



February 3, 2020

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

**Re: Notice of Exempt Modification – Antenna and RRU Add**  
**Property Address: 7 Stony Hill Road, Bethel, CT 06801**  
**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 145-feet on an existing 140-foot utility pole, owned by Connecticut Light and Power Co. at P.O. Box 270, Hartford, CT 06141-0270. AT&T now intends to remove three (3) 6' Powerwave P65-16-XLH-RR Panel Antennas, each currently installed in position [2], and swap these for three (3) 6' CCI HPA65R-BU6A Panel Antennas, each to be installed in position [2], all sectors. All of the changes will take place on the existing antenna mount. This modification/proposal includes B2, B5, and B12 hardware that is both 4G(LTE) and 5GNR capable through remote software configuration and either or both services may be turned on or off at various times.

Attached is 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. § 16-50j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to Christopher Baldwin – Town Building Official, Town of Branford, CT at 1 School Street, Bethel, CT 06801 and Matt Knickerbocker – First Selectman, Town of Bethel, CT at 1 School Street, Bethel, CT 06801. A copy of this letter is being sent to the Tower owner, Connecticut Light and Power Co.. c/o Eversource Energy at 56 Prospect Street, First Floor, Hartford, CT 06103, and the property owner, Target Corporation at PO Box 9456, Minneapolis, MN 55440.

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

- **EM-CING-009-080219** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunication facility located at 7 Stony Hill Road, Bethel, Connecticut.
- **EM-CING-009-160322** - New Cingular Wireless, PCS, LLC notice of intent to modify an existing telecommunications facility located at 7 Stony Hill Road, Bethel, Connecticut
- **EM-AT&T-009-181224** - AT&T notice of intent to modify an existing telecommunications facility located at 7 Stony Hill Road, Bethel, Connecticut.
- **EM-AT&T-009-200604** – AT&T Mobility, LLC notice of intent to modify an existing telecommunications facility located at 7 Stony Hill Road, Bethel, 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 145-foot level of the 140-foot utility tower.



2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require an 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,

Kristina Cottone

CC w/enclosures:  
Christopher Baldwin – Town Building Official, Town of Branford, CT  
Matt Knickerbocker – First Selectman, Town of Bethel, CT  
Connecticut Light and Power Co. – Tower Owner  
Target Corporation – Property Owner



05/27/2020

**Memo: No Initial Zoning Decision Found**

Upon consulting with the Building Inspector for the Town of Bethel, it was determined that no initial zoning decision for this tower could be found. The town phone number is (203) 794-8517.

Kristina Cottone  
Real Estate Specialist | Smartlink  
85 Rangeway Road, Building 3, Suite  
102 North Billerica, MA 01862

7 stony

Search Results

Parcel Details

Return To Search Results

7 STONY HILL ROAD



TARGET CORPORATION

PO BOX 9456  
MINNEAPOLIS, MN 55440  
Parcel ID: 59 095 01  
Lot Size (AC): 14.144  
Parcel Value: 12400000

- | Links                          | Abutters                     |
|--------------------------------|------------------------------|
| <a href="#">Parcel Details</a> | <a href="#">Property Map</a> |
| <a href="#">Photo</a>          |                              |
| <a href="#">Google Map</a>     |                              |

Parcel\_ID 59 095 01

Feat\_type PARCEL

Map 59

Block 095

Lot 1

Address 7 STONY HILL ROAD

Size 14.144

Photo 5909501-1



About

Layers

Identify



Danbury

lat:41.4164, long:-73.4093



**Summary** ✕

7 STONY HILL ROAD

**TARGET CORPORATION**

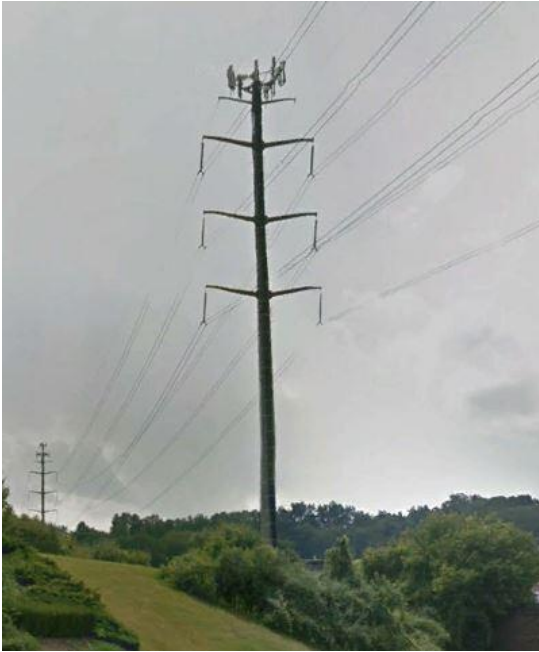
Parcel\_ID: 59 095 01

[View Details](#)





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info@sitesafe.com • www.sitesafe.com



**Smartlink on behalf of  
AT&T Mobility, LLC  
Site FA – 10071269  
Site ID – CT5176  
(MRCTB032343-MRCTB032344-  
MRCTB032332)  
USID – 60443  
Site Name – Bethel Stony Hill AWS**

**7 Stony Hill Road  
Bethel, CT 06801**

Latitude: N41-24-56.85  
Longitude: W73-24-06.12  
Structure Type: Transmission Tower

Report generated date: January 24, 2019  
Report by: Scott Broyles  
Customer Contact: David Barbagallo

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**AT&T Mobility, LLC is compliant based on FCC  
Rules and Regulations.**

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# 1 General Site Summary

## 1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Yes
Max Cumulative Simulated RFE Level on the Ground	<1% General Public Limit
FCC & AT&T Compliant?	Yes
Optional AT&T Mitigation Items?	Yes










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

RFDS: NEW-ENGLAND\_CONNECTICUT\_CTL05176\_2018-LTE-Next-Carrier\_LTE\_om636a\_2051A0H051\_10071269\_60443\_04-04-2018\_Final-Approved\_v4.00

CD's: 10071269\_AE201\_181213\_CTL05176\_Rev 2\_6C-7C-5G NR Upgrade

RF Powers Used: RFDS and AT&T Default Powers based on RRU

## 1.2 Signage Summary

AT&T Signage Locations									
	Information 1	Information 2	Notice	Notice 2	Caution	Caution 2	Warning	Warning 2	Barriers
Gate	1								
Tower Access	1				1				
Alpha									
Beta									
Gamma									
Delta									
Epsilon									

Note: All existing signage was documented during a previous site visit 8-20-2013

## 1.3 Fall Arrest Anchor Point Summary

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

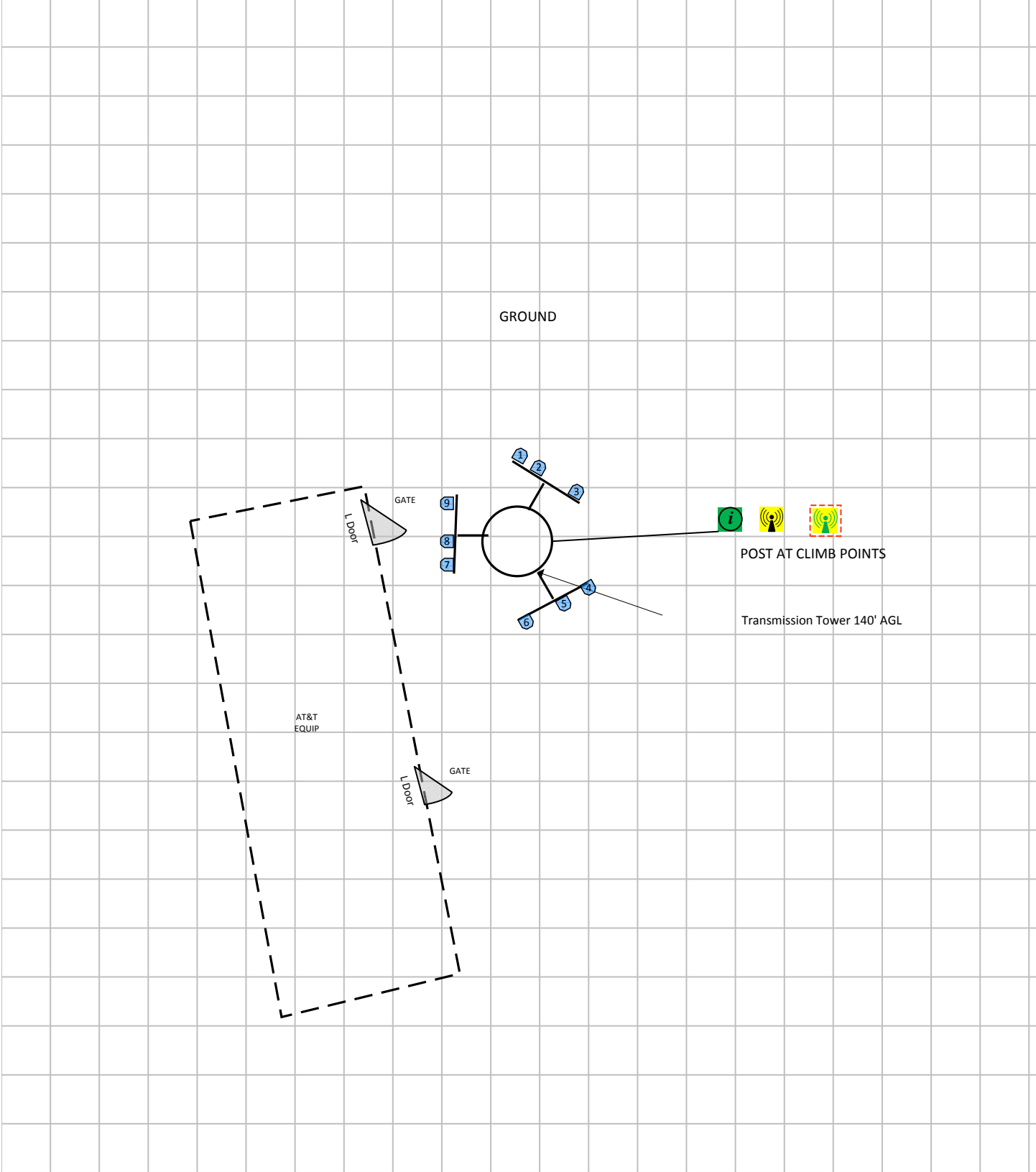


## 2 Scale Maps of Site

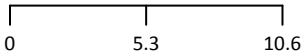
The following diagrams are included:

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

# Site Scale Map For: Bethel Stony Hill AWS



(Feet)



www.sitesafe.com  
 Site Name: Bethel Stony Hill AWS  
 1/24/2019 9:57:25 AM

		<b>Carrier Identification</b>															
	AT&T MOBILITY LLC		VERIZON WIRELESS		T-MOBILE		SPRINT		UNKNOWN CARRIER								
<b>Sign Legend</b>																	
	Caution 1		Caution 2		Notice 2		Notice 1		Warning		Warning 2		Info 1		Info 2		RF Safety Plan
<b>Barrier</b>				<b>Proposed Barriers/</b>				<b>Signs</b>									

### 3 Antenna Inventory

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

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Technology	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Power	Power Type	Power Unit	Radio Count	Total ERP (Watts)	Ant Gain (dBd)	Z AGL	MDT	EDT
1	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	30	82	4.6	40	TPO	Watt	1	566.3	11.51	142.7'	0'	10'
2	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA65R-BU6A	Panel	763	LTE	30	64	5.9	80	TPO	Watt	1	1409.6	12.46	142'	0'	10'
2	AT&T MOBILITY LLC (Proposed)	CCI Antennas HPA65R-BU6A	Panel	2100	LTE	30	59.6	5.9	240	TPO	Watt	1	10869.5	16.56	142'	0'	4'
3	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	722	LTE	30	69	6	80	TPO	Watt	1	1119.7	11.46	142'	0'	3'
3	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	850	LTE	30	63	6	80	TPO	Watt	1	997.9	10.96	142'	0'	10'
3	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	737	LTE	30	69	6	60	TPO	Watt	1	839.8	11.46	142'	0'	10'
3	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	2300	LTE	30	64	6	100	TPO	Watt	1	2857.6	14.56	142'	0'	2'
3	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	1900	LTE	30	68	6	160	TPO	Watt	1	4169.8	14.16	142'	0'	4'
3	AT&T MOBILITY LLC (Proposed)	Quintel QS66512-2	Panel	5G 850	LTE	30	63	6	80	TPO	Watt	1	997.9	10.96	142'	0'	10'
4	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	UMTS	150	82	4.6	40	TPO	Watt	1	566.3	11.51	142.7'	0'	8'
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9	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	722	LTE	270	69	6	80	TPO	Watt	1	1119.7	11.46	142'	0'	3'

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

**Note:** The 5G 850 \_MHz LTE technology is being added to an existing antenna.

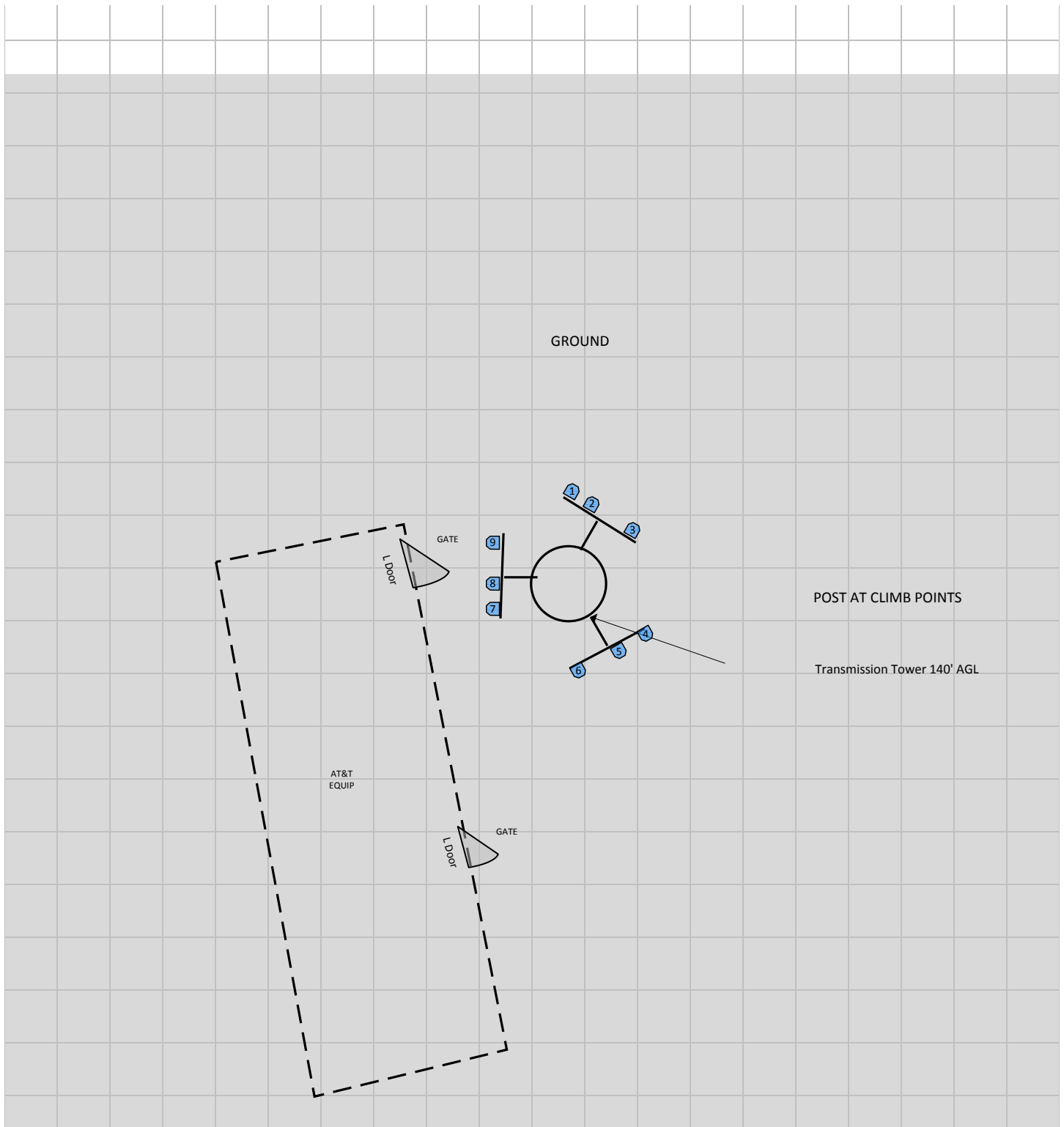
## 4 Emission Predictions

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 total analyzed elevations in the below RF Exposure Simulations are listed below.

- Ground = 0'

The Antenna Inventory heights are referenced to the same level.

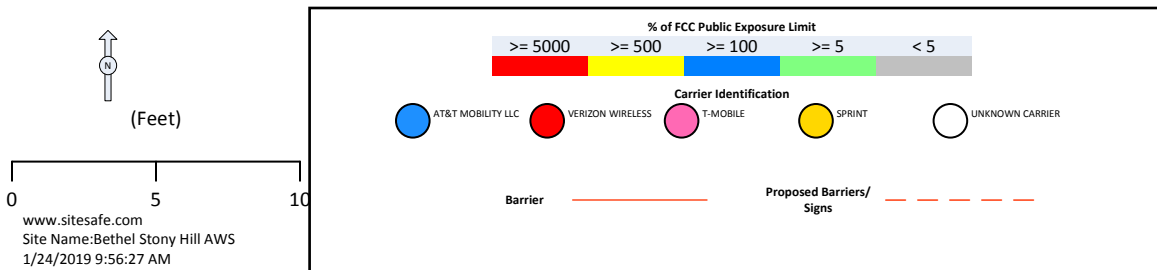
# RF Exposure Simulation For: Bethel Stony Hill AWS Composite View



POST AT CLIMB POINTS

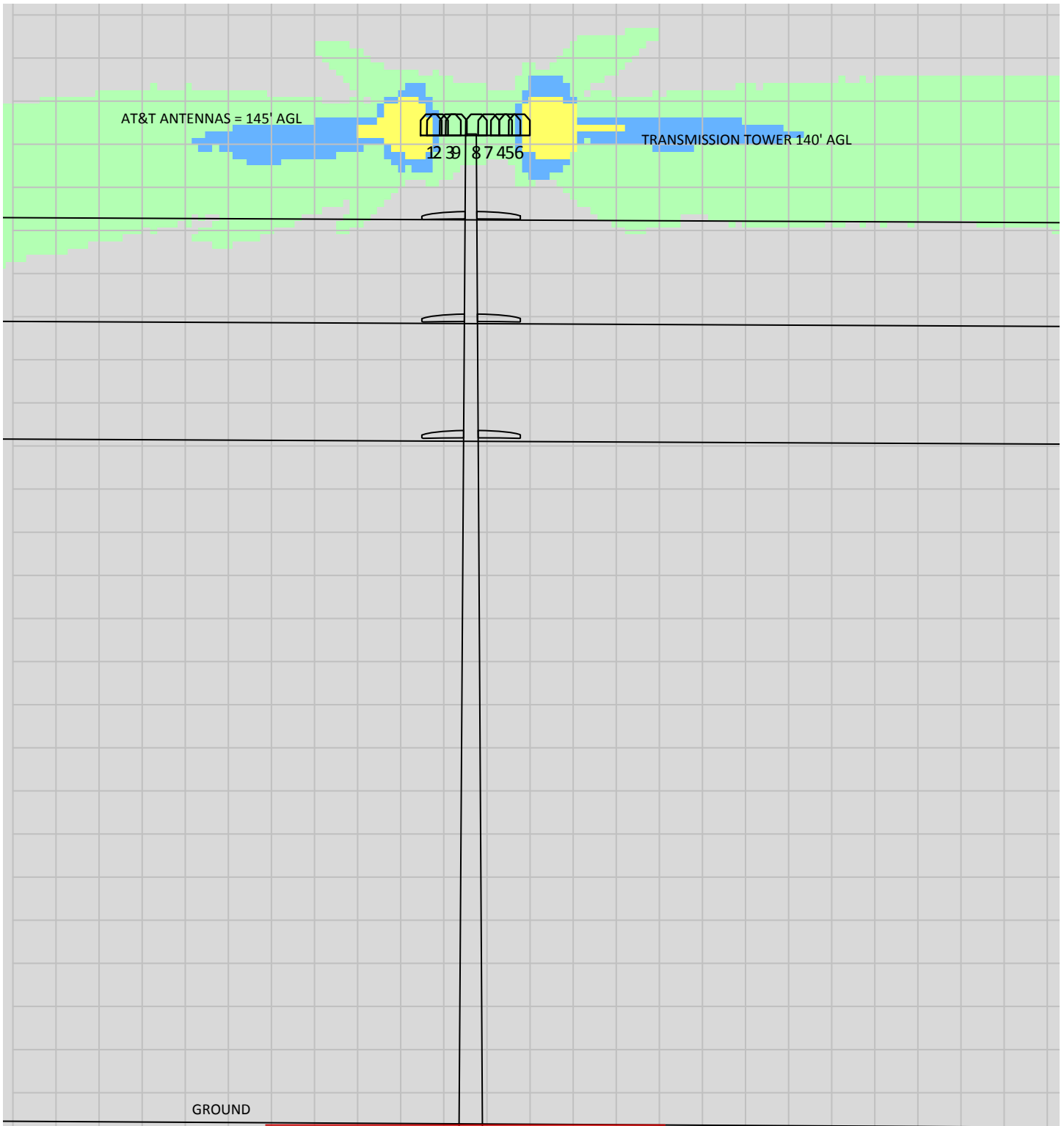
Transmission Tower 140' AGL

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

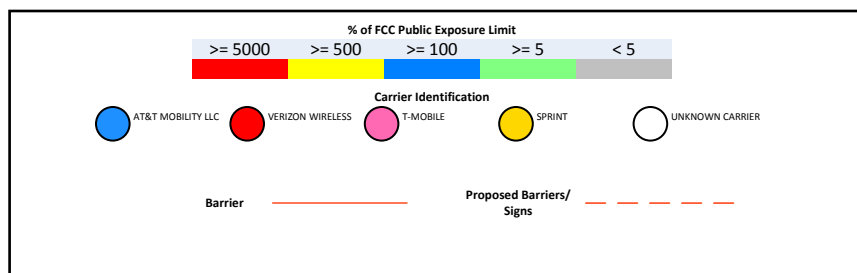
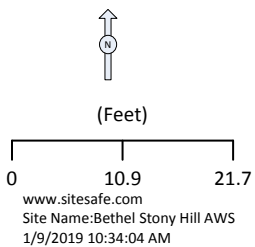


Sitesafe OET-65 Model  
Near Field Boundary:  
1.5 \* Aperture  
Reflection Factor: 1  
Spatially Averaged

# RF Exposure Simulation For: Bethel Stony Hill AWS Elevation View



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



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 is compliant with the FCC rules and regulations, as described in OET Bulletin 65.

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 is compliant with the FCC rules and regulations.

#### Optional Mitigation Items:

##### Site Access and Gate Location

Sitesafe recommends that all AT&T Mobility, LLC signage be removed, as they are not required by AT&T Mobility, LLC's signage policy.

##### Transmission Tower Access Location

Recommend Information 1 and Caution 1 be replaced with Caution 2 B sign.

#### Notes:

- 700 DE is moved to antenna position 4 per client notification.
- Ensure all existing signage documented in this report still exist at the site, unless otherwise indicated.



## 6 Reviewer Certification

The reviewer whose signature appears below hereby certifies and affirms:

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

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

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

January 24, 2019

## Appendix A – Statement of Limiting Conditions

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

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

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

## Appendix B – Regulatory Background Information

### FCC Rules and Regulations

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

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

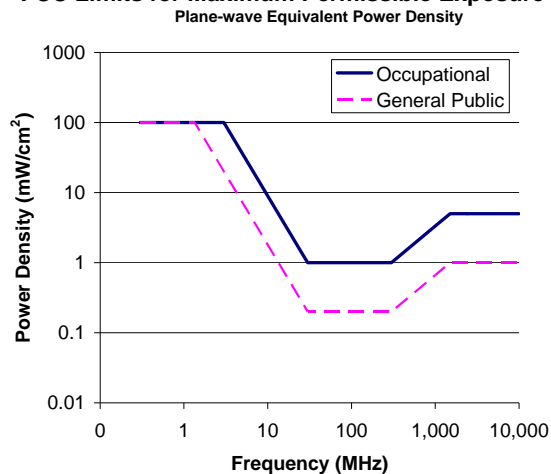
Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

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

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

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

#### FCC Limits for Maximum Permissible Exposure (MPE)



### 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 <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	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 <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	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](http://www.osha.gov).

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

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

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

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

## Appendix F – References

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

Sitesafe, LLC.

<http://www.sitesafe.com>

FCC Radio Frequency Safety

<http://www.fcc.gov/encyclopedia/radio-frequency-safety>

National Council on Radiation Protection and Measurements (NCRP)

<http://www.ncrponline.org>

Institute of Electrical and Electronics Engineers, Inc., (IEEE)

<http://www.ieee.org>

American National Standards Institute (ANSI)

<http://www.ansi.org>

Environmental Protection Agency (EPA)

<http://www.epa.gov/radtown/wireless-tech.html>

National Institutes of Health (NIH)

<http://www.niehs.nih.gov/health/topics/agents/emf/>

Occupational Safety and Health Agency (OSHA)

<http://www.osha.gov/SLTC/radiofrequencyradiation/>

International Commission on Non-Ionizing Radiation Protection (ICNIRP)

<http://www.icnirp.org>

World Health Organization (WHO)

<http://www.who.int/peh-emf/en/>

National Cancer Institute

<http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones>

American Cancer Society (ACS)

[http://www.cancer.org/docroot/PED/content/PED\\_1\\_3X\\_Cellular\\_Phone\\_Towers.asp?sitearea=PED](http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?sitearea=PED)

European Commission Scientific Committee on Emerging and Newly Identified Health Risks

[http://ec.europa.eu/health/ph\\_risk/committees/04\\_scenihp/docs/scenihp\\_o\\_022.pdf](http://ec.europa.eu/health/ph_risk/committees/04_scenihp/docs/scenihp_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](http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368)

Norwegian Institute of Public Health

<http://www.fhi.no/dokumenter/545eea7147.pdf>

## Structural Analysis Report

Transmission Pole #10254  
Long Mountain - Plumtree – 345kV Line

Bethel Stony Hill – AWS Site #CTL05176

Prepared on behalf of:



99 East River Road, 9<sup>th</sup> Floor  
East Hartford, CT 06108

PJF Project #A80618-0011.001.6090\_6050\_R4

REVISION	DATE	DESCRIPTION	ENGINEER	PJF TRACKING
0	11/20/2018	ORIGINAL ISSUE DATE	CEC	.001.6000_6050
1	1/25/2019	REVISED PER COMMENTS	CEC	.001.6000_6050
2	3/11/2019	REVISED PER LOADING COMMENTS	CEC	.001.6000_6050
3	5/21/2019	REVISED PER CONSTRUCTION COMMENTS	CEC	.001.6000_6050
4	10/24/2019	REVISED FOR CLIENT COMMENTS	CEC	.001.6000_6050

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**Report Date:** October 24, 2019

**Client:** Smartlink, LLC  
85 Rangeway Rd  
North Billerica, MA 01862-2105  
Attn: David Barbagallo  
860-681-7708  
david.barbagallo@smartlinkllc.com

**Utility Name:** Eversource  
**Structure:** Existing 140-ft Transmission Pole #10254  
**Line Reference:** Long Mountain - Plumtree - 345kV Line  
**Site Name:** AT&T – Bethel Stony Hill – AWS – CTL05176  
**Site Address:** 7 Stony Hill Rd  
**City, County, State:** Bethel, Fairfield County, CT  
**Latitude, Longitude:** 41.415792, -73.401700

**PJF Project:** A80618-0011.001.6000\_6050\_R4

Paul J. Ford and Company is pleased to submit this “**Structural Analysis Report**”. The purpose of this analysis is to determine if the structure has sufficient capacity to support the existing and proposed equipment described herein.

**Analysis Criteria:**

Reference Standard: IEEE Standards Association, “National Electrical Safety Code” (NESC) C2-2007  
ANSI/TIA-222-G-2-2009 Standard, “Structural Standard for Antenna Supporting Structures and Antennas – Addendum 2”  
ASCE Standard 48-05, “Design of Steel Transmission Pole Structures”

Utility Specification: Eversource OTRM 059 Rev. 1 (11/19/2018)

**Proposed Appurtenance Loads:**


The structure was analyzed with the addition of the proposed appurtenances loads shown in Table 1 combined with the existing and reserved loads shown in Table 2 and 3 of this report.

**Summary of Analysis Results:**

Existing Structure: **Pass**  
Existing Foundation: **Pass**  
Existing Antenna Mast: **Pass**

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and Smartlink, LLC. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully Submitted by:  
Paul J. Ford and Company

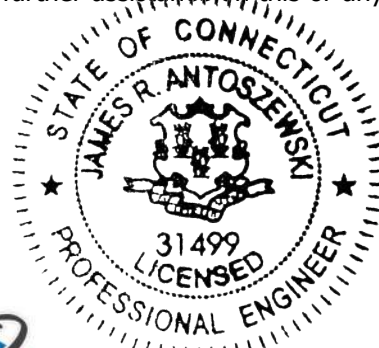
  
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**Founded in 1965**



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10/24/2019

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## 1) INTRODUCTION

The purpose of this analysis is to determine if the existing structure and existing foundations have sufficient capacity to support the existing and proposed equipment along with the existing wire loads described herein. The existing structure is a 140' tall double circuit steel transmission pole designated as a 345kV type "A-4". The existing pole consists of a 12-sided round polygonal pole shaft and base plate.

The antenna mounting system consists of (1) existing triple T-Arm (RMV12-372) with proposed handrail kit installed on an existing antenna mast. Refer to Tables 1 and 2 below and drawing SK-1 located in Appendix A for further antenna equipment and mount information.

**The proposed modifications, as shown on the drawings referenced in Table 5 of this report, have been taken into account as part of this analysis.**

## 2) ANALYSIS CRITERIA

Reference Standard: IEEE Standards Association, "National Electrical Safety Code" (NESC) C2-2007  
 ANSI/TIA-222-G-2-2009 Standard, "Structural Standard for Antenna Supporting Structures and Antennas – Addendum 2"  
 ASCE Standard 48-05, "Design of Steel Transmission Pole Structures"

Utility Specification: Eversource OTRM 059 Rev. 1 (11/19/2018)

**Table 1 – Proposed Antenna and Cable Information<sup>1</sup>**

Mounting Level (feet)	Center Line Elevation (feet)	Quantity	Manufacturer	Model	Number of Feed Lines <sup>2</sup>	Feed Line Size (inches)	Note
147.0	147.0	1	Sitepro1	HRK12	6 (E)	1-5/8	-
145.0	145.0	3	CCI	HPA65R-BU6A (Antenna)			
		6	CCI	TMABPD7823VG12A (TMA)			

Notes:

- See drawing SK-1 in "Appendix A – Structure Profile Sheet" for further details.
- (E) – Coax mounted externally and exposed to the wind.

**Table 2 – Existing and Reserved Antenna and Cable Information**

Mounting Level (feet)	Center Line Elevation (feet)	Quantity	Manufacturer	Model	Number of Feed Lines <sup>2</sup>	Feed Line Size (inches)	Note
145.0	145.0	3	Powerwave	7770 (Antenna)	24 (E)	1-5/8	3
		6	Powerwave	LGP 21401 (TMA)			
		3	Powerwave	P65-16-XLH-RR (Antenna)			
		3	CCI	DTMABP7819VG12A (TMA)			4
		3	Quintel	QS66512-2 (Antenna)			
		6	Kaelus	TMA2117F00V1-1 (TMA)			
		1	SitePro1	RMV12-372 (Triple T-arm)			

Notes:

- See drawing SK-1 in "Appendix A – Structure Profile Sheet" for further details.
- (E) – Coax mounted externally and exposed to the wind.
- Existing equipment to remain.
- To be removed and not considered in this analysis.

**Table 3 – Existing Electrical Utility Wire Information<sup>1</sup>**

Wire Designation	Wire Type	Tension Angle (degrees)	Wind Span		Weight Span	
			Back (feet)	Ahead (feet)	Back (feet)	Ahead (feet)
Shield Wire #1	(1) – AFL DNO-4963 0.457" OPGW	0	-	-	-	-
Shield Wire #2	(1) – 7#8 Alumoweld					
Conductor	(6) – Bundled 1272 "Bittern" ACSR					

Notes:

1. Wire loads provided by the utility. See "Appendix B – Load Calculations" for further details.

**Table 4a – Utility Tower Analysis - Load Case Information<sup>1</sup>**

Load Case Name	Radial Ice (inches)	Wind Speed (mph)	Overload Capacity Factors				Note
			Vertical	Wind	Wire Tension		
					Long.	Trans.	
NESC 250B (Heavy)	0.5	39.5	1.5	2.5	1.1	1.65	-
NESC 250C (Extreme Wind)	0	100	1.0	1.0	1.0	1.0	2

Notes:

1. As per the requirements of NU Design Criteria Table, NESC C2-2017 – Construction Grade B, and ASCE 48-11, "Design of Steel Transmission Pole Structures".
2. Apply a 1.25 X Gust Response Factor to all telecommunication equipment projected above top of pole and a 1.0 X Gust Response Factor to the pole structure as per NU Design Criteria Table.

**Table 4b – Antenna Mount Analysis - Load Case Information<sup>1</sup>**

Load Case Name	Radial Ice (inches)	Wind Speed (mph)	Note
TIA/EIA – High Wind	0	93	1
TIA/EIA – Wind and Ice	0.75	50	-

Notes:

1. As per the requirements of the CT State Building Code (Appendix N).

### 3) ANALYSIS PROCEDURE

**Table 5 – Documents Provided**

Document	Remarks	Reference	Source
Structure Erection Drawings	Combustion Engineering Inc. – 01/1977	01143-50004 Sh. 5	Eversource
Structure Anchor Bolt Drawings	Combustion Engineering Inc. – 01/1977	01143-50004 Sh. 14	
Structure Foundation Drawings	NUSCO – 03/16/1977	01143-60001 Sh. 7	
Previous Structural Analysis	Centek Engineering, Inc. – 02/05/2016	15267.003	
Jet Grout Submittal	Helical Drilling Inc., 08/27/2012	-	
RF Data Sheet	AT&T v5.00, 1/23/2019	Bethel Stony Hill AWS	AT&T
Mount Modification Drawings	PJF, 05/21/2019	80618-0011.002.6190_R2	

#### 3.1) Analysis Method

tnxTower (version 7.05.1), is a commercially available analysis software package. tnxTower was used to create a three-dimensional model of the mast extension and calculate member stresses for various load cases. Selected output from the analysis is included in Appendix C.

PLS-Pole™ is a commercially available analysis software package made by Powerline Systems, Inc. PLS-Pole™ was used to create a three-dimensional model of the pole and calculate member stresses for various load cases. Load Calculations are included in Appendix B. Selected output from the analysis is included in Appendix C.

LPILE (version 6.0.22) is a commercially available software package by Ensoft, Inc. LPILE was used to create a model of the foundation. Additional calculations were completed using MathCAD. Load Calculations and selected output from the analysis is included in Appendix D.

### 3.2) Assumptions

- 1) *The structure was built in accordance with the manufacturer’s specifications.*
- 2) *The structure has been maintained in accordance with the manufacturer’s specifications.*
- 3) *The analysis assumes that no physical deterioration has occurred in any of the structural components and that all members have the same load carrying capacity as the day the structure was erected. No allowance was made for any damaged, missing, or rusted members.*
- 4) *All bolts have been torqued to the snug-tight condition as defined by AISC.*
- 5) *No residual stresses exist due to incorrect tower erection.*
- 6) *All welds conform to the requirements of AWS D1.1.*
- 7) *The configuration of antennas, cables, mounts and other appurtenances are as specified in Tables 1 and 2 of this report and as per the referenced documents in Table 5.*
- 8) *The wind loads applied to the structure, due to the antenna installations, are based on the full projected area of all antenna equipment in all directions (i.e. no shielding used).*
- 9) *Mast and utility tower are in plumb condition.*
- 10) *Pole shaft steel material assumed to be A572-65 with minimum yield stress of 65ksi.*
- 11) *Pole base plate steel material assumed to be A572-60 with a minimum yield stress of 60ksi.*
- 12) *The structure modifications, as shown in the referenced PJF documents, have been installed.*
- 13) *No further modifications to the structure have been made other than those referenced herein.*
- 14) *The geotechnical parameters were obtained from Centek Engineering, Inc., report dated 02/05/2016.*

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

### 4) ANALYSIS RESULTS

The following table provides the maximum usages for each structure element type and the loading condition in which they occur:

**Table 6 – Maximum Structure Element Usages**

Pole – Analysis		
Element Type	Load Case	Usage (%)
Pole Shaft	NESC 250C (Extreme Wind)	91.6
Base Plate	NESC 250C (Extreme Wind)	94.2
Davit Arms	NESC 250B (Heavy)	32.9
Pole – Supplemental Analysis		
Element Type	Load Case	Usage (%)
Anchor Bolts	NESC 250C (Extreme Wind)	78
<b>Maximum Structure Element Usage =</b>		<b>94.2</b>
<b>Existing Structure Result =</b>		<b>Pass</b>

Notes:

1. See "Appendix C – Computer Output" for further detailed information.
2. See "Appendix D – Supplemental Calculations" for calculations supporting the % capacity used.



**Table 7 – Maximum Structure Foundation Usages**

Foundation Analysis		
	Load Case	Usage (%)
Axial Check	NESC 250C (Extreme Wind)	46.6
Moment Check	NESC 250C (Extreme Wind)	61.2
<b>Maximum Foundation Usage =</b>		<b>61.2</b>
<b>Existing Foundation Result =</b>		<b>Pass</b>

Notes:

1. See "Appendix D – Supplemental Calculations" for calculations supporting the % capacity used.

**Table 8 – Maximum Antenna Mast Usages**

Antenna Mount – Analysis			
Member		Load Case	Usage (%)
18"Ø Mast		TIA/EIA – High Wind	8
Mast Connection to CL&P Tower		TIA/EIA – High Wind	18.4
Limit State Deformations <sup>(1)</sup>			
Limit State	Analysis Value	Maximum Allowable Value	Result
Twist	0.0°	4°	OK
Sway (Tilt)	0.0°	4°	OK
Horizontal Displacement	0.007"	1.44" <sup>(3)</sup>	OK
<b>Maximum Antenna Mast Usage =</b>			<b>18.4</b>
<b>Error! Reference source not found. Antenna Mast Result =</b>			<b>Pass</b>

Notes:

1. See "Appendix C – Computer Output" for further detailed information.
2. See "Appendix D – Supplemental Calculations" for calculations supporting the % capacity used.
3. 1.5% of cantilevered mast height = 8' \* 12"/ft x 0.015 = 1.44"

**4.1) Recommendations**

Install all modifications as per the mod drawing package referenced in Table 5.

**5) CONCLUSION**

The existing transmission pole has **sufficient** capacity to support the existing and proposed equipment along with the existing wire loads described herein.

The existing foundation(s) have **sufficient** capacity to support the existing and proposed equipment along with the existing wire loads described herein.

The existing antenna mast has mount has **sufficient** capacity to support the existing and proposed equipment described herein.

This analysis is presented based upon the assumptions listed herein and information provided by the utility and the wireless carrier. If the existing conditions are different than those presented here, Paul J. Ford and Company should be contacted to verify the validity of the conclusions presented here.

**STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY PAUL J. FORD AND COMPANY**

- 1) It is the responsibility of the client to ensure that the information provided to Paul J. Ford and Company is accurate and complete. Paul J. Ford and Company will rely on the accuracy and completeness of such information in performing or furnishing services under this project.
- 2) If the existing conditions are not as represented on the referenced drawings and/or documents, Paul J. Ford and Company should be contacted immediately to evaluate the significance of the deviation.
- 3) The structure has been analyzed according to the minimum design loads recommended by the Reference Standard. If additional design loads are required, Paul J. Ford and Company should be made aware of this prior to the start of the project.
- 4) The standard of care for all Professional Engineering Services performed or furnished by Paul J. Ford and Company under this project will be the skill and care used by members of the Consultant’s profession practicing under similar circumstances at the same time and in the same locality.
- 5) All Services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Paul J. Ford and Company is not responsible for the conclusions, opinions and/or recommendations made by others based on the information supplied herein.

\*\*\*\*\*

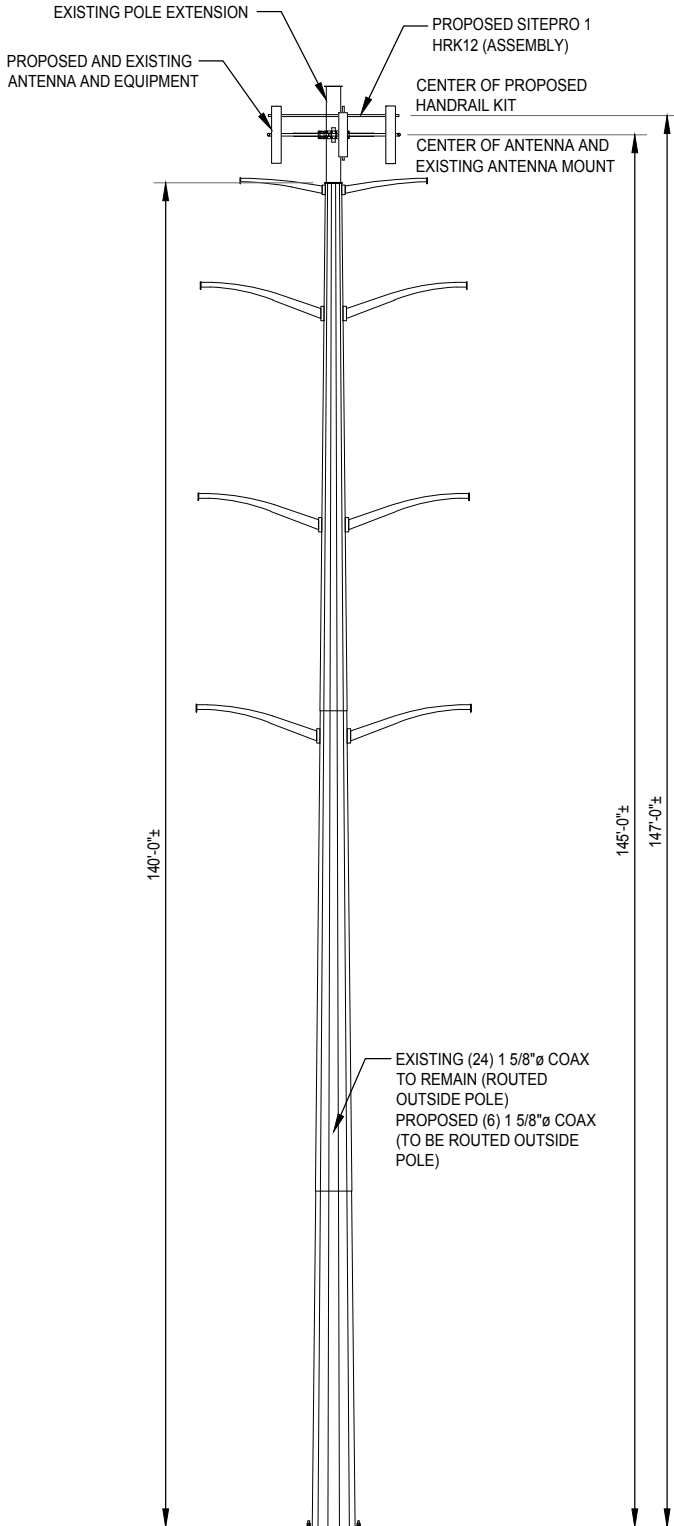
# **APPENDIX A**

## **STRUCTURE PHOTOS / PROFILE SHEET**



### FINAL ANTENNA INFORMATION

RAD #	STATUS	QUANTITY	MANUFACTURER	MODEL
147'-0"±		1	SITEPRO1	HRK12 (HANDRAIL ASSEMBLY)
145'-0"±	PROPOSED	3	CCI	HPA65R-BU6A (ANTENNA)
		6	CCI	TMABPD7823VG12A (TMA)
		3	POWERWAVE	7770 (ANTENNA)
	EXISTING	6	POWERWAVE	LGP 21401 (TMA)
		3	QUINTEL	QS66512-2 (ANTENNA)
		6	KAELUS	TMA2117F00V1-1 (TMA)
		1	SITEPRO1	RMV12-372 (TRIPLE T-ARM)



**ELEVATION**  
TRANSVERSE FACE  
LOOKING AHEAD

**NOTE:**  
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80618-0011.002.6000 R4.dwg

**PJF PAUL J. FORD & COMPANY**  
250 E Broad St. Ste 600 · Columbus, OH 43215  
Phone 614.221.6679 www.pauljford.com

Description: TRANSMISSION POLE WITH POLE EXTENSION - ELEVATIONS AND SECTIONS  
Utility: EVERSOURCE

Job No. 80618-0011.001.6000 R4  
Drawn by: TAN/FE  
Designed by: CEC  
Checked by: JRA  
Date: 7-22-2019

**AT&T**

99 EAST RIVER ROAD, 9TH FLOOR EAST HARTFORD, CONNECTICUT 06108

Structure Info: POLE #10254; CIRCUIT #LONG MOUNTAIN - PLUMTREE  
Site Info: 7 STONY HILL RD, BETHEL, FAIRFIELD COUNTY, CT BETHEL STONY FILL - AWS SITE #CTL05176

**SK-1**

# **APPENDIX B**

## **LOAD CALCULATIONS**

Project: 321/1887 Lines, Structure 10254

From Previous Analysis

Date: 10/10/18

Engineer: JS

Purpose: Recalculate wire loads for AT&T site.

**Shield Wires:**

321: AFL DNO-4963 0.457" OPGW, sagged to 4200# NESC 250B Final

1887: 7#8 Alumoweld, sagged in PLS-CADD

**Conductors:**

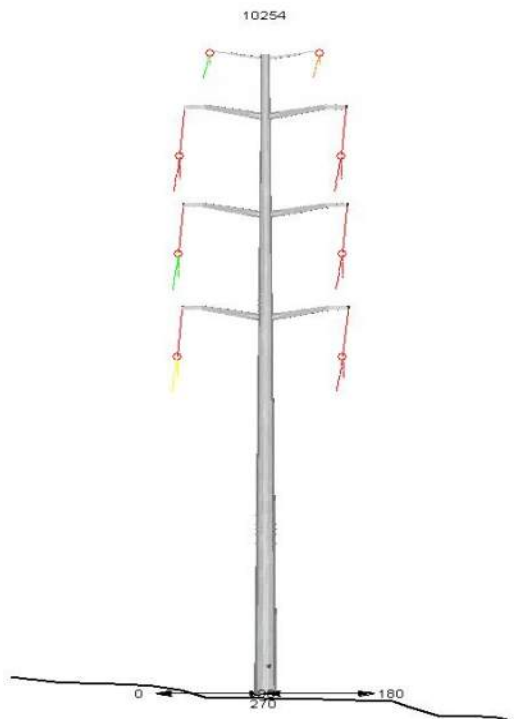
Bundled 1272 "Bittern" ACSR, sagged in PLS-CADD

**NESC 250B**

	Vertical	Transverse	Longitudinal
Alumoweld	1035	1185	0
OPGW	1072	1234	0
Conductor	7090	4255	0

**NESC 250C**

	Vertical	Transverse	Longitudinal
Alumoweld	216	733	0
OPGW	201	865	0
Conductor	2748	4942	0



Looking south.

Transverse forces are in the direction of the 0 degree angle.

OPGW is top left as seen here.

Alumoweld is top right as seen here.

# **APPENDIX C**

## **COMPUTER OUTPUT**



A500-42

**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
SitePro1 HRK12 (Verizon / P)	147	(2) TMA2117F00V1-1 (Verizon / E)	145
SitePro1 RMV 12-372 (Verizon / P)	145	(2) TMA2117F00V1-1 (Verizon / E)	145
7770.00 w/ Mount Pipe (Verizon / E)	145	(2) TMA2117F00V1-1 (Verizon / E)	145
7770.00 w/ Mount Pipe (Verizon / E)	145	HPA65R-BU6A w/ mount pipe (Verizon / P)	145
7770.00 w/ Mount Pipe (Verizon / E)	145	HPA65R-BU6A w/ mount pipe (Verizon / P)	145
(2) LGP21401 (Verizon / E)	145	HPA65R-BU6A w/ mount pipe (Verizon / P)	145
(2) LGP21401 (Verizon / E)	145	HPA65R-BU6A w/ mount pipe (Verizon / P)	145
(2) LGP21401 (Verizon / E)	145	HPA65R-BU6A w/ mount pipe (Verizon / P)	145
QS66512-2 w/ Mount Pipe (Verizon / E)	145	(2) TMABPD7823VG12A (Verizon / P)	145
QS66512-2 w/ Mount Pipe (Verizon / E)	145	(2) TMABPD7823VG12A (Verizon / P)	145
QS66512-2 w/ Mount Pipe (Verizon / E)	145	(2) TMABPD7823VG12A (Verizon / P)	145

**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-42	42 ksi	58 ksi			

**TOWER DESIGN NOTES**

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class III.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. Weld together tower sections have flange connections.
8. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
9. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
10. Welds are fabricated with ER-70S-6 electrodes.
11. TOWER RATING: 7.8%

1

P18x.375

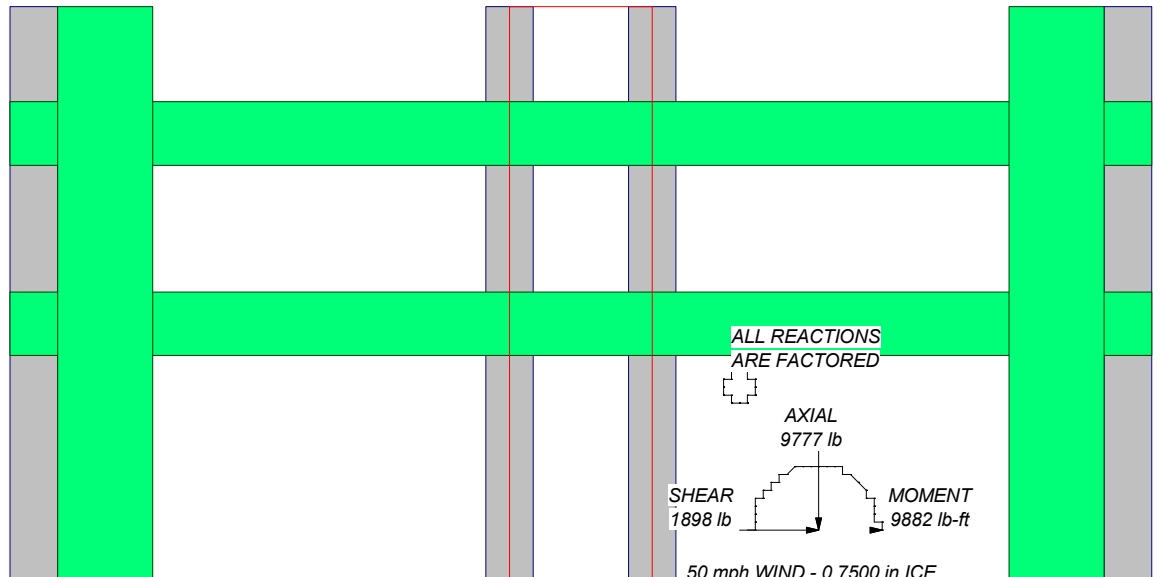
8.00

565.2

148.0 ft

140.0 ft

565.2




Section

Size

Length (ft)

Grade

Weight (lb)

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	Client: Smartlink, LLC Code: TIA-222-G Path:	Drawn by: ccarrillo Date: 05/02/19	App'd: Scale: NTS Dwg No. E-1

<b>tnxTower</b>  <b>Paul J. Ford and Company</b> 250 East Broad st., Suite 600 Columbus, OH 43215 Phone: (614) 221-6679 FAX:	<b>Job</b> Stony Hill	<b>Page</b> 1 of 12
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	<b>Client</b> Smartlink, LLC	<b>Designed by</b> ccarrillo

## Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Basic wind speed of 93 mph.

Structure Class III.

Exposure Category C.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

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

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

Weld together tower sections have flange connections..

Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..

Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..

Welds are fabricated with ER-70S-6 electrodes..

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

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

## Options

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

## Pole Section Geometry

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Section	Elevation	Section Length	Pole Size	Pole Grade	Socket Length
	ft	ft			ft
L1	148.00-140.00	8.00	P18x.375	A500-42 (42 ksi)	

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1 148.00-140.00				1	1	1			

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

Description	Sector	Exclude From Torque Calculation	Component Type	Placement	Total Number	Number Per Row	Start/End Position	Width or Diameter	Perimeter	Weight
				ft				in	in	plf
LDF7-50A (1-5/8 FOAM) (Verizon / E)	B	No	Surface Ar (CaAa)	145.00 - 140.00	15	15	0.000 0.000	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (Verizon / E)	C	No	Surface Ar (CaAa)	145.00 - 140.00	15	15	0.000 0.000	1.9800		0.82

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation	Face	$A_R$	$A_F$	$C_{AA}$ In Face	$C_{AA}$ Out Face	Weight
	ft		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	lb
L1	148.00-140.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	14.850	0.000	61.50
		C	0.000	0.000	14.850	0.000	61.50

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

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	$A_R$	$A_F$	$C_{AA}$ In Face	$C_{AA}$ Out Face	Weight
	ft		in	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	lb
L1	148.00-140.00	A	2.173	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	21.278	0.000	373.73
		C		0.000	0.000	21.278	0.000	373.73

### Feed Line Center of Pressure

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Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub> Ice	CP <sub>z</sub> Ice
	ft	in	in	in	in
L1	148.00-140.00	3.4817	2.0102	2.6938	1.5553

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

### Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L1	1	LDF7-50A (1-5/8 FOAM)	140.00 - 145.00	1.0000	1.0000
L1	2	LDF7-50A (1-5/8 FOAM)	140.00 - 145.00	1.0000	1.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
SitePro1 HRK12 (Verizon / P)	A	None		0.0000	147.00	No Ice 4.25 1/2" Ice 5.98 1" Ice 7.72	4.25 5.98 7.72	500.00 531.47 573.72
SitePro1 RMV 12-372 (Verizon / P)	A	None		0.0000	145.00	No Ice 7.44 1/2" Ice 14.00 1" Ice 20.56	7.44 14.00 20.56	850.00 983.33 1116.66
7770.00 w/ Mount Pipe (Verizon / E)	A	From Face	3.00 0.00 0.00	0.0000	145.00	No Ice 5.75 1/2" Ice 6.18 1" Ice 6.61	4.25 5.01 5.71	55.38 102.81 156.64
7770.00 w/ Mount Pipe (Verizon / E)	B	From Face	3.00 0.00 0.00	0.0000	145.00	No Ice 5.75 1/2" Ice 6.18 1" Ice 6.61	4.25 5.01 5.71	55.38 102.81 156.64
7770.00 w/ Mount Pipe (Verizon / E)	C	From Face	3.00 0.00 0.00	0.0000	145.00	No Ice 5.75 1/2" Ice 6.18 1" Ice 6.61	4.25 5.01 5.71	55.38 102.81 156.64
(2) LGP21401 (Verizon / E)	A	From Face	3.00 0.00 0.00	0.0000	145.00	No Ice 1.10 1/2" Ice 1.24 1" Ice 1.38	0.35 0.44 0.54	14.10 21.26 30.32
(2) LGP21401 (Verizon / E)	B	From Face	3.00 0.00 0.00	0.0000	145.00	No Ice 1.10 1/2" Ice 1.24 1" Ice 1.38	0.35 0.44 0.54	14.10 21.26 30.32
(2) LGP21401 (Verizon / E)	C	From Face	3.00 0.00 0.00	0.0000	145.00	No Ice 1.10 1/2" Ice 1.24 1" Ice 1.38	0.35 0.44 0.54	14.10 21.26 30.32
QS66512-2 w/ Mount Pipe	A	From Face	3.00	0.0000	145.00	No Ice 2.60	5.00	140.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
(Verizon / E)			0.00		1/2" Ice	9.29	9.66	211.24
			0.00		1" Ice	9.91	10.62	295.07
QS66512-2 w/ Mount Pipe (Verizon / E)	B	From Face	3.00	0.0000	145.00	No Ice	2.60	140.00
			0.00			1/2" Ice	9.29	211.24
			0.00			1" Ice	9.91	295.07
QS66512-2 w/ Mount Pipe (Verizon / E)	C	From Face	3.00	0.0000	145.00	No Ice	2.60	140.00
			0.00			1/2" Ice	9.29	211.24
			0.00			1" Ice	9.91	295.07
(2) TMA2117F00V1-1 (Verizon / E)	A	From Face	3.00	0.0000	145.00	No Ice	0.30	17.60
			0.00			1/2" Ice	0.37	24.43
			0.00			1" Ice	0.45	33.04
(2) TMA2117F00V1-1 (Verizon / E)	B	From Face	3.00	0.0000	145.00	No Ice	0.30	17.60
			0.00			1/2" Ice	0.37	24.43
			0.00			1" Ice	0.45	33.04
(2) TMA2117F00V1-1 (Verizon / E)	C	From Face	3.00	0.0000	145.00	No Ice	0.30	17.60
			0.00			1/2" Ice	0.37	24.43
			0.00			1" Ice	0.45	33.04
HPA65R-BU6A w/ mount pipe (Verizon / P)	A	From Face	3.00	0.0000	145.00	No Ice	8.34	71.10
			0.00			1/2" Ice	9.01	142.51
			0.00			1" Ice	9.64	222.06
HPA65R-BU6A w/ mount pipe (Verizon / P)	B	From Face	3.00	0.0000	145.00	No Ice	8.34	71.10
			0.00			1/2" Ice	9.01	142.51
			0.00			1" Ice	9.64	222.06
HPA65R-BU6A w/ mount pipe (Verizon / P)	C	From Face	3.00	0.0000	145.00	No Ice	8.34	71.10
			0.00			1/2" Ice	9.01	142.51
			0.00			1" Ice	9.64	222.06
(2) TMABPD7823VG12A (Verizon / P)	A	From Face	3.00	0.0000	145.00	No Ice	0.98	41.90
			0.00			1/2" Ice	1.10	49.19
			0.00			1" Ice	1.23	58.33
(2) TMABPD7823VG12A (Verizon / P)	B	From Face	3.00	0.0000	145.00	No Ice	0.98	41.90
			0.00			1/2" Ice	1.10	49.19
			0.00			1" Ice	1.23	58.33
(2) TMABPD7823VG12A (Verizon / P)	C	From Face	3.00	0.0000	145.00	No Ice	0.98	41.90
			0.00			1/2" Ice	1.10	49.19
			0.00			1" Ice	1.23	58.33

### Tower Pressures - No Ice

$$G_H = 1.350$$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F <sub>a</sub>	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>AA</sub> In Face	C <sub>AA</sub> Out Face
ft	ft		psf	ft <sup>2</sup>	c	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	%	ft <sup>2</sup>	ft <sup>2</sup>
L1 148.00-140.00	144.00	1.367	33	12.000	A	0.000	12.000	12.000	100.00	0.000	0.000
					B	0.000	12.000		100.00	14.850	0.000
					C	0.000	12.000		100.00	14.850	0.000

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**Tower Pressure - With Ice**

$G_H = 1.350$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	t <sub>z</sub>	A <sub>G</sub>	F <sub>a</sub>	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>AA</sub> In Face	C <sub>AA</sub> Out Face
ft	ft		psf	in	ft <sup>2</sup>	e	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 148.00-140.00	144.00	1.367	8	2.1726	14.897	A	0.000	14.897	14.897	100.00	0.000	0.000
						B	0.000	14.897		100.00	21.278	0.000
						C	0.000	14.897		100.00	21.278	0.000

**Tower Pressure - Service**

$G_H = 1.350$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F <sub>a</sub>	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>AA</sub> In Face	C <sub>AA</sub> Out Face
ft	ft		psf	ft <sup>2</sup>	e	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 148.00-140.00	144.00	1.367	11	12.000	A	0.000	12.000	12.000	100.00	0.000	0.000
					B	0.000	12.000		100.00	14.850	0.000
					C	0.000	12.000		100.00	14.850	0.000

**Load Combinations**

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp

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	<b>Client</b>	Smartlink, LLC	<b>Designed by</b>	ccarrillo

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

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	34	9776.94	949.23	-1644.11
	Max. H <sub>x</sub>	21	2951.36	5326.41	0.00
	Max. H <sub>z</sub>	2	3935.14	0.00	5326.41
	Max. M <sub>x</sub>	3	26708.53	0.00	5326.41
	Max. M <sub>z</sub>	8	26786.15	-5326.41	0.00
	Max. Torsion	28	0.00	-949.23	1644.11
	Min. Vert	17	2951.36	2663.21	-4612.81
	Min. H <sub>x</sub>	8	3935.14	-5326.41	0.00
	Min. H <sub>z</sub>	14	3935.14	0.00	-5326.41
	Min. M <sub>x</sub>	14	-26763.66	0.00	-5326.41
	Min. M <sub>z</sub>	21	-26691.66	5326.41	0.00
	Min. Torsion	34	-0.00	949.23	-1644.11

### Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
Dead Only	3279.28	0.00	0.00	25.60	-44.34	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	3935.14	0.00	-5326.41	-26702.20	-53.22	-0.00
0.9 Dead+1.6 Wind 0 deg - No Ice	2951.36	0.00	-5326.41	-26708.53	-39.91	-0.00
1.2 Dead+1.6 Wind 30 deg - No Ice	3935.14	2663.21	-4612.81	-23120.67	-13419.69	-0.00
0.9 Dead+1.6 Wind 30 deg - No Ice	2951.36	2663.21	-4612.81	-23127.18	-13405.70	-0.00

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Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
Ice						
1.2 Dead+1.6 Wind 60 deg - No Ice	3935.14	4612.81	-2663.21	-13335.74	-23204.62	-0.00
0.9 Dead+1.6 Wind 60 deg - No Ice	2951.36	4612.81	-2663.21	-13342.75	-23190.14	-0.00
1.2 Dead+1.6 Wind 90 deg - No Ice	3935.14	5326.41	0.00	30.73	-26786.15	-0.00
0.9 Dead+1.6 Wind 90 deg - No Ice	2951.36	5326.41	0.00	23.04	-26771.49	-0.00
1.2 Dead+1.6 Wind 120 deg - No Ice	3935.14	4612.81	2663.21	13397.19	-23204.62	0.00
0.9 Dead+1.6 Wind 120 deg - No Ice	2951.36	4612.81	2663.21	13388.83	-23190.14	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice	3935.14	2663.21	4612.81	23182.12	-13419.69	0.00
0.9 Dead+1.6 Wind 150 deg - No Ice	2951.36	2663.21	4612.81	23173.27	-13405.70	0.00
1.2 Dead+1.6 Wind 180 deg - No Ice	3935.14	0.00	5326.41	26763.66	-53.22	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	2951.36	0.00	5326.41	26754.62	-39.91	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice	3935.14	-2663.21	4612.81	23182.12	13313.25	0.00
0.9 Dead+1.6 Wind 210 deg - No Ice	2951.36	-2663.21	4612.81	23173.27	13325.88	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice	3935.14	-4612.81	2663.21	13397.19	23098.18	0.00
0.9 Dead+1.6 Wind 240 deg - No Ice	2951.36	-4612.81	2663.21	13388.83	23110.31	0.00
1.2 Dead+1.6 Wind 270 deg - No Ice	3935.14	-5326.41	0.00	30.73	26679.71	0.00
0.9 Dead+1.6 Wind 270 deg - No Ice	2951.36	-5326.41	0.00	23.04	26691.66	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice	3935.14	-4612.81	-2663.21	-13335.74	23098.18	0.00
0.9 Dead+1.6 Wind 300 deg - No Ice	2951.36	-4612.81	-2663.21	-13342.75	23110.31	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice	3935.14	-2663.21	-4612.81	-23120.67	13313.25	-0.00
0.9 Dead+1.6 Wind 330 deg - No Ice	2951.36	-2663.21	-4612.81	-23127.18	13325.88	-0.00
1.2 Dead+1.0 Ice+1.0 Temp	9776.94	0.00	0.00	160.68	-278.31	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	9776.94	0.00	-1898.46	-9400.04	-278.45	-0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	9776.94	949.23	-1644.11	-8119.14	-5058.86	-0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	9776.94	1644.11	-949.23	-4619.64	-8558.35	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	9776.94	1898.46	0.00	160.76	-9839.26	-0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	9776.94	1644.11	949.23	4941.17	-8558.35	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	9776.94	949.23	1644.11	8440.67	-5058.86	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	9776.94	0.00	1898.46	9721.57	-278.45	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	9776.94	-949.23	1644.11	8440.67	4501.95	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	9776.94	-1644.11	949.23	4941.17	8001.45	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	9776.94	-1898.46	0.00	160.76	9282.35	0.00



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Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	9776.94	-1644.11	-949.23	-4619.64	8001.45	0.00
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	9776.94	-949.23	-1644.11	-8119.14	4501.95	-0.00
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	3279.28	0.00	-1078.07	-5384.10	-44.34	0.00
Dead+Wind 30 deg - Service	3279.28	539.04	-933.64	-4659.33	-2749.19	0.00
Dead+Wind 60 deg - Service	3279.28	933.64	-539.04	-2679.25	-4729.27	0.00
Dead+Wind 90 deg - Service	3279.28	1078.07	0.00	25.60	-5454.03	0.00
Dead+Wind 120 deg - Service	3279.28	933.64	539.04	2730.45	-4729.27	0.00
Dead+Wind 150 deg - Service	3279.28	539.04	933.64	4710.53	-2749.19	0.00
Dead+Wind 180 deg - Service	3279.28	0.00	1078.07	5435.29	-44.34	0.00
Dead+Wind 210 deg - Service	3279.28	-539.04	933.64	4710.53	2660.51	0.00
Dead+Wind 240 deg - Service	3279.28	-933.64	539.04	2730.45	4640.59	0.00
Dead+Wind 270 deg - Service	3279.28	-1078.07	0.00	25.60	5365.36	0.00
Dead+Wind 300 deg - Service	3279.28	-933.64	-539.04	-2679.25	4640.59	0.00
Dead+Wind 330 deg - Service	3279.28	-539.04	-933.64	-4659.33	2660.51	0.00

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-3279.28	0.00	0.00	3279.28	0.00	0.000%
2	0.00	-3935.14	-5326.41	0.00	3935.14	5326.41	0.000%
3	0.00	-2951.36	-5326.41	0.00	2951.36	5326.41	0.000%
4	2663.21	-3935.14	-4612.81	-2663.21	3935.14	4612.81	0.000%
5	2663.21	-2951.36	-4612.81	-2663.21	2951.36	4612.81	0.000%
6	4612.81	-3935.14	-2663.21	-4612.81	3935.14	2663.21	0.000%
7	4612.81	-2951.36	-2663.21	-4612.81	2951.36	2663.21	0.000%
8	5326.41	-3935.14	0.00	-5326.41	3935.14	0.00	0.000%
9	5326.41	-2951.36	0.00	-5326.41	2951.36	0.00	0.000%
10	4612.81	-3935.14	2663.21	-4612.81	3935.14	-2663.21	0.000%
11	4612.81	-2951.36	2663.21	-4612.81	2951.36	-2663.21	0.000%
12	2663.21	-3935.14	4612.81	-2663.21	3935.14	-4612.81	0.000%
13	2663.21	-2951.36	4612.81	-2663.21	2951.36	-4612.81	0.000%
14	0.00	-3935.14	5326.41	0.00	3935.14	-5326.41	0.000%
15	0.00	-2951.36	5326.41	0.00	2951.36	-5326.41	0.000%
16	-2663.21	-3935.14	4612.81	2663.21	3935.14	-4612.81	0.000%
17	-2663.21	-2951.36	4612.81	2663.21	2951.36	-4612.81	0.000%
18	-4612.81	-3935.14	2663.21	4612.81	3935.14	-2663.21	0.000%
19	-4612.81	-2951.36	2663.21	4612.81	2951.36	-2663.21	0.000%
20	-5326.41	-3935.14	0.00	5326.41	3935.14	0.00	0.000%
21	-5326.41	-2951.36	0.00	5326.41	2951.36	0.00	0.000%
22	-4612.81	-3935.14	-2663.21	4612.81	3935.14	2663.21	0.000%
23	-4612.81	-2951.36	-2663.21	4612.81	2951.36	2663.21	0.000%
24	-2663.21	-3935.14	-4612.81	2663.21	3935.14	4612.81	0.000%
25	-2663.21	-2951.36	-4612.81	2663.21	2951.36	4612.81	0.000%
26	0.00	-9776.94	0.00	0.00	9776.94	0.00	0.000%
27	0.00	-9776.94	-1898.46	0.00	9776.94	1898.46	0.000%
28	949.23	-9776.94	-1644.11	-949.23	9776.94	1644.11	0.000%
29	1644.11	-9776.94	-949.23	-1644.11	9776.94	949.23	0.000%
30	1898.46	-9776.94	0.00	-1898.46	9776.94	0.00	0.000%
31	1644.11	-9776.94	949.23	-1644.11	9776.94	-949.23	0.000%
32	949.23	-9776.94	1644.11	-949.23	9776.94	-1644.11	0.000%
33	0.00	-9776.94	1898.46	0.00	9776.94	-1898.46	0.000%
34	-949.23	-9776.94	1644.11	949.23	9776.94	-1644.11	0.000%
35	-1644.11	-9776.94	949.23	1644.11	9776.94	-949.23	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
36	-1898.46	-9776.94	0.00	1898.46	9776.94	0.00	0.000%
37	-1644.11	-9776.94	-949.23	1644.11	9776.94	949.23	0.000%
38	-949.23	-9776.94	-1644.11	949.23	9776.94	1644.11	0.000%
39	0.00	-3279.28	-1078.07	0.00	3279.28	1078.07	0.000%
40	539.04	-3279.28	-933.64	-539.04	3279.28	933.64	0.000%
41	933.64	-3279.28	-539.04	-933.64	3279.28	539.04	0.000%
42	1078.07	-3279.28	0.00	-1078.07	3279.28	0.00	0.000%
43	933.64	-3279.28	539.04	-933.64	3279.28	-539.04	0.000%
44	539.04	-3279.28	933.64	-539.04	3279.28	-933.64	0.000%
45	0.00	-3279.28	1078.07	0.00	3279.28	-1078.07	0.000%
46	-539.04	-3279.28	933.64	539.04	3279.28	-933.64	0.000%
47	-933.64	-3279.28	539.04	933.64	3279.28	-539.04	0.000%
48	-1078.07	-3279.28	0.00	1078.07	3279.28	0.00	0.000%
49	-933.64	-3279.28	-539.04	933.64	3279.28	539.04	0.000%
50	-539.04	-3279.28	-933.64	539.04	3279.28	933.64	0.000%

## Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.0000001
2	Yes	4	0.0000001	0.0000001
3	Yes	4	0.0000001	0.0000001
4	Yes	4	0.0000001	0.0000001
5	Yes	4	0.0000001	0.0000001
6	Yes	4	0.0000001	0.0000001
7	Yes	4	0.0000001	0.0000001
8	Yes	4	0.0000001	0.0000001
9	Yes	4	0.0000001	0.0000001
10	Yes	4	0.0000001	0.0000001
11	Yes	4	0.0000001	0.0000001
12	Yes	4	0.0000001	0.0000001
13	Yes	4	0.0000001	0.0000001
14	Yes	4	0.0000001	0.0000001
15	Yes	4	0.0000001	0.0000001
16	Yes	4	0.0000001	0.0000001
17	Yes	4	0.0000001	0.0000001
18	Yes	4	0.0000001	0.0000001
19	Yes	4	0.0000001	0.0000001
20	Yes	4	0.0000001	0.0000001
21	Yes	4	0.0000001	0.0000001
22	Yes	4	0.0000001	0.0000001
23	Yes	4	0.0000001	0.0000001
24	Yes	4	0.0000001	0.0000001
25	Yes	4	0.0000001	0.0000001
26	Yes	4	0.0000001	0.0000001
27	Yes	4	0.0000001	0.0000001
28	Yes	4	0.0000001	0.0000001
29	Yes	4	0.0000001	0.0000001
30	Yes	4	0.0000001	0.0000001
31	Yes	4	0.0000001	0.0000001
32	Yes	4	0.0000001	0.0000001
33	Yes	4	0.0000001	0.0000001
34	Yes	4	0.0000001	0.0000001
35	Yes	4	0.0000001	0.0000001
36	Yes	4	0.0000001	0.0000001

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37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

**Maximum Tower Deflections - Service Wind**

Section No.	Elevation <i>ft</i>	Horz. Deflection <i>in</i>	Gov. Load Comb.	Tilt <i>°</i>	Twist <i>°</i>
L1	148 - 140	0.007	43	0.0000	0.0000

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

Elevation <i>ft</i>	Appurtenance	Gov. Load Comb.	Deflection <i>in</i>	Tilt <i>°</i>	Twist <i>°</i>	Radius of Curvature <i>ft</i>
147.00	SitePro1 HRK12	43	0.006	0.0000	0.0000	Inf
145.00	SitePro1 RMV 12-372	43	0.004	0.0000	0.0000	Inf

**Maximum Tower Deflections - Design Wind**

Section No.	Elevation <i>ft</i>	Horz. Deflection <i>in</i>	Gov. Load Comb.	Tilt <i>°</i>	Twist <i>°</i>
L1	148 - 140	0.032	10	0.0245	0.0000

**Critical Deflections and Radius of Curvature - Design Wind**

Elevation <i>ft</i>	Appurtenance	Gov. Load Comb.	Deflection <i>in</i>	Tilt <i>°</i>	Twist <i>°</i>	Radius of Curvature <i>ft</i>
147.00	SitePro1 HRK12	10	0.028	0.0215	0.0000	Inf
145.00	SitePro1 RMV 12-372	10	0.020	0.0153	0.0000	Inf

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### Compression Checks

### Pole Design Data

Section No.	Elevation <i>ft</i>	Size	<i>L</i> <i>ft</i>	<i>L<sub>u</sub></i> <i>ft</i>	<i>Kl/r</i>	<i>A</i> <i>in<sup>2</sup></i>	<i>P<sub>u</sub></i> <i>lb</i>	$\phi P_n$ <i>lb</i>	Ratio $\frac{P_u}{\phi P_n}$
L1	148 - 140 (1)	P18x.375	8.00	8.00	15.4	20.7640	-3935.14	773525.00	0.005

### Pole Bending Design Data

Section No.	Elevation <i>ft</i>	Size	<i>M<sub>ux</sub></i> <i>lb-ft</i>	$\phi M_{rx}$ <i>lb-ft</i>	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	<i>M<sub>uy</sub></i> <i>lb-ft</i>	$\phi M_{ry}$ <i>lb-ft</i>	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
L1	148 - 140 (1)	P18x.375	26794.42	367000.00	0.073	0.00	367000.00	0.000

### Pole Shear Design Data

Section No.	Elevation <i>ft</i>	Size	Actual <i>V<sub>u</sub></i> <i>lb</i>	$\phi V_n$ <i>lb</i>	Ratio $\frac{V_u}{\phi V_n}$	Actual <i>T<sub>u</sub></i> <i>lb-ft</i>	$\phi T_n$ <i>lb-ft</i>	Ratio $\frac{T_u}{\phi T_n}$
L1	148 - 140 (1)	P18x.375	5326.41	392439.00	0.014	0.00	564641.67	0.000

### Pole Interaction Design Data

Section No.	Elevation <i>ft</i>	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	Ratio $\frac{M_{uy}}{\phi M_{ry}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	148 - 140 (1)	0.005	0.073	0.000	0.014	0.000	0.078	1.000	4.8.2 ✓

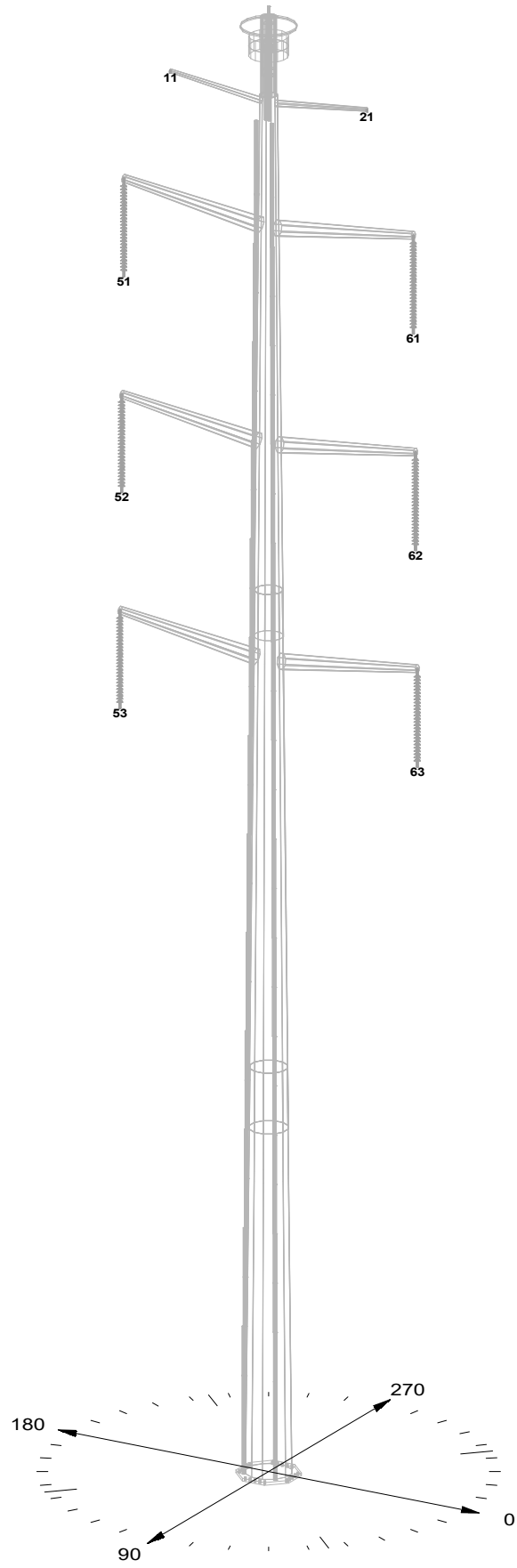
### Section Capacity Table

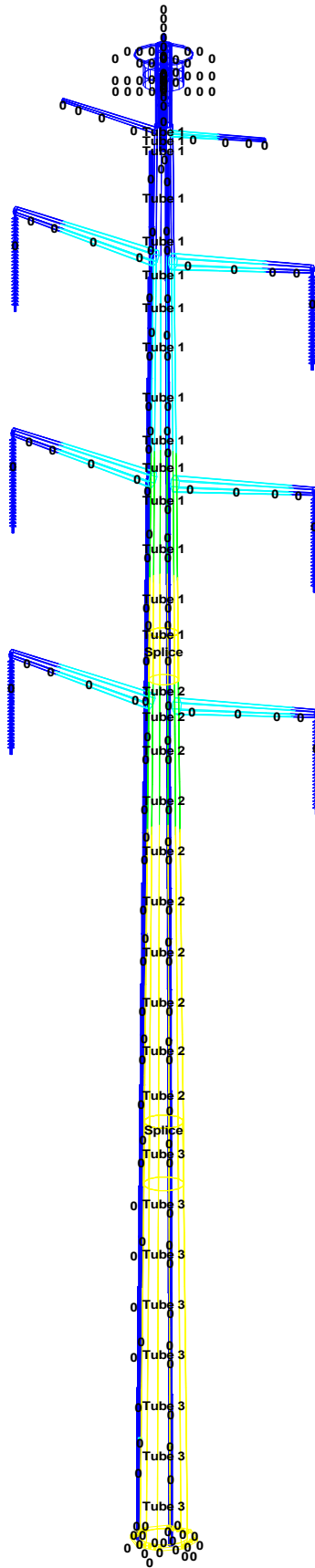
Section No.	Elevation <i>ft</i>	Component Type	Size	Critical Element	<i>P</i> <i>lb</i>	$\phi P_{allow}$ <i>lb</i>	% Capacity	Pass Fail	
L1	148 - 140	Pole	P18x.375	1	-3935.14	773525.00	7.8	Pass	
							Pole (L1) Summary	7.8	Pass

<b><i>tnxTower</i></b>  <b><i>Paul J. Ford and Company</i></b> <i>250 East Broad st., Suite 600</i> <i>Columbus, OH 43215</i> <i>Phone: (614) 221-6679</i> <i>FAX:</i>	<b>Job</b>	Stony Hill	<b>Page</b>	12 of 12
	<b>Project</b>	A80618-0011.001.6000	<b>Date</b>	12:40:45 05/02/19
	<b>Client</b>	Smartlink, LLC	<b>Designed by</b>	ccarrillo

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Size</i>	<i>Critical Element</i>	<i>P lb</i>	$\emptyset P_{allow}$ <i>lb</i>	<i>% Capacity</i>	<i>Pass Fail</i>
<b>RATING =</b>							<b>7.8</b>	<b>Pass</b>

Program Version 8.0.5.0 - 11/28/2018 File:G:/Transmission/Eversource/2018/806\_Smartlink/80618-0011 - Stony Hill/001.6000 - SA/\_R3/tnxTower/A80618-0011.001.6000 Mast Calculations.eri





Project Name : Pole 10254  
 Project Notes: AT&T - Bethel Stony Hill - AWS  
 Project File : G:\Transmission\Eversource\2018\806\_Smartlink\80618-0011\_Pole 10254\_ATT\_CTL05176\_Stony Hill\001.6000 - SA\R3\PLS-Pole\80618-0011.001.6000.pol  
 Date run : 9:23:20 AM Tuesday, May 21, 2019  
 by : PLS-POLE Version 15.52  
 Licensed to : Paul J. Ford and Company

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: G:\Transmission\Eversource\2018\806\_Smartlink\80618-0011\_Pole 10254\_ATT\_CTL05176\_Stony Hill\001.6000 - SA\R3\PLS-Pole\80618-0011.001.6000.lca

\*\*\* Analysis Results:

Maximum element usage is 94.19% for Base Plate "P" in load case "NESC 250C (Extreme Wind)"  
 Maximum insulator usage is 16.54% for Suspension "61" in load case "NESC 250B (Heavy)"

**Foundation Design Forces For All Load Cases:**

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
NESC 250B (Heavy)	P:g	111.24	38.67	4287.42	0.00
NESC 250C (Extreme Wind)	P:g	56.46	51.71	5275.81	0.00

**Summary of Joint Support Reactions For All Load Cases:**

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
NESC 250B (Heavy)	P:g	-0.23	-38.67	-111.24	38.67	4287.29	-33.30	4287.42	-2.96	0.00
NESC 250C (Extreme Wind)	P:g	-0.09	-51.71	-56.46	51.71	5275.80	-13.25	5275.81	-5.46	0.00

**Summary of Tip Deflections For All Load Cases:**

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
NESC 250B (Heavy)	P:t	0.75	98.54	-3.93	98.62	0.05	-6.13	0.01
NESC 250C (Extreme Wind)	P:t	0.28	118.59	-5.62	118.73	0.02	-7.44	0.01

**Tubes Summary:**

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)
P	1	5024	NESC 250C (Extreme Wind)	75.71	1080.67
P	2	10059	NESC 250C (Extreme Wind)	88.58	3228.78
P	3	10117	NESC 250C (Extreme Wind)	91.63	5275.82

\*\*\* Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

**Summary of Steel Pole Usages:**

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
P	91.63	NESC 250C (Extreme Wind)	35	28300.0

**Summary of Tubular Davit Usages:**

Tubular Label	Davit Maximum Usage %	Load Case	Segment Number	Weight (lbs)
SWL	28.48	NESC 250B (Heavy)	1	120.1
SWR	21.98	NESC 250B (Heavy)	1	120.1
TCL	32.33	NESC 250B (Heavy)	1	575.0
TCR	27.18	NESC 250B (Heavy)	1	575.0
MCL	32.55	NESC 250B (Heavy)	1	575.0
MCR	27.51	NESC 250B (Heavy)	1	575.0



BCL	32.87	NESC 250B (Heavy)	1	575.0
BCR	27.99	NESC 250B (Heavy)	1	575.0
Mast	8.87	NESC 250C (Extreme Wind)	1	565.2
CX11	29.99	NESC 250B (Heavy)	1	0.5
CX12	30.00	NESC 250B (Heavy)	1	0.5
CX21	19.96	NESC 250B (Heavy)	1	0.5
CX22	19.97	NESC 250B (Heavy)	1	0.5
CX31	19.96	NESC 250B (Heavy)	1	0.5
CX32	19.96	NESC 250B (Heavy)	1	0.5
CX41	19.95	NESC 250B (Heavy)	1	0.5
CX42	19.95	NESC 250B (Heavy)	1	0.5
CX51	19.93	NESC 250B (Heavy)	1	0.5
CX52	19.94	NESC 250B (Heavy)	1	0.5
CX61	19.92	NESC 250B (Heavy)	1	0.5
CX62	19.93	NESC 250B (Heavy)	1	0.5
CX71	19.91	NESC 250B (Heavy)	1	0.5
CX72	19.92	NESC 250B (Heavy)	1	0.5
CX81	19.90	NESC 250B (Heavy)	1	0.5
CX82	19.91	NESC 250B (Heavy)	1	0.5
CX91	19.88	NESC 250B (Heavy)	1	0.5
CX92	19.89	NESC 250B (Heavy)	1	0.5
CX101	19.87	NESC 250B (Heavy)	1	0.5
CX102	19.88	NESC 250B (Heavy)	1	0.5
CX111	19.85	NESC 250B (Heavy)	1	0.5
CX112	19.87	NESC 250B (Heavy)	1	0.5
CX121	19.84	NESC 250B (Heavy)	1	0.5
CX122	19.85	NESC 250B (Heavy)	1	0.5
CX131	24.81	NESC 250B (Heavy)	1	0.5
CX132	24.82	NESC 250B (Heavy)	1	0.5
CX141	14.86	NESC 250B (Heavy)	1	0.5
CX142	14.87	NESC 250B (Heavy)	1	0.5

\*\*\* Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC 250B (Heavy)	78.15	P Base Plate	
NESC 250C (Extreme Wind)	94.19	P Base Plate	

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC 250B (Heavy)	75.99	P	34
NESC 250C (Extreme Wind)	91.63	P	35

Summary of Base Plate Usages by Load Case:

Load Case	Pole Bend Label	Bend Line #	Length (in)	Vertical Load (kips)	X Moment (ft-k)	Y Bending Moment (ft-k)	Stress (ksi)	Bolt #	# Bolts	Max Bolt Moment Acting On Sum Bend Line (ft-k)	Minimum Load For Bend Line (kips)	Plate Thickness (in)	Usage %
NESC 250B (Heavy)	P	12	42.310	108.142	4287.292	-33.294	46.893	291.058	5	157.905	2.873	78.15	
NESC 250C (Extreme Wind)	P	12	42.310	53.357	5275.796	-13.241	56.517	350.797	5	189.920	3.154	94.19	

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Segment Number
NESC 250B (Heavy)	32.87	BCL	1
NESC 250C (Extreme Wind)	14.09	BCL	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case Weight (lbs)
21 Suspension	NESC 250B (Heavy)	7.87	15.0
11 Suspension	NESC 250B (Heavy)	8.17	15.0
61 Suspension	NESC 250B (Heavy)	16.54	0.0

51 Suspension	16.54	NESC 250B (Heavy)	0.0
62 Suspension	16.54	NESC 250B (Heavy)	0.0
52 Suspension	16.54	NESC 250B (Heavy)	0.0
63 Suspension	16.54	NESC 250B (Heavy)	0.0
53 Suspension	16.54	NESC 250B (Heavy)	0.0

\*\*\* Weight of structure (lbs):  
Weight of Tubular Davit Arms: 4269.8  
Weight of Steel Poles: 28300.0  
Weight of Equipment: 6339.7  
Weight of Suspensions: 30.0  
Total: 38939.4

\*\*\* End of Report

\*\*\*\*\*  
 \* PLS-POLE \*  
 \* POLE AND FRAME ANALYSIS AND DESIGN \*  
 \* Copyright Power Line Systems, Inc. 1999-2018 \*  
 \* \*\*\*\*\*

Project Name : Pole 10254  
 Project Notes: AT&T - Bethel Stony Hill - AWS  
 Project File : G:\Transmission\Eversource\2018\806\_Smartlink\80618-0011\_Pole 10254\_ATT\_CTL05176\_Stony Hill\001.6000 - SA\R3\PLS-Pole\80618-0011.001.6000.pol  
 Date run : 9:23:19 AM Tuesday, May 21, 2019  
 by : PLS-POLE Version 15.52  
 Licensed to : Paul J. Ford and Company

Successfully performed nonlinear analysis

The model has 0 warnings.



Modeling options:  
 Offset Arms from Pole/Mast: Yes  
 Offset Braces from Pole/Mast: Yes  
 Offset Guys from Pole/Mast: Yes  
 Offset Posts from Pole/Mast: Yes  
 Offset Strains from Pole/Mast: Yes  
 Use Alternate Convergence Process: No  
 Steel poles and tubular arms checked with ASCE/SEI 48-05

Default Modulus of Elasticity for Steel = 29000.00 (ksi)  
 Default Weight Density for Steel = 490.00 (lbs/ft^3)

**Steel Pole Properties:**

Steel Pole Property Number Label	Stock Length (ft)	Length Embedded Length (ft)	Base Plate	Shape	Tip Diameter (in)	Base Diameter (in)	Taper (in/ft)	Default Drag Coef.	Tubes	Modulus of Elasticity (ksi)	Weight Density (lbs/ft^3)	Shape At Base	Strength Check Type	Distance From Tip (ft)	Ultimate Trans. Load (kips)	Ultimate Long. Load (kips)	Texture
P10254	140.00	0	Yes	12F	20.19	53.5	0	1.6	3 tubes	0	0		Calculated	0.000	0.0000	0.0000	Galvanized Steel

**Steel Tubes Properties:**

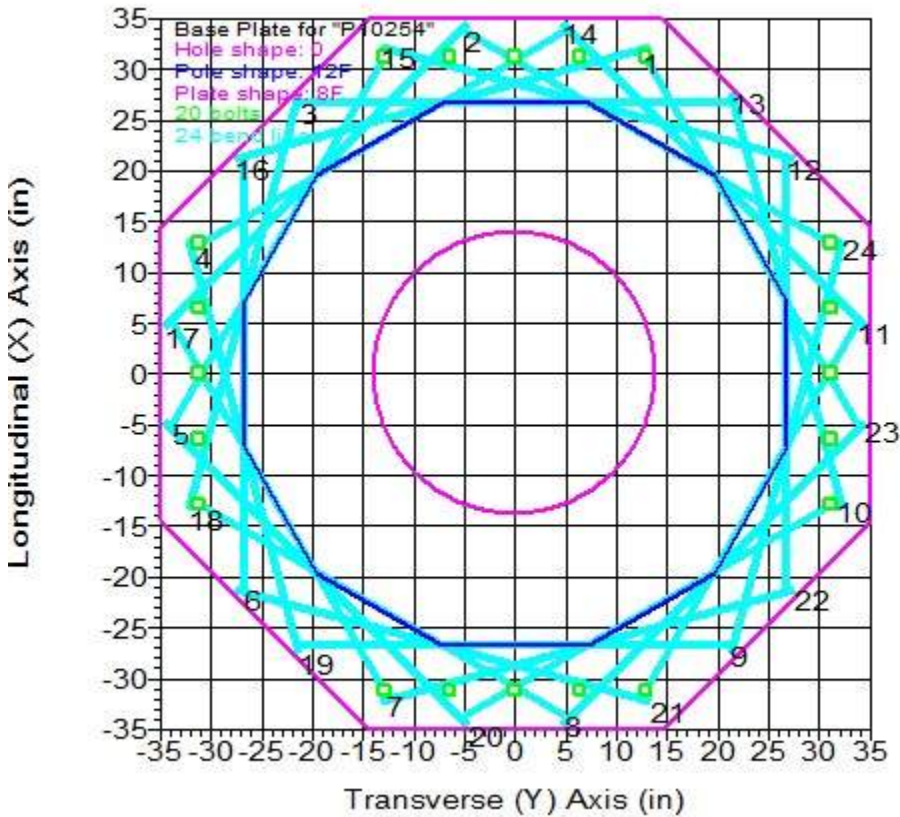
Pole Property No.	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Butt	Gap or Offset (in)	Yield Stress (ksi)	Moment Cap. (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. Diameter (in)	1.5x Diam. Lap Length (ft)	Actual Overlap (ft)
P10254	1	55	0.3125	4.670	0.000		0.000	65.000	0.000	5024	29.85	0.24864	20.19	33.87	4.155	4.670
P10254	2	54.67	0.4375	6.170	0.000		0.000	65.000	0.000	10059	28.95	0.24864	32.08	45.67	5.600	6.170
P10254	3	41.17	0.46875	0.000	0.000		0.000	65.000	0.000	10117	21.32	0.24864	43.26	53.50	0.000	0.000

Base Plate Properties:

Property	Pole Diam. (in)	Plate Shape	Plate Thick. (in)	Plate Weight (lbs)	Bend Line Length Override (in)	Hole Diam. (in)	Hole Shape	Steel Density (lbs/ft^3)	Steel Yield Stress (ksi)	Bolt Diam. (in)	Bolt Pattern Diam. (in)	Num. Of Bolts	Bolt Cage X Inertia (in^4)	Bolt Cage Y Inertia (in^4)
P10254	70.000	8F	3.250	3100	42.310	28.000	0	490.00	60.000	2.250	62.375	20	41968.80	41968.80

Base Plate Bolt Coordinates for Property "P10254":

Bolt Coord.	Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0	1	0	0
1	0.2064	0	0
1	0.4128	0	0
0.4128	1	0	0
0.2064	1	0	0
1	0	0	0



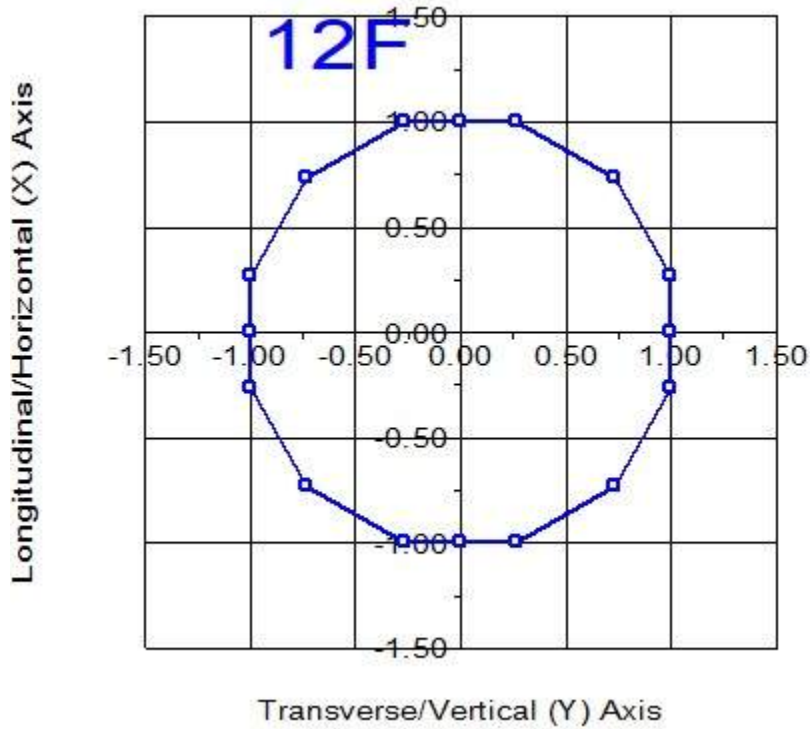
Steel Pole Connectivity:

Pole Label	Tip Joint	Base X of Joint	Y of Base	Z of Base	Inclin. About X	Inclin. About Y	Property Set	Attach. Labels	Base Connect	Embed %	Embed C. Override

----- (ft) (ft) (ft) (deg) (deg) (ft) -----  
P 0 0 0 0 0 P10254 18 labels Fixed 0.00 0

Relative Attachment Labels for Steel Pole "P":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
P:sw	0.70	0.00
P:tc	13.37	0.00
P:mc	35.37	0.00
P:bc	57.37	0.00
P:cx1	0.00	10.00
P:cx2	0.00	20.00
P:cx3	0.00	30.00
P:cx4	0.00	40.00
P:cx5	0.00	50.00
P:cx6	0.00	60.00
P:cx7	0.00	70.00
P:cx8	0.00	80.00
P:cx9	0.00	90.00
P:cx10	0.00	100.00
P:cx11	0.00	110.00
P:cx12	0.00	120.00
P:cx13	0.00	130.00
P:cx14	0.00	139.50



Pole Steel Properties:

Warning: Capacities and usages printed in splices are listed for the inner tube except at the splice top which uses the outer tube. ??

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	T-Moment Inertia (in^4)	L-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	T-Moment Capacity (ft-k)	L-Moment Capacity (ft-k)
P	P:t	P:t Ori	0.00	20.19	19.97	1010.31	1010.31	0.00	14.6	65.00	65.00	542.10	542.10
P	P:cx14	P:cx14 End	0.50	20.31	20.10	1029.38	1029.38	0.00	14.7	65.00	65.00	548.95	548.95
P	P:cx14	P:cx14 Ori	0.50	20.31	20.10	1029.38	1029.38	0.00	14.7	65.00	65.00	548.95	548.95
P	P:sw	P:sw End	0.70	20.36	20.15	1037.08	1037.08	0.00	14.8	65.00	65.00	551.71	551.71
P	P:sw	P:sw Ori	0.70	20.36	20.15	1037.08	1037.08	0.00	14.8	65.00	65.00	551.71	551.71
P	#P:0	Tube 1 End	5.35	21.52	21.31	1226.99	1226.99	0.00	15.8	65.00	65.00	617.67	617.67
P	#P:0	Tube 1 Ori	5.35	21.52	21.31	1226.99	1226.99	0.00	15.8	65.00	65.00	617.67	617.67
P	P:cx13	P:cx13 End	10.00	22.68	22.47	1438.77	1438.77	0.00	16.8	65.00	65.00	687.35	687.35
P	P:cx13	P:cx13 Ori	10.00	22.68	22.47	1438.77	1438.77	0.00	16.8	65.00	65.00	687.35	687.35
P	P:tc	P:tc End	13.37	23.51	23.31	1606.61	1606.61	0.00	17.5	65.00	65.00	740.18	740.18
P	P:tc	P:tc Ori	13.37	23.51	23.31	1606.61	1606.61	0.00	17.5	65.00	65.00	740.18	740.18
P	#P:1	Tube 1 End	16.69	24.34	24.14	1783.97	1783.97	0.00	18.2	65.00	65.00	794.06	794.06
P	#P:1	Tube 1 Ori	16.69	24.34	24.14	1783.97	1783.97	0.00	18.2	65.00	65.00	794.06	794.06
P	P:cx12	P:cx12 End	20.00	25.16	24.97	1973.92	1973.92	0.00	18.9	65.00	65.00	849.83	849.83
P	P:cx12	P:cx12 Ori	20.00	25.16	24.97	1973.92	1973.92	0.00	18.9	65.00	65.00	849.83	849.83
P	#P:2	Tube 1 End	25.00	26.41	26.22	2285.21	2285.21	0.00	20.0	65.00	65.00	937.53	937.53
P	#P:2	Tube 1 Ori	25.00	26.41	26.22	2285.21	2285.21	0.00	20.0	65.00	65.00	937.53	937.53
P	P:cx11	P:cx11 End	30.00	27.65	27.47	2627.62	2627.62	0.00	21.0	65.00	65.00	1029.53	1029.53
P	P:cx11	P:cx11 Ori	30.00	27.65	27.47	2627.62	2627.62	0.00	21.0	65.00	65.00	1029.53	1029.53
P	#P:3	Tube 1 End	32.69	28.32	28.14	2824.85	2824.85	0.00	21.6	65.00	65.00	1080.72	1080.72
P	#P:3	Tube 1 Ori	32.69	28.32	28.14	2824.86	2824.86	0.00	21.6	65.00	65.00	1080.72	1080.72
P	P:mc	P:mc End	35.37	28.98	28.81	3031.72	3031.72	0.00	22.2	65.00	65.00	1133.14	1133.14
P	P:mc	P:mc Ori	35.37	28.98	28.81	3031.72	3031.72	0.00	22.2	65.00	65.00	1133.14	1133.14
P	P:cx10	P:cx10 End	40.00	30.14	29.97	3411.73	3411.73	0.00	23.2	65.00	65.00	1226.46	1226.46
P	P:cx10	P:cx10 Ori	40.00	30.14	29.97	3411.73	3411.73	0.00	23.2	65.00	65.00	1226.46	1226.46
P	#P:4	Tube 1 End	45.00	31.38	31.22	3856.40	3856.40	0.00	24.2	65.00	65.00	1331.39	1331.39
P	#P:4	Tube 1 Ori	45.00	31.38	31.22	3856.40	3856.40	0.00	24.2	65.00	65.00	1331.39	1331.39
P	P:cx9	P:cx9 End	50.00	32.62	32.47	4338.12	4338.12	0.00	25.3	65.00	65.00	1440.62	1440.62
P	P:cx9	P:cx9 Ori	50.00	32.62	32.47	4338.12	4338.12	0.00	25.3	65.00	65.00	1440.62	1440.62
P	#P:5	SpliceT End	50.33	32.70	32.55	4371.25	4371.25	0.00	25.4	65.00	65.00	1447.98	1447.98
P	#P:5	SpliceT Ori	50.33	32.70	32.55	4371.25	4371.25	0.00	25.4	65.00	65.00	1447.98	1447.98
P	#P:6	SpliceB End	55.00	33.24	46.14	6356.28	6356.28	0.00	17.7	65.00	65.00	2071.57	2071.57
P	#P:6	SpliceB Ori	55.00	33.24	46.14	6356.28	6356.28	0.00	17.7	65.00	65.00	2071.57	2071.57
P	P:bc	P:bc End	57.37	33.83	46.97	6704.99	6704.99	0.00	18.0	65.00	65.00	2147.15	2147.15
P	P:bc	P:bc Ori	57.37	33.83	46.97	6705.00	6705.00	0.00	18.0	65.00	65.00	2147.15	2147.15
P	P:cx8	P:cx8 End	60.00	34.48	47.89	7106.63	7106.63	0.00	18.4	65.00	65.00	2232.61	2232.61
P	P:cx8	P:cx8 Ori	60.00	34.48	47.89	7106.63	7106.63	0.00	18.4	65.00	65.00	2232.61	2232.61
P	#P:7	Tube 2 End	65.00	35.73	49.64	7913.83	7913.83	0.00	19.2	65.00	65.00	2399.68	2399.68
P	#P:7	Tube 2 Ori	65.00	35.73	49.64	7913.83	7913.83	0.00	19.2	65.00	65.00	2399.68	2399.68
P	P:cx7	P:cx7 End	70.00	36.97	51.39	8779.95	8779.95	0.00	20.0	65.00	65.00	2572.79	2572.79
P	P:cx7	P:cx7 Ori	70.00	36.97	51.39	8779.95	8779.95	0.00	20.0	65.00	65.00	2572.79	2572.79
P	#P:8	Tube 2 End	75.00	38.21	53.14	9707.06	9707.06	0.00	20.7	65.00	65.00	2751.92	2751.92
P	#P:8	Tube 2 Ori	75.00	38.21	53.14	9707.06	9707.06	0.00	20.7	65.00	65.00	2751.92	2751.92
P	P:cx6	P:cx6 End	80.00	39.46	54.89	10697.25	10697.25	0.00	21.5	65.00	65.00	2937.08	2937.08
P	P:cx6	P:cx6 Ori	80.00	39.46	54.89	10697.25	10697.25	0.00	21.5	65.00	65.00	2937.08	2937.08
P	#P:9	Tube 2 End	85.00	40.70	56.64	11752.59	11752.59	0.00	22.2	65.00	65.00	3128.27	3128.27
P	#P:9	Tube 2 Ori	85.00	40.70	56.64	11752.59	11752.59	0.00	22.2	65.00	65.00	3128.27	3128.27
P	P:cx5	P:cx5 End	90.00	41.94	58.39	12875.16	12875.16	0.00	23.0	65.00	65.00	3325.49	3325.49
P	P:cx5	P:cx5 Ori	90.00	41.94	58.39	12875.16	12875.16	0.00	23.0	65.00	65.00	3325.49	3325.49
P	#P:10	Tube 2 End	94.42	43.04	59.93	13923.93	13923.93	0.00	23.7	65.00	65.00	3504.65	3504.65
P	#P:10	Tube 2 Ori	94.42	43.04	59.93	13923.93	13923.93	0.00	23.7	65.00	65.00	3504.65	3504.65
P	#P:11	SpliceT End	98.83	44.14	61.48	15028.16	15028.16	0.00	24.4	65.00	65.00	3688.51	3688.51
P	#P:11	SpliceT Ori	98.83	44.14	61.48	15028.16	15028.16	0.00	24.4	65.00	65.00	3688.51	3688.51
P	P:cx4	P:cx4 End	100.00	43.55	64.94	15431.24	15431.24	0.00	22.2	65.00	65.00	3838.23	3838.23
P	P:cx4	P:cx4 Ori	100.00	43.55	64.94	15431.24	15431.24	0.00	22.2	65.00	65.00	3838.23	3838.23
P	#P:12	SpliceB End	105.00	44.80	66.81	16805.83	16805.83	0.00	22.9	65.00	65.00	4064.13	4064.13
P	#P:12	SpliceB Ori	105.00	44.80	66.81	16805.84	16805.84	0.00	22.9	65.00	65.00	4064.13	4064.13
P	P:cx3	P:cx3 End	110.00	46.04	68.69	18259.73	18259.73	0.00	23.6	65.00	65.00	4296.49	4296.49
P	P:cx3	P:cx3 Ori	110.00	46.04	68.69	18259.73	18259.73	0.00	23.6	65.00	65.00	4296.49	4296.49
P	#P:13	Tube 3 End	115.00	47.28	70.56	19795.15	19795.15	0.00	24.3	65.00	65.00	4535.31	4535.31
P	#P:13	Tube 3 Ori	115.00	47.28	70.56	19795.15	19795.15	0.00	24.3	65.00	65.00	4535.31	4535.31
P	P:cx2	P:cx2 End	120.00	48.53	72.43	21414.32	21414.32	0.00	25.1	65.00	65.00	4780.58	4780.58
P	P:cx2	P:cx2 Ori	120.00	48.53	72.43	21414.32	21414.32	0.00	25.1	65.00	65.00	4780.58	4780.58
P	#P:14	Tube 3 End	125.00	49.77	74.31	23119.46	23119.46	0.00	25.8	65.00	65.00	5032.32	5032.32
P	#P:14	Tube 3 Ori	125.00	49.77	74.31	23119.47	23119.47	0.00	25.8	65.00	65.00	5032.32	5032.32
P	P:cx1	P:cx1 End	130.00	51.01	76.18	24912.81	24912.81	0.00	26.5	65.00	65.00	5290.52	5290.52
P	P:cx1	P:cx1 Ori	130.00	51.01	76.18	24912.81	24912.81	0.00	26.5	65.00	65.00	5290.52	5290.52
P	#P:15	Tube 3 End	135.00	52.26	78.06	26796.58	26796.58	0.00	27.2	65.00	65.00	5555.18	5555.18
P	#P:15	Tube 3 Ori	135.00	52.26	78.06	26796.58	26796.58	0.00	27.2	65.00	65.00	5555.18	5555.18
P	P:g	P:g End	140.00	53.50	79.93	28772.99	28772.99	0.00	27.9	65.00	65.00	5826.30	5826.30

Equipment Library:

Equipment Property Label	Stock Weight Number	Wind Area	Ice Area	Shape or EIA Antenna Type	Drag Coef.	Diameter	Height	Vertical Offset
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		(lbs)	(ft^2)	(ft^2)		(ft)	(ft)	(ft)
Existing Mounting Pipe #1	2.375"O.D. x 8` Mount Pipe	29.2	1.58	5.04	Circle	1.63	0.20	8.00
Proposed Antenna #1	HPA-65R-BU6A	41.9	5.78	20.29	Square	2.00	0.98	5.93
Proposed TMA #1	TMABPD7823VG12A	23.1	0.81	2.75	Square	2.00	0.89	0.92
Existing Antenna #1	7770	39.0	4.23	13.00	Square	2.00	0.92	4.62
Existing TMA #1	LGP 21401	14.1	0.92	2.69	Square	2.00	0.77	1.20
Existing Antenna #2	QS66512-2	111.0	6.00	23.20	Square	2.00	1.00	6.00
Existing TMA #2	TMA2117F00V1-1	26.0	0.81	3.01	Square	2.00	0.82	0.98
Existing Mount #1	(1) SiteProl RMV12-3xx	850.0	7.48	52.29	Circle	1.00	3.74	2.00
Existing Mount #2	SiteProl HRK14	356.0	1.34	17.14	Circle	1.00	5.36	0.25
CR-1 - CX11 - 0-15ft	CR-1 - CX11	203.0	4.95	116.63	Circle	1.60	0.33	15.00
CR-1 - CX21 - 15-25ft	CR-1 - CX21	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-1 - CX31 - 25-35ft	CR-1 - CX31	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-1 - CX41 - 35-45ft	CR-1 - CX41	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-1 - CX51 - 45-55ft	CR-1 - CX51	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-1 - CX61 - 55-65ft	CR-1 - CX61	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-1 - CX71 - 65-75ft	CR-1 - CX71	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-1 - CX81 - 75-85ft	CR-1 - CX81	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-1 - CX91 - 85-95ft	CR-1 - CX91	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-1 - CX101 - 95-105ft	CR-1 - CX101	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-1 - CX111 - 105-115ft	CR-1 - CX111	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-1 - CX121 - 115-125ft	CR-1 - CX121	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-1 - CX131 - 125-137.5ft	CR-1 - CX131	169.0	4.13	97.19	Circle	1.60	0.33	12.50
CR-1 - CX141 - 137.5-145ft	CR-1 - CX141	101.0	2.48	58.32	Circle	1.60	0.33	7.50
CR-2 - CX12 - 0-15ft	CR-2 - CX12	203.0	4.95	116.63	Circle	1.60	0.33	15.00
CR-2 - CX22 - 15-25ft	CR-2 - CX22	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-2 - CX32 - 25-35ft	CR-2 - CX32	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-2 - CX42 - 35-45ft	CR-2 - CX42	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-2 - CX52 - 45-55ft	CR-2 - CX52	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-2 - CX62 - 55-65ft	CR-2 - CX62	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-2 - CX72 - 65-75ft	CR-2 - CX72	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-2 - CX82 - 75-85ft	CR-2 - CX82	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-2 - CX92 - 85-95ft	CR-2 - CX92	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-2 - CX102 - 95-105ft	CR-2 - CX102	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-2 - CX112 - 105-115ft	CR-2 - CX112	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-2 - CX122 - 115-125ft	CR-2 - CX122	135.0	3.30	77.75	Circle	1.60	0.33	10.00
CR-2 - CX132 - 125-137.5ft	CR-2 - CX132	169.0	4.13	97.19	Circle	1.60	0.33	12.50
CR-2 - CX142 - 137.5-145ft	CR-2 - CX142	101.0	2.48	58.32	Circle	1.60	0.33	7.50

Equipment Connectivity:

Equipment Label	Attach Label	Equipment Property Set	Azimuth (deg)	Offset (ft)	Measured Relative To	EIA Antenna Orientation Angle (deg)
Exist_Mnt-1	Mast:1	Existing Mount #1	0	0	Center	0.00
Exist_Mnt-2	Mast:2	Existing Mount #2	0	0	Center	0.00
Ex_Mnt_Pipe_1-1	Mast:1	Existing Mounting Pipe #1	0	0	Center	0.00
Ex_Mnt_Pipe_1-2	Mast:1	Existing Mounting Pipe #1	0	0	Center	0.00
Ex_Mnt_Pipe_1-3	Mast:1	Existing Mounting Pipe #1	0	0	Center	0.00
Ex_Mnt_Pipe_1-4	Mast:1	Existing Mounting Pipe #1	0	0	Center	0.00
Ex_Mnt_Pipe_1-5	Mast:1	Existing Mounting Pipe #1	0	0	Center	0.00
Ex_Mnt_Pipe_1-6	Mast:1	Existing Mounting Pipe #1	0	0	Center	0.00
Ex_Mnt_Pipe_1-7	Mast:1	Existing Mounting Pipe #1	0	0	Center	0.00
Ex_Mnt_Pipe_1-8	Mast:1	Existing Mounting Pipe #1	0	0	Center	0.00
Ex_Mnt_Pipe_1-9	Mast:1	Existing Mounting Pipe #1	0	0	Center	0.00
Prop_Ant_1-1	Mast:1	Proposed Antenna #1	0	0	Center	0.00
Prop_Ant_1-2	Mast:1	Proposed Antenna #1	0	0	Center	0.00
Prop_Ant_1-3	Mast:1	Proposed Antenna #1	0	0	Center	0.00
Prop_TMA-1-1	Mast:1	Proposed TMA #1	0	0	Center	0.00
Prop_TMA-1-2	Mast:1	Proposed TMA #1	0	0	Center	0.00
Prop_TMA-1-3	Mast:1	Proposed TMA #1	0	0	Center	0.00
Prop_TMA-1-4	Mast:1	Proposed TMA #1	0	0	Center	0.00
Prop_TMA-1-5	Mast:1	Proposed TMA #1	0	0	Center	0.00
Prop_TMA-1-6	Mast:1	Proposed TMA #1	0	0	Center	0.00
Ex_Ant_1-1	Mast:1	Existing Antenna #1	0	0	Center	0.00
Ex_Ant_1-2	Mast:1	Existing Antenna #1	0	0	Center	0.00
Ex_Ant_1-3	Mast:1	Existing Antenna #1	0	0	Center	0.00
Ex_TMA-1-1	Mast:1	Existing TMA #1	0	0	Center	0.00
Ex_TMA-1-2	Mast:1	Existing TMA #1	0	0	Center	0.00
Ex_TMA-1-3	Mast:1	Existing TMA #1	0	0	Center	0.00
Ex_TMA-1-4	Mast:1	Existing TMA #1	0	0	Center	0.00
Ex_TMA-1-5	Mast:1	Existing TMA #1	0	0	Center	0.00
Ex_TMA-1-6	Mast:1	Existing TMA #1	0	0	Center	0.00
Exist_Ant_4	Mast:1	Existing Antenna #2	0	0	Center	0.00
Exist_Ant_5	Mast:1	Existing Antenna #2	0	0	Center	0.00
Exist_Ant_6	Mast:1	Existing Antenna #2	0	0	Center	0.00
Ex_TMA-2-1	Mast:1	Existing TMA #2	0	0	Center	0.00

Ex_TMA-2-2	Mast:1	Existing TMA #2	0	0	Center	0.00
Ex_TMA-2-3	Mast:1	Existing TMA #2	0	0	Center	0.00
Ex_TMA-2-4	Mast:1	Existing TMA #2	0	0	Center	0.00
Ex_TMA-2-5	Mast:1	Existing TMA #2	0	0	Center	0.00
Ex_TMA-2-6	Mast:1	Existing TMA #2	0	0	Center	0.00
CR-1 - CX11	CX11:1	CR-1 - CX11 - 0-15ft	0	0	Center	0.00
CR-1 - CX21	CX21:1	CR-1 - CX21 - 15-25ft	0	0	Center	0.00
CR-1 - CX31	CX31:1	CR-1 - CX31 - 25-35ft	0	0	Center	0.00
CR-1 - CX41	CX41:1	CR-1 - CX41 - 35-45ft	0	0	Center	0.00
CR-1 - CX51	CX51:1	CR-1 - CX51 - 45-55ft	0	0	Center	0.00
CR-1 - CX61	CX61:1	CR-1 - CX61 - 55-65ft	0	0	Center	0.00
CR-1 - CX71	CX71:1	CR-1 - CX71 - 65-75ft	0	0	Center	0.00
CR-1 - CX81	CX81:1	CR-1 - CX81 - 75-85ft	0	0	Center	0.00
CR-1 - CX91	CX91:1	CR-1 - CX91 - 85-95ft	0	0	Center	0.00
CR-1 - CX101	CX101:1	CR-1 - CX101 - 95-105ft	0	0	Center	0.00
CR-1 - CX111	CX111:1	CR-1 - CX111 - 105-115ft	0	0	Center	0.00
CR-1 - CX121	CX121:1	CR-1 - CX121 - 115-125ft	0	0	Center	0.00
CR-1 - CX131	CX131:1	CR-1 - CX131 - 125-137.5ft	0	0	Center	0.00
CR-1 - CX141	CX141:1	CR-1 - CX141 - 137.5-145ft	0	0	Center	0.00
CR-2 - CX12	CX12:1	CR-2 - CX12 - 0-15ft	0	0	Center	0.00
CR-2 - CX22	CX22:1	CR-2 - CX22 - 15-25ft	0	0	Center	0.00
CR-2 - CX32	CX32:1	CR-2 - CX32 - 25-35ft	0	0	Center	0.00
CR-2 - CX42	CX42:1	CR-2 - CX42 - 35-45ft	0	0	Center	0.00
CR-2 - CX52	CX52:1	CR-2 - CX52 - 45-55ft	0	0	Center	0.00
CR-2 - CX62	CX62:1	CR-2 - CX62 - 55-65ft	0	0	Center	0.00
CR-2 - CX72	CX72:1	CR-2 - CX72 - 65-75ft	0	0	Center	0.00
CR-2 - CX82	CX82:1	CR-2 - CX82 - 75-85ft	0	0	Center	0.00
CR-2 - CX92	CX92:1	CR-2 - CX92 - 85-95ft	0	0	Center	0.00
CR-2 - CX102	CX102:1	CR-2 - CX102 - 95-105ft	0	0	Center	0.00
CR-2 - CX112	CX112:1	CR-2 - CX112 - 105-115ft	0	0	Center	0.00
CR-2 - CX122	CX122:1	CR-2 - CX122 - 115-125ft	0	0	Center	0.00
CR-2 - CX132	CX132:1	CR-2 - CX132 - 125-137.5ft	0	0	Center	0.00
CR-2 - CX142	CX142:1	CR-2 - CX142 - 137.5-145ft	0	0	Center	0.00

**Tubular Davit Properties:**

Davit Property Number Label	Stock Number	Steel Shape	Thickness (in)	Base Diameter or Depth (in)	Tip Diameter or Depth (in)	Taper (in/ft)	Drag Coef.	Modulus of Elasticity (ksi)	Geometry	Strength Check Type	Vertical Capacity (lbs)	Tension Capacity (lbs)	Compress. Capacity (lbs)	Long. Capacity (lbs)	Yield Stress (ksi)	Weight Density (lbs/ft^3)	Steel Shape	Texture
Eversource Pole #10254 (SW)		6T	0.1875	7.17	4	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0		
Eversource Pole #10254 (C)		8T	0.25	18.46	9	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0		
3" coax post		0	0.25	1	1	0	1	29000	1 point	Calculated	0	0	0	0	65	0		
8'x18"x0.375" Extension		0	0.375	18	18	0	1.3	29000	3 points	Calculated	0	0	0	0	42	0		

**Intermediate Joints for Davit Property "Eversource Pole #10254 (SW)":**

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
1	10	-1.1979

**Intermediate Joints for Davit Property "Eversource Pole #10254 (C)":**

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
1	15	-2

**Intermediate Joints for Davit Property "3" coax post":**

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
1	0.25	0

**Intermediate Joints for Davit Property "8'x18"x0.375" Extension":**

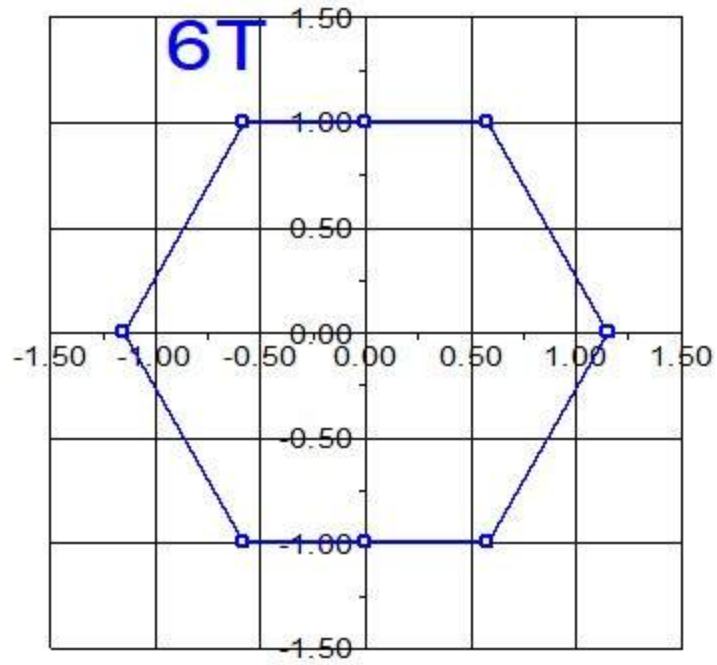
Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
1	0	-5
2	0	-7
3	0	-8



Tubular Davit Arm Connectivity:

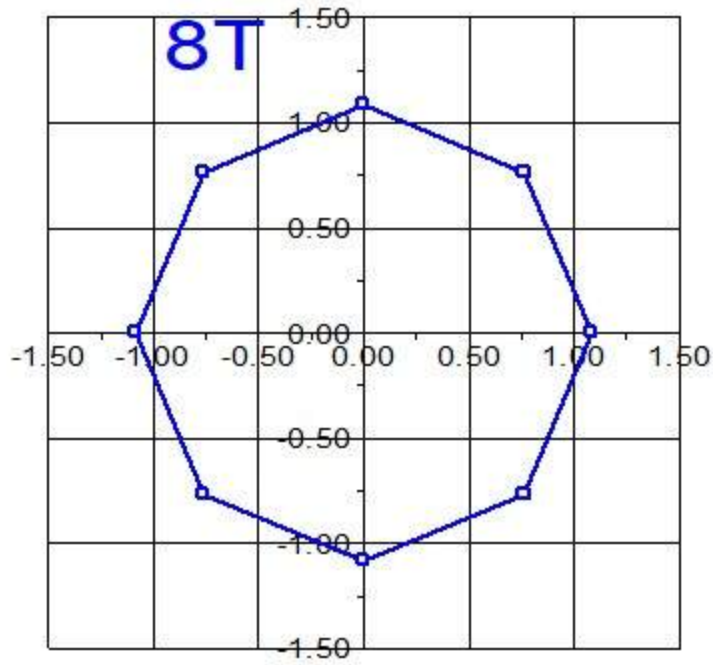
Davit Attach Label	Davit Attach Label	Davit Property Set	Azimuth (deg)
SWL	P:sw	Eversource Pole #10254 (SW)	0
SWR	P:sw	Eversource Pole #10254 (SW)	180
TCL	P:tc	Eversource Pole #10254 (C)	0
TCR	P:tc	Eversource Pole #10254 (C)	180
MCL	P:mc	Eversource Pole #10254 (C)	0
MCR	P:mc	Eversource Pole #10254 (C)	180
BCL	P:bc	Eversource Pole #10254 (C)	0
BCR	P:bc	Eversource Pole #10254 (C)	180
Mast	P:t	8`x18"x0.375" Extension	0
CX11	P:cx1	3" coax post	45
CX12	P:cx1	3" coax post	135
CX21	P:cx2	3" coax post	45
CX22	P:cx2	3" coax post	135
CX31	P:cx3	3" coax post	45
CX32	P:cx3	3" coax post	135
CX41	P:cx4	3" coax post	45
CX42	P:cx4	3" coax post	135
CX51	P:cx5	3" coax post	45
CX52	P:cx5	3" coax post	135
CX61	P:cx6	3" coax post	45
CX62	P:cx6	3" coax post	135
CX71	P:cx7	3" coax post	45
CX72	P:cx7	3" coax post	135
CX81	P:cx8	3" coax post	45
CX82	P:cx8	3" coax post	135
CX91	P:cx9	3" coax post	45
CX92	P:cx9	3" coax post	135
CX101	P:cx10	3" coax post	45
CX102	P:cx10	3" coax post	135
CX111	P:cx11	3" coax post	45
CX112	P:cx11	3" coax post	135
CX121	P:cx12	3" coax post	45
CX122	P:cx12	3" coax post	135
CX131	P:cx13	3" coax post	45
CX132	P:cx13	3" coax post	135
CX141	Mast:1	3" coax post	45
CX142	Mast:1	3" coax post	135

Longitudinal/Horizontal (X) Axis



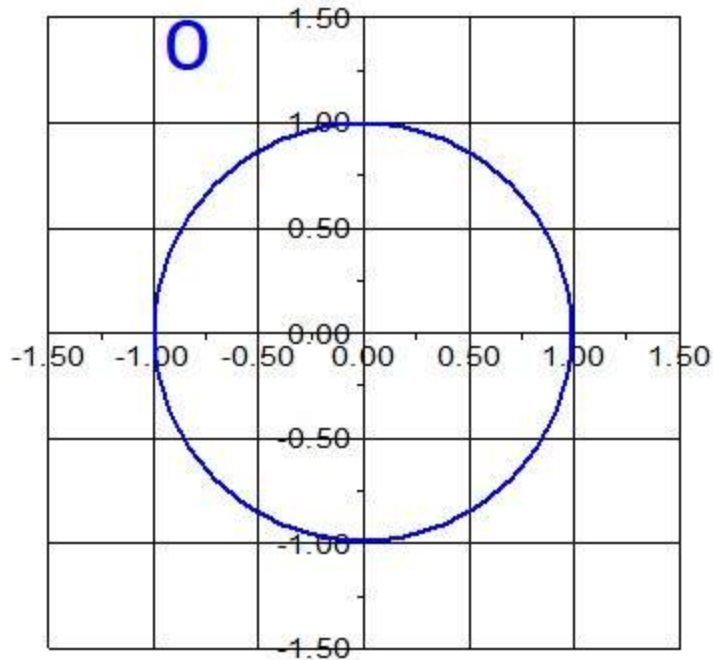
Transverse/Vertical (Y) Axis

Longitudinal/Horizontal (X) Axis



Transverse/Vertical (Y) Axis

Longitudinal/Horizontal (X) Axis



Transverse/Vertical (Y) Axis

**Tubular Davit Arm Steel Properties:**

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in <sup>2</sup> )	V-Moment Inertia (in <sup>4</sup> )	H-Moment Inertia (in <sup>4</sup> )	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	V-Moment Capacity (ft-k)	H-Moment Capacity (ft-k)
SWL	SWL:0	Origin	0.00	7.17	4.54	30.73	30.73	0.00	16.3	65.00	65.00	40.21	46.43
SWL	#SWL:0	End	5.00	5.60	3.51	14.29	14.29	0.00	11.5	65.00	65.00	23.96	27.66
SWL	#SWL:0	Origin	5.00	5.60	3.51	14.29	14.29	0.00	11.5	65.00	65.00	23.96	27.66
SWL	#SWL:1	End	7.54	4.80	2.99	8.86	8.86	0.00	9.0	65.00	65.00	17.32	20.00
SWL	#SWL:1	Origin	7.54	4.80	2.99	8.86	8.86	0.00	9.0	65.00	65.00	17.32	20.00
SWL	SWL:1	End	10.07	4.00	2.48	5.01	5.01	0.00	6.5	65.00	65.00	11.75	13.57
SWR	SWR:0	Origin	0.00	7.17	4.54	30.73	30.73	0.00	16.3	65.00	65.00	40.21	46.43
SWR	#SWR:0	End	5.00	5.60	3.51	14.29	14.29	0.00	11.5	65.00	65.00	23.96	27.66
SWR	#SWR:0	Origin	5.00	5.60	3.51	14.29	14.29	0.00	11.5	65.00	65.00	23.96	27.66
SWR	#SWR:1	End	7.54	4.80	2.99	8.86	8.86	0.00	9.0	65.00	65.00	17.32	20.00
SWR	#SWR:1	Origin	7.54	4.80	2.99	8.86	8.86	0.00	9.0	65.00	65.00	17.32	20.00
SWR	SWR:1	End	10.07	4.00	2.48	5.01	5.01	0.00	6.5	65.00	65.00	11.75	13.57
TCL	TCL:0	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
TCL	#TCL:0	End	5.00	15.33	12.50	375.85	375.85	0.00	21.3	65.00	65.00	245.32	245.32
TCL	#TCL:0	Origin	5.00	15.33	12.50	375.85	375.85	0.00	21.3	65.00	65.00	245.32	245.32
TCL	#TCL:1	End	10.00	12.21	9.91	187.31	187.31	0.00	16.1	65.00	65.00	153.55	153.55
TCL	#TCL:1	Origin	10.00	12.21	9.91	187.31	187.31	0.00	16.1	65.00	65.00	153.55	153.55
TCL	#TCL:2	End	12.57	10.60	8.58	121.60	121.60	0.00	13.4	65.00	65.00	114.77	114.77
TCL	#TCL:2	Origin	12.57	10.60	8.58	121.60	121.60	0.00	13.4	65.00	65.00	114.77	114.77
TCL	TCL:1	End	15.13	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
TCR	TCR:0	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
TCR	#TCR:0	End	5.00	15.33	12.50	375.85	375.85	0.00	21.3	65.00	65.00	245.32	245.32
TCR	#TCR:0	Origin	5.00	15.33	12.50	375.85	375.85	0.00	21.3	65.00	65.00	245.32	245.32

TCR	#TCR:1	End	10.00	12.21	9.91	187.31	187.31	0.00	16.1	65.00	65.00	153.55	153.55
TCR	#TCR:1	Origin	10.00	12.21	9.91	187.31	187.31	0.00	16.1	65.00	65.00	153.55	153.55
TCR	#TCR:2	End	12.57	10.60	8.58	121.60	121.60	0.00	13.4	65.00	65.00	114.77	114.77
TCR	#TCR:2	Origin	12.57	10.60	8.58	121.60	121.60	0.00	13.4	65.00	65.00	114.77	114.77
TCR	TCR:1	End	15.13	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
MCL	MCL:0	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
MCL	#MCL:0	End	5.00	15.33	12.50	375.85	375.85	0.00	21.3	65.00	65.00	245.32	245.32
MCL	#MCL:0	Origin	5.00	15.33	12.50	375.85	375.85	0.00	21.3	65.00	65.00	245.32	245.32
MCL	#MCL:1	End	10.00	12.21	9.91	187.31	187.31	0.00	16.1	65.00	65.00	153.55	153.55
MCL	#MCL:1	Origin	10.00	12.21	9.91	187.31	187.31	0.00	16.1	65.00	65.00	153.55	153.55
MCL	#MCL:2	End	12.57	10.60	8.58	121.60	121.60	0.00	13.4	65.00	65.00	114.77	114.77
MCL	#MCL:2	Origin	12.57	10.60	8.58	121.60	121.60	0.00	13.4	65.00	65.00	114.77	114.77
MCL	MCL:1	End	15.13	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
MCR	MCR:0	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
MCR	#MCR:0	End	5.00	15.33	12.50	375.85	375.85	0.00	21.3	65.00	65.00	245.32	245.32
MCR	#MCR:0	Origin	5.00	15.33	12.50	375.85	375.85	0.00	21.3	65.00	65.00	245.32	245.32
MCR	#MCR:1	End	10.00	12.21	9.91	187.31	187.31	0.00	16.1	65.00	65.00	153.55	153.55
MCR	#MCR:1	Origin	10.00	12.21	9.91	187.31	187.31	0.00	16.1	65.00	65.00	153.55	153.55
MCR	#MCR:2	End	12.57	10.60	8.58	121.60	121.60	0.00	13.4	65.00	65.00	114.77	114.77
MCR	#MCR:2	Origin	12.57	10.60	8.58	121.60	121.60	0.00	13.4	65.00	65.00	114.77	114.77
MCR	MCR:1	End	15.13	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
BCL	BCL:0	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
BCL	#BCL:0	End	5.00	15.33	12.50	375.85	375.85	0.00	21.3	65.00	65.00	245.32	245.32
BCL	#BCL:0	Origin	5.00	15.33	12.50	375.85	375.85	0.00	21.3	65.00	65.00	245.32	245.32
BCL	#BCL:1	End	10.00	12.21	9.91	187.31	187.31	0.00	16.1	65.00	65.00	153.55	153.55
BCL	#BCL:1	Origin	10.00	12.21	9.91	187.31	187.31	0.00	16.1	65.00	65.00	153.55	153.55
BCL	#BCL:2	End	12.57	10.60	8.58	121.60	121.60	0.00	13.4	65.00	65.00	114.77	114.77
BCL	#BCL:2	Origin	12.57	10.60	8.58	121.60	121.60	0.00	13.4	65.00	65.00	114.77	114.77
BCL	BCL:1	End	15.13	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
BCR	BCR:0	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
BCR	#BCR:0	End	5.00	15.33	12.50	375.85	375.85	0.00	21.3	65.00	65.00	245.32	245.32
BCR	#BCR:0	Origin	5.00	15.33	12.50	375.85	375.85	0.00	21.3	65.00	65.00	245.32	245.32
BCR	#BCR:1	End	10.00	12.21	9.91	187.31	187.31	0.00	16.1	65.00	65.00	153.55	153.55
BCR	#BCR:1	Origin	10.00	12.21	9.91	187.31	187.31	0.00	16.1	65.00	65.00	153.55	153.55
BCR	#BCR:2	End	12.57	10.60	8.58	121.60	121.60	0.00	13.4	65.00	65.00	114.77	114.77
BCR	#BCR:2	Origin	12.57	10.60	8.58	121.60	121.60	0.00	13.4	65.00	65.00	114.77	114.77
BCR	BCR:1	End	15.13	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
Mast	P:t	Origin	0.00	18.00	20.76	806.63	806.63	48.00	0.0	42.00	42.00	313.69	313.69
Mast	#Mast:0	End	2.50	18.00	20.76	806.63	806.63	48.00	0.0	42.00	42.00	313.69	313.69
Mast	#Mast:0	Origin	2.50	18.00	20.76	806.63	806.63	48.00	0.0	42.00	42.00	313.69	313.69
Mast	Mast:1	End	5.00	18.00	20.76	806.63	806.63	48.00	0.0	42.00	42.00	313.69	313.69
Mast	Mast:1	Origin	5.00	18.00	20.76	806.63	806.63	48.00	0.0	42.00	42.00	313.69	313.69
Mast	Mast:2	End	7.00	18.00	20.76	806.63	806.63	48.00	0.0	42.00	42.00	313.69	313.69
Mast	Mast:2	Origin	7.00	18.00	20.76	806.63	806.63	48.00	0.0	42.00	42.00	313.69	313.69
Mast	Mast:3	End	8.00	18.00	20.76	806.63	806.63	48.00	0.0	42.00	42.00	313.69	313.69
CX11	CX11:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX11	CX11:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX12	CX12:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX12	CX12:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX21	CX21:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX21	CX21:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX22	CX22:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX22	CX22:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX31	CX31:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX31	CX31:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX32	CX32:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX32	CX32:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX41	CX41:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX41	CX41:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX42	CX42:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX42	CX42:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX51	CX51:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX51	CX51:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX52	CX52:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX52	CX52:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50

CX61	CX61:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX61	CX61:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX62	CX62:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX62	CX62:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX71	CX71:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX71	CX71:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX72	CX72:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX72	CX72:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX81	CX81:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX81	CX81:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX82	CX82:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX82	CX82:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX91	CX91:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX91	CX91:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX92	CX92:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX92	CX92:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX101	CX101:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX101	CX101:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX102	CX102:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX102	CX102:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX111	CX111:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX111	CX111:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX112	CX112:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX112	CX112:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX121	CX121:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX121	CX121:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX122	CX122:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX122	CX122:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX131	CX131:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX131	CX131:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX132	CX132:0	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX132	CX132:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX141	Mast:1	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX141	CX141:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX142	Mast:1	Origin	0.00	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50
CX142	CX142:1	End	0.25	1.00	0.59	0.05	0.05	4.00	0.0	65.00	65.00	0.50	0.50

\*\*\* Insulator Data

Suspension Properties:

Label	Stock Number	Length (ft)	Weight (lbs)	Wind Area (ft^2)	Tension Capacity (lbs)	Top Rect Width (ft)	Top Rect Height (ft)	Bot. Rect Width (ft)	Bot. Rect Height (ft)	Rect Vert. Width (ft)	Rect Vert. Height (ft)	Rect Hardware Capacity (lbs)	Notes	Draw	Rigid
Ground Wire		0.25	15	0.1	2e+04	0	0	0	0	0	0	0	Sheds	No	
Conductor (10'-0")		10	0	0	5e+04	0	0	0	0	0	0	0	Sheds	No	

Suspension Insulator Connectivity:

Suspension Label	Structure Attach Label	Tip Attach Label	Property Set	Cond. 1 Minimum Swing (deg)	Cond. 1 Maximum Swing (deg)	Cond. 2 Minimum Swing (deg)	Cond. 2 Maximum Swing (deg)	Cond. 3 Minimum Swing (deg)	Cond. 3 Maximum Swing (deg)	Cond. 4 Minimum Swing (deg)	Cond. 4 Maximum Swing (deg)	Min. Required Vertical Load (uplift) (lbs)
21	SWL:1	21	Ground Wire	-90.00	90.00	-90.00	90.00	-90.00	90.00	-90.00	90.00	No Limit
11	SWR:1	11	Ground Wire	-90.00	90.00	-90.00	90.00	-90.00	90.00	-90.00	90.00	No Limit
61	TCL:1	61	Conductor (10'-0")	-90.00	90.00	-90.00	90.00	-90.00	90.00	-90.00	90.00	No Limit
51	TCR:1	51	Conductor (10'-0")	-90.00	90.00	-90.00	90.00	-90.00	90.00	-90.00	90.00	No Limit
62	MCL:1	62	Conductor (10'-0")	-90.00	90.00	-90.00	90.00	-90.00	90.00	-90.00	90.00	No Limit
52	MCR:1	52	Conductor (10'-0")	-90.00	90.00	-90.00	90.00	-90.00	90.00	-90.00	90.00	No Limit
63	BCL:1	63	Conductor (10'-0")	-90.00	90.00	-90.00	90.00	-90.00	90.00	-90.00	90.00	No Limit
53	BCR:1	53	Conductor (10'-0")	-90.00	90.00	-90.00	90.00	-90.00	90.00	-90.00	90.00	No Limit

Material List Options:  
 Show Parts: YES  
 Decompose Assemblies: NO  
 Show Assemblies: YES

**Material List**

Stock Number	Item Description	Quantity	Unit of Measure
(1) SitePro1 RMV12-3xx	Equipment property: Existing Mount #1	1.00	Each
SitePro1 HRK14	Equipment property: Existing Mount #2	1.00	Each
2.375"O.D. x 8' Mount Pipe	Equipment property: Existing Mounting Pipe #1	9.00	Each
HPA-65R-BU6A	Equipment property: Proposed Antenna #1	3.00	Each
TMA2117F00V1-1	Equipment property: Proposed TMA #1	6.00	Each
7770	Equipment property: Existing Antenna #1	3.00	Each
LGP 21401	Equipment property: Existing TMA #1	6.00	Each
QS66512-2	Equipment property: Existing Antenna #2	3.00	Each
TMA2117F00V1-1	Equipment property: Existing TMA #1	6.00	Each
CR-1 - CX11	Equipment property: CR-1 - CX11 - 0-15ft	1.00	Each
CR-1 - CX21	Equipment property: CR-1 - CX21 - 15-25ft	1.00	Each
CR-1 - CX31	Equipment property: CR-1 - CX31 - 25-35ft	1.00	Each
CR-1 - CX41	Equipment property: CR-1 - CX41 - 35-45ft	1.00	Each
CR-1 - CX51	Equipment property: CR-1 - CX51 - 45-55ft	1.00	Each
CR-1 - CX61	Equipment property: CR-1 - CX61 - 55-65ft	1.00	Each
CR-1 - CX71	Equipment property: CR-1 - CX71 - 65-75ft	1.00	Each
CR-1 - CX81	Equipment property: CR-1 - CX81 - 75-85ft	1.00	Each
CR-1 - CX91	Equipment property: CR-1 - CX91 - 85-95ft	1.00	Each
CR-1 - CX101	Equipment property: CR-1 - CX101 - 95-105ft	1.00	Each
CR-1 - CX111	Equipment property: CR-1 - CX111 - 105-115ft	1.00	Each
CR-1 - CX121	Equipment property: CR-1 - CX121 - 115-125ft	1.00	Each
CR-1 - CX131	Equipment property: CR-1 - CX131 - 125-137.5ft	1.00	Each
CR-1 - CX141	Equipment property: CR-1 - CX141 - 137.5-145ft	1.00	Each
CR-2 - CX12	Equipment property: CR-2 - CX12 - 0-15ft	1.00	Each
CR-2 - CX22	Equipment property: CR-2 - CX22 - 15-25ft	1.00	Each
CR-2 - CX32	Equipment property: CR-2 - CX32 - 25-35ft	1.00	Each
CR-2 - CX42	Equipment property: CR-2 - CX42 - 35-45ft	1.00	Each
CR-2 - CX52	Equipment property: CR-2 - CX52 - 45-55ft	1.00	Each
CR-2 - CX62	Equipment property: CR-2 - CX62 - 55-65ft	1.00	Each
CR-2 - CX72	Equipment property: CR-2 - CX72 - 65-75ft	1.00	Each
CR-2 - CX82	Equipment property: CR-2 - CX82 - 75-85ft	1.00	Each
CR-2 - CX92	Equipment property: CR-2 - CX92 - 85-95ft	1.00	Each
CR-2 - CX102	Equipment property: CR-2 - CX102 - 95-105ft	1.00	Each
CR-2 - CX112	Equipment property: CR-2 - CX112 - 105-115ft	1.00	Each
CR-2 - CX122	Equipment property: CR-2 - CX122 - 115-125ft	1.00	Each
CR-2 - CX132	Equipment property: CR-2 - CX132 - 125-137.5ft	1.00	Each
CR-2 - CX142	Equipment property: CR-2 - CX142 - 137.5-145ft	1.00	Each

\*\*\* Loads Data

Loads from file: G:\Transmission\Eversource\2018\806\_Smartlink\80618-0011\_Pole 10254\_ATT\_CTL05176\_Stony Hill\001.6000 - SA\R3\PLS-Pole\80618-0011.001.6000.lca

Insulator dead and wind loads are already included in the point loads printed below.

Loading Method Parameters:

Structure Height Summary (used for calculating wind/ice adjust with height):

Z of ground for wind height adjust 0.00 (ft) and structure Z coordinate that will be put on the centerline ground profile in PLS-CADD.  
 Ground elevation shift 0.00 (ft)  
 Z of ground with shift 0.00 (ft)  
 Z of structure top (highest joint) 148.00 (ft)  
 Structure height 148.00 (ft)  
 Structure height above ground 148.00 (ft)

Vector Load Cases:

Pole	Pole Description	Dead Load	Wind Area	SF for Steel Tubular	SF for Wood Poles	SF for Conc. Ult.	SF for Conc. First	SF for Conc. Zero	SF for Guys and Tubular	SF for Non Braces	SF for Insuls.	SF for Hardware	SF For Found.	Point Loads	Wind/Ice Model	Trans. Wind Pressure (psf)	Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Ice Temperature (deg F)	
	NESC 250B (Heavy)	1.5000	2.5000	1.00000	0.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	8 loads	Wind on All	4	0	0.500	57.000	0.0
	NESC 250C (Extreme Wind)	1.0000	1.0000	1.00000	0.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	8 loads	NESC 2007	25.6	0	0.000	57.000	60.0

Point Loads for Load Case "NESC 250B (Heavy)":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
11	1072	1234	0	Shield Wire #1
21	1035	1185	0	Shield Wire #2
51	7090	4255	0	Conductor
52	7090	4255	0	Conductor
53	7090	4255	0	Conductor
61	7090	4255	0	Conductor
62	7090	4255	0	Conductor
63	7090	4255	0	Conductor

Equipment Loads for "NESC 250B (Heavy)":

Equipment Label	Equipment Property Set	Elevation Above Ground (ft)	qzGh (psf)	Ice Thick. (in)	Total Drag Area (ft^2)	Long. Load (lbs)	Trans. Load (lbs)	Vert. Load (lbs)
Exist_Mnt-1	Existing Mount #1	145.00	10.00	0.50	7.96	0.83	79.58	1399.19
Exist_Mnt-2	Existing Mount #2	147.00	10.00	0.50	1.81	0.19	18.07	574.71
Ex_Mnt_Pipe_1-1	Existing Mounting Pipe #1	145.00	10.00	0.50	3.25	0.34	32.51	55.77
Ex_Mnt_Pipe_1-2	Existing Mounting Pipe #1	145.00	10.00	0.50	3.25	0.34	32.51	55.77
Ex_Mnt_Pipe_1-3	Existing Mounting Pipe #1	145.00	10.00	0.50	3.25	0.34	32.51	55.77
Ex_Mnt_Pipe_1-4	Existing Mounting Pipe #1	145.00	10.00	0.50	3.25	0.34	32.51	55.77
Ex_Mnt_Pipe_1-5	Existing Mounting Pipe #1	145.00	10.00	0.50	3.25	0.34	32.51	55.77
Ex_Mnt_Pipe_1-6	Existing Mounting Pipe #1	145.00	10.00	0.50	3.25	0.34	32.51	55.77
Ex_Mnt_Pipe_1-7	Existing Mounting Pipe #1	145.00	10.00	0.50	3.25	0.34	32.51	55.77
Ex_Mnt_Pipe_1-8	Existing Mounting Pipe #1	145.00	10.00	0.50	3.25	0.34	32.51	55.77
Ex_Mnt_Pipe_1-9	Existing Mounting Pipe #1	145.00	10.00	0.50	3.25	0.34	32.51	55.77
Prop_Ant_1-1	Proposed Antenna #1	145.00	10.00	0.50	12.14	1.27	121.36	111.04
Prop_Ant_1-2	Proposed Antenna #1	145.00	10.00	0.50	12.14	1.27	121.36	111.04
Prop_Ant_1-3	Proposed Antenna #1	145.00	10.00	0.50	12.14	1.27	121.36	111.04
Prop_TMA-1-1	Proposed TMA #1	145.00	10.00	0.50	1.77	0.18	17.71	41.18
Prop_TMA-1-2	Proposed TMA #1	145.00	10.00	0.50	1.77	0.18	17.71	41.18
Prop_TMA-1-3	Proposed TMA #1	145.00	10.00	0.50	1.77	0.18	17.71	41.18
Prop_TMA-1-4	Proposed TMA #1	145.00	10.00	0.50	1.77	0.18	17.71	41.18
Prop_TMA-1-5	Proposed TMA #1	145.00	10.00	0.50	1.77	0.18	17.71	41.18
Prop_TMA-1-6	Proposed TMA #1	145.00	10.00	0.50	1.77	0.18	17.71	41.18



Ex_Ant_1-1	Existing Antenna #1	145.00	10.00	0.50	8.92	0.93	89.22	89.38
Ex_Ant_1-2	Existing Antenna #1	145.00	10.00	0.50	8.92	0.93	89.22	89.38
Ex_Ant_1-3	Existing Antenna #1	145.00	10.00	0.50	8.92	0.93	89.22	89.38
Ex_TMA-1-1	Existing TMA #1	145.00	10.00	0.50	2.00	0.21	20.04	27.54
Ex_TMA-1-2	Existing TMA #1	145.00	10.00	0.50	2.00	0.21	20.04	27.54
Ex_TMA-1-3	Existing TMA #1	145.00	10.00	0.50	2.00	0.21	20.04	27.54
Ex_TMA-1-4	Existing TMA #1	145.00	10.00	0.50	2.00	0.21	20.04	27.54
Ex_TMA-1-5	Existing TMA #1	145.00	10.00	0.50	2.00	0.21	20.04	27.54
Ex_TMA-1-6	Existing TMA #1	145.00	10.00	0.50	2.00	0.21	20.04	27.54
Exist_Ant_4	Existing Antenna #2	145.00	10.00	0.50	12.58	1.31	125.83	221.60
Exist_Ant_5	Existing Antenna #2	145.00	10.00	0.50	12.58	1.31	125.83	221.60
Exist_Ant_6	Existing Antenna #2	145.00	10.00	0.50	12.58	1.31	125.83	221.60
Ex_TMA-2-1	Existing TMA #2	145.00	10.00	0.50	1.77	0.18	17.70	46.15
Ex_TMA-2-2	Existing TMA #2	145.00	10.00	0.50	1.77	0.18	17.70	46.15
Ex_TMA-2-3	Existing TMA #2	145.00	10.00	0.50	1.77	0.18	17.70	46.15
Ex_TMA-2-4	Existing TMA #2	145.00	10.00	0.50	1.77	0.18	17.70	46.15
Ex_TMA-2-5	Existing TMA #2	145.00	10.00	0.50	1.77	0.18	17.70	46.15
Ex_TMA-2-6	Existing TMA #2	145.00	10.00	0.50	1.77	0.18	17.70	46.15
CR-1 - CX11	CR-1 - CX11 - 0-15ft	10.00	10.00	0.50	9.20	0.96	91.97	581.50
CR-1 - CX21	CR-1 - CX21 - 15-25ft	20.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-1 - CX31	CR-1 - CX31 - 25-35ft	30.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-1 - CX41	CR-1 - CX41 - 35-45ft	40.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-1 - CX51	CR-1 - CX51 - 45-55ft	50.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-1 - CX61	CR-1 - CX61 - 55-65ft	60.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-1 - CX71	CR-1 - CX71 - 65-75ft	70.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-1 - CX81	CR-1 - CX81 - 75-85ft	80.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-1 - CX91	CR-1 - CX91 - 85-95ft	90.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-1 - CX101	CR-1 - CX101 - 95-105ft	100.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-1 - CX111	CR-1 - CX111 - 105-115ft	110.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-1 - CX121	CR-1 - CX121 - 115-125ft	120.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-1 - CX131	CR-1 - CX131 - 125-137.5ft	130.00	10.00	0.50	7.68	0.80	76.77	484.33
CR-1 - CX141	CR-1 - CX141 - 137.5-145ft	145.00	10.00	0.50	4.62	0.48	46.20	290.01
CR-2 - CX12	CR-2 - CX12 - 0-15ft	10.00	10.00	0.50	9.20	0.96	91.97	581.50
CR-2 - CX22	CR-2 - CX22 - 15-25ft	20.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-2 - CX32	CR-2 - CX32 - 25-35ft	30.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-2 - CX42	CR-2 - CX42 - 35-45ft	40.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-2 - CX52	CR-2 - CX52 - 45-55ft	50.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-2 - CX62	CR-2 - CX62 - 55-65ft	60.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-2 - CX72	CR-2 - CX72 - 65-75ft	70.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-2 - CX82	CR-2 - CX82 - 75-85ft	80.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-2 - CX92	CR-2 - CX92 - 85-95ft	90.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-2 - CX102	CR-2 - CX102 - 95-105ft	100.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-2 - CX112	CR-2 - CX112 - 105-115ft	110.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-2 - CX122	CR-2 - CX122 - 115-125ft	120.00	10.00	0.50	6.14	0.64	61.41	387.16
CR-2 - CX132	CR-2 - CX132 - 125-137.5ft	130.00	10.00	0.50	7.68	0.80	76.77	484.33
CR-2 - CX142	CR-2 - CX142 - 137.5-145ft	145.00	10.00	0.50	4.62	0.48	46.20	290.01

**Detailed Pole Loading Data for Load Case "NESC 250B (Heavy)":**

Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.  
Wind load is calculated for the undeformed shape of a pole.

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Z Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Ice Vertical Load (lbs)	Pole Ice Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
P	P:t	P:cx14	140.00	139.50	139.75	20.252	9.59e+05	1.600	10.00	0.50	51.13	13.50	6.44	0.67	14.17	0.00
P	P:cx14	P:sw	139.50	139.30	139.40	20.339	9.63e+05	1.600	10.00	0.50	20.54	5.42	2.59	0.27	5.69	0.00
P	P:sw		139.30	134.65	136.97	20.942	9.92e+05	1.600	10.00	0.50	491.99	129.85	61.97	6.20	136.05	0.00
P		P:cx13	134.65	130.00	132.33	22.098	1.05e+06	1.600	10.00	0.50	519.56	137.02	65.39	6.20	143.22	0.00
P	P:cx13	P:tc	130.00	126.63	128.32	23.095	1.09e+06	1.600	10.00	0.50	393.77	103.78	49.53	4.49	108.27	0.00
P	P:tc		126.63	123.32	124.97	23.926	1.13e+06	1.600	10.00	0.50	401.48	105.76	50.48	4.42	110.18	0.00
P		P:cx12	123.32	120.00	121.66	24.751	1.17e+06	1.600	10.00	0.50	415.49	109.40	52.21	4.42	113.82	0.00
P	P:cx12		120.00	115.00	117.50	25.784	1.22e+06	1.600	10.00	0.50	653.19	171.91	82.04	6.67	178.57	0.00
P		P:cx11	115.00	110.00	112.50	27.028	1.28e+06	1.600	10.00	0.50	685.07	180.19	86.00	6.67	186.86	0.00
P	P:cx11		110.00	107.31	108.66	27.983	1.32e+06	1.600	10.00	0.50	381.04	100.18	47.81	3.58	103.76	0.00
P		P:mc	107.31	104.63	105.97	28.651	1.36e+06	1.600	10.00	0.50	390.23	102.57	48.95	3.58	106.16	0.00
P	P:mc	P:cx10	104.63	100.00	102.32	29.560	1.4e+06	1.600	10.00	0.50	694.51	182.49	87.10	6.17	188.67	0.00
P	P:cx10		100.00	95.00	97.50	30.757	1.46e+06	1.600	10.00	0.50	780.71	205.06	97.87	6.67	211.73	0.00
P		P:cx9	95.00	90.00	92.50	32.001	1.52e+06	1.600	10.00	0.50	812.59	213.35	101.82	6.67	220.02	0.00
P	P:cx9		90.00	89.67	89.84	32.663	1.55e+06	1.600	10.00	0.50	54.75	14.37	6.86	0.44	14.81	0.00
P		P:bc	89.67	85.00	87.34	32.972	1.56e+06	1.600	10.00	0.50	1870.18	205.32	97.99	6.23	211.55	0.00
P	P:bc		85.00	82.63	83.82	33.535	1.59e+06	1.600	10.00	0.50	563.37	105.98	50.58	3.16	109.14	0.00
P	P:bc	P:cx8	82.63	80.00	81.32	34.157	1.62e+06	1.600	10.00	0.50	636.75	119.78	57.17	3.51	123.29	0.00
P	P:cx8		80.00	75.00	77.50	35.105	1.66e+06	1.600	10.00	0.50	1244.60	234.05	111.70	6.67	240.71	0.00
P		P:cx7	75.00	70.00	72.50	36.348	1.72e+06	1.600	10.00	0.50	1289.24	242.34	115.66	6.67	249.00	0.00
P	P:cx7		70.00	65.00	67.50	37.592	1.78e+06	1.600	10.00	0.50	1333.87	250.62	119.61	6.67	257.29	0.00
P		P:cx6	65.00	60.00	62.50	38.835	1.84e+06	1.600	10.00	0.50	1378.50	258.91	123.57	6.67	265.58	0.00
P	P:cx6		60.00	55.00	57.50	40.078	1.9e+06	1.600	10.00	0.50	1423.13	267.20	127.52	6.67	273.87	0.00

P	P:cx5	55.00	50.00	52.50	41.321	1.96e+06	1.600	10.00	0.50	1467.77	275.49	131.48	6.67	282.16	0.00
P	P:cx5	50.00	45.59	47.79	42.492	2.01e+06	1.600	10.00	0.50	1333.14	250.15	119.39	5.89	256.03	0.00
P		45.59	41.17	43.38	43.589	2.06e+06	1.600	10.00	0.50	1367.94	256.61	122.47	5.89	262.50	0.00
P	P:cx4	41.17	40.00	40.59	43.846	2.08e+06	1.600	10.00	0.50	754.84	68.40	32.65	1.56	69.96	0.00
P	P:cx4	40.00	35.00	37.50	44.176	2.09e+06	1.600	10.00	0.50	3282.88	294.52	140.56	6.67	301.19	0.00
P	P:cx3	35.00	30.00	32.50	45.419	2.15e+06	1.600	10.00	0.50	1729.03	302.81	144.52	6.67	309.48	0.00
P	P:cx3	30.00	25.00	27.50	46.662	2.21e+06	1.600	10.00	0.50	1776.85	311.10	148.47	6.67	317.77	0.00
P	P:cx2	25.00	20.00	22.50	47.906	2.27e+06	1.600	10.00	0.50	1824.67	319.39	152.43	6.67	326.05	0.00
P	P:cx2	20.00	15.00	17.50	49.149	2.33e+06	1.600	10.00	0.50	1872.49	327.68	156.39	6.67	334.34	0.00
P	P:cx1	15.00	10.00	12.50	50.392	2.39e+06	1.600	10.00	0.50	1920.31	335.96	160.34	6.67	342.63	0.00
P	P:cx1	10.00	5.00	7.50	51.635	2.44e+06	1.600	10.00	0.50	1968.13	344.25	164.30	6.67	350.92	0.00
P	P:g	5.00	0.00	2.50	52.878	2.5e+06	1.600	10.00	0.50	2015.96	352.54	168.25	6.67	359.21	0.00

Point Loads for Load Case "NESC 250C (Extreme Wind)":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
11	201	865	0	Shield Wire #1
21	216	733	0	Shield Wire #2
51	2748	4942	0	Conductor
52	2748	4942	0	Conductor
53	2748	4942	0	Conductor
61	2748	4942	0	Conductor
62	2748	4942	0	Conductor
63	2748	4942	0	Conductor

Equipment Loads for "NESC 250C (Extreme Wind)":

Equipment Label	Equipment Property Set	Elevation Above Ground (ft)	qzGh (psf)	Ice Thick. (in)	Total Drag Area (ft^2)	Long. Load (lbs)	Trans. Load (lbs)	Vert. Load (lbs)
Exist_Mnt-1	Existing Mount #1	145.00	27.08	0.00	7.48	0.99	202.52	850.00
Exist_Mnt-2	Existing Mount #2	147.00	27.08	0.00	1.34	0.18	36.28	356.00
Ex_Mnt_Pipe_1-1	Existing Mounting Pipe #1	145.00	27.08	0.00	2.57	0.34	69.51	29.20
Ex_Mnt_Pipe_1-2	Existing Mounting Pipe #1	145.00	27.08	0.00	2.57	0.34	69.51	29.20
Ex_Mnt_Pipe_1-3	Existing Mounting Pipe #1	145.00	27.08	0.00	2.57	0.34	69.51	29.20
Ex_Mnt_Pipe_1-4	Existing Mounting Pipe #1	145.00	27.08	0.00	2.57	0.34	69.51	29.20
Ex_Mnt_Pipe_1-5	Existing Mounting Pipe #1	145.00	27.08	0.00	2.57	0.34	69.51	29.20
Ex_Mnt_Pipe_1-6	Existing Mounting Pipe #1	145.00	27.08	0.00	2.57	0.34	69.51	29.20
Ex_Mnt_Pipe_1-7	Existing Mounting Pipe #1	145.00	27.08	0.00	2.57	0.34	69.51	29.20
Ex_Mnt_Pipe_1-8	Existing Mounting Pipe #1	145.00	27.08	0.00	2.57	0.34	69.51	29.20
Ex_Mnt_Pipe_1-9	Existing Mounting Pipe #1	145.00	27.08	0.00	2.57	0.34	69.51	29.20
Prop_Ant_1-1	Proposed Antenna #1	145.00	27.08	0.00	11.56	1.52	312.98	41.90
Prop_Ant_1-2	Proposed Antenna #1	145.00	27.08	0.00	11.56	1.52	312.98	41.90
Prop_Ant_1-3	Proposed Antenna #1	145.00	27.08	0.00	11.56	1.52	312.98	41.90
Prop_TMA-1-1	Proposed TMA #1	145.00	27.08	0.00	1.62	0.21	43.86	23.10
Prop_TMA-1-2	Proposed TMA #1	145.00	27.08	0.00	1.62	0.21	43.86	23.10
Prop_TMA-1-3	Proposed TMA #1	145.00	27.08	0.00	1.62	0.21	43.86	23.10
Prop_TMA-1-4	Proposed TMA #1	145.00	27.08	0.00	1.62	0.21	43.86	23.10
Prop_TMA-1-5	Proposed TMA #1	145.00	27.08	0.00	1.62	0.21	43.86	23.10
Prop_TMA-1-6	Proposed TMA #1	145.00	27.08	0.00	1.62	0.21	43.86	23.10
Ex_Ant_1-1	Existing Antenna #1	145.00	27.08	0.00	8.46	1.12	229.05	39.00
Ex_Ant_1-2	Existing Antenna #1	145.00	27.08	0.00	8.46	1.12	229.05	39.00
Ex_Ant_1-3	Existing Antenna #1	145.00	27.08	0.00	8.46	1.12	229.05	39.00
Ex_TMA-1-1	Existing TMA #1	145.00	27.08	0.00	1.84	0.24	49.82	14.10
Ex_TMA-1-2	Existing TMA #1	145.00	27.08	0.00	1.84	0.24	49.82	14.10
Ex_TMA-1-3	Existing TMA #1	145.00	27.08	0.00	1.84	0.24	49.82	14.10
Ex_TMA-1-4	Existing TMA #1	145.00	27.08	0.00	1.84	0.24	49.82	14.10
Ex_TMA-1-5	Existing TMA #1	145.00	27.08	0.00	1.84	0.24	49.82	14.10
Ex_TMA-1-6	Existing TMA #1	145.00	27.08	0.00	1.84	0.24	49.82	14.10
Exist_Ant_4	Existing Antenna #2	145.00	27.08	0.00	12.00	1.58	324.90	111.00
Exist_Ant_5	Existing Antenna #2	145.00	27.08	0.00	12.00	1.58	324.90	111.00
Exist_Ant_6	Existing Antenna #2	145.00	27.08	0.00	12.00	1.58	324.90	111.00
Ex_TMA-2-1	Existing TMA #2	145.00	27.08	0.00	1.62	0.21	43.86	26.00
Ex_TMA-2-2	Existing TMA #2	145.00	27.08	0.00	1.62	0.21	43.86	26.00
Ex_TMA-2-3	Existing TMA #2	145.00	27.08	0.00	1.62	0.21	43.86	26.00
Ex_TMA-2-4	Existing TMA #2	145.00	27.08	0.00	1.62	0.21	43.86	26.00
Ex_TMA-2-5	Existing TMA #2	145.00	27.08	0.00	1.62	0.21	43.86	26.00
Ex_TMA-2-6	Existing TMA #2	145.00	27.08	0.00	1.62	0.21	43.86	26.00
CR-1 - CX11	CR-1 - CX11 - 0-15ft	10.00	27.08	0.00	7.92	1.04	214.43	203.00
CR-1 - CX21	CR-1 - CX21 - 15-25ft	20.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-1 - CX31	CR-1 - CX31 - 25-35ft	30.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-1 - CX41	CR-1 - CX41 - 35-45ft	40.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-1 - CX51	CR-1 - CX51 - 45-55ft	50.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-1 - CX61	CR-1 - CX61 - 55-65ft	60.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-1 - CX71	CR-1 - CX71 - 65-75ft	70.00	27.08	0.00	5.28	0.70	142.95	135.00

CR-1 - CX81	CR-1 - CX81 - 75-85ft	80.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-1 - CX91	CR-1 - CX91 - 85-95ft	90.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-1 - CX101	CR-1 - CX101 - 95-105ft	100.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-1 - CX111	CR-1 - CX111 - 105-115ft	110.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-1 - CX121	CR-1 - CX121 - 115-125ft	120.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-1 - CX131	CR-1 - CX131 - 125-137.5ft	130.00	27.08	0.00	6.61	0.87	178.91	169.00
CR-1 - CX141	CR-1 - CX141 - 137.5-145ft	145.00	27.08	0.00	3.97	0.52	107.43	101.00
CR-2 - CX12	CR-2 - CX12 - 0-15ft	10.00	27.08	0.00	7.92	1.04	214.43	203.00
CR-2 - CX22	CR-2 - CX22 - 15-25ft	20.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-2 - CX32	CR-2 - CX32 - 25-35ft	30.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-2 - CX42	CR-2 - CX42 - 35-45ft	40.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-2 - CX52	CR-2 - CX52 - 45-55ft	50.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-2 - CX62	CR-2 - CX62 - 55-65ft	60.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-2 - CX72	CR-2 - CX72 - 65-75ft	70.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-2 - CX82	CR-2 - CX82 - 75-85ft	80.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-2 - CX92	CR-2 - CX92 - 85-95ft	90.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-2 - CX102	CR-2 - CX102 - 95-105ft	100.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-2 - CX112	CR-2 - CX112 - 105-115ft	110.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-2 - CX122	CR-2 - CX122 - 115-125ft	120.00	27.08	0.00	5.28	0.70	142.95	135.00
CR-2 - CX132	CR-2 - CX132 - 125-137.5ft	130.00	27.08	0.00	6.61	0.87	178.91	169.00
CR-2 - CX142	CR-2 - CX142 - 137.5-145ft	145.00	27.08	0.00	3.97	0.52	107.43	101.00

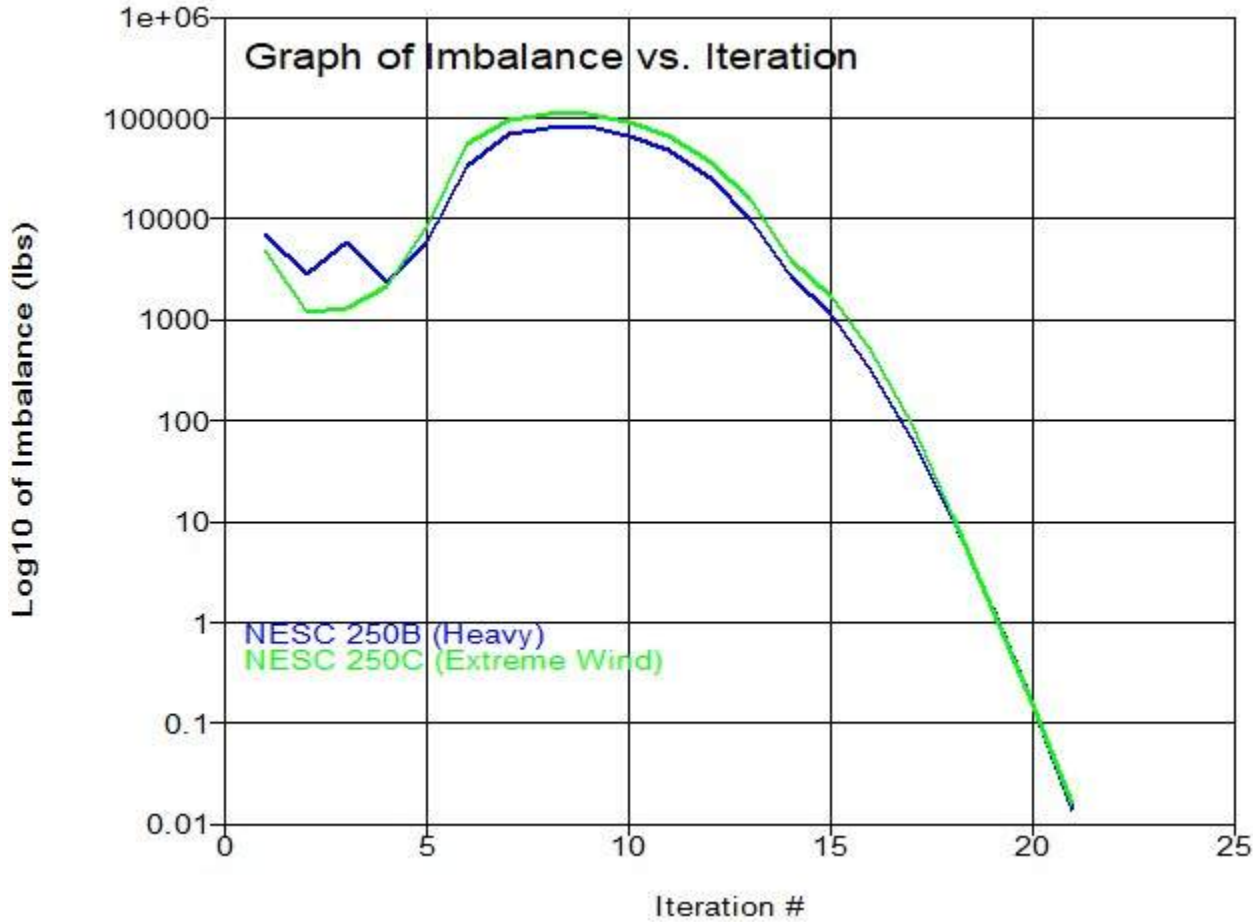
Detailed Pole Loading Data for Load Case "NESC 250C (Extreme Wind)":

Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.  
Wind load is calculated for the undeformed shape of a pole.

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Z Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Vertical Load (lbs)	Ice Load (lbs)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
P	P:t	P:cx14	140.00	139.50	139.75	20.252	1.58e+06	1.000	27.08	0.00	34.09	22.85	0.00	0.00	22.85	0.00	
P	P:cx14	P:sw	139.50	139.30	139.40	20.339	1.58e+06	1.000	27.08	0.00	13.69	9.18	0.00	0.00	9.18	0.00	
P	P:sw		139.30	134.65	136.97	20.942	1.63e+06	1.000	27.08	0.00	327.99	219.72	0.00	0.00	219.72	0.00	
P		P:cx13	134.65	130.00	132.33	22.098	1.72e+06	1.000	27.08	0.00	346.37	231.85	0.00	0.00	231.85	0.00	
P	P:cx13	P:tc	130.00	126.63	128.32	23.095	1.8e+06	1.000	27.08	0.00	262.52	175.61	0.00	0.00	175.61	0.00	
P	P:tc		126.63	123.32	124.97	23.926	1.86e+06	1.000	27.08	0.00	267.65	178.96	0.00	0.00	178.96	0.00	
P		P:cx12	123.32	120.00	121.66	24.751	1.93e+06	1.000	27.08	0.00	276.99	185.12	0.00	0.00	185.12	0.00	
P	P:cx12		120.00	115.00	117.50	25.784	2.01e+06	1.000	27.08	0.00	435.46	290.88	0.00	0.00	290.88	0.00	
P		P:cx11	115.00	110.00	112.50	27.028	2.11e+06	1.000	27.08	0.00	456.72	304.91	0.00	0.00	304.91	0.00	
P	P:cx11		110.00	107.31	108.66	27.983	2.18e+06	1.000	27.08	0.00	254.03	169.52	0.00	0.00	169.52	0.00	
P		P:mc	107.31	104.63	105.97	28.651	2.23e+06	1.000	27.08	0.00	260.16	173.57	0.00	0.00	173.57	0.00	
P	P:mc	P:cx10	104.63	100.00	102.32	29.560	2.3e+06	1.000	27.08	0.00	463.01	308.80	0.00	0.00	308.80	0.00	
P	P:cx10		100.00	95.00	97.50	30.757	2.4e+06	1.000	27.08	0.00	520.48	346.98	0.00	0.00	346.98	0.00	
P		P:cx9	95.00	90.00	92.50	32.001	2.49e+06	1.000	27.08	0.00	541.73	361.01	0.00	0.00	361.01	0.00	
P	P:cx9		90.00	89.67	89.84	32.663	2.54e+06	1.000	27.08	0.00	36.50	24.32	0.00	0.00	24.32	0.00	
P			89.67	85.00	87.34	32.972	2.57e+06	1.000	27.08	0.00	1246.79	347.42	0.00	0.00	347.42	0.00	
P		P:bc	85.00	82.63	83.82	33.535	2.61e+06	1.000	27.08	0.00	375.58	179.32	0.00	0.00	179.32	0.00	
P	P:bc	P:cx8	82.63	80.00	81.32	34.157	2.66e+06	1.000	27.08	0.00	424.50	202.68	0.00	0.00	202.68	0.00	
P	P:cx8		80.00	75.00	77.50	35.105	2.73e+06	1.000	27.08	0.00	829.74	396.03	0.00	0.00	396.03	0.00	
P		P:cx7	75.00	70.00	72.50	36.348	2.83e+06	1.000	27.08	0.00	859.49	410.06	0.00	0.00	410.06	0.00	
P	P:cx7		70.00	65.00	67.50	37.592	2.93e+06	1.000	27.08	0.00	889.25	424.08	0.00	0.00	424.08	0.00	
P		P:cx6	65.00	60.00	62.50	38.835	3.03e+06	1.000	27.08	0.00	919.00	438.11	0.00	0.00	438.11	0.00	
P	P:cx6		60.00	55.00	57.50	40.078	3.12e+06	1.000	27.08	0.00	948.76	452.13	0.00	0.00	452.13	0.00	
P		P:cx5	55.00	50.00	52.50	41.321	3.22e+06	1.000	27.08	0.00	978.51	466.16	0.00	0.00	466.16	0.00	
P	P:cx5		50.00	45.59	47.79	42.492	3.31e+06	1.000	27.08	0.00	888.76	423.28	0.00	0.00	423.28	0.00	
P			45.59	41.17	43.38	43.589	3.4e+06	1.000	27.08	0.00	911.96	434.21	0.00	0.00	434.21	0.00	
P		P:cx4	41.17	40.00	40.59	43.846	3.42e+06	1.000	27.08	0.00	503.23	115.75	0.00	0.00	115.75	0.00	
P	P:cx4		40.00	35.00	37.50	44.176	3.44e+06	1.000	27.08	0.00	2188.58	498.36	0.00	0.00	498.36	0.00	
P		P:cx3	35.00	30.00	32.50	45.419	3.54e+06	1.000	27.08	0.00	1152.69	512.39	0.00	0.00	512.39	0.00	
P	P:cx3		30.00	25.00	27.50	46.662	3.64e+06	1.000	27.08	0.00	1184.57	526.41	0.00	0.00	526.41	0.00	
P		P:cx2	25.00	20.00	22.50	47.906	3.73e+06	1.000	27.08	0.00	1216.45	540.44	0.00	0.00	540.44	0.00	
P	P:cx2		20.00	15.00	17.50	49.149	3.83e+06	1.000	27.08	0.00	1248.33	554.46	0.00	0.00	554.46	0.00	
P		P:cx1	15.00	10.00	12.50	50.392	3.93e+06	1.000	27.08	0.00	1280.21	568.49	0.00	0.00	568.49	0.00	
P	P:cx1		10.00	5.00	7.50	51.635	4.02e+06	1.000	27.08	0.00	1312.09	582.51	0.00	0.00	582.51	0.00	
P		P:g	5.00	0.00	2.50	52.878	4.12e+06	1.000	27.08	0.00	1343.97	596.54	0.00	0.00	596.54	0.00	

\*\*\* Analysis Results:

Maximum element usage is 94.19% for Base Plate "P" in load case "NESC 250C (Extreme Wind)"  
 Maximum insulator usage is 16.54% for Suspension "61" in load case "NESC 250B (Heavy)"



\*\*\* Analysis Results for Load Case No. 1 "NESC 250B (Heavy)" - Number of iterations in SAPS 21

**Equilibrium Joint Positions and Rotations for Load Case "NESC 250B (Heavy)":**

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
P:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
P:t	0.06218	8.212	-0.3279	-6.1319	0.0499	0.0073	0.06218	8.212	139.7
P:cx14	0.06175	8.158	-0.325	-6.1300	0.0499	0.0073	0.06175	8.158	139.2
P:sw	0.06158	8.137	-0.3239	-6.1292	0.0499	0.0073	0.06158	8.137	139
P:cx13	0.05369	7.15	-0.2712	-6.0394	0.0490	0.0073	0.05369	7.15	129.7
P:tc	0.05091	6.797	-0.2526	-5.9900	0.0481	0.0071	0.05091	6.797	126.4
P:cx12	0.04557	6.113	-0.217	-5.8203	0.0462	0.0068	0.04557	6.113	119.8
P:cx11	0.03803	5.129	-0.1681	-5.4502	0.0424	0.0062	0.03803	5.129	109.8
P:mc	0.03426	4.629	-0.1446	-5.2178	0.0400	0.0058	0.03426	4.629	104.5
P:cx10	0.03117	4.217	-0.1259	-4.9894	0.0380	0.0054	0.03117	4.217	99.87

F:cx9	0.02507	3.393	-0.09139	-4.4313	0.0333	0.0047	0.02507	3.393	89.91
P:bc	0.02106	2.848	-0.07083	-4.0605	0.0302	0.0042	0.02106	2.848	82.56
P:cx8	0.01972	2.664	-0.06429	-3.9336	0.0292	0.0040	0.01972	2.664	79.94
P:cx7	0.01502	2.021	-0.04304	-3.4281	0.0254	0.0034	0.01502	2.021	69.96
P:cx6	0.01096	1.467	-0.0272	-2.9046	0.0216	0.0028	0.01096	1.467	59.97
P:cx5	0.007565	1.005	-0.01602	-2.3799	0.0178	0.0023	0.007565	1.005	49.98
P:cx4	0.004812	0.6343	-0.008632	-1.8643	0.0140	0.0018	0.004812	0.6343	39.99
P:cx3	0.002692	0.3518	-0.004153	-1.3675	0.0104	0.0013	0.002692	0.3518	30
P:cx2	0.001193	0.1543	-0.001716	-0.8904	0.0069	0.0008	0.001193	0.1543	20
F:cx1	0.0002983	0.03827	-0.0005587	-0.4345	0.0034	0.0004	0.0002983	0.03827	9.999
SWL:0	0.0614	8.132	-0.4145	-6.1292	0.0499	0.0073	0.0614	8.981	138.9
SWL:1	0.06014	8.204	-1.583	-7.0481	0.0498	0.0072	0.06014	19.05	138.9
SWR:0	0.06177	8.142	-0.2333	-6.1292	0.0499	0.0073	0.06177	7.293	139.1
SWR:1	0.065	8.311	0.7572	-5.4267	0.0502	0.0077	0.065	-2.537	141.3
TCL:0	0.0507	6.791	-0.3548	-5.9900	0.0481	0.0071	0.0507	7.771	126.3
TCL:1	0.04909	6.921	-2.041	-6.7347	0.0480	0.0071	0.04909	22.9	126.6
TCR:0	0.05111	6.802	-0.1503	-5.9900	0.0481	0.0071	0.05111	5.822	126.5
TCR:1	0.0559	7.072	1.315	-5.3698	0.0483	0.0073	0.0559	-8.908	129.9
MCL:0	0.03406	4.624	-0.2544	-5.2178	0.0400	0.0058	0.03406	5.832	104.4
MCL:1	0.0329	4.748	-1.737	-5.9680	0.0400	0.0057	0.0329	20.96	104.9
MCR:0	0.03445	4.634	-0.03475	-5.2178	0.0400	0.0058	0.03445	3.426	104.6
MCR:1	0.03826	4.858	1.231	-4.5897	0.0402	0.0059	0.03826	-11.35	107.9
BCL:0	0.02091	2.844	-0.1706	-4.0605	0.0302	0.0042	0.02091	4.254	82.46
BCL:1	0.02025	2.954	-1.349	-4.8188	0.0302	0.0041	0.02025	19.36	83.28
BCR:0	0.02122	2.851	0.02898	-4.0605	0.0302	0.0042	0.02122	1.441	82.66
BCR:1	0.02388	3.012	0.9939	-3.4208	0.0303	0.0043	0.02388	-13.4	85.62
Mast:1	0.06648	8.746	-0.3566	-6.1435	0.0502	0.0074	0.06648	8.746	144.6
Mast:2	0.0682	8.96	-0.3681	-6.1436	0.0502	0.0074	0.0682	8.96	146.6
Mast:3	0.06906	9.068	-0.3738	-6.1436	0.0502	0.0074	0.06906	9.068	147.6
CX11:0	0.0002865	0.03824	-0.01245	-0.4345	0.0034	0.0004	1.556	1.594	9.988
CX11:1	0.0002609	0.03826	-0.01415	-0.5138	0.0829	0.0129	1.733	1.771	9.986
CX12:0	0.0003101	0.03833	0.01115	-0.4345	0.0034	0.0004	1.556	-1.518	10.01
CX12:1	0.000341	0.03836	0.01213	-0.3551	0.0829	0.0131	1.733	-1.694	10.01
CX21:0	0.001169	0.1541	-0.0249	-0.8904	0.0069	0.0008	1.481	1.634	19.98
CX21:1	0.001159	0.1541	-0.0279	-0.9432	0.0598	0.0091	1.658	1.811	19.97
CX22:0	0.001217	0.1545	0.02111	-0.8904	0.0069	0.0008	1.481	-1.326	20.02
CX22:1	0.001249	0.1545	0.0236	-0.8376	0.0598	0.0093	1.658	-1.502	20.02
CX31:0	0.002655	0.3514	-0.03792	-1.3675	0.0104	0.0013	1.407	1.756	29.96
CX31:1	0.002658	0.3513	-0.04241	-1.4202	0.0633	0.0096	1.584	1.932	29.96
CX32:0	0.00273	0.3522	0.02911	-1.3675	0.0104	0.0013	1.407	-1.052	30.03
CX32:1	0.002777	0.3523	0.03306	-1.3148	0.0633	0.0098	1.584	-1.229	30.03
CX41:0	0.004759	0.6336	-0.05305	-1.8643	0.0140	0.0018	1.36	1.989	39.95
CX41:1	0.004782	0.6335	-0.05907	-1.9169	0.0670	0.0101	1.537	2.165	39.94
CX42:0	0.004864	0.6351	0.03512	-1.8643	0.0140	0.0018	1.36	-0.7201	40.04
CX42:1	0.004935	0.6352	0.0406	-1.8116	0.0670	0.0103	1.537	-0.8967	40.04
CX51:0	0.007497	1.004	-0.06954	-2.3799	0.0178	0.0023	1.287	2.283	49.93
CX51:1	0.007547	1.004	-0.07716	-2.4324	0.0707	0.0106	1.464	2.46	49.92
CX52:0	0.007632	1.006	0.03671	-2.3799	0.0178	0.0023	1.287	-0.273	50.04
CX52:1	0.007734	1.007	0.04376	-2.3274	0.0707	0.0108	1.464	-0.4496	50.04
CX61:0	0.01088	1.466	-0.08864	-2.9046	0.0216	0.0028	1.214	2.669	59.91
CX61:1	0.01097	1.465	-0.09789	-2.9570	0.0745	0.0111	1.391	2.846	59.9
CX62:0	0.01105	1.469	0.03333	-2.9046	0.0216	0.0028	1.215	0.2651	60.03
CX62:1	0.01119	1.469	0.04198	-2.8522	0.0746	0.0113	1.391	0.08872	60.04
CX71:0	0.01492	2.019	-0.111	-3.4281	0.0254	0.0034	1.143	3.146	69.89
CX71:1	0.01505	2.018	-0.1218	-3.4804	0.0784	0.0117	1.319	3.323	69.88
CX72:0	0.01511	2.023	0.02389	-3.4281	0.0254	0.0034	1.143	0.8949	70.02
CX72:1	0.0153	2.023	0.03413	-3.3758	0.0784	0.0119	1.32	0.7186	70.03
CX81:0	0.01961	2.662	-0.137	-3.9336	0.0292	0.0040	1.071	3.713	79.86
CX81:1	0.01978	2.661	-0.1494	-3.9858	0.0822	0.0123	1.248	3.89	79.85
CX82:0	0.01983	2.667	0.007334	-3.9336	0.0292	0.0040	1.072	1.615	80.01
CX82:1	0.02007	2.667	0.01911	-3.8815	0.0823	0.0125	1.249	1.439	80.02
CX91:0	0.02495	3.39	-0.1688	-4.4313	0.0333	0.0047	1.02	4.385	89.83
CX91:1	0.02517	3.389	-0.1828	-4.4833	0.0863	0.0130	1.197	4.561	89.82
CX92:0	0.0252	3.396	-0.01508	-4.4313	0.0333	0.0047	1.02	2.401	89.98
CX92:1	0.0255	3.397	-0.001795	-4.3792	0.0863	0.0132	1.197	2.225	90
CX101:0	0.03103	4.213	-0.2065	-4.9894	0.0380	0.0054	0.9502	5.132	99.79
CX101:1	0.03132	4.212	-0.2221	-5.0413	0.0910	0.0138	1.127	5.308	99.78
CX102:0	0.03131	4.22	-0.04658	-4.9894	0.0380	0.0054	0.9505	3.301	99.95
CX102:1	0.03168	4.221	-0.0316	-4.9374	0.0911	0.0139	1.128	3.125	99.97
CX111:0	0.03788	5.125	-0.2488	-5.4502	0.0424	0.0062	0.8812	5.968	109.8
CX111:1	0.03823	5.124	-0.2659	-5.5019	0.0954	0.0145	1.058	6.144	109.7
CX112:0	0.03818	5.133	-0.0886	-5.4502	0.0424	0.0062	0.8815	4.289	109.9
CX112:1	0.03862	5.134	-0.07224	-5.3984	0.0955	0.0147	1.059	4.114	109.9
CX121:0	0.04542	6.109	-0.2955	-5.8203	0.0462	0.0068	0.8129	6.877	119.7
CX121:1	0.04583	6.108	-0.3137	-5.8720	0.0992	0.0151	0.9901	7.052	119.7
CX122:0	0.04573	6.117	-0.1398	-5.8203	0.0462	0.0068	0.8132	5.35	119.9
CX122:1	0.04623	6.119	-0.1223	-5.7686	0.0993	0.0153	0.9905	5.174	119.9
CX131:0	0.05354	7.146	-0.3446	-6.0394	0.0490	0.0073	0.7452	7.838	129.7
CX131:1	0.05398	7.145	-0.3635	-6.1039	0.1153	0.0177	0.9224	8.013	129.6
CX132:0	0.05384	7.154	-0.199	-6.0394	0.0490	0.0073	0.7455	6.462	129.8
CX132:1	0.05438	7.155	-0.181	-5.9748	0.1154	0.0179	0.9228	6.287	129.8

CX141:1 0.06694 8.745 -0.3758 -6.1821 0.0900 0.0136 0.2437 8.922 144.6  
 CX142:1 0.06703 8.748 -0.3381 -6.1048 0.0900 0.0138 0.2438 8.571 144.7

Joint Support Reactions for Load Case "NESC 250B (Heavy)":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Comp. Force (kips)	Z Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
P:g	-0.23	0.0	-38.67	0.0	0.0	-111.24	0.0	0.0	117.77	0.0	4287.29	0.0	-33.3	0.0	0.0	-2.96	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC 250B (Heavy)":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S (ksi)	V/Q (ksi)	T/R (ksi)	Res. (ksi)	Max. Usage %	At Usage Pt. %
P	P:t	Origin	0.00	98.54	0.75	-3.93	12.89	-0.24	0.0	-5.66	2.60	-0.03	-0.28	1.55	0.07	0.00	1.84	2.8	2
P	P:cx14	End	0.50	97.90	0.74	-3.90	14.19	-0.25	0.0	-5.66	2.60	-0.03	-0.28	1.69	0.07	0.00	1.97	3.0	2
P	P:cx14	Origin	0.50	97.90	0.74	-3.90	14.19	-0.25	0.0	-5.70	2.62	-0.03	-0.28	1.69	0.07	0.00	1.98	3.0	2
P	P:sw	End	0.70	97.64	0.74	-3.89	14.72	-0.26	0.0	-5.70	2.62	-0.03	-0.28	1.74	0.07	0.00	2.03	3.1	2
P	P:sw	Origin	0.70	97.64	0.74	-3.89	17.35	-0.26	0.0	-8.18	5.39	-0.03	-0.41	2.05	0.14	0.00	2.47	3.8	2
P	P:Tube 1	End	5.35	91.70	0.69	-3.57	42.39	-0.42	0.0	-8.18	5.39	-0.03	-0.38	4.47	0.13	0.00	4.86	7.5	2
P	P:Tube 1	Origin	5.35	91.70	0.69	-3.57	42.39	-0.42	0.0	-8.75	5.58	-0.04	-0.41	4.47	0.14	0.00	4.89	7.5	2
P	P:cx13	End	10.00	85.80	0.64	-3.25	68.33	-0.60	0.0	-8.75	5.58	-0.04	-0.39	6.48	0.13	0.00	6.87	10.6	2
P	P:cx13	Origin	10.00	85.80	0.64	-3.25	68.33	-1.42	0.3	-10.22	6.00	-0.04	-0.45	6.50	0.14	0.01	6.96	10.7	2
P	P:tc	End	13.37	81.56	0.61	-3.03	88.56	-1.57	0.3	-10.22	6.00	-0.04	-0.44	7.81	0.14	0.01	8.26	12.7	2
P	P:tc	Origin	13.37	81.56	0.61	-3.03	107.72	-1.60	0.3	-25.59	16.26	-0.06	-1.10	9.50	0.37	0.01	10.62	16.3	2
P	P:Tube 1	End	16.69	77.43	0.58	-2.81	161.63	-1.80	0.3	-25.59	16.26	-0.06	-1.06	13.27	0.36	0.01	14.34	22.1	2
P	P:Tube 1	Origin	16.69	77.43	0.58	-2.81	161.63	-1.80	0.3	-26.07	16.38	-0.07	-1.08	13.27	0.36	0.01	14.37	22.1	2
P	P:cx12	End	20.00	73.36	0.55	-2.60	215.94	-2.02	0.3	-26.07	16.38	-0.07	-1.04	16.56	0.35	0.01	17.61	27.1	2
P	P:cx12	Origin	20.00	73.36	0.55	-2.60	215.94	-2.74	0.5	-27.47	16.73	-0.07	-1.10	16.57	0.36	0.02	17.68	27.2	2
P	P:Tube 1	End	25.00	67.36	0.50	-2.30	299.58	-3.09	0.5	-27.47	16.73	-0.07	-1.05	20.83	0.34	0.02	21.88	33.7	2
P	P:Tube 1	Origin	25.00	67.36	0.50	-2.30	299.58	-3.09	0.4	-28.27	16.89	-0.08	-1.08	20.83	0.34	0.02	21.91	33.7	2
P	P:cx11	End	30.00	61.55	0.46	-2.02	384.04	-3.47	0.4	-28.27	16.89	-0.08	-1.03	24.31	0.33	0.01	25.34	39.0	2
P	P:cx11	Origin	30.00	61.55	0.46	-2.02	384.04	-4.25	0.7	-29.68	17.21	-0.08	-1.08	24.32	0.33	0.02	25.41	39.1	2
P	P:Tube 1	End	32.69	58.52	0.43	-1.87	430.25	-4.46	0.7	-29.68	17.21	-0.08	-1.05	25.95	0.32	0.02	27.01	41.6	2
P	P:Tube 1	Origin	32.69	58.52	0.43	-1.87	430.25	-4.46	0.6	-30.15	17.29	-0.08	-1.07	25.95	0.33	0.02	27.03	41.6	2
P	P:mc	End	35.37	55.55	0.41	-1.73	476.68	-4.68	0.6	-30.15	17.29	-0.08	-1.05	27.42	0.32	0.02	28.47	43.8	2
P	P:mc	Origin	35.37	55.55	0.41	-1.73	495.47	-4.71	0.7	-45.88	27.30	-0.10	-1.59	28.49	0.50	0.02	30.10	46.3	2
P	P:cx10	End	40.00	50.60	0.37	-1.51	621.87	-5.16	0.7	-45.88	27.30	-0.10	-1.53	33.03	0.48	0.02	34.57	53.2	2
P	P:cx10	Origin	40.00	50.60	0.37	-1.51	621.87	-6.00	0.9	-47.59	27.56	-0.11	-1.59	33.04	0.49	0.02	34.64	53.3	2
P	P:Tube 1	End	45.00	45.51	0.34	-1.29	759.65	-6.52	0.9	-47.59	27.56	-0.11	-1.52	37.17	0.47	0.02	38.71	59.5	2
P	P:Tube 1	Origin	45.00	45.51	0.34	-1.29	759.65	-6.52	0.9	-48.61	27.61	-0.11	-1.56	37.17	0.47	0.02	38.74	59.6	2
P	P:cx9	End	50.00	40.72	0.30	-1.10	897.70	-7.06	0.9	-48.61	27.61	-0.11	-1.50	40.59	0.45	0.02	42.09	64.8	2
P	P:cx9	Origin	50.00	40.72	0.30	-1.10	897.70	-7.96	1.1	-49.94	27.81	-0.11	-1.54	40.60	0.45	0.03	42.15	64.8	2
P	P:SpliceT	End	50.33	40.41	0.30	-1.08	906.88	-7.99	1.1	-49.94	27.81	-0.11	-1.53	40.81	0.45	0.03	42.35	65.2	2
P	P:SpliceT	Origin	50.33	40.41	0.30	-1.08	906.88	-7.99	1.1	-51.02	27.89	-0.12	-1.57	40.81	0.45	0.03	42.38	65.2	2
P	P:SpliceB	End	55.00	36.21	0.27	-0.92	1037.13	-8.53	1.1	-51.02	27.89	-0.12	-1.11	32.61	0.32	0.02	33.72	51.9	2
P	P:SpliceB	Origin	55.00	36.21	0.27	-0.92	1037.13	-8.53	1.1	-52.39	27.98	-0.12	-1.14	32.61	0.32	0.02	33.75	51.9	2
P	P:bc	End	57.37	34.17	0.25	-0.85	1103.45	-8.81	1.1	-52.39	27.98	-0.12	-1.12	33.48	0.32	0.02	34.60	53.2	2
P	P:bc	Origin	57.37	34.17	0.25	-0.85	1121.67	-8.83	1.1	-68.36	37.64	-0.13	-1.46	34.03	0.42	0.02	35.49	54.6	2
P	P:cx8	End	60.00	31.97	0.24	-0.77	1220.65	-9.17	1.1	-68.36	37.64	-0.13	-1.43	35.61	0.42	0.02	37.04	57.0	2
P	P:cx8	Origin	60.00	31.97	0.24	-0.77	1220.65	-10.11	1.3	-70.28	37.84	-0.14	-1.47	35.62	0.42	0.02	37.09	57.1	2
P	P:Tube 2	End	65.00	27.97	0.21	-0.64	1409.85	-10.79	1.3	-70.28	37.84	-0.14	-1.42	38.27	0.40	0.02	39.69	61.1	2
P	P:Tube 2	Origin	65.00	27.97	0.21	-0.64	1409.85	-10.79	1.3	-71.82	37.86	-0.14	-1.45	38.27	0.40	0.02	39.72	61.1	2
P	P:cx7	End	70.00	24.25	0.18	-0.52	1599.14	-11.49	1.3	-71.82	37.86	-0.14	-1.40	40.48	0.39	0.02	41.88	64.4	2
P	P:cx7	Origin	70.00	24.25	0.18	-0.52	1599.14	-12.49	1.5	-74.19	38.04	-0.15	-1.44	40.49	0.39	0.02	41.94	64.5	2
P	P:Tube 2	End	75.00	20.79	0.15	-0.41	1789.31	-13.22	1.5	-74.19	38.04	-0.15	-1.40	42.35	0.38	0.02	43.75	67.3	2
P	P:Tube 2	Origin	75.00	20.79	0.15	-0.41	1789.31	-13.22	1.5	-75.83	38.04	-0.15	-1.43	42.35	0.38	0.02	43.78	67.4	2
P	P:cx6	End	80.00	17.60	0.13	-0.33	1979.48	-13.97	1.5	-75.83	38.04	-0.15	-1.38	43.89	0.37	0.02	45.28	69.7	2
P	P:cx6	Origin	80.00	17.60	0.13	-0.33	1979.48	-15.04	1.7	-78.30	38.19	-0.16	-1.43	43.90	0.37	0.02	45.33	69.7	2
P	P:Tube 2	End	85.00	14.70	0.11	-0.25	2170.42	-15.82	1.7	-78.30	38.19	-0.16	-1.38	45.19	0.36	0.02	46.57	71.7	2
P	P:Tube 2	Origin	85.00	14.70	0.11	-0.25	2170.42	-15.82	1.7	-80.05	38.18	-0.16	-1.41	45.19	0.36	0.02	46.60	71.7	2
P	P:cx5	End	90.00	12.06	0.09	-0.19	2361.30	-16.63	1.7	-80.05	38.18	-0.16	-1.37	46.24	0.35	0.02	47.62	73.3	2
P	P:cx5	Origin	90.00	12.06	0.09	-0.19	2361.30	-17.75	2.0	-82.51	38.32	-0.17	-1.41	46.25	0.35	0.02	47.66	73.3	2
P	P:Tube 2	End	94.42	9.96	0.08	-0.15	2530.46	-18.49	2.0	-82.51	38.32	-0.17	-1.38	47.02	0.34	0.02	48.40	74.5	2
P	P:Tube 2	Origin	94.42	9.96	0.08	-0.15	2530.46	-18.50	2.0	-84.13	38.30	-0.17	-1.40	47.02	0.34	0.02	48.43	74.5	2
P	P:SpliceT	End	98.83	8.08	0.06	-0.11	2699.54	-19.26	2.0	-84.13	38.30	-0.17	-1.37	47.66	0.33	0.02	49.04	75.4	2
P	P:SpliceT	Origin	98.83	8.08	0.06	-0.11	2699.54	-19.26	2.0	-85.37	38.29	-0.18	-1.39	47.66	0.33	0.02	49.06	75.5	2
P	P:cx4	End	100.00	7.61	0.06	-0.10	2744.34	-19.47	2.0	-85.37	38.29	-0.18	-1.31	46.56	0.31	0.02	47.88	73.7	2
P	P:cx4	Origin	100.00	7.61	0.06	-0.10	2744.34	-20.65	2.2	-88.35	38.46	-0.18	-1.36	46.57	0.31	0.02	47.93	73.7	2
P	P:SpliceB	End	105.00	5.79	0.04	-0.07	2936.61	-21.55	2.2	-88.35	38.46	-0.18	-1.32	47.06	0.30	0.02	48.38	74.4	2
P	P:SpliceB	Origin	105.00	5.79	0.04	-0.07	2936.61	-21.56	2.2	-91.16	38.45	-0.19	-1.36	47.06	0.30	0.02	48.43	74.5	2
P	P:cx3	End	110.00	4.22	0.03	-0.05	3128.84	-22.48	2.2	-91.16	38.45	-0.19	-1.33	47.43	0.30	0.02	48.76	75.0	2
P	P:cx3	Origin	110.00	4.22	0.03	-0.05	3128.84	-23.71	2.4	-94.00	38.55	-0.19	-1.37	47.43	0.30	0.02	48.80	75.1	2
P	P:Tube 3	End	115.00	2.91	0.02	-0.03	3321.59	-24.67	2.4	-94.00	38.55	-0.19	-1.33	47.70	0.29	0.02	49.03	75.4	2
P	P:Tube 3	Origin	115.00	2.91	0.02	-0.03	3321.59	-24.68	2.4	-96.11	38.52	-0.20	-1.36	47.70	0.29	0.02	49.06	75.5	2
P	P:cx2	End	120.00	1.85	0.01	-0.02	3514.17	-25.67	2.4	-96.11	38.52	-0.20	-1.33	47.87	0.28	0.02	49.20	75.7	2

P	P:cx2	Origin	120.00	1.85	0.01	-0.02	3514.17	-26.96	2.6	-99.04	38.62	-0.21	-1.37	47.88	0.28	0.02	49.25	75.8	2
P	Tube 3	End	125.00	1.04	0.01	-0.01	3707.25	-27.98	2.6	-99.04	38.62	-0.21	-1.33	47.98	0.27	0.02	49.32	75.9	2
P	Tube 3	Origin	125.00	1.04	0.01	-0.01	3707.25	-27.99	2.6	-101.25	38.58	-0.21	-1.36	47.98	0.27	0.02	49.35	75.9	2
P	P:cx1	End	130.00	0.46	0.00	-0.01	3900.14	-29.04	2.6	-101.25	38.58	-0.21	-1.33	48.01	0.27	0.02	49.34	75.9	2
P	P:cx1	Origin	130.00	0.46	0.00	-0.01	3900.14	-31.07	3.0	-104.67	38.74	-0.22	-1.37	48.02	0.27	0.02	49.40	76.0	2
P	Tube 3	End	135.00	0.12	0.00	-0.00	4093.81	-32.16	3.0	-104.67	38.74	-0.22	-1.34	48.00	0.26	0.02	49.35	75.9	2
P	Tube 3	Origin	135.00	0.12	0.00	-0.00	4093.81	-32.17	3.0	-106.97	38.70	-0.23	-1.37	48.00	0.26	0.02	49.37	76.0	2
P	P:g	End	140.00	0.00	0.00	0.00	4287.29	-33.29	3.0	-106.97	38.70	-0.23	-1.34	47.93	0.26	0.02	49.27	75.8	2

Detailed Tubular Davit Arm Usages for Load Case "NESC 250B (Heavy)":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Vert. Mom. (ft-k)	Horz. Mom. (ft-k)	Tors. Mom. (kips)	Axial Force (kips)	Vert. Shear (kips)	Horz. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
SWL	SWL:0	Origin	0.00	97.58	0.74	-4.97	-11.29	-0.01	-0.0	1.18	1.17	0.00	0.26	18.25	0.00	0.00	18.51	28.5	1
SWL	#SWL:0	End	5.00	98.01	0.73	-11.69	-5.43	-0.01	-0.0	1.18	1.17	0.00	0.33	14.73	0.00	0.00	15.07	23.2	1
SWL	SWL:0	Origin	5.00	98.01	0.73	-11.69	-5.43	-0.01	-0.0	1.18	1.09	0.00	0.34	14.73	0.00	0.00	15.07	23.2	1
SWL	#SWL:1	End	7.54	98.23	0.73	-15.29	-2.66	-0.00	-0.0	1.18	1.09	0.00	0.40	9.99	0.00	0.00	10.38	16.0	1
SWL	#SWL:1	Origin	7.54	98.23	0.73	-15.29	-2.66	-0.00	0.0	1.19	1.05	0.00	0.40	9.99	0.00	0.00	10.38	16.0	1
SWL	SWL:1	End	10.07	98.44	0.72	-19.00	0.00	0.00	0.0	1.19	1.05	0.00	0.48	0.00	0.91	0.00	1.65	2.5	3
SWR	SWR:0	Origin	0.00	97.70	0.74	-2.80	-8.64	0.01	0.0	-1.47	0.90	-0.00	-0.32	13.96	0.00	0.00	14.28	22.0	1
SWR	#SWR:0	End	5.00	98.75	0.76	3.29	-4.15	0.01	0.0	-1.47	0.90	-0.00	-0.42	11.26	0.00	0.00	11.68	18.0	1
SWR	#SWR:0	Origin	5.00	98.75	0.76	3.29	-4.15	0.01	0.0	-1.45	0.84	-0.00	-0.41	11.26	0.00	0.00	11.67	18.0	1
SWR	#SWR:1	End	7.54	99.25	0.77	6.23	-2.03	0.00	0.0	-1.45	0.84	-0.00	-0.48	7.63	0.00	0.00	8.11	12.5	1
SWR	#SWR:1	Origin	7.54	99.25	0.77	6.23	-2.03	0.00	0.0	-1.44	0.80	-0.00	-0.48	7.63	0.00	0.00	8.11	12.5	1
SWR	SWR:1	End	10.07	99.73	0.78	9.09	-0.00	0.00	0.0	-1.44	0.80	-0.00	-0.58	0.00	0.69	0.00	1.34	2.1	3
TCL	TCL:0	Origin	0.00	81.49	0.61	-4.26	-114.43	-0.10	-0.0	4.06	7.88	0.01	0.27	20.75	0.00	0.00	21.02	32.3	1
TCL	#TCL:0	End	5.00	82.00	0.60	-10.66	-75.02	-0.07	-0.0	4.06	7.88	0.01	0.32	19.88	0.00	0.00	20.20	31.1	1
TCL	#TCL:0	Origin	5.00	82.00	0.60	-10.66	-75.02	-0.07	-0.0	4.10	7.54	0.01	0.33	19.88	0.00	0.00	20.20	31.1	1
TCL	#TCL:1	End	10.00	82.52	0.60	-17.35	-37.30	-0.03	-0.0	4.10	7.54	0.01	0.41	15.79	0.00	0.00	16.20	24.9	1
TCL	#TCL:1	Origin	10.00	82.52	0.60	-17.35	-37.30	-0.03	-0.0	4.13	7.33	0.01	0.42	15.79	0.00	0.00	16.20	24.9	1
TCL	#TCL:2	End	12.57	82.78	0.59	-20.89	-18.49	-0.02	-0.0	4.13	7.33	0.01	0.48	10.47	0.00	0.00	10.96	16.9	1
TCL	#TCL:2	Origin	12.57	82.78	0.59	-20.89	-18.49	-0.02	0.0	4.15	7.21	0.01	0.48	10.47	0.00	0.00	10.96	16.9	1
TCL	TCL:1	End	15.13	83.05	0.59	-24.49	-0.00	0.00	0.0	4.15	7.21	0.01	0.57	0.00	2.06	0.00	3.61	5.6	3
TCR	TCR:0	Origin	0.00	81.62	0.61	-1.80	-95.28	0.10	0.0	-5.95	6.56	-0.01	-0.39	17.28	0.00	0.00	17.67	27.2	1
TCR	#TCR:0	End	5.00	82.75	0.63	4.24	-62.47	0.07	0.0	-5.95	6.56	-0.01	-0.48	16.55	0.00	0.00	17.03	26.2	1
TCR	#TCR:0	Origin	5.00	82.75	0.63	4.24	-62.47	0.07	0.0	-5.85	6.28	-0.01	-0.47	16.55	0.00	0.00	17.02	26.2	1
TCR	#TCR:1	End	10.00	83.81	0.65	10.04	-31.07	0.03	0.0	-5.85	6.28	-0.01	-0.59	13.15	0.00	0.00	13.74	21.1	1
TCR	#TCR:1	Origin	10.00	83.81	0.65	10.04	-31.07	0.03	0.0	-5.78	6.10	-0.01	-0.58	13.15	0.00	0.00	13.73	21.1	1
TCR	#TCR:2	End	12.57	84.34	0.66	12.94	-15.41	0.02	0.0	-5.78	6.10	-0.01	-0.67	8.72	0.00	0.00	9.40	14.5	1
TCR	#TCR:2	Origin	12.57	84.34	0.66	12.94	-15.41	0.02	0.0	-5.75	6.00	-0.01	-0.67	8.72	0.00	0.00	9.40	14.5	1
TCR	TCR:1	End	15.13	84.86	0.67	15.78	-0.00	0.00	0.0	-5.75	6.00	-0.01	-0.79	0.00	1.72	0.00	3.08	4.7	3
MCL	MCL:0	Origin	0.00	55.49	0.41	-3.05	-115.25	-0.09	-0.0	3.95	7.94	0.01	0.26	20.90	0.00	0.00	21.16	32.6	1
MCL	#MCL:0	End	5.00	55.97	0.40	-8.64	-75.57	-0.06	-0.0	3.95	7.94	0.01	0.32	20.02	0.00	0.00	20.34	31.3	1
MCL	#MCL:0	Origin	5.00	55.97	0.40	-8.64	-75.57	-0.06	-0.0	4.00	7.60	0.01	0.32	20.02	0.00	0.00	20.34	31.3	1
MCL	#MCL:1	End	10.00	56.46	0.40	-14.53	-37.58	-0.03	-0.0	4.00	7.60	0.01	0.40	15.91	0.00	0.00	16.31	25.1	1
MCL	#MCL:1	Origin	10.00	56.46	0.40	-14.53	-37.58	-0.03	-0.0	4.03	7.38	0.01	0.41	15.91	0.00	0.00	16.31	25.1	1
MCL	#MCL:2	End	12.57	56.72	0.40	-17.66	-18.63	-0.01	-0.0	4.03	7.38	0.01	0.47	10.55	0.00	0.00	11.02	17.0	1
MCL	#MCL:2	Origin	12.57	56.72	0.40	-17.66	-18.63	-0.01	0.0	4.05	7.26	0.01	0.47	10.55	0.00	0.00	11.03	17.0	1
MCL	MCL:1	End	15.13	56.98	0.39	-20.84	-0.00	0.00	0.0	4.05	7.26	0.01	0.56	0.00	2.08	0.00	3.64	5.6	3
MCR	MCR:0	Origin	0.00	55.61	0.41	-0.42	-96.48	0.09	0.0	-5.86	6.64	-0.01	-0.39	17.49	0.00	0.00	17.88	27.5	1
MCR	#MCR:0	End	5.00	56.55	0.43	4.84	-63.26	0.06	0.0	-5.86	6.64	-0.01	-0.47	16.76	0.00	0.00	17.23	26.5	1
MCR	#MCR:0	Origin	5.00	56.55	0.43	4.84	-63.26	0.06	0.0	-5.76	6.36	-0.01	-0.46	16.76	0.00	0.00	17.22	26.5	1
MCR	#MCR:1	End	10.00	57.44	0.44	9.85	-31.47	0.03	0.0	-5.76	6.36	-0.01	-0.58	13.32	0.00	0.00	13.90	21.4	1
MCR	#MCR:1	Origin	10.00	57.44	0.44	9.85	-31.47	0.03	0.0	-5.70	6.18	-0.01	-0.58	13.32	0.00	0.00	13.90	21.4	1
MCR	#MCR:2	End	12.57	57.87	0.45	12.33	-15.61	0.01	0.0	-5.70	6.18	-0.01	-0.66	8.84	0.00	0.00	9.50	14.6	1
MCR	#MCR:2	Origin	12.57	57.87	0.45	12.33	-15.61	0.01	0.0	-5.67	6.08	-0.01	-0.66	8.84	0.00	0.00	9.50	14.6	1
MCR	MCR:1	End	15.13	58.30	0.46	14.77	-0.00	0.00	0.0	-5.67	6.08	-0.01	-0.78	0.00	1.74	0.00	3.11	4.8	3
BCL	BCL:0	Origin	0.00	34.13	0.25	-2.05	-116.45	-0.07	-0.0	3.79	8.02	0.00	0.25	21.11	0.00	0.00	21.37	32.9	1
BCL	#BCL:0	End	5.00	34.55	0.25	-6.43	-76.37	-0.04	-0.0	3.79	8.02	0.00	0.30	20.24	0.00	0.00	20.54	31.6	1
BCL	#BCL:0	Origin	5.00	34.55	0.25	-6.43	-76.37	-0.04	-0.0	3.84	7.68	0.00	0.31	20.24	0.00	0.00	20.54	31.6	1
BCL	#BCL:1	End	10.00	34.99	0.25	-11.11	-37.99	-0.02	-0.0	3.84	7.68	0.00	0.39	16.08	0.00	0.00	16.47	25.3	1
BCL	#BCL:1	Origin	10.00	34.99	0.25	-11.11	-37.99	-0.02	-0.0	3.88	7.46	0.00	0.39	16.08	0.00	0.00	16.47	25.3	1
BCL	#BCL:2	End	12.57	35.22	0.24	-13.62	-18.84	-0.01	-0.0	3.88	7.46	0.00	0.45	10.67	0.00	0.00	11.12	17.1	1
BCL	#BCL:2	Origin	12.57	35.22	0.24	-13.62	-18.84	-0.01	0.0	3.90	7.34	0.00	0.45	10.67	0.00	0.00	11.12	17.1	1
BCL	BCL:1	End	15.13	35.45	0.24	-16.19	-0.00	0.00	0.0	3.90	7.34	0.00	0.54	0.00	2.10	0.00	3.68	5.7	3
BCR	BCR:0	Origin	0.00	34.21	0.25	0.35	-98.25	0.07	0.0	-5.72	6.76	-0.01	-0.38	17.81	0.00	0.00	18.19	28.0	1
BCR	#BCR:0	End	5.00	34.90	0.27	4.41	-64.44	0.04	0.0	-5.72	6.76	-0.01	-0.46	17.07	0.00	0.00	17.53	27.0	1
BCR	#BCR:0	Origin	5.00	34.90	0.27	4.41	-64.44	0.04	0.0	-5.63	6.48	-0.00	-0.45	17.07	0.00	0.00	17.52	27.0	1
BCR	#BCR:1	End	10.00	35.53	0.28	8.23	-32.06	0.02	0.0	-5.63	6.48	-0.00	-0.57	13.57	0.00	0.00	14.14	21.8	1
BCR	#BCR:1	Origin	10.00	35.53	0.28	8.23	-32.06	0.02	0.0	-5.57	6.30	-0.00	-0.56	13.57	0.00	0.00	14.13	21.7	1

BCR	#BCR:2	End	12.57	35.84	0.28	10.10	-15.90	0.01	0.0	-5.57	6.30	-0.00	-0.65	9.00	0.00	0.00	9.65	14.9	1
BCR	#BCR:2	Origin	12.57	35.84	0.28	10.10	-15.90	0.01	0.0	-5.54	6.20	-0.00	-0.65	9.00	0.00	0.00	9.65	14.8	1
BCR	BCR:1	End	15.13	36.14	0.29	11.93	-0.00	0.00	0.0	-5.54	6.20	-0.00	-0.76	0.00	1.77	0.00	3.16	4.9	3
Mast	P:t	Origin	0.00	98.54	0.75	-3.93	-12.89	-0.24	0.0	-5.50	2.56	0.03	-0.26	1.73	0.25	0.00	2.04	4.8	1
Mast	#Mast:0	End	2.50	101.75	0.77	-4.11	-6.50	-0.17	0.0	-5.50	2.56	0.03	-0.26	0.87	0.25	0.00	1.21	2.9	1
Mast	#Mast:0	Origin	2.50	101.75	0.77	-4.11	-6.50	-0.17	0.0	-5.24	2.48	0.03	-0.25	0.87	0.24	0.00	1.20	2.9	1
Mast	Mast:1	End	5.00	104.96	0.80	-4.28	-0.30	-0.10	0.0	-5.24	2.48	0.03	-0.25	0.04	0.24	0.00	0.51	1.2	1
Mast	Mast:1	Origin	5.00	104.96	0.80	-4.28	-0.30	-0.00	0.0	-0.78	0.14	0.00	-0.04	0.04	0.01	0.00	0.08	0.2	1
Mast	Mast:2	End	7.00	107.53	0.82	-4.42	-0.02	-0.00	0.0	-0.78	0.14	0.00	-0.04	0.00	0.01	0.00	0.05	0.1	1
Mast	Mast:2	Origin	7.00	107.53	0.82	-4.42	-0.02	-0.00	0.0	-0.05	0.02	0.00	-0.00	0.00	0.00	0.00	0.01	0.0	1
Mast	Mast:3	End	8.00	108.81	0.83	-4.49	0.00	0.00	0.0	-0.05	0.02	0.00	-0.00	0.00	0.00	0.00	0.00	0.0	1
CX11	CX11:0	Origin	0.00	0.46	0.00	-0.15	-0.15	0.02	0.0	0.07	0.58	-0.07	0.12	19.07	1.99	0.00	19.49	30.0	1
CX11	CX11:1	End	0.25	0.46	0.00	-0.17	-0.00	-0.00	0.0	0.07	0.58	-0.07	0.12	0.00	1.99	0.00	3.44	5.3	1
CX12	CX12:0	Origin	0.00	0.46	0.00	0.13	-0.15	0.02	0.0	-0.07	0.58	-0.07	-0.11	19.08	1.99	0.00	19.50	30.0	1
CX12	CX12:1	End	0.25	0.46	0.00	0.15	-0.00	0.00	0.0	-0.07	0.58	-0.07	-0.11	0.00	1.99	0.00	3.44	5.3	1
CX21	CX21:0	Origin	0.00	1.85	0.01	-0.30	-0.10	0.01	0.0	0.05	0.39	-0.05	0.08	12.69	1.32	0.00	12.98	20.0	1
CX21	CX21:1	End	0.25	1.85	0.01	-0.33	-0.00	-0.00	0.0	0.05	0.39	-0.05	0.08	0.00	1.32	0.00	2.29	3.5	1
CX22	CX22:0	Origin	0.00	1.85	0.01	0.25	-0.10	0.01	0.0	-0.05	0.39	-0.05	-0.08	12.70	1.32	0.00	12.98	20.0	1
CX22	CX22:1	End	0.25	1.85	0.01	0.28	-0.00	0.00	0.0	-0.05	0.39	-0.05	-0.08	0.00	1.32	0.00	2.29	3.5	1
CX31	CX31:0	Origin	0.00	4.22	0.03	-0.46	-0.10	0.01	0.0	0.05	0.39	-0.05	0.09	12.68	1.32	0.00	12.97	20.0	1
CX31	CX31:1	End	0.25	4.22	0.03	-0.51	-0.00	-0.00	0.0	0.05	0.39	-0.05	0.09	0.00	1.32	0.00	2.29	3.5	1
CX32	CX32:0	Origin	0.00	4.23	0.03	0.35	-0.10	0.01	0.0	-0.05	0.39	-0.05	-0.08	12.69	1.32	0.00	12.98	20.0	1
CX32	CX32:1	End	0.25	4.23	0.03	0.40	-0.00	0.00	0.0	-0.05	0.39	-0.05	-0.08	0.00	1.32	0.00	2.29	3.5	1
CX41	CX41:0	Origin	0.00	7.60	0.06	-0.64	-0.10	0.01	0.0	0.05	0.39	-0.05	0.09	12.67	1.32	0.00	12.96	19.9	1
CX41	CX41:1	End	0.25	7.60	0.06	-0.71	-0.00	-0.00	0.0	0.05	0.39	-0.05	0.09	0.00	1.32	0.00	2.29	3.5	1
CX42	CX42:0	Origin	0.00	7.62	0.06	0.42	-0.10	0.01	0.0	-0.05	0.39	-0.05	-0.09	12.68	1.32	0.00	12.97	20.0	1
CX42	CX42:1	End	0.25	7.62	0.06	0.49	-0.00	0.00	0.0	-0.05	0.39	-0.05	-0.09	0.00	1.32	0.00	2.29	3.5	1
CX51	CX51:0	Origin	0.00	12.05	0.09	-0.83	-0.10	0.01	0.0	0.06	0.38	-0.05	0.09	12.66	1.32	0.00	12.96	19.9	1
CX51	CX51:1	End	0.25	12.05	0.09	-0.93	-0.00	-0.00	0.0	0.06	0.38	-0.05	0.09	0.00	1.32	0.00	2.29	3.5	1
CX52	CX52:0	Origin	0.00	12.08	0.09	0.44	-0.10	0.01	0.0	-0.05	0.38	-0.06	-0.09	12.67	1.32	0.00	12.96	19.9	1
CX52	CX52:1	End	0.25	12.08	0.09	0.53	-0.00	0.00	0.0	-0.05	0.38	-0.06	-0.09	0.00	1.32	0.00	2.29	3.5	1
CX61	CX61:0	Origin	0.00	17.59	0.13	-1.06	-0.10	0.01	0.0	0.06	0.38	-0.06	0.10	12.65	1.32	0.00	12.95	19.9	1
CX61	CX61:1	End	0.25	17.58	0.13	-1.17	-0.00	-0.00	0.0	0.06	0.38	-0.06	0.10	0.00	1.32	0.00	2.28	3.5	1
CX62	CX62:0	Origin	0.00	17.62	0.13	0.40	-0.10	0.01	0.0	-0.06	0.38	-0.06	-0.10	12.66	1.32	0.00	12.96	19.9	1
CX62	CX62:1	End	0.25	17.63	0.13	0.50	-0.00	0.00	0.0	-0.06	0.38	-0.06	-0.10	0.00	1.32	0.00	2.29	3.5	1
CX71	CX71:0	Origin	0.00	24.22	0.18	-1.33	-0.10	0.01	0.0	0.06	0.38	-0.06	0.10	12.64	1.32	0.00	12.94	19.9	1
CX71	CX71:1	End	0.25	24.22	0.18	-1.46	-0.00	-0.00	0.0	0.06	0.38	-0.06	0.10	0.00	1.32	0.00	2.28	3.5	1
CX72	CX72:0	Origin	0.00	24.27	0.18	0.29	-0.10	0.02	0.0	-0.06	0.38	-0.06	-0.10	12.65	1.32	0.00	12.95	19.9	1
CX72	CX72:1	End	0.25	24.28	0.18	0.41	-0.00	0.00	0.0	-0.06	0.38	-0.06	-0.10	0.00	1.32	0.00	2.28	3.5	1
CX81	CX81:0	Origin	0.00	31.94	0.24	-1.64	-0.10	0.02	0.0	0.06	0.38	-0.06	0.11	12.62	1.31	0.00	12.93	19.9	1
CX81	CX81:1	End	0.25	31.93	0.24	-1.79	-0.00	-0.00	0.0	0.06	0.38	-0.06	0.11	0.00	1.31	0.00	2.28	3.5	1
CX82	CX82:0	Origin	0.00	32.00	0.24	0.09	-0.10	0.02	0.0	-0.06	0.38	-0.06	-0.10	12.63	1.32	0.00	12.94	19.9	1
CX82	CX82:1	End	0.25	32.01	0.24	0.23	-0.00	-0.00	0.0	-0.06	0.38	-0.06	-0.10	0.00	1.32	0.00	2.28	3.5	1
CX91	CX91:0	Origin	0.00	40.68	0.30	-2.03	-0.10	0.02	0.0	0.07	0.38	-0.06	0.11	12.61	1.31	0.00	12.92	19.9	1
CX91	CX91:1	End	0.25	40.67	0.30	-2.19	-0.00	-0.00	0.0	0.07	0.38	-0.06	0.11	0.00	1.31	0.00	2.28	3.5	1
CX92	CX92:0	Origin	0.00	40.75	0.30	-0.18	-0.10	0.02	0.0	-0.06	0.38	-0.07	-0.11	12.62	1.31	0.00	12.93	19.9	1
CX92	CX92:1	End	0.25	40.76	0.31	-0.02	-0.00	-0.00	0.0	-0.06	0.38	-0.07	-0.11	0.00	1.31	0.00	2.28	3.5	1
CX101	CX101:0	Origin	0.00	50.56	0.37	-2.48	-0.10	0.02	0.0	0.07	0.38	-0.07	0.12	12.60	1.31	0.00	12.91	19.9	1
CX101	CX101:1	End	0.25	50.55	0.38	-2.67	-0.00	-0.00	0.0	0.07	0.38	-0.07	0.12	0.00	1.31	0.00	2.28	3.5	1
CX102	CX102:0	Origin	0.00	50.64	0.38	-0.56	-0.10	0.02	0.0	-0.07	0.38	-0.07	-0.11	12.61	1.31	0.00	12.92	19.9	1
CX102	CX102:1	End	0.25	50.65	0.38	-0.38	-0.00	-0.00	0.0	-0.07	0.38	-0.07	-0.11	0.00	1.31	0.00	2.28	3.5	1
CX111	CX111:0	Origin	0.00	61.50	0.45	-2.99	-0.09	0.02	0.0	0.07	0.38	-0.07	0.12	12.58	1.31	0.00	12.90	19.9	1
CX111	CX111:1	End	0.25	61.49	0.46	-3.19	-0.00	-0.00	0.0	0.07	0.38	-0.07	0.12	0.00	1.31	0.00	2.27	3.5	1
CX112	CX112:0	Origin	0.00	61.59	0.46	-1.06	-0.10	0.02	0.0	-0.07	0.38	-0.07	-0.12	12.60	1.31	0.00	12.91	19.9	1
CX112	CX112:1	End	0.25	61.61	0.46	-0.87	-0.00	-0.00	0.0	-0.07	0.38	-0.07	-0.12	0.00	1.31	0.00	2.28	3.5	1
CX121	CX121:0	Origin	0.00	73.31	0.55	-3.55	-0.09	0.02	0.0	0.07	0.38	-0.07	0.12	12.57	1.31	0.00	12.90	19.8	1
CX121	CX121:1	End	0.25	73.30	0.55	-3.76	-0.00	-0.00	0.0	0.07	0.38	-0.07	0.12	0.00	1.31	0.00	2.27	3.5	1



CX122	CX122:0	Origin	0.00	73.41	0.55	-1.68	-0.09	0.02	0.0	-0.07	0.38	-0.07	-0.12	12.59	1.31	0.00	12.91	19.9	1
CX122	CX122:1	End	0.25	73.42	0.55	-1.47	-0.00	-0.00	0.0	-0.07	0.38	-0.07	-0.12	0.00	1.31	0.00	2.27	3.5	1
CX131	CX131:0	Origin	0.00	85.75	0.64	-4.13	-0.12	0.02	0.0	0.09	0.47	-0.09	0.15	15.72	1.64	0.00	16.12	24.8	1
CX131	CX131:1	End	0.25	85.73	0.65	-4.36	-0.00	-0.00	0.0	0.09	0.47	-0.09	0.15	0.00	1.64	0.00	2.84	4.4	1
CX132	CX132:0	Origin	0.00	85.84	0.65	-2.39	-0.12	0.02	0.0	-0.09	0.47	-0.09	-0.15	15.73	1.64	0.00	16.14	24.8	1
CX132	CX132:1	End	0.25	85.86	0.65	-2.17	-0.00	-0.00	0.0	-0.09	0.47	-0.09	-0.15	0.00	1.64	0.00	2.84	4.4	1
CX141	Mast:1	Origin	0.00	104.96	0.80	-4.28	-0.07	0.01	0.0	0.05	0.28	-0.05	0.09	9.42	0.98	0.00	9.66	14.9	1
CX141	CX141:1	End	0.25	104.94	0.80	-4.51	-0.00	-0.00	0.0	0.05	0.28	-0.05	0.09	0.00	0.98	0.00	1.70	2.6	1
CX142	Mast:1	Origin	0.00	104.96	0.80	-4.28	-0.07	0.01	0.0	-0.05	0.28	-0.06	-0.09	9.42	0.98	0.00	9.67	14.9	1
CX142	CX142:1	End	0.25	104.98	0.80	-4.06	-0.00	-0.00	0.0	-0.05	0.28	-0.06	-0.09	0.00	0.98	0.00	1.70	2.6	1

Summary of Suspension Capacities and Usages for Load Case "NESC 250B (Heavy)":

Suspension Label	Tension (kips)	Input Tension Capacity (kips)	Factored Tension Capacity (kips)	Tension Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
21	1.573	20.00	20.00	7.87	0.00	0.00	0.00	7.87
11	1.635	20.00	20.00	8.17	0.00	0.00	0.00	8.17
61	8.269	50.00	50.00	16.54	0.00	0.00	0.00	16.54
51	8.269	50.00	50.00	16.54	0.00	0.00	0.00	16.54
62	8.269	50.00	50.00	16.54	0.00	0.00	0.00	16.54
52	8.269	50.00	50.00	16.54	0.00	0.00	0.00	16.54
63	8.269	50.00	50.00	16.54	0.00	0.00	0.00	16.54
53	8.269	50.00	50.00	16.54	0.00	0.00	0.00	16.54

Equilibrium Joint Positions and Rotations for Load Case "NESC 250C (Extreme Wind)":

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
P:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
P:t	0.02372	9.883	-0.4685	-7.4359	0.0212	0.0123	0.02372	9.883	139.5
P:cx14	0.02355	9.818	-0.4643	-7.4321	0.0211	0.0123	0.02355	9.818	139
P:sw	0.02348	9.792	-0.4626	-7.4304	0.0211	0.0123	0.02348	9.792	138.8
P:cx13	0.02037	8.599	-0.3857	-7.2914	0.0205	0.0122	0.02037	8.599	129.6
P:tc	0.01931	8.173	-0.3586	-7.2200	0.0201	0.0119	0.01931	8.173	126.3
P:cx12	0.01728	7.351	-0.3074	-6.9988	0.0191	0.0114	0.01728	7.351	119.7
P:cx11	0.01445	6.17	-0.2372	-6.5391	0.0174	0.0103	0.01445	6.17	109.8
P:mc	0.01304	5.571	-0.2036	-6.2547	0.0164	0.0097	0.01304	5.571	104.4
P:cx10	0.01189	5.077	-0.1771	-5.9785	0.0155	0.0091	0.01189	5.077	99.82
P:cx9	0.009607	4.091	-0.1281	-5.3109	0.0135	0.0079	0.009607	4.091	89.87
P:bc	0.008098	3.437	-0.09884	-4.8694	0.0122	0.0071	0.008098	3.437	82.53
P:cx8	0.007588	3.217	-0.08956	-4.7187	0.0118	0.0068	0.007588	3.217	79.91
P:cx7	0.005803	2.444	-0.05946	-4.1195	0.0102	0.0059	0.005803	2.444	69.94
P:cx6	0.004255	1.779	-0.03703	-3.4991	0.0086	0.0049	0.004255	1.779	59.96
P:cx5	0.002948	1.222	-0.02124	-2.8756	0.0071	0.0040	0.002948	1.222	49.98
P:cx4	0.001883	0.7727	-0.01091	-2.2600	0.0056	0.0031	0.001883	0.7727	39.99
P:cx3	0.001058	0.4297	-0.004776	-1.6637	0.0041	0.0023	0.001058	0.4297	30
P:cx2	0.0004703	0.189	-0.001627	-1.0873	0.0027	0.0015	0.0004703	0.189	20
P:cx1	0.000118	0.04702	-0.0003663	-0.5326	0.0014	0.0008	0.000118	0.04702	10
SWL:0	0.02326	9.785	-0.5723	-7.4304	0.0211	0.0123	0.02326	10.63	138.7
SWL:1	0.02105	9.856	-1.897	-7.6332	0.0211	0.0121	0.02105	20.7	138.6
SWR:0	0.0237	9.799	-0.3529	-7.4304	0.0211	0.0123	0.0237	8.951	138.9
SWR:1	0.02676	10.04	0.9288	-7.4211	0.0212	0.0125	0.02676	-0.8105	141.4
TCL:0	0.01907	8.165	-0.4818	-7.2200	0.0201	0.0119	0.01907	9.145	126.1
TCL:1	0.01594	8.298	-2.426	-7.5128	0.0200	0.0118	0.01594	24.28	126.2
TCR:0	0.01956	8.181	-0.2355	-7.2200	0.0201	0.0119	0.01956	7.201	126.4
TCR:1	0.024	8.546	1.612	-7.0657	0.0202	0.0121	0.024	-7.434	130.2
MCL:0	0.0128	5.564	-0.3352	-6.2547	0.0164	0.0097	0.0128	6.771	104.3
MCL:1	0.01034	5.694	-2.026	-6.5558	0.0163	0.0096	0.01034	21.9	104.6
MCR:0	0.01328	5.578	-0.07203	-6.2547	0.0164	0.0097	0.01328	4.37	104.6
MCR:1	0.01683	5.88	1.527	-6.0908	0.0164	0.0098	0.01683	-10.33	108.2
BCL:0	0.0079	3.432	-0.2185	-4.8694	0.0122	0.0071	0.0079	4.841	82.41
BCL:1	0.006183	3.55	-1.545	-5.1823	0.0122	0.0070	0.006183	19.96	83.08
BCR:0	0.008297	3.442	0.02081	-4.8694	0.0122	0.0071	0.008297	2.032	82.65
BCR:1	0.01083	3.66	1.261	-4.6919	0.0122	0.0072	0.01083	-12.75	85.89
Mast:1	0.02541	10.53	-0.5107	-7.4592	0.0213	0.0124	0.02541	10.53	144.5
Mast:2	0.0261	10.79	-0.5277	-7.4593	0.0213	0.0124	0.0261	10.79	146.5
Mast:3	0.02645	10.92	-0.5361	-7.4593	0.0213	0.0124	0.02645	10.92	147.5
CX11:0	9.721e-05	0.04697	-0.01487	-0.5326	0.0014	0.0008	1.556	1.603	9.985
CX11:1	3.618e-05	0.04703	-0.01664	-0.5600	0.0291	0.0299	1.733	1.78	9.983
CX12:0	0.0001389	0.04711	0.01406	-0.5326	0.0014	0.0008	1.556	-1.509	10.01
CX12:1	0.0002082	0.04719	0.01558	-0.5051	0.0291	0.0302	1.733	-1.686	10.02
CX21:0	0.00043	0.1887	-0.02979	-1.0873	0.0027	0.0015	1.481	1.669	19.97
CX21:1	0.0003995	0.1887	-0.03323	-1.1054	0.0212	0.0210	1.657	1.846	19.97
CX22:0	0.0005106	0.1893	0.02639	-1.0873	0.0027	0.0015	1.481	-1.291	20.03
CX22:1	0.0005734	0.1894	0.02965	-1.0692	0.0212	0.0212	1.658	-1.468	20.03
CX31:0	0.0009984	0.4291	-0.04565	-1.6637	0.0041	0.0023	1.405	1.833	29.95
CX31:1	0.0009867	0.4291	-0.05087	-1.6816	0.0226	0.0218	1.582	2.01	29.95
CX32:0	0.001117	0.4303	0.03589	-1.6637	0.0041	0.0023	1.405	-0.974	30.04
CX32:1	0.001204	0.4305	0.04093	-1.6458	0.0226	0.0220	1.582	-1.151	30.04
CX41:0	0.001804	0.7718	-0.06449	-2.2600	0.0056	0.0031	1.357	2.127	39.94
CX41:1	0.001821	0.7716	-0.07155	-2.2777	0.0241	0.0226	1.534	2.304	39.93
CX42:0	0.001962	0.7739	0.0424	-2.2600	0.0056	0.0031	1.357	-0.5813	40.04
CX42:1	0.002083	0.7741	0.04926	-2.2423	0.0241	0.0228	1.534	-0.7578	40.05
CX51:0	0.002851	1.22	-0.08558	-2.8756	0.0071	0.0040	1.282	2.499	49.91
CX51:1	0.002907	1.22	-0.09455	-2.8930	0.0256	0.0235	1.459	2.676	49.91
CX52:0	0.003045	1.223	0.04278	-2.8756	0.0071	0.0040	1.282	-0.05611	50.04
CX52:1	0.003212	1.224	0.05153	-2.8581	0.0256	0.0237	1.459	-0.2325	50.05
CX61:0	0.004141	1.776	-0.1107	-3.4991	0.0086	0.0049	1.208	2.98	59.89
CX61:1	0.004248	1.776	-0.1215	-3.5164	0.0271	0.0244	1.385	3.156	59.88
CX62:0	0.004369	1.781	0.03625	-3.4991	0.0086	0.0049	1.208	0.5775	60.04
CX62:1	0.004592	1.782	0.04691	-3.4819	0.0271	0.0246	1.385	0.4012	60.05
CX71:0	0.005673	2.442	-0.1407	-4.1195	0.0102	0.0059	1.133	3.569	69.86
CX71:1	0.00584	2.441	-0.1534	-4.1365	0.0287	0.0253	1.31	3.745	69.85
CX72:0	0.005932	2.447	0.02135	-4.1195	0.0102	0.0059	1.134	1.32	70.02
CX72:1	0.006221	2.448	0.03391	-4.1025	0.0287	0.0255	1.311	1.144	70.03
CX81:0	0.007446	3.213	-0.1763	-4.7187	0.0118	0.0068	1.059	4.265	79.82
CX81:1	0.007681	3.212	-0.1909	-4.7354	0.0303	0.0263	1.236	4.441	79.81
CX82:0	0.007731	3.22	-0.00325	-4.7187	0.0118	0.0068	1.06	2.168	80
CX82:1	0.008095	3.221	0.01113	-4.7019	0.0303	0.0265	1.237	1.993	80.01

CX91:0	0.009449	4.086	-0.2204	-5.3109	0.0135	0.0079	1.004	5.081	89.78
CX91:1	0.00976	4.085	-0.2368	-5.3274	0.0320	0.0274	1.182	5.257	89.76
CX92:0	0.009765	4.095	-0.03618	-5.3109	0.0135	0.0079	1.005	3.1	89.96
CX92:1	0.01021	4.096	-0.02	-5.2943	0.0320	0.0276	1.182	2.924	89.98
CX101:0	0.01171	5.072	-0.273	-5.9785	0.0155	0.0091	0.9309	5.991	99.73
CX101:1	0.01212	5.07	-0.2915	-5.9948	0.0340	0.0286	1.108	6.166	99.71
CX102:0	0.01206	5.082	-0.08156	-5.9785	0.0155	0.0091	0.9313	4.163	99.92
CX102:1	0.01261	5.083	-0.06337	-5.9622	0.0340	0.0288	1.109	3.987	99.94
CX111:0	0.01427	6.164	-0.3335	-6.5391	0.0174	0.0103	0.8576	7.008	109.7
CX111:1	0.01477	6.163	-0.3536	-6.5552	0.0359	0.0298	1.035	7.183	109.6
CX112:0	0.01463	6.175	-0.1414	-6.5391	0.0174	0.0103	0.858	5.332	109.9
CX112:1	0.01528	6.177	-0.1215	-6.5230	0.0360	0.0301	1.035	5.157	109.9
CX121:0	0.0171	7.346	-0.4012	-6.9988	0.0191	0.0114	0.7846	8.113	119.6
CX121:1	0.01768	7.344	-0.4227	-7.0147	0.0377	0.0309	0.962	8.288	119.6
CX122:0	0.01747	7.357	-0.2141	-6.9988	0.0191	0.0114	0.785	6.59	119.8
CX122:1	0.0182	7.359	-0.1929	-6.9829	0.0377	0.0311	0.9625	6.415	119.8
CX131:0	0.02019	8.594	-0.4737	-7.2914	0.0205	0.0122	0.7119	9.285	129.5
CX131:1	0.02081	8.591	-0.4961	-7.3111	0.0437	0.0366	0.8893	9.46	129.5
CX132:0	0.02055	8.605	-0.2981	-7.2914	0.0205	0.0122	0.7122	7.913	129.7
CX132:1	0.02135	8.607	-0.276	-7.2716	0.0438	0.0369	0.8898	7.738	129.7
CX141:1	0.02609	10.53	-0.5337	-7.4709	0.0352	0.0271	0.2029	10.71	144.5
CX142:1	0.02623	10.53	-0.4881	-7.4474	0.0352	0.0272	0.203	10.36	144.5

Joint Support Reactions for Load Case "NESC 250C (Extreme Wind)":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Comp. Force (kips)	Z Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X-M. Moment (ft-k)	X-M. Usage %	Y-M. Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z-M. Moment (ft-k)	Z-M. Usage %	Max. Usage %
P:g	-0.09	0.0	-51.71	0.0	0.0	-56.46	0.0	0.0	76.56	0.0	5275.80	0.0	-13.3	0.0	0.0	-5.46	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC 250C (Extreme Wind)":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt. %
P	P:t	Origin	0.00	118.59	0.28	-5.62	26.16	-0.16	0.0	-2.60	5.31	-0.03	-0.13	3.14	0.14	0.00	3.28	5.0	2
P	P:cx14	End	0.50	117.82	0.28	-5.57	28.82	-0.17	0.0	-2.60	5.31	-0.03	-0.13	3.42	0.14	0.00	3.56	5.5	2
P	P:cx14	Origin	0.50	117.82	0.28	-5.57	28.82	-0.17	0.0	-2.62	5.33	-0.03	-0.13	3.42	0.14	0.00	3.56	5.5	2
P	P:sw	End	0.70	117.51	0.28	-5.55	29.88	-0.18	0.0	-2.62	5.33	-0.03	-0.13	3.53	0.14	0.00	3.66	5.6	2
P	P:sw	Origin	0.70	117.51	0.28	-5.55	32.24	-0.18	0.0	-3.23	7.13	-0.03	-0.16	3.80	0.19	0.00	3.98	6.1	2
P	Tube 1	End	5.35	110.31	0.26	-5.09	65.41	-0.30	0.0	-3.23	7.13	-0.03	-0.15	6.89	0.18	0.00	7.05	10.8	2
P	Tube 1	Origin	5.35	110.31	0.26	-5.09	65.41	-0.30	0.0	-3.57	7.39	-0.03	-0.17	6.89	0.18	0.00	7.07	10.9	2
P	P:cx13	End	10.00	103.19	0.24	-4.63	99.79	-0.44	0.0	-3.57	7.39	-0.03	-0.16	9.45	0.17	0.00	9.61	14.8	2
P	P:cx13	Origin	10.00	103.19	0.24	-4.63	99.79	-0.69	0.4	-4.18	8.03	-0.03	-0.19	9.45	0.19	0.02	9.65	14.8	2
P	P:tc	End	13.37	98.08	0.23	-4.30	126.84	-0.79	0.4	-4.18	8.03	-0.03	-0.18	11.16	0.18	0.02	11.34	17.4	2
P	P:tc	Origin	13.37	98.08	0.23	-4.30	147.92	-0.80	0.4	-9.77	18.87	-0.04	-0.42	13.01	0.43	0.02	13.45	20.7	2
P	Tube 1	End	16.69	93.11	0.22	-3.99	210.47	-0.92	0.4	-9.77	18.87	-0.04	-0.40	17.25	0.41	0.02	17.67	27.2	2
P	Tube 1	Origin	16.69	93.11	0.22	-3.99	210.47	-0.93	0.4	-10.08	19.06	-0.04	-0.42	17.25	0.42	0.02	17.68	27.2	2
P	P:cx12	End	20.00	88.21	0.21	-3.69	273.67	-1.05	0.4	-10.08	19.06	-0.04	-0.40	20.95	0.40	0.02	21.37	32.9	2
P	P:cx12	Origin	20.00	88.21	0.21	-3.69	273.67	-1.27	0.7	-10.72	19.63	-0.04	-0.43	20.96	0.42	0.03	21.40	32.9	2
P	Tube 1	End	25.00	81.01	0.19	-3.25	371.81	-1.47	0.7	-10.72	19.63	-0.04	-0.41	25.81	0.40	0.03	26.22	40.3	2
P	Tube 1	Origin	25.00	81.01	0.19	-3.25	371.81	-1.47	0.7	-11.24	19.93	-0.04	-0.43	25.81	0.40	0.02	26.24	40.4	2
P	P:cx11	End	30.00	74.04	0.17	-2.85	471.46	-1.67	0.7	-11.24	19.93	-0.04	-0.41	29.79	0.38	0.02	30.21	46.5	2
P	P:cx11	Origin	30.00	74.04	0.17	-2.85	471.46	-1.92	1.0	-11.90	20.48	-0.04	-0.43	29.80	0.39	0.03	30.24	46.5	2
P	Tube 1	End	32.69	70.40	0.16	-2.64	526.45	-2.03	1.0	-11.90	20.48	-0.04	-0.42	31.70	0.39	0.03	32.13	49.4	2
P	Tube 1	Origin	32.69	70.40	0.16	-2.64	526.45	-2.03	1.0	-12.21	20.65	-0.04	-0.43	31.70	0.39	0.03	32.14	49.4	2
P	P:mc	End	35.37	66.85	0.16	-2.44	581.89	-2.15	1.0	-12.21	20.65	-0.04	-0.42	33.41	0.38	0.03	33.84	52.1	2
P	P:mc	Origin	35.37	66.85	0.16	-2.44	602.78	-2.16	1.0	-18.16	31.42	-0.05	-0.63	34.61	0.58	0.03	35.26	54.2	2
P	P:cx10	End	40.00	60.92	0.14	-2.12	748.26	-2.38	1.0	-18.16	31.42	-0.05	-0.61	39.69	0.55	0.03	40.31	62.0	2
P	P:cx10	Origin	40.00	60.92	0.14	-2.12	748.26	-2.64	1.4	-19.06	32.01	-0.05	-0.64	39.69	0.56	0.04	40.34	62.1	2
P	Tube 1	End	45.00	54.83	0.13	-1.81	908.34	-2.89	1.4	-19.06	32.01	-0.05	-0.61	44.38	0.54	0.03	45.01	69.2	2
P	Tube 1	Origin	45.00	54.83	0.13	-1.81	908.34	-2.90	1.4	-19.77	32.30	-0.05	-0.63	44.38	0.55	0.03	45.03	69.3	2
P	P:cx9	End	50.00	49.09	0.12	-1.54	1069.85	-3.15	1.4	-19.77	32.30	-0.05	-0.61	48.31	0.53	0.03	48.93	75.3	2
P	P:cx9	Origin	50.00	49.09	0.12	-1.54	1069.85	-3.43	1.7	-20.41	32.77	-0.05	-0.63	48.31	0.53	0.04	48.95	75.3	2
P	SpliceT	End	50.33	48.72	0.11	-1.52	1080.67	-3.45	1.7	-20.41	32.77	-0.05	-0.63	48.55	0.53	0.04	49.19	75.7	2
P	SpliceT	Origin	50.33	48.72	0.11	-1.52	1080.67	-3.46	1.7	-21.14	32.95	-0.05	-0.65	48.55	0.53	0.04	49.21	75.7	2
P	SpliceB	End	55.00	43.69	0.10	-1.29	1234.56	-3.70	1.7	-21.14	32.95	-0.05	-0.46	38.77	0.38	0.03	39.23	60.4	2
P	SpliceB	Origin	55.00	43.69	0.10	-1.29	1234.56	-3.71	1.7	-22.07	33.21	-0.06	-0.48	38.77	0.38	0.03	39.25	60.4	2
P	P:bc	End	57.37	41.24	0.10	-1.19	1313.26	-3.83	1.7	-22.07	33.21	-0.06	-0.47	39.79	0.37	0.03	40.26	61.9	2
P	P:bc	Origin	57.37	41.24	0.10	-1.19	1333.85	-3.84	1.7	-28.32	43.79	-0.06	-0.60	40.41	0.49	0.03	41.02	63.1	2
P	P:cx8	End	60.00	38.60	0.09	-1.07	1449.01	-3.99	1.7	-28.32	43.79	-0.06	-0.59	42.22	0.48	0.03	42.82	65.9	2
P	P:cx8	Origin	60.00	38.60	0.09	-1.07	1449.01	-4.30	2.1	-29.36	44.33	-0.06	-0.61	42.22	0.49	0.03	42.84	65.9	2
P	Tube 2	End	65.00	33.81	0.08	-0.88	1670.65	-4.59	2.1	-29.36	44.33	-0.06	-0.59	45.29	0.47	0.03	45.89	70.6	2
P	Tube 2	Origin	65.00	33.81	0.08	-0.88	1670.65	-4.60	2.1	-30.43	44.64	-0.06	-0.61	45.29	0.48	0.03	45.91	70.6	2
P	P:cx7	End	70.00	29.33	0.07	-0.71	1893.85	-4.90	2.1	-30.43	44.64	-0.06	-0.59	47.88	0.46	0.03	48.48	74.6	2
P	P:cx7	Origin	70.00	29.33	0.07	-0.71	1893.85	-5.24	2.5	-31.80	45.26	-0.07	-0.62	47.88	0.47	0.03	48.51	74.6	2
P	Tube 2	End	75.00	25.18	0.06	-0.57	2120.13	-5.55	2.5	-31.80	45.26	-0.07	-0.60	50.11	0.45	0.03	50.72	78.0	2

P	Tube 2	Origin	75.00	25.18	0.06	-0.57	2120.13	-5.56	2.5	-32.94	45.57	-0.07	-0.62	50.11	0.45	0.03	50.74	78.1	2
P	P:cx6	End	80.00	21.34	0.05	-0.44	2347.97	-5.87	2.5	-32.94	45.57	-0.07	-0.60	52.00	0.44	0.03	52.60	80.9	2
P	P:cx6	Origin	80.00	21.34	0.05	-0.44	2347.97	-6.23	2.9	-34.38	46.19	-0.07	-0.63	52.00	0.45	0.03	52.63	81.0	2
P	Tube 2	End	85.00	17.84	0.04	-0.34	2578.92	-6.56	2.9	-34.38	46.19	-0.07	-0.61	53.62	0.43	0.03	54.23	83.4	2
P	Tube 2	Origin	85.00	17.84	0.04	-0.34	2578.92	-6.57	2.9	-35.59	46.51	-0.07	-0.63	53.62	0.43	0.03	54.26	83.5	2
P	P:cx5	End	90.00	14.66	0.04	-0.25	2811.47	-6.90	2.9	-35.59	46.51	-0.07	-0.61	54.99	0.42	0.03	55.60	85.5	2
P	P:cx5	Origin	90.00	14.66	0.04	-0.25	2811.47	-7.29	3.3	-37.02	47.12	-0.07	-0.63	54.99	0.43	0.03	55.63	85.6	2
P	Tube 2	End	94.42	12.12	0.03	-0.19	3019.48	-7.59	3.3	-37.02	47.12	-0.07	-0.62	56.04	0.42	0.03	56.66	87.2	2
P	Tube 2	Origin	94.42	12.12	0.03	-0.19	3019.48	-7.61	3.3	-38.15	47.41	-0.07	-0.64	56.04	0.42	0.03	56.68	87.2	2
P	SpliceT	End	98.83	9.84	0.02	-0.14	3228.77	-7.91	3.3	-38.15	47.41	-0.07	-0.62	56.94	0.41	0.03	57.56	88.6	2
P	SpliceT	Origin	98.83	9.84	0.02	-0.14	3228.77	-7.92	3.3	-39.00	47.59	-0.07	-0.63	56.94	0.41	0.03	57.58	88.6	2
P	P:cx4	End	100.00	9.27	0.02	-0.13	3284.45	-8.00	3.3	-39.00	47.59	-0.07	-0.60	55.66	0.39	0.03	56.26	86.6	2
P	P:cx4	Origin	100.00	9.27	0.02	-0.13	3284.45	-8.41	3.8	-40.75	48.12	-0.08	-0.63	55.66	0.39	0.03	56.29	86.6	2
P	SpliceB	End	105.00	7.06	0.02	-0.09	3525.04	-8.77	3.8	-40.75	48.12	-0.08	-0.61	56.42	0.38	0.03	57.03	87.7	2
P	SpliceB	Origin	105.00	7.06	0.02	-0.09	3525.04	-8.79	3.8	-42.68	48.46	-0.08	-0.64	56.42	0.38	0.03	57.06	87.8	2
P	P:cx3	End	110.00	5.16	0.01	-0.06	3767.36	-9.15	3.8	-42.68	48.46	-0.08	-0.62	57.03	0.37	0.03	57.66	88.7	2
P	P:cx3	Origin	110.00	5.16	0.01	-0.06	3767.36	-9.59	4.2	-44.36	49.09	-0.08	-0.65	57.03	0.38	0.03	57.68	88.7	2
P	Tube 3	End	115.00	3.56	0.01	-0.03	4012.80	-9.96	4.2	-44.36	49.09	-0.08	-0.63	57.55	0.37	0.03	58.18	89.5	2
P	Tube 3	Origin	115.00	3.56	0.01	-0.03	4012.80	-9.98	4.2	-45.80	49.42	-0.08	-0.65	57.55	0.37	0.03	58.20	89.5	2
P	P:cx2	End	120.00	2.27	0.01	-0.02	4259.92	-10.37	4.2	-45.80	49.42	-0.08	-0.63	57.96	0.36	0.03	58.59	90.1	2
P	P:cx2	Origin	120.00	2.27	0.01	-0.02	4259.92	-10.83	4.7	-47.55	50.06	-0.09	-0.66	57.96	0.37	0.03	58.62	90.2	2
P	Tube 3	End	125.00	1.27	0.00	-0.01	4510.19	-11.23	4.7	-47.55	50.06	-0.09	-0.64	58.29	0.36	0.03	58.94	90.7	2
P	Tube 3	Origin	125.00	1.27	0.00	-0.01	4510.19	-11.25	4.7	-49.06	50.40	-0.09	-0.66	58.29	0.36	0.03	58.96	90.7	2
P	P:cx1	End	130.00	0.56	0.00	-0.00	4762.19	-11.65	4.7	-49.06	50.40	-0.09	-0.64	58.55	0.35	0.03	59.19	91.1	2
P	P:cx1	Origin	130.00	0.56	0.00	-0.00	4762.19	-12.37	5.5	-51.00	51.18	-0.09	-0.67	58.55	0.35	0.03	59.22	91.1	2
P	Tube 3	End	135.00	0.14	0.00	-0.00	5018.11	-12.79	5.5	-51.00	51.18	-0.09	-0.65	58.76	0.35	0.03	59.41	91.4	2
P	Tube 3	Origin	135.00	0.14	0.00	-0.00	5018.11	-12.82	5.5	-52.56	51.54	-0.09	-0.67	58.76	0.35	0.03	59.43	91.4	2
P	P:g	End	140.00	0.00	0.00	0.00	5275.80	-13.24	5.5	-52.56	51.54	-0.09	-0.66	58.90	0.34	0.03	59.56	91.6	2

Detailed Tubular Davit Arm Usages for Load Case "NESC 250C (Extreme Wind)":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Vert. Mom. (ft-k)	Horz. Mom. (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Vert. Shear (kips)	Horz. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
SWL	SWL:0	Origin	0.00	117.42	0.28	-6.87	-2.64	-0.00	-0.0	0.74	0.29	0.00	0.16	4.26	0.00	0.00	4.43	6.8	1
SWL	#SWL:0	End	5.00	117.84	0.27	-14.70	-1.17	-0.00	-0.0	0.74	0.29	0.00	0.21	3.18	0.00	0.00	3.39	5.2	1
SWL	#SWL:0	Origin	5.00	117.84	0.27	-14.70	-1.17	-0.00	-0.0	0.74	0.24	0.00	0.21	3.18	0.00	0.00	3.39	5.2	1
SWL	#SWL:1	End	7.54	118.06	0.26	-18.72	-0.55	-0.00	-0.0	0.74	0.24	0.00	0.25	2.07	0.00	0.00	2.32	3.6	1
SWL	#SWL:1	Origin	7.54	118.06	0.26	-18.72	-0.55	-0.00	-0.0	0.74	0.22	0.00	0.25	2.07	0.00	0.00	2.32	3.6	1
SWL	SWL:1	End	10.07	118.27	0.25	-22.76	0.00	0.00	0.0	0.74	0.22	0.00	0.30	0.00	0.19	0.00	0.44	0.7	3
SWR	SWR:0	Origin	0.00	117.59	0.28	-4.23	-0.31	0.00	0.0	-0.91	0.06	-0.00	-0.20	0.50	0.00	0.00	0.70	1.1	1
SWR	#SWR:0	End	5.00	119.01	0.30	3.40	-0.02	0.00	0.0	-0.91	0.06	-0.00	-0.26	0.05	0.00	0.00	0.31	0.5	1
SWR	#SWR:0	Origin	5.00	119.01	0.30	3.40	-0.02	0.00	0.0	-0.90	0.02	-0.00	-0.26	0.05	0.00	0.00	0.31	0.5	1
SWR	#SWR:1	End	7.54	119.73	0.31	7.27	0.02	0.00	0.0	-0.90	0.02	-0.00	-0.30	0.07	0.00	0.00	0.37	0.6	1
SWR	#SWR:1	Origin	7.54	119.73	0.31	7.27	0.02	0.00	-0.0	-0.89	-0.01	-0.00	-0.30	0.07	0.00	0.00	0.37	0.6	1
SWR	SWR:1	End	10.07	120.46	0.32	11.15	-0.00	0.00	-0.0	-0.89	-0.01	-0.00	-0.36	0.00	0.01	0.00	0.36	0.6	3
TCL	TCL:0	Origin	0.00	97.98	0.23	-5.78	-45.74	-0.03	-0.0	4.92	3.23	0.00	0.33	8.29	0.00	0.00	8.62	13.3	1
TCL	#TCL:0	End	5.00	98.51	0.22	-13.38	-29.58	-0.02	-0.0	4.92	3.23	0.00	0.39	7.84	0.00	0.00	8.23	12.7	1
TCL	#TCL:0	Origin	5.00	98.51	0.22	-13.38	-29.58	-0.02	-0.0	4.93	3.01	0.00	0.39	7.84	0.00	0.00	8.23	12.7	1
TCL	#TCL:1	End	10.00	99.04	0.20	-21.09	-14.52	-0.01	-0.0	4.93	3.01	0.00	0.50	6.15	0.00	0.00	6.65	10.2	1
TCL	#TCL:1	Origin	10.00	99.04	0.20	-21.09	-14.52	-0.01	-0.0	4.94	2.87	0.00	0.50	6.15	0.00	0.00	6.65	10.2	1
TCL	#TCL:2	End	12.57	99.31	0.20	-25.09	-7.16	-0.01	-0.0	4.94	2.87	0.00	0.58	4.06	0.00	0.00	4.63	7.1	1
TCL	#TCL:2	Origin	12.57	99.31	0.20	-25.09	-7.16	-0.01	-0.0	4.94	2.79	0.00	0.58	4.06	0.00	0.00	4.63	7.1	1
TCL	TCL:1	End	15.13	99.58	0.19	-29.11	-0.00	0.00	-0.0	4.94	2.79	0.00	0.68	0.00	0.80	0.00	1.54	2.4	3
TCR	TCR:0	Origin	0.00	98.17	0.23	-2.83	-24.70	0.03	0.0	-5.60	1.81	-0.00	-0.37	4.48	0.00	0.00	4.85	7.5	1
TCR	#TCR:0	End	5.00	99.63	0.25	4.55	-15.66	0.02	0.0	-5.60	1.81	-0.00	-0.45	4.15	0.00	0.00	4.60	7.1	1
TCR	#TCR:0	Origin	5.00	99.63	0.25	4.55	-15.66	0.02	0.0	-5.54	1.62	-0.00	-0.44	4.15	0.00	0.00	4.59	7.1	1
TCR	#TCR:1	End	10.00	101.08	0.27	11.88	-7.55	0.01	0.0	-5.54	1.62	-0.00	-0.56	3.20	0.00	0.00	3.76	5.8	1
TCR	#TCR:1	Origin	10.00	101.08	0.27	11.88	-7.55	0.01	0.0	-5.50	1.50	-0.00	-0.56	3.20	0.00	0.00	3.75	5.8	1
TCR	#TCR:2	End	12.57	101.81	0.28	15.61	-3.69	0.01	0.0	-5.50	1.50	-0.00	-0.64	2.09	0.00	0.00	2.73	4.2	1
TCR	#TCR:2	Origin	12.57	101.81	0.28	15.61	-3.69	0.01	-0.0	-5.49	1.44	-0.00	-0.64	2.09	0.00	0.00	2.73	4.2	1
TCR	TCR:1	End	15.13	102.55	0.29	19.34	-0.00	0.00	-0.0	-5.49	1.44	-0.00	-0.76	0.00	0.41	0.00	1.04	1.6	3
MCL	MCL:0	Origin	0.00	66.76	0.15	-4.02	-46.99	-0.03	-0.0	4.87	3.32	0.00	0.32	8.52	0.00	0.00	8.84	13.6	1
MCL	#MCL:0	End	5.00	67.28	0.14	-10.61	-30.41	-0.02	-0.0	4.87	3.32	0.00	0.39	8.06	0.00	0.00	8.45	13.0	1
MCL	#MCL:0	Origin	5.00	67.28	0.14	-10.61	-30.41	-0.02	-0.0	4.88	3.09	0.00	0.39	8.06	0.00	0.00	8.45	13.0	1
MCL	#MCL:1	End	10.00	67.79	0.13	-17.32	-14.94	-0.01	-0.0	4.88	3.09	0.00	0.49	6.33	0.00	0.00	6.82	10.5	1
MCL	#MCL:1	Origin	10.00	67.79	0.13	-17.32	-14.94	-0.01	-0.0	4.89	2.95	0.00	0.49	6.33	0.00	0.00	6.82	10.5	1
MCL	#MCL:2	End	12.57	68.06	0.13	-20.80	-7.37	-0.00	-0.0	4.89	2.95	0.00	0.57	4.17	0.00	0.00	4.74	7.3	1
MCL	#MCL:2	Origin	12.57	68.06	0.13	-20.80	-7.37	-0.00	-0.0	4.89	2.87	0.00	0.57	4.17	0.00	0.00	4.75	7.3	1
MCL	MCL:1	End	15.13	68.32	0.12	-24.31	-0.00	0.00	-0.0	4.89	2.87	0.00	0.67	0.00	0.82	0.00	1.57	2.4	3
MCR	MCR:0	Origin	0.00	66.94	0.16	-0.86	-26.15	0.03	0.0	-5.56	1.91	-0.00	-0.37	4.74	0.00	0.00	5.11	7.9	1
MCR	#MCR:0	End	5.00	68.15	0.17	5.54	-16.62	0.02	0.0	-5.56	1.91	-0.00	-0.45	4.40	0.00	0.00	4.85	7.5	1
MCR	#MCR:0	Origin	5.00	68.15	0.17	5.54	-16.62	0.02	0.0	-5.51	1.72	-0.00	-0.44	4.40	0.00	0.00	4		

MCR	#MCR:1	End	10.00	69.34	0.19	11.87	-8.03	0.01	0.0	-5.51	1.72	-0.00	-0.56	3.40	0.00	0.00	3.96	6.1	1
MCR	#MCR:1	Origin	10.00	69.34	0.19	11.87	-8.03	0.01	0.0	-5.48	1.60	-0.00	-0.55	3.40	0.00	0.00	3.95	6.1	1
MCR	#MCR:2	End	12.57	69.95	0.19	15.10	-3.93	0.00	0.0	-5.48	1.60	-0.00	-0.64	2.23	0.00	0.00	2.87	4.4	1
MCR	#MCR:2	Origin	12.57	69.95	0.19	15.10	-3.93	0.00	-0.0	-5.46	1.53	-0.00	-0.64	2.23	0.00	0.00	2.86	4.4	1
MCR	MCR:1	End	15.13	70.56	0.20	18.32	-0.00	0.00	-0.0	-5.46	1.53	-0.00	-0.75	0.00	0.44	0.00	1.07	1.6	3
BCL	BCL:0	Origin	0.00	41.18	0.09	-2.62	-48.76	-0.02	-0.0	4.79	3.43	0.00	0.32	8.84	0.00	0.00	9.16	14.1	1
BCL	#BCL:0	End	5.00	41.64	0.09	-7.76	-31.59	-0.01	-0.0	4.79	3.43	0.00	0.38	8.37	0.00	0.00	8.75	13.5	1
BCL	#BCL:0	Origin	5.00	41.64	0.09	-7.76	-31.59	-0.01	-0.0	4.80	3.21	0.00	0.38	8.37	0.00	0.00	8.76	13.5	1
BCL	#BCL:1	End	10.00	42.11	0.08	-13.03	-15.54	-0.01	-0.0	4.80	3.21	0.00	0.48	6.58	0.00	0.00	7.06	10.9	1
BCL	#BCL:1	Origin	10.00	42.11	0.08	-13.03	-15.54	-0.01	-0.0	4.81	3.07	0.00	0.49	6.58	0.00	0.00	7.07	10.9	1
BCL	#BCL:2	End	12.57	42.35	0.08	-15.77	-7.67	-0.00	-0.0	4.81	3.07	0.00	0.56	4.34	0.00	0.00	4.91	7.5	1
BCL	#BCL:2	Origin	12.57	42.35	0.08	-15.77	-7.67	-0.00	-0.0	4.82	2.99	0.00	0.56	4.34	0.00	0.00	4.91	7.5	1
BCL	BCL:1	End	15.13	42.59	0.07	-18.54	-0.00	0.00	-0.0	4.82	2.99	0.00	0.66	0.00	0.85	0.00	1.62	2.5	3
BCR	BCR:0	Origin	0.00	41.30	0.10	0.25	-28.21	0.02	0.0	-5.52	2.04	-0.00	-0.37	5.12	0.00	0.00	5.48	8.4	1
BCR	#BCR:0	End	5.00	42.18	0.11	5.23	-17.99	0.01	0.0	-5.52	2.04	-0.00	-0.44	4.77	0.00	0.00	5.21	8.0	1
BCR	#BCR:0	Origin	5.00	42.18	0.11	5.23	-17.99	0.01	0.0	-5.47	1.85	-0.00	-0.44	4.77	0.00	0.00	5.20	8.0	1
BCR	#BCR:1	End	10.00	43.05	0.12	10.15	-8.72	0.01	0.0	-5.47	1.85	-0.00	-0.55	3.69	0.00	0.00	4.24	6.5	1
BCR	#BCR:1	Origin	10.00	43.05	0.12	10.15	-8.72	0.01	0.0	-5.44	1.73	-0.00	-0.55	3.69	0.00	0.00	4.24	6.5	1
BCR	#BCR:2	End	12.57	43.49	0.12	12.65	-4.27	0.00	0.0	-5.44	1.73	-0.00	-0.63	2.42	0.00	0.00	3.05	4.7	1
BCR	#BCR:2	Origin	12.57	43.49	0.12	12.65	-4.27	0.00	-0.0	-5.42	1.67	-0.00	-0.63	2.42	0.00	0.00	3.05	4.7	1
BCR	BCR:1	End	15.13	43.92	0.13	15.13	-0.00	0.00	-0.0	-5.42	1.67	-0.00	-0.75	0.00	0.48	0.00	1.11	1.7	3
Mast	P:t	Origin	0.00	118.59	0.28	-5.62	-26.16	-0.16	0.0	-2.49	5.22	0.03	-0.12	3.50	0.50	0.00	3.73	8.9	1
Mast	#Mast:0	End	2.50	122.48	0.29	-5.87	-13.11	-0.09	0.0	-2.49	5.22	0.03	-0.12	1.76	0.50	0.00	2.07	4.9	1
Mast	#Mast:0	Origin	2.50	122.48	0.29	-5.87	-13.11	-0.09	0.0	-2.32	5.07	0.02	-0.11	1.76	0.49	0.00	2.05	4.9	1
Mast	Mast:1	End	5.00	126.38	0.30	-6.13	-0.44	-0.03	0.0	-2.32	5.07	0.02	-0.11	0.06	0.49	0.00	0.87	2.1	1
Mast	Mast:1	Origin	5.00	126.38	0.30	-6.13	-0.44	-0.00	0.0	-0.49	0.20	0.00	-0.02	0.06	0.02	0.00	0.09	0.2	1
Mast	Mast:2	End	7.00	129.49	0.31	-6.33	-0.03	-0.00	0.0	-0.49	0.20	0.00	-0.02	0.00	0.02	0.00	0.04	0.1	1
Mast	Mast:2	Origin	7.00	129.49	0.31	-6.33	-0.03	-0.00	0.0	-0.04	0.03	0.00	-0.00	0.00	0.00	0.00	0.01	0.0	1
Mast	Mast:3	End	8.00	131.05	0.32	-6.43	0.00	0.00	0.0	-0.04	0.03	0.00	-0.00	0.00	0.00	0.00	0.01	0.0	1
CX11	CX11:0	Origin	0.00	0.56	0.00	-0.18	-0.05	0.04	0.0	0.15	0.20	-0.15	0.26	8.22	0.86	0.00	8.61	13.3	1
CX11	CX11:1	End	0.25	0.56	0.00	-0.20	-0.00	-0.00	0.0	0.15	0.20	-0.15	0.26	0.00	0.86	0.00	1.51	2.3	1
CX12	CX12:0	Origin	0.00	0.57	0.00	0.17	-0.05	0.04	0.0	-0.15	0.20	-0.15	-0.26	8.26	0.86	0.00	8.65	13.3	1
CX12	CX12:1	End	0.25	0.57	0.00	0.19	-0.00	0.00	0.0	-0.15	0.20	-0.15	-0.26	0.00	0.86	0.00	1.51	2.3	1
CX21	CX21:0	Origin	0.00	2.26	0.01	-0.36	-0.03	0.03	0.0	0.10	0.13	-0.10	0.18	5.46	0.57	0.00	5.72	8.8	1
CX21	CX21:1	End	0.25	2.26	0.00	-0.40	-0.00	-0.00	0.0	0.10	0.13	-0.10	0.18	0.00	0.57	0.00	1.00	1.5	1
CX22	CX22:0	Origin	0.00	2.27	0.01	0.32	-0.03	0.03	0.0	-0.10	0.13	-0.10	-0.17	5.48	0.57	0.00	5.74	8.8	1
CX22	CX22:1	End	0.25	2.27	0.01	0.36	-0.00	0.00	0.0	-0.10	0.13	-0.10	-0.17	0.00	0.57	0.00	1.00	1.5	1
CX31	CX31:0	Origin	0.00	5.15	0.01	-0.55	-0.03	0.03	0.0	0.10	0.13	-0.10	0.18	5.44	0.57	0.00	5.70	8.8	1
CX31	CX31:1	End	0.25	5.15	0.01	-0.61	-0.00	-0.00	0.0	0.10	0.13	-0.10	0.18	0.00	0.57	0.00	1.00	1.5	1
CX32	CX32:0	Origin	0.00	5.16	0.01	0.43	-0.03	0.03	0.0	-0.10	0.13	-0.10	-0.18	5.46	0.57	0.00	5.72	8.8	1
CX32	CX32:1	End	0.25	5.17	0.01	0.49	-0.00	0.00	0.0	-0.10	0.13	-0.10	-0.18	0.00	0.57	0.00	1.00	1.5	1
CX41	CX41:0	Origin	0.00	9.26	0.02	-0.77	-0.03	0.03	0.0	0.11	0.13	-0.10	0.18	5.42	0.56	0.00	5.69	8.7	1
CX41	CX41:1	End	0.25	9.26	0.02	-0.86	-0.00	-0.00	0.0	0.11	0.13	-0.10	0.18	0.00	0.56	0.00	0.99	1.5	1
CX42	CX42:0	Origin	0.00	9.29	0.02	0.51	-0.03	0.03	0.0	-0.10	0.13	-0.11	-0.18	5.45	0.57	0.00	5.71	8.8	1
CX42	CX42:1	End	0.25	9.29	0.02	0.59	-0.00	0.00	0.0	-0.10	0.13	-0.11	-0.18	0.00	0.57	0.00	1.00	1.5	1
CX51	CX51:0	Origin	0.00	14.64	0.03	-1.03	-0.03	0.03	0.0	0.11	0.13	-0.11	0.18	5.40	0.56	0.00	5.67	8.7	1
CX51	CX51:1	End	0.25	14.64	0.03	-1.13	-0.00	-0.00	0.0	0.11	0.13	-0.11	0.18	0.00	0.56	0.00	0.99	1.5	1
CX52	CX52:0	Origin	0.00	14.68	0.04	0.51	-0.03	0.03	0.0	-0.11	0.13	-0.11	-0.18	5.43	0.57	0.00	5.69	8.8	1
CX52	CX52:1	End	0.25	14.68	0.04	0.62	-0.00	0.00	0.0	-0.11	0.13	-0.11	-0.18	0.00	0.57	0.00	1.00	1.5	1
CX61	CX61:0	Origin	0.00	21.32	0.05	-1.33	-0.03	0.03	0.0	0.11	0.13	-0.11	0.18	5.38	0.56	0.00	5.65	8.7	1
CX61	CX61:1	End	0.25	21.31	0.05	-1.46	-0.00	-0.00	0.0	0.11	0.13	-0.11	0.18	0.00	0.56	0.00	0.99	1.5	1
CX62	CX62:0	Origin	0.00	21.37	0.05	0.43	-0.03	0.03	0.0	-0.11	0.13	-0.11	-0.18	5.41	0.56	0.00	5.67	8.7	1
CX62	CX62:1	End	0.25	21.38	0.06	0.56	-0.00	0.00	0.0	-0.11	0.13	-0.11	-0.18	0.00	0.56	0.00	0.99	1.5	1
CX71	CX71:0	Origin	0.00	29.30	0.07	-1.69	-0.03	0.03	0.0	0.11	0.12	-0.11	0.18	5.36	0.56	0.00	5.63	8.7	1
CX71	CX71:1	End	0.25	29.29	0.07	-1.84	-0.00	-0.00	0.0	0.11	0.12	-0.11	0.18	0.00	0.56	0.00	0.98	1.5	1
CX72	CX72:0	Origin	0.00	29.37	0.07	0.26	-0.03	0.03	0.0	-0.11	0.12	-0.11	-0.18	5.39	0.56	0.00	5.65	8.7	1
CX72	CX72:1	End	0.25	29.38	0.07	0.41	-0.00	-0.00	0.0	-0.11	0.12	-0.11	-0.18	0.00	0.56	0.00	0.99	1.5	1
CX81	CX81:0	Origin	0.00	38.56	0.09	-2.12	-0.03	0.03	0.0	0.11	0.12	-0.11	0.19	5.34	0.56	0.00	5.61	8.6	1
CX81	CX81:1	End	0.25	38.55	0.09	-2.29	-0.00	-0.00	0.0	0.11	0.12	-0.11	0.19	0.00	0.56	0.00	0.98	1.5	1
CX82	CX82:0	Origin	0.00	38.64	0.09	-0.04	-0.03	0.03	0.0	-0.11	0.12	-0.11	-0.18	5.37	0.56	0.00	5.64	8.7	1
CX82	CX82:1	End	0.25	38.65	0.10	0.13	-0.00	-0.00	0.0	-0.11	0.12	-0.11	-0.18	0.00	0.56	0.00	0.99	1.5	1

CX91	CX91:0	Origin	0.00	49.04	0.11	-2.64	-0.03	0.03	0.0	0.11	0.12	-0.11	0.19	5.32	0.55	0.00	5.59	8.6	1
CX91	CX91:1	End	0.25	49.02	0.12	-2.84	-0.00	-0.00	0.0	0.11	0.12	-0.11	0.19	0.00	0.55	0.00	0.98	1.5	1
CX92	CX92:0	Origin	0.00	49.14	0.12	-0.43	-0.03	0.03	0.0	-0.11	0.12	-0.11	-0.18	5.35	0.56	0.00	5.62	8.6	1
CX92	CX92:1	End	0.25	49.15	0.12	-0.24	-0.00	-0.00	0.0	-0.11	0.12	-0.11	-0.18	0.00	0.56	0.00	0.98	1.5	1
CX101	CX101:0	Origin	0.00	60.86	0.14	-3.28	-0.03	0.03	0.0	0.11	0.12	-0.11	0.19	5.30	0.55	0.00	5.58	8.6	1
CX101	CX101:1	End	0.25	60.85	0.15	-3.50	-0.00	-0.00	0.0	0.11	0.12	-0.11	0.19	0.00	0.55	0.00	0.98	1.5	1
CX102	CX102:0	Origin	0.00	60.98	0.14	-0.98	-0.03	0.03	0.0	-0.11	0.12	-0.11	-0.19	5.33	0.56	0.00	5.60	8.6	1
CX102	CX102:1	End	0.25	61.00	0.15	-0.76	-0.00	-0.00	0.0	-0.11	0.12	-0.11	-0.19	0.00	0.56	0.00	0.98	1.5	1
CX111	CX111:0	Origin	0.00	73.97	0.17	-4.00	-0.03	0.03	0.0	0.11	0.12	-0.11	0.19	5.29	0.55	0.00	5.56	8.6	1
CX111	CX111:1	End	0.25	73.95	0.18	-4.24	-0.00	-0.00	0.0	0.11	0.12	-0.11	0.19	0.00	0.55	0.00	0.97	1.5	1
CX112	CX112:0	Origin	0.00	74.10	0.18	-1.70	-0.03	0.03	0.0	-0.11	0.12	-0.11	-0.19	5.31	0.55	0.00	5.58	8.6	1
CX112	CX112:1	End	0.25	74.13	0.18	-1.46	-0.00	-0.00	0.0	-0.11	0.12	-0.11	-0.19	0.00	0.55	0.00	0.98	1.5	1
CX121	CX121:0	Origin	0.00	88.15	0.21	-4.81	-0.03	0.03	0.0	0.11	0.12	-0.11	0.19	5.27	0.55	0.00	5.55	8.5	1
CX121	CX121:1	End	0.25	88.12	0.21	-5.07	-0.00	-0.00	0.0	0.11	0.12	-0.11	0.19	0.00	0.55	0.00	0.97	1.5	1
CX122	CX122:0	Origin	0.00	88.28	0.21	-2.57	-0.03	0.03	0.0	-0.11	0.12	-0.11	-0.19	5.30	0.55	0.00	5.57	8.6	1
CX122	CX122:1	End	0.25	88.31	0.22	-2.31	-0.00	-0.00	0.0	-0.11	0.12	-0.11	-0.19	0.00	0.55	0.00	0.97	1.5	1
CX131	CX131:0	Origin	0.00	103.12	0.24	-5.68	-0.04	0.04	0.0	0.14	0.15	-0.14	0.24	6.59	0.69	0.00	6.93	10.7	1
CX131	CX131:1	End	0.25	103.10	0.25	-5.95	-0.00	-0.00	0.0	0.14	0.15	-0.14	0.24	0.00	0.69	0.00	1.21	1.9	1
CX132	CX132:0	Origin	0.00	103.26	0.25	-3.58	-0.04	0.04	0.0	-0.14	0.15	-0.14	-0.24	6.62	0.69	0.00	6.96	10.7	1
CX132	CX132:1	End	0.25	103.28	0.26	-3.31	-0.00	-0.00	0.0	-0.14	0.15	-0.14	-0.24	0.00	0.69	0.00	1.22	1.9	1
CX141	Mast:1	Origin	0.00	126.38	0.30	-6.13	-0.02	0.02	0.0	0.08	0.09	-0.08	0.14	3.94	0.41	0.00	4.15	6.4	1
CX141	CX141:1	End	0.25	126.35	0.31	-6.40	-0.00	-0.00	0.0	0.08	0.09	-0.08	0.14	0.00	0.41	0.00	0.73	1.1	1
CX142	Mast:1	Origin	0.00	126.38	0.30	-6.13	-0.02	0.02	0.0	-0.08	0.09	-0.09	-0.14	3.96	0.41	0.00	4.17	6.4	1
CX142	CX142:1	End	0.25	126.40	0.31	-5.86	-0.00	-0.00	0.0	-0.08	0.09	-0.09	-0.14	0.00	0.41	0.00	0.73	1.1	1

Summary of Suspension Capacities and Usages for Load Case "NESC 250C (Extreme Wind)":

Suspension Label	Tension (kips)	Input Tension Capacity (kips)	Factored Tension Capacity (kips)	Tension Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
21	0.764	20.00	20.00	3.82	0.00	0.00	0.00	3.82
11	0.888	20.00	20.00	4.44	0.00	0.00	0.00	4.44
61	5.655	50.00	50.00	11.31	0.00	0.00	0.00	11.31
51	5.655	50.00	50.00	11.31	0.00	0.00	0.00	11.31
62	5.655	50.00	50.00	11.31	0.00	0.00	0.00	11.31
52	5.655	50.00	50.00	11.31	0.00	0.00	0.00	11.31
63	5.655	50.00	50.00	11.31	0.00	0.00	0.00	11.31
53	5.655	50.00	50.00	11.31	0.00	0.00	0.00	11.31

\*\*\* Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case Segment Number	Weight (lbs)
P	91.63	NESC 250C (Extreme Wind)	35 28300.0

Base Plate Results by Bend Line:

Pole Label	Load Case	Bend Line #	Start X (ft)	Start Y (ft)	End X (ft)	End Y (ft)	Length (in)	Bending Stress (ksi)	Mom. Sum (ft-k)	Bolt #	Acting Max Load (kips)	Min Plate Thickness (in)	Actual Thickness (in)	Usage %
P	NESC 250B (Heavy)	1	2.641	1.049	-0.412	2.812	42.310	21.995	136.520	3	157.417	1.968	3.250	36.66
P	NESC 250B (Heavy)	2	2.812	-0.412	1.049	2.641	42.310	7.698	47.783	3	66.976	1.164	3.250	12.83
P	NESC 250B (Heavy)	3	2.229	-1.763	2.229	1.763	42.310	11.467	71.176	5	66.976	1.421	3.250	19.11
P	NESC 250B (Heavy)	4	1.049	-2.641	2.812	0.412	42.310	6.544	40.616	3	-58.523	1.073	3.250	10.91
P	NESC 250B (Heavy)	5	-0.412	-2.812	2.641	-1.049	42.310	20.590	127.803	3	-147.091	1.904	3.250	34.32
P	NESC 250B (Heavy)	6	-1.763	-2.229	1.763	-2.229	42.310	43.671	271.063	5	-147.091	2.773	3.250	72.79
P	NESC 250B (Heavy)	7	-2.641	-1.049	0.412	-2.812	42.310	20.480	127.118	3	-146.603	1.899	3.250	34.13
P	NESC 250B (Heavy)	8	-2.812	0.412	-1.049	-2.641	42.310	6.229	38.666	3	-56.162	1.047	3.250	10.38
P	NESC 250B (Heavy)	9	-2.229	1.763	-2.229	-1.763	42.310	11.608	72.049	5	69.337	1.429	3.250	19.35
P	NESC 250B (Heavy)	10	-1.049	2.641	-2.812	-0.412	42.310	8.029	49.836	3	69.337	1.189	3.250	13.38
P	NESC 250B (Heavy)	11	0.412	2.812	-2.641	1.049	42.310	22.105	137.205	3	157.905	1.973	3.250	36.84
P	NESC 250B (Heavy)	12	1.763	2.229	-1.763	2.229	42.310	46.893	291.058	5	157.905	2.873	3.250	78.15
P	NESC 250B (Heavy)	13	2.300	1.773	-1.106	2.685	42.310	27.546	170.978	4	157.661	2.202	3.250	45.91
P	NESC 250B (Heavy)	14	2.878	0.385	0.385	2.878	42.310	10.409	64.610	2	156.930	1.354	3.250	17.35
P	NESC 250B (Heavy)	15	2.685	-1.106	1.773	2.300	42.310	7.558	46.910	4	66.976	1.153	3.250	12.60
P	NESC 250B (Heavy)	16	1.773	-2.300	2.685	1.106	42.310	6.525	40.503	4	-58.523	1.072	3.250	10.88
P	NESC 250B (Heavy)	17	0.385	-2.878	2.878	-0.385	42.310	9.559	59.332	2	-147.091	1.297	3.250	15.93
P	NESC 250B (Heavy)	18	-1.106	-2.685	2.300	-1.773	42.310	25.748	159.815	4	-147.091	2.129	3.250	42.91
P	NESC 250B (Heavy)	19	-2.300	-1.773	1.106	-2.685	42.310	25.651	159.212	4	-146.847	2.125	3.250	42.75
P	NESC 250B (Heavy)	20	-2.878	-0.385	-0.385	-2.878	42.310	9.404	58.369	2	-146.116	1.287	3.250	15.67
P	NESC 250B (Heavy)	21	-2.685	1.106	-1.773	-2.300	42.310	6.314	39.191	4	-56.162	1.054	3.250	10.52
P	NESC 250B (Heavy)	22	-1.773	2.300	-2.685	-1.106	42.310	7.923	49.178	4	69.337	1.181	3.250	13.21
P	NESC 250B (Heavy)	23	-0.385	2.878	-2.878	0.385	42.310	10.564	65.573	2	157.905	1.364	3.250	17.61
P	NESC 250B (Heavy)	24	1.106	2.685	-2.300	1.773	42.310	27.644	171.582	4	157.905	2.206	3.250	46.07
P	NESC 250C (Extreme Wind)	1	2.641	1.049	-0.412	2.812	42.310	26.554	164.817	3	189.727	2.162	3.250	44.26
P	NESC 250C (Extreme Wind)	2	2.812	-0.412	1.049	2.641	42.310	9.053	56.190	3	79.416	1.262	3.250	15.09
P	NESC 250C (Extreme Wind)	3	2.229	-1.763	2.229	1.763	42.310	13.932	86.477	5	79.416	1.566	3.250	23.22
P	NESC 250C (Extreme Wind)	4	1.049	-2.641	2.812	0.412	42.310	8.452	52.462	3	-75.019	1.220	3.250	14.09
P	NESC 250C (Extreme Wind)	5	-0.412	-2.812	2.641	-1.049	42.310	25.850	160.450	3	-184.585	2.133	3.250	43.08
P	NESC 250C (Extreme Wind)	6	-1.763	-2.229	1.763	-2.229	42.310	54.928	340.931	5	-184.585	3.110	3.250	91.55
P	NESC 250C (Extreme Wind)	7	-2.641	-1.049	0.412	-2.812	42.310	25.806	160.178	3	-184.391	2.131	3.250	43.01
P	NESC 250C (Extreme Wind)	8	-2.812	0.412	-1.049	-2.641	42.310	8.327	51.686	3	-74.081	1.211	3.250	13.88
P	NESC 250C (Extreme Wind)	9	-2.229	1.763	-2.229	-1.763	42.310	13.988	86.824	5	80.355	1.569	3.250	23.31
P	NESC 250C (Extreme Wind)	10	-1.049	2.641	-2.812	-0.412	42.310	9.184	57.006	3	80.355	1.272	3.250	15.31
P	NESC 250C (Extreme Wind)	11	0.412	2.812	-2.641	1.049	42.310	26.598	165.089	3	189.920	2.164	3.250	44.33
P	NESC 250C (Extreme Wind)	12	1.763	2.229	-1.763	2.229	42.310	56.517	350.797	5	189.920	3.154	3.250	94.19
P	NESC 250C (Extreme Wind)	13	2.300	1.773	-1.106	2.685	42.310	33.239	206.314	4	189.824	2.419	3.250	55.40
P	NESC 250C (Extreme Wind)	14	2.878	0.385	0.385	2.878	42.310	12.503	77.608	2	189.533	1.484	3.250	20.84
P	NESC 250C (Extreme Wind)	15	2.685	-1.106	1.773	2.300	42.310	8.835	54.841	4	79.416	1.247	3.250	14.73
P	NESC 250C (Extreme Wind)	16	1.773	-2.300	2.685	1.106	42.310	8.299	51.509	4	-75.019	1.209	3.250	13.83
P	NESC 250C (Extreme Wind)	17	0.385	-2.878	2.878	-0.385	42.310	12.069	74.911	2	-184.585	1.458	3.250	20.11
P	NESC 250C (Extreme Wind)	18	-1.106	-2.685	2.300	-1.773	42.310	32.343	200.749	4	-184.585	2.386	3.250	53.90
P	NESC 250C (Extreme Wind)	19	-2.300	-1.773	1.106	-2.685	42.310	32.304	200.509	4	-184.488	2.385	3.250	53.84
P	NESC 250C (Extreme Wind)	20	-2.878	-0.385	-0.385	-2.878	42.310	12.007	74.529	2	-184.197	1.454	3.250	20.01
P	NESC 250C (Extreme Wind)	21	-2.685	1.106	-1.773	-2.300	42.310	8.215	50.987	4	-74.081	1.203	3.250	13.69
P	NESC 250C (Extreme Wind)	22	-1.773	2.300	-2.685	-1.106	42.310	8.981	55.743	4	80.355	1.257	3.250	14.97
P	NESC 250C (Extreme Wind)	23	-0.385	2.878	-2.878	0.385	42.310	12.565	77.991	2	189.920	1.487	3.250	20.94
P	NESC 250C (Extreme Wind)	24	1.106	2.685	-2.300	1.773	42.310	33.278	206.554	4	189.920	2.420	3.250	55.46

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case Segment Number	Weight (lbs)
SWL	28.48	NESC 250B (Heavy)	1 120.1
SWR	21.98	NESC 250B (Heavy)	1 120.1
TCL	32.33	NESC 250B (Heavy)	1 575.0
TCR	27.18	NESC 250B (Heavy)	1 575.0
MCL	32.55	NESC 250B (Heavy)	1 575.0
MCR	27.51	NESC 250B (Heavy)	1 575.0
BCL	32.87	NESC 250B (Heavy)	1 575.0
BCR	27.99	NESC 250B (Heavy)	1 575.0

Mast	8.87	NESC 250C (Extreme Wind)	1	565.2
CX11	29.99	NESC 250B (Heavy)	1	0.5
CX12	30.00	NESC 250B (Heavy)	1	0.5
CX21	19.96	NESC 250B (Heavy)	1	0.5
CX22	19.97	NESC 250B (Heavy)	1	0.5
CX31	19.96	NESC 250B (Heavy)	1	0.5
CX32	19.96	NESC 250B (Heavy)	1	0.5
CX41	19.95	NESC 250B (Heavy)	1	0.5
CX42	19.95	NESC 250B (Heavy)	1	0.5
CX51	19.93	NESC 250B (Heavy)	1	0.5
CX52	19.94	NESC 250B (Heavy)	1	0.5
CX61	19.92	NESC 250B (Heavy)	1	0.5
CX62	19.93	NESC 250B (Heavy)	1	0.5
CX71	19.91	NESC 250B (Heavy)	1	0.5
CX72	19.92	NESC 250B (Heavy)	1	0.5
CX81	19.90	NESC 250B (Heavy)	1	0.5
CX82	19.91	NESC 250B (Heavy)	1	0.5
CX91	19.88	NESC 250B (Heavy)	1	0.5
CX92	19.89	NESC 250B (Heavy)	1	0.5
CX101	19.87	NESC 250B (Heavy)	1	0.5
CX102	19.88	NESC 250B (Heavy)	1	0.5
CX111	19.85	NESC 250B (Heavy)	1	0.5
CX112	19.87	NESC 250B (Heavy)	1	0.5
CX121	19.84	NESC 250B (Heavy)	1	0.5
CX122	19.85	NESC 250B (Heavy)	1	0.5
CX131	24.81	NESC 250B (Heavy)	1	0.5
CX132	24.82	NESC 250B (Heavy)	1	0.5
CX141	14.86	NESC 250B (Heavy)	1	0.5
CX142	14.87	NESC 250B (Heavy)	1	0.5

\*\*\* Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC 250B (Heavy)	78.15	P Base Plate	
NESC 250C (Extreme Wind)	94.19	P Base Plate	

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC 250B (Heavy)	75.99	P	34
NESC 250C (Extreme Wind)	91.63	P	35

Summary of Base Plate Usages by Load Case:

Load Case	Pole Bend Label	Bend Length (in)	Vertical Load (kips)	X Moment (ft-k)	Y Bending Moment (ft-k)	Stress (ksi)	Bolt Moment Sum (ft-k)	# Bolts	Max Bolt Load For Bend Line (kips)	Minimum Plate Thickness (in)	Usage %	
NESC 250B (Heavy)	P	12	42.310	108.142	4287.292	-33.294	46.893	291.058	5	157.905	2.873	78.15
NESC 250C (Extreme Wind)	P	12	42.310	53.357	5275.796	-13.241	56.517	350.797	5	189.920	3.154	94.19

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Segment Number
NESC 250B (Heavy)	32.87	BCL	1
NESC 250C (Extreme Wind)	14.09	BCL	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case Weight (lbs)
21 Suspension	NESC 250B (Heavy)	7.87	15.0
11 Suspension	NESC 250B (Heavy)	8.17	15.0
61 Suspension	NESC 250B (Heavy)	16.54	0.0
51 Suspension	NESC 250B (Heavy)	16.54	0.0
62 Suspension	NESC 250B (Heavy)	16.54	0.0



52 Suspension 16.54 NESC 250B (Heavy) 0.0  
 63 Suspension 16.54 NESC 250B (Heavy) 0.0  
 53 Suspension 16.54 NESC 250B (Heavy) 0.0

**Loads At Insulator Attachments For All Load Cases:**

Load Case	Insulator Label	Insulator Type	Structure Attach Label	Structure Attach Load X (kips)	Structure Attach Load Y (kips)	Structure Attach Load Z (kips)	Structure Attach Load Res. (kips)
NESC 250B (Heavy)	21	Suspension	SWL:1	0.000	1.185	1.035	1.573
NESC 250B (Heavy)	11	Suspension	SWR:1	0.000	1.234	1.072	1.635
NESC 250B (Heavy)	61	Suspension	TCL:1	0.000	4.255	7.090	8.269
NESC 250B (Heavy)	51	Suspension	TCR:1	0.000	4.255	7.090	8.269
NESC 250B (Heavy)	62	Suspension	MCL:1	0.000	4.255	7.090	8.269
NESC 250B (Heavy)	52	Suspension	MCR:1	0.000	4.255	7.090	8.269
NESC 250B (Heavy)	63	Suspension	BCL:1	0.000	4.255	7.090	8.269
NESC 250B (Heavy)	53	Suspension	BCR:1	0.000	4.255	7.090	8.269
NESC 250C (Extreme Wind)	21	Suspension	SWL:1	0.000	0.733	0.216	0.764
NESC 250C (Extreme Wind)	11	Suspension	SWR:1	0.000	0.865	0.201	0.888
NESC 250C (Extreme Wind)	61	Suspension	TCL:1	0.000	4.942	2.748	5.655
NESC 250C (Extreme Wind)	51	Suspension	TCR:1	0.000	4.942	2.748	5.655
NESC 250C (Extreme Wind)	62	Suspension	MCL:1	0.000	4.942	2.748	5.655
NESC 250C (Extreme Wind)	52	Suspension	MCR:1	0.000	4.942	2.748	5.655
NESC 250C (Extreme Wind)	63	Suspension	BCL:1	0.000	4.942	2.748	5.655
NESC 250C (Extreme Wind)	53	Suspension	BCR:1	0.000	4.942	2.748	5.655

**Overturning Moments For User Input Concentrated Loads:**

Moments are static equivalents based on central axis of 0,0 (i.e. a single pole).

Load Case	Total Tran. Load (kips)	Total Long. Load (kips)	Total Vert. Load (kips)	Transverse Overturning Moment (ft-k)	Longitudinal Overturning Moment (ft-k)	Torsional Moment (ft-k)
NESC 250B (Heavy)	27.949	0.000	44.647	3061.727	0.000	0.000
NESC 250C (Extreme Wind)	31.250	0.000	16.905	3386.471	0.000	0.000

\*\*\* Weight of structure (lbs):  
 Weight of Tubular Davit Arms: 4269.8  
 Weight of Steel Poles: 28300.0  
 Weight of Equipment: 6339.7  
 Weight of Suspensions: 30.0  
 Total: 38939.4

\*\*\* End of Report

# **APPENDIX D**

## **SUPPLEMENTAL CALCULATIONS**

## Mast Connection - AISC

### Mast Connection / Clamping Collar Bolt Checks

#### tnxTower Reactions:

$$Axial := 0$$

Not Applicable, the mast flange is resting on the top of the tower

$$Shear := 5.3 \text{ kip}$$

Worst Case (from tnxTower)

$$Moment := 26.8 \text{ kip} \cdot \text{ft}$$

Worst Case (from tnxTower)

#### Bolt Input: (ASTM A325):

$$F_{u\_bolt} := 120 \text{ ksi}$$

Minimum tensile strength of bolt

$$F_{nt} := 90 \text{ ksi}$$

Nominal tensile strength of bolt

$$F_{nv} := 54 \text{ ksi}$$

Nominal shear strength of bolt

$$N := 4$$

Number of Bolts per Connection

$$n := 4$$

Number of Connections

$$D_{bolt} := 0.75 \cdot \text{in}$$

Nominal Diameter of Bolt

$$\Phi := 0.75$$

$$MomentArm := 25 \text{ in}$$

Moment Arm Between the Bolt Groups

$$A_b := \frac{\pi}{4} \cdot (D_{bolt})^2 = 0.442 \text{ in}^2$$

Nominal Area of Bolt

$$R_{nt} := \Phi \cdot A_b \cdot F_{nt} = 29.821 \text{ kip}$$

Available Tensile Strength per bolt

$$R_{nv} := \Phi \cdot A_b \cdot F_{nv} = 17.892 \text{ kip}$$

Available Shear Strength per bolt

Bolt Shear Check:

$$MaxBoltShear := \sqrt{\left(\frac{Shear}{2 \cdot N}\right)^2 + \left(\frac{Moment}{MomentArm \cdot N}\right)^2} = 3.284 \text{ kip}$$

Two Bolt Groups in Shear due to  
Wind Across one Axis

$$\frac{MaxBoltShear}{R_{nv}} = 0.184 \quad (\text{ok})$$

## Anchor Bolt Analysis - ASCE 48-05

### Max Flange Loads

Anchor Bolt Load (Max Tension):	$T := 189.92 \cdot kip$	User Input - from PLS-Pole
Pole Shear (Max):	$V := 51.71 \cdot kip$	User Input - from PLS-Pole
Pole Axial Load (Max):	$A := 56.46 \cdot kip$	User Input - from PLS-Pole

### Anchor Bolt Input:

Bolt Type:	ASTM A615 Grade 75	User Input
Bolt Quantity:	$N := 20$	User Input
Bolt Ultimate Strength:	$Fu_{bolt} := 100 \cdot ksi$	User Input
Bolt Yield Strength:	$Fy_{bolt} := 75 \cdot ksi$	User Input
Bolt Nominal Diameter:	$D_{bolt} := 2.25 \cdot in$	User Input
Bolt Threads per Inch:	$n := 4.5$	User Input

### Anchor Bolt Tension Check:

$$A_g := \frac{\pi \cdot D_{bolt}^2}{4} = 3.98 \text{ in}^2$$

Gross Area of Anchor Bolt Shank

$$A_s := \frac{\pi}{4} \cdot \left( D_{bolt} - \frac{0.9743 \text{ in}}{n} \right)^2 = 3.25 \text{ in}^2$$

Stress Area of Anchor Bolt through the threads

$$f_t := \frac{T}{A_s} = 58.479 \text{ ksi}$$

$$F_t := 0.75 \cdot Fu_{bolt} = 75 \text{ ksi}$$

As per ASCE 48-05 Section 6.2.3

$$Bolt_{usage\_tension} := \frac{f_t}{F_t} = 78\%$$

$$Status_{bolt\_tension} := \begin{cases} \text{if } Bolt_{usage\_tension} \leq 1 \\ \quad \text{"OK"} \\ \text{else} \\ \quad \text{"NG"} \end{cases} = \text{"OK"}$$

Anchor Bolt Shear Check:

$$V_{max} := \frac{V}{N} = 2.586 \text{ kip}$$

$$f_v := \frac{V_{max}}{A_g} = 0.65 \text{ ksi}$$

$$F_v := 0.45 F_{u_{bolt}} = 45 \text{ ksi}$$

As per ASCE 48-05 Section 6.2.2

$$Bolt_{usage\_shear} := \frac{f_v}{F_v} = 1.4\%$$

$$Status_{bolt\_shear} := \begin{cases} \text{if } Bolt_{usage\_shear} \leq 1 \\ \text{“OK”} \\ \text{else} \\ \text{“NG”} \end{cases} = \text{“OK”}$$

Anchor Bolt Combined Shear and Tension Check:

$$F_{t,y} := F_t \cdot \sqrt{\left(1 - \left(\frac{f_v}{F_v}\right)^2\right)} = 74.99 \text{ ksi}$$

As per ASCE 48-05 Section 6.2.4

$$Bolt_{usage\_combined} := \frac{f_t}{F_{t,y}} = 78\%$$

$$Status_{bolt\_combined} := \begin{cases} \text{if } Bolt_{usage\_combined} \leq 1 \\ \text{“OK”} \\ \text{else} \\ \text{“NG”} \end{cases} = \text{“OK”}$$

=====  
LPile Plus for Windows, Version 6 (6.0.22)

Analysis of Individual Piles and Drilled Shafts  
Subjected to Lateral Loading Using the p-y Method

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=====  
This program is licensed to:

Charles Carrillo  
PJF

-----  
Files Used for Analysis  
-----

Path to file locations: G:\Transmission\Eversource\2018\806\_Smartlink\80618-0011\_Pole  
10254\_ATT\_CTL05176\_Stony Hill\001.6000 - SA\\_R3\LPile\  
Name of input data file: A80618-0011.001.6050.lpd  
Name of output report file: A80618-0011.001.6050.lp6o  
Name of plot output file: A80618-0011.001.6050.lp6p  
Name of runtime message file: A80618-0011.001.6050.lp6r

-----  
Date and Time of Analysis  
-----

Date: May 20, 2019 Time: 17:17:41

-----  
Problem Title  
-----

Project Name: Structure #10254 / Stony Hill

Job Number: A80618-0011.001.6050

Client: ATT

Engineer: CEC

Description: 8'x20.5' Caisson

-----  
Program Options  
-----

Engineering units are US Customary Units: pounds, inches, feet

Basic Program Options:

This analysis computes nonlinear bending stiffness and nominal moment capacity with pile response computed using nonlinear EI

Computation Options:

- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- No computation of foundation stiffness matrix elements
- Output pile response for full length of pile
- Analysis assumes no soil movements acting on pile
- No p-y curves to be computed and output for user-specified depths

Solution Control Parameters:

- Number of pile increments = 100
- Maximum number of iterations allowed = 500
- Deflection tolerance for convergence = 1.0000E-05 in
- Maximum allowable deflection = 100.0000 in

Pile Response Output Options:

- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (nodal spacing of output points) = 1

-----  
Pile Structural Properties and Geometry  
-----

- Total Number of Sections = 1
- Total Pile Length = 20.50 ft



Depth of ground surface below top of pile = 0.50 ft  
 Slope angle of ground surface = 0.00 deg.

Pile dimensions used for p-y curve computations defined using 2 points.  
 p-y curves are computed using values of pile diameter interpolated over  
 the length of the pile.

Point	Depth X ft	Pile Diameter in
1	0.00000	96.0000000
2	20.500000	96.0000000

Input Structural Properties:

Pile Section No. 1:

Section Type = Drilled Shaft (Bored Pile)  
 Section Length = 20.500 ft  
 Section Diameter = 96.000 in

Ground Slope and Pile Batter Angles

Ground Slope Angle = 0.000 degrees  
 = 0.000 radians  
 Pile Batter Angle = 0.000 degrees  
 = 0.000 radians

Soil and Rock Layering Information

The soil profile is modelled using 4 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 0.500 ft  
 Distance from top of pile to bottom of layer = 7.500 ft  
 p-y subgrade modulus k for top of soil layer = 90.000 lbs/in\*\*3  
 p-y subgrade modulus k for bottom of layer = 90.000 lbs/in\*\*3

Layer 2 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 7.500 ft  
 Distance from top of pile to bottom of layer = 12.000 ft  
 p-y subgrade modulus k for top of soil layer = 90.000 lbs/in\*\*3  
 p-y subgrade modulus k for bottom of layer = 90.000 lbs/in\*\*3

Layer 3 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 12.000 ft  
 Distance from top of pile to bottom of layer = 15.500 ft  
 p-y subgrade modulus k for top of soil layer = 225.000 lbs/in\*\*3  
 p-y subgrade modulus k for bottom of layer = 225.000 lbs/in\*\*3

Layer 4 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 15.500 ft  
 Distance from top of pile to bottom of layer = 20.500 ft  
 p-y subgrade modulus k for top of soil layer = 125.000 lbs/in\*\*3  
 p-y subgrade modulus k for bottom of layer = 125.000 lbs/in\*\*3

(Depth of lowest layer extends 0.00 ft below pile tip)

-----  
 Effective Unit Weight of Soil vs. Depth  
 -----

Effective unit weight of soil with depth defined using 8 points

Point No.	Depth X ft	Eff. Unit Weight pcf
1	0.50	115.78000
2	7.50	115.78000
3	7.50	115.78000
4	12.00	115.78000
5	12.00	129.60000
6	15.50	129.60000
7	15.50	67.39200

8                    20.50                    67.39200

-----  
 Summary of Soil Properties  
 -----

Layer Num.	RQD percent	Soil Type	Epsilon 50 (p-y Curve Criteria)	Soil Type Criteria	Rock Mass psi	Depth ft	Eff. Unit krm	Unit Test Type	Cohesion Test Type	Friction Prop. Ang., deg.	Elas. Subgr. pci	qu psi
1	--	Sand (Reese, et al.)	--	90.000	--	0.500	115.780	--	--	30.000	--	--
	--		--	90.000	--	7.500	115.780	--	--	30.000	--	--
2	--	Sand (Reese, et al.)	--	90.000	--	7.500	115.780	--	--	30.000	--	--
	--		--	90.000	--	12.000	115.780	--	--	30.000	--	--
3	--	Sand (Reese, et al.)	--	90.000	--	12.000	129.600	--	--	40.000	--	--
	--		--	225.000	--	15.500	129.600	--	--	40.000	--	--
4	--	Sand (Reese, et al.)	--	225.000	--	15.500	67.392	--	--	40.000	--	--
	--		--	125.000	--	20.500	67.392	--	--	40.000	--	--
	--		--	125.000	--			--	--		--	--

-----  
 Loading Type  
 -----

Static loading criteria were used when computing p-y curves for all analyses.

-----  
 Pile-head Loading and Pile-head Fixity Conditions  
 -----

Number of loads specified = 2

Load No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs

1	1	V =	42537.000 lbs	M =	56592228.000 in-lbs	122364.000
2	1	V =	56881.000 lbs	M =	69640560.000 in-lbs	62106.000

V = perpendicular shear force applied to pile head  
M = bending moment applied to pile head  
y = lateral deflection relative to pile axis  
S = pile slope relative to original pile batter angle  
R = rotational stiffness applied to pile head  
Axial thrust is assumed to be acting axially

-----  
Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness  
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Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Dimensions and Properties of Drilled Shaft:  
-----

Length of Section	=	20.50000000	ft
Shaft Diameter	=	96.00000000	in
Concrete Cover Thickness	=	6.62500000	in
Number of Reinforcing Bars	=	38	bars
Yield Stress of Reinforcing Bars	=	60.00000000	ksi
Modulus of Elasticity of Reinforcing Bars	=	29000.	ksi
Gross Area of Shaft	=	7238.22947387	sq. in.
Total Area of Reinforcing Steel	=	48.26000000	sq. in.
Area Ratio of Steel Reinforcement	=	0.67	percent
Edge-to-Edge Bar Spacing	=	5.45856507	in

Axial Structural Capacities:  
-----

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	24285.760	kips
Tensile Load for Cracking of Concrete	=	-2965.392	kips
Nominal Axial Tensile Capacity	=	-2895.600	kips

Reinforcing Bar Dimensions and Positions Used in Computations:

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Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.27000	1.27000	40.74000	0.00000
2	1.27000	1.27000	40.18436	6.70558
3	1.27000	1.27000	38.53259	13.22826
4	1.27000	1.27000	35.82976	19.39010
5	1.27000	1.27000	32.14958	25.02303
6	1.27000	1.27000	27.59245	29.97339
7	1.27000	1.27000	22.28267	34.10616
8	1.27000	1.27000	16.36507	37.30861
9	1.27000	1.27000	10.00108	39.49337
10	1.27000	1.27000	3.36428	40.60085
11	1.27000	1.27000	-3.36428	40.60085
12	1.27000	1.27000	-10.00108	39.49337
13	1.27000	1.27000	-16.36507	37.30861
14	1.27000	1.27000	-22.28267	34.10616
15	1.27000	1.27000	-27.59245	29.97339
16	1.27000	1.27000	-32.14958	25.02303
17	1.27000	1.27000	-35.82976	19.39010
18	1.27000	1.27000	-38.53259	13.22826
19	1.27000	1.27000	-40.18436	6.70558
20	1.27000	1.27000	-40.74000	0.00000
21	1.27000	1.27000	-40.18436	-6.70558
22	1.27000	1.27000	-38.53259	-13.22826
23	1.27000	1.27000	-35.82976	-19.39010
24	1.27000	1.27000	-32.14958	-25.02303
25	1.27000	1.27000	-27.59245	-29.97339
26	1.27000	1.27000	-22.28267	-34.10616
27	1.27000	1.27000	-16.36507	-37.30861
28	1.27000	1.27000	-10.00108	-39.49337
29	1.27000	1.27000	-3.36428	-40.60085
30	1.27000	1.27000	3.36428	-40.60085
31	1.27000	1.27000	10.00108	-39.49337
32	1.27000	1.27000	16.36507	-37.30861
33	1.27000	1.27000	22.28267	-34.10616
34	1.27000	1.27000	27.59245	-29.97339
35	1.27000	1.27000	32.14958	-25.02303
36	1.27000	1.27000	35.82976	-19.39010
37	1.27000	1.27000	38.53259	-13.22826
38	1.27000	1.27000	40.18436	-6.70558

Concrete Properties:

Compressive Strength of Concrete = 3.500000 ksi

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Modulus of Elasticity of Concrete = 3372.1654764 ksi  
 Modulus of Rupture of Concrete = -0.4437060 ksi  
 Compression Strain at Peak Stress = 0.0017644  
 Tensile Strain at Fracture of Concrete = -0.0001156  
 Maximum Coarse Aggregate Size = 0.7500000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 2

Number	Axial Thrust Force kips
1	62.106
2	122.364

Definitions of Run Messages and Notes:

C = concrete in section has cracked in tension  
 Y = stress in reinforcing steel has reached yield stress  
 T = tensile strain in reinforcement exceeds 0.005 when compressive strain in concrete is less than 0.003.  
 Z = depth of tensile zone in concrete section is less than 10 percent of section depth  
 Bending Stiffness (EI) = Bending Moment / Curvature  
 Position of neutral axis is computed from compression side of pile  
 Compressive stresses are positive in sign. Tensile stresses are negative in sign.

Axial Thrust Force = 62.106 kips

Bending Steel Run Curvature Stress rad/in.	Bending Moment in-kip	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in	Max Concrete Stress ksi	Max ksi
0.000000313	5467.2834524	17495307048.	54.6646049	0.0000171	-0.0000129	0.0668539	
0.4910480							
0.000000625	10906.	17449166903.	51.3437826	0.0000321	-0.0000279	0.1249823	
0.9219061							
0.000000938	16315.	17402278006.	50.2369197	0.0000471	-0.0000429	0.1826147	
1.3527663							
0.000001250	21694.	17355200483.	49.6835330	0.0000621	-0.0000579	0.2397509	
1.7836281							
0.000001563	27044.	17308047396.	49.3515355	0.0000771	-0.0000729	0.2963910	

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2.2144915							
0.000001875	32364.	17260856484.	49.1302319	0.0000921	-0.0000879	0.3525350	
2.6453563							
0.000002188	37655.	17213643942.	48.9721818	0.0001071	-0.0001029	0.4081829	
3.0762228							
0.000002500	37655.	15061938450.	24.6232045	0.0000616	-0.0001784	0.2353599	
-5.1400177 C							
0.000002813	37655.	13388389733.	24.2383222	0.0000682	-0.0002018	0.2600734	
-5.8139118 C							
0.000003125	37655.	12049550760.	23.9263685	0.0000748	-0.0002252	0.2846449	
-6.4881728 C							
0.000003438	37655.	10954137054.	23.6722878	0.0000814	-0.0002486	0.3091379	
-7.1623188 C							
0.000003750	37655.	10041292300.	23.4588438	0.0000880	-0.0002720	0.3335131	
-7.8366507 C							
0.000004063	37655.	9268885200.	23.2731360	0.0000945	-0.0002955	0.3577169	
-8.5115837 C							
0.000004375	37655.	8606821971.	23.1148960	0.0001011	-0.0003189	0.3818432	
-9.1863976 C							
0.000004688	37655.	8033033840.	22.9786330	0.0001077	-0.0003423	0.4058919	
-9.8610921 C							
0.000005000	37655.	7530969225.	22.8602291	0.0001143	-0.0003657	0.4298628	
-10.5356668 C							
0.000005313	37655.	7087971035.	22.7565350	0.0001209	-0.0003891	0.4537559	
-11.2101213 C							
0.000005625	37655.	6694194866.	22.6651015	0.0001275	-0.0004125	0.4775710	
-11.8844553 C							
0.000005938	37655.	6341868821.	22.5839950	0.0001341	-0.0004359	0.5013079	
-12.5586683 C							
0.000006250	37655.	6024775380.	22.5092854	0.0001407	-0.0004593	0.5249120	
-13.2331920 C							
0.000006563	37655.	5737881314.	22.4412846	0.0001473	-0.0004827	0.5484132	
-13.9077930 C							
0.000006875	37655.	5477068527.	22.3801004	0.0001539	-0.0005061	0.5718370	
-14.5822675 C							
0.000007188	37655.	5238935113.	22.3248459	0.0001605	-0.0005295	0.5951834	
-15.2566149 C							
0.000007500	37655.	5020646150.	22.2747818	0.0001671	-0.0005529	0.6184521	
-15.9308349 C							
0.000007813	37655.	4819820304.	22.2292872	0.0001737	-0.0005763	0.6416430	
-16.6049271 C							
0.000008125	37655.	4634442600.	22.1878368	0.0001803	-0.0005997	0.6647561	
-17.2788909 C							
0.000008438	37655.	4462796578.	22.1499830	0.0001869	-0.0006231	0.6877911	
-17.9527260 C							
0.000008750	37655.	4303410986.	22.1153422	0.0001935	-0.0006465	0.7107479	
-18.6264319 C							
0.000009063	37655.	4155017503.	22.0835837	0.0002001	-0.0006699	0.7336264	

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-19.3000081 C	37655.	4016516920.	22.0544211	0.0002068	-0.0006932	0.7564265
0.000009375						
-19.9734542 C	37655.	3886951858.	22.0276046	0.0002134	-0.0007166	0.7791479
0.000009688						
-20.6467698 C	37655.	3765484612.	22.0029160	0.0002200	-0.0007400	0.8017906
0.0000100						
-21.3199543 C	37655.	3651379018.	21.9801634	0.0002267	-0.0007633	0.8243545
0.0000103						
-21.9930074 C	37655.	3543985518.	21.9591774	0.0002333	-0.0007867	0.8468393
0.0000106						
-22.6659284 C	37655.	3442728788.	21.9398081	0.0002400	-0.0008100	0.8692449
0.0000109						
-23.3387174 C	37655.	3347097433.	21.9219221	0.0002466	-0.0008334	0.8915712
0.0000113						
-24.0113731 C	37655.	3256635340.	21.9054008	0.0002533	-0.0008567	0.9138181
0.0000116						
-24.6838955 C	37655.	3170934410.	21.8901376	0.0002599	-0.0008801	0.9359854
0.0000119						
-25.3562840 C	37655.	3089628400.	21.8760373	0.0002666	-0.0009034	0.9580729
0.0000122						
-26.0285382 C	37655.	2938914819.	21.8509898	0.0002800	-0.0009500	1.0020081
0.0000128						
-27.3726416 C	37655.	2802221107.	21.8296662	0.0002933	-0.0009967	1.0456225
0.0000134						
-28.7162019 C	38689.	2751203585.	21.8115797	0.0003067	-0.0010433	1.0889149
0.0000141						
-30.0592151 C	40315.	2744830405.	21.7963264	0.0003201	-0.0010899	1.1318841
0.0000147						
-31.4016775 C	41939.	2738869619.	21.7835686	0.0003336	-0.0011364	1.1745289
0.0000153						
-32.7435843 C	43562.	2733271894.	21.7730216	0.0003470	-0.0011830	1.2168480
0.0000159						
-34.0849317 C	45182.	2727995483.	21.7644439	0.0003605	-0.0012295	1.2588402
0.0000166						
-35.4257156 C	46802.	2723004703.	21.7576291	0.0003740	-0.0012760	1.3005042
0.0000172						
-36.7659318 C	48419.	2718268871.	21.7524000	0.0003875	-0.0013225	1.3418388
0.0000178						
-38.1055759 C	50035.	2713761457.	21.7486036	0.0004010	-0.0013690	1.3828426
0.0000184						
-39.4446435 C	51649.	2709459402.	21.7461068	0.0004145	-0.0014155	1.4235143
0.0000191						
-40.7831303 C	53261.	2705342569.	21.7447937	0.0004281	-0.0014619	1.4638527
0.0000197						
-42.1210318 C	54872.	2701393291.	21.7445629	0.0004417	-0.0015083	1.5038563
0.0000203						
-43.4583434 C	56481.	2697596004.	21.7453249	0.0004553	-0.0015547	1.5435239
0.0000209						



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-44.7950605 C	58088.	2693936942.	21.7470010	0.0004689	-0.0016011	1.5828540
0.0000216						
-46.1311784 C	59693.	2690403881.	21.7495212	0.0004826	-0.0016474	1.6218453
0.0000222						
-47.4666924 C	61297.	2686985931.	21.7528235	0.0004962	-0.0016938	1.6604964
0.0000228						
-48.8015977 C	62899.	2683673357.	21.7568524	0.0005099	-0.0017401	1.6988059
0.0000234						
-50.1358893 C	64499.	2680457427.	21.7615585	0.0005236	-0.0017864	1.7367722
0.0000241						
-51.4695625 C	66097.	2677330288.	21.7668973	0.0005374	-0.0018326	1.7743941
0.0000247						
-52.8026120 C	67693.	2674284856.	21.7728290	0.0005511	-0.0018789	1.8116700
0.0000253						
-54.1350328 C	69287.	2671314720.	21.7793175	0.0005649	-0.0019251	1.8485985
0.0000259						
-55.4668198 C	70880.	2668414069.	21.7863303	0.0005787	-0.0019713	1.8851780
0.0000266						
-56.7979676 C	72470.	2665577619.	21.7938381	0.0005925	-0.0020175	1.9214070
0.0000272						
-58.1284710 C	74059.	2662800552.	21.8018142	0.0006064	-0.0020636	1.9572840
0.0000278						
-59.4583245 C	75646.	2660078469.	21.8102344	0.0006202	-0.0021098	1.9928075
0.0000284						
-60.0000000 CY	77231.	2657407342.	21.8190767	0.0006341	-0.0021559	2.0279758
0.0000291						
-60.0000000 CY	78814.	2654783476.	21.8283209	0.0006480	-0.0022020	2.0627875
0.0000297						
-60.0000000 CY	80395.	2652203473.	21.8379489	0.0006620	-0.0022480	2.0972407
0.0000303						
-60.0000000 CY	81965.	2649372352.	21.8471562	0.0006759	-0.0022941	2.1312736
0.0000309						
-60.0000000 CY	83324.	2639967721.	21.8387367	0.0006893	-0.0023407	2.1635532
0.0000316						
-60.0000000 CY	84521.	2625884978.	21.8174819	0.0007023	-0.0023877	2.1944214
0.0000322						
-60.0000000 CY	85613.	2609152015.	21.7886945	0.0007149	-0.0024351	2.2242732
0.0000328						
-60.0000000 CY	86583.	2589395625.	21.7510790	0.0007273	-0.0024827	2.2529958
0.0000334						
-60.0000000 CY	87544.	2570089545.	21.7146034	0.0007397	-0.0025303	2.2813721
0.0000341						
-60.0000000 CY	88391.	2548201960.	21.6700540	0.0007517	-0.0025783	2.3086682
0.0000347						
-60.0000000 CY	89178.	2525398926.	21.6224326	0.0007635	-0.0026265	2.3352794
0.0000353						
-60.0000000 CY	89962.	2503296966.	21.5752740	0.0007754	-0.0026746	2.3614930
0.0000359						

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-60.0000000 CY 0.0000366	90730.	2481517176.	21.5274380	0.0007871	-0.0027229	2.3872210
-60.0000000 CY 0.0000372	91387.	2457478632.	21.4713170	0.0007985	-0.0027715	2.4118413
-60.0000000 CY 0.0000397	93849.	2364687476.	21.2536719	0.0008435	-0.0029665	2.5066596
-60.0000000 CY 0.0000422	95802.	2270870975.	21.0216302	0.0008869	-0.0031631	2.5937366
-60.0000000 CY 0.0000447	97617.	2184437093.	20.8079933	0.0009299	-0.0033601	2.6761700
-60.0000000 CY 0.0000472	99036.	2098779733.	20.5817907	0.0009712	-0.0035588	2.7516292
-60.0000000 CY 0.0000497	100418.	2020984652.	20.3692794	0.0010121	-0.0037579	2.8226783
-60.0000000 CY 0.0000522	101542.	1945724066.	20.1550028	0.0010518	-0.0039582	2.8882708
-60.0000000 CY 0.0000547	102533.	1874895082.	19.9507156	0.0010911	-0.0041589	2.9496978
-60.0000000 CY 0.0000572	103518.	1810145341.	19.7671033	0.0011304	-0.0043596	3.0081147
-60.0000000 CY 0.0000597	104409.	1749262516.	19.5862491	0.0011691	-0.0045609	3.0621981
-60.0000000 CY 0.0000622	105082.	1689764155.	19.3931849	0.0012060	-0.0047640	3.1109353
-60.0000000 CY 0.0000647	105749.	1634774782.	19.2172362	0.0012431	-0.0049669	3.1569735
-60.0000000 CY 0.0000672	106412.	1583802381.	19.0566169	0.0012804	-0.0051696	3.2002881
-60.0000000 CY 0.0000697	107069.	1536413210.	18.9097139	0.0013178	-0.0053722	3.2408453
-60.0000000 CY 0.0000722	107618.	1490817270.	18.7631776	0.0013545	-0.0055755	3.2777481
-60.0000000 CY 0.0000747	108051.	1446707514.	18.6072329	0.0013897	-0.0057803	3.3104952
-60.0000000 CY 0.0000772	108475.	1405349798.	18.4595811	0.0014248	-0.0059852	3.3405155
-60.0000000 CY 0.0000797	108896.	1366537453.	18.3229821	0.0014601	-0.0061899	3.3680585
-60.0000000 CY 0.0000822	109312.	1330037250.	18.1964565	0.0014955	-0.0063945	3.3930930
-60.0000000 CY 0.0000847	109725.	1295643478.	18.0791419	0.0015311	-0.0065989	3.4155871
-60.0000000 CY 0.0000872	110127.	1263111074.	17.9695326	0.0015667	-0.0068033	3.4354733
-60.0000000 CY 0.0000897	110459.	1231601602.	17.8588800	0.0016017	-0.0070083	3.4523960
-60.0000000 CY 0.0000922	110732.	1201164765.	17.7474494	0.0016361	-0.0072139	3.4665079

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-60.0000000 CY 0.0000947	110980.	1172068232.	17.6322689	0.0016696	-0.0074204	3.4778583
-60.0000000 CY 0.0000972	111225.	1144435774.	17.5244673	0.0017032	-0.0076268	3.4869027
-60.0000000 CY 0.0000997	111466.	1118156587.	17.4235148	0.0017369	-0.0078331	3.4936106
-60.0000000 CY 0.0001022	111704.	1093130691.	17.3289343	0.0017708	-0.0080392	3.4979508
-60.0000000 CY 0.0001047	111939.	1069267636.	17.2402953	0.0018048	-0.0082452	3.4998909
-60.0000000 CY 0.0001072	112169.	1046477266.	17.1574445	0.0018391	-0.0084509	3.4940244
-60.0000000 CY 0.0001097	112396.	1024693101.	17.0797954	0.0018734	-0.0086566	3.4973057
-60.0000000 CY 0.0001122	112620.	1003851103.	17.0069142	0.0019080	-0.0088620	3.4996345
-60.0000000 CY 0.0001147	112831.	983812462.	16.9374753	0.0019425	-0.0090675	3.4966673
-60.0000000 CY 0.0001172	112987.	964155676.	16.8642953	0.0019763	-0.0092737	3.4945837
-60.0000000 CY 0.0001197	113140.	945295253.	16.7946234	0.0020101	-0.0094799	3.4980556
-60.0000000 CY 0.0001222	113260.	926933881.	16.7168415	0.0020426	-0.0096874	3.4997435
-60.0000000 CY 0.0001247	113377.	909285475.	16.6434675	0.0020752	-0.0098948	3.4970243
-60.0000000 CY 0.0001272	113490.	892308598.	16.5742485	0.0021080	-0.0101020	3.4921132
-60.0000000 CY 0.0001297	113603.	875973992.	16.5085293	0.0021409	-0.0103091	3.4960540
60.0000000 CY 0.0001322	113714.	860244991.	16.4461250	0.0021740	-0.0105160	3.4986524
60.0000000 CY 0.0001347	113823.	845087642.	16.3868650	0.0022071	-0.0107229	3.4998901
60.0000000 CY 0.0001372	113929.	830461565.	16.3310217	0.0022404	-0.0109296	3.4961269
60.0000000 CY 0.0001522	114532.	752569541.	16.0501282	0.0024426	-0.0121674	3.4946524
60.0000000 CY 0.0001672	115002.	687861947.	15.8240717	0.0026456	-0.0134044	3.4999971
60.0000000 CY 0.0001822	115234.	632503454.	15.5854423	0.0028395	-0.0146505	3.4957033
60.0000000 CY 0.0001972	115447.	585467575.	15.3955414	0.0030358	-0.0158942	3.4894478
60.0000000 CY 0.0002122	115642.	545000352.	15.2431522	0.0032344	-0.0171356	3.4962456
60.0000000 CY 0.0002272	115824.	509814777.	15.1198025	0.0034350	-0.0183750	3.4910155

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60.0000000 CY							
0.0002422	115992.	478935005.	15.0195925	0.0036376	-0.0196124	3.4880413	
60.0000000 CY							
0.0002572	116107.	451450649.	14.9233604	0.0038381	-0.0208519	3.4992977	
60.0000000 CY							

Axial Thrust Force = 122.364 kips

Bending Steel Run Curvature Stress rad/in.	Bending Moment in-kip	Bending Stiffness kip-in2	Depth to N Axis in	Max Comp Strain in/in	Max Tens Strain in/in	Max Concrete Stress ksi	Max ksi
0.000000313	5465.2744962	17488878388.	61.1321267	0.0000191	-0.0000109	0.0747906	
0.5496599							
0.000000625	10904.	17445872862.	54.5883578	0.0000341	-0.0000259	0.1328778	
0.9807140							
0.000000938	16313.	17400059511.	52.4073913	0.0000491	-0.0000409	0.1904692	
1.4117760							
0.000001250	21692.	17353523130.	51.3170227	0.0000641	-0.0000559	0.2475644	
1.8428421							
0.000001563	27042.	17306695394.	50.6628769	0.0000792	-0.0000708	0.3041633	
2.2739116							
0.000001875	32362.	17259721597.	50.2268390	0.0000942	-0.0000858	0.3602658	
2.7049844							
0.000002188	37653.	17212664154.	49.9154322	0.0001092	-0.0001008	0.4158719	
3.1360602							
0.000002500	37653.	15061081135.	27.7930947	0.0000695	-0.0001705	0.2656532	
-4.9102006 C							
0.000002813	37653.	13387627676.	27.1285064	0.0000763	-0.0001937	0.2910262	
-5.5781812 C							
0.000003125	37653.	12048864908.	26.5834454	0.0000831	-0.0002169	0.3161410	
-6.2473752 C							
0.000003438	37653.	10953513553.	26.1271867	0.0000898	-0.0002402	0.3410237	
-6.9175961 C							
0.000003750	37653.	10040720757.	25.7413358	0.0000965	-0.0002635	0.3657294	
-7.5884297 C							
0.000004063	37653.	9268357622.	25.4147187	0.0001032	-0.0002868	0.3903362	
-8.2592784 C							
0.000004375	37653.	8606332077.	25.1239890	0.0001099	-0.0003101	0.4146705	
-8.9314939 C							
0.000004688	37653.	8032576605.	24.8728729	0.0001166	-0.0003334	0.4389240	
-9.6035938 C							
0.000005000	37653.	7530540568.	24.6539453	0.0001233	-0.0003567	0.4630965	

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-10.2755779 C	0.000005313	37653.	7087567593.	24.4606598	0.0001299	-0.0003801	0.4871710
-10.9475796 C	0.000005625	37653.	6693813838.	24.2823192	0.0001366	-0.0004034	0.5110150
-11.6206467 C	0.000005938	37653.	6341507846.	24.1234418	0.0001432	-0.0004268	0.5347792
-12.2935948 C	0.000006250	37653.	6024432454.	23.9811103	0.0001499	-0.0004501	0.5584636
-12.9664237 C	0.000006563	37653.	5737554718.	23.8529629	0.0001565	-0.0004735	0.5820679
-13.6391330 C	0.000006875	37653.	5476756776.	23.7370672	0.0001632	-0.0004968	0.6055921
-14.3117222 C	0.000007188	37653.	5238636917.	23.6318271	0.0001699	-0.0005201	0.6290359
-14.9841910 C	0.000007500	37653.	5020360378.	23.5359122	0.0001765	-0.0005435	0.6523994
-15.6565391 C	0.000007813	37653.	4819545963.	23.4447343	0.0001832	-0.0005668	0.6755856
-16.3295524 C	0.000008125	37653.	4634178811.	23.3603910	0.0001898	-0.0005902	0.6986719
-17.0026078 C	0.000008438	37653.	4462542559.	23.2828076	0.0001964	-0.0006136	0.7216788
-17.6755380 C	0.000008750	37653.	4303166039.	23.2112616	0.0002031	-0.0006369	0.7446060
-18.3483423 C	0.000009063	37653.	4154781003.	23.1451299	0.0002098	-0.0006602	0.7674535
-19.0210205 C	0.000009375	37653.	4016288303.	23.0838726	0.0002164	-0.0006836	0.7902211
-19.6935721 C	0.000009688	37653.	3886730616.	23.0270196	0.0002231	-0.0007069	0.8129087
-20.3659966 C	0.0000100	37653.	3765270284.	22.9741595	0.0002297	-0.0007303	0.8355161
-21.0382937 C	0.0000103	37653.	3651171184.	22.9249307	0.0002364	-0.0007536	0.8580433
-21.7104629 C	0.0000106	37653.	3543783796.	22.8790141	0.0002431	-0.0007769	0.8804900
-22.3825037 C	0.0000109	37653.	3442532831.	22.8361274	0.0002498	-0.0008002	0.9028561
-23.0544158 C	0.0000113	37653.	3346906919.	22.7960192	0.0002565	-0.0008235	0.9251414
-23.7261987 C	0.0000116	37653.	3256449975.	22.7584658	0.0002631	-0.0008469	0.9473459
-24.3978519 C	0.0000119	37653.	3170753923.	22.7232666	0.0002698	-0.0008702	0.9694694
-25.0693750 C	0.0000122	37653.	3089452541.	22.6902418	0.0002765	-0.0008935	0.9915117
-25.7407676 C	0.0000128	37653.	2938747539.	22.6300841	0.0002899	-0.0009401	1.0353522

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-27.0831593 C	0.0000134	38662.	2877202333.	22.5768764	0.0003034	-0.0009866	1.0788662
-28.4250234 C	0.0000141	40288.	2864937885.	22.5281552	0.0003168	-0.0010332	1.1219815
-29.7669867 C	0.0000147	41912.	2853599164.	22.4841030	0.0003302	-0.0010798	1.1647344
-31.1087273 C	0.0000153	43535.	2843077135.	22.4449113	0.0003437	-0.0011263	1.2071616
-32.4499065 C	0.0000159	45155.	2833275041.	22.4100174	0.0003572	-0.0011728	1.2492618
-33.7905200 C	0.0000166	46774.	2824110722.	22.3789436	0.0003707	-0.0012193	1.2910340
-35.1305636 C	0.0000172	48392.	2815513959.	22.3512818	0.0003842	-0.0012658	1.3324767
-36.4700329 C	0.0000178	50007.	2807424382.	22.3266814	0.0003977	-0.0013123	1.3735886
-37.8089236 C	0.0000184	51621.	2799789798.	22.3048394	0.0004112	-0.0013588	1.4143685
-39.1472311 C	0.0000191	53233.	2792564851.	22.2854927	0.0004248	-0.0014052	1.4548150
-40.4849510 C	0.0000197	54844.	2785709937.	22.2684116	0.0004384	-0.0014516	1.4949268
-41.8220787 C	0.0000203	56452.	2779190321.	22.2533949	0.0004520	-0.0014980	1.5347026
-43.1586095 C	0.0000209	58059.	2772975272.	22.2402654	0.0004657	-0.0015443	1.5741408
-44.4945393 C	0.0000216	59664.	2767038029.	22.2288668	0.0004793	-0.0015907	1.6132403
-45.8298621 C	0.0000222	61268.	2761354410.	22.2190602	0.0004930	-0.0016370	1.6519995
-47.1645737 C	0.0000228	62869.	2755903024.	22.2107223	0.0005067	-0.0016833	1.6904171
-48.4986692 C	0.0000234	64469.	2750664757.	22.2037428	0.0005204	-0.0017296	1.7284916
-49.8321437 C	0.0000241	66067.	2745622472.	22.1980233	0.0005341	-0.0017759	1.7662216
-51.1649919 C	0.0000247	67663.	2740760760.	22.1934752	0.0005479	-0.0018221	1.8036055
-52.4972088 C	0.0000253	69257.	2736065729.	22.1900189	0.0005617	-0.0018683	1.8406420
-53.8287893 C	0.0000259	70849.	2731524816.	22.1875824	0.0005755	-0.0019145	1.8773295
-55.1597278 C	0.0000266	72439.	2727126636.	22.1861007	0.0005893	-0.0019607	1.9136665
-56.4900192 C	0.0000272	74028.	2722860842.	22.1855150	0.0006032	-0.0020068	1.9496514
-57.8196580 C	0.0000278	75614.	2718718012.	22.1857716	0.0006170	-0.0020530	1.9852828

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-59.1486385 C	77199.	2714689543.	22.1868220	0.0006309	-0.0020991	2.0205589
0.0000284						
-60.0000000 CY	78782.	2710767568.	22.1886216	0.0006449	-0.0021451	2.0554783
0.0000291						
-60.0000000 CY	80362.	2706944872.	22.1911298	0.0006588	-0.0021912	2.0900393
0.0000297						
-60.0000000 CY	81941.	2703214831.	22.1943096	0.0006728	-0.0022372	2.1242402
0.0000303						
-60.0000000 CY	83518.	2699571349.	22.1981269	0.0006868	-0.0022832	2.1580794
0.0000309						
-60.0000000 CY	84954.	2691606670.	22.1905408	0.0007004	-0.0023296	2.1906356
0.0000316						
-60.0000000 CY	86169.	2677082227.	22.1650536	0.0007134	-0.0023766	2.2213881
0.0000322						
-60.0000000 CY	87291.	2660282554.	22.1332206	0.0007262	-0.0024238	2.2512063
0.0000328						
-60.0000000 CY	88282.	2640197750.	22.0918831	0.0007387	-0.0024713	2.2798351
0.0000334						
-60.0000000 CY	89245.	2620051114.	22.0503163	0.0007511	-0.0025189	2.3079943
0.0000341						
-60.0000000 CY	90137.	2598536564.	22.0044321	0.0007633	-0.0025667	2.3353632
0.0000347						
-60.0000000 CY	90926.	2574882569.	21.9518001	0.0007752	-0.0026148	2.3617454
0.0000353						
-60.0000000 CY	91709.	2551900275.	21.9010218	0.0007871	-0.0026629	2.3878272
0.0000359						
-60.0000000 CY	92491.	2529677226.	21.8523843	0.0007990	-0.0027110	2.4136395
0.0000366						
-60.0000000 CY	93180.	2505679287.	21.7975630	0.0008106	-0.0027594	2.4385135
0.0000372						
-60.0000000 CY	95656.	2410232448.	21.5748027	0.0008562	-0.0029538	2.5334134
0.0000397						
-60.0000000 CY	97653.	2314728393.	21.3301739	0.0008999	-0.0031501	2.6198236
0.0000422						
-60.0000000 CY	99496.	2226493500.	21.1045237	0.0009431	-0.0033469	2.7014778
0.0000447						
-60.0000000 CY	100930.	2138912721.	20.8696215	0.0009848	-0.0035452	2.7763379
0.0000472						
-60.0000000 CY	102320.	2059268633.	20.6587858	0.0010265	-0.0037435	2.8475506
0.0000497						
-60.0000000 CY	103491.	1983052517.	20.4386319	0.0010666	-0.0039434	2.9125745
0.0000522						
-60.0000000 CY	104478.	1910446244.	20.2229287	0.0011059	-0.0041441	2.9728668
0.0000547						
-60.0000000 CY	105458.	1844073421.	20.0289416	0.0011454	-0.0043446	3.0301327
0.0000572						
-60.0000000 CY	106374.	1782178254.	19.8477927	0.0011847	-0.0045453	3.0838281
0.0000597						

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-60.0000000 CY 0.0000622	107081.	1721905925.	19.6614114	0.0012227	-0.0047473	3.1326859
-60.0000000 CY 0.0000647	107745.	1665618369.	19.4765330	0.0012599	-0.0049501	3.1774896
-60.0000000 CY 0.0000672	108403.	1613443479.	19.3076883	0.0012972	-0.0051528	3.2195519
-60.0000000 CY 0.0000697	109057.	1564937176.	19.1531900	0.0013347	-0.0053553	3.2588384
-60.0000000 CY 0.0000722	109632.	1518711933.	19.0030136	0.0013718	-0.0055582	3.2947194
-60.0000000 CY 0.0000747	110084.	1473931025.	18.8510729	0.0014079	-0.0057621	3.3269343
-60.0000000 CY 0.0000772	110518.	1431815954.	18.7084658	0.0014441	-0.0059659	3.3563696
-60.0000000 CY 0.0000797	110935.	1392129363.	18.5654262	0.0014794	-0.0061706	3.3825204
-60.0000000 CY 0.0000822	111348.	1354807365.	18.4328906	0.0015150	-0.0063750	3.4061418
-60.0000000 CY 0.0000847	111757.	1319639570.	18.3099600	0.0015506	-0.0065794	3.4272010
-60.0000000 CY 0.0000872	112161.	1286439693.	18.1958396	0.0015864	-0.0067836	3.4456643
-60.0000000 CY 0.0000897	112505.	1254410127.	18.0821803	0.0016217	-0.0069883	3.4612112
-60.0000000 CY 0.0000922	112795.	1223540901.	17.9696810	0.0016566	-0.0071934	3.4739867
-60.0000000 CY 0.0000947	113051.	1193942774.	17.8606413	0.0016912	-0.0073988	3.4841560
-60.0000000 CY 0.0000972	113304.	1165828034.	17.7586022	0.0017259	-0.0076041	3.4918429
-60.0000000 CY 0.0000997	113542.	1138976790.	17.6531796	0.0017598	-0.0078102	3.4969021
-60.0000000 CY 0.0001022	113776.	1113406176.	17.5543898	0.0017938	-0.0080162	3.4995657
-60.0000000 CY 0.0001047	114007.	1089018736.	17.4619327	0.0018280	-0.0082220	3.4965565
-60.0000000 CY 0.0001072	114233.	1065731162.	17.3753893	0.0018624	-0.0084276	3.4964277
-60.0000000 CY 0.0001097	114456.	1043475748.	17.2941435	0.0018970	-0.0086330	3.4992722
-60.0000000 CY 0.0001122	114676.	1022179362.	17.2179792	0.0019316	-0.0088384	3.4985435
-60.0000000 CY 0.0001147	114890.	1001769534.	17.1468824	0.0019665	-0.0090435	3.4939824
-60.0000000 CY 0.0001172	115062.	981864893.	17.0734660	0.0020008	-0.0092492	3.4977338
-60.0000000 CY 0.0001197	115213.	962613293.	17.0012057	0.0020348	-0.0094552	3.4996803



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-60.0000000 CY	0.0001222	115348.	944027379.	16.9313300	0.0020688	-0.0096612	3.4971366
-60.0000000 CY	0.0001247	115470.	926072059.	16.8638092	0.0021027	-0.0098673	3.4926806
-60.0000000 CY	0.0001272	115589.	908807654.	16.7998070	0.0021367	-0.0100733	3.4965906
60.0000000 CY	0.0001297	115699.	892134394.	16.7309964	0.0021698	-0.0102802	3.4989615
60.0000000 CY	0.0001322	115807.	876079198.	16.6656516	0.0022030	-0.0104870	3.4999647
60.0000000 CY	0.0001347	115912.	860595925.	16.6041582	0.0022364	-0.0106936	3.4950022
60.0000000 CY	0.0001372	116015.	845663986.	16.5457866	0.0022699	-0.0109001	3.4914477
60.0000000 CY	0.0001522	116601.	766165050.	16.2510320	0.0024732	-0.0121368	3.4898985
60.0000000 CY	0.0001672	117084.	700315660.	16.0212331	0.0026785	-0.0133715	3.4919131
60.0000000 CY	0.0001822	117341.	644069118.	15.8033140	0.0028792	-0.0146108	3.4994495
60.0000000 CY	0.0001972	117543.	596097868.	15.6033574	0.0030768	-0.0158532	3.4870304
60.0000000 CY	0.0002122	117731.	554845724.	15.4408545	0.0032764	-0.0170936	3.4997180
60.0000000 CY	0.0002272	117903.	518969091.	15.3101048	0.0034783	-0.0183317	3.4798647
60.0000000 CY	0.0002422	118066.	487499439.	15.2018491	0.0036817	-0.0195683	3.4960870
60.0000000 CY	0.0002572	118189.	459545526.	15.1035329	0.0038844	-0.0208056	3.4944948

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 Summary of Results for Nominal (Unfactored) Moment Capacity for Section 1  
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Moment values interpolated at maximum compressive strain = 0.003  
 or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
1	62.106	115408.101	0.00300000
2	122.364	117464.674	0.00300000

Note note that the values of moment capacity in the table above are not factored by a strength reduction factor (phi-factor).

In ACI 318-08, the value of the strength reduction factor depends on whether the transverse reinforcing steel bars are spirals or tied hoops.

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318-08, Section 9.3.2.2 or the value required by the design standard being followed.

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 Computed Values of Pile Loading and Deflection  
 for Lateral Loading for Load Case Number 1  
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Pile-head conditions are Shear and Moment (Loading Type 1)

Horizontal shear force at pile head = 42537.000 lbs  
 Applied moment at pile head = 56592228.000 in-lbs  
 Axial thrust load on pile head = 122364.000 lbs

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil Res.	Soil Spr.	Distrib.
X	y	Moment	Force	S	Stress	Stiffness	p	Es*h	Lat. Load
inches	inches	in-lbs	lbs	radians	psi*	lb-in <sup>2</sup>	lb/in	lb/inch	lb/inch
0.00	3.4548	56592228.	42537.	-0.0207	0.000	2.778E+12	0.000	0.000	
0.000									
2.460	3.4039	56703105.	42537.	-0.0207	0.000	2.778E+12	0.000	0.000	
0.000									
4.920	3.3530	56813966.	42537.	-0.0206	0.000	2.778E+12	0.000	0.000	
0.000									
7.380	3.3023	56924812.	42457.	-0.0206	0.000	2.777E+12	-64.9857	48.4097	
0.000									
9.840	3.2517	57035250.	42154.	-0.0205	0.000	2.777E+12	-181.7460	137.4940	
0.000									
12.300	3.2013	57144573.	41562.	-0.0205	0.000	2.776E+12	-299.5579	230.1931	
0.000									
14.760	3.1509	57252068.	40679.	-0.0204	0.000	2.776E+12	-418.2791	326.5586	
0.000									
17.220	3.1007	57357016.	39503.	-0.0204	0.000	2.776E+12	-537.7688	426.6456	
0.000									
19.680	3.0506	57458695.	38032.	-0.0203	0.000	2.775E+12	-657.8871	530.5130	
0.000									

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0.000	22.140	3.0007	57556377.	36265.	-0.0203	0.000	2.775E+12	-778.4959	638.2235
0.000	24.600	2.9508	57649332.	34201.	-0.0202	0.000	2.775E+12	-899.4579	749.8444
0.000	27.060	2.9011	57736829.	31840.	-0.0202	0.000	2.774E+12	-1020.6375	865.4474
0.000	29.520	2.8515	57818134.	29180.	-0.0201	0.000	2.774E+12	-1141.9000	985.1095
0.000	31.980	2.8021	57892514.	26222.	-0.0201	0.000	2.774E+12	-1263.1124	1108.9130
0.000	34.440	2.7527	57959234.	22965.	-0.0200	0.000	2.773E+12	-1384.1424	1236.9460
0.000	36.900	2.7035	58017562.	19412.	-0.0200	0.000	2.773E+12	-1504.8595	1369.3030
0.000	39.360	2.6545	58066768.	15562.	-0.0199	0.000	2.773E+12	-1625.1341	1506.0856
0.000	41.820	2.6055	58106124.	11417.	-0.0199	0.000	2.773E+12	-1744.8380	1647.4027
0.000	44.280	2.5567	58134905.	6978.3770	-0.0198	0.000	2.773E+12	-1863.8441	1793.3716
0.000	46.740	2.5080	58152391.	2247.9561	-0.0198	0.000	2.773E+12	-1982.0267	1944.1183
0.000	49.200	2.4594	58157868.	-2772.0277	-0.0197	0.000	2.773E+12	-2099.2611	2099.7787
0.000	51.660	2.4109	58150625.	-8079.0902	-0.0197	0.000	2.773E+12	-2215.4240	2260.4992
0.000	54.120	2.3626	58129959.	-13670.	-0.0196	0.000	2.773E+12	-2330.4064	2426.4519
0.000	56.580	2.3144	58095176.	-19543.	-0.0196	0.000	2.773E+12	-2444.4144	2598.1562
0.000	59.040	2.2664	58045584.	-25695.	-0.0195	0.000	2.773E+12	-2557.1571	2775.6346
0.000	61.500	2.2184	57980502.	-32123.	-0.0195	0.000	2.773E+12	-2668.5394	2959.1265
0.000	63.960	2.1706	57899255.	-38823.	-0.0194	0.000	2.774E+12	-2778.4678	3148.8927
0.000	66.420	2.1229	57801179.	-45791.	-0.0194	0.000	2.774E+12	-2886.8510	3345.2177
0.000	68.880	2.0754	57685618.	-53024.	-0.0193	0.000	2.774E+12	-2993.5996	3548.4120
0.000	71.340	2.0279	57551925.	-60518.	-0.0193	0.000	2.775E+12	-3098.6260	3758.8154
0.000	73.800	1.9806	57399464.	-68267.	-0.0192	0.000	2.775E+12	-3201.8445	3976.7999
0.000	76.260	1.9334	57227613.	-76268.	-0.0192	0.000	2.776E+12	-3303.1713	4202.7737
0.000	78.720	1.8864	57035756.	-84516.	-0.0191	0.000	2.777E+12	-3402.5243	4437.1853

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0.000	81.180	1.8394	56823294.	-93006.	-0.0191	0.000	2.778E+12	-3499.8234	4680.5286
0.000	83.640	1.7926	56589637.	-101733.	-0.0190	0.000	2.779E+12	-3594.9902	4933.3485
0.000	86.100	1.7459	56334209.	-110691.	-0.0190	0.000	2.780E+12	-3687.9482	5196.2469
0.000	88.560	1.6994	56056449.	-119875.	-0.0189	0.000	2.781E+12	-3778.6226	5469.8912
0.000	91.020	1.6529	55755807.	-129277.	-0.0189	0.000	2.782E+12	-3865.7096	5753.1906
0.000	93.480	1.6066	55431756.	-138893.	-0.0188	0.000	2.783E+12	-3951.6142	6050.6030
0.000	95.940	1.5604	55083777.	-148716.	-0.0188	0.000	2.785E+12	-4034.7597	6360.8331
0.000	98.400	1.5143	54711366.	-158740.	-0.0187	0.000	2.786E+12	-4114.5782	6684.0615
0.000	100.860	1.4684	54314041.	-168955.	-0.0187	0.000	2.788E+12	-4190.8958	7021.1453
0.000	103.320	1.4225	53891340.	-179356.	-0.0186	0.000	2.790E+12	-4265.0937	7375.7370
0.000	105.780	1.3768	53442815.	-189937.	-0.0186	0.000	2.792E+12	-4337.0006	7749.1936
0.000	108.240	1.3312	52968029.	-200689.	-0.0185	0.000	2.794E+12	-4405.0873	8140.5414
0.000	110.700	1.2857	52466571.	-211605.	-0.0185	0.000	2.796E+12	-4469.1661	8551.2271
0.000	113.160	1.2403	51938054.	-222673.	-0.0184	0.000	2.798E+12	-4529.0408	8982.8843
0.000	115.620	1.1950	51382115.	-233882.	-0.0184	0.000	2.801E+12	-4584.5057	9437.3656
0.000	118.080	1.1499	50798419.	-245223.	-0.0183	0.000	2.804E+12	-4635.3440	9916.7812
0.000	120.540	1.1048	50186658.	-256682.	-0.0183	0.000	2.807E+12	-4681.3265	10424.
0.000	123.000	1.0599	49546555.	-268249.	-0.0182	0.000	2.810E+12	-4722.2090	10960.
0.000	125.460	1.0150	48877862.	-279909.	-0.0182	0.000	2.813E+12	-4757.7309	11531.
0.000	127.920	0.9703	48180363.	-291650.	-0.0182	0.000	2.817E+12	-4787.6115	12138.
0.000	130.380	0.9257	47453880.	-303457.	-0.0181	0.000	2.820E+12	-4811.5472	12787.
0.000	132.840	0.8811	46698266.	-315315.	-0.0181	0.000	2.825E+12	-4829.2071	13482.
0.000	135.300	0.8367	45913416.	-327208.	-0.0180	0.000	2.829E+12	-4840.2279	14230.
0.000	137.760	0.7924	45099263.	-339120.	-0.0180	0.000	2.834E+12	-4844.2078	15039.

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140.220	0.7482	44255782.	-351032.	-0.0180	0.000	2.839E+12	-4840.6978	15916.
0.000								
142.680	0.7040	43382996.	-362926.	-0.0179	0.000	2.844E+12	-4829.1924	16874.
0.000								
145.140	0.6600	42480975.	-377561.	-0.0179	0.000	2.850E+12	-7068.8516	26348.
0.000								
147.600	0.6160	41536164.	-395023.	-0.0178	0.000	2.856E+12	-7127.5699	28463.
0.000								
150.060	0.5722	40548210.	-412608.	-0.0178	0.000	2.863E+12	-7169.2713	30824.
0.000								
152.520	0.5284	39516859.	-430272.	-0.0178	0.000	2.871E+12	-7192.1139	33485.
0.000								
154.980	0.4847	38441975.	-447967.	-0.0177	0.000	2.894E+12	-7193.9117	36513.
0.000								
157.440	0.4411	37323546.	-465637.	-0.0177	0.000	1.722E+13	-7172.0185	40001.
0.000								
159.900	0.3975	36161713.	-483220.	-0.0177	0.000	1.722E+13	-7122.8091	44085.
0.000								
162.360	0.3539	34956775.	-500642.	-0.0177	0.000	1.723E+13	-7042.0178	48954.
0.000								
164.820	0.3103	33709219.	-517821.	-0.0177	0.000	1.725E+13	-6924.0366	54894.
0.000								
167.280	0.2667	32419760.	-534654.	-0.0177	0.000	1.726E+13	-6761.1934	62358.
0.000								
169.740	0.2232	31089384.	-550792.	-0.0177	0.000	1.727E+13	-6359.3882	70100.
0.000								
172.200	0.1796	29720522.	-565032.	-0.0177	0.000	1.728E+13	-5217.9650	71461.
0.000								
174.660	0.1361	28320082.	-576405.	-0.0177	0.000	1.729E+13	-4028.6458	72823.
0.000								
177.120	0.0926	26895261.	-584794.	-0.0177	0.000	1.731E+13	-2791.4328	74185.
0.000								
179.580	0.0491	25453546.	-590080.	-0.0177	0.000	1.732E+13	-1506.3270	75546.
0.000								
182.040	0.005544	24002715.	-592146.	-0.0177	0.000	1.733E+13	-173.3280	76908.
0.000								
184.500	-0.0380	22550833.	-590874.	-0.0177	0.000	1.734E+13	1207.5657	78269.
0.000								
186.960	-0.0814	21106258.	-587610.	-0.0177	0.000	1.736E+13	1445.8538	43672.
0.000								
189.420	-0.1249	19670432.	-583057.	-0.0177	0.000	1.737E+13	2256.2070	44428.
0.000								
191.880	-0.1684	18248259.	-576477.	-0.0177	0.000	1.738E+13	3093.1761	45185.
0.000								
194.340	-0.2119	16844803.	-567806.	-0.0177	0.000	1.739E+13	3956.7642	45941.
0.000								
196.800	-0.2553	15465292.	-556977.	-0.0177	0.000	1.741E+13	4846.9746	46698.
0.000								

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199.260	-0.2988	14115112.	-543926.	-0.0177	0.000	1.741E+13	5763.8115	47454.
0.000								
201.720	-0.3422	12799812.	-528586.	-0.0177	0.000	1.743E+13	6707.2789	48211.
0.000								
204.180	-0.3857	11525101.	-510893.	-0.0177	0.000	1.744E+13	7677.3817	48967.
0.000								
206.640	-0.4291	10296850.	-490781.	-0.0177	0.000	1.745E+13	8674.1246	49724.
0.000								
209.100	-0.4726	9121090.	-468184.	-0.0177	0.000	1.745E+13	9697.5128	50480.
0.000								
211.560	-0.5160	8004016.	-443293.	-0.0177	0.000	1.746E+13	10539.	50241.
0.000								
214.020	-0.5595	6950717.	-416916.	-0.0177	0.000	1.747E+13	10906.	47956.
0.000								
216.480	-0.6029	5963418.	-389648.	-0.0177	0.000	1.748E+13	11263.	45956.
0.000								
218.940	-0.6463	5044276.	-361515.	-0.0177	0.000	1.749E+13	11610.	44188.
0.000								
221.400	-0.6897	4195391.	-332540.	-0.0177	0.000	1.749E+13	11948.	42612.
0.000								
223.860	-0.7332	3418809.	-302742.	-0.0177	0.000	1.749E+13	12278.	41195.
0.000								
226.320	-0.7766	2716526.	-272143.	-0.0177	0.000	1.749E+13	12600.	39913.
0.000								
228.780	-0.8200	2090495.	-240758.	-0.0177	0.000	1.749E+13	12916.	38746.
0.000								
231.240	-0.8635	1542624.	-208606.	-0.0177	0.000	1.749E+13	13224.	37677.
0.000								
233.700	-0.9069	1074782.	-175702.	-0.0177	0.000	1.749E+13	13527.	36693.
0.000								
236.160	-0.9503	688799.	-142061.	-0.0177	0.000	1.749E+13	13823.	35783.
0.000								
238.620	-0.9937	386468.	-107679.	-0.0177	0.000	1.749E+13	14130.	34980.
0.000								
241.080	-1.0371	169647.	-72538.	-0.0177	0.000	1.749E+13	14440.	34249.
0.000								
243.540	-1.0806	40210.	-36641.	-0.0177	0.000	1.749E+13	14745.	33567.
0.000								
246.000	-1.1240	0.000	0.000	-0.0177	0.000	1.749E+13	15045.	16464.
0.000								

\* This analysis makes computations of pile response using nonlinear moment-curvature relationships. The above values of total stress are computed for combined axial stress and do not equal the actual stresses in concrete and steel in the range of nonlinear bending.

Output Verification: Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 1:

Pile-head deflection = 3.4548385 inches  
 Computed slope at pile head = -0.0207402 radians  
 Maximum bending moment = 58157868. inch-lbs  
 Maximum shear force = -592146. lbs  
 Depth of maximum bending moment = 49.2000000 inches below pile head  
 Depth of maximum shear force = 182.0400000 inches below pile head  
 Number of iterations = 94  
 Number of zero deflection points = 1

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 Computed Values of Pile Loading and Deflection  
 for Lateral Loading for Load Case Number 2  
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Pile-head conditions are Shear and Moment (Loading Type 1)

Horizontal shear force at pile head = 56881.000 lbs  
 Applied moment at pile head = 69640560.000 in-lbs  
 Axial thrust load on pile head = 62106.000 lbs

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil Res.	Soil Spr.	Distrib.
X	y	Moment	Force	S	Stress	Stiffness	p	Es*h	Lat. Load
inches	inches	in-lbs	lbs	radians	psi*	lb-in <sup>2</sup>	lb/in	lb/inch	lb/inch
0.000	0.00	69640560.	56881.	-0.0383	0.000	2.670E+12	0.000	0.000	
0.000	2.460	69786331.	56881.	-0.0382	0.000	2.670E+12	0.000	0.000	
0.000	4.920	69932092.	56881.	-0.0382	0.000	2.670E+12	0.000	0.000	
0.000	7.380	70077843.	56798.	-0.0381	0.000	2.670E+12	-67.4375	26.2214	
0.000	9.840	70223176.	56482.	-0.0380	0.000	2.670E+12	-189.8490	74.9267	
0.000	12.300	70367350.	55861.	-0.0380	0.000	2.669E+12	-315.0037	126.2131	
0.000	14.760	70509608.	54928.	-0.0379	0.000	2.669E+12	-442.8183	180.1625	
0.000	17.220	70649177.	53679.	-0.0378	0.000	2.669E+12	-573.2095	236.8611	

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0.000									
19.680	5.8603	70785266.	52105.	-0.0378	0.000	2.669E+12	-706.0936	296.4004	
0.000									
22.140	5.7675	70917073.	50202.	-0.0377	0.000	2.668E+12	-841.3874	358.8772	
0.000									
24.600	5.6748	71043778.	47963.	-0.0376	0.000	2.668E+12	-979.0074	424.3941	
0.000									
27.060	5.5823	71164548.	45382.	-0.0376	0.000	2.668E+12	-1118.8702	493.0600	
0.000									
29.520	5.4900	71278538.	42455.	-0.0375	0.000	2.668E+12	-1260.8923	564.9907	
0.000									
31.980	5.3978	71384887.	39176.	-0.0374	0.000	2.667E+12	-1404.9903	640.3092	
0.000									
34.440	5.3058	71482723.	35540.	-0.0374	0.000	2.667E+12	-1551.0808	719.1463	
0.000									
36.900	5.2140	71571163.	31543.	-0.0373	0.000	2.667E+12	-1699.0805	801.6417	
0.000									
39.360	5.1223	71649311.	27179.	-0.0372	0.000	2.667E+12	-1848.9057	887.9443	
0.000									
41.820	5.0308	71716259.	22444.	-0.0372	0.000	2.667E+12	-2000.4732	978.2128	
0.000									
44.280	4.9394	71771092.	17334.	-0.0371	0.000	2.667E+12	-2153.6995	1072.6174	
0.000									
46.740	4.8482	71812881.	11846.	-0.0370	0.000	2.667E+12	-2308.5011	1171.3400	
0.000									
49.200	4.7572	71840690.	5974.5006	-0.0370	0.000	2.667E+12	-2464.7948	1274.5755	
0.000									
51.660	4.6663	71853573.	-282.8683	-0.0369	0.000	2.667E+12	-2622.4969	1382.5333	
0.000									
54.120	4.5756	71850575.	-6929.7454	-0.0368	0.000	2.667E+12	-2781.4680	1495.4082	
0.000									
56.580	4.4851	71830735.	-13968.	-0.0368	0.000	2.667E+12	-2940.5081	1612.8279	
0.000									
59.040	4.3947	71793090.	-21398.	-0.0367	0.000	2.667E+12	-3100.5530	1735.5842	
0.000									
61.500	4.3045	71736671.	-29224.	-0.0366	0.000	2.667E+12	-3261.5143	1863.9488	
0.000									
63.960	4.2144	71660505.	-37446.	-0.0366	0.000	2.667E+12	-3423.3041	1998.2157	
0.000									
66.420	4.1245	71563613.	-46067.	-0.0365	0.000	2.667E+12	-3585.8340	2138.7031	
0.000									
68.880	4.0348	71445010.	-55089.	-0.0364	0.000	2.667E+12	-3749.0159	2285.7560	
0.000									
71.340	3.9452	71303710.	-64513.	-0.0364	0.000	2.668E+12	-3912.7615	2439.7494	
0.000									
73.800	3.8558	71138721.	-74340.	-0.0363	0.000	2.668E+12	-4076.9828	2601.0917	
0.000									
76.260	3.7666	70949050.	-84572.	-0.0362	0.000	2.668E+12	-4241.5914	2770.2279	



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0.000								
78.720	3.6775	70733701.	-95209.	-0.0362	0.000	2.669E+12	-4406.4993	2947.6447
0.000								
81.180	3.5886	70491675.	-106244.	-0.0361	0.000	2.669E+12	-4564.6663	3129.1091
0.000								
83.640	3.4998	70222016.	-117607.	-0.0360	0.000	2.670E+12	-4673.5668	3285.0145
0.000								
86.100	3.4112	69924064.	-129233.	-0.0360	0.000	2.670E+12	-4778.5051	3446.0155
0.000								
88.560	3.3228	69597185.	-141112.	-0.0359	0.000	2.671E+12	-4879.3818	3612.4236
0.000								
91.020	3.2345	69240768.	-153232.	-0.0359	0.000	2.671E+12	-4974.4912	3783.3618
0.000								
93.480	3.1464	68854237.	-165584.	-0.0358	0.000	2.672E+12	-5066.9836	3961.6498
0.000								
95.940	3.0584	68437034.	-178157.	-0.0357	0.000	2.673E+12	-5155.1369	4146.5116
0.000								
98.400	2.9706	67988624.	-190941.	-0.0357	0.000	2.674E+12	-5238.8647	4338.4321
0.000								
100.860	2.8829	67508501.	-203926.	-0.0356	0.000	2.675E+12	-5318.0842	4537.9563
0.000								
103.320	2.7954	66996186.	-217103.	-0.0355	0.000	2.676E+12	-5394.2699	4747.0662
0.000								
105.780	2.7080	66451217.	-230462.	-0.0355	0.000	2.677E+12	-5467.3529	4966.5955
0.000								
108.240	2.6208	65873153.	-243996.	-0.0354	0.000	2.678E+12	-5535.9156	5196.2198
0.000								
110.700	2.5338	65261578.	-257693.	-0.0354	0.000	2.679E+12	-5599.8923	5436.8799
0.000								
113.160	2.4468	64616106.	-271542.	-0.0353	0.000	2.680E+12	-5659.2207	5689.6506
0.000								
115.620	2.3601	63936378.	-285531.	-0.0352	0.000	2.682E+12	-5713.8415	5955.7645
0.000								
118.080	2.2735	63222062.	-299648.	-0.0352	0.000	2.683E+12	-5763.6984	6236.6418
0.000								
120.540	2.1870	62472858.	-313882.	-0.0351	0.000	2.685E+12	-5808.7383	6533.9263
0.000								
123.000	2.1006	61688494.	-328221.	-0.0351	0.000	2.686E+12	-5848.9110	6849.5310
0.000								
125.460	2.0144	60868725.	-342653.	-0.0350	0.000	2.688E+12	-5884.1693	7185.6944
0.000								
127.920	1.9284	60013339.	-357165.	-0.0350	0.000	2.690E+12	-5914.4692	7545.0520
0.000								
130.380	1.8424	59122153.	-371746.	-0.0349	0.000	2.692E+12	-5939.7693	7930.7277
0.000								
132.840	1.7566	58195014.	-386383.	-0.0349	0.000	2.694E+12	-5960.0314	8346.4512
0.000								
135.300	1.6710	57231798.	-401063.	-0.0348	0.000	2.696E+12	-5975.2201	8796.7112

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0.000									
137.760	1.5854	56232415.	-415775.	-0.0347	0.000	2.698E+12	-5985.2500	9286.8751	
0.000									
140.220	1.5000	55196804.	-430501.	-0.0347	0.000	2.701E+12	-5987.6267	9819.5683	
0.000									
142.680	1.4147	54124950.	-445222.	-0.0346	0.000	2.703E+12	-5980.5599	10399.	
0.000									
145.140	1.3296	53016897.	-463287.	-0.0346	0.000	2.706E+12	-8706.0997	16108.	
0.000									
147.600	1.2445	51856151.	-484806.	-0.0345	0.000	2.709E+12	-8789.2381	17373.	
0.000									
150.060	1.1596	50642209.	-506505.	-0.0345	0.000	2.712E+12	-8852.6274	18780.	
0.000									
152.520	1.0748	49374687.	-528334.	-0.0345	0.000	2.716E+12	-8894.1762	20358.	
0.000									
154.980	0.9901	48053334.	-550235.	-0.0344	0.000	2.719E+12	-8911.4253	22142.	
0.000									
157.440	0.9055	46678046.	-572145.	-0.0344	0.000	2.723E+12	-8901.4312	24184.	
0.000									
159.900	0.8210	45248884.	-593992.	-0.0343	0.000	2.728E+12	-8860.5976	26551.	
0.000									
162.360	0.7366	43766095.	-615695.	-0.0343	0.000	2.733E+12	-8784.4249	29339.	
0.000									
164.820	0.6523	42230140.	-637161.	-0.0342	0.000	2.738E+12	-8667.1205	32688.	
0.000									
167.280	0.5681	40641729.	-658278.	-0.0342	0.000	2.744E+12	-8500.9658	36814.	
0.000									
169.740	0.4839	39001868.	-678912.	-0.0342	0.000	2.750E+12	-8275.2214	42066.	
0.000									
172.200	0.3999	37311923.	-698899.	-0.0342	0.000	1.722E+13	-7974.0850	49053.	
0.000									
174.660	0.3159	35573722.	-718021.	-0.0342	0.000	1.723E+13	-7571.9591	58968.	
0.000									
177.120	0.2319	33789698.	-735935.	-0.0341	0.000	1.725E+13	-6992.5100	74185.	
0.000									
179.580	0.1479	31963357.	-750122.	-0.0341	0.000	1.726E+13	-4541.3884	75546.	
0.000									
182.040	0.0639	30109532.	-758165.	-0.0341	0.000	1.728E+13	-1997.6350	76908.	
0.000									
184.500	-0.0201	28243618.	-759836.	-0.0341	0.000	1.730E+13	638.7528	78269.	
0.000									
186.960	-0.1040	26381569.	-756779.	-0.0341	0.000	1.731E+13	1846.9867	43672.	
0.000									
189.420	-0.1880	24530696.	-750331.	-0.0341	0.000	1.733E+13	3395.2129	44428.	
0.000									
191.880	-0.2719	22700370.	-740011.	-0.0341	0.000	1.734E+13	4994.9135	45185.	
0.000									
194.340	-0.3559	20900270.	-725692.	-0.0341	0.000	1.736E+13	6646.0926	45941.	

A80618-0011.001.6050.1p6o

0.000	196.800	-0.4398	19140389.	-707249.	-0.0341	0.000	1.737E+13	8348.7549	46698.
0.000	199.260	-0.5237	17431031.	-684568.	-0.0341	0.000	1.739E+13	10091.	47398.
0.000	201.720	-0.6076	15782740.	-659018.	-0.0341	0.000	1.741E+13	10681.	43241.
0.000	204.180	-0.6916	14199085.	-632060.	-0.0341	0.000	1.742E+13	11237.	39970.
0.000	206.640	-0.7755	12683429.	-603768.	-0.0341	0.000	1.743E+13	11765.	37321.
0.000	209.100	-0.8594	11238968.	-574205.	-0.0341	0.000	1.744E+13	12270.	35124.
0.000	211.560	-0.9433	9868761.	-543422.	-0.0341	0.000	1.745E+13	12757.	33270.
0.000	214.020	-1.0272	8575755.	-511460.	-0.0341	0.000	1.746E+13	13228.	31680.
0.000	216.480	-1.1111	7362799.	-478357.	-0.0341	0.000	1.747E+13	13685.	30300.
0.000	218.940	-1.1949	6232660.	-444144.	-0.0341	0.000	1.748E+13	14130.	29089.
0.000	221.400	-1.2788	5188028.	-408852.	-0.0341	0.000	1.750E+13	14563.	28015.
0.000	223.860	-1.3627	4231529.	-372504.	-0.0341	0.000	1.750E+13	14987.	27055.
0.000	226.320	-1.4466	3365726.	-335126.	-0.0341	0.000	1.750E+13	15402.	26192.
0.000	228.780	-1.5305	2593130.	-296737.	-0.0341	0.000	1.750E+13	15808.	25409.
0.000	231.240	-1.6144	1916198.	-257359.	-0.0341	0.000	1.750E+13	16207.	24696.
0.000	233.700	-1.6982	1337343.	-217002.	-0.0341	0.000	1.750E+13	16604.	24052.
0.000	236.160	-1.7821	858969.	-175665.	-0.0341	0.000	1.750E+13	17003.	23471.
0.000	238.620	-1.8660	483493.	-133322.	-0.0341	0.000	1.750E+13	17421.	22967.
0.000	241.080	-1.9499	213443.	-89939.	-0.0341	0.000	1.750E+13	17849.	22519.
0.000	243.540	-2.0338	51411.	-45500.	-0.0341	0.000	1.750E+13	18280.	22111.
0.000	246.000	-2.1177	0.000	0.000	-0.0341	0.000	1.750E+13	18712.	10869.

\* This analysis makes computations of pile response using nonlinear moment-curvature relationships. The above values of total stress are computed for combined axial stress and do not equal the actual stresses in concrete and steel in the range of nonlinear bending.

Output Verification: Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 2:

Pile-head deflection = 6.6085449 inches  
 Computed slope at pile head = -0.0382795 radians  
 Maximum bending moment = 71853573. inch-lbs  
 Maximum shear force = -759836. lbs  
 Depth of maximum bending moment = 51.6600000 inches below pile head  
 Depth of maximum shear force = 184.5000000 inches below pile head  
 Number of iterations = 63  
 Number of zero deflection points = 1

-----  
 Summary of Pile Response(s)  
 -----

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, lbs, and Load 2 = Moment, in-lbs  
 Load Type 2: Load 1 = Shear, lbs, and Load 2 = Slope, radians  
 Load Type 3: Load 1 = Shear, lbs, and Load 2 = Rotational Stiffness, in-lbs/radian  
 Load Type 4: Load 1 = Top Deflection, inches, and Load 2 = Moment, in-lbs  
 Load Type 5: Load 1 = Top Deflection, inches, and Load 2 = Slope, radians

Load Case No.	Load Type No.	Pile-head Condition 1 V(lbs) or y(inches)	Pile-head Condition 2 in-lb, rad., or in-lb/rad.	Axial Loading lbs	Pile-head Deflection inches	Maximum Moment in-lbs	Maximum Shear lbs
1	1	V = 42537.	M = 56592228.	122364.	3.45483846	58157868.	-592146.
2	1	V = 56881.	M = 69640560.	62106.	6.60854492	71853573.	-759836.

The analysis ended normally.

## Foundation Analysis - Pole Caisson (OTRM 059 / OTRM 051)

### Analysis Data Input

Overturning Moment (Max):	<b><math>OM := 5275.8 \cdot ft \cdot kip</math></b>	User Input - from PLS-Pole
	$OM_{Lpile} := OM \cdot 1.1 = 69640560 \text{ in} \cdot lbf$	Includes NEU 1.1 Factor - to be used in LPile
Shear (Max):	<b><math>V := 51.71 \cdot kip</math></b>	User Input - from PLS-Pole
	$V_{Lpile} := V \cdot 1.1 = 56881 \text{ lbf}$	Includes NEU 1.1 Factor - to be used in LPile
Axial Load (Max):	<b><math>A := 56.46 \cdot kip</math></b>	User Input - from PLS-Pole
	$A_{Lpile} := A \cdot 1.1 = 62106 \text{ lbf}$	Includes NEU 1.1 Factor - to be used in LPile
Bending Moment Capacity:	<b><math>Mn := 117464.674 \text{ in} \cdot kip</math></b>	User Input - from LPILE
Bending Moment:	<b><math>Mu := 71853573 \text{ in} \cdot lbf</math></b>	User Input - from LPILE
Caisson Diameter:	<b><math>C_{dia} := 8 \text{ ft}</math></b>	User Input
Caisson Overall Length:	<b><math>C_L := 20.5 \text{ ft}</math></b>	User Input
Caisson Reveal:	<b><math>C_R := 0.5 \text{ ft}</math></b>	User Input
Rebar Quantity:	<b><math>n := 38</math></b>	User Input (Assumed)
Rebar Area:	<b><math>A_{reb} := 48.26 \text{ in}^2</math></b>	User Input (Assumed)
Rebar Yield Strength:	<b><math>fy := 60 \text{ ksi}</math></b>	User Input (Assumed)
Concrete Weight:	<b><math>WT_{conc} := 150 \text{ pcf}</math></b>	User Input
Concrete Compressive Strength:	<b><math>fc := 3.5 \text{ ksi}</math></b>	User Input

Caisson Moment Capacity:

Factor of Safety Required:

$$FS_{moment\_req} := 1.0$$

NOTE: 1.1 - as per OTMR 051 Section 6 - Foundation Design Criteria - included with loads applied in LPile

Factor of Safety Provided:

$$FS_{moment} := \frac{Mn}{Mu} = 1.6$$

$$FS_{moment\_check} := \text{if } (FS_{moment} \geq FS_{moment\_req}, \text{"OK"}, \text{"NG"}) = \text{"OK"}$$

Moment Usage:

$$Usage_{moment} := \frac{FS_{moment\_req}}{FS_{moment}} = 61.2\%$$

Caisson Axial Capacity:

Factor of Safety Required:

$$FS_{axial\_req} := 1.0$$

NOTE: 1.1 - as per OTMR 051 Section 6 - Foundation Design Criteria - included with loads applied in LPile

Caisson Area:

$$C_{area} := \pi \cdot \frac{(C_{dia})^2}{4} = 50.3 \text{ ft}^2$$

Caisson Volume:

$$C_{volume} := C_{area} \cdot C_L = 1030.4 \text{ ft}^3$$

Caisson Weight:

$$C_{weight} := C_{volume} \cdot WT_{conc} = 154.6 \text{ kip}$$

Total Axial Load:

$$A_{total} := A + C_{weight} = 211 \text{ kip}$$

Axial Capacity Provided:

$$A_{cap} := n \cdot A_{reb} \cdot fy + (C_{area} - n \cdot A_{reb}) \cdot 0.85 \cdot fc = 126110.7 \text{ kip}$$

Factor of Safety Provided:

$$FS_{axial} := \frac{A_{cap}}{A_{total}} = 597.6$$

$$FS_{axial\_check} := \text{if } (FS_{axial} \geq FS_{axial\_req}, \text{"OK"}, \text{"NG"}) = \text{"OK"}$$

Axial Usage:

$$Usage_{axial} := \frac{FS_{axial\_req}}{FS_{axial}} = 0.2\%$$

Soil Axial Capacity:

Factor of Safety Required:

$$FS_{axial\_soil\_req} := 1.0$$

NOTE: 1.1 - as per OTMR 051 Section 6 - Foundation Design Criteria - included with loads applied in LPile

Soil Allowable Bearing Pressure:

$$SAB := 3 \text{ ksf}$$

OTRM 059 assumed soil value

Soil Ultimate Bearing Pressure:

$$SUB := SAB \cdot 3 = 9 \text{ ksf}$$

Assuming Allowable vs. Ultimate Safety Factor of 3

Soil Ultimate Bearing Capacity:

$$SUB_{cap} := SUB \cdot C_{area} = 452 \text{ kip}$$

Ultimate Bearing Pressure \* Caisson Area

Factor of Safety Provided:

$$FS_{axial\_soil} := \frac{SUB_{cap}}{A_{total}} = 2.1$$

$$FS_{axial\_soil\_check} := \text{if } (FS_{axial\_soil} \geq FS_{axial\_soil\_req}, \text{"OK"}, \text{"NG"}) = \text{"OK"}$$

Axial Usage:

$$Usage_{axial\_soil} := \frac{FS_{axial\_soil\_req}}{FS_{axial\_soil}} = 46.6\%$$

# **APPENDIX E**

## **SUPPLEMENTAL INFORMATION**



HexPort Multi-Band Antenna

HPA65R-BU6A

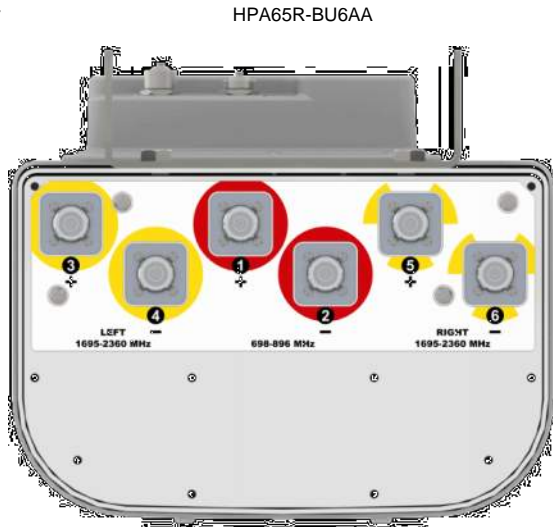
SPECIFICATIONS

Mechanical

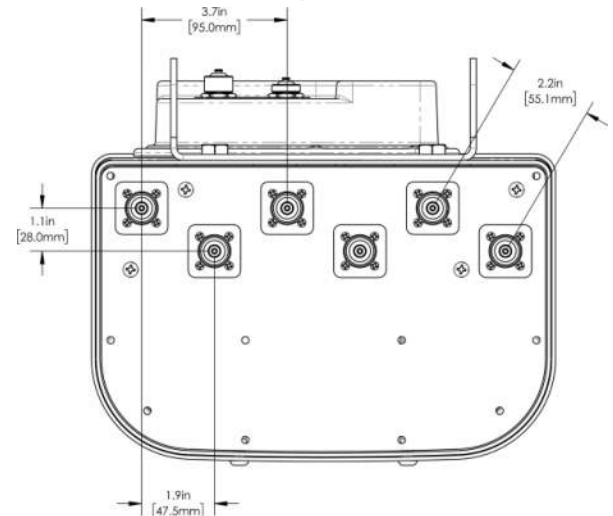
Dimensions (LxWxD)	71.1x11.7x7.6 in (1807x297x193 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	201 lbs (894 N) @ 100 mph (161 kph)
Side Wind Load	142 lbs (633 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	7.9 ft <sup>2</sup> (0.7 m <sup>2</sup> )
Weight*	41.9 lbs (19.0 kg)
RET Weight	5.0 lbs (2.3 kg) for three RET's
RET Weight	3.3 lbs (1.5 kg) for two RET's
Connector	6 x 4.3-10 female
Mounting Pole	2 to 5 in (5 to 12 cm)

\* Weight excludes mounting and RET

Bottom View



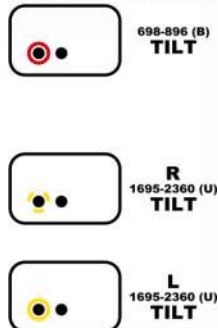
Connector Spacing for HPA65R-BU6AA



RET Connection Diagram

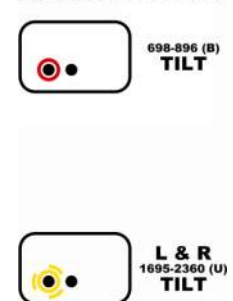
HPA65R-BU6AA (Type 1 RET)

**CONNECT RET ACTUATORS AS SHOWN BELOW**



HPA65R-BU6AB (Type 1 RET)

**CONNECT RET ACTUATORS AS SHOWN BELOW**







# Amplifiers

Triple Band Twin TMA (AWS/PCS/WCS)  
with AWS-3 and 700/850 Bypass

TMABPD7823VG12A

## SPECIFICATIONS

### Environmental

Operating Temperature	-40 °C to +65 °C
Ingress Protection	IP67
MTBF	>500,000 hours
Lightning Protection	8/20us, ±10KA max, 10 strikes each per IEC61000-4-5

### Mechanical

Connectors	6 × 7-16 DIN female 1 × AISG
Dimensions enclosure (H×W×D)	10.63 × 11.04 × 3.75 in. (270.0 × 280.3 × 95.2 mm)
Dimensions with brackets (H×W×D)	14.22 × 11.56 × 4.24 in. (361.8 × 293.5 × 107.6 mm)
Weight enclosure	25.0 lbs (11.3 kg)
Weight with brackets	26.0 lbs (11.8 kg)
Mounting	Pole/Wall mounting bracket

# Dual Broadband Antenna

90° 1.4 m MET Antenna

806-960/1710-2170 MHz

Part Number: 7770.00	Horizontal Beamwidth: 90° Gain: 13.5/16 dBi	Electrical Downtilt: Adjustable Connector Type: 7/16 female
-------------------------	------------------------------------------------	----------------------------------------------------------------

The Powerwave dual band dual polarized broadband antenna has individual adjustable electrical downtilt per band (upgradeable to Remote Electrical Tilt (RET)). Four connector ports allow separate tilts on each frequency band and ensure the use of diversity concepts. The phase shifter technology, based on a patented sliding dielectric, minimizes intermodulation distortion and maximizes efficiency. The slant +/- 45° dual polarization system provides the independent fading signals needed for achieving top-quality coverage via diversity concepts. The Powerwave Broadband antenna design is based on a patented stacked aperture-coupled patch technology, which provides high isolation performance and a wide VSWR bandwidth. The antennas have superior radiation patterns due to a unique reflector design which provides a very small variation of the -3dB horizontal beam width over the frequency band as well as a high front-to-back ratio.



### Key Benefits

- Excellent broad- and multi-band capabilities
- Polarization purity makes good diversity gain
- Excellent pattern performance and high gain over frequency
- High passive intermodulation performance
- Light, slim and robust design

# Preliminary

ANTENNA  
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## Dual Broadband Antenna

## Electrical Specifications (Preliminary)

Frequency band (MHz)	806-960	1710-2170
Gain, $\pm 0.5$ dB (dBi)	13.5	16.0
Polarization	Dual linear $\pm 45^\circ$	
Nominal Impedance (Ohm)	50	
VSWR	1.5:1	
VSWR		1.5:1
Isolation between inputs (dB)	30	
Isolation between inputs (dB)		30
Inter band isolation (dB)	40	
Horizontal -3 dB beamwidth	$85 \pm 5^\circ$	$85 \pm 5^\circ$
Tracking, Horizontal plane, $\pm 60^\circ$ (dB)	$< 2.0$	
Tracking, Horizontal plane, $\pm 60^\circ$ (dB)		$< 2.0$
Electrical downtilt range (adjustable)	$0^\circ$ to $10^\circ$	$0^\circ$ to $8^\circ$
Vertical -3 dB beamwidth	$14.3 \pm 2.0^\circ$	$6.6 \pm 1^\circ$
Sidelobe suppression, Vertical 1 st upper (dB)	$> 17, 16, 15$ $x=0, 5, 10^\circ$ MET	$> 17, 16, 15$ $x=0, 4, 8^\circ$ MET
Vertical beam squint	$< 0.8^\circ$	$< 0.5^\circ$
First null-fill (dB)	$< -25$	$< -25$
Front-to-back ratio (dB)	$> 25$	$> 27$
Front-to-back ratio, total power (dB)	$> 20$	$> 23$
IM3, 2Tx@43dBm (dBc)	$< -153$	
IM3, 2Tx@43dBm (dBc)		$< -153$
IM7, 2Tx@43dBm (dBc)		$< -160$
Power Handling, Average per input (W)	400	250
Power Handling, Average total (W)	800	500

All specifications are subject to change without notice.  
Contact your Powerwave representative for complete performance data.

## Mechanical Specifications

Connector Type	4 x 7/16 DIN female
Connector Position	Bottom
Dimensions, HxWxD	1408mm x 280mm x 125mm (55"x11"x5")
Weight Including Brackets	15.8 kg (35 lbs)
Wind Load, Frontal, 42m/s Cd=1	435N (98 lbf)
Survival Wind Speed (m/s)	70 (156mph)
Lightning Protection	DC grounded
Radome Material	GRP
Radome Color	Light Gray
Mounting	Pre-mounted Standard Brackets
Packing Size	1550mm x 355mm x 255mm (61"x14"x10")

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# Tower Mounted Amplifier

Dual Band 1900 MHz with 850 MHz Bypass

1900/850 MHz

Part Number:  
LGP 214nn

Up-link: 1850-1910 MHz  
Down-link: 1930-1990 MHz  
Bypass: 824-894 MHz

Gain: 12 dB  
Noise Figure: < 1.7 dB

The Powerwave® TMA-DD 1900/850 is a dual band Tower Mounted Amplifier (TMA) to be installed near the antenna. Deployed in an AMPS, GSM, GPRS, EDGE and CDMA network it will increase capacity and coverage as well as extend the battery life time for the handsets. The TMA System will provide enhanced coverage and improved up-link signal quality. Appropriate for new rollouts by optimizing coverage with a reduced number of BTSs or as an upgrade to existing BTSs for enhancing the existing coverage.

Extended band TMA facilitates simplified logistics, especially when the frequency bands are scattered. The unit comprises of high Q band-pass filters, dual balanced low noise amplifiers with circuits for active bias, supervision, alarms and lightning protection circuit. The Powerwave patented design with all active components integrated within the filter body provides an extremely reliable, compact and lightweight TMA solution. The vented enclosure design is employed to prevent the effect of condensation, thereby guaranteeing long, reliable, maintenance-free service in all environmental conditions. These TMAs offer an easy to install, maintenance free, cost effective solution for coverage enhancement and increased quality in mobile communication networks.



## Key Benefits:

- 850 MHz Bypass
- Improved Network Quality
- Increased Coverage
- State of the Art Performance
- Excellent Power Handling
- Low Tx Loss
- Exceptional Reliability

ANTENNA  
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SYSTEMS

# Tower Mounted Amplifier



1900/850 MHz

## Technical Specifications

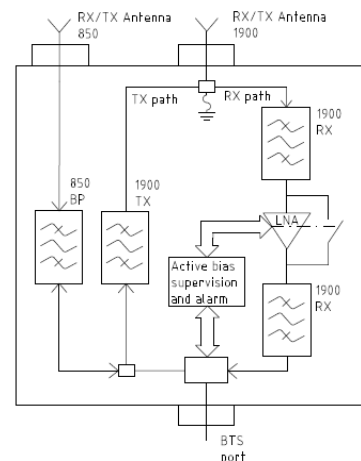
Product Number	LGP214nn	
850 MHz	Bypass (MHz)	824-894
	Return loss* (dB)	> 20
	Insertion loss* (dB)	< 0.3
1900 MHz		
Up-link	Frequency range, full band (60 MHz)	1850-1910
	Nominal gain (dB)	12
	Return loss* (dB)	> 20
	Noise figure* (dB)	< 1.7
	Output 3rd order Intercept Point* (dBm)	> +23
Down-link	Frequency range, full band (60 MHz)	1930-1990
	Insertion loss* (dB)	< 0.6
	Return loss* (dB)	> 20
Intermodulation	2 Tx@x43 dBm (dBc)	<-158
Alarm Functionality	Two levels, individually supervised LNAs	
Power Consumption	@12 VDC	1.2 W

\* Typical

All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

## Mechanical Specifications

Size,W x H x D (without mounting plate)	235 x 366 x 66 mm (9.2 x 14.4 x 2.6 in)
Weight	6.4 kg (14.1 lbs)
Color	Off white (NCS 1502-R)
Housing	Aluminum
RF-connectors	DIN 7/16 female.
Mounting kit	Mounting kit for pole and wall is included
Temperature range	-40 °C to +65 °C (-40 °F to +149 °F)
MTBF	>1 million hours
Safety	UL 60 950
Ingress protection, IP 65	EN 60 529
Environmental	ETS 300 019
EMC	FCC Part 15



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# P65-16-XLH-RR Dual Broadband Antennas

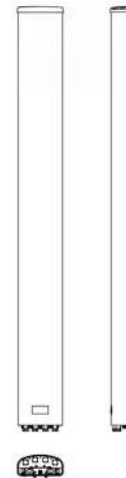
POLARIZATION: Dual linear  $\pm 45^\circ$   
 FREQUENCY (MHz): 698-894, 1710-2170  
 HORIZONTAL BEAM WIDTH ( $^\circ$ ): 65, 65  
 GAIN (dBi/dBd): 15.5/13.4 17.5/15.4  
 TILT: 2-10, 0-10  
 LENGTH: 72"

## ELECTRICAL SPECIFICATIONS\*

Frequency range (MHz)	698-894		1710-2170		
	698-806	806-894	1710-1880	1850-1990	1900-2170
Frequency band (MHz)	698-806	806-894	1710-1880	1850-1990	1900-2170
Gain (dBi/dBd)	14.8/12.7	15.5/13.4	16.9/14.8	17.2/15.1	17.5/15.4
Polarization	Dual Linear +/- 45		Dual Linear +/- 45		
Nominal Impedance ( $\Omega$ )	50		50		
VSWR	< 1.5:1		< 1.5:1		
Horizontal beam width, -3 dB ( $^\circ$ )	73	65	63	57	52
Vertical beam width, -3 dB ( $^\circ$ )	14.7	12.5	6.8	6.4	5.7
Electrical down tilt ( $^\circ$ )	2 to 10		0 to 10		
Side lobe suppression, vertical 1st upper (dB)	> 16	> 16	> 16		
	> 16	> 16			
Isolation between inputs (dB)	> 30	> 30	> 30	> 30	
Inter band Isolation (dB)	> 40		> 40		
Tracking, horizontal plane $\pm 60^\circ$ (dB)	< 2		< 2	< 2	< 2
First null fill (dB)			20	20	20
Vertical beam squint ( $^\circ$ )	< 0.8	< 0.8	< 0.5	< 0.5	< 0.5
Front to back ratio (dB)	> 24	> 24	> 30	> 30	> 28
Front to back ratio, total power (dB)					
Cross polar discrimination (XPD) $0^\circ$ (dB)	> 15	> 15	> 15	> 15	> 15
Cross polar discrimination (XPD) $\pm 60^\circ$ (dB)	> 10	> 10	> 10	> 10	> 10
Far field coupling					
IM3, 2xTx@43dBm (dBc)	-153		-153		
IM7, 2xTx@43dBm (dBc)					
Power handling, average per input (W)	500		250		
Power handling, average total (W)	1000		500		

## MECHANICAL SPECIFICATIONS\*

Connector	4 X 7/16 DIN Female, IP67
Connector position	Bottom
Dimensions, HxWxD, mm (ft)	72" x 12" x 6" (1829 x 305 x 152)
Mounting	Pre-mounted Tilt Brackets
Weight, with brackets, kg (lbs)	64 (29)
Weight, without brackets, kg (lbs)	53 (24)
Wind load, frontal/lateral/rear side 42 m/s Cd=1.6 (N)	1380
Maximum operational wind speed, m/s (mph)	100 (45)
Survival wind speed, m/s (mph)	150 (67)
Lightning protection	DC Ground
Operating Temperature	-40C to +60C
Radome material	PVC, IP55
Packet size, HxWxD, mm (ft)	87" x 16" x 10" (2225 x 400 x 225)
Radome colour	Light Grey
Shipping weight, kg (lbs)	75 (34)
RET	iRET AISGv1.1, MET and AISGv2.0
Brackets	7256.00, 7454.00, 2210.00



\*All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

## ANTENNA PATTERNS\*

For detailed patterns visit <http://www.powerwave.com/rpa/>.



# Amplifiers

## SPECIFICATIONS

### PCS Twin TMA with 700/850 Bypass

DTMABP7819VG12A

#### Electrical

RF Parameters	Ports	Frequency(MHz)	Specification	
Return Loss	PCS ANT	1850 - 1910	18 dB min. (15 dB bypass mode)	
		1930 - 1990	18 dB min.	
Gain	BTS	1850 - 1910	18 dB min. (15 dB bypass mode)	
		1930 - 1990	18 dB min.	
		698 - 894	18 dB min.	
		700/850 ANT	698 - 894	18 dB min.
Gain	PCS ANT - BTS	1850 - 1910	6 to 12 dB adjustable in 0.25 dB steps via AISG ( $\pm$ 1.0 dB)	
Insertion Loss	PCS ANT - BTS (RX Bypass mode)	1850 - 1910	1.6 dB typ. @ 25°C, 1.8 dB @ 65°C; 2.3 dB typ. @ 25°C, 2.5 dB @ 65°C @ 1910 MHz (band edge) ( $\pm$ 1.0 dB)	
		PCS ANT - BTS (TX)	1930 - 1990	0.4 dB typ. ( $\pm$ 0.2dB)
		700/850 ANT - BTS	698 - 894	0.1 dB typ., 0.2 dB max.
Rejection	700/850 ANT - BTS	1850 - 1910	70 dB	
	PCS ANT - BTS	698 - 894	80 dB	
Noise Figure	PCS ANT - BTS	1850 - 1910	1.4 dB @ 25°C, 1.6 dB @ 65°C; 1.7 dB @ 25°C, 1.9 dB @ 65°C @ 1910 MHz (band edge)	
Input Third Order Intercept Point	PCS ANT - BTS	1850 - 1910	+12 dBm min. at max. gain	
General Characteristics				
Impedance	50 ohms			
Continuous Average Power	200 W max.			
Peak Envelope Power	2 kW max.			
Intermodulation Performance(all ports)	<-110 dBm (-153 dBc) typical (2 x +43 dBm tones) all bands			
Operating Voltage	+10V to +30V DC provided via coax or AISG			
Power Consumption	< 1.8 W			

#### Environmental

Operating Temperature	-40 °C to +65 °C
Enclosure	IP65 (Unit Body), IP68 (Connector)
MTBF	>500,000 hours
Lightning Protection	8/20us, $\pm$ 2KA max, 10 strikes each per IEC61000-4-5

#### Mechanical

Connectors	6 x 7-16 DIN female(long neck), 1 x AISG
Dimensions (body only)(HxWxD)	10.63 x 11.02 x 3.78 in. (270 x 280 x 96 mm)
Dimensions (w/bracket)(HxWxD)	14.25 x 11.46 x 4.17 in. (362 x 291 x 106 mm)
Weight	19.18 lbs max (8.7 kg)-without bracket
Mounting	Pole/Wall mounting bracket



- Provides 12 antenna Ports in a slim-line form factor
- Optimized Azimuth patterns for Min Inter-Sector Interference
- Industry leading Minimal Wind-Load design

- 700, 850, PCS, AWS & WCS bands in one antenna
- AISG & 3GPP compliant internal remote electrical tilt (RET)
- AWS & PCS Cross band PIM >159dBc

The Quintel MultiServ™ Multiband 12 Port Antenna with patented QTilt™ technology uniquely delivers four independent services in a single slim-line antenna. This enables existing antenna network sites to be upgraded constraint free to add new services such as LTE for 700, 850, PCS, AWS and WCS bands with the replacement of one antenna. The QS66512-2 also provides 4x1695-1780+2110-2400MHz & 4x1850-1990MHz ports as two side-by-side (CLA-2X) arrays, each set of 4 ports having independent tilt for connection to 2T4R/4T4R services.

Electrical Characteristics	2x Ports 1&2	2x Ports 3&4	4x Ports 5-8			4 Ports 9-12
Operating Frequency (MHz)	<b>698-806*</b>	<b>824-894</b>	<b>1695-1780 and 2110-2400</b>			<b>1850-1990</b>
	698-806	824-894	1695-1780	2110-2180	2300-2400	1850-1990
Azimuth beamwidth <sup>1</sup>	67°	64°	68°	63°	58°	69°
Elevation beamwidth <sup>1</sup>	12°	10°	6.5°	5.5°	4.5°	5.5°
Gain <sup>1</sup> (dBi)	13.2	13.5	16.2	16.5	17.0	16.0
Polarization	±45°	±45°	±45°			±45°
Electrical down-tilt range	2°-10°	2°-10°	2° - 7°			2° - 7°
Upper SLL (20° > mainbeam) <sup>1</sup>	-17dB	-19dB	-18dB	-18B	-18dB	-16dB
Front to Back Ratio(180°±10°) <sup>1</sup>	≥27dB	≥29dB	≥28dB	≥28dB	≥28dB	≥27dB
Port to Port isolation <sup>1</sup>	≥28dB	≥30dB	≥30dB	≥30dB	≥30dB	≥30dB
Return loss (VSWR)	14dB(1.5)	14dB(1.5)	14dB(1.5)	14dB(1.5)	14dB (1.5)	14dB(1.5)
X Polar Discrimination (at 0°)	>18dB	>16dB	>20dB	>20dB	>18dB	>20dB
Max Power handling (per any port)	500 watts	500 watts	250 watts			250 watts
Total Composite Power (all ports)	1750 watts					
PIM (3 <sup>rd</sup> Order) (2x43dBm)	>153dBc	>153dBc	>153dBc			>153dBc
XBand PIM (3 <sup>rd</sup> Order) (2x43dBm)	>159dBc					



<sup>1</sup>Typical Performance across frequency and Downtilt. \*Products Ordered after Jan 2016 will be 698-806MHz

Mechanical Characteristics	
Dimensions	L 72"(1828mm) x W 12"(304mm) x D 9.6"(245mm)
Weight (excl mounting brackets)	111lbs (50.3kg)
No. of Connectors	12x 4.3-10.0 DIN Female Long Neck
Max Wind Speed	150mph (67m/s)
Equivalent Flat Plate Area	2.96ft <sup>2</sup> (0.275m <sup>2</sup> )
Wind Load @ 160km/h (45m/s)	Front: 587N (132 lbs), Side: 382N (86 lbs)
Operating Temperature	-40°C to +65°C

Fully Integrated RET Characteristics	
AISG Standards	V1.1, V 2.0 and 3GPP
Factory Default	AISG 2.0
Surge immunity	IEC 61000-4-5:2005 4KV(AISG PIN)
Device Type	SRET Type 1
AISG Data rate	9.6 kbps
No of connectors	1in/1out.
Connector type	IEC 60130-9 (Ed 3.0)
MTBF	36,000 Operational moves

**All specifications are subject to change without notice. Please contact your Quintel representative for complete information.**



# TMA2117F00V1-1

## TWIN TMA 1900/WCS, LOWPASS

Designed to be deployed in co-located 1900 & WCS systems with wideband antennas, the Kaelus TMA provides internal diplexing and gain in both bands while allowing 700/850 services to pass through to a separate antenna, thereby saving hardware costs.

### FEATURES

- Improved base station sensitivity through gain in PCs and WCS bands
- High Linearity and low noise performance; Bypass provided for 700/850MHz services
- Hardware and software configuration using AISG “Personality” upload
- Fail safe bypass mode with lightning protection



### TECHNICAL SPECIFICATIONS

BAND NAME	1900	WCS
<b>DOWNLINK</b>		
Passband	1930 - 1990MHz	2350 - 2360MHz
Insertion loss	0.5dB typical	
Return loss	18dB minimum	
Maximum input power	160W (average) / 2kW (PEP)	120W (average) / 1.2kW (PEP)
<b>UPLINK</b>		
Passband	1850 - 1910MHz	2305 - 2315MHz
Gain	13dB	12dB
Variable gain	3dB to 13dB in 1dB steps (controlled by AISG commands)	2dB to 12dB in 1dB steps (controlled by AISG commands)
Gain variation	±1dB maximum	
Return loss	18dB minimum operating, 12dB in bypass	
Bypass loss	2.5dB typical	3.3dB typical
Noise figure	1.4dB typical	1.7dB typical
Output IP3	+30dBm typical	
Maximum input power with no damage	+12dBm maximum	
Rejection	27.5dB minimum@2324.54 - 2341.285MHz	
<b>LOW BAND PATH</b>		
Passband	698 - 896MHz	
Return loss	18dB minimum	
Insertion loss	0.35dB typical	
Maximum input power with no damage	200W (average) / 2kW (PEP)	
<b>ELECTRICAL</b>		
Impedance	50Ohms	
Intermodulation products	-153dBc maximum in RX band with 2 x 20 carriers	

**POWER SUPPLY AND ALARM (CURRENT WINDOW ALARM MODE, DEFAULT)**

Current window alarm mode (CWA) is the default TMA operating mode and can be configured to specific customer requirements. The generic personality (F00V1) is configured so that both channels are independently powered and monitored via the respective BTS port. The BTS port sinks additional current to indicate an alarm state in its uplink path. Normal operating and alarm current values are configured independently via a field-loadable personality file, Please contact Kaelus for more information.

DC supply voltage	8.5 to 30V DC, case is DC ground
DC supply	Each BTS powered individually (programmable)
DC supply current, normal mode	200 ± 20mA per port (programmable)
DC supply current, alarm mode	300 ± 30mA per port(programmable)

**AISG MODE OF OPERATION (AUTO SELECTED ON VALID AISG 2.0 FRAMES)**

AISG signals can be applied to either BTS1 or BTS2 ports. The TMA2117FxxVx-1 unit switches to AISG mode when valid frames are detected on one of the BTS ports. Both LNAs take DC power from the port with AISG frames or, if DC is present on both ports, both channels supply equal power to the TMA2117FxxVx-1.

DC supply voltage	+8.5V to +30V DC
AISG version	2.0 (1.1 optional)
Supply current, AISG mode	400mA @ 8.5V, 120mA @ 30V typical
AISG connector, current rating	IEC60130-9, 8-pin female , < 4A peak, 2A continuous, pin 6
Field firmware upgradable	Yes

**ENVIRONMENTAL**

For further details of environmental compliance, please contact Kaelus.

Temperature range	-40°C to +65°C   -40°F to +149°F
Ingress protection	IP67
Lightning protection	IEC61312-1, RF: ±5kA maximum (8/20us), AISG: ±2kA maximum (8/20us)
MTBF	>1,000,000 hours
Compliance	FCC, ETSI EN 300 019 class 4.1, RoHS

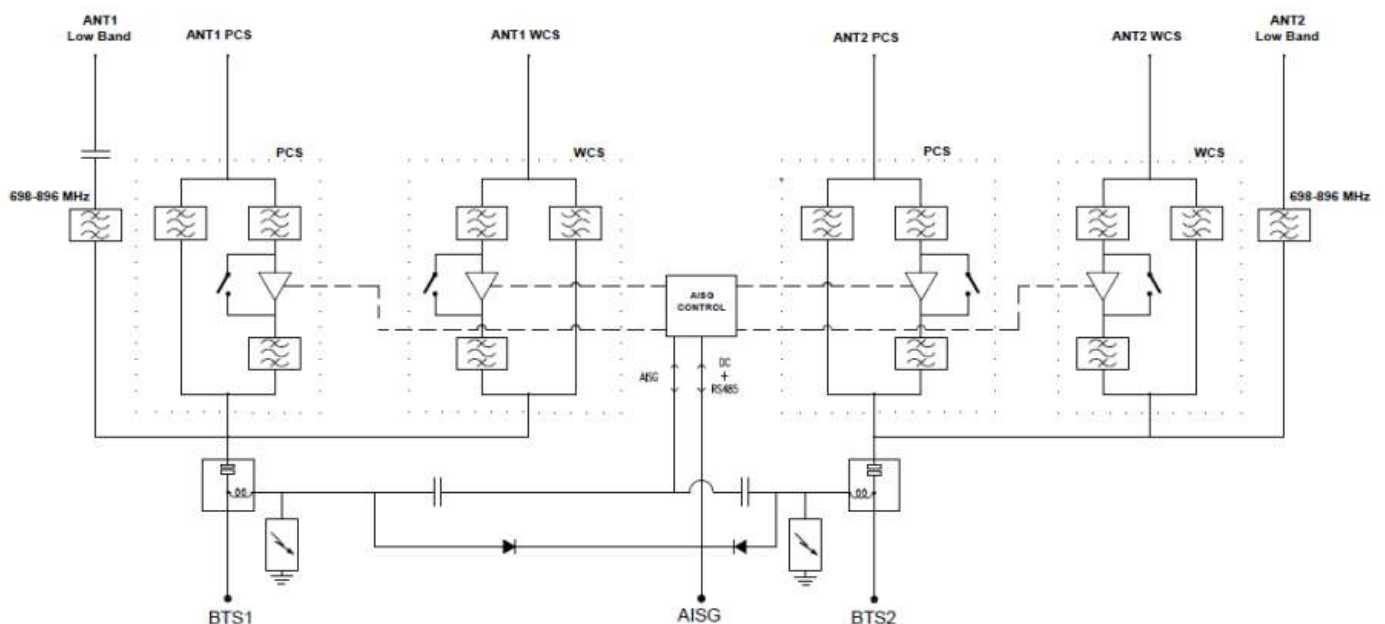
**MECHANICAL**

Dimensions H x D x W	300 x 250 x 118mm   11.81 x 9.84 x 4.65in
Weight	11.8kg   26lbs
Finish	Painted, light grey (RAL7035)
Connectors	4.3-10 (F) x 8 long shank, AISG (F) x 1
Mounting	Pole/wall bracket supplied with two metal clamps 45-178mm diameter poles

**ORDERING INFORMATION**

PART NUMBER	DESCRIPTION
TMA2117F00V1-1	TWIN TMA 1900/WCS, 698-896 LOWPASS, 6 ANT

**ELECTRICAL BLOCK DIAGRAM**



Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CTL05176	DATE:	04/04/2018	RF DESIGN ENG:	Omar Mohammed	RF PERF ENG:		RFDS PROGRAM TYPE:	2018 LTE Next Carrier		
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:	860-721-4315	RF PERF PHONE:		RFDS TECHNOLOGY:	LTE		
REVISION:	FINAL	RF MANAGER:	John Benedetto	RF DESIGN EMAIL:	OM636A@US.ATT.COM	RF PERF EMAIL:		STATE/STATUS:	Final/Approved		
INITIATIVE /PROJECT:	5G NR Upgrade[850], LTE 6[AWS JJ], LTE 7C 700 B14 2T2R.					RFDS VERSION:	5.00	RFDS ID:	2315515		
						GSM FREQUENCY:	om636a	Created By:	om636a	Updated By:	mh705r
						UMTS FREQUENCY:	850	Date Created:	4/4/2018 11:37:16 AM	Date Updated:	1/23/2019 12:17:39 PM
						LTE FREQUENCY:	700, 850, 1900, AWS, WCS				
						5G FREQUENCY:	850				
						I-PLAN JOB # 1:	NER-RCTB-18-03328	IPLAN PRD GRP    SUB GRP #1:	LTE Next Carrier    LTE 6C		
						I-PLAN JOB # 2:	NER-RCTB-18-02487	IPLAN PRD GRP    SUB GRP #2:	Cell Site RF Modifications    5G NR Upgrade		
						I-PLAN JOB # 3:	NER-RCTB-18-03378	IPLAN PRD GRP    SUB GRP #3:	LTE Next Carrier    LTE 7C		
						I-PLAN JOB # 4:		IPLAN PRD GRP    SUB GRP #4:			
						I-PLAN JOB # 5:		IPLAN PRD GRP    SUB GRP #5:			
						I-PLAN JOB # 6:		IPLAN PRD GRP    SUB GRP #6:			
						I-PLAN JOB # 7:		IPLAN PRD GRP    SUB GRP #7:			
						I-PLAN JOB # 8:		IPLAN PRD GRP    SUB GRP #8:			

Section 2 - LOCATION INFORMATION

USID:	60443	FA LOCATION CODE:	10071269	LOCATION NAME:	BETHEL STONY HILL-AWS	ORACLE PTN # 1:	2051A0H051	PACE JOB # 1:	MRCTB032343
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT	ORACLE PTN # 2:	2051A0H047	PACE JOB # 2:	MRCTB032344
ADDRESS:	7 STONY HILL ROAD	CITY:	BETHEL	STATE:	CT	ORACLE PTN # 3:	2051A0H053	PACE JOB # 3:	MRCTB032332
ZIP CODE:	06801	COUNTY:	FAIRFIELD	LONG (DEC. DEG.):	-73.4016989	ORACLE PTN # 4:		PACE JOB # 4:	
LATITUDE (D-M-S):	41d 24m56.85084s	LONGITUDE (D-M-S):	-73d -24m-6.11604s	LAT (DEC. DEG.):	41.4157919	ORACLE PTN # 5:		PACE JOB # 5:	
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	84 EAST DANBURY FOLLOW TO EXIT 8 MAKE LEFT AT THE BOTTOM OF THE RAMP FOLLOW ON STONY HILL RD SITE IS ON THE RIGHT ABOUT MILE POWER LINE MONO POLE DRIVEWAY BEFORE THE BEST WESTERN HOTEL ON THE RIGHT. THE DRIVEWAY IS THE SAME AS TARGETS. FOLLOW UP HILL, SITE IS TO THE LEFT. DEMARC IS IN A GRAY BOX ON SITE SECURITY NO ISSUES ACCESS 24 7. EVERSOURCE ENERGY POWER POLE.					ORACLE PTN # 6:		PACE JOB # 6:	
						ORACLE PTN # 7:		PACE JOB # 7:	
						ORACLE PTN # 8:		PACE JOB # 8:	
						BORDER CELL WITH CONTOUR COORD:		SEARCH RING NAME:	
						AM STUDY REQ'D (Y/N):	No	SEARCH_RING_ID:	
						FREQ COORD:		BTA:	
						OPS DISTRICT:	CT-South	LAC(GSM):	
						OPS ZONE:	NE_CT_S_FRFD_NW_CS	LAC(UMTS):	05995
						RF DISTRICT:	NPO Triage	BSC(GSM):	
						RF ZONE:	Hotseat	RNC(UMTS):	BRPTCT04CR0R05
						PARENT NAME(GSM):		MME POOL ID(LTE):	FF01
						PARENT NAME(UMTS):	BRIDGEPORT RNC05		

Section 3 - LICENSE COVERAGE/FILING INFORMATION

CGSA - NO FILING TRIGGERED (Yes/No):	No	CGSA LOSS:		PCS REDUCED - UPS ZIP:		CGSA CALL SIGNS:
CGSA - MINOR FILING NEEDED (Yes/No):	No	CGSA EXT AGMT NEEDED:		PCS POPS REDUCED:		
CGSA - MAJOR FILING NEEDED (Yes/No):	Yes	CGSA SCORECARD UPDATED:				

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	No	GROUND ELEVATION (ft):	0	STRUCTURE TYPE:	UTILITY	MARKET LOCATION 700 MHz Band:	
ADDITIONAL REGULATORY?:	No	HEIGHT OVERALL (ft):	0.00	FCC ASR NUMBER:	NR	MARKET LOCATION 850 MHz Band:	
SUB-LEASE RIGHTS?:	No	STRUCTURE HEIGHT (ft):	144.32			MARKET LOCATION 1900 MHz Band:	
LIGHTING TYPE:	NOT REQUIRED					MARKET LOCATION AWS Band:	
						MARKET LOCATION WCS Band:	
						MARKET LOCATION Future Band:	



Section 6 - RBS GENERAL INFORMATION - existing

	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	LTE 1ST RBS	LTE 2ND RBS	5G 1ST RBS					
<b>RBS ID:</b>	210670	257794	278028	423158	360126	605860						
<b>CTS COMMON ID:</b>	CTV5176	CTU4176	CTU5176	CTV4176	CTL05176	CTL00876R						
<b>CELL ID / BCF:</b>	CTV5176	CTV4176	CTV5176	CTV4176	CTL05176	CTL00876R						
<b>BTA/TID:</b>	321U	321V	321W	321W	321L	321L						
<b>4-9 DIGIT SITE ID:</b>	5176	4176	5176	04176	5176	0876						
<b>COW OR TOY?:</b>	No	No	No	No	No	No						
<b>CELL SITE TYPE:</b>	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED						
<b>SITE TYPE:</b>	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL						
<b>BTS LOCATION ID:</b>	INTERNAL	INTERNAL	INTERNAL	INTERNAL	INTERNAL	INTERNAL						
<b>BASE STATION TYPE:</b>	BASE	OVERLAY	OVERLAY	BASE	BASE	BASE						
<b>EQUIPMENT NAME:</b>	BETHEL STONY HILL-AWS	STONY HILL	BETHEL STONY HILL-AWS	STONY HILL	BETHEL STONY HILL-AWS	BETHEL STONY HILL-AWS						
<b>DISASTER PRIORITY:</b>	0	0	0	0	3	3						

Section 6 - RBS GENERAL INFORMATION - final

	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	LTE 1ST RBS	LTE 2ND RBS	5G 1ST RBS					
<b>RBS ID:</b>	210670				360126	605860	RFDS_45352512					
<b>CTS COMMON ID:</b>	CTV5176				CTL05176	CTL00876R	CTCN005176					
<b>CELL ID / BCF:</b>	CTV5176				CTL05176	CTL00876R	CTCN005176					
<b>BTA/TID:</b>	321U				321L	321L	321L					
<b>4-9 DIGIT SITE ID:</b>	5176				5176	0876	005176					
<b>COW OR TOY?:</b>	No				No	No	No					
<b>CELL SITE TYPE:</b>	SECTORIZED				SECTORIZED	SECTORIZED	SECTORIZED					
<b>SITE TYPE:</b>	MACRO-CONVENTIONAL				MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL					
<b>BTS LOCATION ID:</b>	INTERNAL				INTERNAL	INTERNAL	INTERNAL					
<b>BASE STATION TYPE:</b>	BASE				BASE	BASE	BASE					
<b>EQUIPMENT NAME:</b>	BETHEL STONY HILL-AWS				BETHEL STONY HILL-AWS	BETHEL STONY HILL-AWS	BETHEL STONY HILL-AWS					
<b>DISASTER PRIORITY:</b>	0				3	3	3					

Section 7 - RBS SPECIFIC INFORMATION - existing

	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	LTE 1ST RBS	LTE 2ND RBS	5G 1ST RBS					
<b>RAC:</b>												
<b>EQUIPMENT VENDOR:</b>	ERICSSON	ERICSSON	ERICSSON	ERICSSON	ERICSSON	ERICSSON						
<b>EQUIPMENT TYPE:</b>	3206 INDOOR	3206 INDOOR	3206 INDOOR	6601 MAIN UNIT UMTS	6601 INDOOR MU	6601 INDOOR MU						
<b>BASEBAND CONFIGURATION:</b>												
<b>LOCATION:</b>												
<b>CABINET LOCATION:</b>												
<b>MARKET STATE CODE:</b>					CT	CT						
<b>AGPS:</b>	Yes	Yes	Yes	Yes	Yes	Yes						
<b>NODE B NUMBER:</b>	0	0	0	0	5176	876						

Section 7 - RBS SPECIFIC INFORMATION - final

	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	UMTS 4TH RBS	LTE 1ST RBS	LTE 2ND RBS	5G 1ST RBS					
<b>RAC:</b>												
<b>EQUIPMENT VENDOR:</b>	ERICSSON				ERICSSON	ERICSSON	ERICSSON					
<b>EQUIPMENT TYPE:</b>	3206 INDOOR				6601 INDOOR MU	6601 INDOOR MU	6601 INDOOR MU					
<b>BASEBAND CONFIGURATION:</b>					2x6601 / 2x5216 / 2xXIMU03 + IDLe		xxxxx / 1x6630 / xxxxx					
<b>LOCATION:</b>												
<b>CABINET LOCATION:</b>												
<b>MARKET STATE CODE:</b>					CT	CT	CT					
<b>AGPS:</b>	Yes				Yes	Yes	Yes					
<b>NODE B NUMBER:</b>	0				5176	876	5176					











Section 15A - CURRENT TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	P65-16-XLH-RR		QS66512-2			
ANTENNA VENDOR	Powerwave	Powerwave		Quintel			
ANTENNA SIZE (H x W x D)	55X11X5	72X12X6		72.0X12.0X9.6			
ANTENNA WEIGHT	35	64		111			
AZIMUTH	30	30		30			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145	145		145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2	2		4			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020	Internal		Internal		
SURGE ARRESTOR (QTY/MODEL)			2	Andrew APTDC-BDFDM-DB Broadband	12	Andrew APTDC-BDFDM-DB Broadband	
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901	2	Powerwave / CM1007-DBPXBC-003	4	CCI Pentaplexer - 5PX-0726	
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10006		LTE RRH		LTE RRH	
DC BLOCK (QTY/MODEL)							
TMA/INA (QTY/MODEL)	2	Powerwave LGP 21401 (DB - 850 Bypass)	1	CCI DTMAPB7819VG12A	2	Kaelus TMA2117F00V1-1 (Twin PCS-WCS w/700/850 BP)	
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860		Andrew / ABT-DFDM-ADBH			
PDU FOR TMAS (QTY/MODEL)	1	LGP 12104 (1900 AND 850 Bypass TMA)					
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1	RRUS-11 (REUSE ONLY)		1	RRUS-E2 B29	
RRH - 850 band (QTY/MODEL)					1	RRUS-11 (REUSE ONLY)	
RRH - 1900 band (QTY/MODEL)					1	RRUS-32 B2	
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)					1	RRUS-32	
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1			CTV51761	CTV51761		UMTS 850	7770.00.850.10	13.5	30	10	None	Andrew 1-5/8	170.04						259.42		1	
ANTENNA POSITION 2	PORT 1			CTL05176_7A_1	CTL05176_7A_1		LTE 700	P65-16-XLH-RR_716MHz_10DT	14.8	30	10	Bottom	Andrew 1-5/8	170.04						1475.7065		3	
ANTENNA POSITION 4	PORT 1			CTL05176_8A_1	CTL05176_8A_1		LTE 850	QS66512-	13.5	30	10	Bottom	Andrew 1-5/8	170.04						1000		7	

							2.840MHz_10DT															
	PORT 2			CTL05176_7A_2_E	CTL05176_7A_2_E	LTE 700	QS66512-2.722MHz_10DT	13	30	10	Bottom	Andrew 1-5/8	170.04							1475.7065		7
	PORT 3			CTL05176_3A_1	CTL05176_3A_1	LTE WCS	QS66512-2.2355MHz_03DT	17	30	3	Bottom	Andrew 1-5/8	170.04							1285.2866		8
	PORT 4			CTL05176_9A_1	CTL05176_9A_1	LTE 1900	QS66512-2.1930MHz_04DT	17.4	30	4	Bottom	Andrew 1-5/8	170.04							2421.029		8
	PORT 7			CTL05176_9A_2	CTL05176_9A_2	LTE 1900	QS66512-2.1930MHz_04DT	17.4	30	4	Bottom	Andrew 1-5/8	170.04							2421.029		8

Section 15B - CURRENT TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	P65-16-XLH-RR		QS66512-2			
ANTENNA VENDOR	Powerwave	Powerwave		Quintel			
ANTENNA SIZE (H x W x D)	55X11X5	72X12X6		72.0X12.0X9.6			
ANTENNA WEIGHT	35	64		111			
AZIMUTH	150	150		150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145	145		145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2	2		4			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020	Internal		Internal		
SURGE ARRESTOR (QTY/MODEL)		2	Andrew APTDC-BDFDM-DB Broadband	12	Andrew APTDC-BDFDM-DB Broadband		
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901	2	Powerwave / CM1007-DBPXBC-003	4	CCI Pentaplexer - 5PX-0726	
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)			LTE RRH		LTE RRH		
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2	Powerwave LGP 21401	1	CCI DTMAPB7819VG12A	2	Kaelus TMA2117F00V1-1 (Twin PCS-WCS w/700/850 BP)	
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860		Andrew / ABT-DFDM-ADBH			
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1	RRUS-11 (REUSE ONLY)	1	RRUS-E2 B29		
RRH - 850 band (QTY/MODEL)				1	RRUS-11 (REUSE ONLY)		
RRH - 1900 band (QTY/MODEL)				1	RRUS-32 B2		
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1	RRUS-32		
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RX/IT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1			CTV51762	CTV51762		UMTS 850	7770.00.850.08	13.5	150	8	None	Andrew 1-5/8	170.04						259.42		9	
ANTENNA POSITION 2	PORT 1			CTL05176_7B_1	CTL05176_7B_1		LTE 700	P65-16-XLH-RR_716MHz_03DT	14.8	150	3	Bottom	Andrew 1-5/8	170.04						1475.7065		11	
ANTENNA POSITION 4	PORT 1			CTL05176_8B_1	CTL05176_8B_1		LTE 850	QS66512-2_840MHz_03DT	13.5	150	3	Bottom	Andrew 1-5/8	170.04						1000		15	

	PORT 2			CTL05176_7B_2_E	CTL05176_7B_2_E		LTE 700	QS66512-2_722MHz_03DT	13	150	3	Bottom	Andrew 1-5/8	170.04						1475.7065		15	
	PORT 3			CTL05176_3B_1	CTL05176_3B_1		LTE WCS	QS66512-2_2355MHz_03DT	17	150	3	BOTTOM	Andrew 1-5/8	170.04						1285.2866		16	
	PORT 4			CTL05176_9B_1	CTL05176_9B_1		LTE 1900	QS66512-2_1930MHz_02DT	17	150	2	Bottom	Andrew 1-5/8	170.04						2421.029		16	
	PORT 7			CTL05176_9B_2	CTL05176_9B_2		LTE 1900	QS66512-2_1930MHz_02DT	17	150	2	Bottom	Andrew 1-5/8	170.04						2421.029		16	

Section 15C - CURRENT TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	P65-16-XLH-RR		QS66512-2			
ANTENNA VENDOR	Powerwave	Powerwave		Quintel			
ANTENNA SIZE (H x W x D)	55X11X5	72X12X6		72.0X12.0X9.6			
ANTENNA WEIGHT	35	64		111			
AZIMUTH	270	270		270			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145	145		145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2	2		4			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020	Internal		Internal		
SURGE ARRESTOR (QTY/MODEL)		2	Andrew APTDC-BDFDM-DB Broadband	12	Andrew APTDC-BDFDM-DB Broadband		
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901	2	Powerwave / CM1007-DBPXBC-003	4	CCI Pentaplexer - 5PX-0726	
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)			LTE RRH		LTE RRH		
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2	Powerwave LGP 21401 (DB - 850 Bypass)	1	CCI DTMBP7819VG12A	2	Kaelus TMA2117F00V1-1 (Twin PCS-WCS w/700/850 BP)	
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860		Andrew / ABT-DFDM-ADBH			
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1	RRUS-11 (REUSE ONLY)	1	RRUS-E2 B29		
RRH - 850 band (QTY/MODEL)				1	RRUS-11 (REUSE ONLY)		
RRH - 1900 band (QTY/MODEL)				1	RRUS-32 B2		
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)				1	RRUS-32		
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1			CTV51763	CTV51763		UMTS 850	7770.00.850.10	13.5	270	10	None	Andrew 1-5/8	170.04						259.42		17	
ANTENNA POSITION 2	PORT 1			CTL05176_7C_1	CTL05176_7C_1		LTE 700	P65-16-XLH-RR_716MHz_08DT	14.8	270	8	Bottom	Andrew 1-5/8	170.04						1475.7065		19	
ANTENNA POSITION 4	PORT 1			CTL05176_8C_1	CTL05176_8C_1		LTE 850	QS66512-2_840MHz_08DT	13.5	270	8	Bottom	Andrew 1-5/8	170.04						1000		23	

	PORT 2			CTL05176_7C_2_E	CTL05176_7C_2_E		LTE 700	QS66512-2_722MHz_03DT	13	270	8	Bottom	Andrew 1-5/8	170.04						1475.7065		23	
	PORT 3			CTL05176_3C_1	CTL05176_3C_1		LTE WCS	QS66512-2_2355MHz_03DT	17	270	3	BOTTOM	Andrew 1-5/8	170.04						1285.2866		24	
	PORT 4			CTL05176_9C_1	CTL05176_9C_1		LTE 1900	QS66512-2_1930MHz_07DT	17.4	270	7	Bottom	Andrew 1-5/8	170.04						2421.029		24	
	PORT 7			CTL05176_9C_2	CTL05176_9C_2		LTE 1900	QS66512-2_1930MHz_07DT	17.4	270	7	Bottom	Andrew 1-5/8	170.04						2421.029		24	



Section 16A - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?	Yes			Yes			
ANTENNA MAKE - MODEL		HPA6SR-BU6A					
ANTENNA VENDOR		CCI					
ANTENNA SIZE (H x W x D)		71X11.7X7.6					
ANTENNA WEIGHT		51					
AZIMUTH		30					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)		145					
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT		0					
FEEDER AMOUNT		2					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)			Internal				
SURGE ARRESTOR (QTY/MODEL)		8	TSXDC-4310FM	4	TSXDC-4310FM		
DIPLEXER (QTY/MODEL)	2	CCI Triplexer -TPX-070821	4	Kaelus QBC0007F1V51-1			
DIPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)			LTE RRH		LTE RRH		
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)		2	TMABPD7823V/G12A				
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1	B14 4478				
RRH - 850 band (QTY/MODEL)				1	4478 B5		
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)		1	4426 B66				
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							

Local Market Note 1	Bronze Standard// LTE 6C AWSJ, LTE 7C B14, LTE 850 5G NR Upgrade.- Antennae and Radio as per PD- Replace LTE antenna with Hex port on pos2,- Add 2 Coax per sector- Add AWS 4426 B66 along with SA on Pos2,- Replace LTE 850 radio to 4478 along with SA on Pos4,- Move LTE 700 RRUS-11 Radio to Pos4,- Move LTE 700 RRUS-E2 to Pos1 UMTS Antenna, // Swap Diplexers with Triplexers.- Replace diplexers with Quadplexers and TMAs with Twin TMA- Swap DUS to 5216's- Add IDLe- Add 6630
Local Market Note 2	Busy Sector B.Sector A and C will share the B14 Radio. Port 1 & 2 will be used for sectorA AND port 3 & 4 to be used for sectorC.
Local Market Note 3	5216-XMU-5216-XMU-IDLe+ 6630

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 2			CTL00876_7A_2_E	CTL00876_7A_2_E		LTE 700	7770.00.700.3	13.5	30	3	None	1 - 5/8 Coax	170.04						1475.7065		1	
ANTENNA POSITION 2	PORT 1			CTL00876_7A_3_F	CTL00876_7A_3_F		LTE 700	HPA6SR-BU6A_770MHz_10DT	14.1	30	10	Bottom	1 - 5/8 Coax	170.04						2951.413		3	
	PORT 3			CTL00876_2A_2	CTL00876_2A_2		LTE AWS	HPA6SR-BU6A_2170MHz_04DT	18.2	30	4	Bottom	1 - 5/8 Coax	170.04						5070.2572		4	
ANTENNA POSITION 4	PORT 1			CTL00876_8A_1	CTL00876_8A_1		LTE 850	QS66512-2_850MHz_10DT	13.5	30	10	Bottom	1 - 5/8 Coax	170.04						1000		7	

	PORT 5			CTCN005176_N005A _1	CTCN005176_N005A _1	5G 850	QS66512- 2_850MHz_10DT	13.5	30	10	Bottom	1 - 5/8 Coax	170.04						1000		7	
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Section 16B - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?	Yes			Yes			
ANTENNA MAKE - MODEL		HPA65R-BU6A					
ANTENNA VENDOR		CCI					
ANTENNA SIZE (H x W x D)		71X11.7X7.6					
ANTENNA WEIGHT		51					
AZIMUTH		150					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)		145					
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT		0					
FEEDER AMOUNT		2					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)			Internal				
SURGE ARRESTOR (QTY/MODEL)				4	TSXDC-4310FM		
DIPLEXER (QTY/MODEL)	2	CCI Triplexer -TPX-070821	4	Kaelus QBC0007F1V51-1			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)					LTE RRH		
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)		2		TMABPD7823V/G12A			
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				RRH is shared with another sector			
RRH - 850 band (QTY/MODEL)					1	4478 B5	
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)		1		4426 B66			
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Bronze Standard// LTE 6C AWSJ, LTE 7C B14, LTE 850 5G NR Upgrade.- Antennae and Radio as per PD- Replace LTE antenna with Hex port on pos2.- Add 2 Coax per sector- Add AWS 4426 B66 along with SA on Pos2.- Replace LTE 850 radio to 4478 along with SA on Pos4.- Move LTE 700 RRUS-11 Radio to Pos4.- Move LTE 700 RRUS-E2 to Pos1 UMTS Antenna, // Swap Diplexers with Triplexers.- Replace diplexers with Quadplexers and TMAs with Twin TMA- Swap DUS to 5216's- Add IDLe- Add 6630						
Local Market Note 2	Busy Sector B.Sector A and C will share the B14 Radio. Port 1 & 2 will be used for sectorA AND port 3 & 4 to be used for sectorC.						
Local Market Note 3	5216-XMU-5216-XMU-IDLe+ 6630						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 2			CTL00876_7B_2_E	CTL00876_7B_2_E		LTE 700	7770.00.700.3	13.5	150	3	None	1 - 5/8 Coax	170.04						1475.7065		9	
ANTENNA POSITION 2	PORT 1			CTL00876_7B_3_F	CTL00876_7B_3_F		LTE 700	HPA65R-BU6A_770MHz_03DT	14.4	150	3	Bottom	1 - 5/8 Coax	170.04						2951.413		11	
	PORT 3			CTL00876_2B_2	CTL00876_2B_2		LTE AWS	HPA65R-BU6A_2170MHz_02DT	17.8	150	2	Bottom	1 - 5/8 Coax	170.04						5070.2572		12	
ANTENNA POSITION 4	PORT 1			CTL00876_8B_1	CTL00876_8B_1		LTE 850	QS66512-	13.5	150	3	Bottom	1 - 5/8 Coax	170.04						1000		15	



Section 16C - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?	Yes			Yes			
ANTENNA MAKE - MODEL		HPA6SR-BU6A					
ANTENNA VENDOR		CCI					
ANTENNA SIZE (H x W x D)		71X11.7X7.6					
ANTENNA WEIGHT		51					
AZIMUTH		270					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)		145					
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT		0					
FEEDER AMOUNT		2					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)			Internal				
SURGE ARRESTOR (QTY/MODEL)		8	TSXDC-4310FM	4	TSXDC-4310FM		
DIPLEXER (QTY/MODEL)	2	CCI Triplexer -TPX-070821	4	Kaelus QBC0007F1V51-1			
DIPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)			LTE RRH		LTE RRH		
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)		2	TMABPD7823V/G12A				
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1	B14 4478				
RRH - 850 band (QTY/MODEL)				1	4478 B5		
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)		1	4426 B66				
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							

Local Market Note 1	Bronze Standard// LTE 6C AWSJ, LTE 7C B14, LTE 850 5G NR Upgrade.- Antennae and Radio as per PD- Replace LTE antenna with Hex port on pos2.- Add 2 Coax per sector- Add AWS 4426 B66 along with SA on Pos2.- Replace LTE 850 radio to 4478 along with SA on Pos4.- Move LTE 700 RRUS-11 Radio to Pos4.- Move LTE 700 RRUS-E2 to Pos1 UMTS Antenna, // Swap Diplexers with Triplexers.- Replace diplexers with Quadplexers and TMAs with Twin TMA- Swap DUS to 5216's- Add IDLe- Add 6630
Local Market Note 2	Busy Sector B.Sector A and C will share the B14 Radio. Port 1 & 2 will be used for sectorA AND port 3 & 4 to be used for sectorC.
Local Market Note 3	5216-XMU-5216-XMU-IDLe+ 6630

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 2			CTL00876_7C_2_E	CTL00876_7C_2_E		LTE 700	7770.00.700.3	13.5	270	3	None	1 - 5/8 Coax	170.04						1475.7065		17	
ANTENNA POSITION 2	PORT 1			CTL00876_7C_3_F	CTL00876_7C_3_F		LTE 700	HPA6SR-BU6A_770MHz_08DT	14.1	270	8	Bottom	1 - 5/8 Coax	170.04						2951.413		19	
	PORT 3			CTL00876_2C_2	CTL00876_2C_2		LTE AWS	HPA6SR-BU6A_2170MHz_07DT	17.9	270	7	Bottom	1 - 5/8 Coax	170.04						5070.2572		20	
ANTENNA POSITION 4	PORT 1			CTL00876_8C_1	CTL00876_8C_1		LTE 850	QS66512-2_850MHz_08DT	13.4	270	8	Bottom	1 - 5/8 Coax	170.04						1000		23	

	PORT 5			CTCN005176_N005C _1	CTCN005176_N005C _1	5G 850	QS66512- 2_850MHz_08DT	13.4	270	8	Bottom	1 - 5/8 Coax	170.04						1000		23	
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Section 17A - FINAL TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK of ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	HPA65R-BU6A		QS866512-2			
ANTENNA VENDOR	Powerwave	CCI		Quintel			
ANTENNA SIZE (H x W x D)	55X11X5	71X11.7X7.6		72.0X12.0X9.6			
ANTENNA WEIGHT	35	51		111			
AZIMUTH	30	30		30			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145	145		145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2	4		4			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020	Internal		Internal		
SURGE ARRESTOR (QTY/MODEL)	2	APTDC-BDFDM-DB	8	TSXDC-4310FM	14	TSXDC-4310FM (4) + APTDC-BDFDM-DB ( 10 )	
DIPLEXER (QTY/MODEL)	2	CCI Triplexer -TPX-070821	4	Kaelus QBC0007F1V51-1	4	CCI Pentaplexer - 5PX-0726	
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10006	LTE RRH		LTE RRH		
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2	Powerwave LGP 21401 (DB - 850 Bypass)	2	TMABPD7823VG12A	2	Kaelus TMA2117F00V1-1 (Twin PCS-WCS w/700/850 BP)	
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860					
PDU FOR TMA (QTY/MODEL)	1	LGP 12104 (1900 AND 850 Bypass TMA)					
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)	1	RRUS-E2 B29	1	B14 4478	1	RRUS-11 (REUSE ONLY)	
RRH - 850 band (QTY/MODEL)					1	4478 B5	
RRH - 1900 band (QTY/MODEL)					1	RRUS-32 B2	
RRH - AWS band (QTY/MODEL)			1	4426 B66			
RRH - WCS band (QTY/MODEL)					1	RRUS-32	
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Bronze Standard/ LTE 6C AWSJ, LTE 7C B14, LTE 850 5G NR Upgrade. - Antennae and Radio as per PD- Replace LTE antenna with Hex port on pos2.- Add 2 Coax per sector- Add AWS 4426 B66 along with SA on Pos2.- Replace LTE 850 radio to 4478 along with SA on Pos4.- Move LTE 700 RRUS-11 Radio to Pos4.- Move LTE 700 RRUS-E2 to Pos1 UMTS Antenna, / Swap Diplexers with Triplexers.- Replace diplexers with Quadplexers and TMAs with Twin TMA- Swap DUS to 5216's- Add IDLe- Add 6630						
Local Market Note 2	Busy Sector B.Sector A and C will share the B14 Radio. Port 1 & 2 will be used for sectorA AND port 3 & 4 to be used for sectorC.						
Local Market Note 3	5216-XMU-5216-XMU-IDLe+ 6630						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	60443.A.850.3G.1		CTV51761	CTV51761		UMTS 850	7770.00.850.10	13.5	30	10	None	1 - 5/8 Coax	170.04						259.42		1	
	PORT 2	60443.A.700.4G.3		CTL00876_7A_2_E	CTL00876_7A_2_E		LTE 700	7770.00.700.3	13.5	30	3	None	1 - 5/8 Coax	170.04						1475.7065		1	
ANTENNA POSITION 2	PORT 1	60443.A.700.4G.4		CTL00876_7A_3_F	CTL00876_7A_3_F		LTE 700	HPA65R-BU6A_770MHz_10DT	14.1	30	10	Bottom	1 - 5/8 Coax	170.04						2951.413		3	
	PORT 3	60443.A.AWS.4G.4		CTL00876_2A_2	CTL00876_2A_2		LTE AWS	HPA65R-	18.2	30	4	Bottom	1 - 5/8 Coax	170.04						5070.2572		4	





Section 17B - FINAL TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	HPA65R-BU6A		QS86512-2			
ANTENNA VENDOR	Powerwave	CCI		Quintel			
ANTENNA SIZE (H x W x D)	55X11X5	71X11.7X7.6		72.0X12.0X9.6			
ANTENNA WEIGHT	35	51		111			
AZIMUTH	150	150		150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145	145		145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2	4		4			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020	Internal		Internal		
SURGE ARRESTOR (QTY/MODEL)	2	APTDC-BDFDM-DB	6	TSXDC-4310FM (4) + APTDC-BDFDM-DB ( 2 )	14	TSXDC-4310FM (4) + APTDC-BDFDM-DB ( 10 )	
DIPLEXER (QTY/MODEL)	2	CCI Triplexer -TPX-070821	4	Kaelus QBC0007F1V51-1	4	CCI Pentaplexer - 5PX-0726	
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH		LTE RRH	
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2	Powerwave LGP 21401	2	TMABPD7823VG12A	2	Kaelus TMA2117F00V1-1 (Twin PCS-WCS w/700/850 BP)	
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860					
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)	1	RRUS-E2 B29	1	RRH is shared with another sector	1	RRUS-11 (REUSE ONLY)	
RRH - 850 band (QTY/MODEL)					1	4478 B5	
RRH - 1900 band (QTY/MODEL)					1	RRUS-32 B2	
RRH - AWS band (QTY/MODEL)			1	4426 B66			
RRH - WCS band (QTY/MODEL)					1	RRUS-32	
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Bronze Standard// LTE 6C AWSJ, LTE 7C B14, LTE 850 5G NR Upgrade.- Antennae and Radio as per PD- Replace LTE antenna with Hex port on pos2.- Add 2 Coax per sector- Add AWS 4426 B66 along with SA on Pos2.- Replace LTE 850 radio to 4478 along with SA on Pos4.- Move LTE 700 RRUS-11 Radio to Pos4.- Move LTE 700 RRUS-E2 to Pos1 UMTS Antenna, // Swap Diplexers with Triplexers.- Replace diplexers with Quadplexers and TMAs with Twin TMA- Swap DUS to 5216's- Add IDLe- Add 6630						
Local Market Note 2	Busy Sector B.Sector A and C will share the B14 Radio. Port 1 & 2 will be used for sectorA AND port 3 & 4 to be used for sectorC.						
Local Market Note 3	5216-XMU-5216-XMU-IDLe+ 6630						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	60443.B.850.3G.1		CTV51762	CTV51762		UMTS 850	7770.00.850.08	13.5	150	8	None	1 - 5/8 Coax	170.04					259.42			9	
	PORT 2	60443.B.700.4G.3		CTL00876_7B_2_E	CTL00876_7B_2_E		LTE 700	7770.00.700.3	13.5	150	3	None	1 - 5/8 Coax	170.04					1475.7065			9	
ANTENNA POSITION 2	PORT 1	60443.B.700.4G.4		CTL00876_7B_3_F	CTL00876_7B_3_F		LTE 700	HPA65R-BU6A_770MHz_03DT	14.4	150	3	Bottom	1 - 5/8 Coax	170.04					2951.413			11	
	PORT 3	60443.B.AWS.4G.4		CTL00876_2B_2	CTL00876_2B_2		LTE AWS	HPA65R-	17.8	150	2	Bottom	1 - 5/8 Coax	170.04					5070.2572			12	

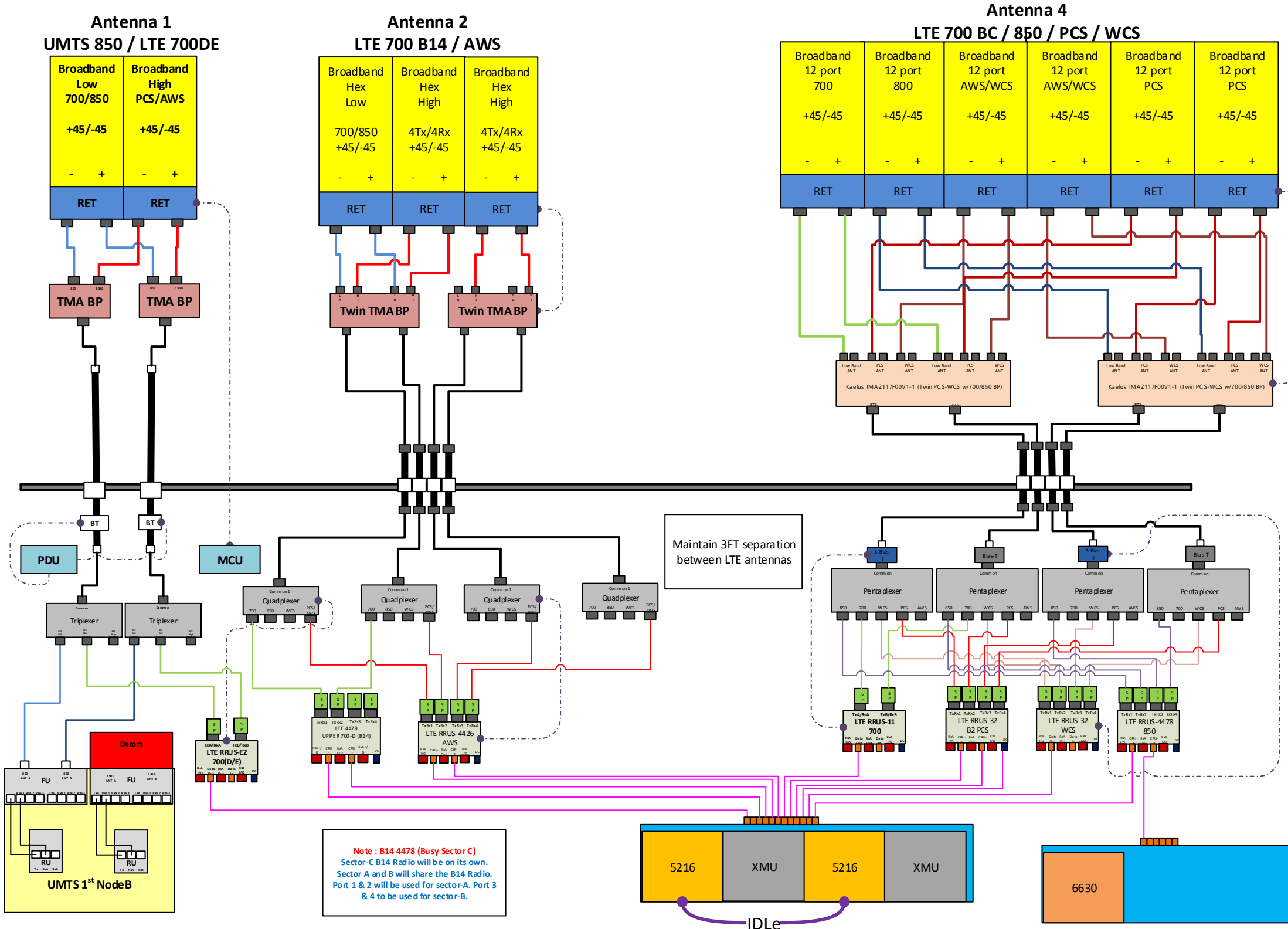


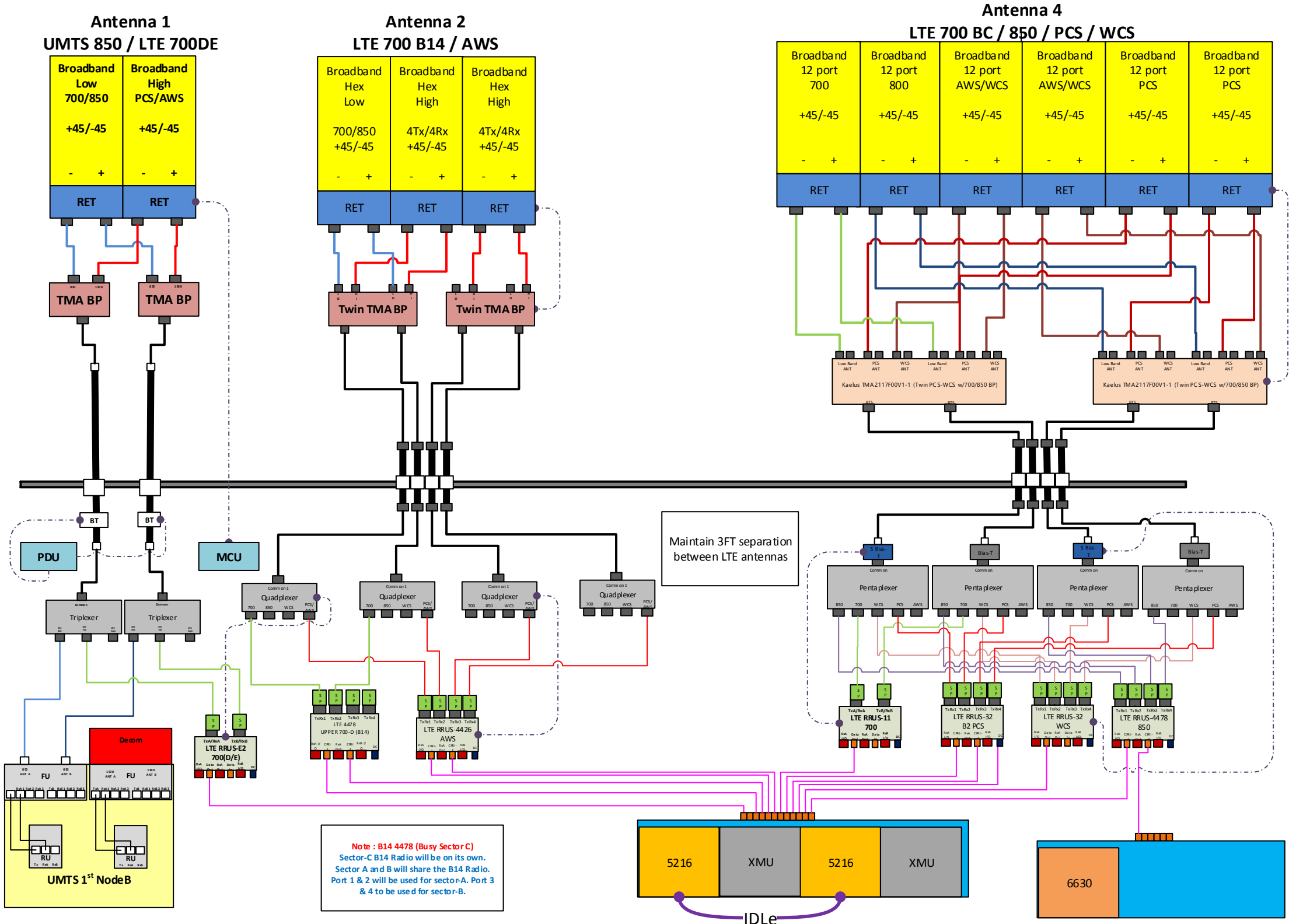
Section 17C - FINAL TOWER CONFIGURATION - SECTOR C

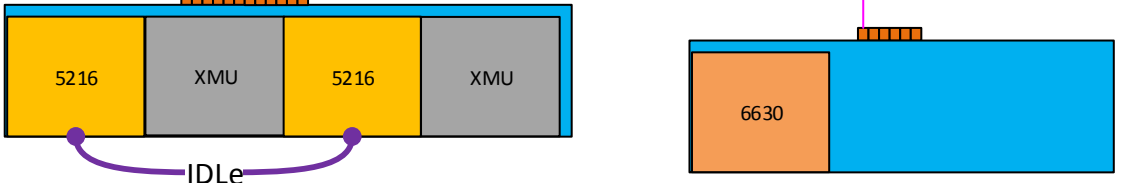
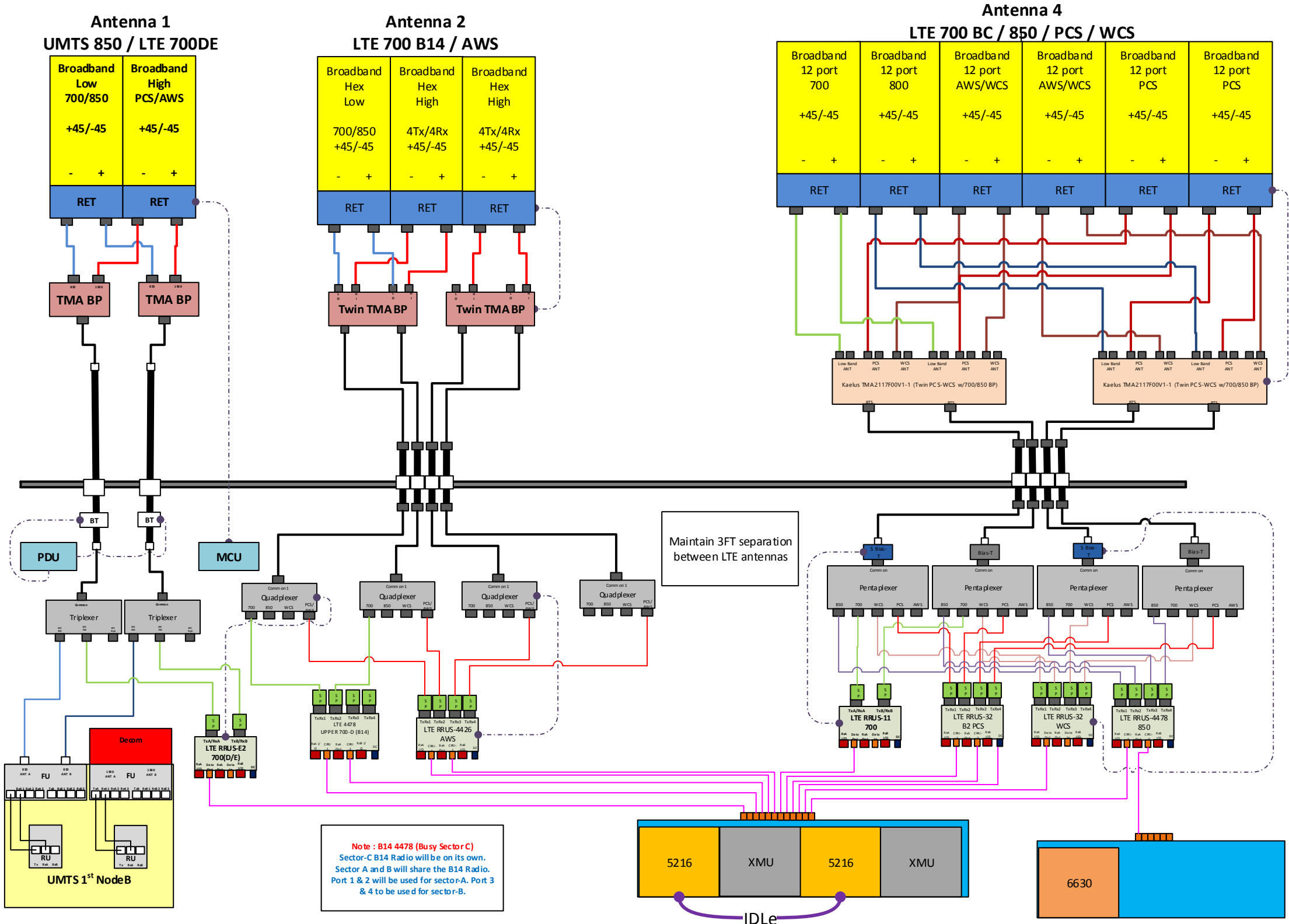
ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	HPA65R-BU6A		QS86512-2			
ANTENNA VENDOR	Powerwave	CCI		Quintel			
ANTENNA SIZE (H x W x D)	55X11X5	71X11.7X7.6		72.0X12.0X9.6			
ANTENNA WEIGHT	35	51		111			
AZIMUTH	270	270		270			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	145	145		145			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2	4		4			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020		Internal			
SURGE ARRESTOR (QTY/MODEL)	2	APTDC-BDFDM-DB	8	TSXDC-4310FM	14	TSXDC-4310FM (4) + APTDC-BDFDM-DB ( 10 )	
DIPLEXER (QTY/MODEL)	2	CCI Triplexer -TPX-070821	4	Kaelus QBC0007F1V51-1	4	CCI Pentaplexer - 5PX-0726	
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH		LTE RRH	
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2	Powerwave LGP 21401 (DB - 850 Bypass)	2	TMABPD7823VG12A	2	Kaelus TMA2117F00V1-1 (Twin PCS-WCS w/700/850 BP)	
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860					
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)	1	RRUS-E2 B29	1	B14 4478	1	RRUS-11 (REUSE ONLY)	
RRH - 850 band (QTY/MODEL)					1	4478 B5	
RRH - 1900 band (QTY/MODEL)					1	RRUS-32 B2	
RRH - AWS band (QTY/MODEL)			1	4426 B66			
RRH - WCS band (QTY/MODEL)					1	RRUS-32	
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Bronze Standard// LTE 6C AWSJ, LTE 7C B14, LTE 850 5G NR Upgrade. - Antennae and Radio as per PD- Replace LTE antenna with Hex port on pos2.- Add 2 Coax per sector- Add AWS 4426 B66 along with SA on Pos2.- Replace LTE 850 radio to 4478 along with SA on Pos4.- Move LTE 700 RRUS-11 Radio to Pos4.- Move LTE 700 RRUS-E2 to Pos1 UMTS Antenna, // Swap Diplexers with Triplexers.- Replace diplexers with Quadplexers and TMAs with Twin TMA- Swap DUS to 5216's- Add IDLe- Add 6630						
Local Market Note 2	Busy Sector B.Sector A and C will share the B14 Radio. Port 1 & 2 will be used for sector A AND port 3 & 4 to be used for sector C.						
Local Market Note 3	5216-XMU-5216-XMU-IDLe+ 6630						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	60443.C.850.3G.1		CTV51763	CTV51763		UMTS 850	7770.00.850.10	13.5	270	10	None	1 - 5/8 Coax	170.04					259.42			17	
	PORT 2	60443.C.700.4G.3		CTL00876_7C_2_E	CTL00876_7C_2_E		LTE 700	7770.00.700.3	13.5	270	3	None	1 - 5/8 Coax	170.04					1475.7065			17	
ANTENNA POSITION 2	PORT 1	60443.C.700.4G.4		CTL00876_7C_3_F	CTL00876_7C_3_F		LTE 700	HPA65R-BU6A_770MHz_08DT	14.1	270	8	Bottom	1 - 5/8 Coax	170.04					2951.413			19	
	PORT 3	60443.C.AWS.4G.4		CTL00876_2C_2	CTL00876_2C_2		LTE AWS	HPA65R-BU6A_2170MHz_07D	17.9	270	7	Bottom	1 - 5/8 Coax	170.04					5070.2572			20	

							T																				
ANTENNA POSITION 4	PORT 1	60443.C.850.4G.2		CTL00876_8C_1	CTL00876_8C_1		LTE 850	QS66512-2_850MHz_08DT	13.4	270	8	Bottom	1 - 5/8 Coax	170.04								1000		23			
	PORT 2	60443.C.700.4G.1		CTL05176_7C_1	CTL05176_7C_1		LTE 700	QS66512-2_722MHz_08DT	13.1	270	8	Bottom	1 - 5/8 Coax	170.04									1475.7065		23		
	PORT 3	60443.C.WCS.4G.1		CTL05176_3C_1	CTL05176_3C_1		LTE WCS	QS66512-2_2355MHz_02DT	16.8	270	2	BOTTOM	1 - 5/8 Coax	170.04									1285.2866		24		
	PORT 4	60443.C.1900.4G.1		CTL05176_9C_1	CTL05176_9C_1		LTE 1900	QS66512-2_1930MHz_07DT	15.9	270	7	Bottom	1 - 5/8 Coax	170.04									4842.058		24		
	PORT 5	60443.C.850.5G.tmp1		CTCN005176_N005C_1	CTCN005176_N005C_1		5G 850	QS66512-2_850MHz_08DT	13.4	270	8	Bottom	1 - 5/8 Coax	170.04										1000		23	
	PORT 7	60443.C.1900.4G.2		CTL05176_9C_2	CTL05176_9C_2		LTE 1900	QS66512-2_1930MHz_07DT	15.9	270	7	Bottom	1 - 5/8 Coax	170.04										4842.058		24	







## NOTES

Date Time (Eastern)	Version	ATTUID	Note
6/13/2018 2:42:11 PM	2.00	om636a	RFDS VERSION incremented.
7/17/2018 5:06:24 PM	3.00	mm093q	RFDS VERSION incremented.
7/17/2018 6:33:06 PM	3.00	mm093q	Updated RFDS to add B14 job as 2T2R, updated Sec 16/17, SOW and PD.
8/14/2018 3:32:14 PM	4.00	mh705r	RFDS VERSION incremented.
8/14/2018 3:37:36 PM	4.00	mh705r	RFDS updated for demotion comments to correct Quadplexer model, B14 RRH info and LM3 notes.
1/22/2019 11:01:50 AM	5.00	mh705r	RFDS VERSION incremented.



WORKFLOW SUMMARY

Date	FROM State / Status	FROM ATTUID	TO State / Status	TO ATTUID	Operation	Comments	PACE Status
05/09/2018	Preliminary In Progress	om636a	Preliminary Submitted for Approval	RC475S	Promote	LTE Preliminary RFDS	NER-RCTB-18-03328 MRCTB032343 SUCCESS 05/09/2018 7:05:17 PM NER-RCTB-18-02487 MRCTB032344 SUCCESS 05/09/2018 7:05:17 PM NER-RCTB-18-03378 MRCTB032332 SUCCESS 05/09/2018 7:05:17 PM
05/14/2018	Preliminary Submitted for Approval	RC475S	Preliminary Approved	JK0520	Promote		
05/17/2018	Preliminary Approved	JK0520	Preliminary Approved	CP140C	Reassign	Successfully Reassigned	
06/13/2018	Preliminary Approved	CP140C	Preliminary In Progress	om636a	Pull Back	To update LBC information	
06/13/2018	Preliminary In Progress	om636a	Preliminary Submitted for Approval	RC475S	Promote	LTE Preliminary RFDS with LBC information updated	NER-RCTB-18-03328 FAILURE 06/13/2018 2:59:43 PM NER-RCTB-18-02487 FAILURE 06/13/2018 2:59:43 PM NER-RCTB-18-03378 FAILURE 06/13/2018 2:59:43 PM
06/14/2018	Preliminary Submitted for Approval	RC475S	Preliminary Approved	CP140C	Promote		
07/10/2018	Preliminary Approved	CP140C	Preliminary Modification Recommended	OM636A	Demote	Other:*Update the diplexer model pos 2, sections 16 and 17 *Section 16 needs to be updated to remove the WCS RRUs-32 *DP doesn't show frequencies *RFDS is missing band 14.	
07/16/2018	Preliminary Modification Recommended	OM636A	Preliminary Modification Recommended	MM093Q	Reassign	Successfully Reassigned	
07/17/2018	Preliminary Modification Recommended	MM093Q	Preliminary Submitted for Approval	RC475S	Promote	Updated RFDS to add B14 job as 2T2R, updated Sec 16/17, SOW and PD.	
07/18/2018	Preliminary Submitted for Approval	RC475S	Preliminary Approved	CP140C	Promote		
07/30/2018	Preliminary Approved	CP140C	Preliminary Modification Recommended	OM636A	Demote	Existing equipment configurations:*Update the diplexer model pos 2, sections 16 and 17 *Section 16 needs to be updated to remove the WCS RRUs-32 *DP doesn't show frequencies *RFDS is missing band 14	
07/31/2018	Preliminary Modification Recommended	OM636A	Preliminary Modification Recommended	RX855W	Reassign	Successfully Reassigned	
07/31/2018	Preliminary Modification Recommended	RX855W	Preliminary Submitted for Approval	RC475S	Promote	Demotion in error. RFDS already updated.	
08/01/2018	Preliminary Submitted for Approval	RC475S	Preliminary Approved	CP140C	Promote		
08/08/2018	Preliminary Approved	CP140C	Preliminary Modification Recommended	OM636A	Demote	Existing equipment configurations:*Update the diplexer model pos 2, sections 16 and 17 *Section 16 needs to be updated to remove the WCS RRUs-32 *DP doesn't show frequencies *RFDS is missing band 14	
08/13/2018	Preliminary Modification Recommended	OM636A	Preliminary Modification Recommended	MH705R	Reassign	Update RFDS as per RAN tracker and Demotion comments	
08/14/2018	Preliminary Modification Recommended	MH705R	Preliminary Submitted for Approval	RC475S	Promote	RFDS Updated for demotion comments except couldn't understand the comment "DP doesn't show freq" and Sec 16 doesn't have WCS info.	
08/15/2018	Preliminary Submitted for Approval	RC475S	Preliminary Approved	CP140C	Promote		
08/16/2018	Preliminary Approved	CP140C	Final RF Approval	OM636A	Promote	Sending to final:	
08/27/2018	Final RF Approval	OM636A	Final Approved	CP140C	Promote	Final approved RFDS	NER-RCTB-18-03328 FAILURE 08/27/2018 5:22:11 PM NER-RCTB-18-02487 FAILURE 08/27/2018 5:22:11 PM NER-RCTB-18-03378 FAILURE 08/27/2018 5:22:11 PM

08/30/2018	Final Approved	CP140C	Final Approved	KD602N	Reassign	Successfully Reassigned	
10/16/2018	Final Approved	KD602N	As Built In Progress	SP4408	Promote	sending to as built:	NER-RCTB-18-03328 MRCTB032343 SUCCESS 10/16/2018 1:24:14 PM NER-RCTB-18-02487 MRCTB032344 SUCCESS 10/16/2018 1:24:14 PM NER-RCTB-18-03378 MRCTB032332 SUCCESS 10/16/2018 1:24:14 PM
01/21/2019	As Built In Progress	SP4408	Final Modification Recommended	OM636A	Demote	Please update showing RRUS-E2 existing at pos 4.	
01/21/2019	Final Modification Recommended	OM636A	Final Modification Recommended	MH705R	Reassign	Update RFDS as per Demotion comments	
01/23/2019	Final Modification Recommended	MH705R	Final Approved	KD602N	Promote	LTE Final RFDS updated for 5G new soft sector IDs format and LTE 700 DE RRH is moved from Pos-4 to Pos-1 in SOW.	

**Report Date:** May 21, 2019

**Client:** Smartlink, LLC  
85 Rangeway Rd  
North Billerica, MA 01862-2105

**Utility Name:** Eversource  
**Structure:** Existing 140-ft Transmission Pole #10254  
**Line Reference:** Long Mountain - Plumtree - 345kV Line  
**Site Name:** AT&T – Bethel Stony Hill – AWS – CTL05176  
**Site Name:** Stony Hill - CTL05176  
**Site Address:** 7 Stony Hill Rd  
**City, County, State:** Bethel, Fairfield County, CT  
**Latitude,Longitude:** 41.415792, -73.401700

**PJF Project:** A80618-0011.002.6190\_R2

Paul J. Ford and Company is pleased to submit this "**Mount Modification Report**". The purpose of this analysis is to determine if the mount has sufficient capacity to support the proposed equipment described herein.

**Analysis Criteria:**

Reference Standard: 2018 Connecticut State Building Code with the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1.

Ultimate Wind Speed: 120 mph 3-second gust wind speed without ice  
Nominal Wind Speed: 93 mph 3-second gust wind speed without ice  
Ice Wind Speed: 50 mph 3-second gust wind speed with 0.75" ice  
IBC Site Criteria: Risk Category II, Topographic Category 1, Exposure Category C

**Proposed Appurtenance Loads:**

The mount was analyzed with the addition of the proposed appurtenance loads shown in Table 1 combined with the existing loads shown in Table 2 of this report.

**Summary of Analysis Results:**

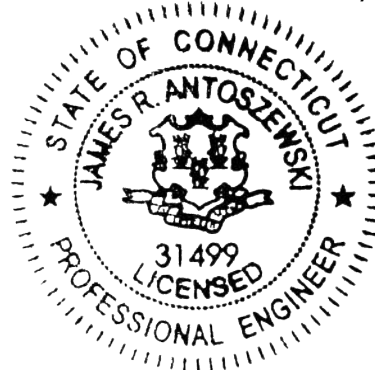
Existing Antenna Mount: **Pass @ 80.0%\***  
\*Sufficient upon completion of changes listed in the 'Recommendations' section of this report.

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and Smartlink, LLC. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully Submitted by:  
Paul J. Ford and Company

  
Charles E. Carrillo, P.E.  
Project Engineer  
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*CEC*



05/22/2019

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## 1) INTRODUCTION

This tower is a 140 ft transmission pole with an existing mount at the 145.0-ft centerline.

## 2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon a nominal 3-second gust wind speed of 93 mph per section 1609.3.1 as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

**Table 1 – Proposed Antenna Information**

Mounting Level (feet)	Center Line Elevation (feet)	Number of Antennas	Antenna Manufacturer	Antenna Model	Note
145.0	147.0	1	SitePro1	HRK12 (Assembly)	-
	145.0	3	CCI	HPA65R-BU6A (Antenna)	-
		6	CCI	TMABPD7823VG12A (TMA)	

Notes:

- 1) Proposed equipment

**Table 2 – Existing Antenna Information**

Mounting Level (feet)	Center Line Elevation (feet)	Number of Antennas	Antenna Manufacturer	Antenna Model	Note
145.0	145.0	3	Powerwave	7770 (Antenna)	1
		6	Powerwave	LGP 21401 (TMA)	
		3	Powerwave	P65-16-XLH-RR (Antenna)	2
		3	CCI	DTMABP7819VG12A (TMA)	
		3	Quintel	QS665112-2 (Antenna)	1
		6	Kaelus	TMA2117F00V1-1 (TMA)	
		1	SitePro1	RMV12-372 (Triple T-Arm)	3

Notes:

- 1) Existing equipment
- 2) Equipment to be removed and not considered in this analysis
- 3) To be relocated from elevation of 145' to elevation of 143'

### 3) ANALYSIS PROCEDURE

**Table 3 – Documents Provided**

Document	Remarks	Reference	Source
Mount Drawings	SitePro1, 07/13/2014	HRK12	Eversource
Site Photos	-	-	
RF Data Sheet	AT&T V5.0, 01/23/2019	Bethel Stony Hill AWS	AT&T
Previous Mount Analysis	PJF, 11/20/2018	80618-0011.001.6190	PJF
	PJF, 03/11/2019	80618-0011.001.6190_R1	
Mount Modification Drawings	PJF, 05/21/2019	80618-0011.002.6190_R2	

#### 3.1) Analysis Method

RISA-3D (version 15.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the mount and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

#### 3.2) Assumptions

- 1) *The analysis of the existing transmission pole or the effect of the mount attachment to the tower is not within the current scope of work.*
- 2) *The antenna mounting system was properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer’s specifications and all bolts are tightened as specified by the manufacturer and AISC requirements.*
- 3) *The configuration of antennas, mounts, and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.*
- 4) *All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.*
- 5) *This analysis will be required to be revised if the existing conditions in the field differ from those shown in the above referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.*
- 6) *Steel grades have been assumed as follows:*
  - a) *Channel, Solid Round, Angle, Plate, Unistrut*      *ASTM A36 (GR 36)*
  - b) *Pipe*      *ASTM A53 (GR 35)*
  - c) *HSS (Rectangular)*      *ASTM 500 (GR B-46)*
  - d) *Connection Bolts*      *ASTM A325*
- 7) *This analysis was performed based on manufacturer’s drawings and existing photos.*

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

#### 4) ANALYSIS RESULTS

**Table 4 – Mount Component Stresses vs. Capacity**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Mount Pipes	145.0	80.0	Pass
1	Face Horizontal		63.6	Pass
1	Standoff		53.0	Pass
1	Handrail		41.4	Pass

<b>Structural Rating (max from all components) =</b>	<b>80.0%</b>
------------------------------------------------------	--------------

Notes:

1. See additional documentation in "Appendix A – RISA 3D Output" for calculations supporting the % capacity consumed.

#### 4.1) Recommendations

- Install the proposed modifications referenced in Table 3 of this report.

#### 5) CONCLUSION

The mount will have sufficient capacity to carry the proposed loading configuration once the recommendations are met and properly installed.

This analysis is presented based upon the assumptions listed herein and information provided by the wireless carrier. If the existing conditions are different than those presented here, Paul J. Ford and Company should be contacted to verify the validity of the conclusions presented here.

**STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING MOUNTS BY PAUL J. FORD AND COMPANY**

- 1) It is the responsibility of the client to ensure that the information provided to Paul J. Ford and Company is accurate and complete. Paul J. Ford and Company will rely on the accuracy and completeness of such information in performing or furnishing services under this project.
- 2) If the existing conditions are not as represented on the referenced drawings and/or documents, Paul J. Ford and Company should be contacted immediately to evaluate the significance of the deviation.
- 3) The mount has been analyzed according to the minimum design loads recommended by the Reference Standard. If additional design loads are required, Paul J. Ford and Company should be made aware of this prior to the start of the project.
- 4) The standard of care for all Professional Engineering Services performed or furnished by Paul J. Ford and Company under this project will be the skill and care used by members of the Consultant's profession practicing under similar circumstances at the same time and in the same locality.
- 5) All Services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Paul J. Ford and Company is not responsible for the conclusions, opinions and/or recommendations made by others based on the information supplied herein.

\*\*\*\*\*



# **APPENDIX A**

## **LOAD CALCULATIONS**

## Equipment Loads - TIA-222-G Calculations

### Design Data as per TIA-222-G

Wind Speed w/o Ice:	$V := 93$	mph	User Input - See 2018 CT State Building Code - Appendix N
Wind Speed w/ Ice:	$V_i := 50$	mph	User Input - See Annex B of TIA-222-G
Radial Ice Thickness:	$t_i := 0.75$	in	User Input - See Annex B of TIA-222-G
Radial Ice Density:	$I_d := 57$	pcf	User Input - See Annex B of TIA-222-G
Height to Center of Antennas:	$z_{carrier\_1} := 145$	ft	User Input
Structure Type:	$ST :=$ "Pole"		User Input
Structure Class:	$SC :=$ "III"		User Input - Table 2-1 - TIA-222-G
Exposure Category:	$Exp :=$ "C"		User Input - Section 2.6.5.1 - TIA-222-G
Wind Direction Probability Factor:	$K_d := 0.95$		User Input - Table 2-2 - TIA-222-G
Importance Factor, Wind:	$I_{wind} := 1.15$		User Input - Table 2-3 - TIA-222-G
Importance Factor, Ice:	$I_{ice} := 1.25$		User Input - Table 2-3 - TIA-222-G
Importance Factor, Ice With Wind:	$I_{iceWind} := 1$		User Input - Table 2-3 - TIA-222-G
Exposure Category Coefficient:	$Z_g := 900$	ft	User Input - Table 2-4 - TIA-222-G
Exposure Category Coefficient:	$\alpha := 9.5$		User Input - Table 2-4 - TIA-222-G
Gust Response Factor:	$G_H := 1$		
Velocity Pressure Coefficient:	$K_{z_{carrier\_1}} := 2.01 \left( \frac{z_{carrier\_1}}{Z_g} \right)^{\frac{2}{\alpha}} = 1.37$		Section 2.6.5.2 - TIA-222-G
	$K_{zt} := 1.0$		Section 2.6.6.4 - TIA-222-G
Velocity Pressure w/o Ice:	$q_{z_{carrier\_1}} := 0.00256 \cdot K_d \cdot K_{z_{carrier\_1}} \cdot K_{zt} \cdot V^2 \cdot I_{wind} \cdot psf = 33.11$		psf
Velocity Pressure w/ Ice:	$q_{z_{ice\_carrier\_1}} := 0.00256 \cdot K_d \cdot K_{z_{carrier\_1}} \cdot K_{zt} \cdot V_i^2 \cdot I_{iceWind} \cdot psf = 8.32$		psf
Height Escalation Factor for Ice Thickness:	$K_{iz} := \left( \frac{z_{carrier\_1}}{33 \text{ ft}} \right)^{0.1} = 1.16$		
Factored Ice Thickness:	$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.17$		in Section 2.6.8 - TIA-222-G

## Standard Equipment Calculations - Equipment 1 (Front Wind)

### Equipment Properties

Antenna Carrier:	<b>AT&amp;T</b>	User Defined
Equipment Model:	<b>Proposed Antenna CCI - HPA65R-BU6A</b>	User Defined
Equipment Shape:	<b>Flat</b>	User Defined
Equipment Height:	$L_{eq\_1} := 71.1 \cdot in$	User Defined
Equipment Width:	$W_{eq\_1} := 11.7 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_1} := 7.6 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_1} := 41.9 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_1} := L_{eq\_1} \cdot W_{eq\_1} \cdot D_{eq\_1} = 3.66 \cdot ft^3$	
Equipment Quantity:	$N_{eq\_1} := 1$	User Defined
Equipment Aspect Ratio:	$Ar_{eq\_1} := \frac{L_{eq\_1}}{W_{eq\_1}} = 6.08$	
Mast Force Coefficient:	$Ca_{eq\_1} := 1.2 + \frac{(Ar_{eq\_1} - 2.5)}{4.5} \cdot 0.2 = 1.36$	As per Table 2-8 ( <b>Flat</b> ) - TIA-222-G

### Equipment Wind Loads

Equipment Projected Area:	$SA_{eq\_1} := L_{eq\_1} \cdot W_{eq\_1} = 5.78 \cdot ft^2$	
Equipment Wind Force (All):	$F_{eq\_1} := qz_{carrier\_1} \cdot G_H \cdot Ca_{eq\_1} \cdot SA_{eq\_1} \cdot N_{eq\_1} = 260 \cdot lbf$	<b>BLC 7</b> Member Point Load

### Equipment Wind Loads (w/ Ice)

Equipment Projected Area (w/ Ice):	$A_{ice_{eq\_1}} := (L_{eq\_1} + 2 \cdot tiz) \cdot (W_{eq\_1} + 2 \cdot tiz) = 8 \cdot ft^2$	
Equipment Wind Force (w/ Ice) (All):	$Fi_{eq\_1} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{eq\_1} \cdot A_{ice_{eq\_1}} \cdot N_{eq\_1} = 95 \cdot lbf$	<b>BLC 5</b> Member Point Load

### Equipment Vertical Loads

Weight of Equipment (All):	$WT_{eq\_1} \cdot N_{eq\_1} = 41.9 \cdot lbf$	<b>BLC 2</b> Member Point Load
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### Equipment Vertical Loads (Ice Only)

Volume of Ice on Equipment:	$V_{ice_{eq\_1}} := (L_{eq\_1} + 2 \cdot tiz) \cdot (W_{eq\_1} + 2 \cdot tiz) \cdot (D_{eq\_1} + 2 \cdot tiz) - V_{eq\_1} = 4.71 \cdot ft^3$	
Weight of Ice on Equipment (All):	$WT_{ice_{eq\_1}} := V_{ice_{eq\_1}} \cdot Id \cdot N_{eq\_1} = 269 \cdot lbf$	<b>BLC 3</b> Member Point Load

## Standard Equipment Calculations - Equipment 1 (Side Wind)

### Equipment Properties

Antenna Carrier:	AT&T	User Defined
Equipment Model:	Proposed Antenna CCI - HPA65R-BU6A	User Defined
Equipment Shape:	Flat	User Defined
Equipment Height:	$L_{eq\_1} := 71.1 \cdot in$	User Defined
Equipment Width:	$W_{eq\_1} := 11.7 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_1} := 7.6 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_1} := 41.9 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_1} := L_{eq\_1} \cdot W_{eq\_1} \cdot D_{eq\_1} = 3.66 \cdot ft^3$	
Equipment Quantity:	$N_{eq\_1} := 1$	User Defined
Equipment Aspect Ratio:	$Ar_{eq\_1} := \frac{L_{eq\_1}}{D_{eq\_1}} = 9.36$	
Mast Force Coefficient:	$Ca_{eq\_1} := 1.4 + \frac{(Ar_{eq\_1} - 7)}{18} \cdot 0.6 = 1.48$	As per Table 2-8 (Flat) - TIA-222-G

### Equipment Wind Loads

Equipment Projected Area:	$SA_{eq\_1} := L_{eq\_1} \cdot D_{eq\_1} = 3.75 \cdot ft^2$	
Equipment Wind Force (All):	$F_{eq\_1} := qz_{carrier\_1} \cdot G_H \cdot Ca_{eq\_1} \cdot SA_{eq\_1} \cdot N_{eq\_1} = 184 \cdot lbf$	<b>BLC 6</b> Member Point Load

### Equipment Wind Loads (w/ Ice)

Equipment Projected Area (w/ Ice):	$A_{ice_{eq\_1}} := (L_{eq\_1} + 2 \cdot tiz) \cdot (D_{eq\_1} + 2 \cdot tiz) = 6 \cdot ft^2$	
Equipment Wind Force (w/ Ice) (All):	$Fi_{eq\_1} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{eq\_1} \cdot A_{ice_{eq\_1}} \cdot N_{eq\_1} = 77 \cdot lbf$	<b>BLC 4</b> Member Point Load

### Equipment Vertical Loads

Weight of Equipment (All):	$WT_{eq\_1} \cdot N_{eq\_1} = 41.9 \cdot lbf$	<b>BLC 2</b> Member Point Load
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## Standard Equipment Calculations - Equipment 2 (Front Wind)

### Equipment Properties

Antenna Carrier:	AT&T	User Defined
Equipment Model:	Proposed TMA CCI - TMABPD7823VG12A	User Defined
Equipment Shape:	Flat	User Defined
Equipment Height:	$L_{eq\_2} := 10.63 \cdot in$	User Defined
Equipment Width:	$W_{eq\_2} := 11.04 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_2} := 3.75 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_2} := 25 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_2} := L_{eq\_2} \cdot W_{eq\_2} \cdot D_{eq\_2} = 0.25 \cdot ft^3$	
Equipment Quantity:	$N_{eq\_2} := 2$	User Defined
Equipment Aspect Ratio:	$Ar_{eq\_2} := \frac{L_{eq\_2}}{W_{eq\_2}} = 0.96$	
Mast Force Coefficient:	$Ca_{eq\_2} := 1.2$	As per Table 2-8 (Flat) - TIA-222-G

### Equipment Wind Loads

Equipment Projected Area:	$SA_{eq\_2} := L_{eq\_2} \cdot W_{eq\_2} = 0.81 \cdot ft^2$	
Equipment Wind Force (All):	$F_{eq\_2} := qz_{carrier\_1} \cdot G_H \cdot Ca_{eq\_2} \cdot SA_{eq\_2} \cdot N_{eq\_2} = 65 \cdot lbf$	<b>BLC 7</b> Member Point Load

### Equipment Wind Loads (w/ Ice)

Equipment Projected Area (w/ Ice):	$A_{ice_{eq\_2}} := (L_{eq\_2} + 2 \cdot tiz) \cdot (W_{eq\_2} + 2 \cdot tiz) = 2 \cdot ft^2$	
Equipment Wind Force (w/ Ice) (All):	$Fi_{eq\_2} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{eq\_2} \cdot A_{ice_{eq\_2}} \cdot N_{eq\_2} = 32 \cdot lbf$	<b>BLC 5</b> Member Point Load

### Equipment Vertical Loads

Weight of Equipment (All):	$WT_{eq\_2} \cdot N_{eq\_2} = 50 \cdot lbf$	<b>BLC 2</b> Member Point Load
----------------------------	---------------------------------------------	-----------------------------------

### Equipment Vertical Loads (Ice Only)

Volume of Ice on Equipment:	$V_{ice_{eq\_2}} := (L_{eq\_2} + 2 \cdot tiz) \cdot (W_{eq\_2} + 2 \cdot tiz) \cdot (D_{eq\_2} + 2 \cdot tiz) - V_{eq\_2} = 0.83 \cdot ft^3$	
Weight of Ice on Equipment (All):	$WT_{ice_{eq\_2}} := V_{ice_{eq\_2}} \cdot Id \cdot N_{eq\_2} = 94 \cdot lbf$	<b>BLC 3</b> Member Point Load

## Standard Equipment Calculations - Equipment 2 (Side Wind)

### Equipment Properties

Antenna Carrier:	<b>AT&amp;T</b>	User Defined
Equipment Model:	<b>Proposed TMA CCI - TMABPD7823VG12A</b>	User Defined
Equipment Shape:	<b>Flat</b>	User Defined
Equipment Height:	$L_{eq\_2} := 10.63 \cdot in$	User Defined
Equipment Width:	$W_{eq\_2} := 11.04 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_2} := 3.75 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_2} := 25 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_2} := L_{eq\_2} \cdot W_{eq\_2} \cdot D_{eq\_2} = 0.25 \cdot ft^3$	
Equipment Quantity:	$N_{eq\_2} := 2$	User Defined
Equipment Aspect Ratio:	$Ar_{eq\_2} := \frac{L_{eq\_2}}{D_{eq\_2}} = 2.83$	
Mast Force Coefficient:	$Ca_{eq\_2} := 1.2 + \frac{(Ar_{eq\_2} - 2.5)}{4.5} \cdot 0.2 = 1.21$	As per Table 2-8 ( <b>Flat</b> ) - TIA-222-G

### Equipment Wind Loads

Equipment Projected Area:	$SA_{eq\_2} := L_{eq\_2} \cdot D_{eq\_2} = 0.28 \cdot ft^2$	
Equipment Wind Force (All):	$F_{eq\_2} := qz_{carrier\_1} \cdot G_H \cdot Ca_{eq\_2} \cdot SA_{eq\_2} \cdot N_{eq\_2} = 22 \cdot lbf$	<b>BLC 6</b> Member Point Load

### Equipment Wind Loads (w/ Ice)

Equipment Projected Area (w/ Ice):	$A_{ice_{eq\_2}} := (L_{eq\_2} + 2 \cdot tiz) \cdot (D_{eq\_2} + 2 \cdot tiz) = 1 \cdot ft^2$	
Equipment Wind Force (w/ Ice) (All):	$Fi_{eq\_2} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{eq\_2} \cdot A_{ice_{eq\_2}} \cdot N_{eq\_2} = 17 \cdot lbf$	<b>BLC 4</b> Member Point Load

### Equipment Vertical Loads

Weight of Equipment (All):	$WT_{eq\_2} \cdot N_{eq\_2} = 50 \cdot lbf$	<b>BLC 2</b> Member Point Load
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## Standard Equipment Calculations - Equipment 3 (Front Wind)

### Equipment Properties

Antenna Carrier:	<b>AT&amp;T</b>	User Defined
Equipment Model:	<b>Existing Antenna Powerwave 7770</b>	User Defined
Equipment Shape:	<b>Flat</b>	User Defined
Equipment Height:	$L_{eq\_3} := 55 \cdot in$	User Defined
Equipment Width:	$W_{eq\_3} := 11 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_3} := 5 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_3} := 35 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_3} := L_{eq\_3} \cdot W_{eq\_3} \cdot D_{eq\_3} = 1.75 \cdot ft^3$	
Equipment Quantity:	$N_{eq\_3} := 1$	User Defined
Equipment Aspect Ratio:	$Ar_{eq\_3} := \frac{L_{eq\_3}}{W_{eq\_3}} = 5$	
Mast Force Coefficient:	$Ca_{eq\_3} := 1.2 + \frac{(Ar_{eq\_3} - 2.5)}{4.5} \cdot 0.2 = 1.31$	As per Table 2-8 ( <b>Flat</b> ) - TIA-222-G

### Equipment Wind Loads

Equipment Projected Area:	$SA_{eq\_3} := L_{eq\_3} \cdot W_{eq\_3} = 4.2 \cdot ft^2$	
Equipment Wind Force (All):	$F_{eq\_3} := qz_{carrier\_1} \cdot G_H \cdot Ca_{eq\_3} \cdot SA_{eq\_3} \cdot N_{eq\_3} = 182 \cdot lbf$	<b>BLC 7</b> Member Point Load

### Equipment Wind Loads (w/ Ice)

Equipment Projected Area (w/ Ice):	$A_{ice_{eq\_3}} := (L_{eq\_3} + 2 \cdot tiz) \cdot (W_{eq\_3} + 2 \cdot tiz) = 6 \cdot ft^2$	
Equipment Wind Force (w/ Ice) (All):	$Fi_{eq\_3} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{eq\_3} \cdot A_{ice_{eq\_3}} \cdot N_{eq\_3} = 69 \cdot lbf$	<b>BLC 5</b> Member Point Load

### Equipment Vertical Loads

Weight of Equipment (All):	$WT_{eq\_3} \cdot N_{eq\_3} = 35 \cdot lbf$	<b>BLC 2</b> Member Point Load
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### Equipment Vertical Loads (Ice Only)

Volume of Ice on Equipment:	$V_{ice_{eq\_3}} := (L_{eq\_3} + 2 \cdot tiz) \cdot (W_{eq\_3} + 2 \cdot tiz) \cdot (D_{eq\_3} + 2 \cdot tiz) - V_{eq\_3} = 3.18 \cdot ft^3$	
Weight of Ice on Equipment (All):	$WT_{ice_{eq\_3}} := V_{ice_{eq\_3}} \cdot Id \cdot N_{eq\_3} = 181 \cdot lbf$	<b>BLC 3</b> Member Point Load

## Standard Equipment Calculations - Equipment 3 (Side Wind)

### Equipment Properties

Antenna Carrier:	AT&T	User Defined
Equipment Model:	Existing Antenna Powerwave 7770	User Defined
Equipment Shape:	Flat	User Defined
Equipment Height:	$L_{eq\_3} := 55 \cdot in$	User Defined
Equipment Width:	$W_{eq\_3} := 11 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_3} := 5 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_3} := 35 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_3} := L_{eq\_3} \cdot W_{eq\_3} \cdot D_{eq\_3} = 1.75 \cdot ft^3$	
Equipment Quantity:	$N_{eq\_3} := 1$	User Defined
Equipment Aspect Ratio:	$Ar_{eq\_3} := \frac{L_{eq\_3}}{D_{eq\_3}} = 11$	
Mast Force Coefficient:	$Ca_{eq\_3} := 1.4 + \frac{(Ar_{eq\_3} - 7)}{18} \cdot 0.6 = 1.53$	As per Table 2-8 (Flat) - TIA-222-G

### Equipment Wind Loads

Equipment Projected Area:	$SA_{eq\_3} := L_{eq\_3} \cdot D_{eq\_3} = 1.91 \cdot ft^2$	
Equipment Wind Force (All):	$F_{eq\_3} := qz_{carrier\_1} \cdot G_H \cdot Ca_{eq\_3} \cdot SA_{eq\_3} \cdot N_{eq\_3} = 97 \cdot lbf$	<b>BLC 6</b> Member Point Load

### Equipment Wind Loads (w/ Ice)

Equipment Projected Area (w/ Ice):	$A_{ice_{eq\_3}} := (L_{eq\_3} + 2 \cdot tiz) \cdot (D_{eq\_3} + 2 \cdot tiz) = 4 \cdot ft^2$	
Equipment Wind Force (w/ Ice) (All):	$Fi_{eq\_3} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{eq\_3} \cdot A_{ice_{eq\_3}} \cdot N_{eq\_3} = 49 \cdot lbf$	<b>BLC 4</b> Member Point Load

### Equipment Vertical Loads

Weight of Equipment (All):	$WT_{eq\_3} \cdot N_{eq\_3} = 35 \cdot lbf$	<b>BLC 2</b> Member Point Load
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## Standard Equipment Calculations - Equipment 4 (Front Wind)

### Equipment Properties

Antenna Carrier:	AT&T	User Defined
Equipment Model:	Existing TMA Powerwave LGP 21401	User Defined
Equipment Shape:	Flat	User Defined
Equipment Height:	$L_{eq\_4} := 14.4 \cdot in$	User Defined
Equipment Width:	$W_{eq\_4} := 9.2 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_4} := 2.6 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_4} := 14.1 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_4} := L_{eq\_4} \cdot W_{eq\_4} \cdot D_{eq\_4} = 0.2 \cdot ft^3$	
Equipment Quantity:	$N_{eq\_4} := 2$	User Defined
Equipment Aspect Ratio:	$Ar_{eq\_4} := \frac{L_{eq\_4}}{W_{eq\_4}} = 1.57$	
Mast Force Coefficient:	$Ca_{eq\_4} := 1.2$	As per Table 2-8 (Flat) - TIA-222-G

### Equipment Wind Loads

Equipment Projected Area:	$SA_{eq\_4} := L_{eq\_4} \cdot W_{eq\_4} = 0.92 \cdot ft^2$	
Equipment Wind Force (All):	$F_{i_{eq\_2}} := qz_{carrier\_1} \cdot G_H \cdot Ca_{eq\_4} \cdot SA_{eq\_4} \cdot N_{eq\_4} = 73 \cdot lbf$	<b>BLC 7</b> Member Point Load

### Equipment Wind Loads (w/ Ice)

Equipment Projected Area (w/ Ice):	$A_{ice_{eq\_4}} := (L_{eq\_4} + 2 \cdot tiz) \cdot (W_{eq\_4} + 2 \cdot tiz) = 2 \cdot ft^2$	
Equipment Wind Force (w/ Ice) (All):	$F_{i_{eq\_2}} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{eq\_4} \cdot A_{ice_{eq\_4}} \cdot N_{eq\_4} = 35 \cdot lbf$	<b>BLC 5</b> Member Point Load

### Equipment Vertical Loads

Weight of Equipment (All):	$WT_{eq\_4} \cdot N_{eq\_4} = 28.2 \cdot lbf$	<b>BLC 2</b> Member Point Load
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### Equipment Vertical Loads (Ice Only)

Volume of Ice on Equipment:	$V_{ice_{eq\_4}} := (L_{eq\_4} + 2 \cdot tiz) \cdot (W_{eq\_4} + 2 \cdot tiz) \cdot (D_{eq\_4} + 2 \cdot tiz) - V_{eq\_4} = 0.82 \cdot ft^3$	
Weight of Ice on Equipment (All):	$WT_{ice_{eq\_4}} := V_{ice_{eq\_4}} \cdot Id \cdot N_{eq\_4} = 94 \cdot lbf$	<b>BLC 3</b> Member Point Load

## Standard Equipment Calculations - Equipment 4 (Side Wind)

## Standard Equipment Calculations - Equipment 4 (Side Wind)

### Equipment Properties

Antenna Carrier:	AT&T	User Defined
Equipment Model:	Existing TMA Powerwave LGP 21401	User Defined
Equipment Shape:	Flat	User Defined
Equipment Height:	$L_{eq\_4} := 14.4 \cdot in$	User Defined
Equipment Width:	$W_{eq\_4} := 9.2 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_4} := 2.6 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_4} := 14.1 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_4} := L_{eq\_4} \cdot W_{eq\_4} \cdot D_{eq\_4} = 0.2 \cdot ft^3$	
Equipment Quantity:	$N_{eq\_4} := 2$	User Defined
Equipment Aspect Ratio:	$Ar_{eq\_4} := \frac{L_{eq\_4}}{D_{eq\_4}} = 5.54$	
Mast Force Coefficient:	$Ca_{eq\_4} := 1.2$	As per Table 2-8 (Flat) - TIA-222-G

### Equipment Wind Loads

Equipment Projected Area:	$SA_{eq\_4} := L_{eq\_4} \cdot D_{eq\_4} = 0.26 \cdot ft^2$	
Equipment Wind Force (All):	$F_{eq\_2} := qz_{carrier\_1} \cdot G_H \cdot Ca_{eq\_4} \cdot SA_{eq\_4} \cdot N_{eq\_4} = 21 \cdot lbf$	<b>BLC 6</b> Member Point Load

### Equipment Wind Loads (w/ Ice)

Equipment Projected Area (w/ Ice):	$A_{ice_{eq\_4}} := (L_{eq\_4} + 2 \cdot tiz) \cdot (D_{eq\_4} + 2 \cdot tiz) = 1 \cdot ft^2$	
Equipment Wind Force (w/ Ice) (All):	$Fi_{eq\_2} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{eq\_4} \cdot A_{ice_{eq\_4}} \cdot N_{eq\_4} = 18 \cdot lbf$	<b>BLC 4</b> Member Point Load

### Equipment Vertical Loads

Weight of Equipment (All):	$WT_{eq\_4} \cdot N_{eq\_4} = 28.2 \cdot lbf$	<b>BLC 2</b> Member Point Load
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## Standard Equipment Calculations - Equipment 5 (Front Wind)

### Equipment Properties

Antenna Carrier:	<b>AT&amp;T</b>	User Defined
Equipment Model:	<b>Existing Antenna Quintel QS66512-2</b>	User Defined
Equipment Shape:	<b>Flat</b>	User Defined
Equipment Height:	$L_{eq\_5} := 72 \cdot in$	User Defined
Equipment Width:	$W_{eq\_5} := 12 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_5} := 9.6 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_5} := 111 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_5} := L_{eq\_5} \cdot W_{eq\_5} \cdot D_{eq\_5} = 4.8 \cdot ft^3$	
Equipment Quantity:	$N_{eq\_5} := 1$	User Defined
Equipment Aspect Ratio:	$Ar_{eq\_5} := \frac{L_{eq\_5}}{W_{eq\_5}} = 6$	
Mast Force Coefficient:	$Ca_{eq\_5} := 1.2 + \frac{(Ar_{eq\_5} - 2.5)}{4.5} \cdot 0.2 = 1.36$	As per Table 2-8 ( <b>Flat</b> ) - TIA-222-G

### Equipment Wind Loads

Equipment Projected Area:	$SA_{eq\_5} := L_{eq\_5} \cdot W_{eq\_5} = 6 \cdot ft^2$	
Equipment Wind Force (All):	$F_{eq\_5} := qz_{carrier\_1} \cdot G_H \cdot Ca_{eq\_5} \cdot SA_{eq\_5} \cdot N_{eq\_5} = 269 \cdot lbf$	<b>BLC 7</b> Member Point Load

### Equipment Wind Loads (w/ Ice)

Equipment Projected Area (w/ Ice):	$A_{ice_{eq\_5}} := (L_{eq\_5} + 2 \cdot tiz) \cdot (W_{eq\_5} + 2 \cdot tiz) = 9 \cdot ft^2$	
Equipment Wind Force (w/ Ice) (All):	$Fi_{eq\_5} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{eq\_5} \cdot A_{ice_{eq\_5}} \cdot N_{eq\_5} = 98 \cdot lbf$	<b>BLC 5</b> Member Point Load

### Equipment Vertical Loads

Weight of Equipment (All):	$WT_{eq\_5} \cdot N_{eq\_5} = 111 \cdot lbf$	<b>BLC 2</b> Member Point Load
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### Equipment Vertical Loads (Ice Only)

Volume of Ice on Equipment:	$V_{ice_{eq\_5}} := (L_{eq\_5} + 2 \cdot tiz) \cdot (W_{eq\_5} + 2 \cdot tiz) \cdot (D_{eq\_5} + 2 \cdot tiz) - V_{eq\_5} = 5.28 \cdot ft^3$	
Weight of Ice on Equipment (All):	$WT_{ice_{eq\_5}} := V_{ice_{eq\_5}} \cdot Id \cdot N_{eq\_5} = 301 \cdot lbf$	<b>BLC 3</b> Member Point Load

## Standard Equipment Calculations - Equipment 5 (Side Wind)

## Standard Equipment Calculations - Equipment 5 (Side Wind)

### Equipment Properties

Antenna Carrier:	<b>AT&amp;T</b>	User Defined
Equipment Model:	<b>Existing Antenna Quintel QS66512-2</b>	User Defined
Equipment Shape:	<b>Flat</b>	User Defined
Equipment Height:	$L_{eq\_5} := 72 \cdot in$	User Defined
Equipment Width:	$W_{eq\_5} := 12 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_5} := 9.6 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_5} := 111 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_5} := L_{eq\_5} \cdot W_{eq\_5} \cdot D_{eq\_5} = 4.8 \cdot ft^3$	
Equipment Quantity:	$N_{eq\_5} := 1$	User Defined
Equipment Aspect Ratio:	$Ar_{eq\_5} := \frac{L_{eq\_5}}{D_{eq\_5}} = 7.5$	
Mast Force Coefficient:	$Ca_{eq\_5} := 1.2 + \frac{(Ar_{eq\_5} - 2.5)}{4.5} \cdot 0.2 = 1.42$	As per Table 2-8 ( <b>Flat</b> ) - TIA-222-G

### Equipment Wind Loads

Equipment Projected Area:	$SA_{eq\_5} := L_{eq\_5} \cdot D_{eq\_5} = 4.8 \cdot ft^2$	
Equipment Wind Force (All):	$F_{eq\_5} := qz_{carrier\_1} \cdot G_H \cdot Ca_{eq\_5} \cdot SA_{eq\_5} \cdot N_{eq\_5} = 226 \cdot lbf$	<b>BLC 6</b> Member Point Load

### Equipment Wind Loads (w/ Ice)

Equipment Projected Area (w/ Ice):	$A_{ice_{eq\_5}} := (L_{eq\_5} + 2 \cdot tiz) \cdot (D_{eq\_5} + 2 \cdot tiz) = 7 \cdot ft^2$	
Equipment Wind Force (w/ Ice) (All):	$Fi_{eq\_5} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{eq\_5} \cdot A_{ice_{eq\_5}} \cdot N_{eq\_5} = 88 \cdot lbf$	<b>BLC 4</b> Member Point Load

### Equipment Vertical Loads

Weight of Equipment (All):	$WT_{eq\_5} \cdot N_{eq\_5} = 111 \cdot lbf$	<b>BLC 2</b> Member Point Load
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## Standard Equipment Calculations - Equipment 6 (Front Wind)

### Equipment Properties

Antenna Carrier:	AT&T	User Defined
Equipment Model:	Existing Antenna Kaelus TMA2117F00V1-1	User Defined
Equipment Shape:	Flat	User Defined
Equipment Height:	$L_{eq\_6} := 11.81 \cdot in$	User Defined
Equipment Width:	$W_{eq\_6} := 9.84 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_6} := 4.65 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_6} := 26 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_6} := L_{eq\_6} \cdot W_{eq\_6} \cdot D_{eq\_6} = 0.31 \cdot ft^3$	
Equipment Quantity:	$N_{eq\_6} := 2$	User Defined
Equipment Aspect Ratio:	$Ar_{eq\_6} := \frac{L_{eq\_6}}{W_{eq\_6}} = 1.2$	
Mast Force Coefficient:	$Ca_{eq\_6} := 1.2$	As per Table 2-8 (Flat) - TIA-222-G

### Equipment Wind Loads

Equipment Projected Area:	$SA_{eq\_6} := L_{eq\_6} \cdot W_{eq\_6} = 0.81 \cdot ft^2$	
Equipment Wind Force (All):	$F_{eq\_6} := qz_{carrier\_1} \cdot G_H \cdot Ca_{eq\_6} \cdot SA_{eq\_6} \cdot N_{eq\_6} = 64 \cdot lbf$	<b>BLC 7</b> Member Point Load

### Equipment Wind Loads (w/ Ice)

Equipment Projected Area (w/ Ice):	$A_{ice\_eq\_6} := (L_{eq\_6} + 2 \cdot tiz) \cdot (W_{eq\_6} + 2 \cdot tiz) = 2 \cdot ft^2$	
Equipment Wind Force (w/ Ice) (All):	$Fi_{eq\_6} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{eq\_6} \cdot A_{ice\_eq\_6} \cdot N_{eq\_6} = 32 \cdot lbf$	<b>BLC 5</b> Member Point Load

### Equipment Vertical Loads

Weight of Equipment (All):	$WT_{eq\_6} \cdot N_{eq\_6} = 52 \cdot lbf$	<b>BLC 2</b> Member Point Load
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### Equipment Vertical Loads (Ice Only)

Volume of Ice on Equipment:	$V_{ice\_eq\_6} := (L_{eq\_6} + 2 \cdot tiz) \cdot (W_{eq\_6} + 2 \cdot tiz) \cdot (D_{eq\_6} + 2 \cdot tiz) - V_{eq\_6} = 0.88 \cdot ft^3$	
Weight of Ice on Equipment (All):	$WT_{ice\_eq\_6} := V_{ice\_eq\_6} \cdot Id \cdot N_{eq\_6} = 100 \cdot lbf$	<b>BLC 3</b> Member Point Load

## Standard Equipment Calculations - Equipment 6 (Side Wind)

## Standard Equipment Calculations - Equipment 6 (Side Wind)

### Equipment Properties

Antenna Carrier:	AT&T	User Defined
Equipment Model:	Existing Antenna Kaelus TMA2117F00V1-1	User Defined
Equipment Shape:	Flat	User Defined
Equipment Height:	$L_{eq\_6} := 11.81 \cdot in$	User Defined
Equipment Width:	$W_{eq\_6} := 9.84 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_6} := 4.65 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_6} := 26 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_6} := L_{eq\_6} \cdot W_{eq\_6} \cdot D_{eq\_6} = 0.31 \cdot ft^3$	
Equipment Quantity:	$N_{eq\_6} := 2$	User Defined
Equipment Aspect Ratio:	$Ar_{eq\_6} := \frac{L_{eq\_6}}{D_{eq\_6}} = 2.54$	
Mast Force Coefficient:	$Ca_{eq\_6} := 1.2 + \frac{(Ar_{eq\_6} - 2.5)}{4.5} \cdot 0.2 = 1.2$	As per Table 2-8 (Flat) - TIA-222-G

### Equipment Wind Loads

Equipment Projected Area:	$SA_{eq\_6} := L_{eq\_6} \cdot D_{eq\_6} = 0.38 \cdot ft^2$	
Equipment Wind Force (All):	$F_{eq\_6} := qz_{carrier\_1} \cdot G_H \cdot Ca_{eq\_6} \cdot SA_{eq\_6} \cdot N_{eq\_6} = 30 \cdot lbf$	<b>BLC 6</b> Member Point Load

### Equipment Wind Loads (w/ Ice)

Equipment Projected Area (w/ Ice):	$A_{ice_{eq\_6}} := (L_{eq\_6} + 2 \cdot tiz) \cdot (D_{eq\_6} + 2 \cdot tiz) = 1 \cdot ft^2$	
Equipment Wind Force (w/ Ice) (All):	$Fi_{eq\_6} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{eq\_6} \cdot A_{ice_{eq\_6}} \cdot N_{eq\_6} = 20 \cdot lbf$	<b>BLC 4</b> Member Point Load

### Equipment Vertical Loads

Weight of Equipment (All):	$WT_{eq\_6} \cdot N_{eq\_6} = 52 \cdot lbf$	<b>BLC 2</b> Member Point Load
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## Standard Equipment Calculations - Mount Member 1 (Front/Side Wind)

### Pipe Properties

Antenna Carrier:	<b>AT&amp;T</b>	User Defined
Equipment Model:	<b>Mounting Pipes</b>	User Defined
Pipe Height:	$L_{pipe\_1} := 96 \cdot in$	User Defined
Pipe Diameter:	$W_{pipe\_1} := 2.375 \cdot in$	User Defined
Pipe Weight:	$WT_{pipe\_1} := 29.3 \cdot lbf$	User Defined
Pipe Volume:	$V_{pipe\_1} := L_{pipe\_1} \cdot \frac{(W_{pipe\_1})^2 \cdot \pi}{4} = 0.25 \cdot ft^3$	
Pipe Quantity:	$N_{pipe\_1} := 1$	User Defined
Pipe Aspect Ratio:	$Ar_{pipe\_1} := \frac{L_{pipe\_1}}{W_{pipe\_1}} = 40.42$	
Pipe Force Coefficient:	$Ca_{pipe\_1} := 1.2$	As per Table 2-8 (Round)-TIA-222-G

### Pipe Wind Loads

Pipe Projected Area:	$SA_{pipe\_1} := L_{pipe\_1} \cdot W_{pipe\_1} = 1.58 \cdot ft^2$	
Pipe Wind Force (All):	$F_{pipe\_1} := qz_{carrier\_1} \cdot G_H \cdot Ca_{pipe\_1} \cdot SA_{pipe\_1} = 63 \cdot lbf$	<b>BLC 6/7</b>
Pipe Wind Force (Distributed):	$\frac{F_{pipe\_1}}{L_{pipe\_1}} = 7.9 \cdot plf$	<b>BLC 6/7</b>

### Pipe Wind Loads (w/ Ice)

Pipe Projected Area (w/ Ice):	$A_{ice_{pipe\_1}} := (L_{pipe\_1} + 2 \cdot tiz) \cdot (W_{pipe\_1} + 2 \cdot tiz) = 4.69 \cdot ft^2$	
Pipe Wind Force (w/ Ice) (All):	$F_{i_{pipe\_1}} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{pipe\_1} \cdot A_{ice_{pipe\_1}} = 47 \cdot lbf$	<b>BLC 4/5</b>
Pipe Wind Force (w/ Ice) (Distributed):	$\frac{F_{i_{pipe\_1}}}{L_{pipe\_1}} = 5.8 \cdot plf$	<b>BLC 4/5</b>

### Pipe Vertical Loads

Weight of Pipe (All):	$WT_{pipe\_1} = 29 \cdot lbf$	<b>BLC 2</b>
Weight of Pipe (Distributed):	$\frac{WT_{pipe\_1}}{L_{pipe\_1}} = 3.7 \cdot plf$	<b>BLC 2</b>

### Pipe Vertical Loads (Ice Only)

Volume of Ice on Pipe:	$V_{ice_{pipe\_1}} := (L_{pipe\_1} + 2 \cdot tiz) \cdot \left( \frac{(W_{pipe\_1} + 2 \cdot tiz)^2 \cdot \pi}{4} \right) - V_{pipe\_1} = 1.82 \cdot ft^3$	
Weight of Ice on Pipe (All):	$WT_{ice_{pipe\_1}} := V_{ice_{pipe\_1}} \cdot Id = 103 \cdot lbf$	<b>BLC 3</b>
Weight of Ice on Pipe (Distributed):	$\frac{WT_{ice_{pipe\_1}}}{L_{pipe\_1}} = 12.9 \cdot plf$	<b>BLC 3</b>

## Standard Equipment Calculations - Mount Member 2 (Front/Side Wind)

### Pipe Properties

Antenna Carrier:	<b>AT&amp;T</b>	User Defined
Equipment Model:	<b>Pipe Boom</b>	User Defined
Pipe Height:	$L_{pipe\_2} := 150 \cdot in$	User Defined
Pipe Diameter:	$W_{pipe\_2} := 3.5 \cdot in$	User Defined
Pipe Weight:	$WT_{pipe\_2} := 94.75 \cdot lbf$	User Defined
Pipe Volume:	$V_{pipe\_2} := L_{pipe\_2} \cdot \frac{(W_{pipe\_2})^2 \cdot \pi}{4} = 0.84 \cdot ft^3$	
Pipe Aspect Ratio:	$Ar_{pipe\_2} := \frac{L_{pipe\_2}}{W_{pipe\_2}} = 42.86$	
Pipe Force Coefficient:	$Ca_{pipe\_2} := 1.2$	As per Table 2-8 (Round)-TIA-222-G

### Pipe Wind Loads

Pipe Projected Area:	$SA_{pipe\_2} := L_{pipe\_2} \cdot W_{pipe\_2} = 3.65 \cdot ft^2$	
Pipe Wind Force (All):	$F_{pipe\_2} := qz_{carrier\_1} \cdot G_H \cdot Ca_{pipe\_2} \cdot SA_{pipe\_2} = 145 \cdot lbf$	<b>BLC 6/7</b>
Pipe Wind Force (Distributed):	$\frac{F_{pipe\_2}}{L_{pipe\_2}} = 11.6 \cdot plf$	<b>BLC 6/7</b>

### Pipe Wind Loads (w/ Ice)

Pipe Projected Area (w/ Ice):	$A_{ice\_pipe\_2} := (L_{pipe\_2} + 2 \cdot tiz) \cdot (W_{pipe\_2} + 2 \cdot tiz) = 8.41 \cdot ft^2$	
Pipe Wind Force (w/ Ice) (All):	$Fi_{pipe\_2} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{pipe\_2} \cdot A_{ice\_pipe\_2} = 84 \cdot lbf$	<b>BLC 4/5</b>
Pipe Wind Force (w/ Ice) (Distributed):	$\frac{Fi_{pipe\_2}}{L_{pipe\_2}} = 6.7 \cdot plf$	<b>BLC 4/5</b>

### Pipe Vertical Loads

Weight of Pipe (All):	$WT_{pipe\_2} = 95 \cdot lbf$	<b>BLC 2</b>
Weight of Pipe (Distributed):	$\frac{WT_{pipe\_2}}{L_{pipe\_2}} = 7.6 \cdot plf$	<b>BLC 2</b>

### Pipe Vertical Loads (Ice Only)

Volume of Ice on Pipe:	$V_{ice\_pipe\_2} := (L_{pipe\_2} + 2 \cdot tiz) \cdot \left( \frac{(W_{pipe\_2} + 2 \cdot tiz)^2 \cdot \pi}{4} \right) - V_{pipe\_2} = 3.49 \cdot ft^3$	
Weight of Ice on Pipe (All):	$WT_{ice\_pipe\_2} := V_{ice\_pipe\_2} \cdot Id = 199 \cdot lbf$	<b>BLC 3</b>
Weight of Ice on Pipe (Distributed):	$\frac{WT_{ice\_pipe\_2}}{L_{pipe\_2}} = 15.9 \cdot plf$	<b>BLC 3</b>



## Standard Equipment Calculations - Mount Member 3 (Front/Side Wind)

### Pipe Properties

Antenna Carrier:	<b>AT&amp;T</b>	User Defined
Equipment Model:	<b>Vertical Pipe</b>	User Defined
Pipe Height:	$L_{pipe\_3} := 18 \cdot in$	User Defined
Pipe Diameter:	$W_{pipe\_3} := 4.5 \cdot in$	User Defined
Pipe Weight:	$WT_{pipe\_3} := 16.2 \cdot lbf$	User Defined
Pipe Volume:	$V_{pipe\_3} := L_{pipe\_3} \cdot \frac{((W_{pipe\_3})^2 \cdot \pi)}{4} = 0.17 \text{ ft}^3$	
Pipe Aspect Ratio:	$Ar_{pipe\_3} := \frac{L_{pipe\_3}}{W_{pipe\_3}} = 4$	
Pipe Force Coefficient:	$Ca_{pipe\_3} := 0.7 + \frac{(Ar_{pipe\_3} - 2.5)}{4.5} \cdot 0.1 = 0.73$	As per Table 2-8 (Round)-TIA-222-G

### Pipe Wind Loads

Pipe Projected Area:	$SA_{pipe\_3} := L_{pipe\_3} \cdot W_{pipe\_3} = 0.56 \text{ ft}^2$	
Pipe Wind Force (All):	$F_{pipe\_3} := qz_{carrier\_1} \cdot G_H \cdot Ca_{pipe\_3} \cdot SA_{pipe\_3} = 14 \text{ lbf}$	<b>BLC 6/7</b>
Pipe Wind Force (Distributed):	$\frac{F_{pipe\_3}}{L_{pipe\_3}} = 9.1 \text{ plf}$	<b>BLC 6/7</b>

### Pipe Wind Loads (w/ Ice)

Pipe Projected Area (w/ Ice):	$A_{ice\_pipe\_3} := (L_{pipe\_3} + 2 \cdot tiz) \cdot (W_{pipe\_3} + 2 \cdot tiz) = 1.37 \text{ ft}^2$	
Pipe Wind Force (w/ Ice) (All):	$Fi_{pipe\_3} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{pipe\_3} \cdot A_{ice\_pipe\_3} = 8 \text{ lbf}$	<b>BLC 4/5</b>
Pipe Wind Force (w/ Ice) (Distributed):	$\frac{Fi_{pipe\_3}}{L_{pipe\_3}} = 5.6 \text{ plf}$	<b>BLC 4/5</b>

### Pipe Vertical Loads

Weight of Pipe (All):	$WT_{pipe\_3} = 16 \text{ lbf}$	<b>BLC 2</b>
Weight of Pipe (Distributed):	$\frac{WT_{pipe\_3}}{L_{pipe\_3}} = 10.8 \text{ plf}$	<b>BLC 2</b>

### Pipe Vertical Loads (Ice Only)

Volume of Ice on Pipe:	$V_{ice\_pipe\_3} := (L_{pipe\_3} + 2 \cdot tiz) \cdot \left( \frac{(W_{pipe\_3} + 2 \cdot tiz)^2 \cdot \pi}{4} \right) - V_{pipe\_3} = 0.63 \text{ ft}^3$	
Weight of Ice on Pipe (All):	$WT_{ice\_pipe\_3} := V_{ice\_pipe\_3} \cdot Id = 36 \text{ lbf}$	<b>BLC 3</b>
Weight of Ice on Pipe (Distributed):	$\frac{WT_{ice\_pipe\_3}}{L_{pipe\_3}} = 23.9 \text{ plf}$	<b>BLC 3</b>

## Standard Equipment Calculations - Mount Member 4 (Front/Side Wind)

### Pipe Properties

Antenna Carrier:	<b>AT&amp;T</b>	User Defined
Equipment Model:	<b>HSS Arm Member</b>	User Defined
HSS Height:	$L_{member\_4} := 33.75 \cdot in$	User Defined
HSS Width:	$W_{member\_4} := 4 \cdot in$	User Defined
HSS Weight:	$WT_{member\_4} := 34.3 \cdot lbf$	User Defined
HSS Volume:	$V_{member\_4} := L_{member\_4} \cdot W_{member\_4}^2 = 0.31 \text{ ft}^3$	
HSS Aspect Ratio:	$Ar_{member\_4} := \frac{L_{member\_4}}{W_{member\_4}} = 8.44$	
HSS Force Coefficient:	$Ca_{member\_4} := 1.4 + \frac{(Ar_{member\_4} - 7)}{18} \cdot 0.6 = 1.45$	As per Table 2-8 (Flat)-TIA-222-G

### HSS Wind Loads

HSS Projected Area:	$SA_{member\_4} := L_{member\_4} \cdot W_{member\_4} = 0.94 \text{ ft}^2$	
HSS Wind Force (All):	$F_{member\_4} := qz_{carrier\_1} \cdot G_H \cdot Ca_{member\_4} \cdot SA_{member\_4} = 45 \text{ lbf}$	<b>BLC 6/7</b>
HSS Wind Force (All):	$\frac{F_{member\_4}}{L_{member\_4}} = 16 \text{ plf}$	<b>BLC 6/7</b>

### HSS Wind Loads (w/ Ice)

HSS Projected Area (w/ Ice):	$A_{ice\_member\_4} := (L_{member\_4} + 2 \cdot tiz) \cdot (W_{member\_4} + 2 \cdot tiz) = 2.21 \text{ ft}^2$	
HSS Wind Force (w/ Ice) (All):	$Fi_{member\_4} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{member\_4} \cdot A_{ice\_member\_4} = 27 \text{ lbf}$	<b>BLC 4/5</b>
HSS Wind Force (w/ Ice) (Distributed):	$\frac{Fi_{member\_4}}{L_{member\_4}} = 9.5 \text{ plf}$	<b>BLC 4/5</b>

### HSS Vertical Loads

Weight of HSS (All):	$WT_{member\_4} = 34 \text{ lbf}$	<b>BLC 2</b>
Weight of HSS (Distributed):	$\frac{WT_{member\_4}}{L_{member\_4}} = 12.2 \text{ plf}$	<b>BLC 2</b>

### HSS Vertical Loads (Ice Only)

Volume of Ice on HSS Arm:	$V_{ice\_member\_4} := (L_{member\_4} + 2 \cdot tiz) \cdot (W_{member\_4} + 2 \cdot tiz)^2 - V_{member\_4} = 1.22 \text{ ft}^3$	
Weight of Ice on HSS (All):	$WT_{ice\_member\_4} := V_{ice\_member\_4} \cdot Id = 70 \text{ lbf}$	<b>BLC 3</b>
Weight of Ice on HSS (Distributed):	$\frac{WT_{ice\_member\_4}}{L_{member\_4}} = 24.8 \text{ plf}$	<b>BLC 3</b>

## Standard Equipment Calculations - Mount Member 5 (Front/Side Wind)

### Pipe Properties

Antenna Carrier:	<b>AT&amp;T</b>	User Defined
Equipment Model:	<b>Proposed Handrail Member 1</b>	User Defined
Pipe Height:	$L_{pipe\_5} := 150 \cdot in$	User Defined
Pipe Diameter:	$W_{pipe\_5} := 2.375 \cdot in$	User Defined
Pipe Weight:	$WT_{pipe\_5} := 45.75 \cdot lbf$	User Defined
Pipe Volume:	$V_{pipe\_5} := L_{pipe\_5} \cdot \frac{(W_{pipe\_5})^2 \cdot \pi}{4} = 0.38 \cdot ft^3$	
Pipe Quantity:	$N_{pipe\_5} := 1$	User Defined
Pipe Aspect Ratio:	$Ar_{pipe\_5} := \frac{L_{pipe\_5}}{W_{pipe\_5}} = 63.16$	
Pipe Force Coefficient:	$Ca_{pipe\_5} := 1.2$	As per Table 2-8 (Round)-TIA-222-G

### Pipe Wind Loads

Pipe Projected Area:	$SA_{pipe\_5} := L_{pipe\_5} \cdot W_{pipe\_5} = 2.47 \cdot ft^2$	
Pipe Wind Force (All):	$F_{pipe\_5} := qz_{carrier\_1} \cdot G_H \cdot Ca_{pipe\_5} \cdot SA_{pipe\_5} = 98 \cdot lbf$	<b>BLC 6/7</b>
Pipe Wind Force (Distributed):	$\frac{F_{pipe\_5}}{L_{pipe\_5}} = 7.9 \cdot plf$	<b>BLC 6/7</b>

### Pipe Wind Loads (w/ Ice)

Pipe Projected Area (w/ Ice):	$A_{ice_{pipe\_5}} := (L_{pipe\_5} + 2 \cdot t_{iz}) \cdot (W_{pipe\_5} + 2 \cdot t_{iz}) = 7.21 \cdot ft^2$	
Pipe Wind Force (w/ Ice) (All):	$F_{i_{pipe\_5}} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{pipe\_5} \cdot A_{ice_{pipe\_5}} = 72 \cdot lbf$	<b>BLC 4/5</b>
Pipe Wind Force (w/ Ice) (Distributed):	$\frac{F_{i_{pipe\_5}}}{L_{pipe\_5}} = 5.8 \cdot plf$	<b>BLC 4/5</b>

### Pipe Vertical Loads

Weight of Pipe (All):	$WT_{pipe\_5} = 46 \cdot lbf$	<b>BLC 2</b>
Weight of Pipe (Distributed):	$\frac{WT_{pipe\_5}}{L_{pipe\_5}} = 3.7 \cdot plf$	<b>BLC 2</b>

### Pipe Vertical Loads (Ice Only)

Volume of Ice on Pipe:	$V_{ice_{pipe\_5}} := (L_{pipe\_5} + 2 \cdot t_{iz}) \cdot \left( \frac{(W_{pipe\_5} + 2 \cdot t_{iz})^2 \cdot \pi}{4} \right) - V_{pipe\_5} = 2.79 \cdot ft^3$	
Weight of Ice on Pipe (All):	$WT_{ice_{pipe\_5}} := V_{ice_{pipe\_5}} \cdot Id = 159 \cdot lbf$	<b>BLC 3</b>
Weight of Ice on Pipe (Distributed):	$\frac{WT_{ice_{pipe\_5}}}{L_{pipe\_5}} = 12.7 \cdot plf$	<b>BLC 3</b>

## Standard Equipment Calculations - Mount Member 6 (Front/Side Wind)

### Pipe Properties

Antenna Carrier:	AT&T	User Defined
Equipment Model:	Proposed Handrail Member 2	User Defined
Single Angle Length:	$L_{member\_6} := 24.437 \cdot in$	User Defined
Single Angle Width:	$W_{member\_6} := 2 \cdot in$	User Defined
Single Angle Weight:	$WT_{member\_6} := 4.97 \cdot lbf$	User Defined
Single Angle Volume:	$V_{member\_6} := L_{member\_6} \cdot W_{member\_6}^2 = 0.06 \cdot ft^3$	
Single Angle Aspect Ratio:	$Ar_{member\_6} := \frac{L_{member\_6}}{W_{member\_6}} = 12.22$	
Single Angle Force Coefficient:	$Ca_{member\_6} := 1.4 + \frac{(Ar_{member\_6} - 7)}{18} \cdot 0.6 = 1.57$	As per Table 2-8 (Flat)-TIA-222-G

### Single Angle Wind Loads

Single Angle Projected Area:	$SA_{member\_6} := L_{member\_6} \cdot W_{member\_6} = 0.34 \cdot ft^2$	
Single Angle Wind Force (All):	$F_{member\_6} := qz_{carrier\_1} \cdot G_H \cdot Ca_{member\_6} \cdot SA_{member\_6} = 18 \cdot lbf$	BLC 6/7
Single Angle Wind Force (All):	$\frac{F_{member\_6}}{L_{member\_6}} = 8.7 \cdot plf$	BLC 6/7

### Single Angle Wind Loads (w/ Ice)

Single Angle Projected Area (w/ Ice):	$A_{ice\_member\_6} := (L_{member\_6} + 2 \cdot tiz) \cdot (W_{member\_6} + 2 \cdot tiz) = 1.27 \cdot ft^2$	
Single Angle Wind Force (w/ Ice) (All):	$Fi_{member\_6} := qz_{ice\_carrier\_1} \cdot G_H \cdot Ca_{member\_6} \cdot A_{ice\_member\_6} = 17 \cdot lbf$	BLC 4/5
Single Angle Wind Force (w/ Ice) (Distributed):	$\frac{Fi_{member\_6}}{L_{member\_6}} = 8.2 \cdot plf$	BLC 4/5

### Single Angle Vertical Loads

Weight of Single Angle (All):	$WT_{member\_6} = 5 \cdot lbf$	BLC 2
Weight of Single Angle (Distributed):	$\frac{WT_{member\_6}}{L_{member\_6}} = 2.4 \cdot plf$	BLC 2

### Single Angle Vertical Loads (Ice Only)

Volume of Ice on Single Angle:	$V_{ice\_member\_6} := (L_{member\_6} + 2 \cdot tiz) \cdot (W_{member\_6} + 2 \cdot tiz)^2 - V_{member\_6} = 0.61 \cdot ft^3$	
Weight of Ice on Single Angle (All):	$WT_{ice\_member\_6} := V_{ice\_member\_6} \cdot Id = 35 \cdot lbf$	BLC 3
Weight of Ice on Single Angle (Distributed):	$\frac{WT_{ice\_member\_6}}{L_{member\_6}} = 17.2 \cdot plf$	BLC 3

### General Information for use in Risa-3D

**Risa-3D Basic Load Cases**

- 1
- 2
- 3
- 4
- 5
- 6
- 7

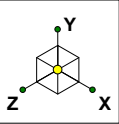
- Description**  
 Self Weight (Mast)  
 Weight of Appurtenances  
 Weight of Ice Only  
 TIA Wind with Ice - X  
 TIA Wind with Ice - Z  
 TIA Wind - X  
 TIA Wind - Z

Load Combination	Description	Wind Factor	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.2D + 1.6W (0)	1.6	Y	1	1.2	2	1.2	6	1.6				
2	1.2D + 1.6W (30)	1.6	Y	1	1.2	2	1.2	6	1.39	7	0.8		
3	1.2D + 1.6W (60)	1.6	Y	1	1.2	2	1.2	6	0.8	7	1.39		
4	1.2D + 1.6W (90)	1.6	Y	1	1.2	2	1.2	7	1.6				
5	1.2D + 1.6W (120)	1.6	Y	1	1.2	2	1.2	6	-0.8	7	1.39		
6	1.2D + 1.6W (150)	1.6	Y	1	1.2	2	1.2	6	-1.39	7	0.8		
7	1.2D + 1.6W (180)	1.6	Y	1	1.2	2	1.2	6	-1.6				
8	1.2D + 1.6W (210)	1.6	Y	1	1.2	2	1.2	6	-1.39	7	-0.8		
9	1.2D + 1.6W (240)	1.6	Y	1	1.2	2	1.2	6	-0.8	7	-1.39		
10	1.2D + 1.6W (270)	1.6	Y	1	1.2	2	1.2	7	-1.6				
11	1.2D + 1.6W (300)	1.6	Y	1	1.2	2	1.2	6	0.8	7	-1.39		
12	1.2D + 1.6W (330)	1.6	Y	1	1.2	2	1.2	6	1.39	7	-0.8		
13	1.2D+1.0Di+1.0Wi (0)	1.0	Y	1	1.2	2	1.2	3	1.0	4	1.0		
14	1.2D+1.0Di+1.0Wi (30)	1.0	Y	1	1.2	2	1.2	3	1.0	4	0.866	5	0.5
15	1.2D+1.0Di+1.0Wi (60)	1.0	Y	1	1.2	2	1.2	3	1.0	4	0.5	5	0.866
16	1.2D+1.0Di+1.0Wi (90)	1.0	Y	1	1.2	2	1.2	3	1.0	5	1.0		
17	1.2D+1.0Di+1.0Wi (120)	1.0	Y	1	1.2	2	1.2	3	1.0	4	-0.5	5	0.866
18	1.2D+1.0Di+1.0Wi (150)	1.0	Y	1	1.2	2	1.2	3	1.0	4	-0.866	5	0.5
19	1.2D+1.0Di+1.0Wi (180)	1.0	Y	1	1.2	2	1.2	3	1.0	4	-1.0		
20	1.2D+1.0Di+1.0Wi (210)	1.0	Y	1	1.2	2	1.2	3	1.0	4	-0.866	5	-0.5
21	1.2D+1.0Di+1.0Wi (240)	1.0	Y	1	1.2	2	1.2	3	1.0	4	-0.5	5	-0.866
22	1.2D+1.0Di+1.0Wi (270)	1.0	Y	1	1.2	2	1.2	3	1.0	5	-1.0		
23	1.2D+1.0Di+1.0Wi (300)	1.0	Y	1	1.2	2	1.2	3	1.0	4	0.5	5	-0.866
24	1.2D+1.0Di+1.0Wi (330)	1.0	Y	1	1.2	2	1.2	3	1.0	4	0.866	5	-0.5

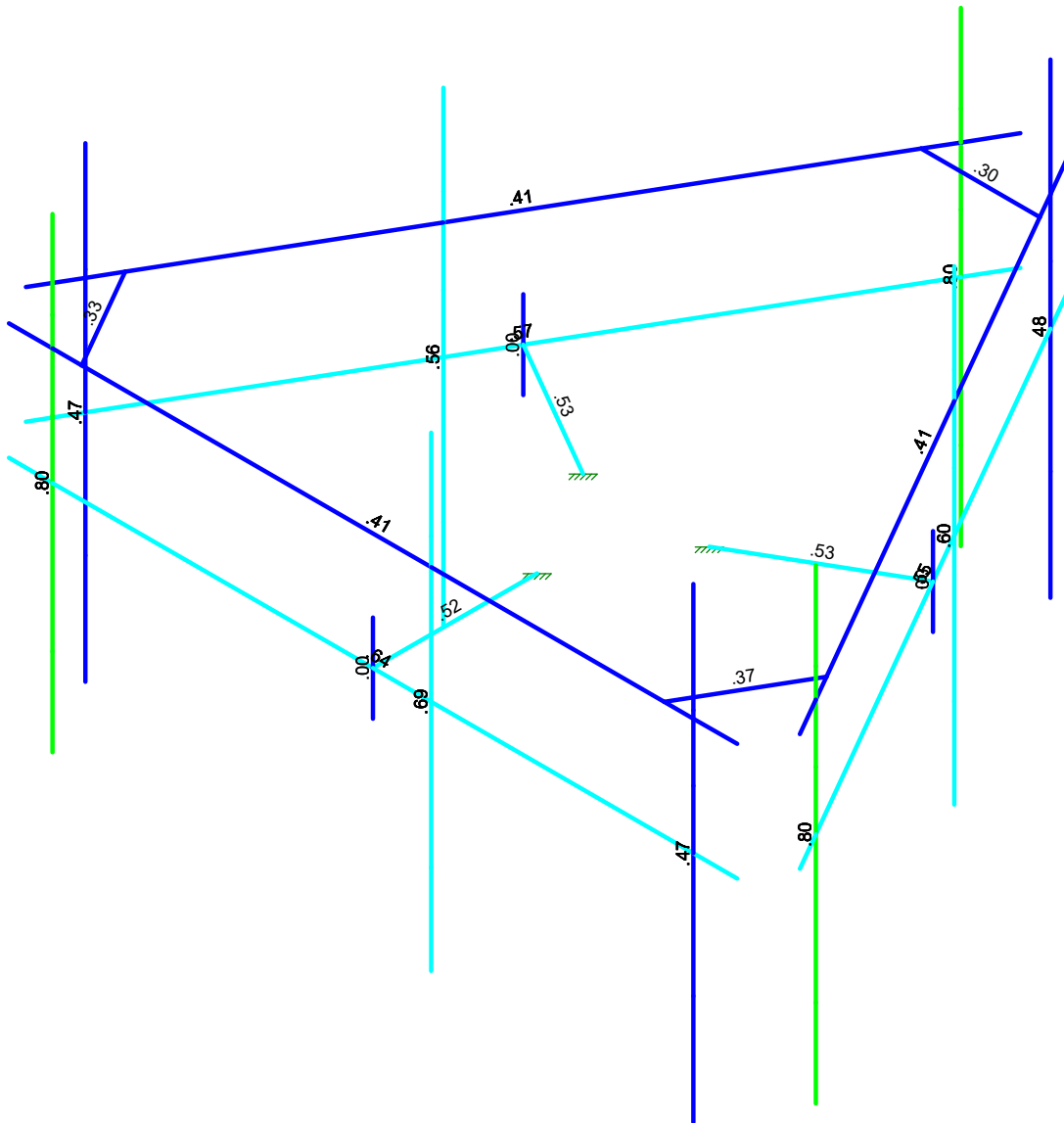
Where:  
 BLC = Basic Load Case  
 D = Dead Load  
 Di = Dead Load of Ice  
 W = Wind Load  
 Wi = Wind Load w/ Ice

# **APPENDIX B**

## **RISA 3D OUTPUT**



Code Check ( Env )	
Black	No Calc
Red	> 1.0
Pink	.90-1.0
Green	.75-.90
Cyan	.50-.75
Blue	0.-.50

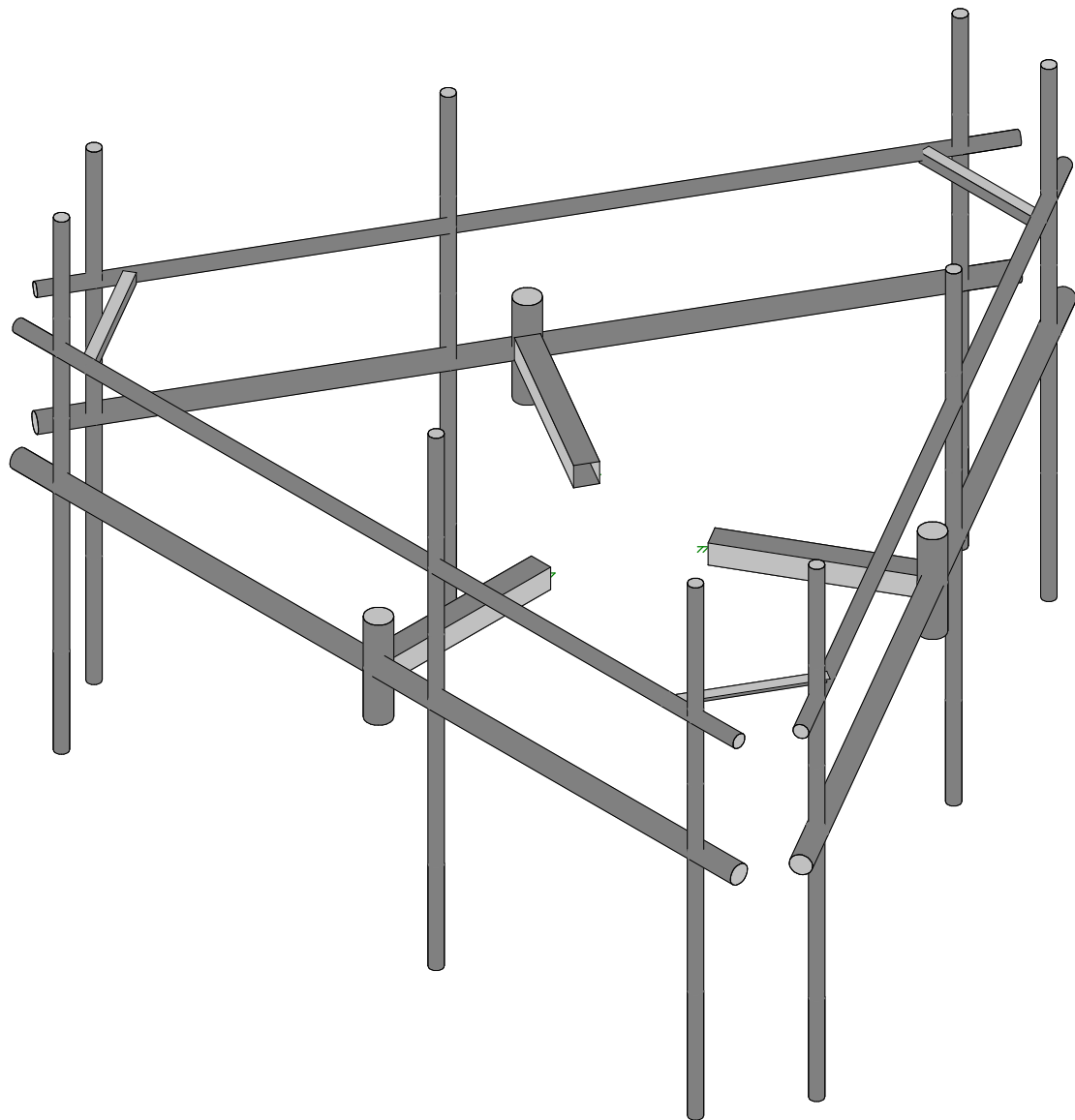
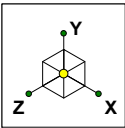


Member Code Checks Displayed (Enveloped)  
Envelope Only Solution

Paul J Ford & Company	Bethel Stony Hill - AWS	SK - 1
CEC		May 2, 2019 at 2:40 PM
A80618-0011.002.6190		A80618-0011.002.6190_R2 - Hand...

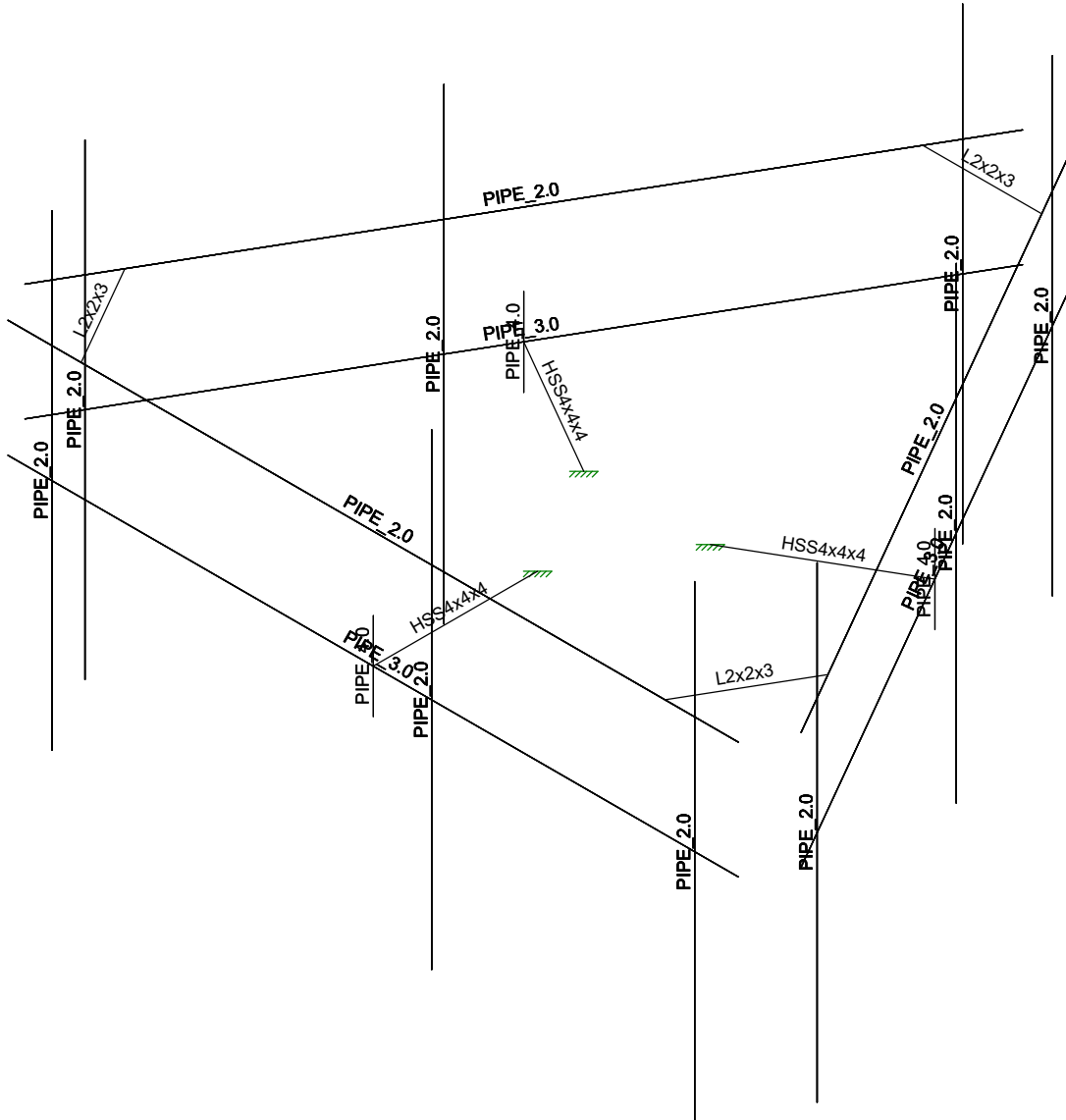
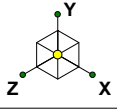






Envelope Only Solution

Paul J Ford & Company	Bethel Stony Hill - AWS	SK - 3
CEC		May 2, 2019 at 2:40 PM
A80618-0011.002.6190		A80618-0011.002.6190_R2 - Hand...



Envelope Only Solution

Paul J Ford & Company

CEC

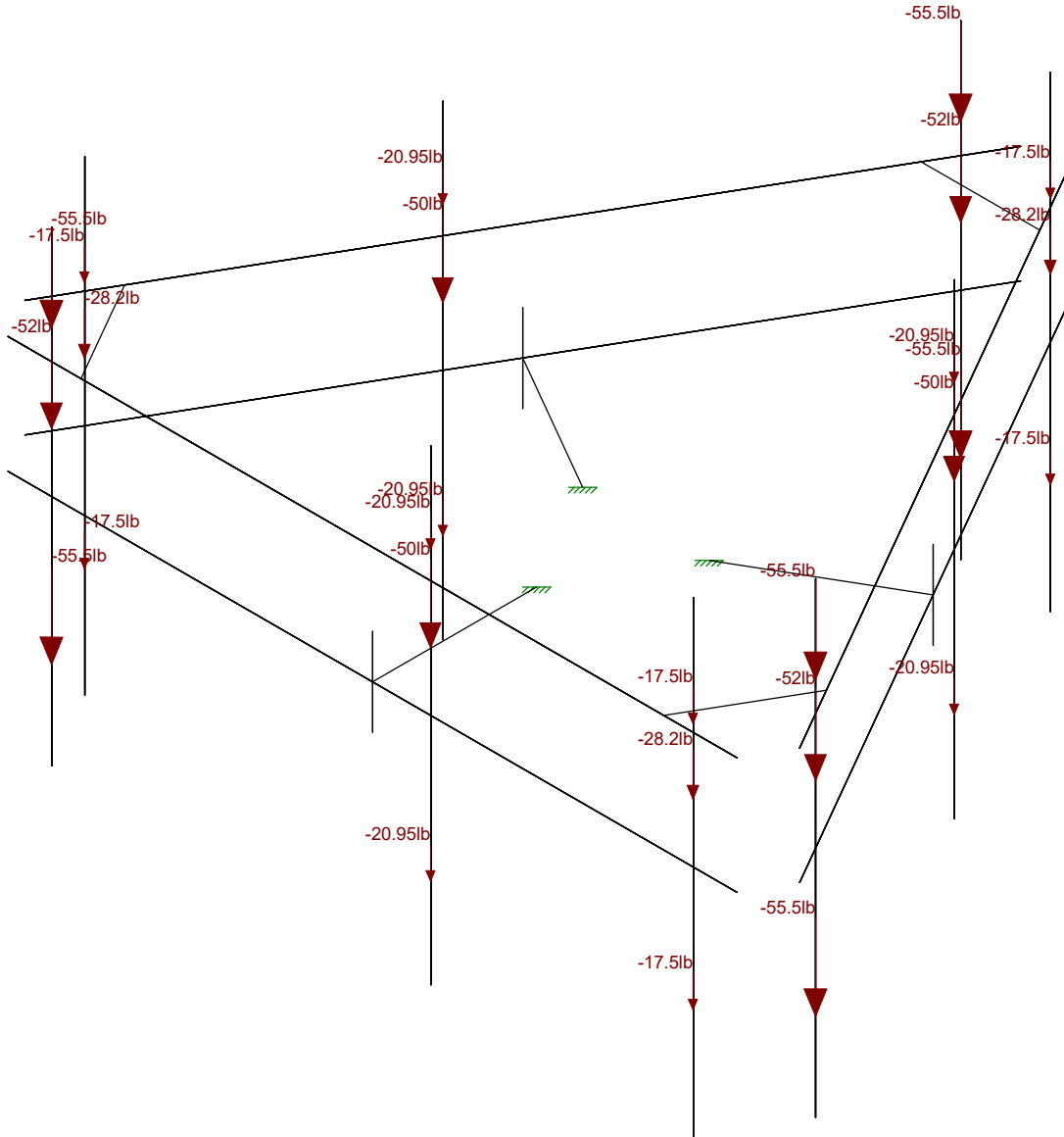
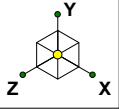
A80618-0011.002.6190

Bethel Stony Hill - AWS

SK - 4

May 2, 2019 at 2:41 PM

A80618-0011.002.6190\_R2 - Hand...



Loads: BLC 2, Weight of Appurtenances  
Envelope Only Solution

Paul J Ford & Company

CEC

A80618-0011.002.6190

Bethel Stony Hill - AWS

SK - 5

May 2, 2019 at 2:41 PM

A80618-0011.002.6190\_R2 - Hand...



**(Global) Model Settings**

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISACONNECTION CODE	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parame Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR SET ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8



**(Global) Model Settings, Continued**

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

**Hot Rolled Steel Properties**

	Label	E [ksi]	G [ksj]	Nu	Therm (1...	Density[k/...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

**Member Primary Data**

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Ru...
1	M1	N3	N2			PIPE 2.0	None	None	A53 Gr.B	Typical
2	M4	N11	N15		90	PIPE 2.0	None	None	A53 Gr.B	Typical
3	M6	N14	N18		90	PIPE 2.0	None	None	A53 Gr.B	Typical
4	M7	N12	N16		90	PIPE 2.0	None	None	A53 Gr.B	Typical
5	M7A	N24A	N23A			PIPE 3.0	None	None	A53 Gr.B	Typical
6	M8	N26	N25			PIPE 4.0	None	None	A53 Gr.B	Typical
7	M9	N22A	N27			HSS4x4x4	None	None	A500 Gr.B Rect	Typical
8	M10	N36	N35			PIPE 2.0	None	None	A53 Gr.B	Typical
9	M13	N43	N46		210	PIPE 2.0	None	None	A53 Gr.B	Typical
10	M14	N45	N48		210	PIPE 2.0	None	None	A53 Gr.B	Typical
11	M15	N44	N47		210	PIPE 2.0	None	None	A53 Gr.B	Typical
12	M16	N57	N56			PIPE 3.0	None	None	A53 Gr.B	Typical
13	M17	N59	N58			PIPE 4.0	None	None	A53 Gr.B	Typical
14	M18	N55	N60			HSS4x4x4	None	None	A500 Gr.B Rect	Typical
15	M19	N69	N68			PIPE 2.0	None	None	A53 Gr.B	Typical
16	M22	N76	N79		330	PIPE 2.0	None	None	A53 Gr.B	Typical
17	M23	N78	N81		330	PIPE 2.0	None	None	A53 Gr.B	Typical
18	M24	N77	N80		330	PIPE 2.0	None	None	A53 Gr.B	Typical
19	M25	N90	N89			PIPE 3.0	None	None	A53 Gr.B	Typical



**Member Primary Data (Continued)**

	Label	I Joint	J Joint	K Joint	Rotate(d...)	Section/Shape	Type	Design List	Material	Design Ru...
20	M26	N92	N91			PIPE_4.0	None	None	A53 Gr.B	Typical
21	M27	N88	N93			HSS4x4x4	None	None	A500 Gr.B Rect	Typical
22	M28	N105	N100		90	L2x2x3	Beam	None	A36 Gr.36	Typical
23	M29	N103	N101		90	L2x2x3	Beam	None	A36 Gr.36	Typical
24	M30	N104	N102		90	L2x2x3	Beam	None	A36 Gr.36	Typical

**Member Advanced Data**

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
1	M1						Yes			None
2	M4						Yes			None
3	M6						Yes			None
4	M7						Yes			None
5	M7A						Yes			None
6	M8						Yes			None
7	M9						Yes			None
8	M10						Yes			None
9	M13						Yes			None
10	M14						Yes			None
11	M15						Yes			None
12	M16						Yes			None
13	M17						Yes			None
14	M18						Yes			None
15	M19						Yes			None
16	M22						Yes			None
17	M23						Yes			None
18	M24						Yes			None
19	M25						Yes			None
20	M26						Yes			None
21	M27						Yes			None
22	M28	OOOOOX	OOOOOX				Yes			None
23	M29	OOOOOX	OOOOOX				Yes			None
24	M30	OOOOOX	OOOOOX				Yes			None

**Hot Rolled Steel Design Parameters**

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	PIPE 2.0	150			Lbyy						Lateral
2	M4	PIPE 2.0	96									Lateral
3	M6	PIPE 2.0	96									Lateral
4	M7	PIPE 2.0	96									Lateral
5	M7A	PIPE 3.0	150			Lbyy						Lateral
6	M8	PIPE 4.0	18			Lbyy						Lateral
7	M9	HSS4x4x4	33.75			Lbyy						Lateral
8	M10	PIPE 2.0	150			Lbyy						Lateral
9	M13	PIPE 2.0	96									Lateral
10	M14	PIPE 2.0	96									Lateral
11	M15	PIPE 2.0	96									Lateral
12	M16	PIPE 3.0	150			Lbyy						Lateral
13	M17	PIPE 4.0	18			Lbyy						Lateral
14	M18	HSS4x4x4	33.75			Lbyy						Lateral
15	M19	PIPE 2.0	150			Lbyy						Lateral
16	M22	PIPE 2.0	96									Lateral
17	M23	PIPE 2.0	96									Lateral
18	M24	PIPE 2.0	96									Lateral
19	M25	PIPE 3.0	150			Lbyy						Lateral



**Hot Rolled Steel Design Parameters (Continued)**

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
20	M26	PIPE 4.0	18			Lbyy						Lateral
21	M27	HSS4x4x4	33.75			Lbyy						Lateral
22	M28	L2x2x3	24.437									Lateral
23	M29	L2x2x3	24.437									Lateral
24	M30	L2x2x3	24.437									Lateral

**Joint Loads and Enforced Displacements (BLC 2 : Weight of Appurtenances)**

	Joint Label	L,D,M	Direction	Magnitude[(lb.k-ft), (in.rad), (lb*s^2/...)]
1	EQ1TOP	L	Y	-20.95
2	EQ1BOT	L	Y	-20.95
3	EQ2	L	Y	-50
4	EQ3TOP	L	Y	-17.5
5	EQ3BOT	L	Y	-17.5
6	EQ4	L	Y	-28.2
7	EQ5TOP	L	Y	-55.5
8	EQ5BOT	L	Y	-55.5
9	EQ6	L	Y	-52
10	N40	L	Y	-52
11	N41	L	Y	-28.2
12	N42	L	Y	-50
13	N49	L	Y	-17.5
14	N50	L	Y	-17.5
15	N51	L	Y	-20.95
16	N52	L	Y	-20.95
17	N53	L	Y	-55.5
18	N54	L	Y	-55.5
19	N73	L	Y	-52
20	N74	L	Y	-28.2
21	N75	L	Y	-50
22	N82	L	Y	-17.5
23	N83	L	Y	-17.5
24	N84	L	Y	-20.95
25	N85	L	Y	-20.95
26	N86	L	Y	-55.5
27	N87	L	Y	-55.5

**Joint Loads and Enforced Displacements (BLC 3 : Weight of Ice Only)**

	Joint Label	L,D,M	Direction	Magnitude[(lb.k-ft), (in.rad), (lb*s^2/...)]
1	EQ1TOP	L	Y	-134.5
2	EQ1BOT	L	Y	-134.5
3	EQ2	L	Y	-94
4	EQ3TOP	L	Y	-90.5
5	EQ3BOT	L	Y	-90.5
6	EQ4	L	Y	-94
7	EQ5TOP	L	Y	-150.5
8	EQ5BOT	L	Y	-150.5
9	EQ6	L	Y	-100
10	N40	L	Y	-100
11	N41	L	Y	-94
12	N42	L	Y	-94
13	N49	L	Y	-90.5
14	N50	L	Y	-90.5
15	N51	L	Y	-134.5
16	N52	L	Y	-134.5
17	N53	L	Y	-150.5



**Joint Loads and Enforced Displacements (BLC 3 : Weight of Ice Only) (Continued)**

	Joint Label	L,D,M	Direction	Magnitude(lb.k-ft), (in.rad), (lb*s^2/...
18	N54	L	Y	-150.5
19	N73	L	Y	-100
20	N74	L	Y	-94
21	N75	L	Y	-94
22	N82	L	Y	-90.5
23	N83	L	Y	-90.5
24	N84	L	Y	-134.5
25	N85	L	Y	-134.5
26	N86	L	Y	-150.5
27	N87	L	Y	-150.5

**Joint Loads and Enforced Displacements (BLC 4 : TIA Wind with Ice - X)**

	Joint Label	L,D,M	Direction	Magnitude(lb.k-ft), (in.rad), (lb*s^2/...
1	EQ2	L	X	17
2	EQ1TOP	L	X	38.5
3	EQ1BOT	L	X	38.5
4	EQ3TOP	L	X	24.5
5	EQ3BOT	L	X	24.5
6	EQ4	L	X	18
7	EQ5TOP	L	X	44
8	EQ5BOT	L	X	44
9	EQ6	L	X	20
10	N40	L	X	20
11	N41	L	X	18
12	N42	L	X	17
13	N49	L	X	24.5
14	N50	L	X	24.5
15	N51	L	X	38.5
16	N52	L	X	38.5
17	N53	L	X	44
18	N54	L	X	44
19	N73	L	X	20
20	N74	L	X	18
21	N75	L	X	17
22	N82	L	X	24.5
23	N83	L	X	24.5
24	N84	L	X	38.5
25	N85	L	X	38.5
26	N86	L	X	44
27	N87	L	X	44

**Joint Loads and Enforced Displacements (BLC 5 : TIA Wind with Ice - Z)**

	Joint Label	L,D,M	Direction	Magnitude(lb.k-ft), (in.rad), (lb*s^2/...
1	EQ2	L	Z	32
2	EQ1TOP	L	Z	47.5
3	EQ1BOT	L	Z	47.5
4	EQ3TOP	L	Z	34.5
5	EQ3BOT	L	Z	34.5
6	EQ4	L	Z	35
7	EQ5TOP	L	Z	49
8	EQ5BOT	L	Z	49
9	EQ6	L	Z	32
10	N40	L	Z	32
11	N41	L	Z	35
12	N42	L	Z	32
13	N49	L	Z	34.5





**Joint Loads and Enforced Displacements (BLC 5 : TIA Wind with Ice - Z) (Continued)**

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
14	N50	L	Z	34.5
15	N51	L	Z	47.5
16	N52	L	Z	47.5
17	N53	L	Z	49
18	N54	L	Z	49
19	N73	L	Z	32
20	N74	L	Z	35
21	N75	L	Z	32
22	N82	L	Z	34.5
23	N83	L	Z	34.5
24	N84	L	Z	47.5
25	N85	L	Z	47.5
26	N86	L	Z	49
27	N87	L	Z	49

**Joint Loads and Enforced Displacements (BLC 6 : TIA Wind - X)**

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
1	EQ2	L	X	22
2	EQ1TOP	L	X	92
3	EQ1BOT	L	X	92
4	EQ3TOP	L	X	48.5
5	EQ3BOT	L	X	48.5
6	EQ4	L	X	21
7	EQ5TOP	L	X	113
8	EQ5BOT	L	X	113
9	EQ6	L	X	30
10	N40	L	X	30
11	N41	L	X	21
12	N42	L	X	22
13	N49	L	X	48.5
14	N50	L	X	48.5
15	N51	L	X	92
16	N52	L	X	92
17	N53	L	X	113
18	N54	L	X	113
19	N73	L	X	30
20	N74	L	X	21
21	N75	L	X	22
22	N82	L	X	48.5
23	N83	L	X	48.5
24	N84	L	X	92
25	N85	L	X	92
26	N86	L	X	113
27	N87	L	X	113

**Joint Loads and Enforced Displacements (BLC 7 : TIA Wind - Z)**

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
1	EQ2	L	Z	65
2	EQ1TOP	L	Z	130
3	EQ1BOT	L	Z	130
4	EQ3TOP	L	Z	91
5	EQ3BOT	L	Z	91
6	EQ4	L	Z	73
7	EQ5TOP	L	Z	134.5
8	EQ5BOT	L	Z	134.5
9	EQ6	L	Z	64



**Joint Loads and Enforced Displacements (BLC 7 : TIA Wind - Z) (Continued)**

	Joint Label	L,D,M	Direction	Magnitude(lb,k-ft), (in,rad), (lb*s^2/...
10	N40	L	Z	64
11	N41	L	Z	73
12	N42	L	Z	65
13	N49	L	Z	91
14	N50	L	Z	91
15	N51	L	Z	130
16	N52	L	Z	130
17	N53	L	Z	134.5
18	N54	L	Z	134.5
19	N73	L	Z	64
20	N74	L	Z	73
21	N75	L	Z	65
22	N82	L	Z	91
23	N83	L	Z	91
24	N84	L	Z	130
25	N85	L	Z	130
26	N86	L	Z	134.5
27	N87	L	Z	134.5

**Member Distributed Loads (BLC 3 : Weight of Ice Only)**

	Member Label	Direction	Start Magnitude[lb/ft,F,ksf]	End Magnitude[lb/ft,F,ksf]	Start Location[in,%]	End Location[in,%]
1	M4	Y	-12.9	-12.9	0	0
2	M6	Y	-12.9	-12.9	0	0
3	M7	Y	-12.9	-12.9	0	0
4	M7A	Y	-15.9	-15.9	0	0
5	M8	Y	-23.9	-23.9	0	0
6	M9	Y	-24.8	-24.8	0	0
7	M13	Y	-12.9	-12.9	0	0
8	M14	Y	-12.9	-12.9	0	0
9	M15	Y	-12.9	-12.9	0	0
10	M16	Y	-15.9	-15.9	0	0
11	M17	Y	-23.9	-23.9	0	0
12	M18	Y	-24.8	-24.8	0	0
13	M22	Y	-12.9	-12.9	0	0
14	M23	Y	-12.9	-12.9	0	0
15	M24	Y	-12.9	-12.9	0	0
16	M25	Y	-15.9	-15.9	0	0
17	M26	Y	-23.9	-23.9	0	0
18	M27	Y	-24.8	-24.8	0	0
19	M1	Y	-12.7	-12.7	0	0
20	M10	Y	-12.7	-12.7	0	0
21	M19	Y	-12.7	-12.7	0	0
22	M28	Y	-17.2	-17.2	0	0
23	M29	Y	-17.2	-17.2	0	0
24	M30	Y	-17.2	-17.2	0	0

**Member Distributed Loads (BLC 4 : TIA Wind with Ice - X)**

	Member Label	Direction	Start Magnitude[lb/ft,F,ksf]	End Magnitude[lb/ft,F,ksf]	Start Location[in,%]	End Location[in,%]
1	M4	X	5.8	5.8	0	0
2	M6	X	5.8	5.8	0	0
3	M7	X	5.8	5.8	0	0
4	M8	X	5.6	5.6	0	0
5	M9	X	9.5	9.5	0	0
6	M13	X	5.8	5.8	0	0
7	M14	X	5.8	5.8	0	0



**Member Distributed Loads (BLC 4 : TIA Wind with Ice - X) (Continued)**

Member Label	Direction	Start Magnitude[lb/ft.F,ksf]	End Magnitude[lb/ft.F,ksf]	Start Location[in.%]	End Location[in.%]	
8	M15	X	5.8	5.8	0	0
9	M17	X	5.6	5.6	0	0
10	M18	X	9.5	9.5	0	0
11	M22	X	5.8	5.8	0	0
12	M23	X	5.8	5.8	0	0
13	M24	X	5.8	5.8	0	0
14	M26	X	5.6	5.6	0	0
15	M27	X	9.5	9.5	0	0
16	M7A	X	6.7	6.7	0	0
17	M16	X	6.7	6.7	0	0
18	M25	X	6.7	6.7	0	0
19	M1	X	5.8	5.8	0	0
20	M10	X	5.8	5.8	0	0
21	M19	X	5.8	5.8	0	0
22	M28	X	8.2	8.2	0	0
23	M29	X	8.2	8.2	0	0
24	M30	X	8.2	8.2	0	0

**Member Distributed Loads (BLC 5 : TIA Wind with Ice - Z)**

Member Label	Direction	Start Magnitude[lb/ft.F,ksf]	End Magnitude[lb/ft.F,ksf]	Start Location[in.%]	End Location[in.%]	
1	M4	Z	5.8	5.8	0	0
2	M6	Z	5.8	5.8	0	0
3	M7	Z	5.8	5.8	0	0
4	M7A	Z	6.7	6.7	0	0
5	M8	Z	5.6	5.6	0	0
6	M13	Z	5.8	5.8	0	0
7	M14	Z	5.8	5.8	0	0
8	M15	Z	5.8	5.8	0	0
9	M16	Z	6.7	6.7	0	0
10	M17	Z	5.6	5.6	0	0
11	M22	Z	5.8	5.8	0	0
12	M23	Z	5.8	5.8	0	0
13	M24	Z	5.8	5.8	0	0
14	M25	Z	6.7	6.7	0	0
15	M26	Z	5.6	5.6	0	0
16	M9	Z	9.5	9.5	0	0
17	M18	Z	9.5	9.5	0	0
18	M27	Z	9.5	9.5	0	0
19	M1	Z	5.8	5.8	0	0
20	M10	Z	5.8	5.8	0	0
21	M19	Z	5.8	5.8	0	0
22	M28	Z	8.2	8.2	0	0
23	M29	Z	8.2	8.2	0	0
24	M30	Z	8.2	8.2	0	0

**Member Distributed Loads (BLC 6 : TIA Wind - X)**

Member Label	Direction	Start Magnitude[lb/ft.F,ksf]	End Magnitude[lb/ft.F,ksf]	Start Location[in.%]	End Location[in.%]	
1	M4	X	7.9	7.9	0	0
2	M6	X	7.9	7.9	0	0
3	M7	X	7.9	7.9	0	0
4	M8	X	9.1	9.1	0	0
5	M9	X	16	16	0	0
6	M13	X	7.9	7.9	0	0
7	M14	X	7.9	7.9	0	0
8	M15	X	7.9	7.9	0	0
9	M17	X	9.1	9.1	0	0



**Member Distributed Loads (BLC 6 : TIA Wind - X) (Continued)**

	Member Label	Direction	Start Magnitude[lb/ft.F,ksf]	End Magnitude[lb/ft.F,ksf]	Start Location[in.%]	End Location[in.%]
10	M18	X	16	16	0	0
11	M22	X	7.9	7.9	0	0
12	M23	X	7.9	7.9	0	0
13	M24	X	7.9	7.9	0	0
14	M26	X	9.1	9.1	0	0
15	M27	X	16	16	0	0
16	M7A	X	11.6	11.6	0	0
17	M16	X	11.6	11.6	0	0
18	M25	X	11.6	11.6	0	0
19	M1	X	7.9	7.9	0	0
20	M10	X	7.9	7.9	0	0
21	M19	X	7.9	7.9	0	0
22	M28	X	8.7	8.7	0	0
23	M29	X	8.7	8.7	0	0
24	M30	X	8.7	8.7	0	0

**Member Distributed Loads (BLC 7 : TIA Wind - Z)**

	Member Label	Direction	Start Magnitude[lb/ft.F,ksf]	End Magnitude[lb/ft.F,ksf]	Start Location[in.%]	End Location[in.%]
1	M4	Z	7.9	7.9	0	0
2	M6	Z	7.9	7.9	0	0
3	M7	Z	7.9	7.9	0	0
4	M7A	Z	11.6	11.6	0	0
5	M8	Z	9.1	9.1	0	0
6	M13	Z	7.9	7.9	0	0
7	M14	Z	7.9	7.9	0	0
8	M15	Z	7.9	7.9	0	0
9	M16	Z	11.6	11.6	0	0
10	M17	Z	9.1	9.1	0	0
11	M22	Z	7.9	7.9	0	0
12	M23	Z	7.9	7.9	0	0
13	M24	Z	7.9	7.9	0	0
14	M25	Z	11.6	11.6	0	0
15	M26	Z	9.1	9.1	0	0
16	M9	Z	16	16	0	0
17	M18	Z	16	16	0	0
18	M27	Z	16	16	0	0
19	M1	Z	7.9	7.9	0	0
20	M10	Z	7.9	7.9	0	0
21	M19	Z	7.9	7.9	0	0
22	M28	Z	8.7	8.7	0	0
23	M29	Z	8.7	8.7	0	0
24	M30	Z	8.7	8.7	0	0

**Basic Load Cases**

	BLC Description	Category	X Grav...	Y Grav...	Z Grav...	Joint	Point	Distrib...	Area(...	Surfac...
1	Self Weight	None		-1.1						
2	Weight of Appurtenances	None				27				
3	Weight of Ice Only	None				27		24		
4	TIA Wind with Ice - X	None				27		24		
5	TIA Wind with Ice - Z	None				27		24		
6	TIA Wind - X	None				27		24		
7	TIA Wind - Z	None				27		24		



**Load Combinations**

	Description	S...	PDelta	SRSS	B...	Fa...	B...	Fac...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (0 deg)	Y...	Y		1	1.2	2	1.2	6	1.6										
2	1.2D + 1.6W (30 deg)	Y...	Y		1	1.2	2	1.2	6	1.39	7	.8								
3	1.2D + 1.6W (60 deg)	Y...	Y		1	1.2	2	1.2	6	.8	7	1.39								
4	1.2D + 1.6W (90 deg)	Y...	Y		1	1.2	2	1.2	7	1.6										
5	1.2D + 1.6W (120 deg)	Y...	Y		1	1.2	2	1.2	6	-.8	7	1.39								
6	1.2D + 1.6W (150 deg)	Y...	Y		1	1.2	2	1.2	6	-1...	7	.8								
7	1.2D + 1.6W (180 deg)	Y...	Y		1	1.2	2	1.2	6	-1.6										
8	1.2D + 1.6W (210 deg)	Y...	Y		1	1.2	2	1.2	6	-1...	7	-.8								
9	1.2D + 1.6W (240 deg)	Y...	Y		1	1.2	2	1.2	6	-.8	7	-1...								
10	1.2D + 1.6W (270 deg)	Y...	Y		1	1.2	2	1.2	7	-1.6										
11	1.2D + 1.6W (300 deg)	Y...	Y		1	1.2	2	1.2	6	.8	7	-1...								
12	1.2D + 1.6W (330 deg)	Y...	Y		1	1.2	2	1.2	6	1.39	7	-.8								
13	1.2D + 1.0Di + 1.0Wi (0 deg)	Y...	Y		1	1.2	2	1.2	3	1	4	1								
14	1.2D + 1.0Di + 1.0Wi (30 deg)	Y...	Y		1	1.2	2	1.2	3	1	4	.866	5	.5						
15	1.2D + 1.0Di + 1.0Wi (60 deg)	Y...	Y		1	1.2	2	1.2	3	1	4	.5	5	.866						
16	1.2D + 1.0Di + 1.0Wi (90 deg)	Y...	Y		1	1.2	2	1.2	3	1	5	1								
17	1.2D + 1.0Di + 1.0Wi (120 deg)	Y...	Y		1	1.2	2	1.2	3	1	4	-.5	5	.866						
18	1.2D + 1.0Di + 1.0Wi (150 deg)	Y...	Y		1	1.2	2	1.2	3	1	4	-.8...	5	.5						
19	1.2D + 1.0Di + 1.0Wi (180 deg)	Y...	Y		1	1.2	2	1.2	3	1	4	-1								
20	1.2D + 1.0Di + 1.0Wi (210 deg)	Y...	Y		1	1.2	2	1.2	3	1	4	-.8...	5	-.5						
21	1.2D + 1.0Di + 1.0Wi (240 deg)	Y...	Y		1	1.2	2	1.2	3	1	4	-.5	5	-.8...						
22	1.2D + 1.0Di + 1.0Wi (270 deg)	Y...	Y		1	1.2	2	1.2	3	1	5	-1								
23	1.2D + 1.0Di + 1.0Wi (300 deg)	Y...	Y		1	1.2	2	1.2	3	1	4	.5	5	-.8...						
24	1.2D + 1.0Di + 1.0Wi (330 deg)	Y...	Y		1	1.2	2	1.2	3	1	4	.866	5	-.5						

**Envelope AISC 14th(360-10): LRFD Steel Code Checks**

Mem...	Shape	Code Check	Loc[in]	LC	Shear ...	Loc...	Dir	LC	phi*Pn...	phi*Pn...	phi*Mn ...	phi*Mn ...	Cb Eqn
1	M4 PIPE_2.0	.800	48	24	.130	48		23	14916....	32130	1.872	1.872	1...H...
2	M22 PIPE_2.0	.800	48	16	.130	48		15	14916....	32130	1.872	1.872	1...H...
3	M13 PIPE_2.0	.799	48	20	.128	48		19	14916....	32130	1.872	1.872	1...H...
4	M6 PIPE_2.0	.693	48	10	.127	48		10	14916....	32130	1.872	1.872	1...H...
5	M7A PIPE_3.0	.636	75	10	.229	75		10	28250....	65205	5.749	5.749	1...H...
6	M14 PIPE_2.0	.604	48	5	.102	48		5	14916....	32130	1.872	1.872	1...H...
7	M25 PIPE_3.0	.567	75	3	.190	75		14	28250....	65205	5.749	5.749	1...H...
8	M23 PIPE_2.0	.561	48	3	.111	48		3	14916....	32130	1.872	1.872	1...H...
9	M16 PIPE_3.0	.552	75	6	.202	75		6	28250....	65205	5.749	5.749	1...H...
10	M27 HSS4x4x4	.530	33.75	23	.162	33.75	z	11	134974...	139518	16.181	16.181	1...H...
11	M18 HSS4x4x4	.527	33.75	15	.161	33.75	z	3	134974...	139518	16.181	16.181	1...H...
12	M9 HSS4x4x4	.517	33.75	19	.129	33.75	z	7	134974...	139518	16.181	16.181	1...H...
13	M15 PIPE_2.0	.482	48	16	.083	48		17	14916....	32130	1.872	1.872	1...H...
14	M24 PIPE_2.0	.473	48	24	.081	48		13	14916....	32130	1.872	1.872	1...H...
15	M7 PIPE_2.0	.472	48	20	.082	48		21	14916....	32130	1.872	1.872	1...H...
16	M10 PIPE_2.0	.414	87.5	17	.122	14.0...		11	6295.4...	32130	1.872	1.872	2...H...
17	M1 PIPE_2.0	.412	87.5	21	.121	135...		11	6295.4...	32130	1.872	1.872	2...H...
18	M19 PIPE_2.0	.407	87.5	13	.109	14.0...		7	6295.4...	32130	1.872	1.872	2...H...
19	M29 L2x2x3	.375	0	11	.022	0	z	11	19004....	23392.8	.558	1.239	1...H...
20	M28 L2x2x3	.331	0	3	.022	0	y	4	19004....	23392.8	.558	1.239	1...H...
21	M30 L2x2x3	.298	24.4...	7	.018	0	y	8	19004....	23392.8	.558	1.239	1...H...
22	M26 PIPE_4.0	.000	9	11	.000	9		11	92571....	93240	10.631	10.631	1...H...
23	M17 PIPE_4.0	.000	9	3	.000	9		3	92571....	93240	10.631	10.631	1...H...
24	M8 PIPE_4.0	.000	9	6	.000	9		6	92571....	93240	10.631	10.631	1...H...

# MODIFIED MOUNT ON 140'-0" TRANSMISSION POLE EVERSOURCE STRUCTURE #10254 LONG MOUNTAIN - PLUMTREE 345kV LINE

## AT&T BETHEL STONY HILL - AWS SITE #CTL05176

7 STONY HILL ROAD  
BETHEL, FAIRFIELD COUNTY, CONNECTICUT  
LAT: 41.415792°; LONG: -73.401700°

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AT&T

99 EAST RIVER ROAD, 9TH FLOOR EAST HARTFORD, CONNECTICUT 06108

### PROJECT CONTACTS

**STRUCTURE OWNER:**  
EVERSOURCE  
CONTACT: JOEL SZARKOWICZ AT JOEL.SZARKOWICZ@EVERSOURCE.COM  
PH: (860) 728-4503

**CARRIER INFO:**  
AT&T  
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PH: (860) 881-7708

**ENGINEER OF RECORD:**  
PJFMOD@PAULJFORD.COM

### THIS PROJECT INCLUDES THE FOLLOWING ITEMS

INSTALLATION OF NEW HANDRAIL SYSTEM

2

### SHEET INDEX

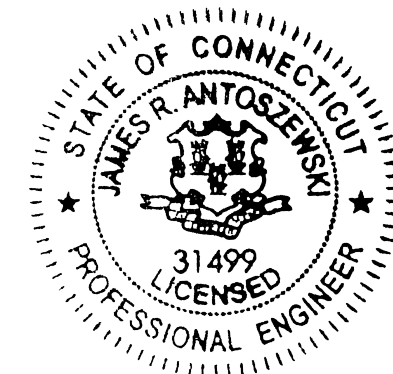
SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
N-1	GENERAL NOTES
MI-1	INSPECTION NOTES
S-1	TOWER ELEVATIONS AND MATERIAL LIST

### DESIGN DATA - ANTENNA MOUNT

REFERENCE STANDARD	TIA/EIA-222-G (W/ ALL ADDENDUMS)	
STRUCTURE CLASS	III	
EXPOSURE CATEGORY	C	
TOPOGRAPHIC CATEGORY	1	
LOAD CASE DESCRIPTION	WIND WITHOUT ICE	WIND WITH ICE
BASIC WIND SPEED (MPH)	93	50
ICE THICKNESS (IN)	0	0.75

### DESIGN DATA - TOWER

REFERENCE STANDARD(S)	NESC C2-2007			
STRUCTURE OWNER STANDARD	EVERSOURCE OTRM 059			
NESC SECTION	250B		250C	
LOAD CASE DESCRIPTION	HEAVY	MEDIUM	LIGHT	EXTREME WIND
LOAD CASE USED	X			X
RADIAL ICE (IN)	0.5	0.25	0	0
WIND SPEED (3-SEC GUST) MPH	40	40	60	100
TEMPERATURE (DEG F)	0	15	30	60



05/22/2019

EVERSOURCE STRUCTURE #10254

LONG MOUNTAIN - PLUMTREE 345KV LINE  
7 STONY HILL ROAD  
BETHEL, FAIRFIELD COUNTY, CONNECTICUT  
AT&T BETHEL STONY HILL - AWS SITE #CTL05176

PROJECT No: 80618-0011.002.6190  
DRAWN BY: FE  
DESIGNED BY: CEC  
CHECKED BY: *CFH*  
DATE: 5-2-2019

TITLE SHEET

T-1

SHEET #1 OF 4

REV	DATE	DESCRIPTION
2	5-21-2019	TEXT

80618-0011.002.6190.DWG

**1. GENERAL NOTES**

- 1.1. THE STRUCTURAL ANALYSIS ASSUMES THAT ALL TOWER COMPONENTS ARE IN BRAND-NEW CONDITION. NO ALLOWANCE WAS MADE FOR ANY DAMAGED, MISSING OR RUSTED MEMBERS. IF ANY OF THESE CONDITIONS ARE DISCOVERED, THE CONTRACTOR SHALL BRING THEM TO THE ATTENTION OF THE OWNERS REPRESENTATIVE.
- 1.2. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED BY OWNER. THE INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY THE ENGINEER OF RECORD (EOR) FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT DRAWINGS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO THE EOR AND OWNER FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.
- 1.3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
- 1.4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE MODIFICATIONS DESCRIBED HEREIN. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
- 1.5. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET OSHA AND GENERAL INDUSTRY STANDARDS.
- 1.6. OBSERVATION VISITS TO THE SITE BY OWNER AND/OR THE EOR SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES. ANY SUPPORT SERVICES PERFORMED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING GENERAL CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- 1.8. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY OWNER AND EOR PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- 1.9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS OWNER SAFETY GUIDELINES.
- 1.10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW EQUIPMENT DURING CONSTRUCTION.
- 1.11. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE STRUCTURE THAT MAY INTERFERE WITH THE INSTALLATION OF THE MODIFICATION SYSTEM WILL HAVE TO BE REMOVED AND RELOCATED, REPLACED, OR RE-INSTALLED AS REQUIRED AFTER THE MODIFICATION IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH OWNER, TESTING AGENCY, AND EOR.
- 1.12. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE EOR.

**2. STRUCTURAL STEEL**

- 2.1. SHOP DRAWINGS SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKERS INITIALS BEFORE SUBMITTING TO ENGINEER. CONTRACTOR SHALL REVIEW THE SHOP DRAWINGS FOR GENERAL CONFORMANCE TO THE PLANS PRIOR TO SUBMITTING TO ENGINEER. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS, ELEVATIONS AND SECTIONS. SHOP DRAWINGS SHALL ALSO INCLUDE SECTION PROFILES, SIZES, CONNECTIONS, ATTACHMENTS, REINFORCING, ANCHORAGE SIZE AND TYPE OF FASTENERS AND ASSEMBLIES.
- 2.2. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
  - 2.2.1. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
    - 2.2.1.1. "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS"
    - 2.2.1.2. SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS;" AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS.
    - 2.2.1.3. "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
  - 2.2.2. BY THE AMERICAN WELDING SOCIETY (AWS):
    - 2.2.2.1. "STRUCTURAL WELDING CODE - STEEL D1.1."
    - 2.2.2.2. "STANDARD SYMBOLS FOR WELDING, BRAZING, AND NONDESTRUCTIVE EXAMINATION"
  - 2.2.3. BY THE AMERICAN SOCIETY OF CIVIL ENGINEERS:
    - 2.2.3.1. DESIGN OF LATTICED STEEL TRANSMISSION STRUCTURES (ASCE 10-XX)
    - 2.2.3.2. DESIGN OF STEEL TRANSMISSION POLE STRUCTURES (ASCE 48-XX)
- 2.3. NEW STEEL (UNLESS NOTED OTHERWISE) SHALL CONFORM TO THE REQUIREMENTS OF THE ASTM STANDARD SPECIFICATION FOR STRUCTURAL STEEL AS NOTED BELOW:
  - M, S, C, MC, L, PLATES & BARS - ASTM A36 (36 KSI YIELD POINT MATERIAL)
  - W - ASTM A992 (50 KSI YIELD POINT MATERIAL)
  - HSS RECTANGULAR - ASTM A500, GRADE B (46 KSI YIELD POINT MATERIAL)
  - HSS ROUND - ASTM A500, GRADE B (42 KSI YIELD POINT MATERIAL)
  - PIPE - ASTM A53, GRADE B (35 KSI YIELD POINT MATERIAL)
- 2.4. NEW BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A325, TYPE "X" UNLESS NOTED OTHERWISE. ALL HOLES FOR BOLTS SHALL BE 1/16" LARGER THAN THE BOLT DIAMETER WITH AN EDGE DISTANCE OF AT LEAST 1 3/4 TIMES THE BOLT DIAMETER AND A SPACING OF AT LEAST 3 TIMES THE BOLT DIAMETER UNLESS NOTED OTHERWISE. ALL BOLTS SHALL BE PROVIDED WITH LOCK WASHERS, PALNUTS, OR LOCK NUTS.
- 2.5. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO A SNUG TIGHT CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', UNLESS NOTED OTHERWISE ON DRAWINGS.
- 2.6. ALL U-BOLTS SHALL BE A307 UNLESS NOTED OTHERWISE.
- 2.7. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- 2.8. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E70XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- 2.9. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
- 2.10. ALL SURFACES MUST BE CLEAN AND FREE OF WELD SPATTER. ALL EDGES SHALL BE DEBURRED.
- 2.11. ALL PARTS ARE TO BE MARKED WITH ITEM NUMBERS USING 3/4" HIGH STEEL STENCILS.
- 2.12. SHOP SHALL ASSEMBLE AND VERIFY FIT AND GAPS BEFORE BREAKDOWN FOR GALVANIZING.
- 2.13. NO FIELD WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL OF THE OWNER AND SUPERVISION BY THE INSPECTION/TESTING AGENCY.
- 2.14. FIELD CUTTING OF STEEL:
  - 2.14.1. IMPORTANT CUTTING AND WELDING SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL OWNER CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT OWNER GUIDELINES. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
  - 2.14.2. ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CONTRACTOR TO AVOID 90 DEGREE CORNERS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS.
  - 2.14.3. FIELD HOLES SHALL BE PUNCHED OR DRILLED. BURNING OF MEMBERS SHALL NOT BE PERMITTED.

**3. BASE PLATE GROUT - NOT REQUIRED)**

**4. FOUNDATION WORK - NOT REQUIRED)**

**5. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**

**6. EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)**

**7. TOUCH UP OF GALVANIZING**

- 7.1. THE CONTRACTOR SHALL TOUCH UP ANY AND ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS AND FIELD DRILLING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
- 7.2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
- 7.3. OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE ADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

**8. HOT-DIP GALVANIZING**

- 8.1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123, ASTM A386 OR PER ASTM A153, AS APPROPRIATE.
- 8.2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
- 8.3. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES WITH EOR APPROVAL OF LOCATIONS.
- 8.4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

**9. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER**

- 9.1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MODIFICATION SYSTEM AND THE WORK HAS BEEN ACCEPTED BY OWNER, OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE STRUCTURE AND MODIFICATION SYSTEM.

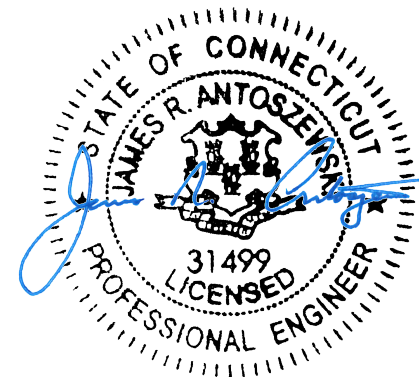
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**EVERSOURCE STRUCTURE #10254**

LONG MOUNTAIN - PLUMTREE 345KV LINE  
 7 STONY HILL ROAD  
 BETHEL, FAIRFIELD COUNTY, CONNECTICUT  
 AT&T BETHEL STONY HILL - AWS SITE #CTL05176



05/22/2019

PROJECT No:	80618-0011.002.6190
DRAWN BY:	FE
DESIGNED BY:	CEC
CHECKED BY:	CSH
DATE:	5-2-2019

**GENERAL NOTES**

**N-1**

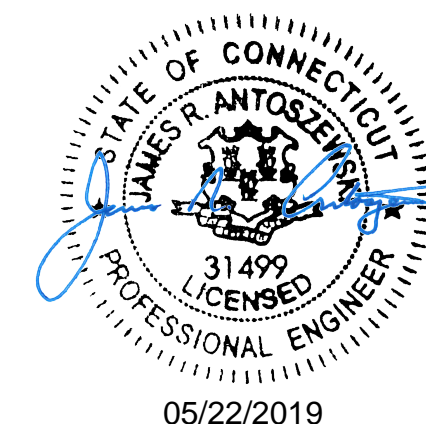
SHEET #2 OF 4

REV	DATE	DESCRIPTION
2	5-21-2019	NO CHANGE

**MODIFICATION INSPECTION NOTES:**

1. **INSPECTION AND TESTING**
  - 1.1. INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS ARE STILL REQUIRED WHEN THE EOR PERFORMS SUPPORT SERVICES DURING CONSTRUCTION.
  - 1.2. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
  - 1.3. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
    - 1.3.1. ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
    - 1.3.2. THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
  - 1.4. **GENERAL**
    - 1.4.1. PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER AND THE EOR IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
  - 1.5. **FOUNDATIONS AND SOIL PREPARATION**
    - 1.5.1. VERIFY MATERIALS AT BOTTOM OF EXCAVATION ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.
    - 1.5.2. VERIFY THAT EXCAVATIONS HAVE EXTENDED TO PROPER DEPTH AND ARE FOUNDED ON PROPER MATERIAL.
    - 1.5.3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS AS SPECIFIED.
    - 1.5.4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.
    - 1.5.5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY SITE HAS BEEN PREPARED PROPERLY.
  - 1.6. **CONCRETE TESTING PER ACI**
    - 1.6.1. INSPECT PLACEMENT OF REINFORCING STEEL.
    - 1.6.2. INSPECT BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE.
    - 1.6.3. VERIFY USE OF REQUIRED MIX DESIGN.
    - 1.6.4. AT THE TIME FRESH CONCRETE IS SAMPLED FABRICATE SPECIMENS FOR STRENGTH TEST, PERFORM SLUMP AND AIR CONTENT TEST AND DETERMINE TEMPERATURE OF THE CONCRETE.
    - 1.6.5. INSPECT CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUE.
    - 1.6.6. INSPECT SPECIFIED CURING AND TEMPERATURE TECHNIQUES.
  - 1.7. **STRUCTURAL STEEL**
    - 1.7.1. CHECK STEEL ON THE JOB WITH THE PLANS.
    - 1.7.2. CHECK MILL CERTIFICATIONS. CALL FOR LABORATORY TEST REPORTS WHEN MILL CERTIFICATION IS IN QUESTION.
    - 1.7.3. CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
    - 1.7.4. INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
    - 1.7.5. CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
    - 1.7.6. CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
    - 1.7.7. CHECK THAT BOLTS HAVE BEEN TIGHTENED PROPERLY.
    - 1.7.8. PRIOR TO ANY FIELD CUTTING THE CONTRACTOR SHALL MARK THE CUTOUT LINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
  - 1.8. **WELDING:**
    - 1.8.1. VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
    - 1.8.2. INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND WITH AWS D1.1.
    - 1.8.3. APPROVE FIELD WELDING SEQUENCE.
    - 1.8.4. INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
      - 1.8.4.1. INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE, AND WORKING CONDITIONS.
      - 1.8.4.2. VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
      - 1.8.4.3. INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
      - 1.8.4.4. VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT.
      - 1.8.4.5. SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE.
      - 1.8.4.6. INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED DRAWINGS.
      - 1.8.4.7. VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
      - 1.8.4.8. REVIEW THE REPORTS BY TESTING LABS.
      - 1.8.4.9. CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
      - 1.8.4.10. INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
      - 1.8.4.11. CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
      - 1.8.4.12. FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1.
      - 1.8.4.13. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1.
  - 1.9. **REPORTS:**
    - 1.9.1. COMPILER AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO OWNER.
    - 1.9.2. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES OR PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. OWNER RESERVES THE RIGHT TO DETERMINE WHETHER OR NOT A RESOLUTION IS ACCEPTABLE.
    - 1.9.3. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
    - 1.9.4. THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

- 1.10. **CORRECTION OF FAILING MI'S**
  - 1.10.1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH THE OWNER TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
    - 1.10.1.1. CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
    - 1.10.1.2. OR, WITH THE OWNERS APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION
- 1.11. **PHOTOGRAPHS**
  - 1.11.1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
    - 1.11.1.1. PRE-CONSTRUCTION GENERAL SITE CONDITION
    - 1.11.1.2. PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
      - 1.11.1.2.1. RAW MATERIALS
      - 1.11.1.2.2. PHOTOS OF ALL CRITICAL DETAILS
      - 1.11.1.2.3. FOUNDATION MODIFICATIONS
      - 1.11.1.2.4. WELD PREPARATION
      - 1.11.1.2.5. BOLT INSTALLATION AND TORQUE
      - 1.11.1.2.6. FINAL INSTALLED CONDITION
      - 1.11.1.2.7. SURFACE COATING REPAIR
    - 1.11.1.3. POST CONSTRUCTION PHOTOGRAPHS
      - 1.11.1.3.1. FINAL INFIELD CONDITION
  - 1.11.2. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.



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**PJF PAUL J. FORD & COMPANY**  
 250 E Broad St, Ste 600 · Columbus, OH 43215  
 Phone 614.221.6679 www.pauljford.com

**AT&T**  
 99 EAST RIVER ROAD, 9TH FLOOR EAST HARTFORD, CONNECTICUT 06108

POST-MODIFICATION CHECKLIST		
REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
<b>PRE-CONSTRUCTION</b>		
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT
X	EOR APPROVED SHOP DRAWINGS	FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE THE APPROVED SHOP DRAWINGS TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FABRICATOR CERTIFIED WELD INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE TESTING AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL WITH A YIELD STRENGTH GREATER THAN 36 KSI AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FABRICATOR NDE INSPECTION	A VISUAL OBSERVATION OF A PORTION OF THE EXISTING STRUCTURE (AS NOTED ON THESE DRAWINGS) IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)	A VISUAL OBSERVATION OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
<b>CONSTRUCTION</b>		
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	POST INSTALLED ANCHOR ROD VERIFICATION	ANCHOR ROD INSTALLATION SHALL INCLUDE VERIFICATION BY LETTER AND PHOTOGRAPHIC DOCUMENTATION.
NA	BASE PLATE GROUT VERIFICATION	A LETTER FROM THE GENERAL CONTRACTOR SHALL BE PROVIDED TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH SPECIFICATIONS FOR INCLUSION IN THE MI REPORT.
NA	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT. PRE, DURING AND POST WELD INSPECTION IS REQUIRED.
NA	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH SPECIFICATIONS.
NA	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE FOR INCLUSION IN THE MI REPORT.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD DUE TO FIELD CONDITIONS.
NA	MICROPILE / ROCK ANCHOR	THE GENERAL CONTRACTOR SHALL PROVIDE INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTATION TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
<b>POST-CONSTRUCTION</b>		
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
NA	POST INSTALLED ANCHOR ROD PULL TESTING	POST INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH SPECIFICATIONS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
NA	POST INSTALLED MICROPILE / ROCK ANCHOR TESTING	POST INSTALLED ANCHORS SHALL BE TESTED AND INSPECTED IN ACCORDANCE WITH SPECIFICATION STATED ON MICROPILE/ROCK ANCHOR NOTES.

NOTE: X DENOTES A DOCUMENT NEEDED FROM THE CONTRACTOR FOR THE MI REPORT  
 NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

**EVERSOURCE STRUCTURE #10254**  
 LONG MOUNTAIN - PLUMTREE 345KV LINE  
 7 STONY HILL ROAD  
 BETHEL, FAIRFIELD COUNTY, CONNECTICUT  
 AT&T BETHEL STONY HILL - AWS SITE #CTL05176

PROJECT No:	80618-0011.002.6190
DRAWN BY:	FE
DESIGNED BY:	CEC
CHECKED BY:	<i>CSH</i>
DATE:	5-2-2019

**INSPECTION NOTES**

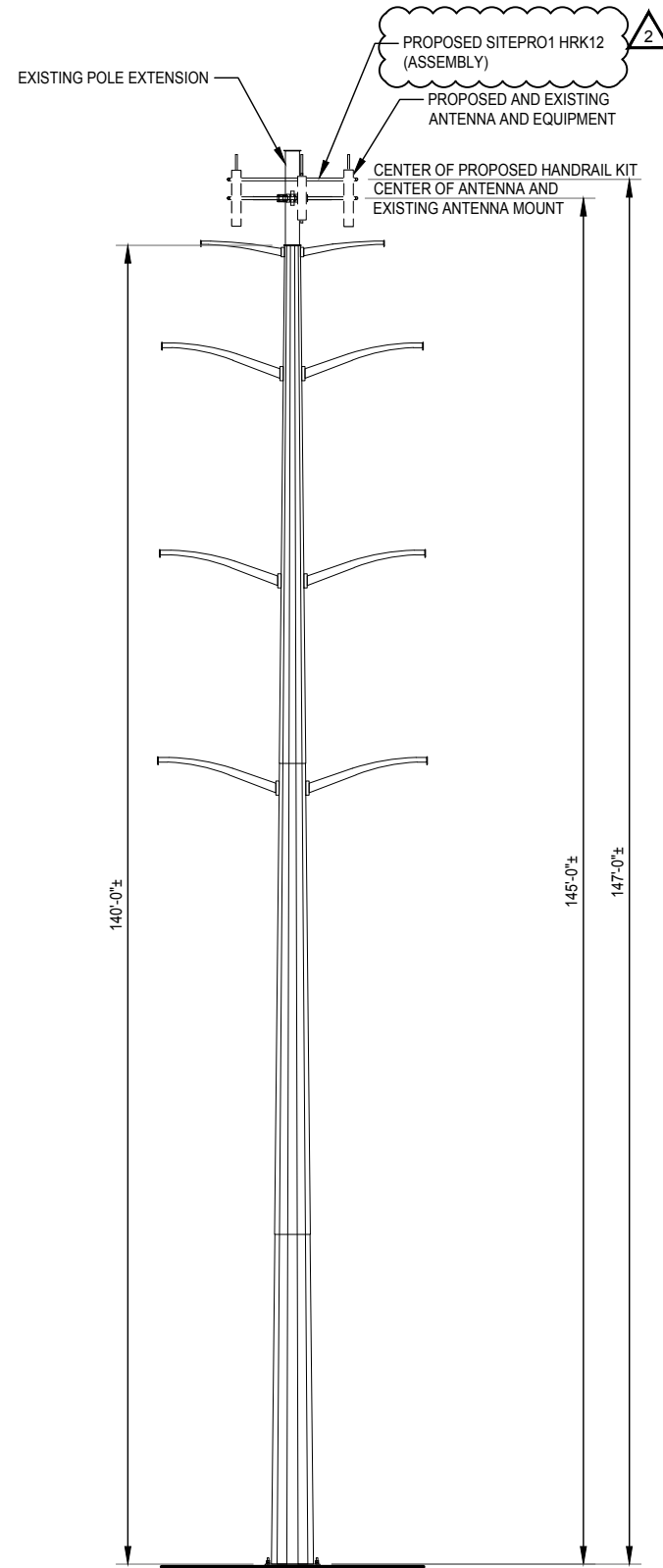
**MI-1**

SHEET #3 OF 4

2	5-21-2019	NO CHANGE
REV	DATE	DESCRIPTION

80618-0011.002.6190.DWG





TOWER ELEVATION 1  
S-1

**MATERIAL LIST**  
FOR "ONE" ANTENNA MOUNT MODIFICATION

PART NO.	NO. REQ'D.	SHIP PER PK	ORDER QTY.	DESCRIPTION	TOTAL WT (lb)
HRK12	1	1	1	SITEPRO1 HANDRAIL ASSEMBLY	272
<b>TOTAL MEMBER WEIGHT</b>					<b>272</b>

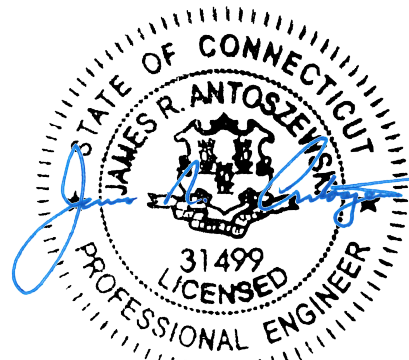
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Phone 614.221.6679 www.pauljford.com

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99 EAST RIVER ROAD, 9TH FLOOR EAST HARTFORD, CONNECTICUT 06108

**EVERSOURCE STRUCTURE #10254**  
LONG MOUNTAIN - PLUMTREE 345KV LINE  
7 STONY HILL ROAD  
BETHEL, FAIRFIELD COUNTY, CONNECTICUT  
AT&T BETHEL STONY HILL - AWS SITE #CTL05176

PROJECT No:	80618-0011.002.6190
DRAWN BY:	FE
DESIGNED BY:	CEC
CHECKED BY:	<i>CFH</i>
DATE:	5-2-2019



05/22/2019

2	5-21-2019	HANDRAIL KIT
REV	DATE	DESCRIPTION

TOWER ELEVATIONS AND MATERIAL LIST

**S-1**  
SHEET #4 OF 4

80618-0011.002.6190.DWG

**Kristina Cottone**

---

**From:** TrackingUpdates@fedex.com  
**Sent:** Friday, February 5, 2021 1:49 PM  
**To:** Kristina Cottone  
**Subject:** FedEx Shipment 772810401650: Your package has been delivered



Hi. Your package was delivered Fri, 02/05/2021 at 1:47pm.



Delivered to 1 SCHOOL ST, Bethel, CT 06801  
Received by CCOVID

**OBTAIN PROOF OF DELIVERY**

**TRACKING NUMBER**     [772810401650](#)

**FROM**     Smartlink LLC  
85 Rangeway Road  
Building 3 Suite 102  
NORTH BILLERICA, MA, US, 01862

**TO**     Town of Branford  
ATTN: Building Department Chris B.

1 School Street  
BETHEL, CT, US, 06801

**REFERENCE** CTL05176 - Bethel

**SHIP DATE** Thu 2/04/2021 12:00 AM

**PACKAGING TYPE** Package

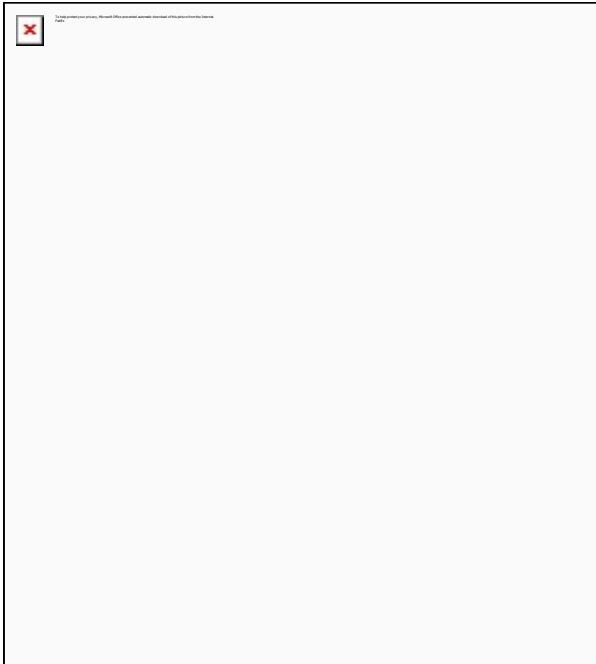
**ORIGIN** NORTH BILLERICA, MA, US, 01862

**DESTINATION** BETHEL, CT, US, 06801

**NUMBER OF PIECES** 1

**TOTAL SHIPMENT WEIGHT** 1.00 LB

**SERVICE TYPE** FedEx Ground




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All weights are estimated.

**Kristina Cottone**

---

**From:** TrackingUpdates@fedex.com  
**Sent:** Friday, February 5, 2021 1:49 PM  
**To:** Kristina Cottone  
**Subject:** FedEx Shipment 772810454973: Your package has been delivered



Hi. Your package was delivered Fri, 02/05/2021 at 1:47pm.



Delivered to 1 SCHOOL ST, Bethel, CT 06801  
Received by CCOVID

**OBTAIN PROOF OF DELIVERY**

**TRACKING NUMBER**     [772810454973](#)

**FROM**                     Smartlink LLC  
85 Rangeway Road  
Building 3 Suite 102  
NORTH BILLERICA, MA, US, 01862

**TO**                             Town of Branford  
ATTN: First Selectman Matt K.

1 School Street  
BETHEL, CT, US, 06801

**REFERENCE** CTL05176 - Bethel

**SHIP DATE** Thu 2/04/2021 12:00 AM

**PACKAGING TYPE** Package

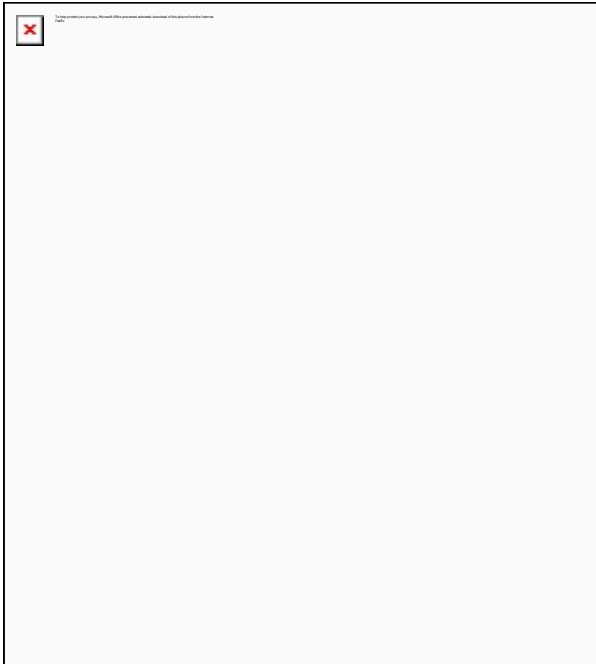
**ORIGIN** NORTH BILLERICA, MA, US, 01862

**DESTINATION** BETHEL, CT, US, 06801

**NUMBER OF PIECES** 1

**TOTAL SHIPMENT WEIGHT** 1.00 LB

**SERVICE TYPE** FedEx Ground




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All weights are estimated.

**Kristina Cottone**

---

**From:** TrackingUpdates@fedex.com  
**Sent:** Monday, February 8, 2021 4:29 PM  
**To:** Kristina Cottone  
**Subject:** FedEx Shipment 772810502339: Your package has been delivered



Hi. Your package was  
delivered Mon, 02/08/2021 at  
4:28pm.



Delivered to  
Received by Signature on File

**OBTAIN PROOF OF DELIVERY**

**TRACKING NUMBER**     [772810502339](#)

**FROM**     Smartlink LLC  
85 Rangeway Road  
Building 3 Suite 102  
NORTH BILLERICA, MA, US, 01862

**TO**     Conn. Light and Power C/O Eversource  
ATTN: Joel Szarkowicz  
56 Prospect Street

1st Floor  
HARTFORD, CT, US, 06103

**REFERENCE** CTL05176 - Bethel

**SHIP DATE** Thu 2/04/2021 12:00 AM

**PACKAGING TYPE** Package

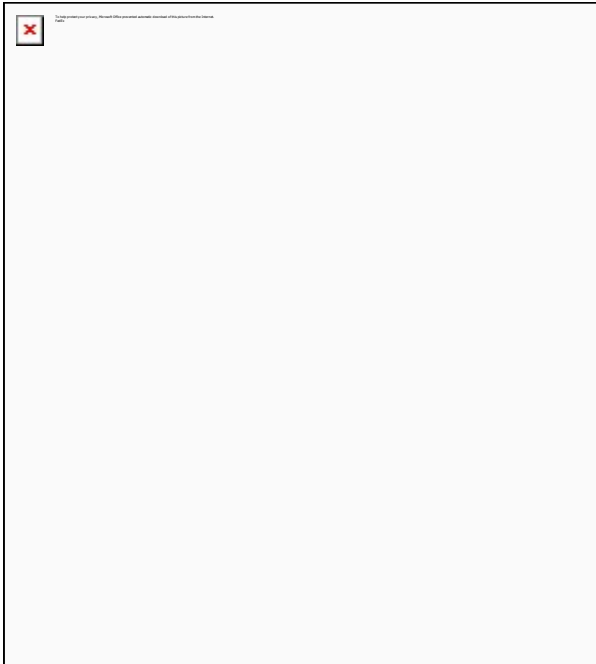
**ORIGIN** NORTH BILLERICA, MA, US, 01862

**DESTINATION** HARTFORD, CT, US, 06103

**NUMBER OF PIECES** 1

**TOTAL SHIPMENT WEIGHT** 1.00 LB

**SERVICE TYPE** FedEx Ground




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All weights are estimated.

## Kristina Cottone

---

**From:** auto-reply@usps.com  
**Sent:** Monday, February 8, 2021 11:56 AM  
**To:** Kristina Cottone  
**Subject:** USPS® Item Delivered 9500112444771034375836



Hello **Kristina Cottone**,

Your item was delivered at 7:01 am on February 6, 2021 in MINNEAPOLIS, MN 55440.

Tracking Number: [9500112444771034375836](#)

**Delivered**



**Tracking & Delivery Options**

**My Account**

Visit [USPS Tracking®](#) to check the most up-to-date status of your package. Sign up for [Informed Delivery®](#) to digitally preview the address side of your incoming letter-sized mail and manage your packages scheduled to arrive soon! To update how frequently you receive emails from USPS, log in to your [USPS.com](#) account.

Want regular updates on your package? [Set up text alerts.](#)

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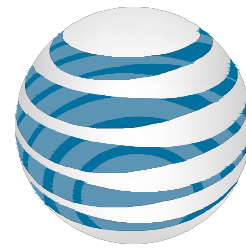


## PROJECT NOTES

1. SITE INFORMATION OBTAINED FROM THE FOLLOWING:
  - A. PLAN ENTITLED "EVERSOURCE STRUCT. NO. 10254" PREPARED BY CENTEK ENGINEERING OF BRANFORD, CT LAST REVISED 02/24/16.
  - B. LIMITED FIELD OBSERVATION BY MASER CONSULTING ON 05/21/2018.
  - C. MOUNT MODS ENTITLED "EVERSOURCE STRUCTURE #10254" BY PAUL J. FORD & COMPANY OF COLUMBUS, OH DATED ON 05/02/19.
2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITY COMPANIES OR OTHER PUBLIC/GOVERNING AUTHORITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
4. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE AS A RESULT OF CONSTRUCTION OF THIS FACILITY AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
6. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
7. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING THE BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND CONSTRUCTION DRAWINGS.
8. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THESE DRAWINGS MUST BE VERIFIED. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
9. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY POTENTIALLY DANGEROUS EXPOSURE LEVELS.
10. THE PROPOSED FACILITY WILL CAUSE NO INCREASE IN STORM WATER RUNOFF, THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
11. NO NOISE, SMOKE, DUST OR ODOR WILL RESULT FROM THIS FACILITY AS TO CAUSE A NUISANCE.
12. THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION (NO HANDICAP ACCESS IS REQUIRED).
13. THE FACILITY DOES NOT REQUIRE POTABLE WATER OR SANITARY SERVICE.
14. CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTHS WITH RF ENGINEERING PRIOR TO INSTALLATION.
15. THE MOUNTS AND ANTENNAS SHALL BE DESIGNED TO MEET EIA/TIA-222-G AS PER IBC REQUIREMENTS.
16. CONTRACTOR MUST FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION.
17. CONSTRUCTION SHALL NOT COMMENCE UNTIL COMPLETION OF A PASSING STRUCTURAL ANALYSIS CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER. THE STRUCTURAL ANALYSIS IS TO BE PERFORMED BY OTHERS.
18. CONTRACTOR SHALL CONTACT STATE SPECIFIC ONE CALL SYSTEM THREE WORKING DAYS PRIOR TO ANY EARTH MOVING ACTIVITIES.

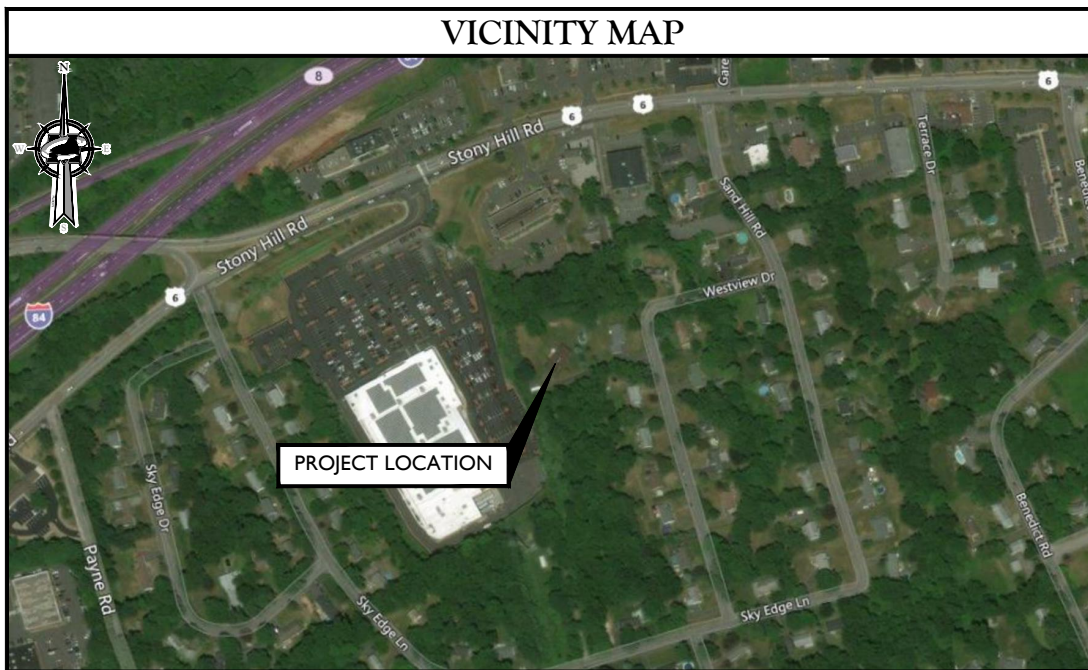
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# at&t

**SITE NAME: BETHEL STONY HILLAWS**  
**FA NUMBER: 10071269**  
**SITE NUMBER: CTL05176**  
**6C - MRCTB032343**  
**5G NR UPGRADE - MRCTB032344**  
**7C - MRCTB032332**  
**7 STONY HILL ROAD**  
**BETHEL, CT 06801**  
**FAIRFIELD COUNTY**  
**EVERSOURCE STRUCTURE 10254**



## CODE COMPLIANCE

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. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING CODES.

- |                                                                     |                                                                                                                |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| 1. 2018 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2015 IBC | 8. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81 IEEE C2 LATEST EDITION                                |
| 2. 2017 NATIONAL ELECTRICAL CODE - NFPA 70                          | 9. TELCORDIA GR-1275                                                                                           |
| 3. 2015 NFPA 101                                                    | 10. ANSI T1.311                                                                                                |
| 4. AMERICAN INSTITUTE OF STEEL CONSTRUCTION 360-10                  | 11. PROPOSED USE: UNMANNED TELECOM FACILITY                                                                    |
| 5. AMERICAN CONCRETE INSTITUTE                                      | 12. HANDICAP REQUIREMENTS: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED. |
| 6. TIA-222-G                                                        | 13. CONSTRUCTION TYPE: IIB                                                                                     |
| 7. TIA 607 FOR GROUNDING                                            | 14. USE GROUP: U                                                                                               |

## PROJECT INFORMATION

### SITE INFORMATION

LATITUDE: 41.4157919° N  
 LONGITUDE: 73.4016989° W  
 JURISDICTION: FAIRFIELD COUNTY

### APPLICANT/LESSEE

COMPANY: NEW CINGULAR WIRELESS PCS, LLC  
 ADDRESS: 550 COCHITUATE ROAD  
 CITY, STATE, ZIP: FRAMINGHAM, MA 01701

### LANDLORD:

LANDLORD: EVERSOURCE F/K/A/CONNECTICUT LIGHT AND POWER CO.  
 SITE NUMBER: EVERSOURCE STRUCTURE 10254  
 ADDRESS: 107 SELDON STREET  
 CITY, STATE, ZIP: BERLIN, CT 06037

### CLIENT REPRESENTATIVE

COMPANY: SMARTLINK, LLC  
 ADDRESS: 85 RANGWAY ROAD, BUILDING 3, STE. 102  
 CITY, STATE, ZIP: NORTH BILLERICA, MA 01862  
 CONTACT: TODD OLIVER  
 E-MAIL: TODD.OLIVER@SMARTLINKLLC.COM

### SITE ACQUISITION

COMPANY: SMARTLINK, LLC  
 ADDRESS: 85 RANGWAY ROAD, BUILDING 3, STE. 102  
 CITY, STATE, ZIP: NORTH BILLERICA, MA 01862  
 CONTACT: SHARON KEEFE  
 E-MAIL: SHARON.KEEFE@SMARTLINKLLC.COM

### CONSTRUCTION MANAGER

COMPANY: SMARTLINK, LLC  
 ADDRESS: 85 RANGWAY ROAD, BUILDING 3, STE. 102  
 CITY, STATE, ZIP: NORTH BILLERICA, MA 01862  
 CONTACT: MARK DONNELLY  
 E-MAIL: MARK.DONNELLY@SMARTLINKLLC.COM

### ENGINEER

COMPANY: MASER CONSULTING P.A.  
 ADDRESS: 331 NEWMAN SPRINGS ROAD, SUITE 203  
 CITY, STATE, ZIP: RED BANK, NJ 07701  
 CONTACT: ROBERT ANDREWS  
 PHONE: (856) 797-0412  
 E-MAIL: RANDREWS@MASERCONSULTING.COM

## PROJECT DESCRIPTION/ SCOPE OF WORK

- INSTALL (8) NEW RRU'S AT GRADE
- INSTALL (3) NEW PANEL ANTENNAS, (1) PER SECTOR
- REMOVE (3) EXISTING PANEL ANTENNAS, (1) PER SECTOR
- REMOVE (6) DIPLEXERS AT GRADE
- INSTALL (6) TRIPLEXERS AT GRADE
- INSTALL (12) QUADPLEXERS AT GRADE
- INSTALL (6) TMA'S, (2) PER SECTOR
- INSTALL (1) NEW DC-12 SURGE SUPPRESSION BOX
- INSTALL (1) NEW 18-PAIR FIBER TRUNK
- INSTALL (4) NEW 6/C DC CABLES
- INSTALL (6) NEW 1-5/8" COAX CABLES, 2 PER SECTOR
- SWAP DUS WITH (1) 5216
- ADD (1) IDLe AND (1) RBS 6630

PROPOSED PROJECT SCOPE BASED ON RFDS ID# 2315515, VERSION 4.00, LAST UPDATED 08/27/2018.

## SHEET INDEX

SHEET	DESCRIPTION
T-1	TITLE SHEET
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C-3	ANTENNA LAYOUTS AND ANTENNA SCHEDULE
A-1	CONSTRUCTION DETAILS
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A-3	CONSTRUCTION DETAILS
A-4	CONSTRUCTION DETAILS
A-5	RF PLUMBING DIAGRAM
G-1	GROUNDING DETAILS AND NOTES



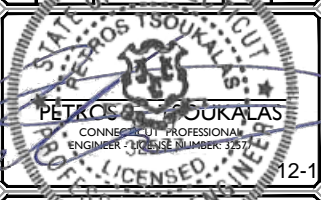
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1	10/02/18	REVISED PER COMMENTS	AJC	RA
0	09/24/18		AJC	RA
REV			DRAWN	CHECKED BY



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### SITE NAME:

**BETHEL STONY HILLAWS**  
**FA# 10071269**  
**SITE# CT5176**  
**7 STONY HILL ROAD**  
**BETHEL, CT 06801**  
**FAIRFIELD COUNTY**



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 331 Newman Springs Road  
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 Red Bank, NJ 07711-5669  
 Phone: 732.383.1950  
 Fax: 732.383.1984  
 email: solutions@maserconsulting.com

SHEET TITLE:

**TITLE SHEET**

SHEET NUMBER:

**T-1**

**GENERAL NOTES:**

- THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTNING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
- ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
- THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 50 HNS OR LESS.
- THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
- METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
- METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
- EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE EQUIPMENT GROUND RING WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
- CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
- ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
- ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. ALL BENDS SHALL BE MADE WITH 12" RADIUS OR LARGER.
- EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
- ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS EXCEPT FOR GROUND BAR CONNECTION FROM MGB TO OUTSIDE EXTERIOR GROUND SHALL ALL BE CADWELD CONNECTIONS.
- COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
- ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED TO THE TOWER GROUND BAR.
- APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- ALL EXTERIOR AND INTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
- MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
- GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G. NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
- ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/4" IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50.
- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
  - CONTRACTOR - SMARTLINK
  - SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
  - OWNER - AT&T (NEW CINGULAR WIRELESS PCS, LLC)
- ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
- DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
- ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

- THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
- THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
- THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE RESPONSIBLE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING & EXCAVATION.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED 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.
- 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.
- SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
- THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
- IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
- SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR.
- SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
- ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
- ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS.
- ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
- CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
- SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
- THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION, ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
- SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN ALERT OF DANGEROUS EXPOSURE LEVELS.



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4	7/31/19	REVISED PER COMMENTS	AJC NO
3	12/12/18	FOR CONSTRUCTION	AJC RA
2	10/31/18	REVISED PER COMMENTS	AJC RA
1	10/02/18	REVISED PER COMMENTS	AJC RA
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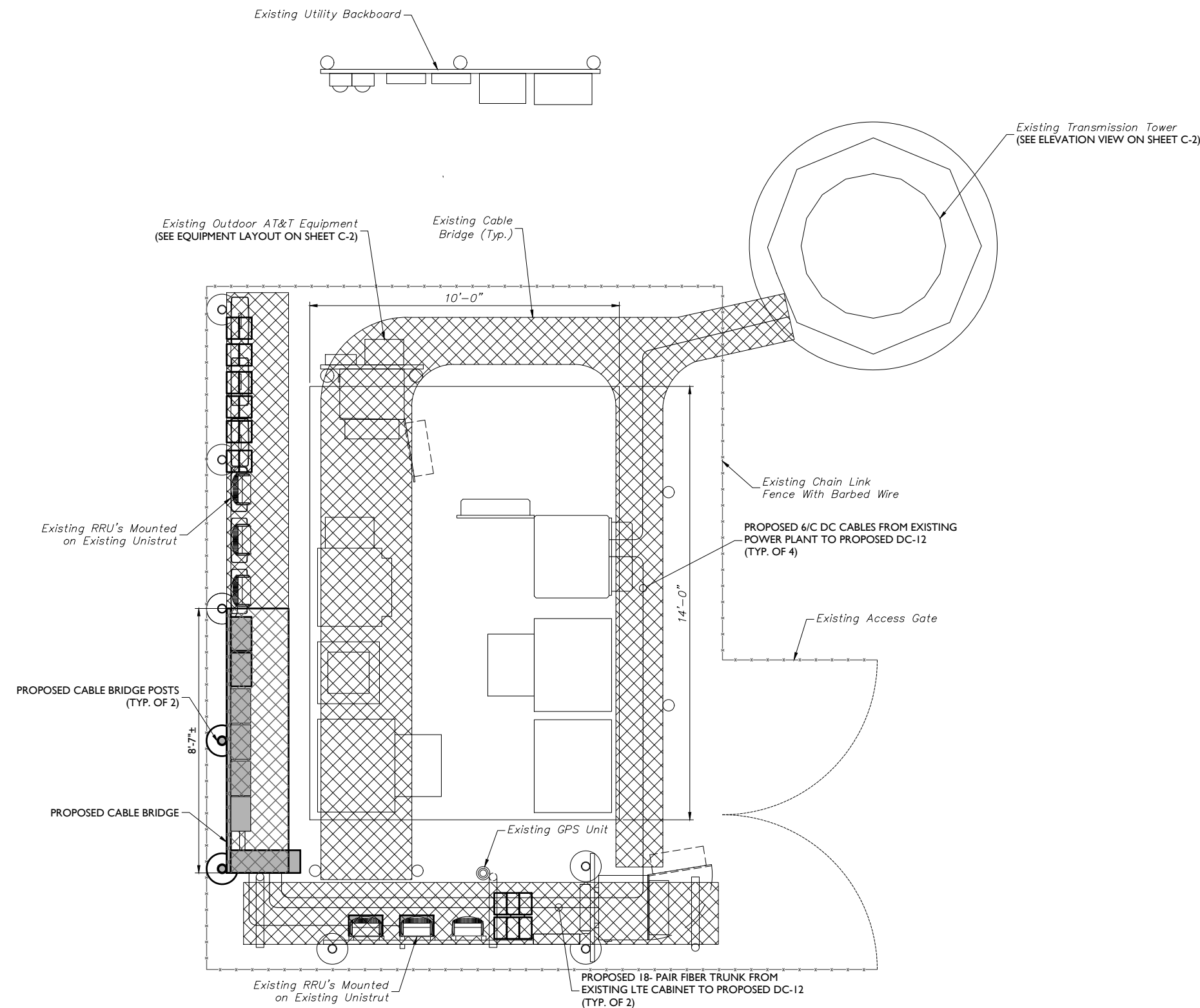
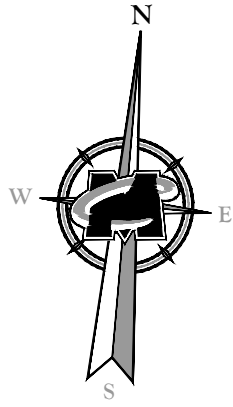
**SITE NAME:**  
BETHEL STONY HILLAWS  
FA# 10071269  
SITE# CT5176  
7 STONY HILL ROAD  
BETHEL, CT 06801  
FAIRFIELD COUNTY



SHEET TITLE:  
**GENERAL NOTES**

SHEET NUMBER:  
**GN-1**

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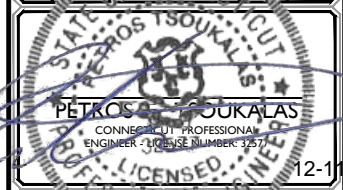
**COMPOUND PLAN**  
 SCALE : 1" = 2' FOR 22"X34"  
 (SCALE : 1" = 4' FOR 11"X17")

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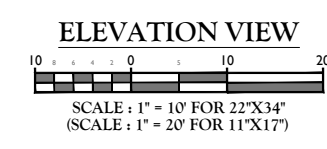
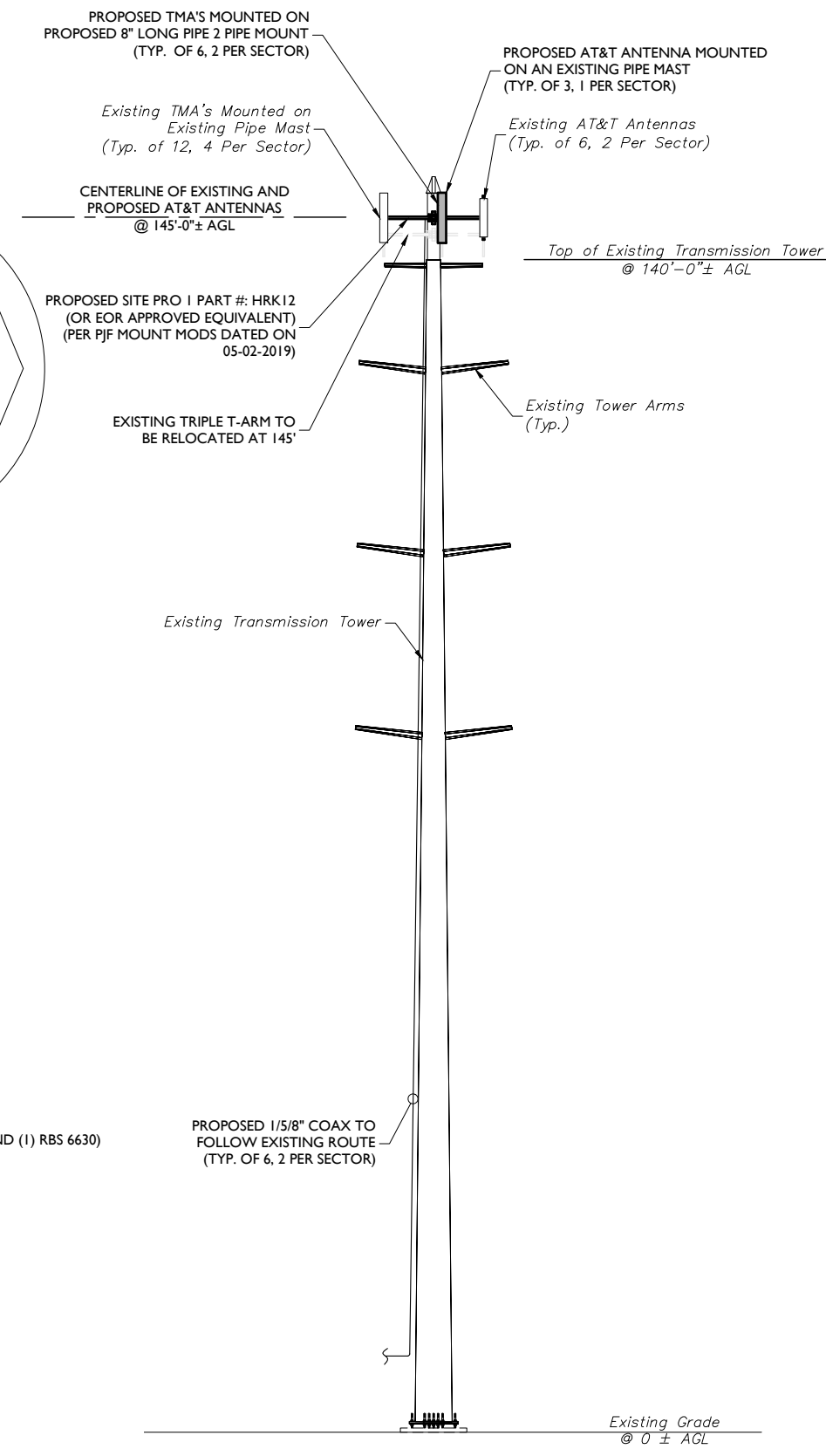
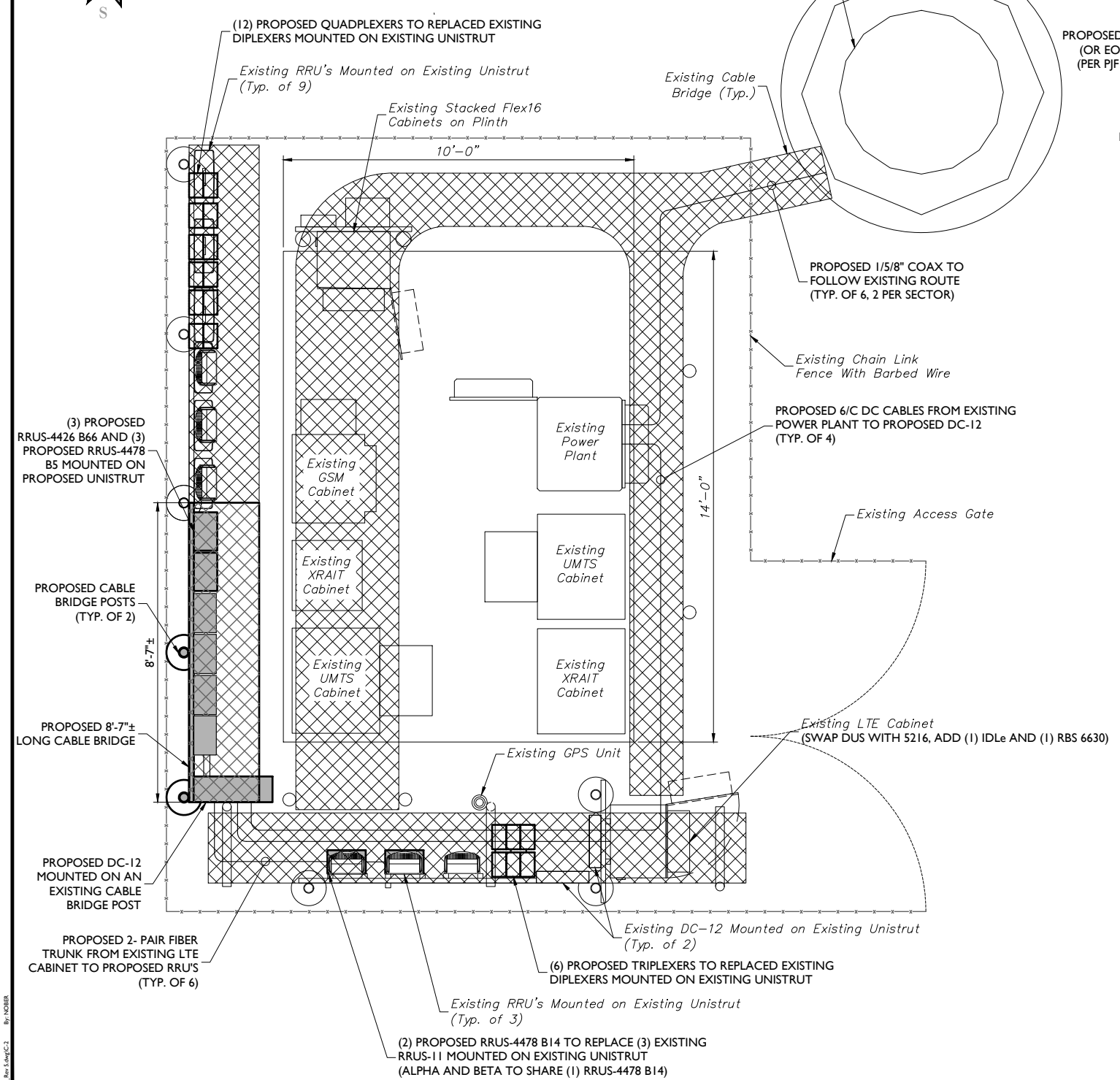
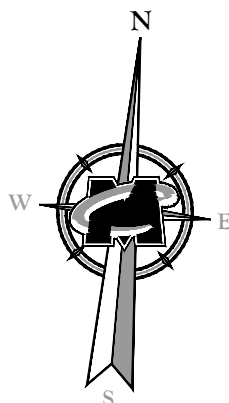
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SHEET TITLE:  
**COMPOUND PLAN**

SHEET NUMBER:  
**C-1**

M:\Projects\55881\0071269\_CTS176\_CSD\_Rev.5.dwg\CC1 By: NOBER

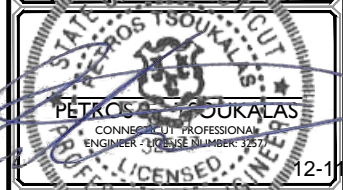


**STRUCTURAL NOTES:**

1. A MOUNT ANALYSIS REPORT PREPARED BY PJF, DATED 05/21/19 HAS BEEN PREPARED TO CHECK THE STRUCTURAL CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED ANTENNA AND EQUIPMENT CONFIGURATION AS DEPICTED WITHIN THESE CONSTRUCTION DRAWINGS. BASED ON THE CONCLUSIONS OF THIS REPORT, THE ANTENNA MOUNT HAS BEEN DETERMINED TO HAVE SUFFICIENT CAPACITY. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, CABLES, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.
2. A STRUCTURAL ANALYSIS REPORT PREPARED BY PJF, DATED 10/24/19 HAS BEEN PREPARED TO CHECK THE STRUCTURAL CAPACITY OF THE EXISTING TOWER TO SUPPORT THE PROPOSED ANTENNA AND EQUIPMENT CONFIGURATION AS DEPICTED WITHIN THESE CONSTRUCTION DRAWINGS. BASED ON THE CONCLUSIONS OF THIS REPORT, THE EXISTING TOWER HAS BEEN DETERMINED TO HAVE SUFFICIENT CAPACITY.



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FAIRFIELD COUNTY



SHEET TITLE:  
**EQUIPMENT LAYOUT AND ELEVATION VIEW**

SHEET NUMBER:  
**C-2**

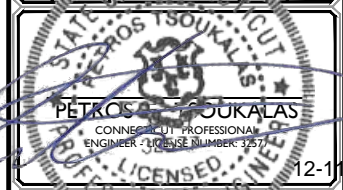
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SCALE:	AS SHOWN	JOB NUMBER:	18946026A
REV	DESCRIPTION	DATE	CHECKED BY
5	12/11/19	REVISED PER COMMENTS	CDH NO
4	7/31/19	REVISED PER COMMENTS	AJC NO
3	12/12/18	FOR CONSTRUCTION	AJC RA
2	10/31/18	REVISED PER COMMENTS	AJC RA
1	10/02/18	REVISED PER COMMENTS	AJC RA
0	09/24/18		AJC RA



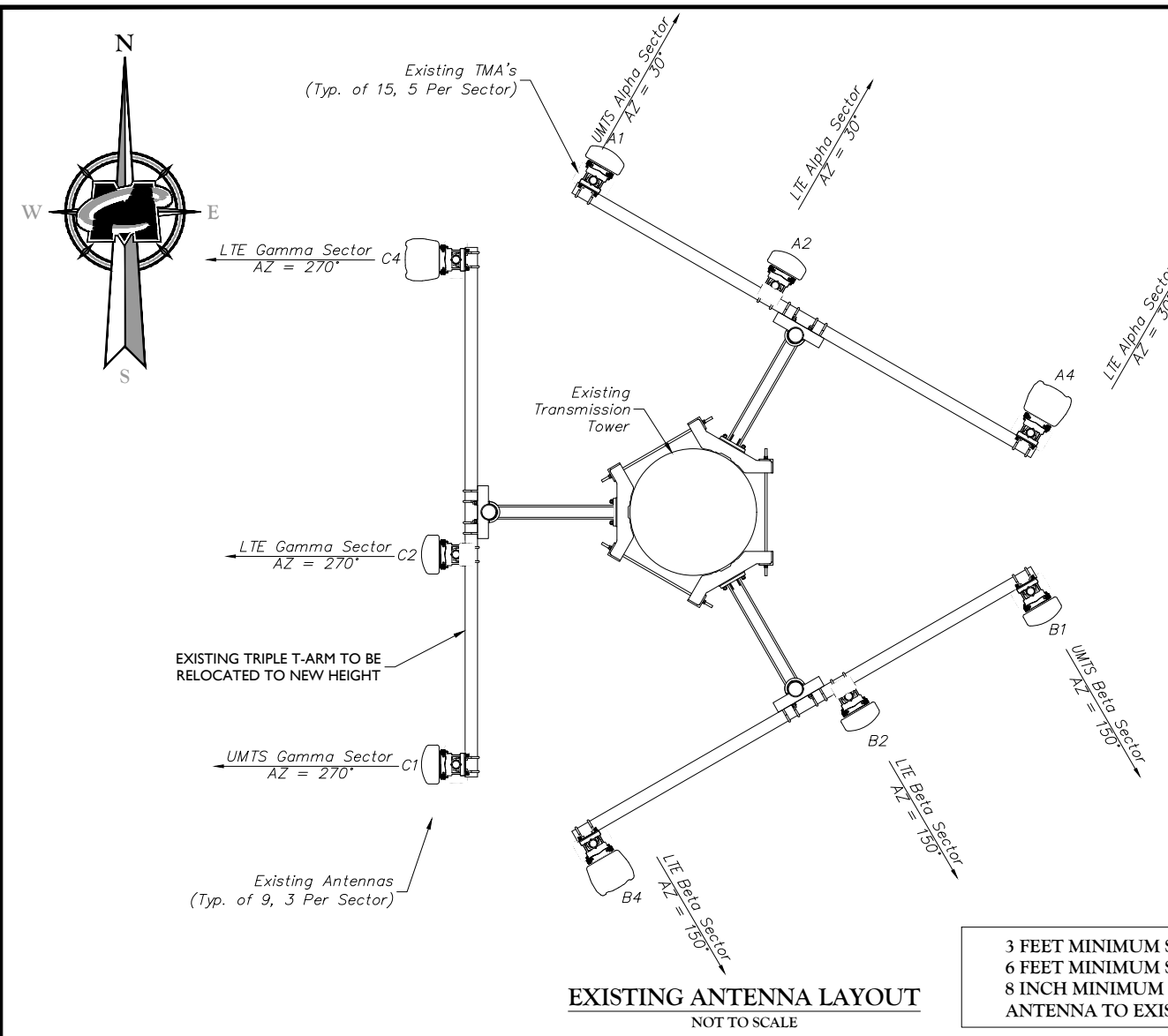
IT IS A VIOLATION OF THE PROFESSIONAL ENGINEER ACT FOR ANY PERSON, UNLESS THEY ARE WORKING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

**SITE NAME:**  
**BETHEL STONY HILLAWS**  
**FA# 10071269**  
**SITE# CT5176**  
**7 STONY HILL ROAD**  
**BETHEL, CT 06801**  
**FAIRFIELD COUNTY**

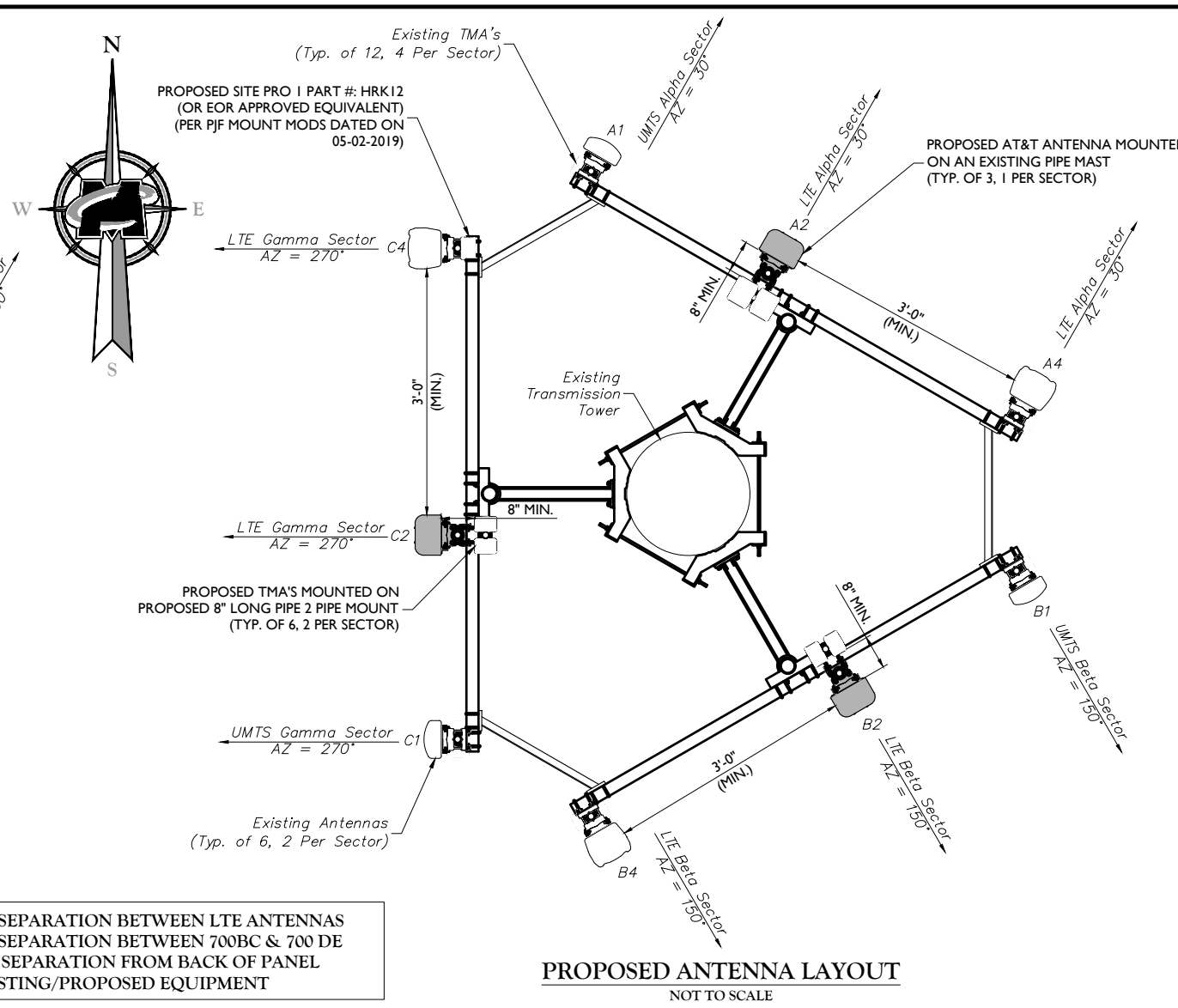
**RED BANK OFFICE**  
 331 Newman Springs Road  
 Suite 203  
 Red Bank, NJ 07711-5669  
 Phone: 732.383.1950  
 Fax: 732.383.1984  
 email: solutions@maserconsulting.com

**SHEET TITLE:**  
**ANTENNA LAYOUTS AND**  
**ANTENNA SCHEDULE**

**SHEET NUMBER:**  
**C-3**



**EXISTING ANTENNA LAYOUT**  
 NOT TO SCALE



**PROPOSED ANTENNA LAYOUT**  
 NOT TO SCALE

**3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS**  
**6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE**  
**8 INCH MINIMUM SEPARATION FROM BACK OF PANEL**  
**ANTENNA TO EXISTING/PROPOSED EQUIPMENT**

ANTENNA SCHEDULE															
SECTOR	EXISTING ANTENNA	PROPOSED ANTENNA	TECHNOLOGY	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH (DEG.)	ANT. CL. ELEV. (ft.)	REMOTE RADIO/TMA CONFIGURATION	TRANSMISSION CABLE			
												QUANTITY	TYPE	STATUS	
Sector 1	1	POWERWAVE 7770	POWERWAVE	UMTS	EXISTING	55.00	11.00	5.00	35.00	30	145°	(2) TPX-070821 (GRADE) (2) LGP 21401 TMAX (1) RRU5-E2 829 (GRADE)	2	1.58" COAX	EXISTING
	2	POWERWAVE P65-16-XLHRR	CCI HPA65R-BU6A	LTE	PROPOSED	71.10	11.70	7.60	59.50	30	145°	(4) QBC0007FV151-1 (GRADE) (2) BPD7823VG12A TMA (1) RRU5-4478 B14 (GRADE) (1) RRU5-4426 B66 (GRADE)	2	1.58" COAX	PROPOSED EXISTING
	3														
	4	QUINTEL Q566512-2	QUINTEL Q566512-2	LTE	EXISTING	72.00	12.00	9.60	126.60	30	145°	(4) TSXDC-4310FH (GRADE) (1) RRU5-4478 B5 (GRADE) (1) RRU5-11 (GRADE) (1) RRU5-32 B2 (GRADE) (1) RRU5-32 (GRADE) (2) TMA211700V1-1	4	1.58" COAX	EXISTING
Sector 2	1	POWERWAVE 7770	POWERWAVE 7770	UMTS	EXISTING	55.00	11.00	5.00	35.00	150	145°	(2) TPX-070821 (GRADE) (2) LGP 21401 TMAX (1) RRU5-E2 829 (GRADE)	2	1.58" COAX	EXISTING
	2	POWERWAVE P65-16-XLHRR	CCI HPA65R-BU6A	LTE	PROPOSED	71.10	11.70	7.60	59.50	150	145°	(4) QBC0007FV151-1 (GRADE) (2) BPD7823VG12A TMA (1) RRU5-4478 B14 (SHARED) (1) RRU5-4426 B66 (GRADE)	2	1.58" COAX	PROPOSED EXISTING
	3														
	4	QUINTEL Q566512-2	QUINTEL Q566512-2	LTE	EXISTING	72.00	12.00	9.60	126.60	150	145°	(4) TSXDC-4310FH (GRADE) (1) RRU5-4478 B5 (GRADE) (1) RRU5-11 (GRADE) (1) RRU5-32 B2 (GRADE) (1) RRU5-32 (GRADE) (2) TMA211700V1-1	4	1.58" COAX	EXISTING
Sector 3	1	POWERWAVE 7770	POWERWAVE 7770	UMTS	EXISTING	55.00	11.00	5.00	35.00	270	145°	(2) TPX-070821 (GRADE) (2) LGP 21401 TMAX (1) RRU5-E2 829 (GRADE)	2	1.58" COAX	EXISTING
	2	POWERWAVE P65-16-XLHRR	CCI HPA65R-BU6A	LTE	PROPOSED	71.10	11.70	7.60	59.50	270	145°	(4) QBC0007FV151-1 (GRADE) (2) BPD7823VG12A TMA (1) RRU5-4478 B14 (GRADE) (1) RRU5-4426 B66 (GRADE)	2	1.58" COAX	PROPOSED EXISTING
	3														
	4	QUINTEL Q566512-2	QUINTEL Q566512-2	LTE	EXISTING	72.00	12.00	9.60	126.60	270	145°	(4) TSXDC-4310FH (GRADE) (1) RRU5-4478 B5 (GRADE) (1) RRU5-11 (GRADE) (1) RRU5-32 B2 (GRADE) (1) RRU5-32 (GRADE) (2) TMA211700V1-1	4	1.58" COAX	EXISTING

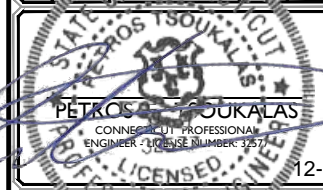
By: NDBER 5/28/2019 07:29:00 CT5176\_C3D\_Rev\_5.mxd





SCALE: AS SHOWN JOB NUMBER: 18946026A

REV	DESCRIPTION	DATE	BY	CHECKED
5	12/11/19	REVISED PER COMMENTS	CDH	NO
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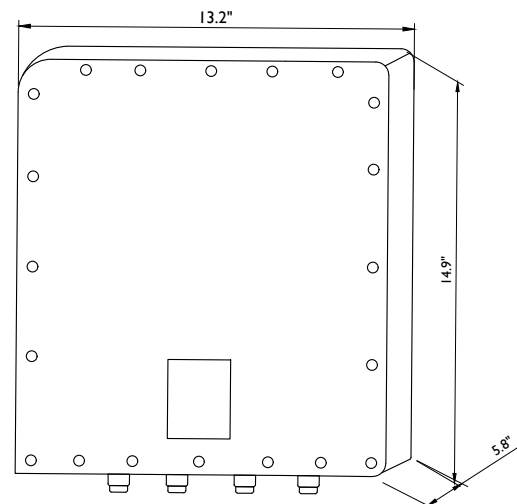
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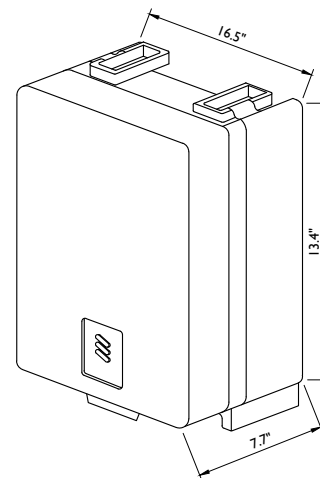
SHEET TITLE:  
**CONSTRUCTION DETAILS**

SHEET NUMBER:  
**A-2**



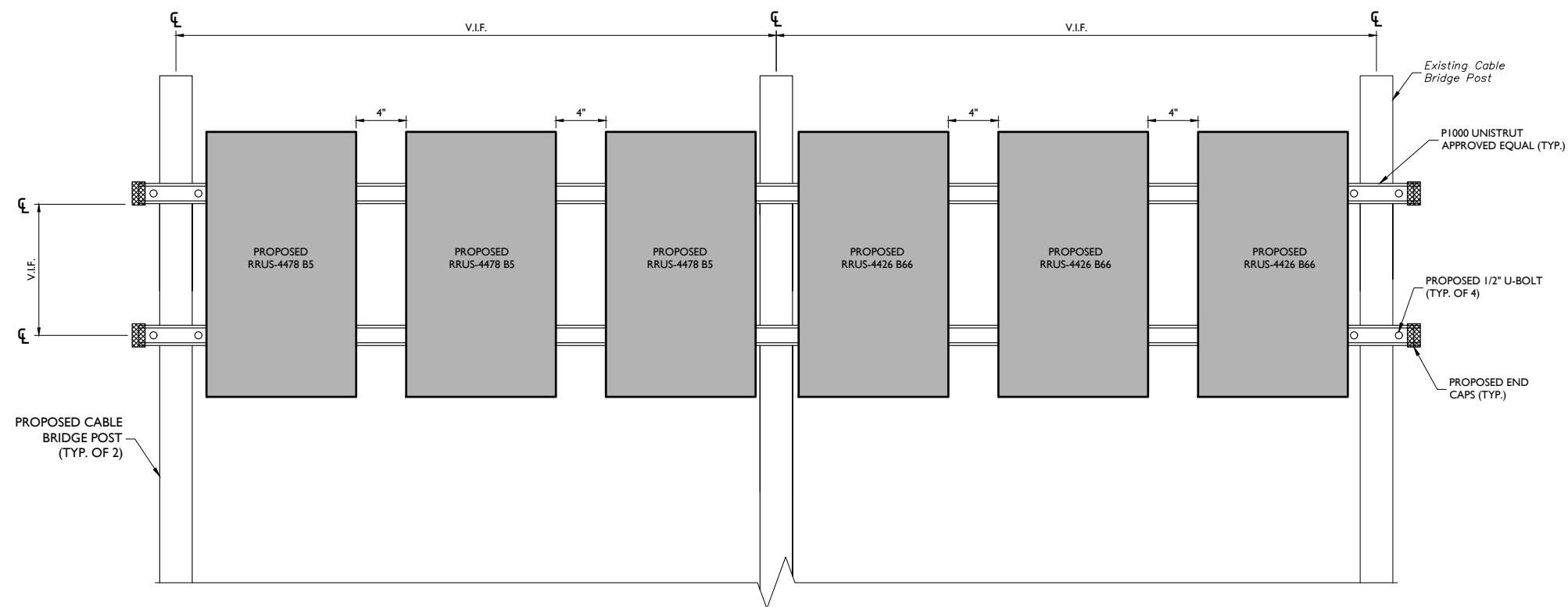
RRUS 4426 B66 DIMENSIONS (H X W X D): 14.9" X 13.2" X 5.9"  
(INCLUDES SUNSHIELD) WEIGHT: 48 LBS

**RRUS 4426 B66 DETAIL**  
NOT TO SCALE



DIMENSIONS (H X W X D): 16.5"H X 13.4"W X 7.7"D (INCLUDES SUNSHIELD)  
WEIGHT: 59.9 LBS

**RRU-4478-B5 DETAIL**  
NOT TO SCALE



**NOTES:**

1. INSTALL HORIZONTAL/VERTICAL UNISTRUT CHANNELS AS REQUIRED TO ALIGN FRAME WITH EQUIPMENT MOUNTING HOLES. FASTEN UNISTRUT CHANNELS TOGETHER WITH 3/8" UNISTRUT BOLTING HARDWARE AND SPRING NUTS.
2. EACH UNISTRUT TO BE MOUNTED ON EXISTING VERTICAL PIPE MASTS USING 3/8" Ø U-BOLTS, MINIMUM ONE AT EACH END OF UNISTRUT.
3. MOUNT RRUS TO UNISTRUT WITH 3/8" Ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS THROUGH EQUIPMENT MOUNTING HOLES. SUBCONTRACTOR SHALL SUPPLY.
4. PAINTING OF THE RRUS SHALL BE IN STRICT CONFORMANCE WITH MANUFACTURER'S WRITTEN SPECIFICATIONS.
5. ANTENNAS NOT SHOWN FOR CLARITY.

**RRU MOUNTING DETAIL**  
NOT TO SCALE



SCALE: AS SHOWN JOB NUMBER: 18946026A

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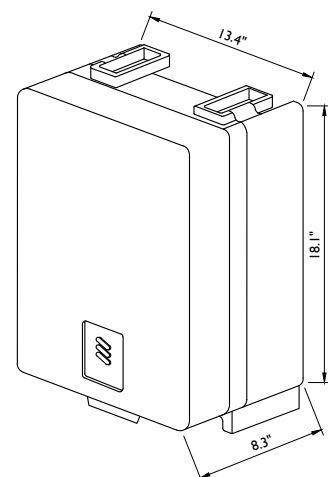


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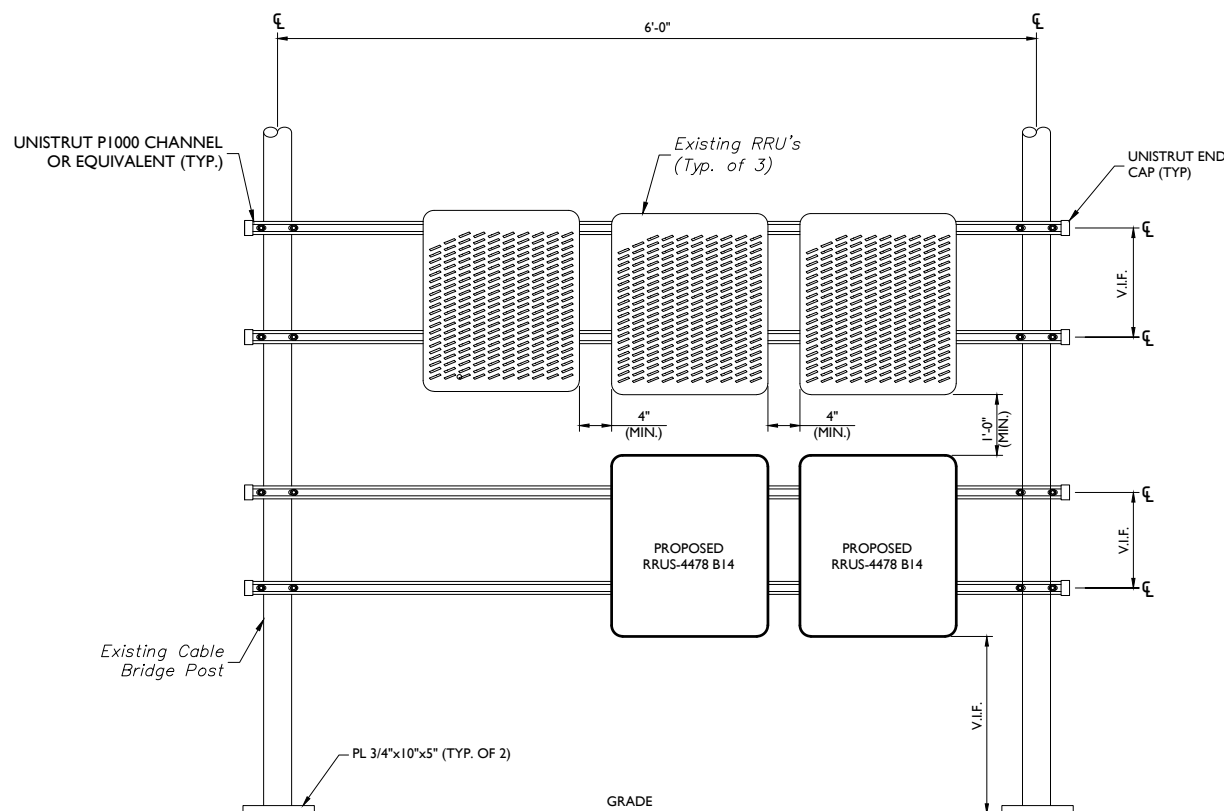
**RED BANK OFFICE**  
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Fax: 732.383.1984  
email: solutions@maserconsulting.com

SHEET TITLE: CONSTRUCTION DETAILS  
SHEET NUMBER: A-3



DIMENSIONS (H X W X D): 18.1"H X 13.4"W X 8.3"D (INCLUDES SUNSHIELD)  
WEIGHT: 59.4 LBS

**RRUS-4478 B14 DETAIL**  
NOT TO SCALE



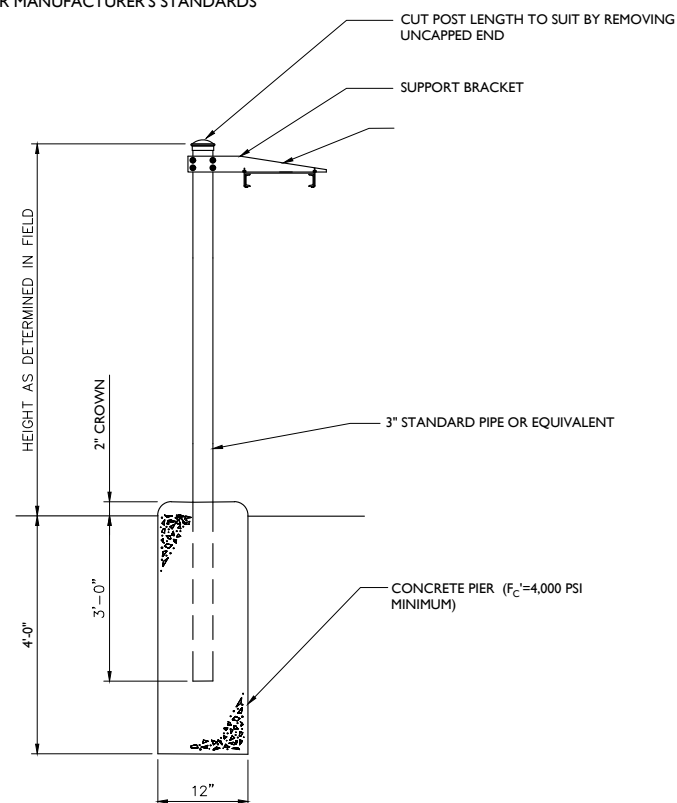
**NOTES:**

- INSTALL VERTICAL UNISTRUT CHANNELS AS REQUIRED TO ALIGN FRAME WITH EQUIPMENT MOUNTING HOLES. FASTEN UNISTRUT CHANNELS TOGETHER WITH 3/8" UNISTRUT BOLTING HARDWARE AND SPRING NUTS.
- MOUNT RRU'S TO UNISTRUT PER MANUFACTURER'S SPECIFICATIONS.
- MOUNT FRAME AS CLOSE TO PLATFORM AS POSSIBLE.
- NO PAINTING OF THE RRU IS ALLOWED.

**RRU MOUNTING DETAIL**

NOT TO SCALE

\* INSTALL DRIP LOOP ON ANTENNA CABLES AT BOTTOM OF TOWER/MONOPOLE. BENDING RADIUS PER MANUFACTURER'S STANDARDS



**NOTES:**

- WHEN USING COMPONENTS AS SHOWN IN STANDARD DETAILS, MAXIMUM ALLOWABLE SPAN BETWEEN SUPPORTS ON A CONTINUOUS SINGLE SECTION OF BRIDGE CHANNEL SHALL BE 6 FEET.
- WHEN USING COMPONENTS FOR SPLICING BRIDGE CHANNEL SECTIONS, THE SPLICE SHOULD BE PROVIDED AT THE SUPPORT, IF POSSIBLE, OR AT A MAXIMUM OF 2 FEET FROM THE SUPPORT.
- WHEN USING COMPONENTS, SUPPORT SHOULD BE PROVIDED AS CLOSE AS POSSIBLE TO THE ENDS OF ICE BRIDGES, WITH A MAXIMUM CANTILEVER DISTANCE OF 2 FEET FROM THE SUPPORT TO THE FREE END OF THE ICE BRIDGE.
- CUT BRIDGE CHANNEL SECTIONS SHALL HAVE RAW EDGES TREATED WITH A MATERIAL TO RESTORE THESE EDGES TO THE ORIGINAL CHANNEL, OR EQUIVALENT, FINISH.
- ICE BRIDGES MAY BE CONSTRUCTED WITH COMPONENTS FROM OTHER MANUFACTURERS, PROVIDED THE MANUFACTURER'S INSTALLATION GUIDELINES ARE FOLLOWED.
- DEVIATIONS FROM STANDARDS FOR COMPONENT INSTALLATIONS ARE PERMITTED WITH THE RESPECTIVE MANUFACTURER'S APPROVAL.
- DEVIATIONS FROM ICE BRIDGE FOUNDATIONS REQUIRE ENGINEERING APPROVAL.
- THE DESIGN IS BASED ON ASCE 7-05, 3 SECOND GUST WIND SPEED OF 90 MPH, EXPOSURE C, ELEVATION AT GRADE.
- THIS DESIGN IS BASED ON 24" WIDE ICE BRIDGE, 3" STD PIPE AND (12) 1/8" DIA. COAX. CABLES IN 3 ROWS OF 4 AND POST SUPPORT SPACING OF 7'-0".
- HEIGHT OF POST SHALL BE 10'-6" MAX. ABOVE GROUND LEVEL.

**CABLE BRIDGE DETAIL**  
NOT TO SCALE

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4	7/31/19	REVISED PER COMMENTS	AJC	NO
3	12/12/18	FOR CONSTRUCTION	AJC	RA
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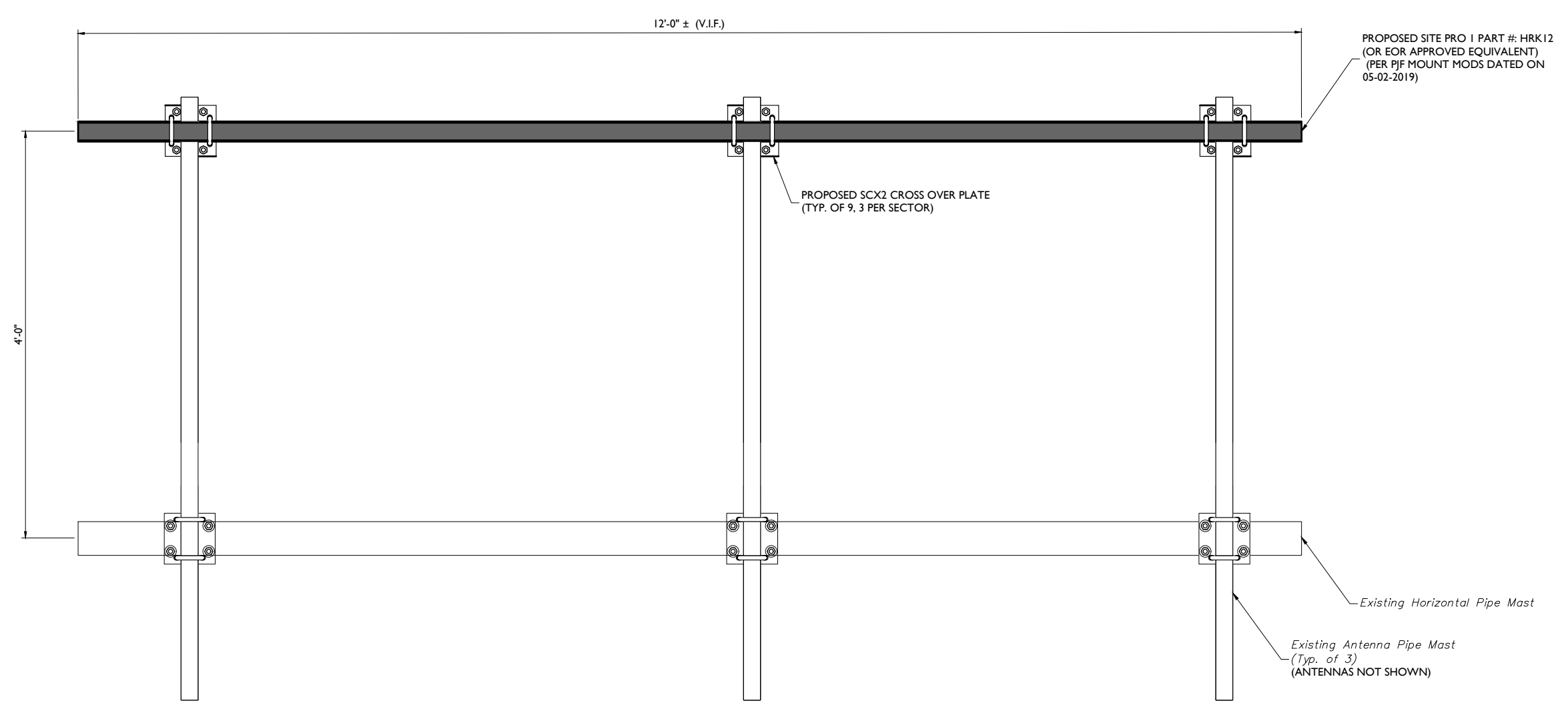
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SHEET TITLE:  
**CONSTRUCTION DETAILS**

SHEET NUMBER:  
**A-4**



**MOUNT MODIFICATION DETAIL**  
 NOT TO SCALE

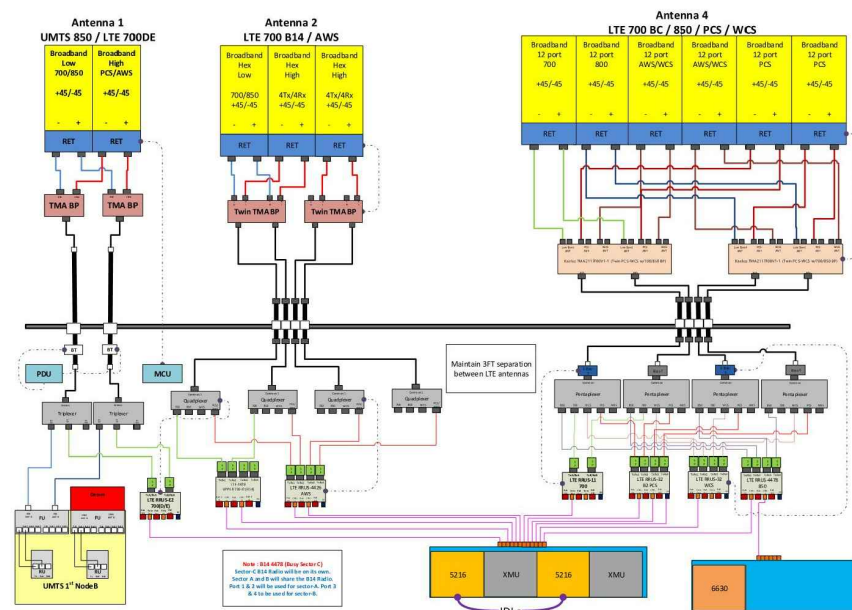
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 By: NDOBK



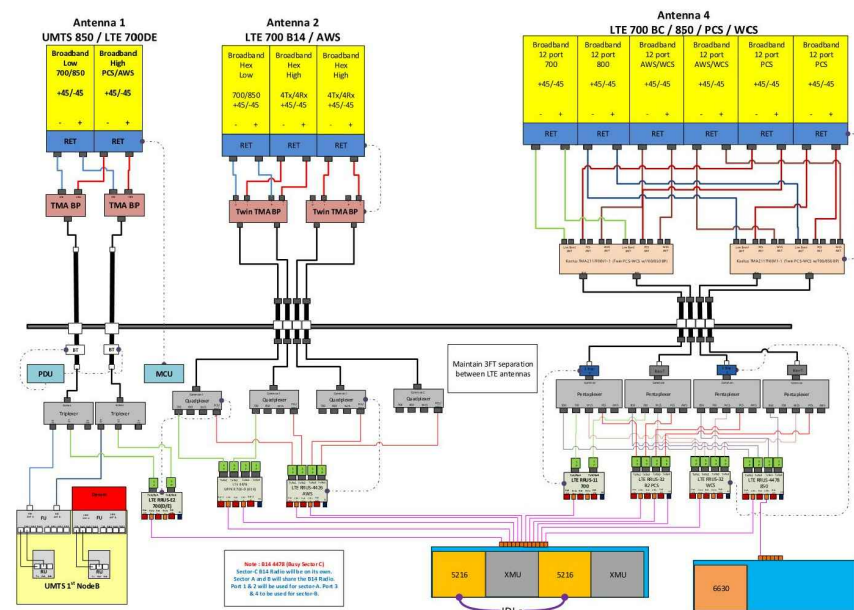
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Host Site Name: CTL05176 Location Name: BETHEL STONY HILL AWS Market: CONNECTICUT Market Cluster: NEW ENGLAND  
Comments: Important Note: For detailed radio to antenna wiring refer to the latest field notice. Antenna: Radio Connection Drawings Playbook v4.0 - Ericsson

Diagram: Sector B Diagram File Name: CT5176\_A,B,C,6C,7C,850\_Rev2.ind  
Host Site Name: CTL05176 Location Name: BETHEL STONY HILL AWS Market: CONNECTICUT Market Cluster: NEW ENGLAND  
Comments: Important Note: For detailed radio to antenna wiring refer to the latest field notice. Antenna: Radio Connection Drawings Playbook v4.0 - Ericsson

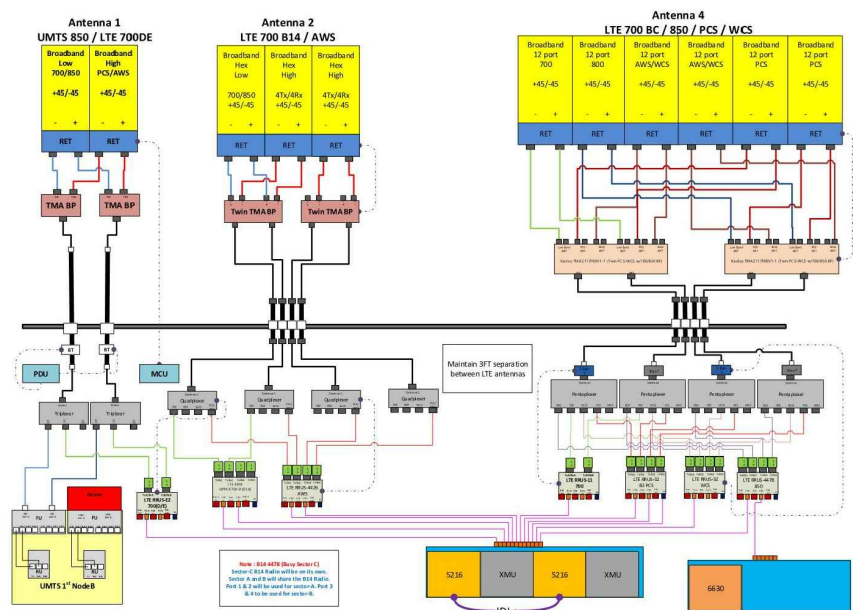
Diagram: Sector C Diagram File Name: CT5176\_A,B,C,6C,7C,850\_Rev2.ind  
Host Site Name: CTL05176 Location Name: BETHEL STONY HILL AWS Market: CONNECTICUT Market Cluster: NEW ENGLAND  
Comments: Important Note: For detailed radio to antenna wiring refer to the latest field notice. Antenna: Radio Connection Drawings Playbook v4.0 - Ericsson



ALPHA SECTOR



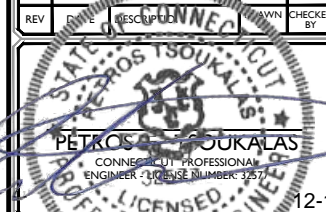
BETA SECTOR



GAMMA SECTOR

BASED ON: RF ENGINEERING DESIGN ENTITLED "NEW-ENGLAND\_CONNECTICUT\_CTL05176\_2018-LTE-Next-Carrier\_LTE\_om636a\_2051A0H051\_10071269\_60443\_04-04-2018\_Final-Approved\_v4.00", LAST REVISED 08/27/2018.

RF PLUMBING DIAGRAMS



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BETHEL, CT 06801  
FAIRFIELD COUNTY

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email: solutions@maserconsulting.com

SHEET TITLE:  
RF PLUMBING DIAGRAM  
SHEET NUMBER:  
A-5

By: NOBER

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REV		DESIGNED BY	DRAWN BY	CHECKED BY

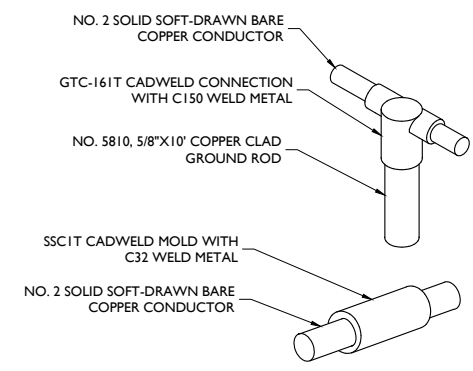


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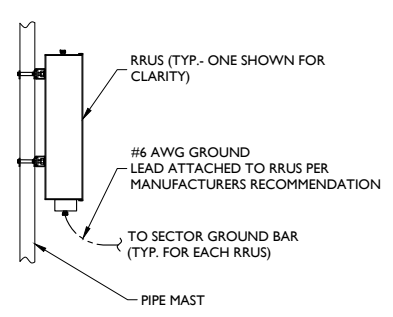
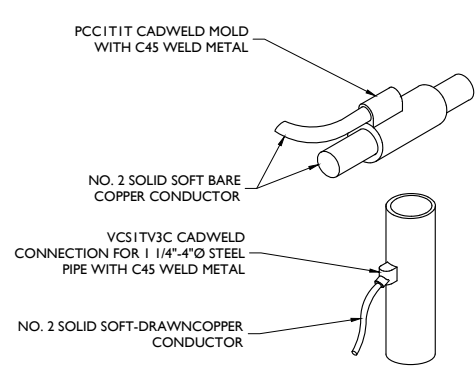
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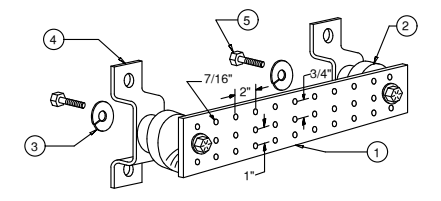
SHEET TITLE:  
**GROUNDING DETAILS**  
SHEET NUMBER:  
**G-1**



**CADWELD DETAILS**  
NOT TO SCALE



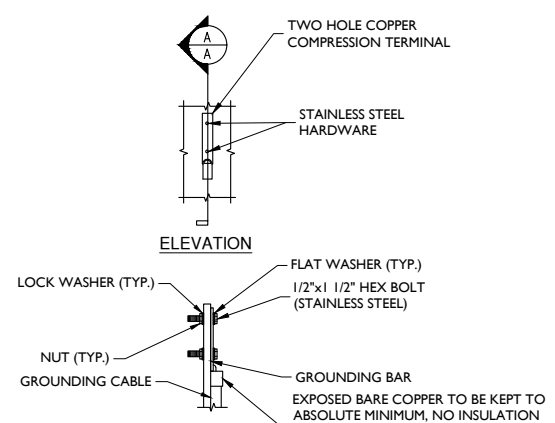
**RRU GROUNDING**  
NOT TO SCALE



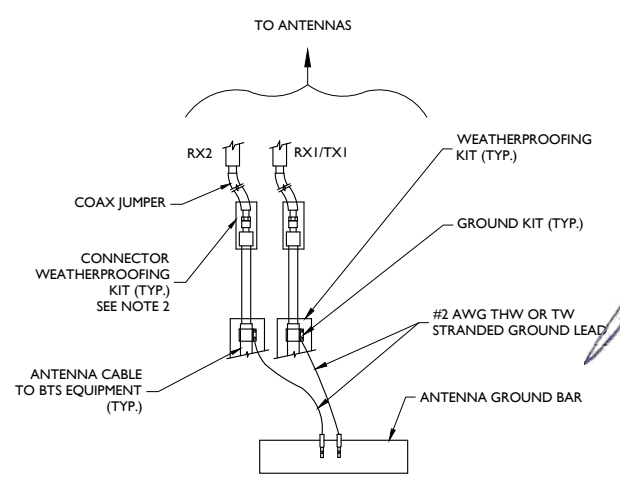
- LEGEND**
- 1- TINNED COPPER GROUND BAR, 1/4"x4"x20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
  - 2- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4
  - 3- 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8
  - 4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A-5056
  - 5- 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT. NO. 3012-1
  - 6- EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

- SECTION "P" - SURGE PRODUCERS**
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
  - GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
  - TELCO GROUND BAR
  - COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
  - +24V POWER SUPPLY RETURN BAR (#2)
  - 48V POWER SUPPLY RETURN BAR (#2)
  - RECTIFIER FRAMES.
- SECTION "A" - SURGE ABSORBERS**
- INTERIOR GROUND RING (#2)
  - EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
  - METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
  - BUILDING STEEL (IF AVAILABLE) (#2)

**MASTER GROUND BAR**  
NOT TO SCALE

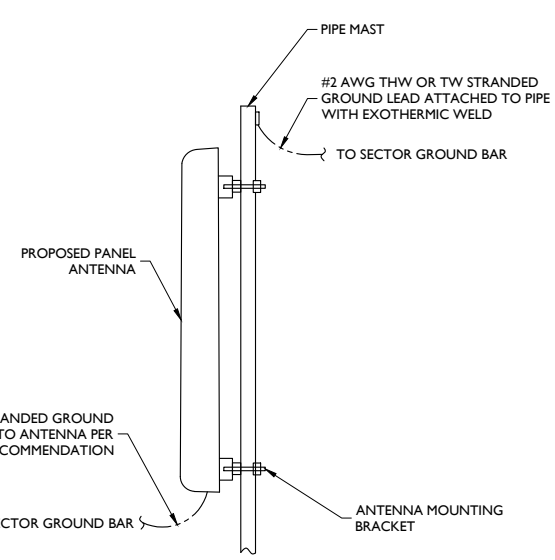


**TYPICAL GROUND BAR CONNECTION DETAIL**  
NOT TO SCALE

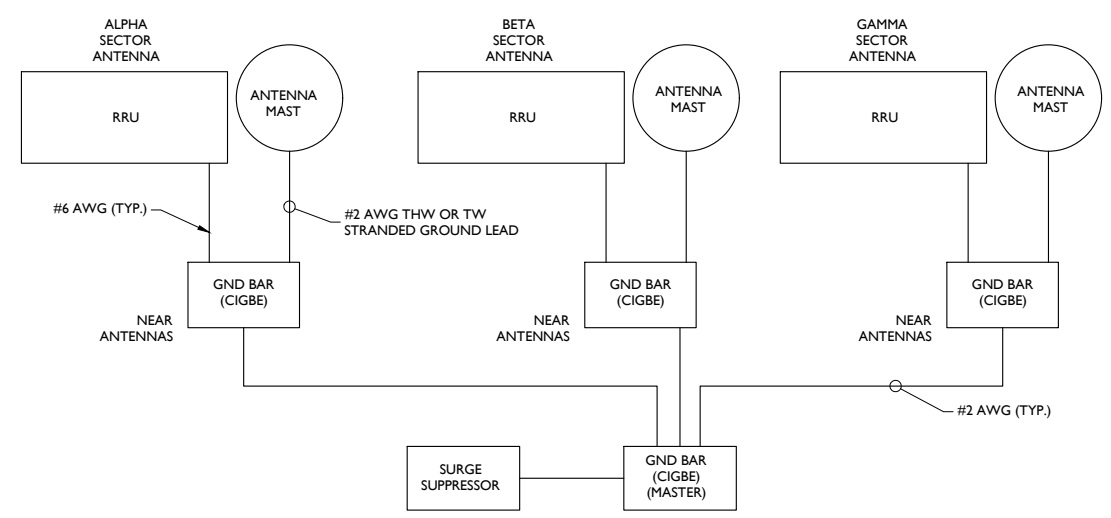


- NOTES:**
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
  2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

**TYPICAL GROUND WIRE TO GROUNDING BAR**  
NOT TO SCALE



**ANTENNA GROUNDING**



**SCHEMATIC DIAGRAM GROUNDING SYSTEM**

By: NOBER  
M:\Projects\5588\00721269\_CTS176\_C02\_Rev\_5.dwg