0.14	0.50	6.63	0.529	0.50	0.00	0.00
22	126.00	APXVSPP18-C-A20	3	57.00	8.02	0.86	283.49	11.681	0.88	0.00	0.00
23	115.00	Flush Mount	1	350.00	5.00	1.00	730.68	9.532	1.00	0.00	0.00
24	115.00	RR65-18-02DP	3	18.00	4.36	0.73	164.10	5.719	0.80	0.00	0.00
25	115.00	TMA	3	11.00	0.01	0.67	11.01	0.010	0.67	0.00	0.00
26	100.00	Flush Mount	1	350.00	5.00	1.00	725.39	9.469	1.00	0.00	0.00
27	100.00	742 213	3	22.00	5.12	0.78	187.39	6.832	0.84	0.00	0.00
28	50.00	Standoff	1	50.00	1.50	1.00	154.24	3.585	1.00	0.00	0.00
29	50.00	GPS	1	1.00	0.01	1.00	1.08	0.011	1.00	0.00	0.00
30	20.50	Splice Plate	2	276.00	3.83	0.94	378.53	5.118	0.96	0.00	0.00
		Totals:	**75**	**7,087.30**			**19,569.92**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	150.00	(3) 1/2"	0.00	Inside
0.00	150.00	(1) 7/8"	0.00	Inside
0.00	138.00	(12) 1 1/4" Coax	0.00	Inside
0.00	138.00	(3) 3" Conduit	0.00	Inside
0.00	126.00	(3) 1-1/4" Fiber	0.00	Inside
0.00	115.00	(6) 1 5/8" Coax	0.00	Inside
0.00	100.00	(6) 1 5/8" Coax	0.00	Inside
76.70	90.00	(1) 1.5" Reinforcing Plate	3.00	Outside
69.50	76.70	(1) 1.25" Reinforcing Plate	2.00	Outside
43.40	69.50	(1) 1.5" Reinforcing Plate	3.00	Outside
37.00	43.40	(1) 1.25" Reinforcing Plate	2.00	Outside

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
0.50	37.00	(1) 1.5" Reinforcing Plate			3.00	Outside					

Shaft Section Properties

Structure: CT46134-A-SBA | **Code:** EIA/TIA-222-G | 9/27/2016

Site Name: Granby-n. Granby | **Exposure:** C

Height: 150.00 (ft) | **Crest Height:** 0.00

Base Elev: 0.000 (ft) | **Site Class:** D - Stiff Soil

Gh: 1.1 | **Topography:** 1 | **Struct Class:** II | Page: 8

Tower Engineering Solutions

Increment Length: 5 (ft)

											Additional Reinforcing			
Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)	Area (in^2)	Ixp (in^4)	Iyp (in^4)	Weight (lb)
0.00	RB1 RB2 RB3	0.3750	43.000	51.470	11936.2	28.58	114.67	65	74	0.0	56.44	16136.4	11736.5	
5.00		0.3750	42.100	50.383	11196.0	27.94	112.27	65	74	866.5	56.44	15491.8	11270.5	960.3
10.00		0.3750	41.200	49.296	10487.0	27.30	109.87	65	75	848.0	56.44	14860.3	10814.1	960.3
14.17	RB4	0.3750	40.449	48.390	9919.1	26.76	107.87	65	76	693.1	65.50	15967.5	12484.2	929.5
15.00		0.3750	40.300	48.209	9808.6	26.65	107.47	65	76	136.4	65.50	15854.1	12396.2	185.0
20.00		0.3750	39.400	47.123	9160.1	26.01	105.07	65	76	811.0	65.50	15179.5	11872.6	1114.5
20.50	RT1 RT2 RB5	0.3750	39.310	47.014	9096.9	25.94	104.83	65	76	80.1	53.06	11076.9	11076.9	90.3
25.00		0.3750	38.500	46.036	8540.9	25.37	102.67	65	77	712.4	53.06	10644.1	10644.1	812.5
30.00		0.3750	37.600	44.949	7950.2	24.72	100.27	65	78	774.0	53.06	10173.5	10173.5	902.8
35.00		0.3750	36.700	43.862	7387.4	24.08	97.87	65	78	755.5	53.06	9713.6	9713.6	902.8
37.00	RT5	0.3750	36.340	43.428	7169.9	23.82	96.91	65	79	297.0	27.19	4863.3	4863.3	185.0
40.00		0.3750	35.800	42.776	6851.8	23.44	95.47	65	79	440.0	27.19	4726.4	4726.4	277.5
43.36	RB6	0.3750	35.195	42.045	6506.8	23.00	93.85	65	80	484.9	53.06	8968.6	8968.6	606.7
43.50	Bot - Section 2	0.3750	35.170	42.015	6492.7	22.99	93.79	65	80	20.0	53.06	8956.4	8956.4	25.3
45.00		0.3750	34.900	41.689	6342.7	22.79	93.07	65	80	395.2	53.06	9129.3	9129.3	270.8
48.50	Top - Section 1	0.3125	34.895	34.799	5312.0	27.78	111.66	65	74	910.2	53.06	8823.6	8823.6	632.0
50.00		0.3125	34.625	34.527	5188.6	27.55	110.80	65	75	176.9	53.06	8694.1	8694.1	270.8
54.17	RT3 RT4	0.3125	33.874	33.772	4855.5	26.90	108.40	65	75	484.6	25.88	4085.4	4085.4	367.2
55.00		0.3125	33.725	33.621	4790.9	26.77	107.92	65	76	95.2	25.88	4051.3	4051.3	73.1
60.00		0.3125	32.825	32.716	4414.1	26.00	105.04	65	76	564.3	25.88	3848.8	3848.8	440.3
64.17	RB7	0.3125	32.074	31.960	4115.4	25.36	102.64	65	77	458.9	48.38	6842.5	6842.5	686.4
65.00		0.3125	31.925	31.810	4057.6	25.23	102.16	65	77	90.1	48.38	6782.2	6782.2	136.6
69.50	RT6	0.3125	31.115	30.995	3753.6	24.54	99.57	65	78	480.9	22.50	2981.3	2981.3	344.5
70.00		0.3125	31.025	30.904	3720.8	24.46	99.28	65	78	52.7	22.50	2964.9	2964.9	38.3
75.00		0.3125	30.125	29.999	3403.2	23.69	96.40	65	79	518.1	22.50	2803.8	2803.8	382.8
76.71	RB8	0.3125	29.817	29.689	3298.9	23.42	95.42	65	79	173.7	43.88	5392.3	5392.3	255.3
76.84	Bot - Section 3	0.3125	29.794	29.666	3291.2	23.40	95.34	65	79	12.8	43.88	5384.5	5384.5	18.9
80.00		0.3125	29.225	29.093	3104.2	22.92	93.52	65	80	574.1	43.88	5360.8	5360.8	472.3
80.17	RT7	0.3125	29.194	29.062	3094.3	22.89	93.42	65	80	30.5	21.38	2622.1	2622.1	12.4
81.17	Top - Section 2	0.2500	29.514	23.558	2575.1	29.49	118.06	65	73	179.0	21.38	2592.2	2592.2	72.7
85.00		0.2500	28.825	23.003	2397.4	28.75	115.30	65	73	303.4	21.38	2479.2	2479.2	278.6
85.92	RB9	0.2500	28.659	22.870	2356.0	28.57	114.64	65	74	71.8	40.13	4569.8	4569.8	125.6
90.00	RT8	0.2500	27.925	22.278	2177.9	27.79	111.70	65	74	313.4	18.75	2015.7	2015.7	260.2
95.00		0.2500	27.025	21.554	1972.3	26.82	108.10	65	75	372.9	18.75	1894.5	1894.5	318.9
100.00	RT9	0.2500	26.125	20.829	1780.0	25.86	104.50	65	77	360.6	18.75	1777.1	1777.1	318.9
105.00		0.2500	25.225	20.105	1600.7	24.89	100.90	65	78	348.2				
110.00		0.2500	24.325	19.380	1433.8	23.93	97.30	65	79	335.9				
111.21	Bot - Section 4	0.2500	24.107	19.205	1395.1	23.69	96.43	65	79	79.7				
114.80	Top - Section 3	0.1875	23.837	14.278	1019.3	31.92	127.13	65	70	407.5				
115.00		0.1875	23.800	14.256	1014.5	31.87	126.93	65	70	9.9				
120.00		0.1875	22.900	13.713	902.9	30.58	122.13	65	71	237.9				
125.00		0.1875	22.000	13.169	799.8	29.30	117.33	65	73	228.7				
126.00		0.1875	21.820	13.061	780.1	29.04	116.37	65	73	44.6				
130.00		0.1875	21.100	12.626	704.8	28.01	112.53	65	74	174.8				
135.00		0.1875	20.200	12.083	617.7	26.72	107.73	65	76	210.2				
138.00		0.1875	19.660	11.757	569.0	25.95	104.85	65	76	121.7				
140.00		0.1875	19.300	11.539	538.0	25.44	102.93	65	77	79.3				
145.00		0.1875	18.400	10.996	465.5	24.15	98.13	65	78	191.7				
150.00		0.1875	17.500	10.452	399.9	22.86	93.33	65	80	182.5				
									Total Weight	**16190.3**				**13729.0**

Wind Loading - Shaft

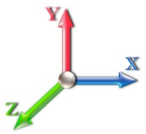
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1 RB2 RB3	1.00	0.85	17.879	19.67	318.08	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	17.879	19.67	311.42	1.000	0.000	5.00	18.355	18.35	577.6	0.0	1039.7
10.00		1.00	0.85	17.879	19.67	304.76	1.000	0.000	5.00	17.966	17.97	565.4	0.0	1017.6
14.17	RB4	1.00	0.85	17.879	19.67	299.21	1.000	0.000	4.17	14.687	14.69	462.2	0.0	831.7
15.00		1.00	0.85	17.879	19.67	298.11	1.000	0.000	0.83	2.891	2.89	91.0	0.0	163.7
20.00		1.00	0.90	18.971	20.87	300.21	1.000	0.000	5.00	17.190	17.19	573.9	0.0	973.2
20.50	RT1 RT2 RB5	1.00	0.91	19.069	20.98	300.31	1.000	0.000	0.50	1.698	1.70	57.0	0.0	96.1
25.00		1.00	0.95	19.883	21.87	300.33	1.000	0.000	4.50	15.104	15.10	528.6	0.0	854.9
30.00		1.00	0.98	20.661	22.73	298.99	1.000	0.000	5.00	16.413	16.41	596.8	0.0	928.8
35.00		1.00	1.01	21.343	23.48	296.61	1.000	0.000	5.00	16.025	16.03	602.0	0.0	906.6
37.00	RT5	1.00	1.03	21.594	23.75	295.42	1.000	0.000	2.00	6.301	6.30	239.5	0.0	356.4
40.00		1.00	1.04	21.951	24.15	293.43	1.000	0.000	3.00	9.336	9.34	360.7	0.0	528.0
43.36	RB6	1.00	1.06	22.327	24.56	290.93	1.000	0.000	3.36	10.290	10.29	404.3	0.0	581.9
43.50	Bot - Section 2	1.00	1.06	22.342	24.58	290.82	1.000	0.000	0.14	0.425	0.42	16.7	0.0	24.0
45.00		1.00	1.07	22.502	24.75	289.62	1.000	0.000	1.50	4.615	4.61	182.8	0.0	474.2
48.50	Top - Section 1	1.00	1.09	22.860	25.15	286.64	1.000	0.000	3.50	10.632	10.63	427.8	0.0	1092.2
50.00	Appurtenance(s)	1.00	1.09	23.007	25.31	290.54	1.000	0.000	1.50	4.498	4.50	182.1	0.0	212.3
54.17	RT3 RT4	1.00	1.11	23.398	25.74	286.65	1.000	0.000	4.17	12.322	12.32	507.4	0.0	581.5
55.00		1.00	1.12	23.473	25.82	285.85	1.000	0.000	0.83	2.420	2.42	100.0	0.0	114.2
60.00		1.00	1.14	23.907	26.30	280.78	1.000	0.000	5.00	14.354	14.35	604.0	0.0	677.2
64.17	RB7	1.00	1.15	24.248	26.67	276.30	1.000	0.000	4.17	11.674	11.67	498.2	0.0	550.6
65.00		1.00	1.16	24.313	26.74	275.39	1.000	0.000	0.83	2.291	2.29	98.1	0.0	108.1
69.50	RT6	1.00	1.17	24.658	27.12	270.30	1.000	0.000	4.50	12.237	12.24	531.1	0.0	577.0
70.00		1.00	1.17	24.696	27.17	269.72	1.000	0.000	0.50	1.340	1.34	58.3	0.0	63.2
75.00		1.00	1.19	25.057	27.56	263.81	1.000	0.000	5.00	13.189	13.19	581.6	0.0	621.7
76.71	RB8	1.00	1.20	25.176	27.69	261.73	1.000	0.000	1.71	4.422	4.42	195.9	0.0	208.4
76.84	Bot - Section 3	1.00	1.20	25.185	27.70	261.58	1.000	0.000	0.13	0.326	0.33	14.4	0.0	15.3
80.00		1.00	1.21	25.400	27.94	257.67	1.000	0.000	3.16	8.190	8.19	366.1	0.0	688.9
80.17	RT7	1.00	1.21	25.411	27.95	257.46	1.000	0.000	0.17	0.436	0.44	19.5	0.0	36.6
81.17	Top - Section 2	1.00	1.21	25.478	28.03	256.20	1.000	0.000	1.00	2.554	2.55	114.5	0.0	214.8
85.00		1.00	1.22	25.726	28.30	255.77	1.000	0.000	3.83	9.638	9.64	436.4	0.0	364.1
85.92	RB9	1.00	1.23	25.784	28.36	254.59	1.002 *	0.000	0.92	2.281	2.29	103.8	0.0	86.2
90.00	RT8	1.00	1.24	26.037	28.64	249.28	1.007 *	0.000	4.08	9.959	10.03	459.7	0.0	376.1
95.00		1.00	1.25	26.336	28.97	242.62	1.000	0.000	5.00	11.852	11.85	549.3	0.0	447.5
100.00	RT9	1.00	1.27	26.621	29.28	235.81	1.000	0.000	5.00	11.464	11.46	537.1	0.0	432.7
105.00		1.00	1.28	26.896	29.59	228.86	1.000	0.000	5.00	11.075	11.08	524.3	0.0	417.9
110.00		1.00	1.29	27.161	29.88	221.78	1.000	0.000	5.00	10.687	10.69	510.9	0.0	403.1
111.21	Bot - Section 4	1.00	1.29	27.224	29.95	220.04	1.000	0.000	1.21	2.535	2.53	121.5	0.0	95.6
114.80	Top - Section 3	1.00	1.30	27.406	30.15	214.87	1.000	0.000	3.58	7.469	7.47	360.3	0.0	489.0
115.00	Appurtenance(s)	1.00	1.30	27.416	30.16	218.01	1.000	0.000	0.20	0.418	0.42	20.2	0.0	11.8
120.00		1.00	1.32	27.663	30.43	210.71	1.000	0.000	5.00	10.072	10.07	490.4	0.0	285.5
125.00		1.00	1.33	27.902	30.69	203.30	1.000	0.000	5.00	9.684	9.68	475.6	0.0	274.4
126.00	Appurtenance(s)	1.00	1.33	27.949	30.74	201.80	1.000	0.000	1.00	1.890	1.89	93.0	0.0	53.6
130.00		1.00	1.34	28.133	30.95	195.79	1.000	0.000	4.00	7.406	7.41	366.7	0.0	209.8
135.00		1.00	1.35	28.358	31.19	188.18	1.000	0.000	5.00	8.908	8.91	444.6	0.0	252.2
138.00	Appurtenance(s)	1.00	1.35	28.489	31.34	183.58	1.000	0.000	3.00	5.158	5.16	258.6	0.0	146.0
140.00		1.00	1.36	28.576	31.43	180.49	1.000	0.000	2.00	3.361	3.36	169.0	0.0	95.1

Wind Loading - Shaft

Structure:	CT46134-A-SBA		**Code:**	EIA/TIA-222-G	9/27/2016
Site Name:	Granby-n. Granby		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 10

Tower Engineering Solutions

145.00	1.00	1.37	28.788	31.67	172.71	1.000	0.000	5.00	8.131	8.13	412.0	0.0	230.0
150.00 Appurtenance(s)	1.00	1.38	28.994	31.89	164.85	1.000	0.000	5.00	7.743	7.74	395.1	0.0	219.0
							Totals:	**150.00**			**16,285.6**		**19,428.4**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

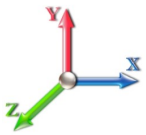
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	10' Dipole	1	29.195	32.114	1.00	1.00	3.76	36.00	0.000	5.000	193.20	0.00	965.99
2	150.00	18' Omni	1	29.352	32.287	1.00	1.00	5.40	66.00	0.000	9.000	278.96	0.00	2510.62
3	150.00	10' Omni	1	29.195	32.114	1.00	1.00	3.00	30.00	0.000	5.000	154.15	0.00	770.74
4	150.00	Low Profile Platform-flat	1	28.994	31.893	1.00	1.00	34.00	1440.00	0.000	0.000	1734.99	0.00	0.00
5	150.00	3' Yagi	1	28.994	31.893	1.00	1.00	2.98	12.00	0.000	0.000	152.07	0.00	0.00
6	138.00	P65-17-XLH-RR	2	28.489	31.338	0.64	0.80	14.64	141.60	0.000	0.000	734.23	0.00	0.00
7	138.00	Low Profile Platform-flat	1	28.489	31.338	1.00	1.00	34.00	1440.00	0.000	0.000	1704.80	0.00	0.00
8	138.00	SBNH-1D6565C	1	28.489	31.338	0.67	0.80	7.71	79.32	0.000	0.000	386.48	0.00	0.00
9	138.00	7770.00	6	28.489	31.338	0.62	0.80	20.33	252.00	0.000	0.000	1019.27	0.00	0.00
10	138.00	RRUS-11 700MHz	6	28.489	31.338	0.40	0.80	6.05	367.20	0.000	0.000	303.25	0.00	0.00
11	138.00	TT19-08BP111-001	6	28.489	31.338	0.54	0.80	2.06	115.20	0.000	0.000	103.20	0.00	0.00
12	138.00	RRUS-12 1900 MHz	3	28.489	31.338	0.40	0.80	3.24	216.00	0.000	0.000	162.46	0.00	0.00
13	138.00	LGP 21901	6	28.489	31.338	0.54	0.80	0.74	39.60	0.000	0.000	37.09	0.00	0.00
14	138.00	DC6-48-60-18-8F	1	28.489	31.338	0.80	0.80	0.74	38.16	0.000	0.000	36.90	0.00	0.00
15	126.00	APXVSPP18-C-A20	3	27.949	30.744	0.69	0.80	16.55	205.20	0.000	0.000	814.25	0.00	0.00
16	126.00	ACU-A20-N	4	27.949	30.744	0.40	0.80	0.22	4.80	0.000	0.000	11.02	0.00	0.00
17	126.00	TD-RRH8x20-25	3	27.949	30.744	0.40	0.80	4.86	252.00	0.000	0.000	239.06	0.00	0.00
18	126.00	800 MHz	3	27.949	30.744	0.40	0.80	2.99	190.80	0.000	0.000	146.98	0.00	0.00
19	126.00	1900MHz	3	27.949	30.744	0.40	0.80	4.56	158.40	0.000	0.000	224.31	0.00	0.00
20	126.00	APXVTM14-C-120	3	27.949	30.744	0.62	0.80	11.87	201.60	0.000	0.000	583.81	0.00	0.00
21	126.00	Low Profile Platform-flat	1	27.949	30.744	1.00	1.00	34.00	1440.00	0.000	0.000	1672.46	0.00	0.00
22	126.00	800MHz Filter	3	27.949	30.744	0.54	0.80	1.25	31.68	0.000	0.000	61.70	0.00	0.00
23	115.00	Flush Mount	1	27.416	30.158	1.00	1.00	5.00	420.00	0.000	0.000	241.26	0.00	0.00
24	115.00	TMA	3	27.416	30.158	0.67	1.00	0.02	39.60	0.000	0.000	0.97	0.00	0.00
25	115.00	RR65-18-02DP	3	27.416	30.158	0.73	1.00	9.55	64.80	0.000	0.000	460.74	0.00	0.00
26	100.00	742 213	3	26.621	29.284	0.78	1.00	11.98	79.20	0.000	0.000	561.35	0.00	0.00
27	100.00	Flush Mount	1	26.621	29.284	1.00	1.00	5.00	420.00	0.000	0.000	234.27	0.00	0.00
28	50.00	GPS	1	23.007	25.308	1.00	1.00	0.01	1.20	0.000	0.000	0.40	0.00	0.00
29	50.00	Standoff	1	23.007	25.308	1.00	1.00	1.50	60.00	0.000	0.000	60.74	0.00	0.00
30	20.50	Splice Plate	2	19.069	20.976	0.94	1.00	7.20	662.40	0.000	0.000	241.66	0.00	0.00
							Totals:		**8,504.76**			**12,556.00**		

Total Applied Force Summary

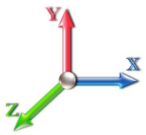
Structure:	CT46134-A-SBA		**Code:**	EIA/TIA-222-G	9/27/2016
Site Name:	Granby-n. Granby		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 12

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		577.57	1217.90	0.00	0.00
10.00		565.35	1195.71	0.00	0.00
14.17		462.16	980.25	0.00	0.00
15.00		90.98	193.27	0.00	0.00
20.00		573.94	1151.33	0.00	0.00
20.50	(2) attachments	298.64	776.31	0.00	0.00
25.00		528.55	1015.23	0.00	0.00
30.00		596.85	1106.96	0.00	0.00
35.00		601.95	1084.77	0.00	0.00
37.00		239.48	427.70	0.00	0.00
40.00		360.67	634.89	0.00	0.00
43.36		404.35	701.59	0.00	0.00
43.50		16.71	29.02	0.00	0.00
45.00		182.76	527.65	0.00	0.00
48.50		427.75	1216.94	0.00	0.00
50.00	(2) attachments	243.29	326.96	0.00	0.00
54.17		507.41	730.06	0.00	0.00
55.00		99.99	143.78	0.00	0.00
60.00		603.95	855.34	0.00	0.00
64.17		498.20	699.22	0.00	0.00
65.00		98.05	137.64	0.00	0.00
69.50		531.07	737.36	0.00	0.00
70.00		58.25	81.00	0.00	0.00
75.00		581.64	799.87	0.00	0.00
76.71		195.92	269.31	0.00	0.00
76.84		14.44	19.86	0.00	0.00
80.00		366.12	801.65	0.00	0.00
80.17		19.49	42.70	0.00	0.00
81.17		114.53	250.42	0.00	0.00
85.00		436.41	500.55	0.00	0.00
85.92		103.78	118.94	0.00	0.00
90.00		459.68	521.45	0.00	0.00
95.00		549.34	625.61	0.00	0.00
100.00	(4) attachments	1332.73	1110.01	0.00	0.00
105.00		524.28	558.58	0.00	0.00
110.00		510.88	543.79	0.00	0.00
111.21		121.46	129.73	0.00	0.00
114.80		360.25	589.81	0.00	0.00
115.00	(7) attachments	723.13	541.97	0.00	0.00
120.00		490.40	388.79	0.00	0.00
125.00		475.56	377.69	0.00	0.00
126.00	(23) attachments	3846.56	2558.69	0.00	0.00
130.00		366.69	278.65	0.00	0.00
135.00		444.58	338.33	0.00	0.00
138.00	(32) attachments	4746.31	2886.75	0.00	0.00
140.00		169.05	97.52	0.00	0.00

Total Applied Force Summary

Structure:	CT46134-A-SBA		**Code:**	EIA/TIA-222-G	9/27/2016
Site Name:	Granby-n. Granby		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 13

Tower Engineering Solutions

145.00		411.98	236.04	0.00	0.00
150.00	(5) attachments	2908.47	1808.95	0.00	4247.35
	Totals:	**28,841.60**	**32,366.56**	**0.00**	**4,247.35**

Linear Appurtenance Segment Forces (Factored)

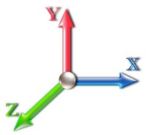
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1.5" Reinforcing Plate	Yes	4.50	0.000	3.00	1.13	0.00	0.061	0.000	17.879	0.00	0.00
10.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.070	0.000	17.879	0.00	0.00
14.17	1.5" Reinforcing Plate	Yes	4.17	0.000	3.00	1.04	0.00	0.071	0.000	17.879	0.00	0.00
15.00	1.5" Reinforcing Plate	Yes	0.83	0.000	3.00	0.21	0.00	0.072	0.000	17.879	0.00	0.00
20.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.073	0.000	18.971	0.00	0.00
20.50	1.5" Reinforcing Plate	Yes	0.50	0.000	3.00	0.13	0.00	0.074	0.000	19.069	0.00	0.00
25.00	1.5" Reinforcing Plate	Yes	4.50	0.000	3.00	1.13	0.00	0.074	0.000	19.883	0.00	0.00
30.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.076	0.000	20.661	0.00	0.00
35.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.078	0.000	21.343	0.00	0.00
37.00	1.5" Reinforcing Plate	Yes	2.00	0.000	3.00	0.50	0.00	0.079	0.000	21.594	0.00	0.00
40.00	1.25" Reinforcing	Yes	3.00	0.000	2.50	0.63	0.00	0.067	0.000	21.951	0.00	0.00
43.36	1.25" Reinforcing	Yes	3.36	0.000	2.50	0.70	0.00	0.068	0.000	22.327	0.00	0.00
43.50	1.5" Reinforcing Plate	Yes	0.10	0.000	3.00	0.03	0.00	0.078	0.000	22.342	0.00	0.00
43.50	1.25" Reinforcing	Yes	0.04	0.000	2.50	0.01	0.00	0.078	0.000	22.342	0.00	0.00
45.00	1.5" Reinforcing Plate	Yes	1.50	0.000	3.00	0.38	0.00	0.083	0.000	22.502	0.00	0.00
48.50	1.5" Reinforcing Plate	Yes	3.50	0.000	3.00	0.88	0.00	0.084	0.000	22.860	0.00	0.00
50.00	1.5" Reinforcing Plate	Yes	1.50	0.000	3.00	0.38	0.00	0.083	0.000	23.007	0.00	0.00
54.17	1.5" Reinforcing Plate	Yes	4.17	0.000	3.00	1.04	0.00	0.085	0.000	23.398	0.00	0.00
55.00	1.5" Reinforcing Plate	Yes	0.83	0.000	3.00	0.21	0.00	0.086	0.000	23.473	0.00	0.00
60.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.087	0.000	23.907	0.00	0.00
64.17	1.5" Reinforcing Plate	Yes	4.17	0.000	3.00	1.04	0.00	0.089	0.000	24.248	0.00	0.00
65.00	1.5" Reinforcing Plate	Yes	0.83	0.000	3.00	0.21	0.00	0.091	0.000	24.313	0.00	0.00
69.50	1.5" Reinforcing Plate	Yes	4.50	0.000	3.00	1.13	0.00	0.092	0.000	24.658	0.00	0.00
70.00	1.25" Reinforcing	Yes	0.50	0.000	2.50	0.10	0.00	0.078	0.000	24.696	0.00	0.00
75.00	1.25" Reinforcing	Yes	5.00	0.000	2.50	1.04	0.00	0.079	0.000	25.057	0.00	0.00
76.71	1.5" Reinforcing Plate	Yes	0.01	0.000	3.00	0.00	0.00	0.081	0.000	25.176	0.00	0.00
76.71	1.25" Reinforcing	Yes	1.70	0.000	2.50	0.35	0.00	0.081	0.000	25.176	0.00	0.00
76.84	1.5" Reinforcing Plate	Yes	0.13	0.000	3.00	0.03	0.00	0.097	0.000	25.185	0.00	0.00
80.00	1.5" Reinforcing Plate	Yes	3.16	0.000	3.00	0.79	0.00	0.098	0.000	25.400	0.00	0.00
80.17	1.5" Reinforcing Plate	Yes	0.17	0.000	3.00	0.04	0.00	0.099	0.000	25.411	0.00	0.00
81.17	1.5" Reinforcing Plate	Yes	1.00	0.000	3.00	0.25	0.00	0.100	0.000	25.478	0.00	0.00
85.00	1.5" Reinforcing Plate	Yes	3.83	0.000	3.00	0.96	0.00	0.099	0.000	25.726	0.00	0.00
85.92	1.5" Reinforcing Plate	Yes	0.92	0.000	3.00	0.23	0.00	0.101	1.002	25.784	0.00	0.00
90.00	1.5" Reinforcing Plate	Yes	4.08	0.000	3.00	1.02	0.00	0.102	1.007	26.037	0.00	0.00
										Totals:	**0.0**	**0.0**

Calculated Forces

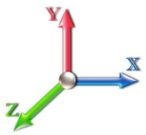
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 93 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-32.32	-28.89	0.00	-2908.9	0.00	2908.91	3406.69	1703.35	5989.16	2957.82	0.00	0.000	0.000	0.500
5.00	-31.02	-28.40	0.00	-2764.4	0.00	2764.46	3366.57	1683.28	5792.56	2860.73	0.09	-0.170	0.000	0.486
10.00	-29.75	-27.91	0.00	-2622.4	0.00	2622.44	3325.07	1662.53	5596.65	2763.98	0.36	-0.341	0.000	0.471
14.17	-28.74	-27.49	0.00	-2506.0	0.00	2506.05	3289.41	1644.70	5433.91	2683.60	0.72	-0.483	0.000	0.417
15.00	-28.50	-27.44	0.00	-2483.2	0.00	2483.23	3282.20	1641.10	5401.59	2667.64	0.81	-0.510	0.000	0.415
20.00	-27.31	-26.89	0.00	-2346.0	0.00	2346.04	3237.96	1618.98	5207.54	2571.81	1.42	-0.664	0.000	0.401
20.50	-26.50	-26.62	0.00	-2332.5	0.00	2332.59	3233.46	1616.73	5188.20	2562.26	1.49	-0.680	0.000	0.415
25.00	-25.43	-26.15	0.00	-2212.7	0.00	2212.79	3192.34	1596.17	5014.65	2476.55	2.21	-0.824	0.000	0.402
30.00	-24.26	-25.60	0.00	-2082.0	0.00	2082.04	3145.35	1572.68	4823.07	2381.93	3.15	-0.984	0.000	0.387
35.00	-23.14	-25.02	0.00	-1954.0	0.00	1954.04	3097.00	1548.50	4632.96	2288.04	4.27	-1.142	0.000	0.373
37.00	-22.67	-24.82	0.00	-1903.9	0.00	1903.99	3077.27	1538.63	4557.36	2250.71	4.76	-1.206	0.000	0.509
40.00	-21.98	-24.49	0.00	-1829.5	0.00	1829.54	3047.27	1523.63	4444.46	2194.95	5.56	-1.339	0.000	0.498
43.36	-21.26	-24.10	0.00	-1747.2	0.00	1747.24	3013.08	1506.54	4318.79	2132.89	6.56	-1.486	0.000	0.348
43.50	-21.22	-24.09	0.00	-1743.8	0.00	1743.86	3011.64	1505.82	4313.57	2130.31	6.60	-1.491	0.000	0.347
45.00	-20.67	-23.92	0.00	-1707.7	0.00	1707.72	2996.16	1498.08	4257.75	2102.74	7.08	-1.538	0.000	0.336
48.50	-19.43	-23.49	0.00	-1623.9	0.00	1623.99	2330.75	1165.37	3323.66	1641.43	8.24	-1.646	0.000	0.358
50.00	-19.07	-23.27	0.00	-1588.7	0.00	1588.75	2320.40	1160.20	3282.84	1621.27	8.77	-1.692	0.000	0.370
54.17	-18.33	-22.76	0.00	-1491.7	0.00	1491.73	2290.97	1145.49	3169.67	1565.38	10.31	-1.823	0.000	0.522
55.00	-18.13	-22.70	0.00	-1472.8	0.00	1472.84	2285.00	1142.50	3147.20	1554.29	10.63	-1.863	0.000	0.518
60.00	-17.22	-22.13	0.00	-1359.3	0.00	1359.33	2248.23	1124.12	3012.38	1487.70	12.70	-2.090	0.000	0.493
64.17	-16.50	-21.64	0.00	-1267.0	0.00	1267.04	2216.52	1108.26	2900.67	1432.53	14.61	-2.279	0.000	0.336
65.00	-16.33	-21.56	0.00	-1249.0	0.00	1249.08	2210.09	1105.05	2878.53	1421.60	15.01	-2.306	0.000	0.332
69.50	-15.59	-21.02	0.00	-1152.0	0.00	1152.06	2174.60	1087.30	2759.01	1362.57	17.25	-2.448	0.000	0.476
70.00	-15.46	-20.99	0.00	-1141.5	0.00	1141.55	2170.58	1085.29	2745.79	1356.04	17.51	-2.472	0.000	0.473
75.00	-14.63	-20.42	0.00	-1036.5	0.00	1036.59	2129.70	1064.85	2614.33	1291.12	20.22	-2.704	0.000	0.444
76.71	-14.36	-20.22	0.00	-1001.6	0.00	1001.68	2115.40	1057.70	2569.69	1269.07	21.20	-2.784	0.000	0.303
76.84	-14.32	-20.22	0.00	-999.12	0.00	999.12	2114.34	1057.17	2566.39	1267.45	21.28	-2.788	0.000	0.302
80.00	-13.52	-19.82	0.00	-935.17	0.00	935.17	2087.45	1043.72	2484.30	1226.90	23.16	-2.888	0.000	0.282
80.17	-13.47	-19.81	0.00	-931.80	0.00	931.80	2085.98	1042.99	2479.91	1224.73	23.26	-2.894	0.000	0.416
81.17	-13.19	-19.70	0.00	-911.99	0.00	911.99	1538.24	769.12	1857.13	917.17	23.87	-2.939	0.000	0.460
85.00	-12.68	-19.27	0.00	-836.52	0.00	836.52	1518.69	759.35	1789.97	884.00	26.30	-3.109	0.000	0.470
85.92	-12.53	-19.18	0.00	-818.80	0.00	818.80	1513.87	756.94	1773.86	876.04	26.90	-3.153	0.000	0.322
90.00	-11.98	-18.73	0.00	-740.56	0.00	740.56	1491.95	745.98	1702.59	840.84	29.65	-3.284	0.000	0.462
95.00	-11.32	-18.19	0.00	-646.93	0.00	646.93	1463.84	731.92	1615.70	797.93	33.22	-3.519	0.000	0.418
100.00	-10.23	-16.82	0.00	-556.01	0.00	556.01	1434.36	717.18	1529.45	755.34	37.02	-3.740	0.000	0.373
105.00	-9.62	-16.31	0.00	-471.89	0.00	471.89	1403.51	701.75	1444.00	713.14	41.04	-3.946	0.000	0.669
110.00	-9.05	-15.80	0.00	-390.32	0.00	390.32	1371.28	685.64	1359.50	671.40	45.38	-4.329	0.000	0.588
111.21	-8.89	-15.70	0.00	-371.15	0.00	371.15	1363.25	681.63	1339.15	661.36	46.49	-4.421	0.000	0.568
114.80	-8.29	-15.31	0.00	-314.90	0.00	314.90	898.25	449.12	876.91	433.07	49.91	-4.671	0.000	0.738
115.00	-7.76	-14.57	0.00	-311.79	0.00	311.79	897.59	448.79	874.90	432.08	50.11	-4.685	0.000	0.731
120.00	-7.32	-14.10	0.00	-238.92	0.00	238.92	880.69	440.34	825.45	407.66	55.22	-5.071	0.000	0.595
125.00	-6.95	-13.61	0.00	-168.44	0.00	168.44	862.42	431.21	776.03	383.25	60.71	-5.392	0.000	0.449
126.00	-4.74	-9.55	0.00	-154.83	0.00	154.83	858.60	429.30	766.16	378.38	61.84	-5.450	0.000	0.415
130.00	-4.47	-9.17	0.00	-116.62	0.00	116.62	842.77	421.39	726.80	358.94	66.49	-5.648	0.000	0.331
135.00	-4.16	-8.71	0.00	-70.75	0.00	70.75	821.76	410.88	677.90	334.79	72.50	-5.837	0.000	0.217
138.00	-1.77	-3.69	0.00	-44.63	0.00	44.63	808.49	404.24	648.79	320.41	76.19	-5.917	0.000	0.142
140.00	-1.69	-3.52	0.00	-37.24	0.00	37.24	799.37	399.68	629.50	310.89	78.68	-5.958	0.000	0.122
145.00	-1.49	-3.08	0.00	-19.66	0.00	19.66	775.61	387.80	581.75	287.30	84.95	-6.033	0.000	0.070

Calculated Forces

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

150.00	0.00	-2.91	0.00	-4.25	0.00	4.25	750.48	375.24	534.80	264.12	91.28	-6.069	0.000	0.016

Wind Loading - Shaft

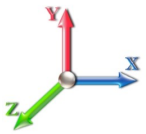
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1 RB2 RB3	1.00	0.85	17.879	19.67	318.08	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	17.879	19.67	311.42	1.000	0.000	5.00	18.355	18.35	577.6	0.0	779.8
10.00		1.00	0.85	17.879	19.67	304.76	1.000	0.000	5.00	17.966	17.97	565.4	0.0	763.2
14.17	RB4	1.00	0.85	17.879	19.67	299.21	1.000	0.000	4.17	14.687	14.69	462.2	0.0	623.8
15.00		1.00	0.85	17.879	19.67	298.11	1.000	0.000	0.83	2.891	2.89	91.0	0.0	122.8
20.00		1.00	0.90	18.971	20.87	300.21	1.000	0.000	5.00	17.190	17.19	573.9	0.0	729.9
20.50	RT1 RT2 RB5	1.00	0.91	19.069	20.98	300.31	1.000	0.000	0.50	1.698	1.70	57.0	0.0	72.1
25.00		1.00	0.95	19.883	21.87	300.33	1.000	0.000	4.50	15.104	15.10	528.6	0.0	641.2
30.00		1.00	0.98	20.661	22.73	298.99	1.000	0.000	5.00	16.413	16.41	596.8	0.0	696.6
35.00		1.00	1.01	21.343	23.48	296.61	1.000	0.000	5.00	16.025	16.03	602.0	0.0	680.0
37.00	RT5	1.00	1.03	21.594	23.75	295.42	1.000	0.000	2.00	6.301	6.30	239.5	0.0	267.3
40.00		1.00	1.04	21.951	24.15	293.43	1.000	0.000	3.00	9.336	9.34	360.7	0.0	396.0
43.36	RB6	1.00	1.06	22.327	24.56	290.93	1.000	0.000	3.36	10.290	10.29	404.3	0.0	436.4
43.50	Bot - Section 2	1.00	1.06	22.342	24.58	290.82	1.000	0.000	0.14	0.425	0.42	16.7	0.0	18.0
45.00		1.00	1.07	22.502	24.75	289.62	1.000	0.000	1.50	4.615	4.61	182.8	0.0	355.6
48.50	Top - Section 1	1.00	1.09	22.860	25.15	286.64	1.000	0.000	3.50	10.632	10.63	427.8	0.0	819.2
50.00	Appurtenance(s)	1.00	1.09	23.007	25.31	290.54	1.000	0.000	1.50	4.498	4.50	182.1	0.0	159.2
54.17	RT3 RT4	1.00	1.11	23.398	25.74	286.65	1.000	0.000	4.17	12.322	12.32	507.4	0.0	436.1
55.00		1.00	1.12	23.473	25.82	285.85	1.000	0.000	0.83	2.420	2.42	100.0	0.0	85.7
60.00		1.00	1.14	23.907	26.30	280.78	1.000	0.000	5.00	14.354	14.35	604.0	0.0	507.9
64.17	RB7	1.00	1.15	24.248	26.67	276.30	1.000	0.000	4.17	11.674	11.67	498.2	0.0	413.0
65.00		1.00	1.16	24.313	26.74	275.39	1.000	0.000	0.83	2.291	2.29	98.1	0.0	81.0
69.50	RT6	1.00	1.17	24.658	27.12	270.30	1.000	0.000	4.50	12.237	12.24	531.1	0.0	432.8
70.00		1.00	1.17	24.696	27.17	269.72	1.000	0.000	0.50	1.340	1.34	58.3	0.0	47.4
75.00		1.00	1.19	25.057	27.56	263.81	1.000	0.000	5.00	13.189	13.19	581.6	0.0	466.3
76.71	RB8	1.00	1.20	25.176	27.69	261.73	1.000	0.000	1.71	4.422	4.42	195.9	0.0	156.3
76.84	Bot - Section 3	1.00	1.20	25.185	27.70	261.58	1.000	0.000	0.13	0.326	0.33	14.4	0.0	11.5
80.00		1.00	1.21	25.400	27.94	257.67	1.000	0.000	3.16	8.190	8.19	366.1	0.0	516.7
80.17	RT7	1.00	1.21	25.411	27.95	257.46	1.000	0.000	0.17	0.436	0.44	19.5	0.0	27.5
81.17	Top - Section 2	1.00	1.21	25.478	28.03	256.20	1.000	0.000	1.00	2.554	2.55	114.5	0.0	161.1
85.00		1.00	1.22	25.726	28.30	255.77	1.000	0.000	3.83	9.638	9.64	436.4	0.0	273.1
85.92	RB9	1.00	1.23	25.784	28.36	254.59	1.002 *	0.000	0.92	2.281	2.29	103.8	0.0	64.6
90.00	RT8	1.00	1.24	26.037	28.64	249.28	1.007 *	0.000	4.08	9.959	10.03	459.7	0.0	282.1
95.00		1.00	1.25	26.336	28.97	242.62	1.000	0.000	5.00	11.852	11.85	549.3	0.0	335.6
100.00	RT9	1.00	1.27	26.621	29.28	235.81	1.000	0.000	5.00	11.464	11.46	537.1	0.0	324.5
105.00		1.00	1.28	26.896	29.59	228.86	1.000	0.000	5.00	11.075	11.08	524.3	0.0	313.4
110.00		1.00	1.29	27.161	29.88	221.78	1.000	0.000	5.00	10.687	10.69	510.9	0.0	302.3
111.21	Bot - Section 4	1.00	1.29	27.224	29.95	220.04	1.000	0.000	1.21	2.535	2.53	121.5	0.0	71.7
114.80	Top - Section 3	1.00	1.30	27.406	30.15	214.87	1.000	0.000	3.58	7.469	7.47	360.3	0.0	366.7
115.00	Appurtenance(s)	1.00	1.30	27.416	30.16	218.01	1.000	0.000	0.20	0.418	0.42	20.2	0.0	8.9
120.00		1.00	1.32	27.663	30.43	210.71	1.000	0.000	5.00	10.072	10.07	490.4	0.0	214.1
125.00		1.00	1.33	27.902	30.69	203.30	1.000	0.000	5.00	9.684	9.68	475.6	0.0	205.8
126.00	Appurtenance(s)	1.00	1.33	27.949	30.74	201.80	1.000	0.000	1.00	1.890	1.89	93.0	0.0	40.2
130.00		1.00	1.34	28.133	30.95	195.79	1.000	0.000	4.00	7.406	7.41	366.7	0.0	157.3
135.00		1.00	1.35	28.358	31.19	188.18	1.000	0.000	5.00	8.908	8.91	444.6	0.0	189.2
138.00	Appurtenance(s)	1.00	1.35	28.489	31.34	183.58	1.000	0.000	3.00	5.158	5.16	258.6	0.0	109.5
140.00		1.00	1.36	28.576	31.43	180.49	1.000	0.000	2.00	3.361	3.36	169.0	0.0	71.3

Wind Loading - Shaft

Structure: CT46134-A-SBA
Site Name: Granby-n. Granby
Height: 150.00 (ft)
Base Elev: 0.000 (ft)
Gh: 1.1
Topography: 1

Code: EIA/TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: D - Stiff Soil
Struct Class: II

9/27/2016

Tower Engineering Solutions

145.00	1.00	1.37	28.788	31.67	172.71	1.000	0.000	5.00	8.131	8.13	412.0	0.0	172.5
150.00 Appurtenance(s)	1.00	1.38	28.994	31.89	164.85	1.000	0.000	5.00	7.743	7.74	395.1	0.0	164.2
							Totals:	**150.00**			**16,285.6**		**14,571.3**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

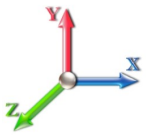
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	10' Dipole	1	29.195	32.114	1.00	1.00	3.76	27.00	0.000	5.000	193.20	0.00	965.99
2	150.00	18' Omni	1	29.352	32.287	1.00	1.00	5.40	49.50	0.000	9.000	278.96	0.00	2510.62
3	150.00	10' Omni	1	29.195	32.114	1.00	1.00	3.00	22.50	0.000	5.000	154.15	0.00	770.74
4	150.00	Low Profile Platform-flat	1	28.994	31.893	1.00	1.00	34.00	1080.00	0.000	0.000	1734.99	0.00	0.00
5	150.00	3' Yagi	1	28.994	31.893	1.00	1.00	2.98	9.00	0.000	0.000	152.07	0.00	0.00
6	138.00	P65-17-XLH-RR	2	28.489	31.338	0.64	0.80	14.64	106.20	0.000	0.000	734.23	0.00	0.00
7	138.00	Low Profile Platform-flat	1	28.489	31.338	1.00	1.00	34.00	1080.00	0.000	0.000	1704.80	0.00	0.00
8	138.00	SBNH-1D6565C	1	28.489	31.338	0.67	0.80	7.71	59.49	0.000	0.000	386.48	0.00	0.00
9	138.00	7770.00	6	28.489	31.338	0.62	0.80	20.33	189.00	0.000	0.000	1019.27	0.00	0.00
10	138.00	RRUS-11 700MHz	6	28.489	31.338	0.40	0.80	6.05	275.40	0.000	0.000	303.25	0.00	0.00
11	138.00	TT19-08BP111-001	6	28.489	31.338	0.54	0.80	2.06	86.40	0.000	0.000	103.20	0.00	0.00
12	138.00	RRUS-12 1900 MHz	3	28.489	31.338	0.40	0.80	3.24	162.00	0.000	0.000	162.46	0.00	0.00
13	138.00	LGP 21901	6	28.489	31.338	0.54	0.80	0.74	29.70	0.000	0.000	37.09	0.00	0.00
14	138.00	DC6-48-60-18-8F	1	28.489	31.338	0.80	0.80	0.74	28.62	0.000	0.000	36.90	0.00	0.00
15	126.00	APXVSPP18-C-A20	3	27.949	30.744	0.69	0.80	16.55	153.90	0.000	0.000	814.25	0.00	0.00
16	126.00	ACU-A20-N	4	27.949	30.744	0.40	0.80	0.22	3.60	0.000	0.000	11.02	0.00	0.00
17	126.00	TD-RRH8x20-25	3	27.949	30.744	0.40	0.80	4.86	189.00	0.000	0.000	239.06	0.00	0.00
18	126.00	800 MHz	3	27.949	30.744	0.40	0.80	2.99	143.10	0.000	0.000	146.98	0.00	0.00
19	126.00	1900MHz	3	27.949	30.744	0.40	0.80	4.56	118.80	0.000	0.000	224.31	0.00	0.00
20	126.00	APXVTM14-C-120	3	27.949	30.744	0.62	0.80	11.87	151.20	0.000	0.000	583.81	0.00	0.00
21	126.00	Low Profile Platform-flat	1	27.949	30.744	1.00	1.00	34.00	1080.00	0.000	0.000	1672.46	0.00	0.00
22	126.00	800MHz Filter	3	27.949	30.744	0.54	0.80	1.25	23.76	0.000	0.000	61.70	0.00	0.00
23	115.00	Flush Mount	1	27.416	30.158	1.00	1.00	5.00	315.00	0.000	0.000	241.26	0.00	0.00
24	115.00	TMA	3	27.416	30.158	0.67	1.00	0.02	29.70	0.000	0.000	0.97	0.00	0.00
25	115.00	RR65-18-02DP	3	27.416	30.158	0.73	1.00	9.55	48.60	0.000	0.000	460.74	0.00	0.00
26	100.00	742 213	3	26.621	29.284	0.78	1.00	11.98	59.40	0.000	0.000	561.35	0.00	0.00
27	100.00	Flush Mount	1	26.621	29.284	1.00	1.00	5.00	315.00	0.000	0.000	234.27	0.00	0.00
28	50.00	GPS	1	23.007	25.308	1.00	1.00	0.01	0.90	0.000	0.000	0.40	0.00	0.00
29	50.00	Standoff	1	23.007	25.308	1.00	1.00	1.50	45.00	0.000	0.000	60.74	0.00	0.00
30	20.50	Splice Plate	2	19.069	20.976	0.94	1.00	7.20	496.80	0.000	0.000	241.66	0.00	0.00
							Totals:		**6,378.57**			**12,556.00**		

Total Applied Force Summary

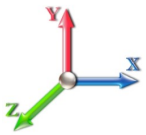
Structure:	CT46134-A-SBA		**Code:**	EIA/TIA-222-G	9/27/2016
Site Name:	Granby-n. Granby		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 20

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		577.57	913.42	0.00	0.00
10.00		565.35	896.78	0.00	0.00
14.17		462.16	735.19	0.00	0.00
15.00		90.98	144.95	0.00	0.00
20.00		573.94	863.50	0.00	0.00
20.50	(2) attachments	298.64	582.23	0.00	0.00
25.00		528.55	761.42	0.00	0.00
30.00		596.85	830.22	0.00	0.00
35.00		601.95	813.58	0.00	0.00
37.00		239.48	320.77	0.00	0.00
40.00		360.67	476.17	0.00	0.00
43.36		404.35	526.19	0.00	0.00
43.50		16.71	21.76	0.00	0.00
45.00		182.76	395.73	0.00	0.00
48.50		427.75	912.70	0.00	0.00
50.00	(2) attachments	243.29	245.22	0.00	0.00
54.17		507.41	547.54	0.00	0.00
55.00		99.99	107.83	0.00	0.00
60.00		603.95	641.51	0.00	0.00
64.17		498.20	524.41	0.00	0.00
65.00		98.05	103.23	0.00	0.00
69.50		531.07	553.02	0.00	0.00
70.00		58.25	60.75	0.00	0.00
75.00		581.64	599.90	0.00	0.00
76.71		195.92	201.99	0.00	0.00
76.84		14.44	14.90	0.00	0.00
80.00		366.12	601.24	0.00	0.00
80.17		19.49	32.03	0.00	0.00
81.17		114.53	187.82	0.00	0.00
85.00		436.41	375.41	0.00	0.00
85.92		103.78	89.21	0.00	0.00
90.00		459.68	391.09	0.00	0.00
95.00		549.34	469.20	0.00	0.00
100.00	(4) attachments	1332.73	832.51	0.00	0.00
105.00		524.28	418.94	0.00	0.00
110.00		510.88	407.84	0.00	0.00
111.21		121.46	97.30	0.00	0.00
114.80		360.25	442.36	0.00	0.00
115.00	(7) attachments	723.13	406.48	0.00	0.00
120.00		490.40	291.59	0.00	0.00
125.00		475.56	283.27	0.00	0.00
126.00	(23) attachments	3846.56	1919.02	0.00	0.00
130.00		366.69	208.99	0.00	0.00
135.00		444.58	253.75	0.00	0.00
138.00	(32) attachments	4746.31	2165.07	0.00	0.00
140.00		169.05	73.14	0.00	0.00

Total Applied Force Summary

Structure:	CT46134-A-SBA		**Code:**	EIA/TIA-222-G	9/27/2016
Site Name:	Granby-n. Granby		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 21

145.00		411.98	177.03	0.00	0.00
150.00	(5) attachments	2908.47	1356.71	0.00	4247.35
	Totals:	**28,841.60**	**24,274.92**	**0.00**	**4,247.35**

Linear Appurtenance Segment Forces (Factored)

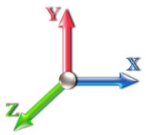
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1.5" Reinforcing Plate	Yes	4.50	0.000	3.00	1.13	0.00	0.061	0.000	17.879	0.00	0.00
10.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.070	0.000	17.879	0.00	0.00
14.17	1.5" Reinforcing Plate	Yes	4.17	0.000	3.00	1.04	0.00	0.071	0.000	17.879	0.00	0.00
15.00	1.5" Reinforcing Plate	Yes	0.83	0.000	3.00	0.21	0.00	0.072	0.000	17.879	0.00	0.00
20.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.073	0.000	18.971	0.00	0.00
20.50	1.5" Reinforcing Plate	Yes	0.50	0.000	3.00	0.13	0.00	0.074	0.000	19.069	0.00	0.00
25.00	1.5" Reinforcing Plate	Yes	4.50	0.000	3.00	1.13	0.00	0.074	0.000	19.883	0.00	0.00
30.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.076	0.000	20.661	0.00	0.00
35.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.078	0.000	21.343	0.00	0.00
37.00	1.5" Reinforcing Plate	Yes	2.00	0.000	3.00	0.50	0.00	0.079	0.000	21.594	0.00	0.00
40.00	1.25" Reinforcing	Yes	3.00	0.000	2.50	0.63	0.00	0.067	0.000	21.951	0.00	0.00
43.36	1.25" Reinforcing	Yes	3.36	0.000	2.50	0.70	0.00	0.068	0.000	22.327	0.00	0.00
43.50	1.5" Reinforcing Plate	Yes	0.10	0.000	3.00	0.03	0.00	0.078	0.000	22.342	0.00	0.00
43.50	1.25" Reinforcing	Yes	0.04	0.000	2.50	0.01	0.00	0.078	0.000	22.342	0.00	0.00
45.00	1.5" Reinforcing Plate	Yes	1.50	0.000	3.00	0.38	0.00	0.083	0.000	22.502	0.00	0.00
48.50	1.5" Reinforcing Plate	Yes	3.50	0.000	3.00	0.88	0.00	0.084	0.000	22.860	0.00	0.00
50.00	1.5" Reinforcing Plate	Yes	1.50	0.000	3.00	0.38	0.00	0.083	0.000	23.007	0.00	0.00
54.17	1.5" Reinforcing Plate	Yes	4.17	0.000	3.00	1.04	0.00	0.085	0.000	23.398	0.00	0.00
55.00	1.5" Reinforcing Plate	Yes	0.83	0.000	3.00	0.21	0.00	0.086	0.000	23.473	0.00	0.00
60.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.087	0.000	23.907	0.00	0.00
64.17	1.5" Reinforcing Plate	Yes	4.17	0.000	3.00	1.04	0.00	0.089	0.000	24.248	0.00	0.00
65.00	1.5" Reinforcing Plate	Yes	0.83	0.000	3.00	0.21	0.00	0.091	0.000	24.313	0.00	0.00
69.50	1.5" Reinforcing Plate	Yes	4.50	0.000	3.00	1.13	0.00	0.092	0.000	24.658	0.00	0.00
70.00	1.25" Reinforcing	Yes	0.50	0.000	2.50	0.10	0.00	0.078	0.000	24.696	0.00	0.00
75.00	1.25" Reinforcing	Yes	5.00	0.000	2.50	1.04	0.00	0.079	0.000	25.057	0.00	0.00
76.71	1.5" Reinforcing Plate	Yes	0.01	0.000	3.00	0.00	0.00	0.081	0.000	25.176	0.00	0.00
76.71	1.25" Reinforcing	Yes	1.70	0.000	2.50	0.35	0.00	0.081	0.000	25.176	0.00	0.00
76.84	1.5" Reinforcing Plate	Yes	0.13	0.000	3.00	0.03	0.00	0.097	0.000	25.185	0.00	0.00
80.00	1.5" Reinforcing Plate	Yes	3.16	0.000	3.00	0.79	0.00	0.098	0.000	25.400	0.00	0.00
80.17	1.5" Reinforcing Plate	Yes	0.17	0.000	3.00	0.04	0.00	0.099	0.000	25.411	0.00	0.00
81.17	1.5" Reinforcing Plate	Yes	1.00	0.000	3.00	0.25	0.00	0.100	0.000	25.478	0.00	0.00
85.00	1.5" Reinforcing Plate	Yes	3.83	0.000	3.00	0.96	0.00	0.099	0.000	25.726	0.00	0.00
85.92	1.5" Reinforcing Plate	Yes	0.92	0.000	3.00	0.23	0.00	0.101	1.002	25.784	0.00	0.00
90.00	1.5" Reinforcing Plate	Yes	4.08	0.000	3.00	1.02	0.00	0.102	1.007	26.037	0.00	0.00
										Totals:	**0.0**	**0.0**

Calculated Forces

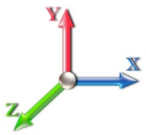
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 93 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-24.23	-28.88	0.00	-2887.5	0.00	2887.56	3406.69	1703.35	5989.16	2957.82	0.00	0.000	0.000	0.495
5.00	-23.24	-28.37	0.00	-2743.1	0.00	2743.18	3366.57	1683.28	5792.56	2860.73	0.09	-0.169	0.000	0.481
10.00	-22.27	-27.86	0.00	-2601.3	0.00	2601.34	3325.07	1662.53	5596.65	2763.98	0.36	-0.338	0.000	0.466
14.17	-21.49	-27.42	0.00	-2485.1	0.00	2485.18	3289.41	1644.70	5433.91	2683.60	0.72	-0.480	0.000	0.413
15.00	-21.31	-27.36	0.00	-2462.4	0.00	2462.42	3282.20	1641.10	5401.59	2667.64	0.80	-0.506	0.000	0.411
20.00	-20.41	-26.81	0.00	-2325.6	0.00	2325.60	3237.96	1618.98	5207.54	2571.81	1.41	-0.659	0.000	0.397
20.50	-19.79	-26.53	0.00	-2312.1	0.00	2312.19	3233.46	1616.73	5188.20	2562.26	1.48	-0.675	0.000	0.410
25.00	-18.97	-26.04	0.00	-2192.8	0.00	2192.80	3192.34	1596.17	5014.65	2476.55	2.19	-0.818	0.000	0.397
30.00	-18.08	-25.48	0.00	-2062.5	0.00	2062.57	3145.35	1572.68	4823.07	2381.93	3.13	-0.975	0.000	0.383
35.00	-17.23	-24.90	0.00	-1935.1	0.00	1935.15	3097.00	1548.50	4632.96	2288.04	4.23	-1.132	0.000	0.368
37.00	-16.87	-24.68	0.00	-1885.3	0.00	1885.35	3077.27	1538.63	4557.36	2250.71	4.72	-1.196	0.000	0.503
40.00	-16.35	-24.35	0.00	-1811.3	0.00	1811.30	3047.27	1523.63	4444.46	2194.95	5.52	-1.327	0.000	0.492
43.36	-15.80	-23.96	0.00	-1729.4	0.00	1729.48	3013.08	1506.54	4318.79	2132.89	6.50	-1.473	0.000	0.344
43.50	-15.77	-23.95	0.00	-1726.1	0.00	1726.13	3011.64	1505.82	4313.57	2130.31	6.55	-1.478	0.000	0.343
45.00	-15.34	-23.77	0.00	-1690.2	0.00	1690.21	2996.16	1498.08	4257.75	2102.74	7.02	-1.525	0.000	0.332
48.50	-14.41	-23.34	0.00	-1607.0	0.00	1607.00	2330.75	1165.37	3323.66	1641.43	8.17	-1.631	0.000	0.353
50.00	-14.14	-23.11	0.00	-1572.0	0.00	1572.00	2320.40	1160.20	3282.84	1621.27	8.69	-1.677	0.000	0.365
54.17	-13.57	-22.61	0.00	-1475.6	0.00	1475.62	2290.97	1145.49	3169.67	1565.38	10.22	-1.807	0.000	0.516
55.00	-13.42	-22.53	0.00	-1456.8	0.00	1456.86	2285.00	1142.50	3147.20	1554.29	10.53	-1.846	0.000	0.512
60.00	-12.72	-21.96	0.00	-1344.1	0.00	1344.19	2248.23	1124.12	3012.38	1487.70	12.59	-2.071	0.000	0.486
64.17	-12.17	-21.46	0.00	-1252.6	0.00	1252.63	2216.52	1108.26	2900.67	1432.53	14.48	-2.257	0.000	0.331
65.00	-12.04	-21.38	0.00	-1234.8	0.00	1234.82	2210.09	1105.05	2878.53	1421.60	14.87	-2.284	0.000	0.328
69.50	-11.48	-20.84	0.00	-1138.6	0.00	1138.63	2174.60	1087.30	2759.01	1362.57	17.09	-2.424	0.000	0.469
70.00	-11.38	-20.80	0.00	-1128.2	0.00	1128.21	2170.58	1085.29	2745.79	1356.04	17.35	-2.448	0.000	0.466
75.00	-10.75	-20.22	0.00	-1024.2	0.00	1024.20	2129.70	1064.85	2614.33	1291.12	20.04	-2.677	0.000	0.438
76.71	-10.54	-20.03	0.00	-989.62	0.00	989.62	2115.40	1057.70	2569.69	1269.07	21.01	-2.756	0.000	0.298
76.84	-10.51	-20.02	0.00	-987.08	0.00	987.08	2114.34	1057.17	2566.39	1267.45	21.08	-2.760	0.000	0.298
80.00	-9.91	-19.63	0.00	-923.75	0.00	923.75	2087.45	1043.72	2484.30	1226.90	22.94	-2.859	0.000	0.278
80.17	-9.87	-19.62	0.00	-920.41	0.00	920.41	2085.98	1042.99	2479.91	1224.73	23.05	-2.865	0.000	0.410
81.17	-9.65	-19.51	0.00	-900.79	0.00	900.79	1538.24	769.12	1857.13	917.17	23.65	-2.910	0.000	0.453
85.00	-9.27	-19.07	0.00	-826.06	0.00	826.06	1518.69	759.35	1789.97	884.00	26.05	-3.077	0.000	0.463
85.92	-9.15	-18.98	0.00	-808.51	0.00	808.51	1513.87	756.94	1773.86	876.04	26.65	-3.121	0.000	0.317
90.00	-8.73	-18.53	0.00	-731.08	0.00	731.08	1491.95	745.98	1702.59	840.84	29.37	-3.250	0.000	0.455
95.00	-8.22	-17.98	0.00	-638.45	0.00	638.45	1463.84	731.92	1615.70	797.93	32.90	-3.482	0.000	0.412
100.00	-7.41	-16.63	0.00	-548.53	0.00	548.53	1434.36	717.18	1529.45	755.34	36.66	-3.700	0.000	0.367
105.00	-6.95	-16.11	0.00	-465.39	0.00	465.39	1403.51	701.75	1444.00	713.14	40.65	-3.903	0.000	0.658
110.00	-6.52	-15.60	0.00	-384.83	0.00	384.83	1371.28	685.64	1359.50	671.40	44.94	-4.281	0.000	0.578
111.21	-6.38	-15.49	0.00	-365.90	0.00	365.90	1363.25	681.63	1339.15	661.36	46.04	-4.371	0.000	0.558
114.80	-5.94	-15.11	0.00	-310.39	0.00	310.39	898.25	449.12	876.91	433.07	49.41	-4.618	0.000	0.724
115.00	-5.54	-14.38	0.00	-307.32	0.00	307.32	897.59	448.79	874.90	432.08	49.61	-4.632	0.000	0.718
120.00	-5.20	-13.90	0.00	-235.43	0.00	235.43	880.69	440.34	825.45	407.66	54.67	-5.013	0.000	0.584
125.00	-4.92	-13.41	0.00	-165.95	0.00	165.95	862.42	431.21	776.03	383.25	60.09	-5.329	0.000	0.440
126.00	-3.35	-9.41	0.00	-152.54	0.00	152.54	858.60	429.30	766.16	378.38	61.21	-5.386	0.000	0.408
130.00	-3.15	-9.04	0.00	-114.90	0.00	114.90	842.77	421.39	726.80	358.94	65.80	-5.581	0.000	0.324
135.00	-2.92	-8.58	0.00	-69.72	0.00	69.72	821.76	410.88	677.90	334.79	71.74	-5.767	0.000	0.212
138.00	-1.24	-3.64	0.00	-43.99	0.00	43.99	808.49	404.24	648.79	320.41	75.39	-5.846	0.000	0.139
140.00	-1.18	-3.46	0.00	-36.72	0.00	36.72	799.37	399.68	629.50	310.89	77.84	-5.886	0.000	0.120
145.00	-1.05	-3.03	0.00	-19.42	0.00	19.42	775.61	387.80	581.75	287.30	84.04	-5.960	0.000	0.069

Calculated Forces

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

150.00	0.00	-2.91	0.00	-4.25	0.00	4.25	750.48	375.24	534.80	264.12	90.29	-5.996	0.000	0.016

Wind Loading - Shaft

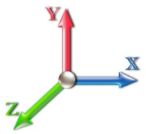
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1 RB2 RB3	1.00	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.656	5.00	19.735	23.68	134.6	469.1	1508.8
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.775	5.00	19.445	23.33	132.7	493.7	1511.3
14.17	RB4	1.00	0.85	5.168	5.68	0.00	1.200	1.838	4.17	15.964	19.16	108.9	419.5	1251.2
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.848	0.83	3.147	3.78	21.5	83.7	247.4
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.902	5.00	18.775	22.53	135.9	508.5	1481.7
20.50	RT1 RT2 RB5	1.00	0.91	5.512	6.06	0.00	1.200	1.907	0.50	1.857	2.23	13.5	50.9	147.0
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.945	4.50	16.563	19.88	125.7	458.2	1313.1
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.981	5.00	18.064	21.68	142.4	507.4	1436.2
35.00		1.00	1.01	6.169	6.79	0.00	1.200	2.012	5.00	17.702	21.24	144.1	503.9	1410.5
37.00	RT5	1.00	1.03	6.242	6.87	0.00	1.200	2.023	2.00	6.976	8.37	57.5	200.9	557.3
40.00		1.00	1.04	6.345	6.98	0.00	1.200	2.039	3.00	10.355	12.43	86.7	299.5	827.5
43.36	RB6	1.00	1.06	6.454	7.10	0.00	1.200	2.055	3.36	11.441	13.73	97.5	332.9	914.7
43.50	Bot - Section 2	1.00	1.06	6.458	7.10	0.00	1.200	2.056	0.14	0.473	0.57	4.0	13.9	37.9
45.00		1.00	1.07	6.504	7.15	0.00	1.200	2.063	1.50	5.130	6.16	44.0	150.5	624.7
48.50	Top - Section 1	1.00	1.09	6.608	7.27	0.00	1.200	2.079	3.50	11.844	14.21	103.3	348.0	1440.3
50.00	Appurtenance(s)	1.00	1.09	6.650	7.32	0.00	1.200	2.085	1.50	5.019	6.02	44.1	148.5	360.9
54.17	RT3 RT4	1.00	1.11	6.763	7.44	0.00	1.200	2.102	4.17	13.782	16.54	123.0	407.9	989.4
55.00		1.00	1.12	6.785	7.46	0.00	1.200	2.105	0.83	2.711	3.25	24.3	81.0	195.2
60.00		1.00	1.14	6.910	7.60	0.00	1.200	2.123	5.00	16.123	19.35	147.1	480.0	1157.2
64.17	RB7	1.00	1.15	7.009	7.71	0.00	1.200	2.138	4.17	13.160	15.79	121.7	394.5	945.1
65.00		1.00	1.16	7.028	7.73	0.00	1.200	2.140	0.83	2.587	3.10	24.0	78.3	186.3
69.50	RT6	1.00	1.17	7.128	7.84	0.00	1.200	2.155	4.50	13.853	16.62	130.3	417.3	994.3
70.00		1.00	1.17	7.138	7.85	0.00	1.200	2.156	0.50	1.520	1.82	14.3	46.3	109.5
75.00		1.00	1.19	7.243	7.97	0.00	1.200	2.171	5.00	14.998	18.00	143.4	453.5	1075.2
76.71	RB8	1.00	1.20	7.277	8.00	0.00	1.200	2.176	1.71	5.042	6.05	48.4	154.0	362.4
76.84	Bot - Section 3	1.00	1.20	7.280	8.01	0.00	1.200	2.176	0.13	0.372	0.45	3.6	11.4	26.7
80.00		1.00	1.21	7.342	8.08	0.00	1.200	2.185	3.16	9.342	11.21	90.5	285.3	974.2
80.17	RT7	1.00	1.21	7.345	8.08	0.00	1.200	2.186	0.17	0.498	0.60	4.8	15.3	52.0
81.17	Top - Section 2	1.00	1.21	7.364	8.10	0.00	1.200	2.188	1.00	2.919	3.50	28.4	89.7	304.5
85.00		1.00	1.22	7.436	8.18	0.00	1.200	2.198	3.83	11.042	13.25	108.4	337.8	701.9
85.92	RB9	1.00	1.23	7.453	8.20	0.00	1.203 *	2.201	0.92	2.619	3.15	25.8	80.8	167.0
90.00	RT8	1.00	1.24	7.526	8.28	0.00	1.209 *	2.211	4.08	11.462	13.85	114.7	351.6	727.6
95.00		1.00	1.25	7.612	8.37	0.00	1.200	2.223	5.00	13.704	16.45	137.7	420.4	867.8
100.00	RT9	1.00	1.27	7.695	8.46	0.00	1.200	2.234	5.00	13.326	15.99	135.4	409.7	842.3
105.00		1.00	1.28	7.774	8.55	0.00	1.200	2.245	5.00	12.946	15.54	132.9	398.7	816.6
110.00		1.00	1.29	7.851	8.64	0.00	1.200	2.256	5.00	12.567	15.08	130.2	387.6	790.6
111.21	Bot - Section 4	1.00	1.29	7.869	8.66	0.00	1.200	2.258	1.21	2.992	3.59	31.1	93.4	189.0
114.80	Top - Section 3	1.00	1.30	7.922	8.71	0.00	1.200	2.266	3.58	8.822	10.59	92.2	273.9	762.9
115.00	Appurtenance(s)	1.00	1.30	7.925	8.72	0.00	1.200	2.266	0.20	0.495	0.59	5.2	15.5	27.4
120.00		1.00	1.32	7.996	8.80	0.00	1.200	2.276	5.00	11.969	14.36	126.3	370.2	655.7
125.00		1.00	1.33	8.065	8.87	0.00	1.200	2.285	5.00	11.588	13.91	123.4	358.5	632.9
126.00	Appurtenance(s)	1.00	1.33	8.079	8.89	0.00	1.200	2.287	1.00	2.271	2.73	24.2	71.2	124.8
130.00		1.00	1.34	8.132	8.95	0.00	1.200	2.294	4.00	8.935	10.72	95.9	277.3	487.1
135.00		1.00	1.35	8.197	9.02	0.00	1.200	2.303	5.00	10.826	12.99	117.1	334.7	586.9
138.00	Appurtenance(s)	1.00	1.35	8.235	9.06	0.00	1.200	2.308	3.00	6.312	7.57	68.6	196.4	342.5
140.00		1.00	1.36	8.260	9.09	0.00	1.200	2.311	2.00	4.132	4.96	45.0	129.0	224.1

Wind Loading - Shaft

Structure: CT46134-A-SBA
Site Name: Granby-n. Granby
Height: 150.00 (ft)
Base Elev: 0.000 (ft)
Gh: 1.1
Topography: 1

Code: EIA/TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: D - Stiff Soil
Struct Class: II

9/27/2016

Tower Engineering Solutions

145.00	1.00	1.37	8.321	9.15	0.00	1.200	2.319	5.00	10.064	12.08	110.5	310.3	540.3
150.00 Appurtenance(s)	1.00	1.38	8.381	9.22	0.00	1.200	2.327	5.00	9.682	11.62	107.1	297.9	516.8
							Totals:	**150.00**			**4,032.1**		**32,446.8**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

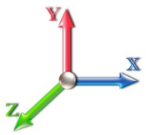
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	10' Dipole	1	8.439	9.283	1.00	1.00	11.76	152.78	0.000	5.000	109.17	0.00	545.83
2	150.00	18' Omni	1	8.484	9.333	1.00	1.00	13.93	208.22	0.000	9.000	130.04	0.00	1170.40
3	150.00	10' Omni	1	8.439	9.283	1.00	1.00	7.81	109.71	0.000	5.000	72.48	0.00	362.41
4	150.00	Low Profile Platform-flat	1	8.381	9.219	1.00	1.00	71.98	2536.17	0.000	0.000	663.53	0.00	0.00
5	150.00	3' Yagi	1	8.381	9.219	1.00	1.00	11.35	106.32	0.000	0.000	104.64	0.00	0.00
6	138.00	P65-17-XLH-RR	2	8.235	9.058	0.66	0.80	20.87	590.41	0.000	0.000	189.06	0.00	0.00
7	138.00	Low Profile Platform-flat	1	8.235	9.058	1.00	1.00	71.66	2524.58	0.000	0.000	649.12	0.00	0.00
8	138.00	SBNH-1D6565C	1	8.235	9.058	0.70	0.80	10.97	317.39	0.000	0.000	99.41	0.00	0.00
9	138.00	7770.00	6	8.235	9.058	0.65	0.80	27.07	1622.53	0.000	0.000	245.20	0.00	0.00
10	138.00	RRUS-11 700MHz	6	8.235	9.058	0.40	0.80	8.06	844.58	0.000	0.000	72.99	0.00	0.00
11	138.00	TT19-08BP111-001	6	8.235	9.058	0.54	0.80	4.58	240.97	0.000	0.000	41.48	0.00	0.00
12	138.00	RRUS-12 1900 MHz	3	8.235	9.058	0.40	0.80	4.95	447.15	0.000	0.000	44.82	0.00	0.00
13	138.00	LGP 21901	6	8.235	9.058	0.54	0.80	2.30	87.41	0.000	0.000	20.88	0.00	0.00
14	138.00	DC6-48-60-18-8F	1	8.235	9.058	0.80	0.80	1.20	102.21	0.000	0.000	10.86	0.00	0.00
15	126.00	APXVSPP18-C-A20	3	8.079	8.886	0.70	0.80	24.67	736.16	0.000	0.000	219.22	0.00	0.00
16	126.00	ACU-A20-N	4	8.079	8.886	0.40	0.80	0.85	22.12	0.000	0.000	7.52	0.00	0.00
17	126.00	TD-RRH8x20-25	3	8.079	8.886	0.40	0.80	6.21	598.41	0.000	0.000	55.16	0.00	0.00
18	126.00	800 MHz	3	8.079	8.886	0.40	0.80	4.79	418.23	0.000	0.000	42.53	0.00	0.00
19	126.00	1900MHz	3	8.079	8.886	0.40	0.80	6.75	493.91	0.000	0.000	59.94	0.00	0.00
20	126.00	APXVTM14-C-120	3	8.079	8.886	0.66	0.80	15.46	760.21	0.000	0.000	137.35	0.00	0.00
21	126.00	Low Profile Platform-flat	1	8.079	8.886	1.00	1.00	71.32	2512.04	0.000	0.000	633.78	0.00	0.00
22	126.00	800MHz Filter	3	8.079	8.886	0.54	0.80	2.62	86.03	0.000	0.000	23.26	0.00	0.00
23	115.00	Flush Mount	1	7.925	8.717	1.00	1.00	9.53	700.68	0.000	0.000	83.09	0.00	0.00
24	115.00	TMA	3	7.925	8.717	0.67	1.00	0.02	72.63	0.000	0.000	0.18	0.00	0.00
25	115.00	RR65-18-02DP	3	7.925	8.717	0.80	1.00	13.73	557.10	0.000	0.000	119.66	0.00	0.00
26	100.00	742 213	3	7.695	8.464	0.84	1.00	17.22	641.37	0.000	0.000	145.72	0.00	0.00
27	100.00	Flush Mount	1	7.695	8.464	1.00	1.00	9.47	695.39	0.000	0.000	80.15	0.00	0.00
28	50.00	GPS	1	6.650	7.315	1.00	1.00	0.01	2.28	0.000	0.000	0.08	0.00	0.00
29	50.00	Standoff	1	6.650	7.315	1.00	1.00	3.58	139.24	0.000	0.000	26.22	0.00	0.00
30	20.50	Splice Plate	2	5.512	6.063	0.96	1.00	9.83	1419.46	0.000	0.000	59.59	0.00	0.00
							Totals:		**19,745.68**			**4,147.13**		

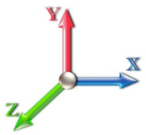
Total Applied Force Summary

Structure:	CT46134-A-SBA		**Code:**	EIA/TIA-222-G	9/27/2016
Site Name:	Granby-n. Granby		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 28

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		134.62	1711.61	0.00	0.00
10.00		132.65	1719.98	0.00	0.00
14.17		108.90	1426.71	0.00	0.00
15.00		21.47	282.38	0.00	0.00
20.00		135.90	1693.96	0.00	0.00
20.50	(2) attachments	73.09	1587.67	0.00	0.00
25.00		125.65	1505.32	0.00	0.00
30.00		142.40	1650.82	0.00	0.00
35.00		144.15	1626.09	0.00	0.00
37.00		57.47	643.65	0.00	0.00
40.00		86.73	955.95	0.00	0.00
43.36		97.46	1058.96	0.00	0.00
43.50		4.03	43.95	0.00	0.00
45.00		44.05	689.85	0.00	0.00
48.50		103.31	1592.58	0.00	0.00
50.00	(2) attachments	70.37	567.72	0.00	0.00
54.17		123.04	1171.49	0.00	0.00
55.00		24.28	231.45	0.00	0.00
60.00		147.07	1376.19	0.00	0.00
64.17		121.75	1128.17	0.00	0.00
65.00		24.00	222.79	0.00	0.00
69.50		130.33	1192.31	0.00	0.00
70.00		14.32	131.23	0.00	0.00
75.00		143.39	1293.34	0.00	0.00
76.71		48.43	437.03	0.00	0.00
76.84		3.57	32.34	0.00	0.00
80.00		90.54	1114.05	0.00	0.00
80.17		4.83	59.48	0.00	0.00
81.17		28.37	348.74	0.00	0.00
85.00		108.38	871.54	0.00	0.00
85.92		25.83	207.73	0.00	0.00
90.00		114.70	908.68	0.00	0.00
95.00		137.70	1045.97	0.00	0.00
100.00	(4) attachments	361.22	2357.23	0.00	0.00
105.00		132.86	957.29	0.00	0.00
110.00		130.23	931.35	0.00	0.00
111.21		31.07	223.11	0.00	0.00
114.80		92.25	863.71	0.00	0.00
115.00	(7) attachments	208.10	1363.50	0.00	0.00
120.00		126.33	758.99	0.00	0.00
125.00		123.37	736.22	0.00	0.00
126.00	(23) attachments	1202.99	5772.54	0.00	0.00
130.00		95.91	556.00	0.00	0.00
135.00		117.14	673.02	0.00	0.00
138.00	(32) attachments	1442.44	7171.35	0.00	0.00
140.00		45.05	226.54	0.00	0.00

Total Applied Force Summary

Structure:	CT46134-A-SBA		**Code:**	EIA/TIA-222-G	9/27/2016
Site Name:	Granby-n. Granby		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 29

145.00		110.54	546.31	0.00	0.00
150.00	(5) attachments	1186.97	3636.01	0.00	2078.64
	Totals:	**8,179.26**	**57,302.89**	**0.00**	**2,078.64**

Linear Appurtenance Segment Forces (Factored)

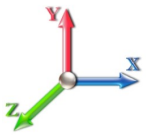
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1.5" Reinforcing Plate	Yes	4.50	0.000	3.00	2.37	0.00	0.061	0.000	5.168	0.00	24.62
10.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	2.73	0.00	0.070	0.000	5.168	0.00	30.54
14.17	1.5" Reinforcing Plate	Yes	4.17	0.000	3.00	2.32	0.00	0.071	0.000	5.168	0.00	26.93
15.00	1.5" Reinforcing Plate	Yes	0.83	0.000	3.00	0.46	0.00	0.072	0.000	5.168	0.00	5.41
20.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	2.84	0.00	0.073	0.000	5.483	0.00	34.14
20.50	1.5" Reinforcing Plate	Yes	0.50	0.000	3.00	0.28	0.00	0.074	0.000	5.512	0.00	3.43
25.00	1.5" Reinforcing Plate	Yes	4.50	0.000	3.00	2.58	0.00	0.074	0.000	5.747	0.00	31.86
30.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	2.90	0.00	0.076	0.000	5.972	0.00	36.47
35.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	2.93	0.00	0.078	0.000	6.169	0.00	37.40
37.00	1.5" Reinforcing Plate	Yes	2.00	0.000	3.00	1.17	0.00	0.079	0.000	6.242	0.00	15.10
40.00	1.25" Reinforcing	Yes	3.00	0.000	2.50	1.64	0.00	0.067	0.000	6.345	0.00	21.57
43.36	1.25" Reinforcing	Yes	3.36	0.000	2.50	1.85	0.00	0.068	0.000	6.454	0.00	24.49
43.50	1.5" Reinforcing Plate	Yes	0.10	0.000	3.00	0.06	0.00	0.078	0.000	6.458	0.00	0.78
43.50	1.25" Reinforcing	Yes	0.04	0.000	2.50	0.02	0.00	0.078	0.000	6.458	0.00	0.29
45.00	1.5" Reinforcing Plate	Yes	1.50	0.000	3.00	0.89	0.00	0.083	0.000	6.504	0.00	11.69
48.50	1.5" Reinforcing Plate	Yes	3.50	0.000	3.00	2.09	0.00	0.084	0.000	6.608	0.00	27.62
50.00	1.5" Reinforcing Plate	Yes	1.50	0.000	3.00	0.90	0.00	0.083	0.000	6.650	0.00	11.90
54.17	1.5" Reinforcing Plate	Yes	4.17	0.000	3.00	2.50	0.00	0.085	0.000	6.763	0.00	33.51
55.00	1.5" Reinforcing Plate	Yes	0.83	0.000	3.00	0.50	0.00	0.086	0.000	6.785	0.00	6.69
60.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	3.02	0.00	0.087	0.000	6.910	0.00	40.86
64.17	1.5" Reinforcing Plate	Yes	4.17	0.000	3.00	2.53	0.00	0.089	0.000	7.009	0.00	34.46
65.00	1.5" Reinforcing Plate	Yes	0.83	0.000	3.00	0.50	0.00	0.091	0.000	7.028	0.00	6.87
69.50	1.5" Reinforcing Plate	Yes	4.50	0.000	3.00	2.74	0.00	0.092	0.000	7.128	0.00	37.68
70.00	1.25" Reinforcing	Yes	0.50	0.000	2.50	0.28	0.00	0.078	0.000	7.138	0.00	3.95
75.00	1.25" Reinforcing	Yes	5.00	0.000	2.50	2.85	0.00	0.079	0.000	7.243	0.00	40.00
76.71	1.5" Reinforcing Plate	Yes	0.01	0.000	3.00	0.01	0.00	0.081	0.000	7.277	0.00	0.09
76.71	1.25" Reinforcing	Yes	1.70	0.000	2.50	0.97	0.00	0.081	0.000	7.277	0.00	13.65
76.84	1.5" Reinforcing Plate	Yes	0.13	0.000	3.00	0.08	0.00	0.097	0.000	7.280	0.00	1.08
80.00	1.5" Reinforcing Plate	Yes	3.16	0.000	3.00	1.94	0.00	0.098	0.000	7.342	0.00	27.11
80.17	1.5" Reinforcing Plate	Yes	0.17	0.000	3.00	0.10	0.00	0.099	0.000	7.345	0.00	1.46
81.17	1.5" Reinforcing Plate	Yes	1.00	0.000	3.00	0.61	0.00	0.100	0.000	7.364	0.00	8.59
85.00	1.5" Reinforcing Plate	Yes	3.83	0.000	3.00	2.36	0.00	0.099	0.000	7.436	0.00	33.16
85.92	1.5" Reinforcing Plate	Yes	0.92	0.000	3.00	0.57	0.00	0.101	1.002	7.453	0.00	7.98
90.00	1.5" Reinforcing Plate	Yes	4.08	0.000	3.00	2.52	0.00	0.102	1.007	7.526	0.00	35.66
										Totals:	**0.0**	**677.0**

Calculated Forces

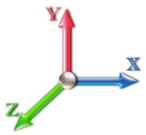
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 23

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-57.30	-8.21	0.00	-907.25	0.00	907.25	3406.69	1703.35	5989.16	2957.82	0.00	0.000	0.000	0.163
5.00	-55.58	-8.12	0.00	-866.22	0.00	866.22	3366.57	1683.28	5792.56	2860.73	0.03	-0.053	0.000	0.159
10.00	-53.85	-8.03	0.00	-825.61	0.00	825.61	3325.07	1662.53	5596.65	2763.98	0.11	-0.107	0.000	0.154
14.17	-52.42	-7.95	0.00	-792.12	0.00	792.12	3289.41	1644.70	5433.91	2683.60	0.23	-0.152	0.000	0.137
15.00	-52.14	-7.95	0.00	-785.52	0.00	785.52	3282.20	1641.10	5401.59	2667.64	0.25	-0.160	0.000	0.137
20.00	-50.44	-7.83	0.00	-745.78	0.00	745.78	3237.96	1618.98	5207.54	2571.81	0.45	-0.209	0.000	0.133
20.50	-48.85	-7.77	0.00	-741.86	0.00	741.86	3233.46	1616.73	5188.20	2562.26	0.47	-0.214	0.000	0.138
25.00	-47.34	-7.68	0.00	-706.88	0.00	706.88	3192.34	1596.17	5014.65	2476.55	0.69	-0.260	0.000	0.134
30.00	-45.68	-7.57	0.00	-668.47	0.00	668.47	3145.35	1572.68	4823.07	2381.93	0.99	-0.311	0.000	0.130
35.00	-44.05	-7.45	0.00	-630.60	0.00	630.60	3097.00	1548.50	4632.96	2288.04	1.35	-0.362	0.000	0.126
37.00	-43.40	-7.41	0.00	-615.71	0.00	615.71	3077.27	1538.63	4557.36	2250.71	1.50	-0.383	0.000	0.172
40.00	-42.44	-7.35	0.00	-593.49	0.00	593.49	3047.27	1523.63	4444.46	2194.95	1.76	-0.426	0.000	0.169
43.36	-41.38	-7.26	0.00	-568.79	0.00	568.79	3013.08	1506.54	4318.79	2132.89	2.07	-0.474	0.000	0.118
43.50	-41.34	-7.26	0.00	-567.78	0.00	567.78	3011.64	1505.82	4313.57	2130.31	2.09	-0.475	0.000	0.118
45.00	-40.64	-7.23	0.00	-556.88	0.00	556.88	2996.16	1498.08	4257.75	2102.74	2.24	-0.491	0.000	0.115
48.50	-39.05	-7.13	0.00	-531.58	0.00	531.58	2330.75	1165.37	3323.66	1641.43	2.61	-0.526	0.000	0.122
50.00	-38.48	-7.07	0.00	-520.88	0.00	520.88	2320.40	1160.20	3282.84	1621.27	2.78	-0.541	0.000	0.127
54.17	-37.30	-6.96	0.00	-491.38	0.00	491.38	2290.97	1145.49	3169.67	1565.38	3.27	-0.584	0.000	0.180
55.00	-37.07	-6.96	0.00	-485.61	0.00	485.61	2285.00	1142.50	3147.20	1554.29	3.37	-0.597	0.000	0.178
60.00	-35.69	-6.84	0.00	-450.80	0.00	450.80	2248.23	1124.12	3012.38	1487.70	4.04	-0.672	0.000	0.171
64.17	-34.55	-6.73	0.00	-422.28	0.00	422.28	2216.52	1108.26	2900.67	1432.53	4.65	-0.735	0.000	0.117
65.00	-34.33	-6.72	0.00	-416.70	0.00	416.70	2210.09	1105.05	2878.53	1421.60	4.78	-0.744	0.000	0.116
69.50	-33.13	-6.59	0.00	-386.47	0.00	386.47	2174.60	1087.30	2759.01	1362.57	5.51	-0.791	0.000	0.167
70.00	-33.00	-6.60	0.00	-383.18	0.00	383.18	2170.58	1085.29	2745.79	1356.04	5.59	-0.800	0.000	0.166
75.00	-31.70	-6.46	0.00	-350.20	0.00	350.20	2129.70	1064.85	2614.33	1291.12	6.47	-0.878	0.000	0.157
76.71	-31.26	-6.41	0.00	-339.15	0.00	339.15	2115.40	1057.70	2569.69	1269.07	6.79	-0.905	0.000	0.107
76.84	-31.23	-6.42	0.00	-338.34	0.00	338.34	2114.34	1057.17	2566.39	1267.45	6.81	-0.906	0.000	0.107
80.00	-30.12	-6.32	0.00	-318.03	0.00	318.03	2087.45	1043.72	2484.30	1226.90	7.43	-0.940	0.000	0.101
80.17	-30.06	-6.32	0.00	-316.95	0.00	316.95	2085.98	1042.99	2479.91	1224.73	7.46	-0.942	0.000	0.148
81.17	-29.70	-6.31	0.00	-310.63	0.00	310.63	1538.24	769.12	1857.13	917.17	7.66	-0.958	0.000	0.164
85.00	-28.83	-6.20	0.00	-286.49	0.00	286.49	1518.69	759.35	1789.97	884.00	8.45	-1.015	0.000	0.169
85.92	-28.62	-6.19	0.00	-280.78	0.00	280.78	1513.87	756.94	1773.86	876.04	8.65	-1.031	0.000	0.116
90.00	-27.71	-6.09	0.00	-255.55	0.00	255.55	1491.95	745.98	1702.59	840.84	9.55	-1.075	0.000	0.168
95.00	-26.65	-5.96	0.00	-225.12	0.00	225.12	1463.84	731.92	1615.70	797.93	10.72	-1.157	0.000	0.154
100.00	-24.30	-5.59	0.00	-195.30	0.00	195.30	1434.36	717.18	1529.45	755.34	11.97	-1.234	0.000	0.138
105.00	-23.33	-5.47	0.00	-167.38	0.00	167.38	1403.51	701.75	1444.00	713.14	13.30	-1.307	0.000	0.251
110.00	-22.40	-5.35	0.00	-140.00	0.00	140.00	1371.28	685.64	1359.50	671.40	14.75	-1.443	0.000	0.225
111.21	-22.17	-5.34	0.00	-133.51	0.00	133.51	1363.25	681.63	1339.15	661.36	15.12	-1.476	0.000	0.218
114.80	-21.30	-5.24	0.00	-114.37	0.00	114.37	898.25	449.12	876.91	433.07	16.26	-1.567	0.000	0.288
115.00	-19.94	-5.03	0.00	-113.30	0.00	113.30	897.59	448.79	874.90	432.08	16.33	-1.572	0.000	0.285
120.00	-19.17	-4.92	0.00	-88.17	0.00	88.17	880.69	440.34	825.45	407.66	18.05	-1.713	0.000	0.238
125.00	-18.44	-4.80	0.00	-63.57	0.00	63.57	862.42	431.21	776.03	383.25	19.91	-1.833	0.000	0.187
126.00	-12.70	-3.42	0.00	-58.77	0.00	58.77	858.60	429.30	766.16	378.38	20.30	-1.855	0.000	0.170
130.00	-12.15	-3.32	0.00	-45.09	0.00	45.09	842.77	421.39	726.80	358.94	21.89	-1.930	0.000	0.140
135.00	-11.47	-3.19	0.00	-28.49	0.00	28.49	821.76	410.88	677.90	334.79	23.95	-2.005	0.000	0.099
138.00	-4.36	-1.50	0.00	-18.91	0.00	18.91	808.49	404.24	648.79	320.41	25.22	-2.037	0.000	0.064
140.00	-4.13	-1.45	0.00	-15.91	0.00	15.91	799.37	399.68	629.50	310.89	26.08	-2.055	0.000	0.056
145.00	-3.59	-1.32	0.00	-8.67	0.00	8.67	775.61	387.80	581.75	287.30	28.25	-2.087	0.000	0.035

Calculated Forces

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 32	

150.00	0.00	-1.19	0.00	-2.08	0.00	2.08	750.48	375.24	534.80	264.12	30.45	-2.104	0.000	0.008

Seismic Segment Forces (Factored)

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 33	

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	21
Gust Response Factor	1.10				**Sds**	0.19		**Ss**	0.18
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.07
Wind Load Factor	0.00	**Structure Frequency**	0.29		**SA**	0.03	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00	RB1 RB2 RB3	0.00	0.00	0.00	0.00	0.00	
5.00		866.45	0.00	0.03	0.02	16.97	
10.00		847.96	0.01	0.05	0.03	23.68	
14.17	RB4	693.06	0.02	0.06	0.04	21.80	
15.00		136.41	0.02	0.06	0.04	4.36	
20.00		810.99	0.03	0.07	0.04	27.55	
20.50	RT1 RT2 RB5	632.08	0.04	0.07	0.04	21.56	
25.00		712.41	0.05	0.07	0.04	25.04	
30.00		774.01	0.08	0.07	0.04	27.90	
35.00		755.52	0.10	0.07	0.04	27.90	
37.00	RT5	297.03	0.11	0.07	0.04	11.08	
40.00		440.00	0.13	0.07	0.03	16.63	
43.36	RB6	484.89	0.16	0.07	0.03	18.57	
43.50	Bot - Section 2	20.02	0.16	0.07	0.03	0.77	
45.00		395.17	0.17	0.07	0.03	15.20	
48.50	Top - Section 1	910.19	0.20	0.06	0.02	35.12	
50.00	Appurtenance(s)	227.92	0.21	0.06	0.02	8.78	
54.17	RT3 RT4	484.56	0.25	0.06	0.02	18.22	
55.00		95.17	0.25	0.05	0.02	3.55	
60.00		564.33	0.30	0.04	0.01	19.16	
64.17	RB7	458.86	0.35	0.03	0.01	13.26	
65.00		90.05	0.35	0.03	0.01	2.49	
69.50	RT6	480.85	0.41	0.02	0.01	9.02	
70.00		52.66	0.41	0.01	0.01	0.93	
75.00		518.10	0.47	-0.01	0.01	2.19	
76.71	RB8	173.65	0.49	-0.01	0.01	-0.15	
76.84	Bot - Section 3	12.79	0.50	-0.01	0.01	-0.02	
80.00		574.12	0.54	-0.03	0.01	-6.17	
80.17	RT7	30.54	0.54	-0.03	0.01	-0.34	
81.17	Top - Section 2	178.99	0.55	-0.04	0.01	-2.54	
85.00		303.40	0.61	-0.06	0.02	-7.45	
85.92	RB9	71.80	0.62	-0.06	0.02	-1.92	
90.00	RT8	313.40	0.68	-0.08	0.03	-10.89	
95.00		372.88	0.76	-0.10	0.04	-14.90	
100.00	RT9	776.55	0.84	-0.12	0.07	-31.00	
105.00		348.23	0.93	-0.12	0.10	-12.08	
110.00		335.90	1.02	-0.11	0.14	-8.21	
111.21	Bot - Section 4	79.65	1.04	-0.10	0.15	-1.69	
114.80	Top - Section 3	407.47	1.11	-0.07	0.19	-4.09	
115.00	Appurtenance(s)	446.87	1.11	-0.06	0.19	-4.17	
120.00		237.93	1.21	0.01	0.26	2.53	
125.00		228.68	1.31	0.14	0.35	8.12	
126.00	Appurtenance(s)	2115.0	1.33	0.17	0.37	86.85	
130.00		174.81	1.42	0.32	0.45	11.42	
135.00		210.19	1.53	0.58	0.58	21.06	
138.00	Appurtenance(s)	2362.5	1.60	0.78	0.67	292.05	

Seismic Segment Forces (Factored)

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 34	

140.00			79.27	1.65	0.93	0.73	11.12		
145.00			191.70	1.77	1.39	0.92	35.59		
150.00	Appurtenance(s)		1502.4	1.89	1.98	1.14	355.37		
		Totals:	**23,277.6**				**1,090.2**	**Total Wind:**	**28,841.6**

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 35	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E

Gust Response Factor	1.10			**Sds**	0.19			**Iterations**	21
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10			**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.29	**SA**	0.03			**S1**	0.07
								Seismic Importance Factor	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-32.37	-1.20	0.00	-134.16	0.00	134.16	3406.69	1703.35	5989.16	2957.82		0.00	0.00	0.027
5.00	-31.15	-1.18	0.00	-128.17	0.00	128.17	3366.57	1683.28	5792.56	2860.73		0.00	-0.01	0.027
10.00	-29.95	-1.16	0.00	-122.25	0.00	122.25	3325.07	1662.53	5596.65	2763.98		0.02	-0.02	0.026
14.17	-28.97	-1.14	0.00	-117.40	0.00	117.40	3289.41	1644.70	5433.91	2683.60		0.03	-0.02	0.023
15.00	-28.78	-1.14	0.00	-116.45	0.00	116.45	3282.20	1641.10	5401.59	2667.64		0.04	-0.02	0.023
20.00	-27.63	-1.12	0.00	-110.74	0.00	110.74	3237.96	1618.98	5207.54	2571.81		0.07	-0.03	0.022
20.50	-26.85	-1.10	0.00	-110.18	0.00	110.18	3233.46	1616.73	5188.20	2562.26		0.07	-0.03	0.023
25.00	-25.84	-1.07	0.00	-105.26	0.00	105.26	3192.34	1596.17	5014.65	2476.55		0.10	-0.04	0.023
30.00	-24.73	-1.05	0.00	-99.89	0.00	99.89	3145.35	1572.68	4823.07	2381.93		0.15	-0.05	0.022
35.00	-23.64	-1.02	0.00	-94.66	0.00	94.66	3097.00	1548.50	4632.96	2288.04		0.20	-0.05	0.021
37.00	-23.22	-1.01	0.00	-92.61	0.00	92.61	3077.27	1538.63	4557.36	2250.71		0.22	-0.06	0.029
40.00	-22.58	-1.00	0.00	-89.58	0.00	89.58	3047.27	1523.63	4444.46	2194.95		0.26	-0.06	0.029
43.36	-21.88	-0.98	0.00	-86.23	0.00	86.23	3013.08	1506.54	4318.79	2132.89		0.31	-0.07	0.020
43.50	-21.85	-0.98	0.00	-86.10	0.00	86.10	3011.64	1505.82	4313.57	2130.31		0.31	-0.07	0.020
45.00	-21.32	-0.96	0.00	-84.63	0.00	84.63	2996.16	1498.08	4257.75	2102.74		0.33	-0.07	0.020
48.50	-20.11	-0.93	0.00	-81.25	0.00	81.25	2330.75	1165.37	3323.66	1641.43		0.39	-0.08	0.021
50.00	-19.78	-0.92	0.00	-79.86	0.00	79.86	2320.40	1160.20	3282.84	1621.27		0.41	-0.08	0.022
54.17	-19.05	-0.90	0.00	-76.02	0.00	76.02	2290.97	1145.49	3169.67	1565.38		0.49	-0.09	0.031
55.00	-18.90	-0.90	0.00	-75.27	0.00	75.27	2285.00	1142.50	3147.20	1554.29		0.50	-0.09	0.031
60.00	-18.05	-0.88	0.00	-70.77	0.00	70.77	2248.23	1124.12	3012.38	1487.70		0.60	-0.10	0.030
64.17	-17.35	-0.87	0.00	-67.08	0.00	67.08	2216.52	1108.26	2900.67	1432.53		0.70	-0.11	0.021
65.00	-17.21	-0.87	0.00	-66.36	0.00	66.36	2210.09	1105.05	2878.53	1421.60		0.71	-0.11	0.021
69.50	-16.47	-0.86	0.00	-62.44	0.00	62.44	2174.60	1087.30	2759.01	1362.57		0.82	-0.12	0.030
70.00	-16.39	-0.86	0.00	-62.01	0.00	62.01	2170.58	1085.29	2745.79	1356.04		0.84	-0.12	0.030
75.00	-15.59	-0.86	0.00	-57.70	0.00	57.70	2129.70	1064.85	2614.33	1291.12		0.97	-0.13	0.029
76.71	-15.32	-0.86	0.00	-56.23	0.00	56.23	2115.40	1057.70	2569.69	1269.07		1.02	-0.14	0.020
76.84	-15.30	-0.86	0.00	-56.12	0.00	56.12	2114.34	1057.17	2566.39	1267.45		1.02	-0.14	0.020
80.00	-14.50	-0.86	0.00	-53.40	0.00	53.40	2087.45	1043.72	2484.30	1226.90		1.12	-0.14	0.019
80.17	-14.46	-0.86	0.00	-53.25	0.00	53.25	2085.98	1042.99	2479.91	1224.73		1.12	-0.14	0.028
81.17	-14.21	-0.86	0.00	-52.39	0.00	52.39	1538.24	769.12	1857.13	917.17		1.15	-0.15	0.030
85.00	-13.71	-0.86	0.00	-49.09	0.00	49.09	1518.69	759.35	1789.97	884.00		1.28	-0.16	0.032
85.92	-13.59	-0.86	0.00	-48.30	0.00	48.30	1513.87	756.94	1773.86	876.04		1.31	-0.16	0.022
90.00	-13.07	-0.86	0.00	-44.78	0.00	44.78	1491.95	745.98	1702.59	840.84		1.45	-0.17	0.032
95.00	-12.44	-0.86	0.00	-40.47	0.00	40.47	1463.84	731.92	1615.70	797.93		1.63	-0.18	0.030
100.00	-11.33	-0.86	0.00	-36.15	0.00	36.15	1434.36	717.18	1529.45	755.34		1.83	-0.20	0.028
105.00	-10.77	-0.87	0.00	-31.83	0.00	31.83	1403.51	701.75	1444.00	713.14		2.04	-0.21	0.052
110.00	-10.23	-0.87	0.00	-27.50	0.00	27.50	1371.28	685.64	1359.50	671.40		2.28	-0.24	0.048
111.21	-10.10	-0.87	0.00	-26.45	0.00	26.45	1363.25	681.63	1339.15	661.36		2.34	-0.24	0.047
114.80	-9.51	-0.87	0.00	-23.34	0.00	23.34	898.25	449.12	876.91	433.07		2.53	-0.26	0.064
115.00	-8.97	-0.87	0.00	-23.17	0.00	23.17	897.59	448.79	874.90	432.08		2.54	-0.26	0.064
120.00	-8.58	-0.87	0.00	-18.83	0.00	18.83	880.69	440.34	825.45	407.66		2.83	-0.29	0.056
125.00	-8.20	-0.86	0.00	-14.50	0.00	14.50	862.42	431.21	776.03	383.25		3.15	-0.32	0.047
126.00	-5.64	-0.76	0.00	-13.64	0.00	13.64	858.60	429.30	766.16	378.38		3.21	-0.32	0.043
130.00	-5.36	-0.75	0.00	-10.60	0.00	10.60	842.77	421.39	726.80	358.94		3.49	-0.34	0.036
135.00	-5.02	-0.73	0.00	-6.87	0.00	6.87	821.76	410.88	677.90	334.79		3.86	-0.36	0.027
138.00	-2.14	-0.42	0.00	-4.69	0.00	4.69	808.49	404.24	648.79	320.41		4.09	-0.37	0.017
140.00	-2.04	-0.40	0.00	-3.86	0.00	3.86	799.37	399.68	629.50	310.89		4.24	-0.37	0.015

Calculated Forces

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 36	

145.00	-1.81	-0.37	0.00	-1.84	0.00	1.84	775.61	387.80	581.75	287.30	4.63	-0.38	0.009
150.00	0.00	-0.36	0.00	0.00	0.00	0.00	750.48	375.24	534.80	264.12	5.03	-0.38	0.000

Seismic Segment Forces (Factored)

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 37	

Tower Engineering Solutions

Load Case:	0.9D + 1.0E							**Iterations**	21
Gust Response Factor	1.10				**Sds**	0.19		**Ss**	0.18
Dead Load Factor	0.90	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.07
Wind Load Factor	0.00	**Structure Frequency**	0.29		**SA**	0.03	**Seismic Importance Factor**		1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00	RB1 RB2 RB3	0.00	0.00	0.00	0.00	0.00	
5.00		866.45	0.00	0.03	0.02	16.97	
10.00		847.96	0.01	0.05	0.03	23.68	
14.17	RB4	693.06	0.02	0.06	0.04	21.80	
15.00		136.41	0.02	0.06	0.04	4.36	
20.00		810.99	0.03	0.07	0.04	27.55	
20.50	RT1 RT2 RB5	632.08	0.04	0.07	0.04	21.56	
25.00		712.41	0.05	0.07	0.04	25.04	
30.00		774.01	0.08	0.07	0.04	27.90	
35.00		755.52	0.10	0.07	0.04	27.90	
37.00	RT5	297.03	0.11	0.07	0.04	11.08	
40.00		440.00	0.13	0.07	0.03	16.63	
43.36	RB6	484.89	0.16	0.07	0.03	18.57	
43.50	Bot - Section 2	20.02	0.16	0.07	0.03	0.77	
45.00		395.17	0.17	0.07	0.03	15.20	
48.50	Top - Section 1	910.19	0.20	0.06	0.02	35.12	
50.00	Appurtenance(s)	227.92	0.21	0.06	0.02	8.78	
54.17	RT3 RT4	484.56	0.25	0.06	0.02	18.22	
55.00		95.17	0.25	0.05	0.02	3.55	
60.00		564.33	0.30	0.04	0.01	19.16	
64.17	RB7	458.86	0.35	0.03	0.01	13.26	
65.00		90.05	0.35	0.03	0.01	2.49	
69.50	RT6	480.85	0.41	0.02	0.01	9.02	
70.00		52.66	0.41	0.01	0.01	0.93	
75.00		518.10	0.47	-0.01	0.01	2.19	
76.71	RB8	173.65	0.49	-0.01	0.01	-0.15	
76.84	Bot - Section 3	12.79	0.50	-0.01	0.01	-0.02	
80.00		574.12	0.54	-0.03	0.01	-6.17	
80.17	RT7	30.54	0.54	-0.03	0.01	-0.34	
81.17	Top - Section 2	178.99	0.55	-0.04	0.01	-2.54	
85.00		303.40	0.61	-0.06	0.02	-7.45	
85.92	RB9	71.80	0.62	-0.06	0.02	-1.92	
90.00	RT8	313.40	0.68	-0.08	0.03	-10.89	
95.00		372.88	0.76	-0.10	0.04	-14.90	
100.00	RT9	776.55	0.84	-0.12	0.07	-31.00	
105.00		348.23	0.93	-0.12	0.10	-12.08	
110.00		335.90	1.02	-0.11	0.14	-8.21	
111.21	Bot - Section 4	79.65	1.04	-0.10	0.15	-1.69	
114.80	Top - Section 3	407.47	1.11	-0.07	0.19	-4.09	
115.00	Appurtenance(s)	446.87	1.11	-0.06	0.19	-4.17	
120.00		237.93	1.21	0.01	0.26	2.53	
125.00		228.68	1.31	0.14	0.35	8.12	
126.00	Appurtenance(s)	2115.0	1.33	0.17	0.37	86.85	
130.00		174.81	1.42	0.32	0.45	11.42	
135.00		210.19	1.53	0.58	0.58	21.06	
138.00	Appurtenance(s)	2362.5	1.60	0.78	0.67	292.05	

Seismic Segment Forces (Factored)

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 38	

140.00			79.27	1.65	0.93	0.73	11.12		
145.00			191.70	1.77	1.39	0.92	35.59		
150.00	Appurtenance(s)		1502.4	1.89	1.98	1.14	355.37		
		Totals:	**23,277.6**				**1,090.2**	**Total Wind:**	**28,841.6**

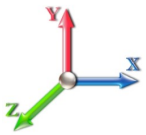
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 39	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	21		
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.18		
Wind Load Factor	0.00	**Structure Frequency**	0.29	**SA**	0.03	**S1**	0.07	**Seismic Importance Factor**	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-24.27	-1.20	0.00	-133.05	0.00	133.05	3406.69	1703.35	5989.16	2957.82		0.00	0.00	0.026
5.00	-23.36	-1.18	0.00	-127.07	0.00	127.07	3366.57	1683.28	5792.56	2860.73		0.00	-0.01	0.025
10.00	-22.46	-1.16	0.00	-121.16	0.00	121.16	3325.07	1662.53	5596.65	2763.98		0.02	-0.02	0.025
14.17	-21.73	-1.14	0.00	-116.31	0.00	116.31	3289.41	1644.70	5433.91	2683.60		0.03	-0.02	0.022
15.00	-21.58	-1.14	0.00	-115.37	0.00	115.37	3282.20	1641.10	5401.59	2667.64		0.04	-0.02	0.022
20.00	-20.72	-1.11	0.00	-109.68	0.00	109.68	3237.96	1618.98	5207.54	2571.81		0.07	-0.03	0.021
20.50	-20.14	-1.09	0.00	-109.12	0.00	109.12	3233.46	1616.73	5188.20	2562.26		0.07	-0.03	0.022
25.00	-19.38	-1.07	0.00	-104.21	0.00	104.21	3192.34	1596.17	5014.65	2476.55		0.10	-0.04	0.022
30.00	-18.55	-1.04	0.00	-98.87	0.00	98.87	3145.35	1572.68	4823.07	2381.93		0.15	-0.05	0.021
35.00	-17.73	-1.01	0.00	-93.66	0.00	93.66	3097.00	1548.50	4632.96	2288.04		0.20	-0.05	0.020
37.00	-17.41	-1.00	0.00	-91.63	0.00	91.63	3077.27	1538.63	4557.36	2250.71		0.22	-0.06	0.028
40.00	-16.94	-0.99	0.00	-88.62	0.00	88.62	3047.27	1523.63	4444.46	2194.95		0.26	-0.06	0.027
43.36	-16.41	-0.97	0.00	-85.29	0.00	85.29	3013.08	1506.54	4318.79	2132.89		0.30	-0.07	0.019
43.50	-16.39	-0.97	0.00	-85.16	0.00	85.16	3011.64	1505.82	4313.57	2130.31		0.31	-0.07	0.019
45.00	-15.99	-0.96	0.00	-83.70	0.00	83.70	2996.16	1498.08	4257.75	2102.74		0.33	-0.07	0.019
48.50	-15.08	-0.92	0.00	-80.35	0.00	80.35	2330.75	1165.37	3323.66	1641.43		0.38	-0.08	0.020
50.00	-14.83	-0.91	0.00	-78.97	0.00	78.97	2320.40	1160.20	3282.84	1621.27		0.41	-0.08	0.021
54.17	-14.29	-0.90	0.00	-75.16	0.00	75.16	2290.97	1145.49	3169.67	1565.38		0.48	-0.09	0.030
55.00	-14.18	-0.89	0.00	-74.42	0.00	74.42	2285.00	1142.50	3147.20	1554.29		0.50	-0.09	0.029
60.00	-13.54	-0.88	0.00	-69.95	0.00	69.95	2248.23	1124.12	3012.38	1487.70		0.60	-0.10	0.028
64.17	-13.01	-0.86	0.00	-66.30	0.00	66.30	2216.52	1108.26	2900.67	1432.53		0.69	-0.11	0.020
65.00	-12.91	-0.86	0.00	-65.58	0.00	65.58	2210.09	1105.05	2878.53	1421.60		0.71	-0.11	0.020
69.50	-12.36	-0.85	0.00	-61.71	0.00	61.71	2174.60	1087.30	2759.01	1362.57		0.82	-0.12	0.029
70.00	-12.29	-0.85	0.00	-61.28	0.00	61.28	2170.58	1085.29	2745.79	1356.04		0.83	-0.12	0.028
75.00	-11.69	-0.85	0.00	-57.02	0.00	57.02	2129.70	1064.85	2614.33	1291.12		0.96	-0.13	0.027
76.71	-11.49	-0.85	0.00	-55.57	0.00	55.57	2115.40	1057.70	2569.69	1269.07		1.01	-0.14	0.019
76.84	-11.48	-0.85	0.00	-55.46	0.00	55.46	2114.34	1057.17	2566.39	1267.45		1.01	-0.14	0.019
80.00	-10.88	-0.85	0.00	-52.77	0.00	52.77	2087.45	1043.72	2484.30	1226.90		1.11	-0.14	0.018
80.17	-10.84	-0.85	0.00	-52.62	0.00	52.62	2085.98	1042.99	2479.91	1224.73		1.11	-0.14	0.026
81.17	-10.66	-0.85	0.00	-51.77	0.00	51.77	1538.24	769.12	1857.13	917.17		1.14	-0.15	0.029
85.00	-10.28	-0.85	0.00	-48.51	0.00	48.51	1518.69	759.35	1789.97	884.00		1.26	-0.16	0.030
85.92	-10.19	-0.85	0.00	-47.73	0.00	47.73	1513.87	756.94	1773.86	876.04		1.29	-0.16	0.021
90.00	-9.80	-0.85	0.00	-44.25	0.00	44.25	1491.95	745.98	1702.59	840.84		1.43	-0.17	0.031
95.00	-9.33	-0.85	0.00	-39.99	0.00	39.99	1463.84	731.92	1615.70	797.93		1.61	-0.18	0.029
100.00	-8.50	-0.85	0.00	-35.72	0.00	35.72	1434.36	717.18	1529.45	755.34		1.81	-0.19	0.027
105.00	-8.08	-0.85	0.00	-31.45	0.00	31.45	1403.51	701.75	1444.00	713.14		2.02	-0.21	0.050
110.00	-7.67	-0.86	0.00	-27.18	0.00	27.18	1371.28	685.64	1359.50	671.40		2.25	-0.23	0.046
111.21	-7.57	-0.86	0.00	-26.14	0.00	26.14	1363.25	681.63	1339.15	661.36		2.31	-0.24	0.045
114.80	-7.13	-0.86	0.00	-23.07	0.00	23.07	898.25	449.12	876.91	433.07		2.50	-0.26	0.061
115.00	-6.72	-0.86	0.00	-22.90	0.00	22.90	897.59	448.79	874.90	432.08		2.51	-0.26	0.060
120.00	-6.43	-0.85	0.00	-18.62	0.00	18.62	880.69	440.34	825.45	407.66		2.80	-0.29	0.053
125.00	-6.15	-0.85	0.00	-14.35	0.00	14.35	862.42	431.21	776.03	383.25		3.11	-0.31	0.045
126.00	-4.23	-0.75	0.00	-13.50	0.00	13.50	858.60	429.30	766.16	378.38		3.18	-0.32	0.041
130.00	-4.02	-0.74	0.00	-10.50	0.00	10.50	842.77	421.39	726.80	358.94		3.46	-0.34	0.034
135.00	-3.77	-0.72	0.00	-6.80	0.00	6.80	821.76	410.88	677.90	334.79		3.82	-0.35	0.025
138.00	-1.60	-0.41	0.00	-4.65	0.00	4.65	808.49	404.24	648.79	320.41		4.04	-0.36	0.016
140.00	-1.53	-0.40	0.00	-3.82	0.00	3.82	799.37	399.68	629.50	310.89		4.20	-0.37	0.014

Calculated Forces

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 40	

145.00	-1.35	-0.36	0.00	-1.82	0.00	1.82	775.61	387.80	581.75	287.30	4.58	-0.37	0.008
150.00	0.00	-0.36	0.00	0.00	0.00	0.00	750.48	375.24	534.80	264.12	4.98	-0.38	0.000

Wind Loading - Shaft

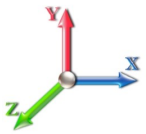
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 41	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1 RB2 RB3	1.00	0.85	7.442	8.19	205.21	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	200.92	1.000	0.000	5.00	18.355	18.35	150.3	0.0	866.5
10.00		1.00	0.85	7.442	8.19	196.62	1.000	0.000	5.00	17.966	17.97	147.1	0.0	848.0
14.17	RB4	1.00	0.85	7.442	8.19	193.04	1.000	0.000	4.17	14.687	14.69	120.2	0.0	693.1
15.00		1.00	0.85	7.442	8.19	192.33	1.000	0.000	0.83	2.891	2.89	23.7	0.0	136.4
20.00		1.00	0.90	7.896	8.69	193.69	1.000	0.000	5.00	17.190	17.19	149.3	0.0	811.0
20.50	RT1 RT2 RB5	1.00	0.91	7.937	8.73	193.75	1.000	0.000	0.50	1.698	1.70	14.8	0.0	80.1
25.00		1.00	0.95	8.276	9.10	193.76	1.000	0.000	4.50	15.104	15.10	137.5	0.0	712.4
30.00		1.00	0.98	8.600	9.46	192.90	1.000	0.000	5.00	16.413	16.41	155.3	0.0	774.0
35.00		1.00	1.01	8.883	9.77	191.36	1.000	0.000	5.00	16.025	16.03	156.6	0.0	755.5
37.00	RT5	1.00	1.03	8.988	9.89	190.59	1.000	0.000	2.00	6.301	6.30	62.3	0.0	297.0
40.00		1.00	1.04	9.137	10.05	189.31	1.000	0.000	3.00	9.336	9.34	93.8	0.0	440.0
43.36	RB6	1.00	1.06	9.293	10.22	187.70	1.000	0.000	3.36	10.290	10.29	105.2	0.0	484.9
43.50	Bot - Section 2	1.00	1.06	9.300	10.23	187.63	1.000	0.000	0.14	0.425	0.42	4.3	0.0	20.0
45.00		1.00	1.07	9.366	10.30	186.85	1.000	0.000	1.50	4.615	4.61	47.5	0.0	395.2
48.50	Top - Section 1	1.00	1.09	9.515	10.47	184.93	1.000	0.000	3.50	10.632	10.63	111.3	0.0	910.2
50.00	Appurtenance(s)	1.00	1.09	9.576	10.53	187.45	1.000	0.000	1.50	4.498	4.50	47.4	0.0	176.9
54.17	RT3 RT4	1.00	1.11	9.739	10.71	184.94	1.000	0.000	4.17	12.322	12.32	132.0	0.0	484.6
55.00		1.00	1.12	9.770	10.75	184.42	1.000	0.000	0.83	2.420	2.42	26.0	0.0	95.2
60.00		1.00	1.14	9.951	10.95	181.15	1.000	0.000	5.00	14.354	14.35	157.1	0.0	564.3
64.17	RB7	1.00	1.15	10.093	11.10	178.26	1.000	0.000	4.17	11.674	11.67	129.6	0.0	458.9
65.00		1.00	1.16	10.120	11.13	177.67	1.000	0.000	0.83	2.291	2.29	25.5	0.0	90.1
69.50	RT6	1.00	1.17	10.264	11.29	174.39	1.000	0.000	4.50	12.237	12.24	138.2	0.0	480.9
70.00		1.00	1.17	10.279	11.31	174.01	1.000	0.000	0.50	1.340	1.34	15.2	0.0	52.7
75.00		1.00	1.19	10.430	11.47	170.20	1.000	0.000	5.00	13.189	13.19	151.3	0.0	518.1
76.71	RB8	1.00	1.20	10.479	11.53	168.86	1.000	0.000	1.71	4.422	4.42	51.0	0.0	173.7
76.84	Bot - Section 3	1.00	1.20	10.483	11.53	168.76	1.000	0.000	0.13	0.326	0.33	3.8	0.0	12.8
80.00		1.00	1.21	10.572	11.63	166.24	1.000	0.000	3.16	8.190	8.19	95.2	0.0	574.1
80.17	RT7	1.00	1.21	10.577	11.63	166.10	1.000	0.000	0.17	0.436	0.44	5.1	0.0	30.5
81.17	Top - Section 2	1.00	1.21	10.605	11.67	165.29	1.000	0.000	1.00	2.554	2.55	29.8	0.0	179.0
85.00		1.00	1.22	10.708	11.78	165.01	1.000	0.000	3.83	9.638	9.64	113.5	0.0	303.4
85.92	RB9	1.00	1.23	10.732	11.81	164.25	1.002 *	0.000	0.92	2.281	2.29	27.0	0.0	71.8
90.00	RT8	1.00	1.24	10.838	11.92	160.83	1.007 *	0.000	4.08	9.959	10.03	119.6	0.0	313.4
95.00		1.00	1.25	10.962	12.06	156.53	1.000	0.000	5.00	11.852	11.85	142.9	0.0	372.9
100.00	RT9	1.00	1.27	11.081	12.19	152.14	1.000	0.000	5.00	11.464	11.46	139.7	0.0	360.6
105.00		1.00	1.28	11.195	12.31	147.65	1.000	0.000	5.00	11.075	11.08	136.4	0.0	348.2
110.00		1.00	1.29	11.305	12.44	143.08	1.000	0.000	5.00	10.687	10.69	132.9	0.0	335.9
111.21	Bot - Section 4	1.00	1.29	11.331	12.46	141.96	1.000	0.000	1.21	2.535	2.53	31.6	0.0	79.7
114.80	Top - Section 3	1.00	1.30	11.407	12.55	138.63	1.000	0.000	3.58	7.469	7.47	93.7	0.0	407.5
115.00	Appurtenance(s)	1.00	1.30	11.412	12.55	140.65	1.000	0.000	0.20	0.418	0.42	5.2	0.0	9.9
120.00		1.00	1.32	11.514	12.67	135.94	1.000	0.000	5.00	10.072	10.07	127.6	0.0	237.9
125.00		1.00	1.33	11.614	12.78	131.16	1.000	0.000	5.00	9.684	9.68	123.7	0.0	228.7
126.00	Appurtenance(s)	1.00	1.33	11.633	12.80	130.20	1.000	0.000	1.00	1.890	1.89	24.2	0.0	44.6
130.00		1.00	1.34	11.710	12.88	126.31	1.000	0.000	4.00	7.406	7.41	95.4	0.0	174.8
135.00		1.00	1.35	11.803	12.98	121.41	1.000	0.000	5.00	8.908	8.91	115.7	0.0	210.2
138.00	Appurtenance(s)	1.00	1.35	11.858	13.04	118.44	1.000	0.000	3.00	5.158	5.16	67.3	0.0	121.7
140.00		1.00	1.36	11.894	13.08	116.44	1.000	0.000	2.00	3.361	3.36	44.0	0.0	79.3

Wind Loading - Shaft

Structure: CT46134-A-SBA
Site Name: Granby-n. Granby
Height: 150.00 (ft)
Base Elev: 0.000 (ft)
Gh: 1.1
Topography: 1

Code: EIA/TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: D - Stiff Soil
Struct Class: II

9/27/2016

Tower Engineering Solutions

145.00	1.00	1.37	11.982	13.18	111.42	1.000	0.000	5.00	8.131	8.13	107.2	0.0	191.7
150.00 Appurtenance(s)	1.00	1.38	12.068	13.27	106.35	1.000	0.000	5.00	7.743	7.74	102.8	0.0	182.5
							Totals:	**150.00**			**4,236.6**		**16,190.3**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

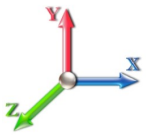
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 43	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	150.00	10' Dipole	1	12.152	13.367	1.00	1.00	3.76	30.00	0.000	5.000	50.26	0.00	251.30
2	150.00	18' Omni	1	12.217	13.439	1.00	1.00	5.40	55.00	0.000	9.000	72.57	0.00	653.13
3	150.00	10' Omni	1	12.152	13.367	1.00	1.00	3.00	25.00	0.000	5.000	40.10	0.00	200.50
4	150.00	Low Profile Platform-flat	1	12.068	13.275	1.00	1.00	34.00	1200.00	0.000	0.000	451.35	0.00	0.00
5	150.00	3' Yagi	1	12.068	13.275	1.00	1.00	2.98	10.00	0.000	0.000	39.56	0.00	0.00
6	138.00	P65-17-XLH-RR	2	11.858	13.044	0.64	0.80	14.64	118.00	0.000	0.000	191.01	0.00	0.00
7	138.00	Low Profile Platform-flat	1	11.858	13.044	1.00	1.00	34.00	1200.00	0.000	0.000	443.50	0.00	0.00
8	138.00	SBNH-1D6565C	1	11.858	13.044	0.67	0.80	7.71	66.10	0.000	0.000	100.54	0.00	0.00
9	138.00	7770.00	6	11.858	13.044	0.62	0.80	20.33	210.00	0.000	0.000	265.16	0.00	0.00
10	138.00	RRUS-11 700MHz	6	11.858	13.044	0.40	0.80	6.05	306.00	0.000	0.000	78.89	0.00	0.00
11	138.00	TT19-08BP111-001	6	11.858	13.044	0.54	0.80	2.06	96.00	0.000	0.000	26.85	0.00	0.00
12	138.00	RRUS-12 1900 MHz	3	11.858	13.044	0.40	0.80	3.24	180.00	0.000	0.000	42.26	0.00	0.00
13	138.00	LGP 21901	6	11.858	13.044	0.54	0.80	0.74	33.00	0.000	0.000	9.65	0.00	0.00
14	138.00	DC6-48-60-18-8F	1	11.858	13.044	0.80	0.80	0.74	31.80	0.000	0.000	9.60	0.00	0.00
15	126.00	APXVSPP18-C-A20	3	11.633	12.797	0.69	0.80	16.55	171.00	0.000	0.000	211.82	0.00	0.00
16	126.00	ACU-A20-N	4	11.633	12.797	0.40	0.80	0.22	4.00	0.000	0.000	2.87	0.00	0.00
17	126.00	TD-RRH8x20-25	3	11.633	12.797	0.40	0.80	4.86	210.00	0.000	0.000	62.19	0.00	0.00
18	126.00	800 MHz	3	11.633	12.797	0.40	0.80	2.99	159.00	0.000	0.000	38.24	0.00	0.00
19	126.00	1900MHz	3	11.633	12.797	0.40	0.80	4.56	132.00	0.000	0.000	58.35	0.00	0.00
20	126.00	APXVTM14-C-120	3	11.633	12.797	0.62	0.80	11.87	168.00	0.000	0.000	151.88	0.00	0.00
21	126.00	Low Profile Platform-flat	1	11.633	12.797	1.00	1.00	34.00	1200.00	0.000	0.000	435.08	0.00	0.00
22	126.00	800MHz Filter	3	11.633	12.797	0.54	0.80	1.25	26.40	0.000	0.000	16.05	0.00	0.00
23	115.00	Flush Mount	1	11.412	12.553	1.00	1.00	5.00	350.00	0.000	0.000	62.76	0.00	0.00
24	115.00	TMA	3	11.412	12.553	0.67	1.00	0.02	33.00	0.000	0.000	0.25	0.00	0.00
25	115.00	RR65-18-02DP	3	11.412	12.553	0.73	1.00	9.55	54.00	0.000	0.000	119.86	0.00	0.00
26	100.00	742 213	3	11.081	12.189	0.78	1.00	11.98	66.00	0.000	0.000	146.03	0.00	0.00
27	100.00	Flush Mount	1	11.081	12.189	1.00	1.00	5.00	350.00	0.000	0.000	60.94	0.00	0.00
28	50.00	GPS	1	9.576	10.534	1.00	1.00	0.01	1.00	0.000	0.000	0.11	0.00	0.00
29	50.00	Standoff	1	9.576	10.534	1.00	1.00	1.50	50.00	0.000	0.000	15.80	0.00	0.00
30	20.50	Splice Plate	2	7.937	8.731	0.94	1.00	7.20	552.00	0.000	0.000	62.87	0.00	0.00
							Totals:		**7,087.30**			**3,266.39**		

Total Applied Force Summary

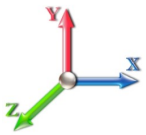
Structure:	CT46134-A-SBA		**Code:**	EIA/TIA-222-G	9/27/2016
Site Name:	Granby-n. Granby		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 44

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		150.25	1014.91	0.00	0.00
10.00		147.07	996.42	0.00	0.00
14.17		120.23	816.88	0.00	0.00
15.00		23.67	161.06	0.00	0.00
20.00		149.31	959.45	0.00	0.00
20.50	(2) attachments	77.69	646.93	0.00	0.00
25.00		137.50	846.03	0.00	0.00
30.00		155.27	922.47	0.00	0.00
35.00		156.60	903.98	0.00	0.00
37.00		62.30	356.41	0.00	0.00
40.00		93.83	529.07	0.00	0.00
43.36		105.19	584.66	0.00	0.00
43.50		4.35	24.18	0.00	0.00
45.00		47.54	439.70	0.00	0.00
48.50		111.28	1014.11	0.00	0.00
50.00	(2) attachments	63.29	272.46	0.00	0.00
54.17		132.00	608.38	0.00	0.00
55.00		26.01	119.81	0.00	0.00
60.00		157.12	712.79	0.00	0.00
64.17		129.60	582.68	0.00	0.00
65.00		25.51	114.70	0.00	0.00
69.50		138.16	614.47	0.00	0.00
70.00		15.15	67.50	0.00	0.00
75.00		151.31	666.56	0.00	0.00
76.71		50.97	224.43	0.00	0.00
76.84		3.76	16.55	0.00	0.00
80.00		95.24	668.04	0.00	0.00
80.17		5.07	35.59	0.00	0.00
81.17		29.79	208.69	0.00	0.00
85.00		113.53	417.12	0.00	0.00
85.92		27.00	99.12	0.00	0.00
90.00		119.58	434.55	0.00	0.00
95.00		142.91	521.34	0.00	0.00
100.00	(4) attachments	346.70	925.01	0.00	0.00
105.00		136.39	465.49	0.00	0.00
110.00		132.90	453.16	0.00	0.00
111.21		31.60	108.11	0.00	0.00
114.80		93.72	491.51	0.00	0.00
115.00	(7) attachments	188.12	451.64	0.00	0.00
120.00		127.57	323.99	0.00	0.00
125.00		123.72	314.74	0.00	0.00
126.00	(23) attachments	1000.67	2132.24	0.00	0.00
130.00		95.39	232.21	0.00	0.00
135.00		115.66	281.94	0.00	0.00
138.00	(32) attachments	1234.73	2405.63	0.00	0.00
140.00		43.98	81.27	0.00	0.00

Total Applied Force Summary

Structure:	CT46134-A-SBA		**Code:**	EIA/TIA-222-G	9/27/2016
Site Name:	Granby-n. Granby		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 45

145.00		107.17	196.70	0.00	0.00
150.00	(5) attachments	756.63	1507.46	0.00	1104.93
	Totals:	**7,503.02**	**26,972.13**	**0.00**	**1,104.93**

Linear Appurtenance Segment Forces (Factored)

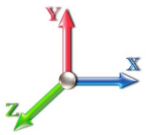
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 46	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1.5" Reinforcing Plate	Yes	4.50	0.000	3.00	1.13	0.00	0.061	0.000	7.442	0.00	0.00
10.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.070	0.000	7.442	0.00	0.00
14.17	1.5" Reinforcing Plate	Yes	4.17	0.000	3.00	1.04	0.00	0.071	0.000	7.442	0.00	0.00
15.00	1.5" Reinforcing Plate	Yes	0.83	0.000	3.00	0.21	0.00	0.072	0.000	7.442	0.00	0.00
20.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.073	0.000	7.896	0.00	0.00
20.50	1.5" Reinforcing Plate	Yes	0.50	0.000	3.00	0.13	0.00	0.074	0.000	7.937	0.00	0.00
25.00	1.5" Reinforcing Plate	Yes	4.50	0.000	3.00	1.13	0.00	0.074	0.000	8.276	0.00	0.00
30.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.076	0.000	8.600	0.00	0.00
35.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.078	0.000	8.883	0.00	0.00
37.00	1.5" Reinforcing Plate	Yes	2.00	0.000	3.00	0.50	0.00	0.079	0.000	8.988	0.00	0.00
40.00	1.25" Reinforcing	Yes	3.00	0.000	2.50	0.63	0.00	0.067	0.000	9.137	0.00	0.00
43.36	1.25" Reinforcing	Yes	3.36	0.000	2.50	0.70	0.00	0.068	0.000	9.293	0.00	0.00
43.50	1.5" Reinforcing Plate	Yes	0.10	0.000	3.00	0.03	0.00	0.078	0.000	9.300	0.00	0.00
43.50	1.25" Reinforcing	Yes	0.04	0.000	2.50	0.01	0.00	0.078	0.000	9.300	0.00	0.00
45.00	1.5" Reinforcing Plate	Yes	1.50	0.000	3.00	0.38	0.00	0.083	0.000	9.366	0.00	0.00
48.50	1.5" Reinforcing Plate	Yes	3.50	0.000	3.00	0.88	0.00	0.084	0.000	9.515	0.00	0.00
50.00	1.5" Reinforcing Plate	Yes	1.50	0.000	3.00	0.38	0.00	0.083	0.000	9.576	0.00	0.00
54.17	1.5" Reinforcing Plate	Yes	4.17	0.000	3.00	1.04	0.00	0.085	0.000	9.739	0.00	0.00
55.00	1.5" Reinforcing Plate	Yes	0.83	0.000	3.00	0.21	0.00	0.086	0.000	9.770	0.00	0.00
60.00	1.5" Reinforcing Plate	Yes	5.00	0.000	3.00	1.25	0.00	0.087	0.000	9.951	0.00	0.00
64.17	1.5" Reinforcing Plate	Yes	4.17	0.000	3.00	1.04	0.00	0.089	0.000	10.093	0.00	0.00
65.00	1.5" Reinforcing Plate	Yes	0.83	0.000	3.00	0.21	0.00	0.091	0.000	10.120	0.00	0.00
69.50	1.5" Reinforcing Plate	Yes	4.50	0.000	3.00	1.13	0.00	0.092	0.000	10.264	0.00	0.00
70.00	1.25" Reinforcing	Yes	0.50	0.000	2.50	0.10	0.00	0.078	0.000	10.279	0.00	0.00
75.00	1.25" Reinforcing	Yes	5.00	0.000	2.50	1.04	0.00	0.079	0.000	10.430	0.00	0.00
76.71	1.5" Reinforcing Plate	Yes	0.01	0.000	3.00	0.00	0.00	0.081	0.000	10.479	0.00	0.00
76.71	1.25" Reinforcing	Yes	1.70	0.000	2.50	0.35	0.00	0.081	0.000	10.479	0.00	0.00
76.84	1.5" Reinforcing Plate	Yes	0.13	0.000	3.00	0.03	0.00	0.097	0.000	10.483	0.00	0.00
80.00	1.5" Reinforcing Plate	Yes	3.16	0.000	3.00	0.79	0.00	0.098	0.000	10.572	0.00	0.00
80.17	1.5" Reinforcing Plate	Yes	0.17	0.000	3.00	0.04	0.00	0.099	0.000	10.577	0.00	0.00
81.17	1.5" Reinforcing Plate	Yes	1.00	0.000	3.00	0.25	0.00	0.100	0.000	10.605	0.00	0.00
85.00	1.5" Reinforcing Plate	Yes	3.83	0.000	3.00	0.96	0.00	0.099	0.000	10.708	0.00	0.00
85.92	1.5" Reinforcing Plate	Yes	0.92	0.000	3.00	0.23	0.00	0.101	1.002	10.732	0.00	0.00
90.00	1.5" Reinforcing Plate	Yes	4.08	0.000	3.00	1.02	0.00	0.102	1.007	10.838	0.00	0.00
										Totals:	**0.0**	**0.0**

Calculated Forces

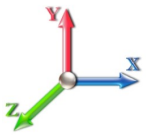
Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 47	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-26.97	-7.51	0.00	-753.79	0.00	753.79	3406.69	1703.35	5989.16	2957.82	0.00	0.000	0.000	0.132
5.00	-25.95	-7.38	0.00	-716.23	0.00	716.23	3366.57	1683.28	5792.56	2860.73	0.02	-0.044	0.000	0.128
10.00	-24.95	-7.25	0.00	-679.32	0.00	679.32	3325.07	1662.53	5596.65	2763.98	0.09	-0.088	0.000	0.124
14.17	-24.13	-7.14	0.00	-649.08	0.00	649.08	3289.41	1644.70	5433.91	2683.60	0.19	-0.125	0.000	0.110
15.00	-23.96	-7.13	0.00	-643.15	0.00	643.15	3282.20	1641.10	5401.59	2667.64	0.21	-0.132	0.000	0.110
20.00	-23.00	-6.98	0.00	-607.53	0.00	607.53	3237.96	1618.98	5207.54	2571.81	0.37	-0.172	0.000	0.106
20.50	-22.35	-6.91	0.00	-604.04	0.00	604.04	3233.46	1616.73	5188.20	2562.26	0.39	-0.176	0.000	0.110
25.00	-21.50	-6.78	0.00	-572.94	0.00	572.94	3192.34	1596.17	5014.65	2476.55	0.57	-0.214	0.000	0.106
30.00	-20.58	-6.64	0.00	-539.02	0.00	539.02	3145.35	1572.68	4823.07	2381.93	0.82	-0.255	0.000	0.102
35.00	-19.67	-6.49	0.00	-505.81	0.00	505.81	3097.00	1548.50	4632.96	2288.04	1.11	-0.296	0.000	0.098
37.00	-19.31	-6.43	0.00	-492.83	0.00	492.83	3077.27	1538.63	4557.36	2250.71	1.23	-0.312	0.000	0.134
40.00	-18.78	-6.35	0.00	-473.53	0.00	473.53	3047.27	1523.63	4444.46	2194.95	1.44	-0.347	0.000	0.131
43.36	-18.19	-6.25	0.00	-452.20	0.00	452.20	3013.08	1506.54	4318.79	2132.89	1.70	-0.385	0.000	0.092
43.50	-18.17	-6.24	0.00	-451.33	0.00	451.33	3011.64	1505.82	4313.57	2130.31	1.71	-0.386	0.000	0.092
45.00	-17.73	-6.20	0.00	-441.96	0.00	441.96	2996.16	1498.08	4257.75	2102.74	1.83	-0.398	0.000	0.089
48.50	-16.71	-6.09	0.00	-420.26	0.00	420.26	2330.75	1165.37	3323.66	1641.43	2.14	-0.426	0.000	0.094
50.00	-16.44	-6.03	0.00	-411.13	0.00	411.13	2320.40	1160.20	3282.84	1621.27	2.27	-0.438	0.000	0.098
54.17	-15.83	-5.90	0.00	-386.00	0.00	386.00	2290.97	1145.49	3169.67	1565.38	2.67	-0.472	0.000	0.138
55.00	-15.70	-5.88	0.00	-381.10	0.00	381.10	2285.00	1142.50	3147.20	1554.29	2.75	-0.482	0.000	0.137
60.00	-14.99	-5.73	0.00	-351.70	0.00	351.70	2248.23	1124.12	3012.38	1487.70	3.29	-0.541	0.000	0.130
64.17	-14.40	-5.60	0.00	-327.81	0.00	327.81	2216.52	1108.26	2900.67	1432.53	3.78	-0.590	0.000	0.089
65.00	-14.29	-5.58	0.00	-323.16	0.00	323.16	2210.09	1105.05	2878.53	1421.60	3.89	-0.597	0.000	0.088
69.50	-13.67	-5.44	0.00	-298.05	0.00	298.05	2174.60	1087.30	2759.01	1362.57	4.47	-0.634	0.000	0.126
70.00	-13.60	-5.43	0.00	-295.32	0.00	295.32	2170.58	1085.29	2745.79	1356.04	4.53	-0.640	0.000	0.125
75.00	-12.93	-5.28	0.00	-268.16	0.00	268.16	2129.70	1064.85	2614.33	1291.12	5.24	-0.700	0.000	0.117
76.71	-12.71	-5.23	0.00	-259.12	0.00	259.12	2115.40	1057.70	2569.69	1269.07	5.49	-0.721	0.000	0.080
76.84	-12.69	-5.23	0.00	-258.46	0.00	258.46	2114.34	1057.17	2566.39	1267.45	5.51	-0.722	0.000	0.080
80.00	-12.02	-5.13	0.00	-241.92	0.00	241.92	2087.45	1043.72	2484.30	1226.90	6.00	-0.748	0.000	0.075
80.17	-11.99	-5.13	0.00	-241.04	0.00	241.04	2085.98	1042.99	2479.91	1224.73	6.02	-0.749	0.000	0.110
81.17	-11.77	-5.10	0.00	-235.92	0.00	235.92	1538.24	769.12	1857.13	917.17	6.18	-0.761	0.000	0.121
85.00	-11.36	-4.99	0.00	-216.39	0.00	216.39	1518.69	759.35	1789.97	884.00	6.81	-0.805	0.000	0.124
85.92	-11.26	-4.96	0.00	-211.80	0.00	211.80	1513.87	756.94	1773.86	876.04	6.97	-0.816	0.000	0.085
90.00	-10.82	-4.84	0.00	-191.56	0.00	191.56	1491.95	745.98	1702.59	840.84	7.68	-0.850	0.000	0.122
95.00	-10.30	-4.70	0.00	-167.34	0.00	167.34	1463.84	731.92	1615.70	797.93	8.60	-0.911	0.000	0.111
100.00	-9.37	-4.35	0.00	-143.82	0.00	143.82	1434.36	717.18	1529.45	755.34	9.59	-0.968	0.000	0.099
105.00	-8.90	-4.22	0.00	-122.06	0.00	122.06	1403.51	701.75	1444.00	713.14	10.63	-1.021	0.000	0.178
110.00	-8.45	-4.09	0.00	-100.97	0.00	100.97	1371.28	685.64	1359.50	671.40	11.75	-1.120	0.000	0.157
111.21	-8.34	-4.06	0.00	-96.01	0.00	96.01	1363.25	681.63	1339.15	661.36	12.04	-1.144	0.000	0.151
114.80	-7.85	-3.96	0.00	-81.46	0.00	81.46	898.25	449.12	876.91	433.07	12.92	-1.209	0.000	0.197
115.00	-7.39	-3.77	0.00	-80.66	0.00	80.66	897.59	448.79	874.90	432.08	12.98	-1.212	0.000	0.195
120.00	-7.07	-3.65	0.00	-61.81	0.00	61.81	880.69	440.34	825.45	407.66	14.30	-1.312	0.000	0.160
125.00	-6.75	-3.52	0.00	-43.58	0.00	43.58	862.42	431.21	776.03	383.25	15.72	-1.395	0.000	0.122
126.00	-4.64	-2.47	0.00	-40.06	0.00	40.06	858.60	429.30	766.16	378.38	16.02	-1.410	0.000	0.111
130.00	-4.41	-2.37	0.00	-30.18	0.00	30.18	842.77	421.39	726.80	358.94	17.22	-1.461	0.000	0.089
135.00	-4.13	-2.25	0.00	-18.31	0.00	18.31	821.76	410.88	677.90	334.79	18.78	-1.510	0.000	0.060
138.00	-1.76	-0.96	0.00	-11.55	0.00	11.55	808.49	404.24	648.79	320.41	19.74	-1.531	0.000	0.038
140.00	-1.68	-0.91	0.00	-9.64	0.00	9.64	799.37	399.68	629.50	310.89	20.38	-1.542	0.000	0.033
145.00	-1.49	-0.80	0.00	-5.09	0.00	5.09	775.61	387.80	581.75	287.30	22.01	-1.561	0.000	0.020

Calculated Forces

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 48	

150.00	0.00	-0.76	0.00	-1.10	0.00	1.10	750.48	375.24	534.80	264.12	23.65	-1.571	0.000	0.004

Final Analysis Summary

Structure:	CT46134-A-SBA	**Code:**	EIA/TIA-222-G	9/27/2016	
Site Name:	Granby-n. Granby	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 49	

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 93 mph Wind	28.9	0.00	32.32	0.00	0.00	2908.91
0.9D + 1.6W 93 mph Wind	28.9	0.00	24.23	0.00	0.00	2887.56
1.2D + 1.0Di + 1.0Wi 50 mph Wind	8.2	0.00	57.30	0.00	0.00	907.25
1.2D + 1.0E	1.2	0.00	32.37	0.00	0.00	134.16
0.9D + 1.0E	1.2	0.00	24.27	0.00	0.00	133.05
1.0D + 1.0W 60 mph Wind	7.5	0.00	26.97	0.00	0.00	753.79

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 93 mph Wind	-8.29	-15.31	0.00	-314.90	0.00	-314.90	898.25	449.12	876.91	433.07	114.80	0.738
0.9D + 1.6W 93 mph Wind	-5.94	-15.11	0.00	-310.39	0.00	-310.39	898.25	449.12	876.91	433.07	114.80	0.724
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-21.30	-5.24	0.00	-114.37	0.00	-114.37	898.25	449.12	876.91	433.07	114.80	0.288
1.2D + 1.0E	-9.51	-0.87	0.00	-23.34	0.00	-23.34	898.25	449.12	876.91	433.07	114.80	0.064
0.9D + 1.0E	-7.13	-0.86	0.00	-23.07	0.00	-23.07	898.25	449.12	876.91	433.07	114.80	0.061
1.0D + 1.0W 60 mph Wind	-7.85	-3.96	0.00	-81.46	0.00	-81.46	898.25	449.12	876.91	433.07	114.80	0.197

Additional Steel Summary

			Intermediate Connectors			Lower Termination				Upper Termination				Max Member			
Elev From (ft)	Elev To (ft)	Member	VQ/I (lb/in)	Vu (kips)	phi Vn (kips)	MQ/I (kips)	phi Vn (kips)	Num Reqd	Num Actual	MQ/I (kips)	phi Vn (kips)	Num Reqd	Num Actual	Pu (kips)	phi Pn (kips)	phi Tn (kips)	Ratio
0.0	20.5	(3) PLT-6.5x1.5(31mm Hole)	276.8	4.15	37.1	320.7	0.0		12	266.9	37.1		11	320.70	429.2	386.10	0.831
0.0	20.5	(1) PLT-7.25"x1.25(1.25hole)	223.6	4.02	37.1	260.0	0.0		13	194.4	37.1	6	13	260.04	499.7	450.00	0.578
0.0	54.2	(2) PLT-7.25"x1.25(1.25hole)	-359.2	-6.46	37.1	273.4	0.0		13	215.9	37.1	6	13	323.41	499.7	450.00	0.719
14.2	54.2	(1) PLT-7.25"x1.25(1.25hole)	359.2	6.46	37.1	213.4	0.0	6	13	215.9	37.1	6	13	323.41	499.7	450.00	0.719
20.5	37.0	(3) PLT-5.75x1.5(31mm Hole)	253.8	4.57	37.1	244.2	37.1		11	223.2	37.1	7	11	244.19	376.1	331.26	0.737
43.4	69.5	(3) PLT-5.75x1.5(31mm Hole)	401.7	7.23	37.1	214.4	0.0	6	11	190.4	37.1	6	9	305.43	376.1	331.26	0.922
64.2	80.2	(3) PLT-6"X1-1/4"(1.25" Hole	-389.4	-7.01	37.1	173.4	0.0	5	11	153.6	37.1	5	11	249.13	413.6	356.25	0.699
76.7	90.0	(3) PLT-4.75x1.5(31mm Hole)	428.5	10.28	37.1	154.3	0.0	5	8	142.7	37.1	4	7	222.38	303.1	258.13	0.862
85.9	100.0	(3) PLT-5"x1-1/4"(1.25"Hole)	-415.6	-9.97	37.1	132.6	0.0	4	9	160.5	37.1	5	9	193.20	329.1	281.25	0.687

Base Plate Summary

Structure:	CT46134-A-SB		**Code:**	EIA/TIA-222-G	9/27/2016
Site Name:	Granby-n. Granby		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 50

Tower Engineering Solutions

Reactions

Original Design

Moment (kip-ft):	2128.00
Axial (kip):	21.60
Shear (kip):	21.50

Analysis

Moment (kip-ft):	2908.91
Axial (kip):	57.30
Shear (kip):	28.89
Moment Design %:	136.70

Base Plate

Yield (ksi):	60.00
Width (in):	57.00
Style:	Round
Polygon Sides:	0.00
Clip Length (in):	0.00
Effective Len (in):	15.57
Moment (kip-in):	577.65
Allow Stress (ksi):	81.00
Applied Stress (ksi):	0.00
Stress Ratio:	0.90

Anchor Bolts

Bolt Circle:	51.00
Number Bolts:	12.00
Bolt Type:	2.25" 18J
Bolt Diameter (in):	2.25
Yield (ksi):	75.00
Ultimate (ksi):	100.00
Arrangement:	Radial
Cluster Dist (in):	0.00
Start Angle (deg):	0.00

Compression

Force (kip):	177.18
Allowable (kip):	260.00
Ratio:	0.70

Tension

Force (kip):	167.63
Allowable (kip):	260.00
Ratio:	0.66

Monopole Mat Foundation Design

			Date: 9/20/2016
Customer Name:	AT&T	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	150
Site Number:	CT46134-A-SBA	**Engineer Name:**	M. Baker
Engr. Number:	26042	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

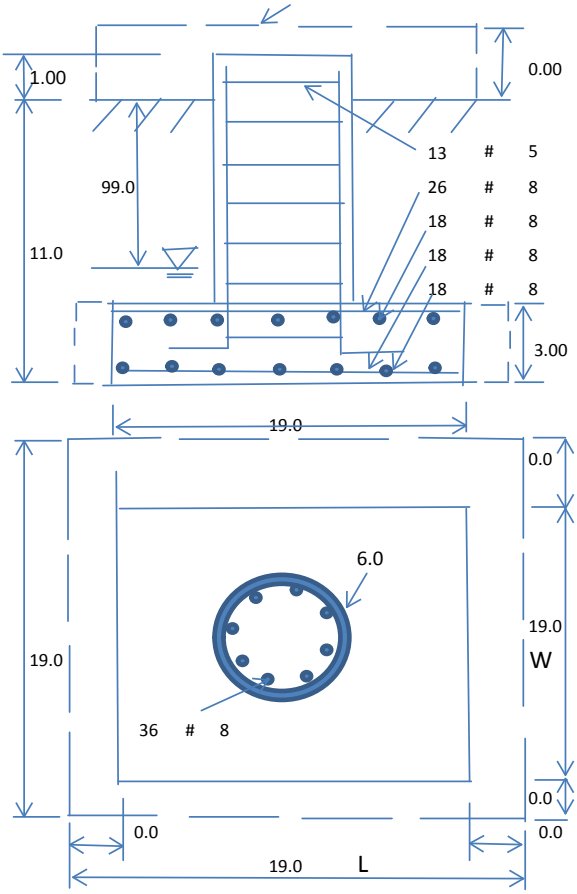
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	32.2	Shear Force (Kips):	28.9
Uplift Force (Kips):	0.0	Moment (Kips-ft):	2908.9
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	6.0	Depth of Base BG (ft.):	11.0
Pier Height A. G. (ft.):	1.00	Thickness of Pad (ft):	3.00
Length of Pad (ft.):	19	Width of Pad (ft.):	19
Final Length of pad (ft)	19.0	Final width of pad (ft):	19.0
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	36	Tie Spacing (in):	11.5	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	26	Qty. of Rebar in Pad (W):	26	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	18	Qty. of Rebar in Pad (W):	18	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	110.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	12000	Ultimate Skin Friction:	175	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 — Compression Strength Reduction Factor: 0.75

Total Dry Soil Volume (cu. Ft.):	2661.81	Total Dry Soil Weight (Kips):	292.91
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	292.91	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	1337.47	Total Dry Concrete Weight (Kips):	200.62
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	200.62	Total Vertical Load on Base (Kips):	525.73

Check Soil Capacities:

				Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	5415	<	Allowable Factored Soil Bearing (psf): 9000	0.60	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	4525.5	>	Design Factored Momont (kips-ft): 3256	0.72	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.39	OK!			

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75		
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.00		

(1) Concrete Pier:

					Load/ Capacity Ratio	
Vertical Steel Rebar Area (sq. in./each):	0.79		Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	4078.9	>	Design Factored Moment (Mu, Kips-Ft	3169.0	0.78	OK!
Calculated Shear Capacity (Kips):	572.6	>	Design Factored Shear (Kips):	28.9	0.05	OK!
Calculated Tension Capacity (Tn, Kips):	1535.8	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	7148.1	>	Design Factored Axial Load (Pu Kips):	32.2	0.00	OK!
Moment & Axial Strength Combination:	0.78	OK!	Check Tie Spacing (Design/Required):		0.9583	OK!
Pier Reinforcement Ratio:	0.007	Reinforcement Ratio is satisfied per ACI				

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	703.0	>	One-Way Factored Shear (L-D. Kips):	213.8	0.30	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	703.0	>	One-Way Factored Shear (W-D., Kips)	213.8	0.30	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	772.2	>	One-Way Factored Shear (C-C, Kips):	212.6	0.28	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0028	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0028		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	2930.5	>	Moment at Bottom (L-Direct. K-Ft):	405.3	0.14	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	2930.5	>	Moment at Bottom (W-Direct. K-Ft):	405.3	0.14	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	4114.5	>	Moment at Bottom (C-C Dir. K-Ft):	573.2	0.14	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0019	OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0019		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	2044.5	>	Moment at the top (L-Dir Kips-Ft):	321.3	0.16	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	2044.5	>	Moment at the top (W-Dir Kips-Ft):	321.3	0.16	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	2877.0	>	Moment at the top (C-C Direc. K-Ft):	362.5	0.13	OK!

PROJECT:	LTE 2C
SITE NUMBER:	CTL01219
FA NUMBER:	10035127
PTN NUMBER:	2051A066GY
PACE NUMBER:	MRCTB018201
SBA#:	CT46134
SITE NAME:	GRANBY EAST
SITE ADDRESS:	15 NORTH GRANBY ROAD GRANBY, CT 06035

PROJECT INFORMATION

SITE NAME:	GRANBY EAST
SITE NUMBER:	CTL01219
SITE ADDRESS:	15 NORTH GRANBY ROAD GRANBY, CT 06035
FA NUMBER:	10035127
PTN NUMBER:	2051A066GY
PACE NUMBER:	MRCTB018201
USID NUMBER:	25933
SBA NUMBER:	CT46134
APPLICANT:	AT&T WIRELESS 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701
TOWER OWNER:	SBA COMMUNICATIONS CORPORATION 8051 CONGRESS AVENUE BOCA RATON, FL 33487
JURISDICTION:	GRANBY, CT
COUNTY:	HARTFORD COUNTY
SITE COORDINATES FROM	(RFDS)
LATITUDE:	41.953575°
LONGITUDE:	-72.793721°
GROUND ELEV.:	249'
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
AT&T RF MANAGER:	CAMERON SYME
PHONE:	(508) 596-7146
EMAIL:	cs6970@att.com

PROJECT CONSULTANTS

PROJECT MANAGER:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	RYAN BURGDORFER (508) 665-8005
EMAIL:	Ryan.Burgdorfer@Smartlinkllc.com
SITE AQUISITION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	SHARON KEEFE (978) 930-3918
EMAIL:	Sharon.Keefe@Smartlinkllc.com
ENGINEER/ARCHITECT:	FULLERTON ENGINEERING
ADDRESS:	1100 E. WOODFIELD ROAD, SUITE 500 SCHAUMBURG, IL 60173
CONTACT:	MILEN DIMITROV (847) 908-8439
EMAIL:	MDimitrov@fullertonengineering.com
CONSTRUCTION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	MARK DONNELLY (617) 515-2080
EMAIL:	mark.donnelly@smartlinkllc.com

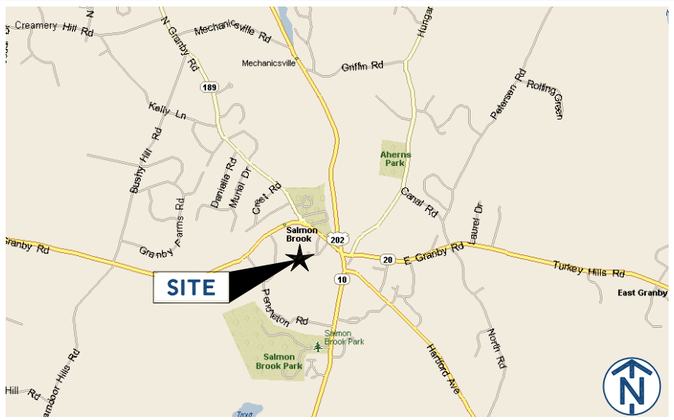
SCOPE OF WORK

LTE 1900 WILL BE 2C AT THE SITE, Q&D.
PROPOSED 2C PROJECT SCOPE HEREIN BASED ON RFDS ID # 1111514, VERSION 2.00 LAST UPDATED 05/18/2016.

- (3) NEW RRUS-12 UNITS
- (3) NEW 25 AMP BREAKERS
- (1) NEW LTE DUS

- CONTRACTOR SHALL FURNISH ALL MATERIAL WITH THE EXCEPTION OF AT&T SUPPLIED MATERIAL.
- ALL MATERIAL SHALL BE INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE.

SITE LOCATION MAP



NO SCALE

DIRECTIONS

SCAN QR CODE FOR LINK
TO SITE LOCATION MAP

APPLICABLE BUILDING CODES AND STANDARDS

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

BUILDING CODE:	2003 INTERNATIONAL BUILDING CODE
ELECTRICAL CODE:	2011 NATIONAL ELECTRIC CODE

- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- ADA ACCESS REQUIREMENTS ARE NOT REQUIRED.
- THIS FACILITY DOES NOT REQUIRE POTABLE WATER AND WILL NOT PRODUCE ANY SEWAGE

DRAWING INDEX

T1	TITLE SHEET
SP1	NOTES AND SPECIFICATIONS
SP2	NOTES AND SPECIFICATIONS
A1	COMPOUND PLAN
A2	EQUIPMENT PLAN
A3	ELEVATIONS
A4	ANTENNA PLANS
A5	EQUIPMENT DETAILS
A6	ANTENNA & CABLE CONFIGURATION
A7	CABLE NOTES AND COLOR CODING
A8	GROUNDING DETAILS

NOTE: DRAWING SCALES ARE FOR 11"x17" SHEETS UNLESS OTHERWISE NOTED

550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

FULLERTON
ENGINEERING · DESIGN
1100 E. WOODFIELD ROAD, SUITE 500
SCHAUMBURG, ILLINOIS 60173
TEL: 847-908-8400
COA# PEC.0001444
www.FullertonEngineering.com

REV	DATE	DESCRIPTION	BY
0	06/15/16	90% REVIEW	VV
1	10/28/16	FOR PERMIT	VV

I HEREBY CERTIFY THAT THESE DRAWING WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

SITE NAME
GRANBY EAST

SITE NUMBER:
CTL01219

SITE ADDRESS
15 NORTH GRANBY ROAD
GRANBY, CT 06035

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

FEC# 2016.0200.0012

GENERAL CONSTRUCTION

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR/CM – SMARTLINK
   OWNER – AT&T WIRELESS

2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.

3. GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.

4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.

5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.

6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

7. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.

8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.

10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.

11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.

12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.

13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.

14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.

15. CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.

16. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.

17. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.

18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.

19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.

20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.

21. THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2–A OT 2–A:10–B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.

22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.

23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.

24. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.

25. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.

26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE–APPROVED BY THE LOCAL JURISDICTION.

28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.

29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.

30. CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS–BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.

31. CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.

32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).

33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.

34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.

35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.

36. CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.

37. CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.

38. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

39. NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.

ANTENNA MOUNTING

40. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA–222 OR APPLICABLE LOCAL CODES.

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

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

43. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.

44. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.

45. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.

46. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50–OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.

47. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/– 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/– 0.5% AS DEFINED BY THE RFDS. REFER TO ND–00246.

48. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.

49. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.

50. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

51. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.

52. ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.
   A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.
   B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.

FIBER & POWER CABLE MOUNTING

53. THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.

54. THE TYPE TC–ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC–ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.

55. WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC–ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

62. TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO

    ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.

63. CONTRACTOR SHALL VERIFY THE DOWN–TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.

64. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.

65. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'–0".

66. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'–0" OC.

67. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.

68. CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.

69. CONTRACTOR SHALL PROVIDE STRAIN–RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN–RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

70. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

71. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.

72. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.

73. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.

74. ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE–HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.

75. IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
   A. TEMPERATURE SHALL BE ABOVE 50° F.
   B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
   C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.
   D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS

76. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
   A. GROUNDING AT THE ANTENNA LEVEL.
   B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'–0", ADDITIONAL CABLE GROUNDING REQUIRED.
   C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
   D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
   E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.

77. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWNLEADS A MINIMUM DISTANCE OF 4'–0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.

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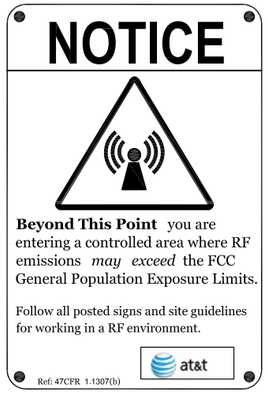
SITE NAME
GRANBY EAST

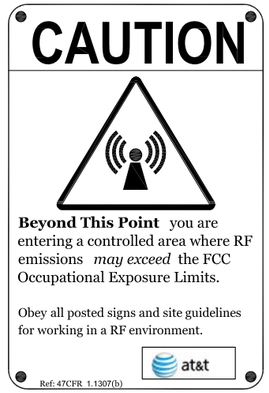
SITE NUMBER:
CTL01219

SITE ADDRESS
15 NORTH GRANBY ROAD
GRANBY, CT 06035

SHEET NAME
NOTES AND SPECIFICATIONS

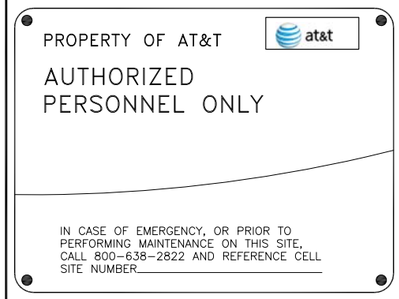
SHEET NUMBER
SP1





ALERTING SIGNS

ALERTING SIGN



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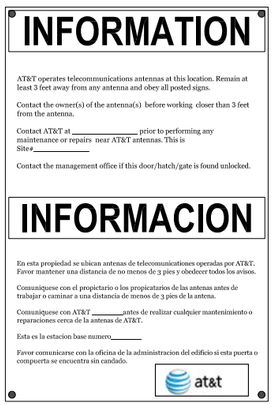

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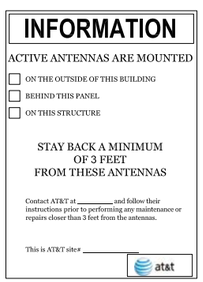

INFO SIGN #2

INFO SIGN #3

ALERTING SIGN (FOR CELL SITE BATTERIES)

ALERTING SIGN (FOR DIESEL FUEL)

ALERTING SIGN (FOR PROPANE)

GENERAL SIGNAGE GUIDELINES

STRUCTURE TYPE	INFO SIGN #1	INFO SIGN #2	INFO SIGN #3	INFO SIGN #4	STRIPING	NOTICE SIGN	CAUTION SIGN
TOWERS							
MONOPOLE/MONOPINE/MONOPALM	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			AT THE HEIGHT OF THE FIRST CLIMBING STEP, MIN 9 FT ABOVE GROUND
SEC TOWERS/TOWERS WITH HIGH VOLTAGE	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
LIGHT POLES/FLAG POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
UTILITY WOOD POLES (JPA)	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		IF GP MAX VALUE OF MPE AT ANTENNA LEVEL IS: 0-99%; NOTICE SIGN; OVER 99%: CAUTION SIGN AT NO LESS THAN 3FT BELOW ANTENNA AND 9FT ABOVE GROUND	
MICROCELLS MOUNTED ON NON-JPA POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		NOTICE OR CAUTION SIGN AT NO LESS THAN 9FT ABOVE GROUND: ONLY IF THE EXPOSURE EXCEEDS 90% OF THE GENERAL PUBLIC EXPOSURE AT EXPOSURE AT 6FT ABOVE GROUND OR AT OUTSIDE OF SURFACE OF ADJACENT BUILDING	
TOWERS							
AT ALL ACCESS POINTS TO THE ROOF	X			X			
ON ANTENNAS	X		X	X			
CONCEALED ANTENNAS	X	X		X			
ANTENNAS MOUNTED FACING OUTSIDE THE BUILDING	X	X		X			
ANTENNAS ON SUPPORT STRUCTURE	X	X		X			
ROOFVIEW GRAPH						EITHER NOTICE OR CAUTION SIGN (BASED ON ROOFVIEW RESULTS) AT ANTENNA /BARRIER	
RADIATION AREA IS WITHIN 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X			
RADIATION AREA IS BEYOND 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X	DIAGONAL, YELLOW STRIPING AS TO ROOFVIEW GRAPH		
CHURCH STEEPLES	ACCESS TO STEEPLE	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO STEEPLE			CAUTION SIGN AT THE ANTENNAS
WATER STATIONS	ACCESS TO LADDER	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO LADDER			CAUTION SIGN BESIDE INFO SIGN #1, MIN. 9FT ABOVE GROUND

NOTES FOR ROOFTOP SITES:

1. EITHER NOTICE OR CAUTION SIGNS NEED TO BE POSTED AT EACH SECTOR AS CLOSE AS POSSIBLE TO: THE OUTER EDGE OF THE STRIPED OFF AREA OR THE OUTER ANTENNAS OF THE SECTOR
2. IF ROOFVIEWS SHOWS: ONLY BLUE = NOTICE SIGN, BLUE AND YELLOW = CAUTION SIGN, ONLY YELLOW = CAUTION SIGN TO BE INSTALLED
3. SHOULD THE REQUIRED STRIPING AREAS INTERFERE WITH ANY STRUCTURE OR EQUIPMENT (A/C, VENTS, ROOF HATCH, DOORS, OTHER ANTENNAS, DISHES, ETC.). PLEASE NOTIFY AT&T TO MODIFY THE STRIPING AREA, PRIOR TO STARTING THE WORK.

SIGNAGE GUIDELINES CHART

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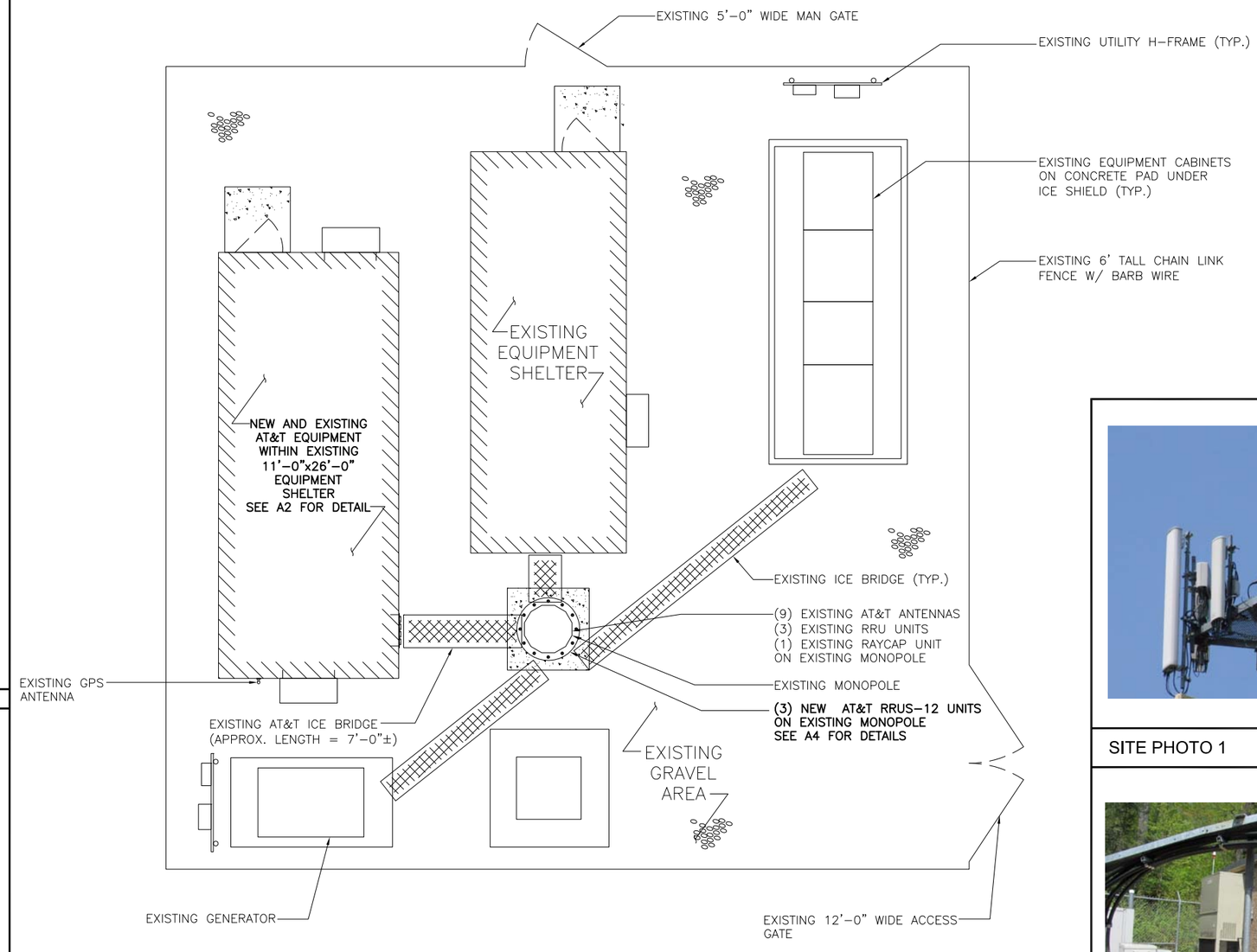
FEC# 2016.0200.0012

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
℄	CENTERLINE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ELEV	ELEVATION
EQUIP	EQUIPMENT
(E)	EXISTING
EXT	EXTERIOR
FND	FOUNDATION
F	FIBER
FIF	FACILITY INTERFACE FRAME
GA	GAUGE
GALV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE COMMUNICATION
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MCPA	MULTI-CARRIER POWER AMPLIFIER
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTS	MANUAL TRANSFER SWITCH
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OE/OT	OVERHEAD ELECTRIC/TELCO
PPC	POWER PROTECTION CABINET
PL	PROPERY LINE
RBS	RADIO BASED STATION
RET	REMOTE ELECTRIC TILT
RRU	REMOTE RADIO UNIT
RGS	RIGID GALVANIZED STEEL
IN	INCH(ES)
INT	INTERIOR
LB(S), #	POUND(S)
SF	SQUARE FOOT
STL	STEEL
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UE/UT	UNDERGROUND ELECTRIC/TELCO
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELE-COMMUNICATION SYSTEM
VIF	VERIFY IN FIELD
W/	WITH
XFMR	TRANSFORMER

SYMBOLS

- REVISION
- WORK POINT
- UTILITY POLE
- COMPRESSED STONE
- BRICK
- CONCRETE
- EARTH
- GRAVEL
- MASONRY
- STEEL
- CENTERLINE
- PROPERTY LINE
- LEASE LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- WOOD FENCE
- UE — BELOW GRADE ELECTRIC
- UT — BELOW GRADE TELEPHONE
- OE/OT — OVERHEAD ELECTRIC/TELEPHONE
- SECTION REFERENCE (A, S-1)



COMPOUND PLAN — SCALE: 1/8" = 1'-0" — 1

SITE PHOTO 1 — SCALE: N.T.S. — 2

SITE PHOTO 2 — SCALE: N.T.S. — 3

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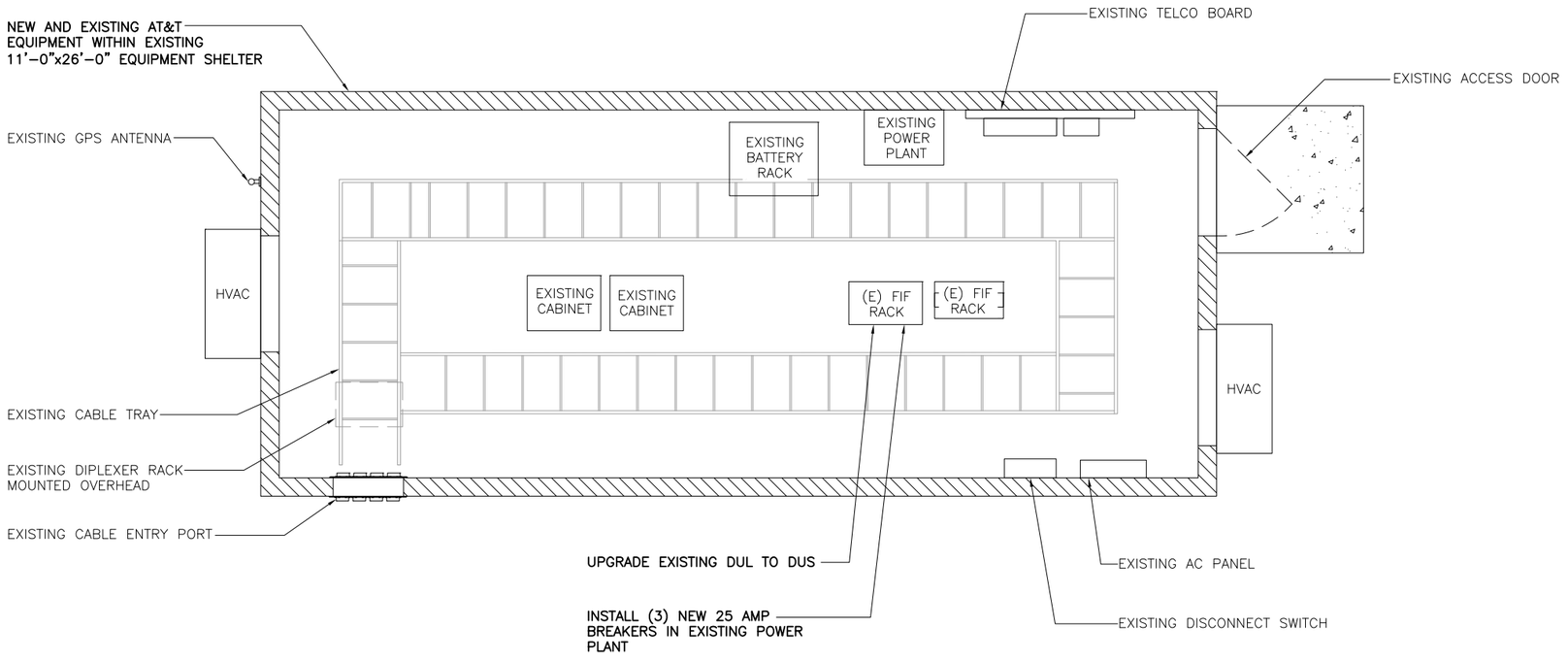
SHEET NAME
COMPOUND PLAN

SHEET NUMBER
A1

FEC# 2016.0200.0012



EQUIPMENT PLAN

SCALE: 1/4" = 1'-0"

1

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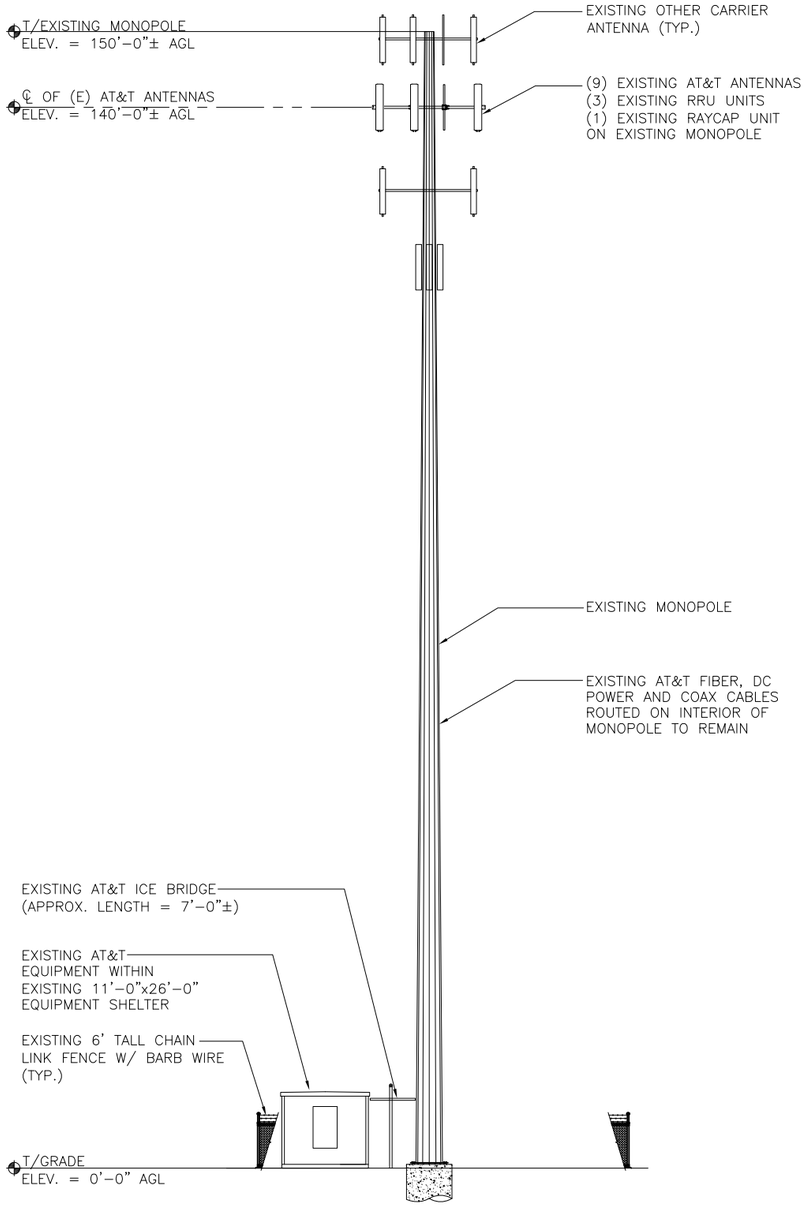
SHEET NAME
EQUIPMENT PLAN

SHEET NUMBER
A2

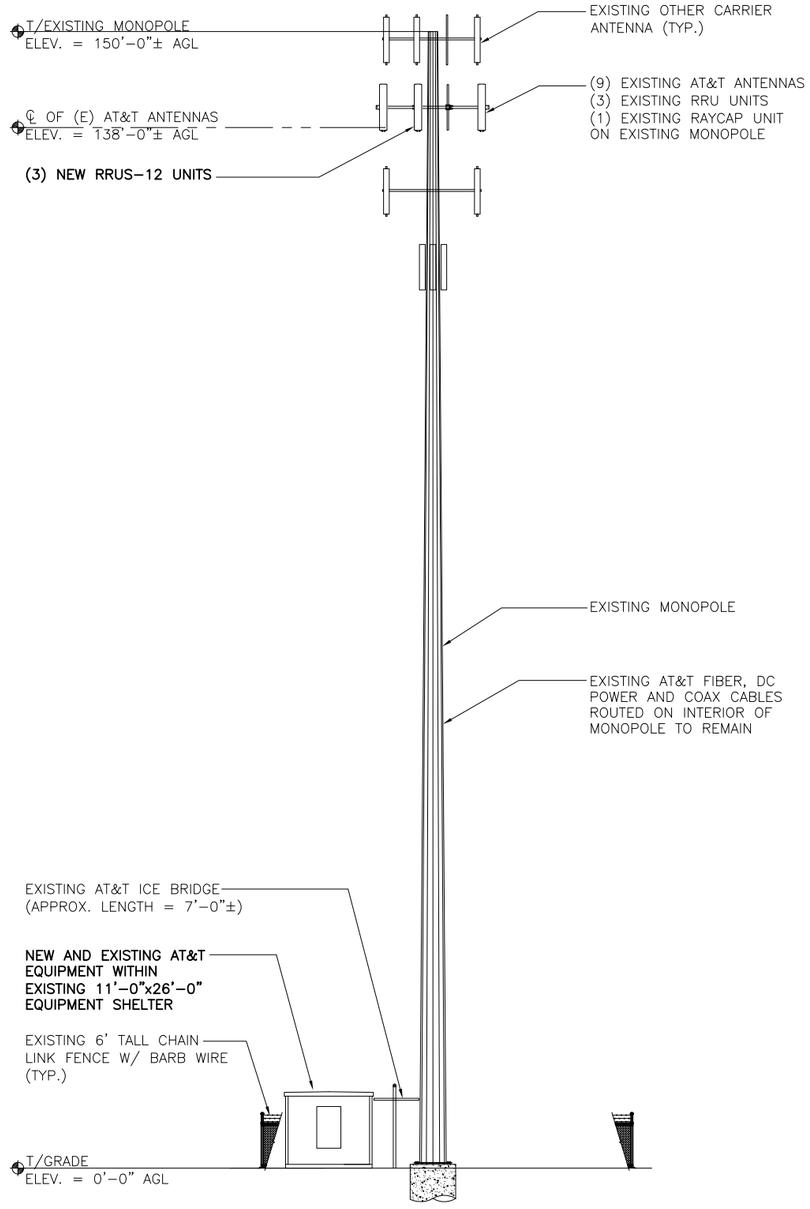
FEC# 2016.0200.0012

NOTES:

1. CALCULATIONS FOR THE STRUCTURE WERE PREPARED BY OTHERS AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
2. CALCULATIONS FOR THE ANTENNA MOUNTS WERE PREPARED BY FULLERTON AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
3. CABLES NOT SHOWN FOR CLARITY



EXISTING ELEVATION — SCALE: 1" = 20'-0" — 1



NEW ELEVATION — SCALE: 1" = 20'-0" — 2

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SHEET NAME
ELEVATIONS

SHEET NUMBER
A3

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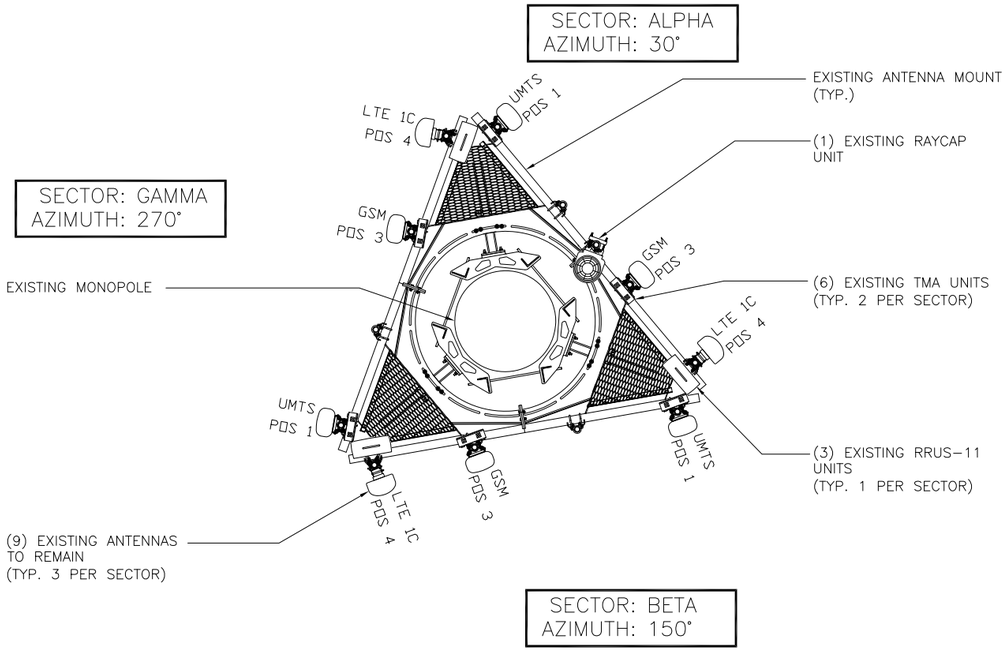
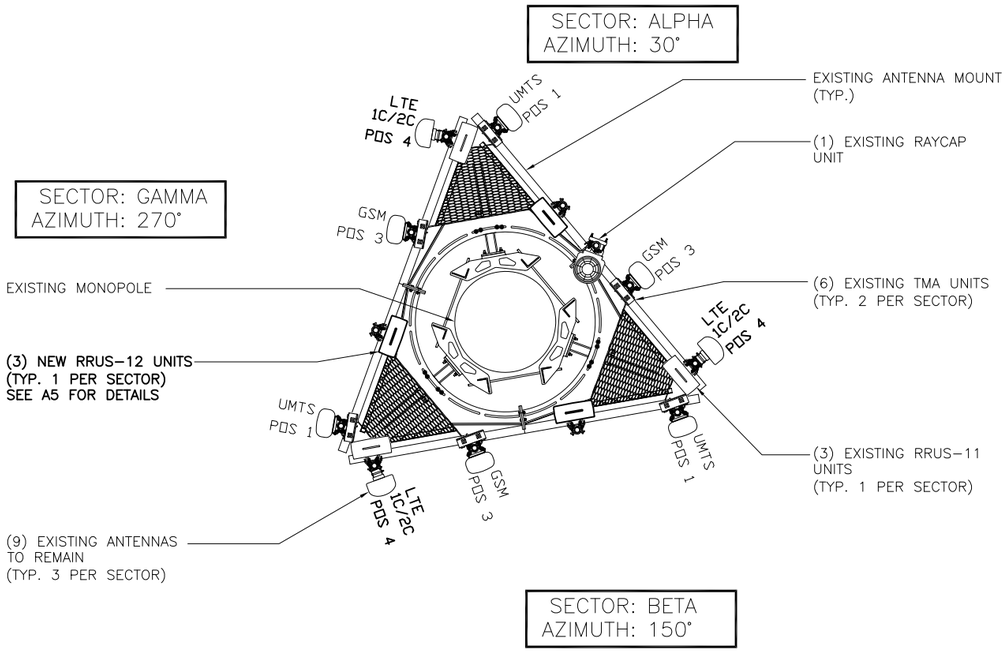


EXISTING ANTENNA PLAN — SCALE: 3/16" = 1'-0" — 1



FINAL ANTENNA PLAN — SCALE: 3/16" = 1'-0" — 2

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SHEET NAME
ANTENNA PLANS

SHEET NUMBER
A4

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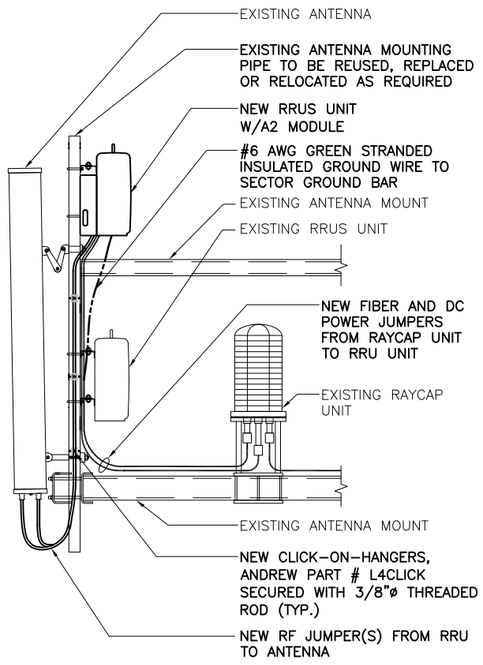
NOT USED — SCALE: N.T.S. — 1

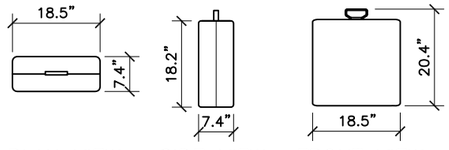
NOT USED — SCALE: N.T.S. — 2

ANTENNA SCHEMATIC — SCALE: N.T.S. — 3



NOT USED — SCALE: N.T.S. — 4

RRU SPEC — SCALE: N.T.S. — 5



ERICSSON – RRUS 12
WITH SOLAR SHIELD

UNIT WEIGHT 52.2 Lbs

A2 BOX SPEC — SCALE: N.T.S. — 6

NOT USED — SCALE: N.T.S. — 7

NOT USED — SCALE: N.T.S. — 8

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GRANBY, CT 06035

SHEET NAME
EQUIPMENT DETAILS

SHEET NUMBER
A5

FEC# 2016.0200.0012

FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (05/18/16)

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A–1	(E) UMTS ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	50°	142'–0"	1–5/8"ø LDF7–50A	165'–0"	(1) (E) DC6–48–60–18–8F UNIT
								1–5/8"ø LDF7–50A	165'–0"	
	A–2	–	–	–	–	–	–	–		
	A–3	(E) GSM ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	50°	142'–0"	1–5/8"ø LDF7–50A	165'–0"	
								1–5/8"ø LDF7–50A	165'–0"	
	A–4	**(N) LTE1C/2C ANTENNA**	P65–17–XLH–RR	POWERWAVE	(1) EXISTING RRUS–11 UNIT **AND (1) NEW RRUS–12 UNIT**	50°	142'–0"	(1) EXISTING FIBER CABLE	165'–0"	
								(2) EXISTING DC POWER CABLES	165'–0"	
BETA	B–1	(E) UMTS ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	160°	142'–0"	1–5/8"ø LDF7–50A	165'–0"	
								1–5/8"ø LDF7–50A	165'–0"	
	B–2	–	–	–	–	–	–	–		
	B–3	(E) GSM ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	160°	142'–0"	1–5/8"ø LDF7–50A	165'–0"	
								1–5/8"ø LDF7–50A	165'–0"	
	B–4	**(N) LTE1C/2C ANTENNA**	SBNH–1D6565C	COMMSCOPE	(1) EXISTING RRUS–11 UNIT **AND (1) NEW RRUS–12 UNIT**	160°	142'–0"	SEE ANTENNA A–3 FOR CABLE TYPE AND LENGTH		
GAMMA	C–1	(E) UMTS ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	280°	142'–0"	1–5/8"ø LDF7–50A	165'–0"	
								1–5/8"ø LDF7–50A	165'–0"	
	C–2	–	–	–	–	–	–	–		
	C–3	(E) GSM ANTENNA	7770	POWERWAVE	(1) EXISTING TMA UNIT(S)	280°	142'–0"	1–5/8"ø LDF7–50A	165'–0"	
								1–5/8"ø LDF7–50A	165'–0"	
	C–4	**(N) LTE1C/2C ANTENNA**	P65–17–XLH–RR	POWERWAVE	(1) EXISTING RRUS–11 UNIT **AND (1) NEW RRUS–12 UNIT**	280°	142'–0"	SEE ANTENNA A–3 FOR CABLE TYPE AND LENGTH		

ANTENNA & CABLE CONFIGURATION

SCALE: N.T.S.

1

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0	06/15/16	90% REVIEW	VV
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I HEREBY CERTIFY THAT THESE DRAWING WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

SITE NAME

GRANBY EAST

SITE NUMBER:

CTL01219

SITE ADDRESS

15 NORTH GRANBY ROAD
GRANBY, CT 06035

SHEET NAME

ANTENNA & CABLE CONFIGURATION

SHEET NUMBER

A6

FEC# 2016.0200.0012

1. CONTRACTOR IS TO REFER TO AT&T'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
2. THE SIZE, HEIGHT, AND DIRECTION OF THE ANTENNAS SHALL BE ADJUSTED TO ACHIEVE THE AZIMUTHS SPECIFIED AND LIMIT SHADOWING AND TO MEET THE SYSTEM REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY THE HEIGHT OF THE ANTENNA WITH THE AT&T WIRELESS PROJECT MANAGER.
4. VERIFY TYPE AND SIZE OF TOWER LEG PRIOR TO ORDERING ANY ANTENNA MOUNT.
5. UNLESS NOTED OTHERWISE THE CONTRACTOR MUST PROVIDE ALL MATERIAL NECESSARY.
6. ANTENNA AZIMUTHS ARE DEGREES OFF OF TRUE NORTH, BEARING CLOCKWISE, IN WHICH ANTENNA FACE IS DIRECTED. ALL ANTENNAS (AND SUPPORTING STRUCTURES AS PRACTICAL) SHALL BE ACCURATELY ORIENTED IN THE SPECIFIED DIRECTION.
7. CONTRACTOR SHALL VERIFY ALL RF INFORMATION PRIOR TO CONSTRUCTION.
8. SWEEP TEST SHALL BE PERFORMED BY GENERAL CONTRACTOR AND SUBMITTED TO AT&T WIRELESS CONSTRUCTION SPECIALIST. TEST SHALL BE PERFORMED PER AT&T WIRELESS STANDARDS.
9. CABLE LENGTHS WERE DETERMINED BASED ON THE DESIGN DRAWING. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK.
10. CONTRACTOR TO USE ROSENBERGER FIBER LINE HANGER COMPONENTS (OR ENGINEER APPROVED EQUAL).

ANTENNA AND CABLING NOTES

SCALE: N.T.S. | 1

RF, DC, & COAX CABLE MARKING LOCATIONS TABLE	
NO	LOCATIONS
1	EACH TOP-JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
2	EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
3	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER.
4	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.
5	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.

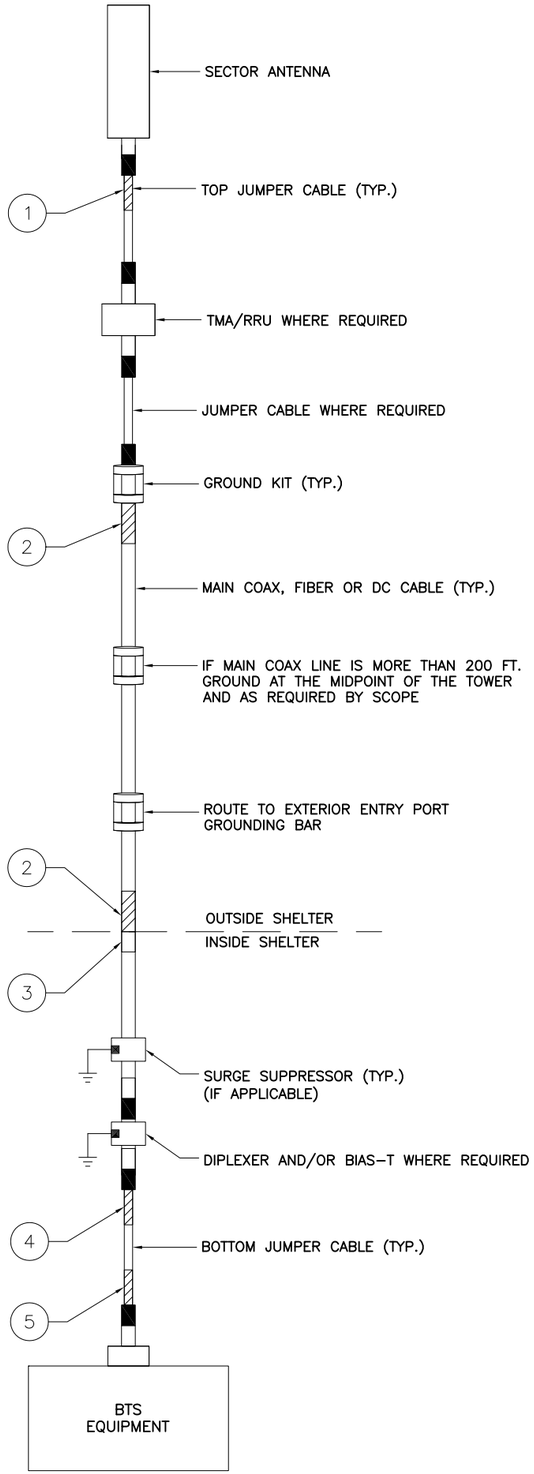
CABLE MARKING DIAGRAM

SCALE: N.T.S. | 2

1. THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE.
2. THE STANDARD IS BASED ON EIGHT COLORED TAPES-RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE, AND VIOLET. THESE TAPES MUST BE 3/4" WIDE & UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR CONTRACTOR ON SITE.
3. USING COLOR BANDS ON THE CABLES, MARK ALL RF CABLE BY SECTOR AND CABLE NUMBER AS SHOWN ON "CABLE COLOR CHART".
4. WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN TECHNOLOGIES IS ENCOUNTERED, THE CONTRACTOR SHALL REMOVE THE EXISTING COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING STANDARD. IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME, OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THIS GUIDELINE SHALL BE IMPLEMENTED AT THAT SITE REGARDLESS OF TECHNOLOGY.
5. ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) THREE WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID UNRAVELING.
6. ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM OF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE BETWEEN EACH COLOR.
7. ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
8. IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE NEW TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

CABLE MARKING NOTES

SCALE: N.T.S. | 3



CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. | 4

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SHEET NAME
CABLE NOTES AND COLOR CODING

SHEET NUMBER
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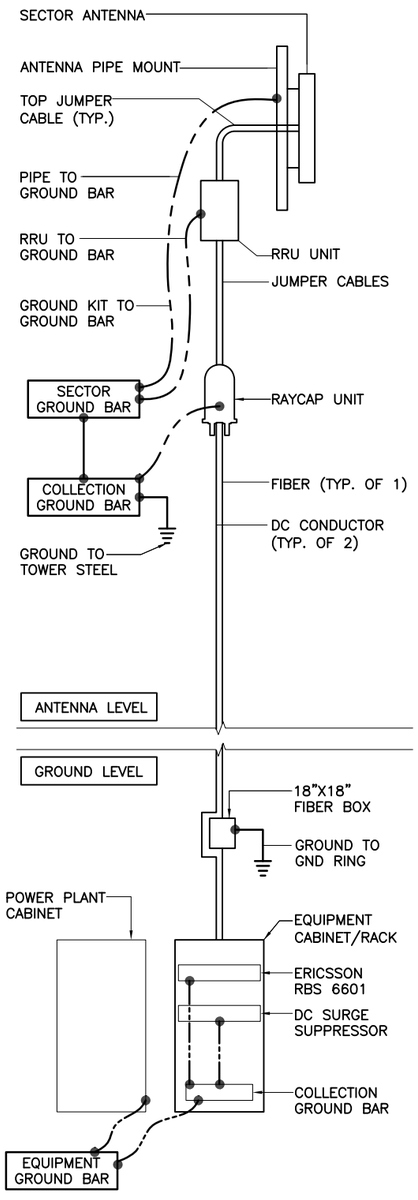
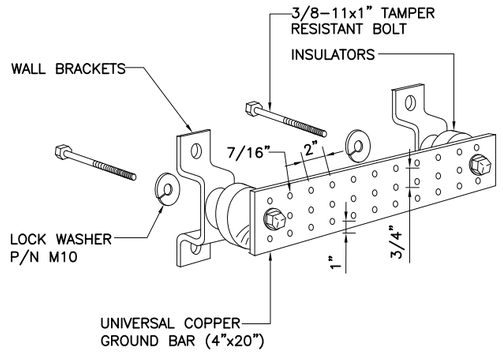
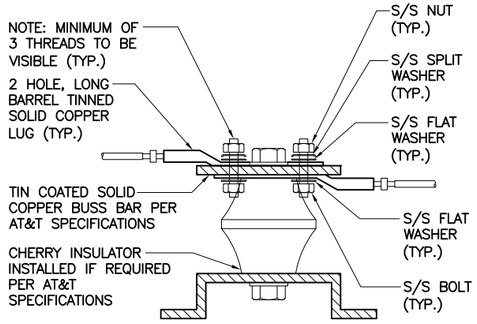


GROUNDING SCHEMATIC SCALE: N.T.S. 1



GROUND BAR DETAIL SCALE: N.T.S. 2

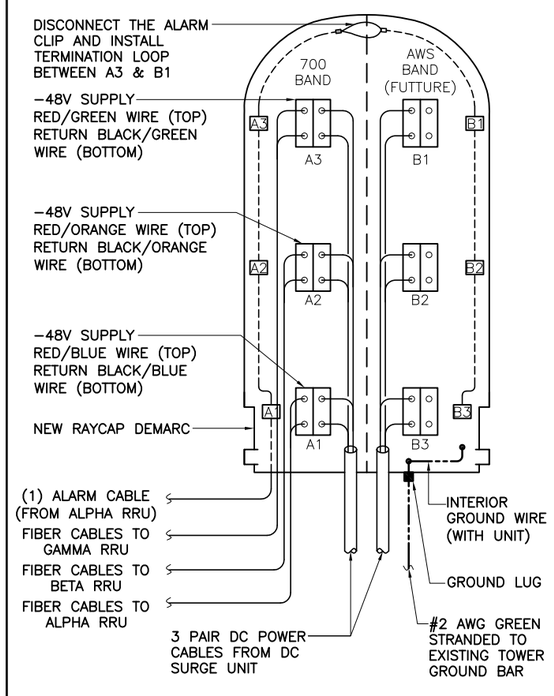


NOTES:

1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
2. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
3. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

LUG DETAIL SCALE: N.T.S. 3

EXOTHERMIC WELD DETAILS SCALE: N.T.S. 4



RAYCAP DC POWER AND ALARM DET. SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

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