



June 15, 2022

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:** 5 Perryridge Road Greenwich, CT 06830  
**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 twelve (12) wireless telecommunication antennas at an antenna center line height of 131-feet on an existing 170-foot Monopole, owned by Greenwich Hospital.

AT&T desires to modify its existing telecommunications facility by swapping nine (9) existing antennas with (9) new antennas, swapping three (3) existing remote radio units with (3) new remote radio units and adding associated cables. The centerline height of said antennas is and will remain at 134' on the existing antenna mount.

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 The Honorable Fred Camillo, First Selectman, Town of Greenwich, Katie DeLuca, AICP, Director of Planning & Zoning, Town of Greenwich, and Greenwich Hospital.

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

**EM-AT&T-057-180425** – New Cingular Wireless, PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 5 Perryridge Road, Greenwich, CT.

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 131-foot level of the 170-foot Monopole.
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,

Carolyn Seeley  
Real Estate Project Manager  
Smartlink on behalf of AT&T  
(978) 760-5577  
Carolyn.seeley@smartlinkgroup.com

CC w/enclosures

The Honorable Fred Camillo, First Selectman, Town of Greenwich  
Katie DeLuca, AICP, Director of Planning & Zoning, Town of Greenwich  
Greenwich Hospital

## Radio Frequency Safety Survey Report Predictive (RFSSRP) Prepared For AT&T



<b>Site Name:</b>	GREENWICH PERRYRIDGE RD TWR
<b>FA#</b>	10128691
<b>USID:</b>	100184
<b>Site ID:</b>	CTL02102
<b>Address:</b>	5 PERRYRIDGE ROAD DUP, GREENWICH, CT 06830
<b>County:</b>	FAIRFIELD
<b>Latitude:</b>	41.0339361
<b>Longitude:</b>	-73.6308333
<b>Structure Type:</b>	MONOPOLE
<b>Property Owner:</b>	NA
<b>Pace Job:</b>	MRCTB055165
<b>RFDS Technology:</b>	5G NR 1SR CBAND

### Report Information

**Report Writer:** Manoj Singh

**Report Generated Date:** 06-15-2022

### Compliance Statement

**AT&T Mobility Compliance Statement:** Based on the information collected, AT&T Mobility will be Compliant when the remediation recommended in section 5 or appropriate remediation determined by AT&T is implemented

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## 1. Executive Summary

### 1.1 Site Summary

Max Predictive Spatial Average MPE% & Location on Site (General Public)	16934.0% on Antennas Centerline Level & at AT&T Sec-B antenna no. #B3-2
Max Predictive Spatial Average MPE% at Ground Level (General Public)	1.36%
AT&T Mobility Site Compliance	AT&T Mobility will be Compliant by implementing remediation recommended as per section 5 in this report.
<b>TABLE 1: Site Summary</b>	

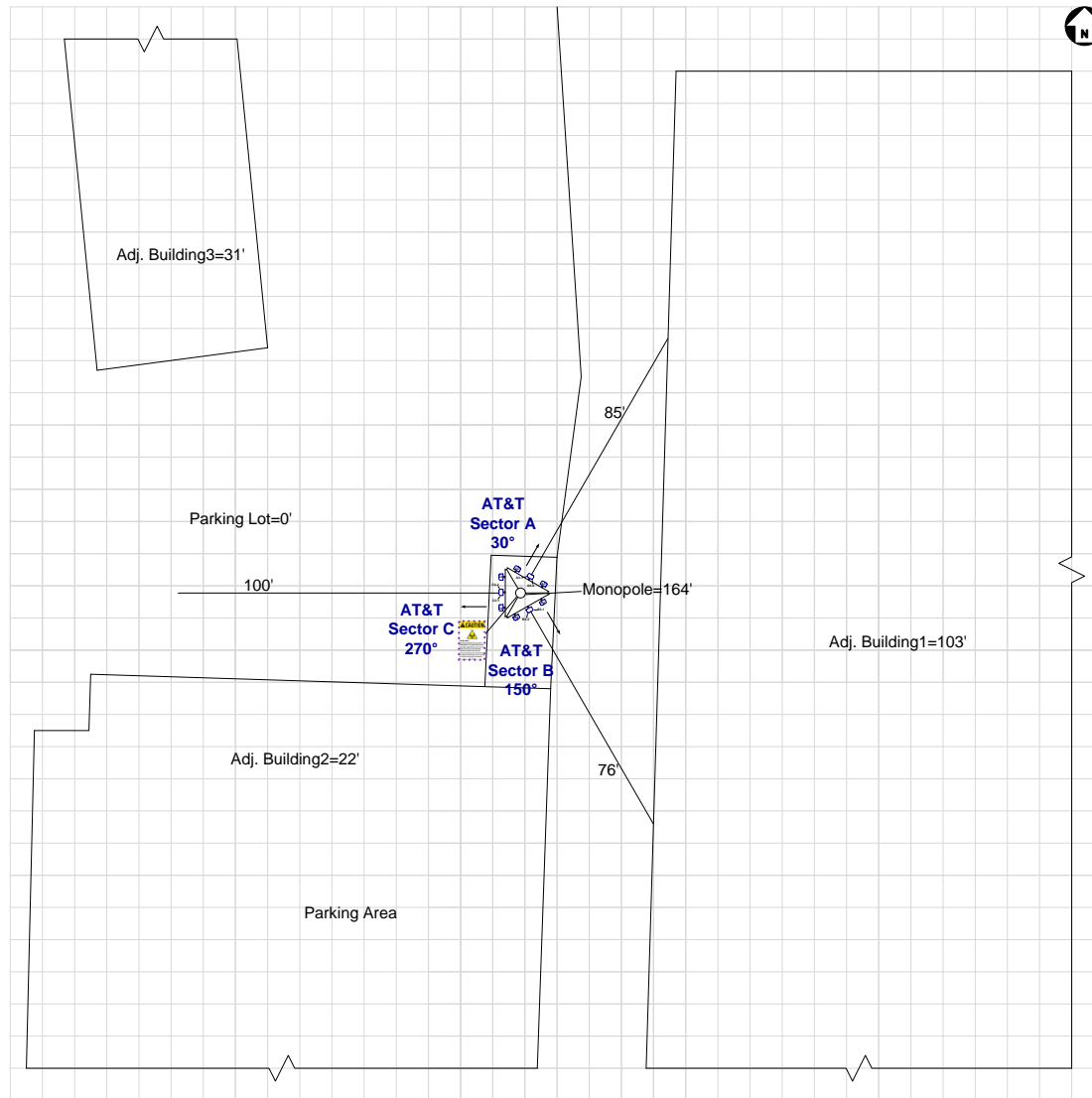
### 1.2 Signage Summary (Proposed)

AT&T Signage Locations	Sign Type									
	Safety Instructions	Notice Sign 2	Caution Sign 2	Caution Sign 2B	Caution Sign 2C	Caution 7"x7"	Warning Sign 1B	RF Exposure Map	Lock	Barriers
Access Point(s)				1						
Alpha										
Beta										
Gamma										
<b>TABLE 2: Signage Summary (Proposed)</b>										

### 1.3 List of Documents used to prepare this Report

- 10128691\_AE201\_220516\_CTL02102\_REV2
- NEW-ENGLAND\_CONNECTICUT\_CTL02102\_2022-5G-mmWave\_5G-NR-1SR-CBAND\_mh705r\_2051A11N8G\_10128691\_100184\_05-17-2021\_Final-Approved\_v3.00

## 2. Site Scale Map



AT&T Antenna		Proposed		Proposed Signage								Lock	Map Scale = 10 ft
	Panel		Barrier										
	OMNI		Posts										

### 3. Antenna Inventory

Ant ID	Operator	Antenna Mfg	Antenna Model	Antenna Type	FREQ. (MHz)	TECH.	AZ. (°)	H B W (°)	Antenna Gain (dBd)	Antenna Aperture (ft)	Transmitter Power (Watts)	Total Loss (dB)	Total ERP (Watts)	Total EIRP (Watts)
A2	AT&T	Quintel	QD6616-7	Panel	700	LTE(FN)	30	71	12.05	6	120.00	0.5	1714.67	2813.07
A2	AT&T	Quintel	QD6616-7	Panel	700	LTE(B29)	30	71	12.05	6	60.00	0.5	857.34	1406.54
A2	AT&T	Quintel	QD6616-7	Panel	1900	LTE/5G	30	67	15.05	6	120.00	0.5	3421.22	5612.82
A2	AT&T	Quintel	QD6616-7	Panel	2100	LTE/5G	30	62	15.55	6	120.00	0.5	3838.67	6297.69
A3-1	AT&T	Ericsson	AIR 6419 B77G^	Panel	3450	5G	30	11	23.5	2.55	108.44*	0	24277.05*	39828.68*
A3-2	AT&T	Ericsson	AIR 6449 B77D^	Panel	3840	5G	30	11	23.5	2.55	108.44*	0	24277.05*	39828.68*
A4	AT&T	CCI	DMP65R-BU6D	Panel	700	LTE(B12)	30	74	11.85	6	120.00	0.5	1637.50	2686.47
A4	AT&T	CCI	DMP65R-BU6D	Panel	850	5G	30	63	12.45	6	120.00	0.5	1880.10	3084.47
A4	AT&T	CCI	DMP65R-BU6D	Panel	2300	LTE	30	54	16.25	6	75.00	0.5	2818.78	4624.46
B2	AT&T	Quintel	QD6616-7	Panel	700	LTE(FN)	150	71	12.05	6	120.00	0.5	1714.67	2813.07
B2	AT&T	Quintel	QD6616-7	Panel	700	LTE(B29)	150	71	12.05	6	60.00	0.5	857.34	1406.54
B2	AT&T	Quintel	QD6616-7	Panel	1900	LTE/5G	150	67	15.05	6	120.00	0.5	3421.22	5612.82
B2	AT&T	Quintel	QD6616-7	Panel	2100	LTE/5G	150	62	15.55	6	120.00	0.5	3838.67	6297.69
B3-1	AT&T	Ericsson	AIR 6419 B77G^	Panel	3450	5G	150	11	23.5	2.55	108.44*	0	24277.05*	39828.68*
B3-2	AT&T	Ericsson	AIR 6449 B77D^	Panel	3840	5G	150	11	23.5	2.55	108.44*	0	24277.05*	39828.68*
B4	AT&T	CCI	DMP65R-BU6D	Panel	700	LTE(B12)	150	74	11.85	6	120.00	0.5	1637.50	2686.47
B4	AT&T	CCI	DMP65R-BU6D	Panel	850	5G	150	63	12.45	6	120.00	0.5	1880.10	3084.47
B4	AT&T	CCI	DMP65R-BU6D	Panel	2300	LTE	150	54	16.25	6	75.00	0.5	2818.78	4624.46

**Table 3.1: Antenna Inventory Table**

Note: ^ **Mechanical Tilt value of "0°" MUST be retained for C-BAND and/or DoD AAS antenna(s) at all times to ensure that "EME (Predictive) Study" shall remain valid.**

\* 75% TDD duty Cycle, 1.5dB Power Tolerance & 0.32 Power Reduction factor<sup>1</sup> are used to calculate Transmitter Power & ERP/EIRP

Ant ID	Operator	Antenna Mfg	Antenna Model	Antenna Type	FREQ. (MHz)	TECH.	AZ. (°)	H B W (°)	Antenna Gain (dBd)	Antenna Aperture (ft)	Transmitter Power (Watts)	Total Loss (dB)	Total ERP (Watts)	Total EIRP (Watts)
C2	AT&T	Quintel	QD6616-7	Panel	700	LTE(FN)	270	71	12.05	6	120.00	0.5	1714.67	2813.07
C2	AT&T	Quintel	QD6616-7	Panel	700	LTE(B29)	270	71	12.05	6	60.00	0.5	857.34	1406.54
C2	AT&T	Quintel	QD6616-7	Panel	1900	LTE/5G	270	67	15.05	6	120.00	0.5	3421.22	5612.82
C2	AT&T	Quintel	QD6616-7	Panel	2100	LTE/5G	270	62	15.55	6	120.00	0.5	3838.67	6297.69
C3-1	AT&T	Ericsson	AIR 6419 B77G^	Panel	3450	5G	270	11	23.5	2.55	108.44*	0	24277.05*	39828.68*
C3-2	AT&T	Ericsson	AIR 6449 B77D^	Panel	3840	5G	270	11	23.5	2.55	108.44*	0	24277.05*	39828.68*
C4	AT&T	CCI	DMP65R-BU6D	Panel	700	LTE(B12)	270	74	11.85	6	120.00	0.5	1637.50	2686.47
C4	AT&T	CCI	DMP65R-BU6D	Panel	850	5G	270	63	12.45	6	120.00	0.5	1880.10	3084.47
C4	AT&T	CCI	DMP65R-BU6D	Panel	2300	LTE	270	54	16.25	6	75.00	0.5	2818.78	4624.46

**Table 3.2: Antenna Inventory Table**

Note: ^ **Mechanical Tilt value of "0°" MUST be retained for C-BAND and/or DoD AAS antenna(s) at all times to ensure that "EME (Predictive) Study" shall remain valid.**

\* 75% TDD duty Cycle, 1.5dB Power Tolerance & 0.32 Power Reduction factor<sup>1</sup> are used to calculate Transmitter Power & ERP/EIRP



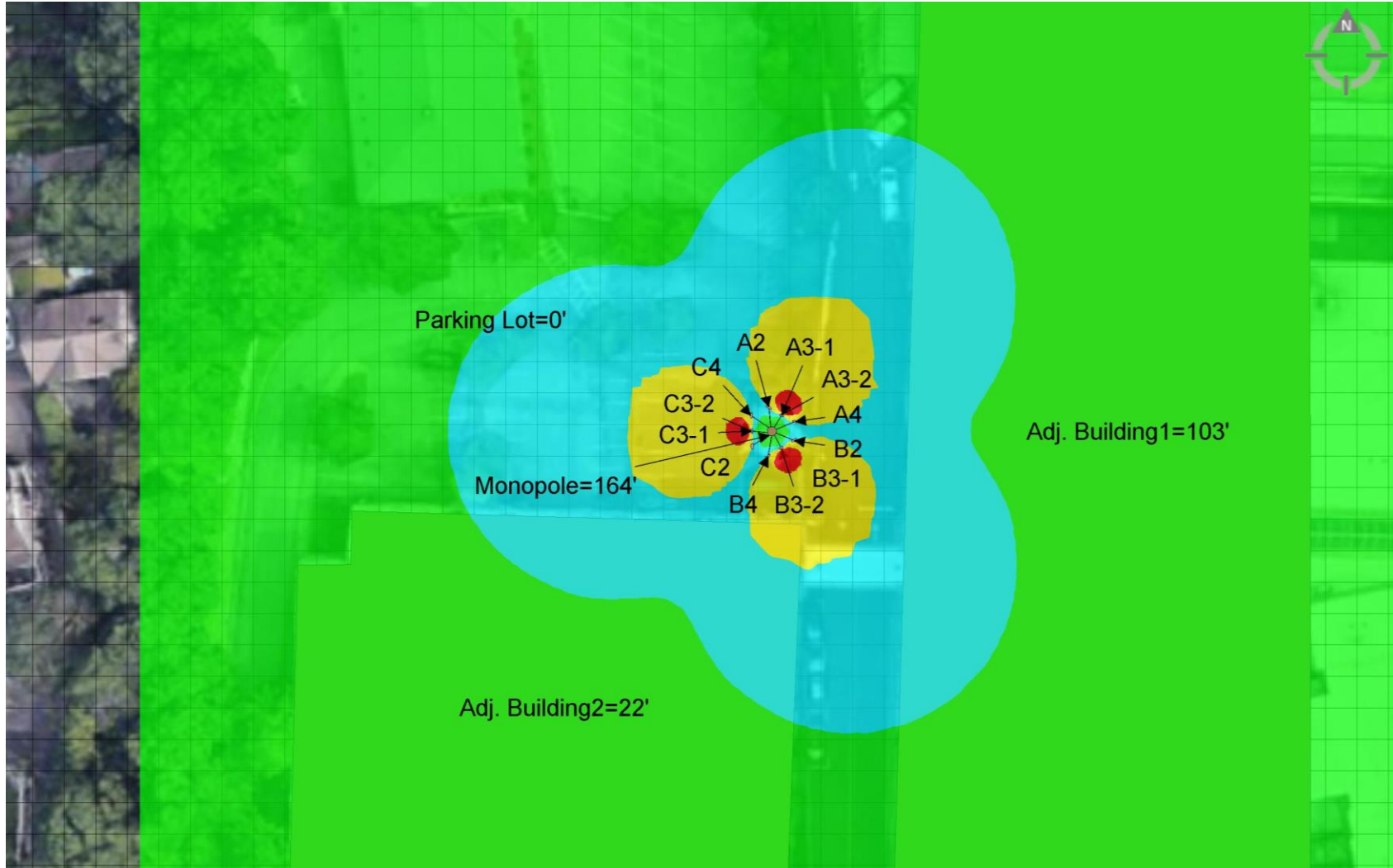
## Antenna Heights (Z)

Ant ID	Operator	Antenna Radiation Centerline	Z-Height from Adj. Building1	Z-Height from Adj. Building2	Z-Height from Ground
A2	AT&T	134.00	28.00	109.00	131.00
A3-1	AT&T	135.78	31.50	112.50	134.50
A3-2	AT&T	132.23	27.95	108.95	130.95
A4	AT&T	134.00	28.00	109.00	131.00
B2	AT&T	134.00	28.00	109.00	131.00
B3-1	AT&T	135.78	31.50	112.50	134.50
B3-2	AT&T	132.23	27.95	108.95	130.95
B4	AT&T	134.00	28.00	109.00	131.00
C2	AT&T	134.00	28.00	109.00	131.00
C3-1	AT&T	135.78	31.50	112.50	134.50
C3-2	AT&T	132.23	27.95	108.95	130.95
C4	AT&T	134.00	28.00	109.00	131.00

**Table 3.3: Antenna Height(s) Summary Table**

#### 4. Predicted Emission

##### 4.1 Predictive Cumulative MPE Contribution from All Sources at Antennas Centerline Level (134 ft.)



Max. Predictive Spatial Average MPE% = 16934.0%

% of FCC General Public Exposure Limit (Predictive Spatial Average)

Proposed Barrier

Proposed Posts

Non-Simulated	0-1	1-100	100-500	500-5000	>5000

Map Scale = 10 ft

**4.2 Predictive Cumulative MPE Contribution from All Sources at Adj. Building1 Level (103 ft.)**



Max. Predictive Spatial Average MPE% = 60.21%

% of FCC General Public Exposure Limit (Predictive Spatial Average)

Proposed Barrier   
 Proposed Posts

Non-Simulated	0-1	1-100	100-500	500-5000	>5000

Map Scale = 10 ft

**4.3 Predictive Cumulative MPE Contribution from All Sources at Adj. Building2 Level (22 ft.)**



Max. Predictive Spatial Average MPE% = **1.69%**

% of FCC General Public Exposure Limit (Predictive Spatial Average)

Proposed Barrier

Proposed Posts

Non-Simulated	0-1	1-100	100-500	500-5000	>5000

**Map Scale = 10 ft**

**4.4 Predictive Cumulative MPE Contribution from All Sources at Ground Level (0 ft.)**



Max. Predictive Spatial Average MPE% = 1.36%

% of FCC General Public Exposure Limit (Predictive Spatial Average)

Proposed Barrier   
 Proposed Posts

Non-Simulated	0-1	1-100	100-500	500-5000	>5000

Map Scale = 10 ft

## 5. Statement of Compliance

### 5.1 *Statement of AT&T Mobility Compliance*

At the time of our Analysis, AT&T Mobility is required to take action to fulfill their Obligations to comply with the FCC's mandate as defined in OET-65

#### **Recommendations.**

##### **AT&T Alpha Sector:**

- No action Required.

##### **AT&T Beta Sector:**

- No action Required.

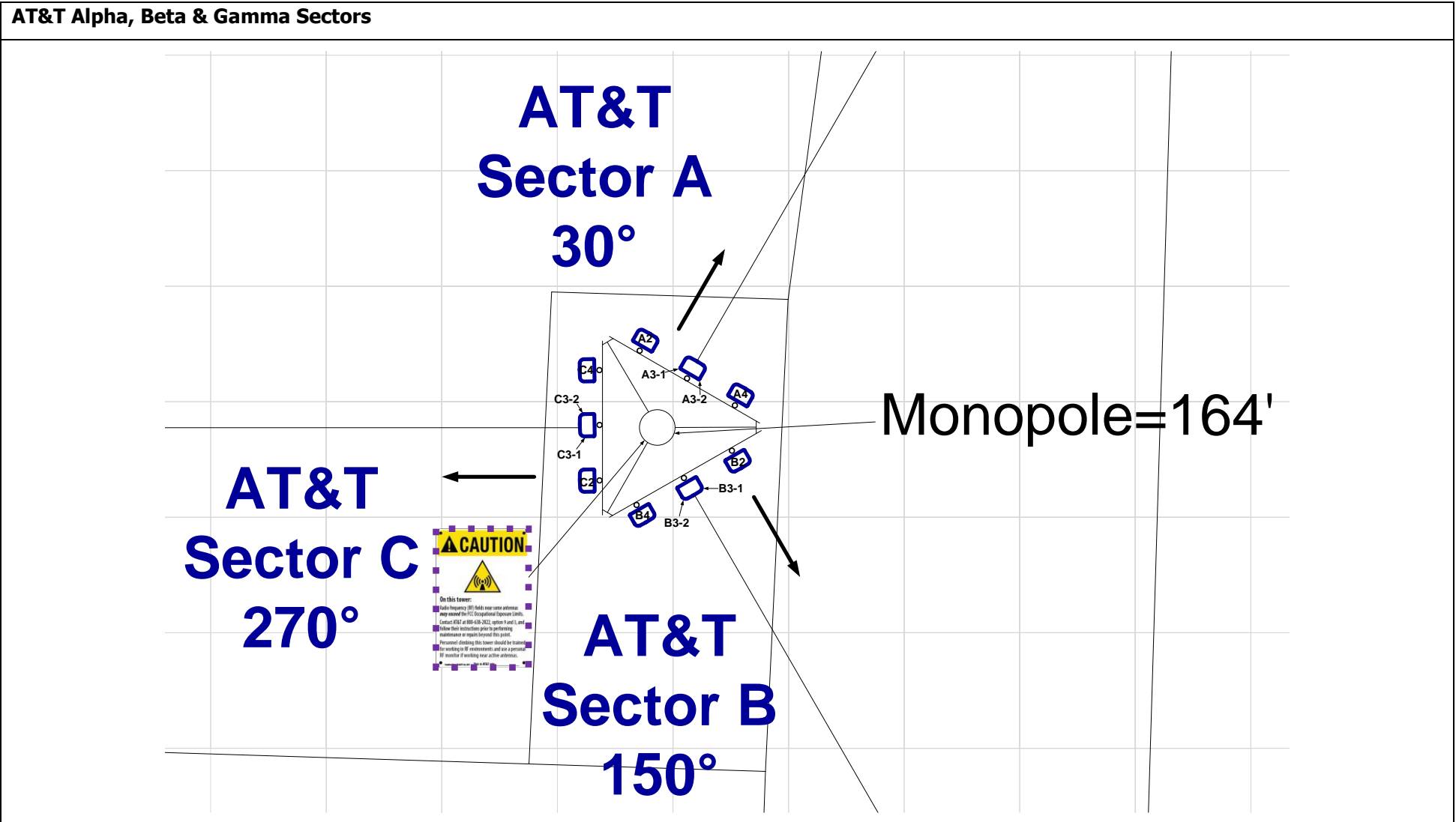
##### **AT&T Gamma Sector:**

- No action Required.

##### **Monopole:**

- One Caution 2B Sign to be posted on Monopole at the climbing access, facing outwards so approaching people can see as shown in "Recommendations Map – Detailed View" on page 13. (1 Total Sign)

Recommendations Map – Detailed View



AT&T Antenna	Proposed	Proposed Signage								Map Scale = 10 ft
Panel OMNI	Barrier Posts	Safety Instructions	Notice 2	Caution 2	Caution 2B	Caution 2C	Caution 7"x7"	Warning 1B	RF Exposure Map	

## Appendix A – Statement of Limiting Conditions

### General Model Assumptions

*In this site compliance report, it is assumed that all antennas are operating at full power at all times. AT&T has further recommended to assume a 75% duty cycle of maximum radiated power for all LTE & 5G carriers (& consider 100% duty cycle for all UMTS carriers).*

*In this site compliance report, it is assumed that Mechanical Tilt value of “0°” MUST be retained for C-BAND and/or DoD AAS<sup>^</sup> antenna(s) at all times to ensure that “EME (Predictive) Study” shall remain valid.*

*AT&T recommended to consider - For C-BAND and/or DoD AAS<sup>^</sup> antenna(s) 75% TDD duty Cycle, 1.5dB Power Tolerance & 0.32 Power Reduction factor<sup>1</sup> are used to calculate Transmitter Power & ERP/EIRP.*

*AT&T recommended to use worst-case tilts for the simulations.*

<sup>1</sup> **Power Reduction Factor:** IEC Standard 62232: 2017 allows for a statistically conservative power density model to more realistically define the RF exposure area. AT&T recommends a “0.32” factor to calculate the “Actual Maximum” (time averaged) power value, which accounts for “Beam Scanning,” “Scheduling,” and “RBS Utilization” This recommended value is a conservative figure modelled and supported by other vendors and through measurements published in scientific articles and white papers by IEEE and others. Those publication are listed below:

1. IEEE Access, *Time-Averaged Realistic Maximum Power Levels for the Assessment of RF Exposure for 5G Radio Base Stations Using Massive MIMO* (Published Sept. 18, 2017 / BJÖRN THORS, ANDERS FURUSKÅR, DAVIDE COLOMBI, AND CHRISTER TÖRNEVIK)
2. IEEE Explore, *A Statistical Approach for RF Exposure Compliance Boundary Assessment in Massive MIMO Systems* (Published Jan. 25, 2018 / Paolo Baracca, Andreas Weber, Thorsten Wild, Christophe Grangeat)
3. IEEE Access, *In-situ Measurement Methodology for the Assessment of 5G NR Massive MIMO Base Station Exposure at Sub-6 GHz Frequencies* (Published Dec. 20, 2019 / SAM AERTS, LEEN VERLOOCK, MATTHIAS VAN DEN BOSSCHE, DAVIDE COLOMBI, LUC MARTENS, CHRISTER TÖRNEVIK AND WOUT JOSEPH)
4. Applied Sciences, *Analysis of the Actual Power and EMF Exposure from Base Stations in a Commercial 5G Network* (Published July 30, 2020 / Davide Colombi, Paramananda Joshi, Bo Xu, Fatemeh Ghasemifard, Vignesh Narasaraju and Christer Törnevik)
5. Ofcom Technical Report, *Electromagnetic Field (EMF) measurements near 5G mobile phone base stations* (Published Feb. 21, 2020 / Davide Colombi, Paramananda Joshi, Bo Xu, Fatemeh Ghasemifard, Vignesh Narasaraju and Christer Törnevik)

*MobileComm believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor). Thus, at any time, if power density measurements were made, we believe the real time measurements would indicate levels below those depicted in the RF emission diagram(s) in this report. By modelling in this way, MobileComm has conservatively shown exclusion areas – areas that should not be entered without the use of a personal monitor, carriers reducing power, or performing real-time measurements to indicate real-time exposure levels.*

### Use of Generic Antennas

*For the purposes of this report, the use of “Generic” as an antenna model, or “Other Carrier” 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, MobileComm will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. 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, MobileComm uses the closest frequency in the antenna’s range that corresponds to the highest Maximum Exposure Limit (MPE), resulting in a conservative analysis.*



## Appendix B – FCC Guidelines and Emissions Threshold Limits

All power density values used in this report were analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General Population/Uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limit for the 700 and 800 MHz Bands is approximately 467  $\mu\text{W}/\text{cm}^2$  and 567  $\mu\text{W}/\text{cm}^2$  respectively, and the general population exposure limit for the 1900 MHz PCS and 2100 MHz AWS bands is 1000  $\mu\text{W}/\text{cm}^2$ . Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/Controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure, have been properly trained in RF safety and can exercise control over their exposure. Occupational/Controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure, have been trained in RF safety and can exercise control over his or her exposure by leaving the area or by some other appropriate means. The Occupational/Controlled exposure limits all utilized frequency bands is five (5) times the FCC's General Public / Uncontrolled exposure limit.

Additional details can be found in FCC OET 65.

Table 1: Limits for Maximum Permissible Exposure (MPE)				
(A) Limits for Occupational/Controlled Exposure				
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
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Public/Uncontrolled Exposure				
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
300-1,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

## Appendix C – Rules & Regulations

### Explanation of Applicable Rules and Regulations

*FCC has set forth guidelines in OET Bulletin 65 for human exposure to radio frequency electromagnetic fields. Currently, there are two different levels of MPE - General Public MPE and Occupational MPE. An individual classified as Occupational can be defined as an individual who has received appropriate RF training and meets the conditions outlined below. General Public is defined as anyone who does not meet the conditions of being Occupational. FCC Rules and Regulations define compliance in terms of total exposure to total RF energy, regardless of location of or proximity to the sources of energy.*

*It is the responsibility of all licensees to ensure these guidelines are maintained at all times. It is the ongoing responsibility of all licensees composing the site to maintain ongoing compliance with FCC rules and regulations.*

*A building owner or site manager can use this report as part of an overall RF Health and Safety Policy. It is important for building owners/site managers to identify areas in excess of the General Population MPE and ensure that only persons qualified as Occupational are granted access to those areas.*

### Occupational Environment Explained

*The FCC definition of Occupational exposure limits apply to persons who:*

- *are exposed to RF energy as a consequence of their employment;*
- *have been made aware of the possibility of exposure; and*
- *can exercise control over their exposure.*

*FCC guidelines go further to state that persons must complete RF Safety Awareness training and must be trained in the use of appropriate personal protective equipment.*

*In order to consider this site an Occupational Environment, the site must be controlled to prevent access by any individuals classified as the General Public. Compliance is also maintained when any non-occupational individuals (the General Public) are prevented from accessing areas indicated as Red or Yellow in the attached RF Emissions diagram. In addition, a person must be aware of the RF environment into which they are entering. This can be accomplished by an RF Safety Awareness class, and by appropriate written documentation such as this Site Compliance Report.*

## Appendix D – General Safety Recommendations

The following are general recommendations appropriate for any site with accessible areas in excess of 100% General Public MPE. These recommendations are not specific to this site. These are safety recommendations appropriate for typical site management, building management, and other tenant operations.

- All individuals needing access to the main site should be instructed to read and obey all posted placards and signs.
- The site should be routinely inspected and this or similar report updated with the addition of any antennas or upon any changes to the RF environment including:
  - adding new antennas that may have been located on the site
  - removing of any existing antennas
  - changes in the radiating power or number of RF emitters
- Post the appropriate SAFETY INSTRUCTIONS, NOTICE, CAUTION & WARNING sign at the main site access point(s) and other locations as required. Note: Please refer to RF Exposure Diagrams in the report section above, to inform everyone who has access to this site that beyond posted signs there may be levels in excess of the limits prescribed by the FCC. The signs below are examples of signs meeting FCC guidelines.



- Ensure that the site door remains locked (or appropriately controlled) to deny access to the general public if deemed as policy by the building/site owner.
- For a General Public environment the five color levels identified in measured RF emission diagram can be interpreted in the following manner:
  - White represents areas predicted to be greater than or equal to 0% and less than 1% of the MPE general public limits
  - Green represents areas predicted to be greater than or equal to 1% and less than 100% of the MPE general public limits
  - Blue represents areas predicted to be greater than or equal to 100% and lesser than 500% of the MPE general public limits.
  - Yellow represents areas predicted to be greater than or equal to 500% and lesser than 5000% of the MPE general public limits.
  - Red areas indicates predicted levels greater than or equal to 5000% of the MPE general public limits.

## Appendix E – References

### 1 - FCC Definition

*FCC defines an Occupational or Controlled environment as one where persons are exposed to RF fields 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. Typical criteria for an Occupational or Controlled environment is restricted access (i.e. locked doors, gates, etc.) to areas where antennas are located coupled with proper RF warning signage.*

*FCC defines a site as a General Public or Uncontrolled environment when human exposure to RF fields occurs to the general public or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over the exposure. Typical criteria for a General Public or Uncontrolled environment are unrestricted access (i.e. unlocked or no restrictions) to areas where antennas are located without proper RF warning signage being posted.*

### 2 - Physical Testing measurement procedure and Tools

*The Narda Broadband Field Meter NBM-550 can make rapid conformance measurements with evaluation in the time domain when used in conjunction EA5091 probe. This probe is a so-called Shaped Probe, i.e. it is frequency weighted so that it automatically takes account of the FCC Occupational limit values. To collect data, the probe is pointed towards the potential source(s) of EME radiation and moved slowly from ground level up to slightly above head height (approx. 6 ft).*

*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 energy an average sized human body will absorb while present in an electromagnetic field of energy.*

### 3 - Site Safety 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 locations (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.*

**Rooftop RF Emissions Diagram:** *Section 4 of this report contains an RF Emissions Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas on the rooftop. This analysis is all theoretical and assumes a duty cycle of 75% for each transmitting antenna at full power. This analysis is a worst case scenario. 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.*

#### **4 - Definitions**

**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 75% 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, this product is divided by the cable losses*

**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 in dbd)** – *The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from a reference dipole. Gain is a measure of the relative efficiency of a directional antennas as compared to a reference dipole.*

**General Population/Uncontrolled Environment** – *Defined by the FCC, as an area where RFR exposure 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, MobileComm 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 Exposure Limit (MPE)** – *The RMS and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed 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.*

**Radio Frequency Radiation** – *Electromagnetic waves that are propagated from antennas through space.*

**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 energy an average sized human body will absorb while present in an electromagnetic field of energy.*

**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 – Proprietary Statement

*This report was prepared for the use of AT&T Mobility, LLC to meet requirements specified in AT&T's corporate RF safety guidelines. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by MobileComm are based solely on the information provided by AT&T Mobility and all observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to MobileComm so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.*



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# STRUCTURAL ANALYSIS REPORT

STRUCTURE: Monopole

PREPARED FOR: SMLINK

CARRIER: AT&T

SITE NUMBER/NAME : CTL02102/GREENWICH PERRYRIDGE RD TWR

SITE LOCATION:

5 Perryridge Road Dup  
Greenwich, CT 06830  
N41.0339361, W73.6308333

DATE: May 20, 2022

REV. 1: New RFDS

## RESULTS

PASS (MAX STRESS RATIO: 76.7%)

**Barbara T. Kotecki, P.E.**



**Fullerton Engineering Consultants, LLC**  
1100 E. Woodfield Road, Suite 500  
Schaumburg, IL 60173  
Tel: 847.908.8400  
[www.fullertonengineering.com](http://www.fullertonengineering.com)

Project Number: 2021.0215.0006

## Summary

A structural analysis was performed by Fullerton, as requested by the client, to determine the adequacy of the existing structure with the proposed appurtenance and equipment addition on the abovementioned structure. The analysis considers the tower properties, existing and proposed appurtenances, and the required loading criteria.

## Conclusion

Component	% Capacity	Pass / Fail
Tower	42.1%	PASS
Anchor Rods	38.9%	PASS
Base Plate	32.6%	PASS
Foundation	76.7%	PASS
<b>Structural Rating (max from all components) = 76.7%</b>		<b>PASS</b>

## Analysis Criteria

Reference Standard:	TIA-222-H Standard	
Wind Parameters:	Basic Wind Speed:	127 mph (3-Sec gust)
	Ice Wind Speed:	50 mph (3-Sec gust)
	Design Ice Thickness:	1 in.
	Risk Category	III
	Exposure Category:	C
	Topographic Category:	1

## Sources

The following documents for the existing structure were made available for our structural analysis.

Reference Document	Date
Structural Analysis Report by Malouf Engineering Intl., Inc. Project #: CT05918M-20V3	08/27/2020
Structural Analysis by Centek Engineering, Project #: 15001.145	1/20/2016
RFDS by AT&T Ver. 3	03/21/2022
Site Walk Photos	02/09/2022

## Final Proposed Appurtenance Loading Schedule

ANTENNA/EQUIPMENT				COAXIAL	
Elev. (Ft)	QTY.	MANUFACTURER/MODEL	MOUNT TYPE	QTY.	SIZE/TYPE.
134.0	3	(N) Quintel QD6616-7 Antennas	Low-Profile Platform	1	(N) DC Cable
	3	(N) Ericsson AIR 6449 B77D + AIR 6419 B77G Stacked		1	(N) Fiber
	3	(N) CCI DMP65R-BU6DA		2	(E) Fiber
	3	(N) Ericsson RRUS 4449 B5/B12		6	(E) DC Cable
	1	(N) Raycap DC9-48-60-24-8C-EV		6	(E) 1-5/8" Coax
	2	(E) Raycap DC6-48-60-18			
	3	(E) Ericsson RRUS-32 B30			
	3	(E) Ericsson RRUS-32 B66A			
	3	(E) Ericsson RRUS-32 B2			
	3	(E) Ericsson RRUS 4478 B14			

*(E) denotes existing loading*

*(N) denotes proposed loading*

## Results

### Tower

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$\phi P_{allow}$ lb	% Capacity	Pass Fail	
L1	164 - 131.5	Pole	TP53.42x47x0.3125	1	-21792.50	3081550.00	11.8	Pass	
L2	131.5 - 119.29	Pole	TP56.15x53.42x0.375	2	-23723.80	3790180.00	12.1	Pass	
L3	119.29 - 78.79	Pole	TP62.97x54.0585x0.4375	3	-44758.30	4948720.00	26.7	Pass	
L4	78.79 - 39.88	Pole	TP69.66x60.4813x0.5625	4	-67931.30	7029490.00	30.1	Pass	
L5	39.88 - 1.5	Pole	TP76x66.7412x0.5625	5	-100586.00	7879030.00	42.1	Pass	
							Summary		
							Pole (L5)	42.1	Pass
							RATING =	42.1	Pass

### Foundation

Components	%Capacity	PASS/FAIL
ANCHOR RODS	38.9%	PASS
BASE PLATE	32.6%	PASS
FOUNDATION	76.7%	PASS

## Assumptions

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This analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. The analysis is based solely on the information supplied, and the results, in turn, are only as accurate as data extracted from this information. Fullerton has been instructed by the client to assume the information supplied is accurate, and Fullerton has made no independent determination of its accuracy. The exception to the previous statement is if Fullerton has been contracted by the client to provide an independent structural mapping report of the tower and related appurtenances, in which case Fullerton has made an independent determination of the accuracy of the information resulting from the mapping report.

- The tower member sizes and geometry are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and stated in the materials section.
- The existing tower is assumed to have been properly maintained in accordance with the TIA/EIA standard and/or its original manufacturer's recommendations. The existing tower is assumed to be in good condition with no structural defects and with no deterioration to its member capacities.
- The antenna configuration is as supplied and/or stated in the analysis section. It is assumed to be complete and accurate. All antennas, mounts, remote radios, cables, and cable supports are assumed to be properly installed and supported as per the manufacturer's requirements.
- The antennas, mounts, remote radios, cables, and cable supports, and lines stated in the appurtenance loading schedule represent Fullerton's understanding of the overall antenna configuration. If the actual configuration is different than above, then this analysis is invalid. Please refer to this report for the projected wind areas used in the calculations for antennas and mounts. If variations or discrepancies are identified, please inform Fullerton.
- Some assumptions are made regarding antenna and mount sizes and their projected areas based on a best interpretation of the data supplied and a best knowledge of antenna type and industry practice.
- The existing foundation is assumed to be in good condition with no structural defects and with no deterioration to its member capacities.
- The soil parameters are as per data supplied, or as assumed, and stated in the calculations.
- All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
- All prior structural modifications, if any, are assumed to be as per data supplied/ available, to be properly installed and to be fully effective.

## Scope and Limitations

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The engineering services rendered by Fullerton Engineering Consultants, LLC (Fullerton) in connection with this structural analysis are limited to an analysis of the structure, size, and capacity of its members. Fullerton does not analyze the fabrication, including welding and connection capacities, except as included in this report.

The information and conclusions contained in this report were determined by application of the current engineering standards and analysis procedures and formulae, and Fullerton assumes no obligation to revise any of the information or conclusions contained in this report in the event such engineering and analysis procedures and formulae are hereafter modified or revised.

Fullerton makes no warranties, expressed, or implied in connection with this report and disclaims any liability arising from original design, material, fabrication, and erection deficiencies or the “as-built” condition of this tower.

Installation procedures are not within the scope of this report and should be performed and evaluated by a competent tower erection contractor.

# Structural Calculations

# Tower Analysis Summary Form

## General Info

Site Name	GREENWICH PERRYRIDGE RD TWR
Site Number	CTL02102
FA Number	10128891
Date of Analysis	4/7/2022
Company Performing Ev	Fullerton Engineering Consultants, LLC

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info	Description	Date
Tower Type (GT, SST, MIP)		
Tower Height (Top of Structure)	164	
Tower Manufacturer	N/A	
Tower Model	N/A	
Tower Design	N/A	
Foundation Design	N/A	
Geotech Report	N/A	
No Climb Site Visit	N/A	
Previous Structural Analysis	Malouf Engineering Project #: 15001.145	8/27/2020
Foundation Mapping	N/A	

Design Parameters	Value
Design Code Used	2015 IBC
Location of Tower (County, State)	TIA-222-H Fairfield, CT
Basic Wind Speed (mph)	127 (3-second gust)
Ice Thickness (in)	1
Structure Classification (I, II, III)	III
Exposure Category (B, C, D)	C
Topographic Category (1 to 5)	1

Analysis Results (% Maximum Usage)	Value
Existing/Reserved + Proposed Condition	
Tower (%)	42.1%
Anchor Rods (%)	38.9%
Base Plate (%)	32.6%
Foundation (%)	76.7%
Foundation Adequate?	Yes

## Steel Yield Strength (ksi)

Roof	65
Anchor Bolts	75
Base Plate	60

Note: Material grade assumed based on preferred material specifications.

## Existing / Reserved Loading

Antenna		Mount		Transmission Line										
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External
Unknown	164	164	3	Omni	Unknown	12' Whip		1	Unknown	13' Platform w/ Rails	2	Unknown	1/2"	Internal
Unknown	164	164	1	Camera	Unknown	Camera				on the same mount	2	Unknown	7/8"	Internal
Unknown	164	164	2	Omni	Sinclair	SC479-HF1LDF				on the same mount	6	Unknown	1-1/4"	Internal
Unknown	164	164	1	Omni	Sinclair	SC229-DFLN				on the same mount	1	Unknown	1-5/8"	Internal
Unknown	164	164	1	TMA	Unknown	432E-931-01-T TTA				on the same mount	3	Unknown	1-1/4"	Internal
Unknown	160	160	1	Dish	Unknown	4' HP Dish		1	Unknown	Pipe				
Unknown	160	160	1	Dish	Unknown	4' HP Dish		1	Unknown	Pipe				
Unknown	160	160	1	Dish	Unknown	4' HP Dish		1	Unknown	Pipe				
Unknown	154	154	1	Dish	Dragonwave	A-Ant-23G-2		1	Unknown	Pipe				
Unknown	154	154	1	Dish	Dragonwave	A-Ant-23G-2		1	Unknown	Pipe				
Unknown	154	154	3	Panel	Commscope	LLPX310R-V1		1	Unknown	13' Platform w/ Rails	2	Unknown	2" Conduit	Internal
Unknown	154	154	2	ODU	Dragonwave	Horizon Duo				on the same mount	2	Unknown	5/8"	Internal
Unknown	154	154	3	Panel	RFS	APXVPP18-C-A20				on the same mount	6	Unknown	1-5/8"	Internal
Unknown	154	154	3	Panel	Powerwave	P40-16-XLU-I20				on the same mount	1	Unknown	1/2"	Internal
Unknown	154	154	1	GPS	Unknown	GPS				on the same mount				
Unknown	151.5	151.5	3	RRH	Samsung	FDD-R6		1	Valmont	Tri-Bracket				
Unknown	151.5	151.5	3	RRH	ALU	RRH4x45-1900								
Unknown	151.5	151.5	3	RRH	ALU	RRH2x50W								
Unknown	151.5	151.5	3	RRH	ALU	RRH8x20-25								
Unknown	144	144	3	Panel	Ericsson	AIR 32		1	Unknown	13' Platform w/ Rails	12	Unknown	1-5/8"	Internal
Unknown	144	144	3	Panel	RFS	APXVAARR24-43 U A20				on the same mount				
Unknown	144	144	3	Panel	Ericsson	AIR 3245 B66				on the same mount				
Unknown	144	144	3	RRH	Ericsson	4449 B12/71				on the same mount				
Unknown	144	144	6	TMA	Unknown	TMA				on the same mount				
AT&T	134	134	3	RRH	Ericsson	RRUS-32 B30		1	Unknown	16' Platform w/ kicker ground mounted	6	Unknown	1-5/8"	Internal
AT&T	134	134	3	RRH	Ericsson	RRUS-E2 B29				on the same mount	2	Fiber	3/8"	Internal
AT&T	134	134	3	RRH	Ericsson	RRUS-32 B66				on the same mount	6	DC Power	3/4"	Internal
AT&T	134	134	3	RRH	Ericsson	RRUS-32 B2				on the same mount				
AT&T	134	134	3	RRH	Ericsson	RRUS-4479 B14				on the same mount				
AT&T	134	134	2	Surge	Raycap	DC6-48-60-18				on the same mount				
Unknown	124	124	6	Panel	Decibel	DB844G6SAZAXY		1	Unknown	13' Platform w/ Rails	6	Unknown	1-5/8"	Internal
Unknown	124	124	3	Panel	Quintel	QS6656-3				on the same mount	2	Unknown	1-5/8"	Internal
Unknown	124	124	3	RRH	Samsung	B2/B66A RRHBR049				on the same mount				
Unknown	124	124	3	RRH	Samsung	B5/B13 RRHBR04C				on the same mount				
Unknown	124	124	3	RRH	Samsung	CBRS RRM RT4401-48A				on the same mount				
Unknown	124	124	2	Surge	Raycap	RC3DC-3315-PF-48				on the same mount				
Unknown	114	114	2	Omni	Unknown	DB586-Y		1	Unknown	13' Platform w/ Rails	2	Unknown	1-5/8"	Internal
Unknown	114	114	1	Omni	Unknown	ANT150F2				on the same mount	2	Unknown	7/8"	Internal
Unknown	114	114	1	Dipole	Unknown	531-70HD				on the same mount	1	Unknown	1/2"	Internal
Unknown	114	114	1	TMA	Unknown	TTA				on the same mount				
Unknown	51.5	51.5	3	GPS	Unknown	GPS								

Note: The existing loading shall be re-used, in addition to the proposed loading.

## Proposed Loading

Antenna		Mount		Transmission Line										
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External
AT&T	134	134	3	Panel	Quintel	QD6616-7	30/150/270				1	Fiber	3/8"	Internal
AT&T	134	134	3	Panel	Ericsson	AIR6419 B77G	30/150/270				1	DC	3/4"	Internal
AT&T	134	134	3	Panel	CCI	DMP65R-BU6DA	30/150/270							
AT&T	134	134	3	RRH	Ericsson	RRUS 4449 B5/B12								
AT&T	134	134	3	RRH	Surge	DC9-48-60-24-9C-EV								

Note: The proposed equipment shall be installed in addition to the existing/reserved loading at the same elevation.

## Future Loading

Antenna		Mount		Transmission Line										
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External



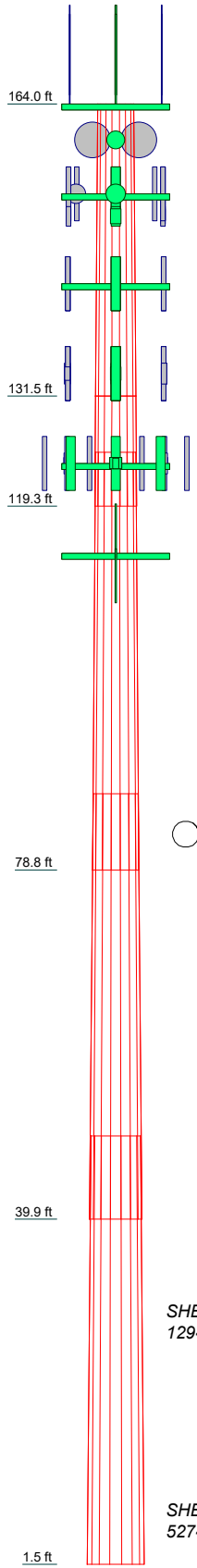
**MATERIAL STRENGTH**

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

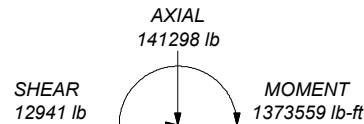
**TOWER DESIGN NOTES**

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 127 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 42.1%

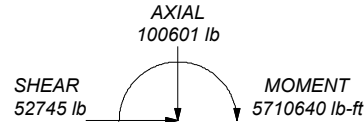
Section	1	2	3	4	5
Length (ft)	32.50	12.21	46.50	47.33	47.63
Number of Sides	18	18	18	18	18
Thickness (in)	0.3125	0.3750	0.4375	0.5625	0.5625
Socket Length (ft)		6.00	8.42	9.25	
Top Dia (in)	47.0000	53.4200	54.0585	60.4813	66.7412
Bot Dia (in)	53.4200	56.1500	62.9700	69.6600	76.0000
Grade			A572-65		
Weight (lb)	5473.4	2690.7	12760.7	18548.8	20489.4



ALL REACTIONS  
ARE FACTORED



TORQUE 1585 lb-ft  
50 mph WIND - 1.0000 in ICE

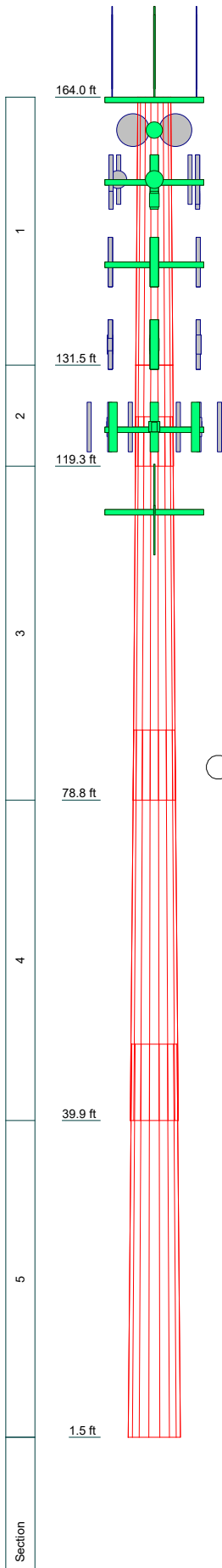


TORQUE 4245 lb-ft  
REACTIONS - 127 mph WIND

**Fullerton Engineering**  
1100 E. Woodfield Road, Suite 500  
Schaumburg, IL 60173  
Phone: (847) 908-8400  
FAX:

Job:	<b>GREENWICH PERRYRIDGE RD TWR/CTL0210</b>		
Project:	<b>164' Monopole</b>		
Client:	AT&T	Drawn by:	FAD
Code:	TIA-222-H	Date:	Page 92 of 75
Path:		Scale:	NTS
		Dwg No.:	E-1

**DESIGNED APPURTENANCE LOADING**



TYPE	ELEVATION	TYPE	ELEVATION
3"x12' Whip	164	RRUS-32 B2	134
3"x12' Whip	164	RRUS-32 B2	134
3"x12' Whip	164	Ericsson RRUS-4478 B14	134
3"x12' Whip	164	Ericsson RRUS-4478 B14	134
Camera	164	Ericsson RRUS-4478 B14	134
Sinclair SC479-HF1LDF	164	Raycap DC6-48-60-18	134
Sinclair SC479-HF1LDF	164	Raycap DC6-48-60-18	134
Sinclair SC229-DFLN	164	16' Low Profile Platform w/ Kicker	134
432E-83I-01-T TTA	164	Quintel QD6616-7	134
13' Low Profile Platform	164	Quintel QD6616-7	134
4" x 4' Mount Pipe	160	Quintel QD6616-7	134
4" x 4' Mount Pipe	160	Ericsson Air6449 B77D	134
4" x 4' Mount Pipe	160	Ericsson Air6449 B77D	134
4' HP Dish	160	Ericsson Air6449 B77D	134
4' HP Dish	160	Ericsson Air6419 B77G	134
2' HP Dish	160	Ericsson Air6419 B77G	134
Dragonwave Horizon Duo	154	Ericsson Air6419 B77G	134
Dragonwave Horizon Duo	154	CCI DMP65R-BU6DA	134
RFS APXVSP18-C-A20	154	CCI DMP65R-BU6DA	134
RFS APXVSP18-C-A20	154	CCI DMP65R-BU6DA	134
RFS APXVSP18-C-A20	154	Ericsson 4449	134
Powerwave P40-16-XLPP-RR	154	Ericsson 4449	134
RFS APXVTM14-ALU-I20	154	Ericsson 4449	134
RFS APXVTM14-ALU-I20	154	Raycap DC9-48-60-24-8C-EV	134
RFS APXVTM14-ALU-I20	154	RRUS-32 B30	134
GPS	154	RRUS-32 B30	134
13' Low Profile Platform	154	RRUS-32 B30	134
Commscope LLPX310R-V1	154	RRUS-32 B66	134
Commscope LLPX310R-V1	154	RRUS-32 B66	134
Commscope LLPX310R-V1	154	(2) DB844G65ZAXY	124
DragonWave A-ANT-23G-2	154	(2) DB844G65ZAXY	124
DragonWave A-ANT-23G-2	154	(2) DB844G65ZAXY	124
ALU FD-RRH4x45-1900	151.5	Quintel QS6656-3	124
ALU RRH2X50W (800 MHz)	151.5	Quintel QS6656-3	124
ALU RRH2X50W (800 MHz)	151.5	Quintel QS6656-3	124
ALU RRH2X50W (800 MHz)	151.5	Quintel AS-005246 (dual mount bracket)	124
ALU TD-RRH8x20-25	151.5	Quintel AS-005246 (dual mount bracket)	124
ALU TD-RRH8x20-25	151.5	Quintel AS-005246 (dual mount bracket)	124
ALU TD-RRH8x20-25	151.5	Quintel AS-005246 (dual mount bracket)	124
Valmont Uni-Tri Bracket	151.5	Quintel AS-005246 (dual mount bracket)	124
Samsung FDD-R6 RRH	151.5	Samsung B2/B66A RRHBR049	124
Samsung FDD-R6 RRH	151.5	Samsung B2/B66A RRHBR049	124
Samsung FDD-R6 RRH	151.5	Samsung B2/B66A RRHBR049	124
ALU FD-RRH4x45-1900	151.5	Samsung B5/B13 RRHBR04C	124
ALU FD-RRH4x45-1900	151.5	Samsung B5/B13 RRHBR04C	124
RFS APXVAARR24 43 U A20	144	Samsung B5/B13 RRHBR04C	124
Ericsson AIR-3246 B66	144	Samsung CBRS RRH-RT4401-48A	124
Ericsson AIR-3246 B66	144	Samsung CBRS RRH-RT4401-48A	124
Ericsson AIR-3246 B66	144	Samsung CBRS RRH-RT4401-48A	124
Ericsson 4449 B12/B71	144	Raycap RC3DC-3315-PF-48	124
Ericsson 4449 B12/B71	144	Raycap RC3DC-3315-PF-48	124
Ericsson 4449 B12/B71	144	13' Low Profile Platform	124
(2) TMA	144	531-70HD	114
(2) TMA	144	Tower Top Amplifier	114
(2) TMA	144	13' Low Profile Platform	114
13' Low Profile Platform	144	DB586-Y	114
AIR 32 w/Mount Pipe	144	DB586-Y	114
AIR 32 w/Mount Pipe	144	ANT150F2	114
AIR 32 w/Mount Pipe	144	GPS	51.5
RFS APXVAARR24 43 U A20	144	GPS	51.5
RFS APXVAARR24 43 U A20	144	GPS	51.5
RRUS-32 B66	134		
RRUS-32 B2	134		

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 1100 E. Woodfield Road, Suite 500  
 Schaumburg, IL 60173  
 Phone: (847) 908-8400  
 FAX:

Job: **GREENWICH PERRYRIDGE RD TWR/CTL0210**  
 Project: **164' Monopole**  
 Client: AT&T  
 Code: TIA-222-H  
 Path:  
 Drawn by: FAD  
 Date: **Page 10 of 75**  
 App'd:  
 Scale: NTS  
 Dwg No. E-1

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	<b>Project</b> 164' Monopole	<b>Date</b> 14:55:58 05/20/22
	<b>Client</b> AT&T	<b>Designed by</b> FAD

## Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

- Tower is located in Fairfield County, Connecticut.
- Tower base elevation above sea level: 143.50 ft.
- Basic wind speed of 127 mph.
- Risk Category III.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

- |  |   |   |
|--|---|---|
| <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-H Bracing Resist. Exemption</li> <li>Use TIA-222-H 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> |
|--|---|---|

## Tapered Pole Section Geometry

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	<b>Client</b>	AT&T	<b>Designed by</b>	FAD

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	164.00-131.50	32.50	0.00	18	47.0000	53.4200	0.3125	1.2500	A572-65 (65 ksi)
L2	131.50-119.29	12.21	6.00	18	53.4200	56.1500	0.3750	1.5000	A572-65 (65 ksi)
L3	119.29-78.79	46.50	8.42	18	54.0585	62.9700	0.4375	1.7500	A572-65 (65 ksi)
L4	78.79-39.88	47.33	9.25	18	60.4813	69.6600	0.5625	2.2500	A572-65 (65 ksi)
L5	39.88-1.50	47.63		18	66.7412	76.0000	0.5625	2.2500	A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	47.6768	46.3082	12752.5270	16.5741	23.8760	534.1149	25521.8341	23.1585	7.7220	24.71
	54.1959	52.6760	18769.9004	18.8532	27.1374	691.6627	37564.4987	26.3430	8.8519	28.326
L2	54.1862	63.1368	22444.4518	18.8310	27.1374	827.0684	44918.4365	31.5744	8.7419	23.312
	56.9584	66.3862	26091.2194	19.8001	28.5242	914.7047	52216.7704	33.1994	9.2224	24.593
L3	55.9925	74.4594	27047.4669	19.0354	27.4617	984.9157	54130.5236	37.2368	8.7443	19.987
	63.8739	86.8342	42898.2727	22.1990	31.9888	1341.0421	85852.9920	43.4253	10.3127	23.572
L4	62.9857	106.9776	48524.0652	21.2712	30.7245	1579.3269	97111.9796	53.4990	9.6547	17.164
	70.6478	123.3649	74413.8720	24.5296	35.3873	2102.8424	148925.659	61.6942	11.2702	20.036
L5	69.5098	118.1537	65376.3617	23.4934	33.9045	1928.2498	130838.747	59.0881	10.7564	19.123
	77.0856	134.6842	96834.1984	26.7803	38.6080	2508.1382	193795.813	67.3549	12.3860	22.02

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 164.00-131.50				1	1	1			
L2 131.50-119.29				1	1	1			
L3 119.29-78.79				1	1	1			
L4 78.79-39.88				1	1	1			
L5 39.88-1.50				1	1	1			

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

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 5/16	C	No	Surface Ar (CaAa)	164.00 - 1.50	1	1	0.000 0.000	0.3125		0.26
1-5/8" Hybrid	B	No	Surface Ar	144.00 -	3	3	0.000	1.6250		1.20

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Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***			(CaAa)	1.50			0.000			
LDF5-50A (7/8 FOAM)	C	No	Surface Ar (CaAa)	51.50 - 1.50	3	3	0.000 0.000	1.0900		0.33

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
Step Bolts	C	No	No	CaAa (Out Of Face)	164.00 - 1.50	1	No Ice 1/2" Ice 1" Ice	0.03 0.13 0.23	0.49 0.97 2.07
***									
LDF4-50A (1/2 FOAM)	A	No	No	Inside Pole	164.00 - 1.50	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.15 0.15 0.15
LDF5-50A (7/8 FOAM)	A	No	No	Inside Pole	164.00 - 1.50	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.33 0.33 0.33
LDF6-50A (1-1/4 FOAM)	A	No	No	Inside Pole	164.00 - 1.50	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.66 0.66 0.66
LDF7-50A (1-5/8 FOAM)	A	No	No	Inside Pole	164.00 - 1.50	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82
LDF6-50A (1-1/4 FOAM)	A	No	No	Inside Pole	164.00 - 1.50	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.66 0.66 0.66
***									
2" Rigid Conduit	B	No	No	Inside Pole	154.00 - 1.50	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	2.80 2.80 2.80
LDF4.5-50 (5/8 FOAM)	B	No	No	Inside Pole	154.00 - 1.50	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.15 0.15 0.15
LDF7-50A (1-5/8 FOAM)	B	No	No	Inside Pole	154.00 - 1.50	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82
LDF4-50A (1/2 FOAM)	B	No	No	Inside Pole	154.00 - 1.50	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.15 0.15 0.15
***									
LDF7-50A (1-5/8 FOAM)	B	No	No	Inside Pole	144.00 - 1.50	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82
***									
LDF7-50A (1-5/8 FOAM)	A	No	No	Inside Pole	134.00 - 1.50	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82
3/8" Fiber	A	No	No	Inside Pole	134.00 - 1.50	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.08 0.08 0.08
3/4" DC power cable	A	No	No	Inside Pole	134.00 - 1.50	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.40 0.40 0.40

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
***									
LDF7-50A (1-5/8 FOAM)	C	No	No	Inside Pole	124.00 - 1.50	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
1-5/8" Hybrid	C	No	No	Inside Pole	124.00 - 1.50	2	No Ice	0.00	1.20
							1/2" Ice	0.00	1.20
							1" Ice	0.00	1.20
***									
LDF7-50A (1-5/8 FOAM)	C	No	No	Inside Pole	114.00 - 1.50	2	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
LDF5-50A (7/8 FOAM)	C	No	No	Inside Pole	114.00 - 1.50	2	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
LDF4-50A (1/2 FOAM)	C	No	No	Inside Pole	114.00 - 1.50	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
***proposed***									
3/8" Fiber	A	No	No	Inside Pole	134.00 - 1.50	1	No Ice	0.00	0.08
							1/2" Ice	0.00	0.08
							1" Ice	0.00	0.08
3/4" DC power cable	A	No	No	Inside Pole	134.00 - 1.50	1	No Ice	0.00	0.40
							1/2" Ice	0.00	0.40
							1" Ice	0.00	0.40

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight lb
L1	164.00-131.50	A	0.000	0.000	0.000	0.000	270.80
		B	0.000	0.000	6.094	0.000	414.82
		C	0.000	0.000	1.016	0.949	24.38
L2	131.50-119.29	A	0.000	0.000	0.000	0.000	191.45
		B	0.000	0.000	5.952	0.000	298.05
		C	0.000	0.000	0.382	0.357	43.63
L3	119.29-78.79	A	0.000	0.000	0.000	0.000	635.04
		B	0.000	0.000	19.744	0.000	988.61
		C	0.000	0.000	1.266	1.183	413.10
L4	78.79-39.88	A	0.000	0.000	0.000	0.000	610.11
		B	0.000	0.000	18.969	0.000	949.79
		C	0.000	0.000	5.016	1.136	420.84
L5	39.88-1.50	A	0.000	0.000	0.000	0.000	601.80
		B	0.000	0.000	18.710	0.000	936.86
		C	0.000	0.000	13.750	1.121	441.75

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

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight lb
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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight lb
L1	164.00-131.50	A	1.336	0.000	0.000	0.000	0.000	270.80
		B		0.000	0.000	11.791	0.000	522.94
		C		0.000	0.000	9.698	9.631	206.98
L2	131.50-119.29	A	1.314	0.000	0.000	0.000	0.000	191.45
		B		0.000	0.000	11.452	0.000	401.61
		C		0.000	0.000	3.591	3.566	110.23
L3	119.29-78.79	A	1.283	0.000	0.000	0.000	0.000	635.04
		B		0.000	0.000	37.986	0.000	1332.12
		C		0.000	0.000	11.911	11.828	633.98
L4	78.79-39.88	A	1.219	0.000	0.000	0.000	0.000	610.11
		B		0.000	0.000	36.194	0.000	1270.58
		C		0.000	0.000	19.680	11.123	694.77
L5	39.88-1.50	A	1.099	0.000	0.000	0.000	0.000	601.80
		B		0.000	0.000	35.088	0.000	1234.72
		C		0.000	0.000	37.948	10.481	842.81

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>x</sub> in	CP <sub>z</sub> in	CP <sub>x</sub> Ice in	CP <sub>z</sub> Ice in
L1	164.00-131.50	1.1158	-0.4083	0.3081	0.9774
L2	131.50-119.29	2.8547	-1.4290	2.0293	-0.1429
L3	119.29-78.79	2.8778	-1.4402	2.0692	-0.1430
L4	78.79-39.88	2.8487	-0.7034	2.0453	0.6579
L5	39.88-1.50	2.7531	0.8718	1.9398	2.2674

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	Safety Line 5/16	131.50 - 164.00	1.0000	1.0000
L1	16	1-5/8" Hybrid	131.50 - 144.00	1.0000	1.0000
L2	1	Safety Line 5/16	119.29 - 131.50	1.0000	1.0000
L2	16	1-5/8" Hybrid	119.29 - 131.50	1.0000	1.0000
L3	1	Safety Line 5/16	78.79 - 119.29	1.0000	1.0000
L3	16	1-5/8" Hybrid	78.79 - 119.29	1.0000	1.0000
L4	1	Safety Line 5/16	39.88 - 78.79	1.0000	1.0000
L4	16	1-5/8" Hybrid	39.88 - 78.79	1.0000	1.0000
L4	29	LDF5-50A (7/8 FOAM)	39.88 - 51.50	1.0000	1.0000
L5	1	Safety Line 5/16	1.50 - 39.88	1.0000	1.0000
L5	16	1-5/8" Hybrid	1.50 - 39.88	1.0000	1.0000
L5	29	LDF5-50A (7/8 FOAM)	1.50 - 39.88	1.0000	1.0000

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### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>Front</sub>	C <sub>A</sub> A <sub>Side</sub>	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
3"x12' Whip	A	From Face	4.00	0.0000	164.00	No Ice	3.60	3.60	25.00
			0.00			1/2" Ice	4.83	4.83	51.06
			6.00			1" Ice	6.08	6.08	84.92
3"x12' Whip	B	From Face	4.00	0.0000	164.00	No Ice	3.60	3.60	25.00
			0.00			1/2" Ice	4.83	4.83	51.06
			6.00			1" Ice	6.08	6.08	84.92
3"x12' Whip	C	From Face	4.00	0.0000	164.00	No Ice	3.60	3.60	25.00
			0.00			1/2" Ice	4.83	4.83	51.06
			6.00			1" Ice	6.08	6.08	84.92
3"x12' Whip	C	From Face	4.00	0.0000	164.00	No Ice	3.60	3.60	25.00
			0.00			1/2" Ice	4.83	4.83	51.06
			6.00			1" Ice	6.08	6.08	84.92
Camera	C	From Face	4.00	0.0000	164.00	No Ice	0.13	0.13	10.00
			0.00			1/2" Ice	0.24	0.24	13.23
			2.00			1" Ice	0.31	0.31	17.53
Sinclair SC479-HF1LDF	A	From Face	4.00	0.0000	164.00	No Ice	4.51	4.51	34.00
			0.00			1/2" Ice	6.54	6.54	69.82
			5.00			1" Ice	8.04	8.04	114.98
Sinclair SC479-HF1LDF	B	From Face	4.00	0.0000	164.00	No Ice	4.51	4.51	34.00
			0.00			1/2" Ice	6.54	6.54	69.82
			5.00			1" Ice	8.04	8.04	114.98
Sinclair SC229-DFLN	C	From Face	4.00	0.0000	164.00	No Ice	6.67	6.67	32.00
			0.00			1/2" Ice	9.02	9.02	80.22
			5.00			1" Ice	11.39	11.39	143.03
432E-83I-01-T TTA	B	From Face	4.00	0.0000	164.00	No Ice	1.42	0.87	25.00
			0.00			1/2" Ice	1.57	0.99	37.93
			0.00			1" Ice	1.73	1.12	53.24
13' Low Profile Platform	C	None		0.0000	164.00	No Ice	15.70	15.70	1300.00
						1/2" Ice	20.10	20.10	1760.00
						1" Ice	24.50	24.50	2220.00
4" x 4' Mount Pipe	A	From Face	0.50	0.0000	160.00	No Ice	1.16	1.16	36.48
			0.00			1/2" Ice	1.47	1.47	48.11
			0.00			1" Ice	1.73	1.73	62.75
4" x 4' Mount Pipe	B	From Face	0.50	0.0000	160.00	No Ice	1.16	1.16	36.48
			0.00			1/2" Ice	1.47	1.47	48.11
			0.00			1" Ice	1.73	1.73	62.75
4" x 4' Mount Pipe	C	From Face	0.50	0.0000	160.00	No Ice	1.16	1.16	36.48
			0.00			1/2" Ice	1.47	1.47	48.11
			0.00			1" Ice	1.73	1.73	62.75
***									
Commscope LLPX310R-V1	A	From Face	3.00	0.0000	154.00	No Ice	5.40	3.86	69.20
			0.00			1/2" Ice	6.16	4.96	116.35
			0.00			1" Ice	6.83	5.91	169.58
Commscope LLPX310R-V1	B	From Face	3.00	0.0000	154.00	No Ice	5.40	3.86	69.20
			0.00			1/2" Ice	6.16	4.96	116.35
			0.00			1" Ice	6.83	5.91	169.58
Commscope LLPX310R-V1	C	From Face	3.00	0.0000	154.00	No Ice	5.40	3.86	69.20



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	<b>Project</b>	164' Monopole	<b>Date</b>	14:55:58 05/20/22
	<b>Client</b>	AT&T	<b>Designed by</b>	FAD

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
			0.00				1/2" Ice	6.16	4.96	116.35
			0.00				1" Ice	6.83	5.91	169.58
Dragonwave Horizon Duo	A	None			0.0000	154.00	No Ice	0.55	0.34	10.00
							1/2" Ice	0.66	0.43	14.00
							1" Ice	0.77	0.52	18.00
Dragonwave Horizon Duo	C	None			0.0000	154.00	No Ice	0.55	0.34	10.00
							1/2" Ice	0.66	0.43	14.00
							1" Ice	0.77	0.52	18.00
RFS APXVSPP18-C-A20	A	From Face	4.00		0.0000	154.00	No Ice	8.02	5.28	64.50
			0.00				1/2" Ice	8.48	5.74	114.02
			0.00				1" Ice	8.94	6.20	169.62
RFS APXVSPP18-C-A20	B	From Face	4.00		0.0000	154.00	No Ice	8.02	5.28	64.50
			0.00				1/2" Ice	8.48	5.74	114.02
			0.00				1" Ice	8.94	6.20	169.62
RFS APXVSPP18-C-A20	C	From Face	4.00		0.0000	154.00	No Ice	8.02	5.28	64.50
			0.00				1/2" Ice	8.48	5.74	114.02
			0.00				1" Ice	8.94	6.20	169.62
Powerwave P40-16-XLPP-RR	B	From Face	4.00		0.0000	154.00	No Ice	8.36	4.94	50.90
			0.00				1/2" Ice	8.87	5.79	114.83
			0.00				1" Ice	9.36	6.51	185.69
RFS APXVTM14-ALU-I20	A	From Face	4.00		0.0000	154.00	No Ice	6.65	5.03	58.90
			0.00				1/2" Ice	7.14	5.89	114.31
			0.00				1" Ice	7.60	6.63	176.47
RFS APXVTM14-ALU-I20	B	From Face	4.00		0.0000	154.00	No Ice	6.65	5.03	58.90
			0.00				1/2" Ice	7.14	5.89	114.31
			0.00				1" Ice	7.60	6.63	176.47
RFS APXVTM14-ALU-I20	C	From Face	4.00		0.0000	154.00	No Ice	6.65	5.03	58.90
			0.00				1/2" Ice	7.14	5.89	114.31
			0.00				1" Ice	7.60	6.63	176.47
GPS	C	From Face	4.00		0.0000	154.00	No Ice	0.76	0.76	17.30
			0.00				1/2" Ice	1.02	1.02	27.45
			3.00				1" Ice	1.30	1.30	40.15
13' Low Profile Platform	C	None			0.0000	154.00	No Ice	15.70	15.70	1300.00
							1/2" Ice	20.10	20.10	1760.00
							1" Ice	24.50	24.50	2220.00
***										
Samsung FDD-R6 RRH	A	From Face	4.00		0.0000	151.50	No Ice	1.80	0.78	30.00
			0.00				1/2" Ice	1.99	0.92	40.00
			0.00				1" Ice	2.18	1.06	50.00
Samsung FDD-R6 RRH	B	From Face	4.00		0.0000	151.50	No Ice	1.80	0.78	30.00
			0.00				1/2" Ice	1.99	0.92	40.00
			0.00				1" Ice	2.18	1.06	50.00
Samsung FDD-R6 RRH	C	From Face	4.00		0.0000	151.50	No Ice	1.80	0.78	30.00
			0.00				1/2" Ice	1.99	0.92	40.00
			0.00				1" Ice	2.18	1.06	50.00
ALU FD-RRH4x45-1900	A	From Face	4.00		0.0000	151.50	No Ice	2.32	2.24	59.50
			0.00				1/2" Ice	2.53	2.44	82.62
			0.00				1" Ice	2.74	2.65	108.98
ALU FD-RRH4x45-1900	B	From Face	4.00		0.0000	151.50	No Ice	2.32	2.24	59.50
			0.00				1/2" Ice	2.53	2.44	82.62
			0.00				1" Ice	2.74	2.65	108.98
ALU FD-RRH4x45-1900	C	From Face	4.00		0.0000	151.50	No Ice	2.32	2.24	59.50
			0.00				1/2" Ice	2.53	2.44	82.62
			0.00				1" Ice	2.74	2.65	108.98
ALU RRH2X50W (800 MHz)	A	From Face	4.00		0.0000	151.50	No Ice	2.13	1.41	53.00
			0.00				1/2" Ice	2.32	1.57	71.78
			0.00				1" Ice	2.51	1.74	93.44

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	<b>Project</b>	164' Monopole	<b>Date</b>	14:55:58 05/20/22
	<b>Client</b>	AT&T	<b>Designed by</b>	FAD

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
ALU RRH2X50W (800 MHz)	B	From Face	4.00	0.0000	151.50	No Ice	2.13	1.41	53.00
			0.00			1/2" Ice	2.32	1.57	71.78
			0.00			1" Ice	2.51	1.74	93.44
ALU RRH2X50W (800 MHz)	C	From Face	4.00	0.0000	151.50	No Ice	2.13	1.41	53.00
			0.00			1/2" Ice	2.32	1.57	71.78
			0.00			1" Ice	2.51	1.74	93.44
ALU TD-RRH8x20-25	A	From Face	4.00	0.0000	151.50	No Ice	4.72	1.70	70.00
			0.00			1/2" Ice	5.01	1.92	97.15
			0.00			1" Ice	5.30	2.14	124.30
ALU TD-RRH8x20-25	B	From Face	4.00	0.0000	151.50	No Ice	4.72	1.70	70.00
			0.00			1/2" Ice	5.01	1.92	97.15
			0.00			1" Ice	5.30	2.14	124.30
ALU TD-RRH8x20-25	C	From Face	4.00	0.0000	151.50	No Ice	4.72	1.70	70.00
			0.00			1/2" Ice	5.01	1.92	97.15
			0.00			1" Ice	5.30	2.14	124.30
Valmont Uni-Tri Bracket	A	None		0.0000	151.50	No Ice	1.75	1.75	290.00
						1/2" Ice	1.94	1.94	310.00
						1" Ice	2.13	2.13	330.00
***									
AIR 32 w/Mount Pipe	A	From Face	4.00	0.0000	144.00	No Ice	6.47	5.87	120.90
			0.00			1/2" Ice	6.95	6.73	179.37
			0.00			1" Ice	7.41	7.46	244.70
AIR 32 w/Mount Pipe	B	From Face	4.00	0.0000	144.00	No Ice	6.47	5.87	120.90
			0.00			1/2" Ice	6.95	6.73	179.37
			0.00			1" Ice	7.41	7.46	244.70
AIR 32 w/Mount Pipe	C	From Face	4.00	0.0000	144.00	No Ice	6.47	5.87	120.90
			0.00			1/2" Ice	6.95	6.73	179.37
			0.00			1" Ice	7.41	7.46	244.70
RFS APXVAARR24 43 U A20	A	From Face	4.00	0.0000	144.00	No Ice	14.46	9.13	151.50
			0.00			1/2" Ice	15.07	9.73	237.90
			0.00			1" Ice	15.68	10.34	332.33
RFS APXVAARR24 43 U A20	B	From Face	4.00	0.0000	144.00	No Ice	14.46	9.13	151.50
			0.00			1/2" Ice	15.07	9.73	237.90
			0.00			1" Ice	15.68	10.34	332.33
RFS APXVAARR24 43 U A20	C	From Face	4.00	0.0000	144.00	No Ice	14.46	9.13	151.50
			0.00			1/2" Ice	15.07	9.73	237.90
			0.00			1" Ice	15.68	10.34	332.33
Ericsson AIR-3246 B66	A	From Face	4.00	0.0000	144.00	No Ice	8.05	5.26	220.00
			0.00			1/2" Ice	8.46	5.63	275.51
			0.00			1" Ice	8.87	6.01	336.66
Ericsson AIR-3246 B66	B	From Face	4.00	0.0000	144.00	No Ice	8.05	5.26	220.00
			0.00			1/2" Ice	8.46	5.63	275.51
			0.00			1" Ice	8.87	6.01	336.66
Ericsson AIR-3246 B66	C	From Face	4.00	0.0000	144.00	No Ice	8.05	5.26	220.00
			0.00			1/2" Ice	8.46	5.63	275.51
			0.00			1" Ice	8.87	6.01	336.66
Ericsson 4449 B12/B71	A	From Face	4.00	0.0000	144.00	No Ice	1.65	1.30	75.00
			0.00			1/2" Ice	1.81	1.45	92.00
			0.00			1" Ice	1.98	1.60	112.00
Ericsson 4449 B12/B71	B	From Face	4.00	0.0000	144.00	No Ice	1.65	1.30	75.00
			0.00			1/2" Ice	1.81	1.45	92.00
			0.00			1" Ice	1.98	1.60	112.00
Ericsson 4449 B12/B71	C	From Face	4.00	0.0000	144.00	No Ice	1.65	1.30	75.00
			0.00			1/2" Ice	1.81	1.45	92.00
			0.00			1" Ice	1.98	1.60	112.00
(2) TMA	A	From Face	4.00	0.0000	144.00	No Ice	0.16	0.10	15.00
			0.00			1/2" Ice	0.21	0.14	16.54

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	<b>Project</b>	164' Monopole	<b>Date</b>	14:55:58 05/20/22
	<b>Client</b>	AT&T	<b>Designed by</b>	FAD

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
(2) TMA	B	From Face	0.00		0.0000	144.00	1" Ice	0.28	0.20	18.95
			4.00				No Ice	0.16	0.10	15.00
			0.00				1/2" Ice	0.21	0.14	16.54
(2) TMA	C	From Face	0.00		0.0000	144.00	1" Ice	0.28	0.20	18.95
			4.00				No Ice	0.16	0.10	15.00
			0.00				1/2" Ice	0.21	0.14	16.54
13' Low Profile Platform	C	None	0.00		0.0000	144.00	1" Ice	0.28	0.20	18.95
							No Ice	15.70	15.70	1300.00
							1/2" Ice	20.10	20.10	1760.00
						1" Ice	24.50	24.50	2220.00	
***										
RRUS-32 B30	A	From Face	4.00		0.0000	134.00	No Ice	2.74	1.67	60.00
			0.00				1/2" Ice	2.96	1.86	81.11
			0.00				1" Ice	3.19	2.05	105.42
RRUS-32 B30	B	From Face	4.00		0.0000	134.00	No Ice	2.74	1.67	60.00
			0.00				1/2" Ice	2.96	1.86	81.11
			0.00				1" Ice	3.19	2.05	105.42
RRUS-32 B30	C	From Face	4.00		0.0000	134.00	No Ice	2.74	1.67	60.00
			0.00				1/2" Ice	2.96	1.86	81.11
			0.00				1" Ice	3.19	2.05	105.42
RRUS-32 B66	A	From Face	4.00		0.0000	134.00	No Ice	2.74	1.67	60.00
			0.00				1/2" Ice	2.96	1.86	81.11
			0.00				1" Ice	3.19	2.05	105.42
RRUS-32 B66	B	From Face	4.00		0.0000	134.00	No Ice	2.74	1.67	60.00
			0.00				1/2" Ice	2.96	1.86	81.11
			0.00				1" Ice	3.19	2.05	105.42
RRUS-32 B66	C	From Face	4.00		0.0000	134.00	No Ice	2.74	1.67	60.00
			0.00				1/2" Ice	2.96	1.86	81.11
			0.00				1" Ice	3.19	2.05	105.42
RRUS-32 B2	A	From Face	4.00		0.0000	134.00	No Ice	2.74	1.67	60.00
			0.00				1/2" Ice	2.96	1.86	81.11
			0.00				1" Ice	3.19	2.05	105.42
RRUS-32 B2	B	From Face	4.00		0.0000	134.00	No Ice	2.74	1.67	60.00
			0.00				1/2" Ice	2.96	1.86	81.11
			0.00				1" Ice	3.19	2.05	105.42
RRUS-32 B2	C	From Face	4.00		0.0000	134.00	No Ice	2.74	1.67	60.00
			0.00				1/2" Ice	2.96	1.86	81.11
			0.00				1" Ice	3.19	2.05	105.42
Ericsson RRUS-4478 B14	A	From Face	4.00		0.0000	134.00	No Ice	1.84	1.06	44.00
			0.00				1/2" Ice	2.01	1.20	59.88
			0.00				1" Ice	2.19	1.34	78.39
Ericsson RRUS-4478 B14	B	From Face	4.00		0.0000	134.00	No Ice	1.84	1.06	44.00
			0.00				1/2" Ice	2.01	1.20	59.88
			0.00				1" Ice	2.19	1.34	78.39
Ericsson RRUS-4478 B14	C	From Face	4.00		0.0000	134.00	No Ice	1.84	1.06	44.00
			0.00				1/2" Ice	2.01	1.20	59.88
			0.00				1" Ice	2.19	1.34	78.39
Raycap DC6-48-60-18	A	From Face	0.50		0.0000	134.00	No Ice	3.81	1.37	18.50
			0.00				1/2" Ice	4.06	1.55	42.83
			0.00				1" Ice	4.32	1.74	70.57
Raycap DC6-48-60-18	B	From Face	0.50		0.0000	134.00	No Ice	3.81	1.37	18.50
			0.00				1/2" Ice	4.06	1.55	42.83
			0.00				1" Ice	4.32	1.74	70.57
16' Low Profile Platform w/ Kicker	C	None			0.0000	134.00	No Ice	18.85	18.85	2400.00
							1/2" Ice	24.30	24.30	3600.00
							1" Ice	29.75	29.75	4800.00
***										

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	<b>Project</b>	164' Monopole	<b>Date</b>	14:55:58 05/20/22
	<b>Client</b>	AT&T	<b>Designed by</b>	FAD

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
(2) DB844G65ZAXY	A	From Face	4.00	0.0000	124.00	No Ice	4.34	3.61	16.00
			0.00			1/2" Ice	4.66	3.92	48.76
			0.00			1" Ice	4.98	4.23	86.00
(2) DB844G65ZAXY	B	From Face	4.00	0.0000	124.00	No Ice	4.34	3.61	16.00
			0.00			1/2" Ice	4.66	3.92	48.76
			0.00			1" Ice	4.98	4.23	86.00
(2) DB844G65ZAXY	C	From Face	4.00	0.0000	124.00	No Ice	4.34	3.61	16.00
			0.00			1/2" Ice	4.66	3.92	48.76
			0.00			1" Ice	4.98	4.23	86.00
Quintel QS6656-3	A	From Face	4.00	0.0000	124.00	No Ice	8.13	8.22	98.90
			0.00			1/2" Ice	8.59	9.19	171.99
			0.00			1" Ice	9.05	10.02	253.01
Quintel QS6656-3	B	From Face	4.00	0.0000	124.00	No Ice	8.13	8.22	98.90
			0.00			1/2" Ice	8.59	9.19	171.99
			0.00			1" Ice	9.05	10.02	253.01
Quintel QS6656-3	C	From Face	4.00	0.0000	124.00	No Ice	8.13	8.22	98.90
			0.00			1/2" Ice	8.59	9.19	171.99
			0.00			1" Ice	9.05	10.02	253.01
Quintel AS-005246 (dual mount bracket)	A	From Face	4.00	0.0000	124.00	No Ice	5.98	3.50	132.22
			0.00			1/2" Ice	7.09	4.48	168.86
			0.00			1" Ice	8.20	5.46	205.50
Quintel AS-005246 (dual mount bracket)	B	From Face	4.00	0.0000	124.00	No Ice	5.98	3.50	132.22
			0.00			1/2" Ice	7.09	4.48	168.86
			0.00			1" Ice	8.20	5.46	205.50
Quintel AS-005246 (dual mount bracket)	C	From Face	4.00	0.0000	124.00	No Ice	5.98	3.50	132.22
			0.00			1/2" Ice	7.09	4.48	168.86
			0.00			1" Ice	8.20	5.46	205.50
Samsung B2/B66A RRHBR049	A	From Face	4.00	0.0000	124.00	No Ice	1.88	1.25	84.40
			0.00			1/2" Ice	2.05	1.39	102.74
			0.00			1" Ice	2.22	1.54	123.87
Samsung B2/B66A RRHBR049	B	From Face	4.00	0.0000	124.00	No Ice	1.88	1.25	84.40
			0.00			1/2" Ice	2.05	1.39	102.74
			0.00			1" Ice	2.22	1.54	123.87
Samsung B2/B66A RRHBR049	C	From Face	4.00	0.0000	124.00	No Ice	1.88	1.25	84.40
			0.00			1/2" Ice	2.05	1.39	102.74
			0.00			1" Ice	2.22	1.54	123.87
Samsung B5/B13 RRHBR04C	A	From Face	4.00	0.0000	124.00	No Ice	1.88	1.01	70.30
			0.00			1/2" Ice	2.05	1.14	86.73
			0.00			1" Ice	2.22	1.28	105.83
Samsung B5/B13 RRHBR04C	B	From Face	4.00	0.0000	124.00	No Ice	1.88	1.01	70.30
			0.00			1/2" Ice	2.05	1.14	86.73
			0.00			1" Ice	2.22	1.28	105.83
Samsung B5/B13 RRHBR04C	C	From Face	4.00	0.0000	124.00	No Ice	1.88	1.01	70.30
			0.00			1/2" Ice	2.05	1.14	86.73
			0.00			1" Ice	2.22	1.28	105.83
Samsung CBRS RRH-RT4401-48A	A	From Face	4.00	0.0000	124.00	No Ice	1.00	0.50	18.70
			0.00			1/2" Ice	1.12	0.60	26.53
			0.00			1" Ice	1.26	0.71	36.29
Samsung CBRS RRH-RT4401-48A	B	From Face	4.00	0.0000	124.00	No Ice	1.00	0.50	18.70
			0.00			1/2" Ice	1.12	0.60	26.53
			0.00			1" Ice	1.26	0.71	36.29
Samsung CBRS RRH-RT4401-48A	C	From Face	4.00	0.0000	124.00	No Ice	1.00	0.50	18.70
			0.00			1/2" Ice	1.12	0.60	26.53
			0.00			1" Ice	1.26	0.71	36.29
Raycap RC3DC-3315-PF-48	A	From Face	4.00	0.0000	124.00	No Ice	3.79	2.51	32.00
			0.00			1/2" Ice	4.04	2.72	63.47
			0.00			1" Ice	4.30	2.94	98.69

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	<b>Project</b>	164' Monopole	<b>Date</b>	14:55:58 05/20/22
	<b>Client</b>	AT&T	<b>Designed by</b>	FAD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAA Front ft <sup>2</sup>	CAA Side ft <sup>2</sup>	Weight lb
Raycap RC3DC-3315-PF-48	B	From Face	4.00 0.00 0.00	0.0000	124.00	No Ice 3.79 1/2" Ice 4.04 1" Ice 4.30	2.51 2.72 2.94	32.00 63.47 98.69
13' Low Profile Platform	C	None		0.0000	124.00	No Ice 15.70 1/2" Ice 20.10 1" Ice 24.50	15.70 20.10 24.50	1300.00 1760.00 2220.00
*** DB586-Y	C	From Face	3.00 0.00 2.50	0.0000	114.00	No Ice 1.01 1/2" Ice 1.28 1" Ice 1.56	1.01 1.28 1.56	8.25 16.59 28.01
DB586-Y	C	From Face	3.00 0.00 -2.50	0.0000	114.00	No Ice 1.01 1/2" Ice 1.28 1" Ice 1.56	1.01 1.28 1.56	8.25 16.59 28.01
ANT150F2	C	From Face	3.00 0.00 0.00	0.0000	114.00	No Ice 1.29 1/2" Ice 1.60 1" Ice 1.91	1.29 1.60 1.91	12.00 22.28 36.06
531-70HD	C	From Face	3.00 0.00 0.00	0.0000	114.00	No Ice 6.00 1/2" Ice 6.90 1" Ice 7.80	6.00 6.90 7.80	40.00 50.00 60.00
Tower Top Amplifier	C	From Face	3.00 0.00 0.00	0.0000	114.00	No Ice 3.11 1/2" Ice 3.35 1" Ice 3.59	1.17 1.34 1.51	40.00 60.00 80.00
13' Low Profile Platform	C	None		0.0000	114.00	No Ice 15.70 1/2" Ice 20.10 1" Ice 24.50	15.70 20.10 24.50	1300.00 1760.00 2220.00
*** GPS	A	From Face	4.00 0.00 3.00	0.0000	51.50	No Ice 0.76 1/2" Ice 1.02 1" Ice 1.30	0.76 1.02 1.30	17.30 27.45 40.15
GPS	B	From Face	4.00 0.00 3.00	0.0000	51.50	No Ice 0.76 1/2" Ice 1.02 1" Ice 1.30	0.76 1.02 1.30	17.30 27.45 40.15
GPS	C	From Face	4.00 0.00 3.00	0.0000	51.50	No Ice 0.76 1/2" Ice 1.02 1" Ice 1.30	0.76 1.02 1.30	17.30 27.45 40.15
***proposed*** Quintel QD6616-7	A	From Face	4.00 0.00 0.00	0.0000	134.00	No Ice 13.58 1/2" Ice 14.08 1" Ice 14.60	6.80 7.27 7.72	114.00 197.97 288.84
Quintel QD6616-7	B	From Face	4.00 0.00 0.00	0.0000	134.00	No Ice 13.58 1/2" Ice 14.08 1" Ice 14.60	6.80 7.27 7.72	114.00 197.97 288.84
Quintel QD6616-7	C	From Face	4.00 0.00 0.00	0.0000	134.00	No Ice 13.58 1/2" Ice 14.08 1" Ice 14.60	6.80 7.27 7.72	114.00 197.97 288.84
Ericsson Air6449 B77D	A	From Face	4.00 0.00 0.00	0.0000	134.00	No Ice 4.03 1/2" Ice 4.29 1" Ice 4.56	2.15 2.36 2.57	81.60 111.21 144.55
Ericsson Air6449 B77D	B	From Face	4.00 0.00 0.00	0.0000	134.00	No Ice 4.03 1/2" Ice 4.29 1" Ice 4.56	2.15 2.36 2.57	81.60 111.21 144.55
Ericsson Air6449 B77D	C	From Face	4.00 0.00 0.00	0.0000	134.00	No Ice 4.03 1/2" Ice 4.29 1" Ice 4.56	2.15 2.36 2.57	81.60 111.21 144.55
Ericsson Air6419 B77G	A	From Face	4.00 0.00 0.00	0.0000	134.00	No Ice 3.80 1/2" Ice 4.05 1" Ice 4.31	1.94 2.14 2.34	77.00 104.86 136.30

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	<b>Project</b>	164' Monopole	<b>Date</b>	14:55:58 05/20/22
	<b>Client</b>	AT&T	<b>Designed by</b>	FAD

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub>		Weight
			Horz	Lateral			Front	Side	
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
Ericsson Air6419 B77G	B	From Face	4.00	0.0000	134.00	No Ice	3.80	1.94	77.00
			0.00			1/2" Ice	4.05	2.14	104.86
			0.00			1" Ice	4.31	2.34	136.30
Ericsson Air6419 B77G	C	From Face	4.00	0.0000	134.00	No Ice	3.80	1.94	77.00
			0.00			1/2" Ice	4.05	2.14	104.86
			0.00			1" Ice	4.31	2.34	136.30
CCI DMP65R-BU6DA	A	From Face	4.00	0.0000	134.00	No Ice	12.71	5.62	79.40
			0.00			1/2" Ice	13.21	6.07	153.36
			0.00			1" Ice	13.71	6.53	233.96
CCI DMP65R-BU6DA	B	From Face	4.00	0.0000	134.00	No Ice	12.71	5.62	79.40
			0.00			1/2" Ice	13.21	6.07	153.36
			0.00			1" Ice	13.71	6.53	233.96
CCI DMP65R-BU6DA	C	From Face	4.00	0.0000	134.00	No Ice	12.71	5.62	79.40
			0.00			1/2" Ice	13.21	6.07	153.36
			0.00			1" Ice	13.71	6.53	233.96
Ericsson 4449	A	From Face	4.00	0.0000	134.00	No Ice	1.98	1.41	70.00
			0.00			1/2" Ice	2.16	1.57	88.55
			0.00			1" Ice	2.34	1.73	109.93
Ericsson 4449	B	From Face	4.00	0.0000	134.00	No Ice	1.98	1.41	70.00
			0.00			1/2" Ice	2.16	1.57	88.55
			0.00			1" Ice	2.34	1.73	109.93
Ericsson 4449	C	From Face	4.00	0.0000	134.00	No Ice	1.98	1.41	70.00
			0.00			1/2" Ice	2.16	1.57	88.55
			0.00			1" Ice	2.34	1.73	109.93
Raycap DC9-48-60-24-8C-EV	C	From Face	0.50	0.0000	134.00	No Ice	0.93	0.93	26.20
			0.00			1/2" Ice	1.48	1.48	43.68
			0.00			1" Ice	1.67	1.67	63.68

## Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight		
				Horz	Lateral								
			ft	ft	°	°	ft	ft	ft <sup>2</sup>	lb			
4' HP Dish	A	Paraboloid w/Shroud (HP)	From Face	1.00	0.0000			160.00	4.00	No Ice	12.57	185.00	
				0.00							1/2" Ice	13.10	295.00
				0.00								1" Ice	13.62
4' HP Dish	B	Paraboloid w/Shroud (HP)	From Face	1.00	0.0000			160.00	4.00	No Ice	12.57	185.00	
				0.00							1/2" Ice	13.10	295.00
				0.00								1" Ice	13.62
2' HP Dish	C	Paraboloid w/Shroud (HP)	From Face	1.00	0.0000			160.00	2.00	No Ice	3.14	40.00	
				0.00							1/2" Ice	3.41	57.50
				0.00								1" Ice	3.68
DragonWave A-ANT-23G-2	A	Paraboloid w/o Radome	From Face	3.10	0.0000			154.00	2.17	No Ice	3.72	27.60	
				0.00							1/2" Ice	4.01	48.18
				0.00								1" Ice	4.30
DragonWave A-ANT-23G-2	C	Paraboloid w/o Radome	From Face	3.80	0.0000			154.00	2.17	No Ice	3.72	27.60	
				0.00							1/2" Ice	4.01	48.18
				0.00								1" Ice	4.30

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	<b>Project</b> 164' Monopole	<b>Date</b> 14:55:58 05/20/22
	<b>Client</b> AT&T	<b>Designed by</b> FAD

**Tower Pressures - No Ice**

$G_H = 1.100$

Section Elevation ft	z ft	$K_Z$	$q_z$ psf	$A_G$ ft <sup>2</sup>	F a c e e	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>
L1 164.00-131.50	147.50	1.374	54	137.953	A	0.000	137.953	137.953	100.00	0.000	0.000
					B	0.000	137.953	100.00	6.094	0.000	
					C	0.000	137.953	100.00	1.016	0.949	
L2 131.50-119.29	125.34	1.327	52	56.545	A	0.000	56.545	56.545	100.00	0.000	0.000
					B	0.000	56.545	100.00	5.952	0.000	
					C	0.000	56.545	100.00	0.382	0.357	
L3 119.29-78.79	98.81	1.262	49	202.275	A	0.000	202.275	202.275	100.00	0.000	0.000
					B	0.000	202.275	100.00	19.744	0.000	
					C	0.000	202.275	100.00	1.266	1.183	
L4 78.79-39.88	59.30	1.134	44	216.653	A	0.000	216.653	216.653	100.00	0.000	0.000
					B	0.000	216.653	100.00	18.969	0.000	
					C	0.000	216.653	100.00	5.016	1.136	
L5 39.88-1.50	21.06	0.912	36	234.431	A	0.000	234.431	234.431	100.00	0.000	0.000
					B	0.000	234.431	100.00	18.710	0.000	
					C	0.000	234.431	100.00	13.750	1.121	

**Tower Pressure - With Ice**

$G_H = 1.100$

Section Elevation ft	z ft	$K_Z$	$q_z$ psf	$t_z$ in	$A_G$ ft <sup>2</sup>	F a c e e	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>
L1 164.00-131.50	147.50	1.374	8	1.3357	145.188	A	0.000	145.188	145.188	100.00	0.000	0.000
						B	0.000	145.188	100.00	11.791	0.000	
						C	0.000	145.188	100.00	9.698	9.631	
L2 131.50-119.29	125.34	1.327	8	1.3142	59.219	A	0.000	59.219	59.219	100.00	0.000	0.000
						B	0.000	59.219	100.00	11.452	0.000	
						C	0.000	59.219	100.00	3.591	3.566	
L3 119.29-78.79	98.81	1.262	8	1.2833	211.145	A	0.000	211.145	211.145	100.00	0.000	0.000
						B	0.000	211.145	100.00	37.986	0.000	
						C	0.000	211.145	100.00	11.911	11.828	
L4 78.79-39.88	59.30	1.134	7	1.2194	224.976	A	0.000	224.976	224.976	100.00	0.000	0.000
						B	0.000	224.976	100.00	36.194	0.000	
						C	0.000	224.976	100.00	19.680	11.123	
L5 39.88-1.50	21.06	0.912	6	1.0995	242.231	A	0.000	242.231	242.231	100.00	0.000	0.000
						B	0.000	242.231	100.00	35.088	0.000	
						C	0.000	242.231	100.00	37.948	10.481	

**Tower Pressure - Service**

$G_H = 1.100$

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	<b>Project</b> 164' Monopole	<b>Date</b> 14:55:58 05/20/22
	<b>Client</b> AT&T	<b>Designed by</b> FAD

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F <sub>a c e</sub>	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
L1 164.00-131.50	147.50	1.374	11	137.953	A	0.000	137.953	137.953	100.00	0.000	0.000
					B	0.000	137.953		100.00	6.094	0.000
					C	0.000	137.953		100.00	1.016	0.949
L2 131.50-119.29	125.34	1.327	10	56.545	A	0.000	56.545	56.545	100.00	0.000	0.000
					B	0.000	56.545		100.00	5.952	0.000
					C	0.000	56.545		100.00	0.382	0.357
L3 119.29-78.79	98.81	1.262	10	202.275	A	0.000	202.275	202.275	100.00	0.000	0.000
					B	0.000	202.275		100.00	19.744	0.000
					C	0.000	202.275		100.00	1.266	1.183
L4 78.79-39.88	59.30	1.134	9	216.653	A	0.000	216.653	216.653	100.00	0.000	0.000
					B	0.000	216.653		100.00	18.969	0.000
					C	0.000	216.653		100.00	5.016	1.136
L5 39.88-1.50	21.06	0.912	7	234.431	A	0.000	234.431	234.431	100.00	0.000	0.000
					B	0.000	234.431		100.00	18.710	0.000
					C	0.000	234.431		100.00	13.750	1.121

### Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	F <sub>a c e</sub>	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
L1 164.00-131.50	710.00	5473.37	A	1	0.73	54	1	1	137.953	5991.37	184.35	C
			B	1	0.73				137.953			
			C	1	0.73				137.953			
L2 131.50-119.29	533.13	2690.72	A	1	0.73	52	1	1	56.545	2372.13	194.28	C
			B	1	0.73				56.545			
			C	1	0.73				56.545			
L3 119.29-78.79	2036.74	12760.73	A	1	0.73	49	1	1	202.275	8055.45	198.90	C
			B	1	0.73				202.275			
			C	1	0.73				202.275			
L4 78.79-39.88	1980.74	18548.81	A	1	0.73	44	1	1	216.653	7725.82	198.56	C
			B	1	0.73				216.653			
			C	1	0.73				216.653			
L5 39.88-1.50	1980.41	20489.35	A	1	0.73	36	1	1	234.431	6766.53	176.30	C
			B	1	0.73				234.431			
			C	1	0.73				234.431			
Sum Weight:	7241.02	59962.98						OTM	2531333.8 9 lb-ft	30911.31		

### Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	F <sub>a c e</sub>	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
L1 164.00-131.50	710.00	5473.37	A	1	0.73	54	1	1	137.953	5991.37	184.35	C
			B	1	0.73				137.953			
			C	1	0.73				137.953			
L2 131.50-119.29	533.13	2690.72	A	1	0.73	52	1	1	56.545	2372.13	194.28	C
			B	1	0.73				56.545			



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	<b>Project</b> 164' Monopole	<b>Date</b> 14:55:58 05/20/22
	<b>Client</b> AT&T	<b>Designed by</b> FAD

Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
L3 119.29-78.79	2036.74	12760.73	C	1	0.73	49	1	1	56.545	8055.45	198.90	C
			A	1	0.73		1	1	202.275			
			B	1	0.73		1	1	202.275			
L4 78.79-39.88	1980.74	18548.81	C	1	0.73	44	1	1	202.275	7725.82	198.56	C
			A	1	0.73		1	1	216.653			
			B	1	0.73		1	1	216.653			
L5 39.88-1.50	1980.41	20489.35	C	1	0.73	36	1	1	216.653	6766.53	176.30	C
			A	1	0.73		1	1	234.431			
			B	1	0.73		1	1	234.431			
Sum Weight:	7241.02	59962.98	C	1	0.73			1	234.431			
								OTM	2531333.8 9 lb-ft	30911.31		

**Tower Forces - No Ice - Wind 90 To Face**

Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
L1 164.00-131.50	710.00	5473.37	A	1	0.73	54	1	1	137.953	5991.37	184.35	C
			B	1	0.73		1	1	137.953			
			C	1	0.73		1	1	137.953			
L2 131.50-119.29	533.13	2690.72	A	1	0.73	52	1	1	56.545	2372.13	194.28	C
			B	1	0.73		1	1	56.545			
			C	1	0.73		1	1	56.545			
L3 119.29-78.79	2036.74	12760.73	A	1	0.73	49	1	1	202.275	8055.45	198.90	C
			B	1	0.73		1	1	202.275			
			C	1	0.73		1	1	202.275			
L4 78.79-39.88	1980.74	18548.81	A	1	0.73	44	1	1	216.653	7725.82	198.56	C
			B	1	0.73		1	1	216.653			
			C	1	0.73		1	1	216.653			
L5 39.88-1.50	1980.41	20489.35	A	1	0.73	36	1	1	234.431	6766.53	176.30	C
			B	1	0.73		1	1	234.431			
			C	1	0.73		1	1	234.431			
Sum Weight:	7241.02	59962.98	C	1	0.73			1	234.431			
								OTM	2531333.8 9 lb-ft	30911.31		

**Tower Forces - With Ice - Wind Normal To Face**

Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
L1 164.00-131.50	1000.72	8235.43	A	1	1.2	8	1	1	145.188	1679.63	51.68	C
			B	1	1.2		1	1	145.188			
			C	1	1.2		1	1	145.188			
L2 131.50-119.29	703.29	3801.84	A	1	1.2	8	1	1	59.219	659.06	53.98	C
			B	1	1.2		1	1	59.219			
			C	1	1.2		1	1	59.219			

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	<b>Project</b> 164' Monopole	<b>Date</b> 14:55:58 05/20/22
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Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
L3 119.29-78.79	2601.14	16633.80	A	1	1.2	8	1	1	210.937	2222.60	54.88	C
			B	1	1.2		1	1	210.937			
			C	1	1.2		1	1	210.937			
L4 78.79-39.88	2575.46	22478.99	A	1	1.2	7	1	1	224.561	2109.42	54.21	C
			B	1	1.2		1	1	224.561			
			C	1	1.2		1	1	224.561			
L5 39.88-1.50	2679.33	24310.92	A	1	1.2	6	1	1	241.464	1828.06	47.63	C
			B	1	1.2		1	1	241.464			
			C	1	1.2		1	1	241.464			
Sum Weight:	9559.94	75460.98						OTM	700818.86 lb-ft	8498.77		

**Tower Forces - With Ice - Wind 60 To Face**

Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
L1 164.00-131.50	1000.72	8235.43	A	1	1.2	8	1	1	145.188	1679.63	51.68	C
			B	1	1.2		1	1	145.188			
			C	1	1.2		1	1	145.188			
L2 131.50-119.29	703.29	3801.84	A	1	1.2	8	1	1	59.219	659.06	53.98	C
			B	1	1.2		1	1	59.219			
			C	1	1.2		1	1	59.219			
L3 119.29-78.79	2601.14	16633.80	A	1	1.2	8	1	1	210.937	2222.60	54.88	C
			B	1	1.2		1	1	210.937			
			C	1	1.2		1	1	210.937			
L4 78.79-39.88	2575.46	22478.99	A	1	1.2	7	1	1	224.561	2109.42	54.21	C
			B	1	1.2		1	1	224.561			
			C	1	1.2		1	1	224.561			
L5 39.88-1.50	2679.33	24310.92	A	1	1.2	6	1	1	241.464	1828.06	47.63	C
			B	1	1.2		1	1	241.464			
			C	1	1.2		1	1	241.464			
Sum Weight:	9559.94	75460.98						OTM	700818.86 lb-ft	8498.77		

**Tower Forces - With Ice - Wind 90 To Face**

Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
L1 164.00-131.50	1000.72	8235.43	A	1	1.2	8	1	1	145.188	1679.63	51.68	C
			B	1	1.2		1	1	145.188			
			C	1	1.2		1	1	145.188			
L2 131.50-119.29	703.29	3801.84	A	1	1.2	8	1	1	59.219	659.06	53.98	C
			B	1	1.2		1	1	59.219			
			C	1	1.2		1	1	59.219			
L3 78.79-39.88	2601.14	16633.80	A	1	1.2	8	1	1	210.937	2222.60	54.88	C

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	<b>Project</b> 164' Monopole	<b>Date</b> 14:55:58 05/20/22
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Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
119.29-78.79			B	1	1.2		1	1	210.937			
			C	1	1.2		1	1	210.937			
L4 78.79-39.88	2575.46	22478.99	A	1	1.2	7	1	1	224.561	2109.42	54.21	C
			B	1	1.2		1	1	224.561			
			C	1	1.2		1	1	224.561			
L5 39.88-1.50	2679.33	24310.92	A	1	1.2	6	1	1	241.464	1828.06	47.63	C
			B	1	1.2		1	1	241.464			
			C	1	1.2		1	1	241.464			
Sum Weight:	9559.94	75460.98						OTM	700818.86 lb-ft	8498.77		

### Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
L1 164.00-131.50	710.00	5473.37	A	1	0.73	11	1	1	137.953	1196.51	36.82	C
			B	1	0.73		1	1	137.953			
			C	1	0.73		1	1	137.953			
L2 131.50-119.29	533.13	2690.72	A	1	0.73	10	1	1	56.545	473.73	38.80	C
			B	1	0.73		1	1	56.545			
			C	1	0.73		1	1	56.545			
L3 119.29-78.79	2036.74	12760.73	A	1	0.73	10	1	1	202.275	1608.72	39.72	C
			B	1	0.73		1	1	202.275			
			C	1	0.73		1	1	202.275			
L4 78.79-39.88	1980.74	18548.81	A	1	0.73	9	1	1	216.653	1542.89	39.65	C
			B	1	0.73		1	1	216.653			
			C	1	0.73		1	1	216.653			
L5 39.88-1.50	1980.41	20489.35	A	1	0.73	7	1	1	234.431	1351.31	35.21	C
			B	1	0.73		1	1	234.431			
			C	1	0.73		1	1	234.431			
Sum Weight:	7241.02	59962.98						OTM	505521.71 lb-ft	6173.16		

### Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
L1 164.00-131.50	710.00	5473.37	A	1	0.73	11	1	1	137.953	1196.51	36.82	C
			B	1	0.73		1	1	137.953			
			C	1	0.73		1	1	137.953			
L2 131.50-119.29	533.13	2690.72	A	1	0.73	10	1	1	56.545	473.73	38.80	C
			B	1	0.73		1	1	56.545			
			C	1	0.73		1	1	56.545			
L3 119.29-78.79	2036.74	12760.73	A	1	0.73	10	1	1	202.275	1608.72	39.72	C
			B	1	0.73		1	1	202.275			

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Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
L4 78.79-39.88	1980.74	18548.81	C	1	0.73	9	1	1	202.275	1542.89	39.65	C
			A	1	0.73		1	1	216.653			
			B	1	0.73		1	1	216.653			
			C	1	0.73		1	1	216.653			
L5 39.88-1.50	1980.41	20489.35	A	1	0.73	7	1	1	234.431	1351.31	35.21	C
			B	1	0.73		1	1	234.431			
			C	1	0.73		1	1	234.431			
Sum Weight:	7241.02	59962.98						OTM	505521.71 lb-ft			

### Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C <sub>F</sub>	q <sub>z</sub> psf	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub> ft <sup>2</sup>	F lb	w plf	Ctrl. Face
L1 164.00-131.50	710.00	5473.37	A	1	0.73	11	1	1	137.953	1196.51	36.82	C
			B	1	0.73		1	1	137.953			
			C	1	0.73		1	1	137.953			
L2 131.50-119.29	533.13	2690.72	A	1	0.73	10	1	1	56.545	473.73	38.80	C
			B	1	0.73		1	1	56.545			
			C	1	0.73		1	1	56.545			
L3 119.29-78.79	2036.74	12760.73	A	1	0.73	10	1	1	202.275	1608.72	39.72	C
			B	1	0.73		1	1	202.275			
			C	1	0.73		1	1	202.275			
L4 78.79-39.88	1980.74	18548.81	A	1	0.73	9	1	1	216.653	1542.89	39.65	C
			B	1	0.73		1	1	216.653			
			C	1	0.73		1	1	216.653			
			C	1	0.73		1	1	216.653			
L5 39.88-1.50	1980.41	20489.35	A	1	0.73	7	1	1	234.431	1351.31	35.21	C
			B	1	0.73		1	1	234.431			
			C	1	0.73		1	1	234.431			
Sum Weight:	7241.02	59962.98						OTM	505521.71 lb-ft			

### Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M <sub>x</sub> lb-ft	Sum of Overturning Moments, M <sub>z</sub> lb-ft	Sum of Torques lb-ft
Leg Weight	59962.98					
Bracing Weight	0.00					
Total Member Self-Weight	59962.98					
Total Weight	83834.50					
Wind 0 deg - No Ice		44.95	-52467.64	-5557033.78	-8270.66	334.83
Wind 30 deg - No Ice		26209.72	-45461.82	-4816133.23	-2778066.27	1388.41
Wind 60 deg - No Ice		45820.51	-26064.76	-2751569.86	-4876292.20	3561.84
Wind 90 deg - No Ice		52744.31	176.72	27096.75	-5605098.13	4225.41
Wind 120 deg - No Ice		45787.96	26149.60	2764992.06	-4871498.66	2844.43

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Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, $M_x$ lb-ft	Sum of Overturning Moments, $M_z$ lb-ft	Sum of Torques lb-ft
Wind 150 deg - No Ice		26702.28	45309.50	4792397.24	-2854634.59	604.12
Wind 180 deg - No Ice		207.20	52487.04	5559810.85	-32784.15	-690.04
Wind 210 deg - No Ice		-26583.08	45290.00	4789539.17	2834054.88	-1805.52
Wind 240 deg - No Ice		-45710.86	26156.99	2766318.02	4857253.97	-3179.26
Wind 270 deg - No Ice		-52641.25	151.91	23542.63	5586778.82	-3672.81
Wind 300 deg - No Ice		-45597.92	-26175.51	-2768258.95	4839630.25	-2871.79
Wind 330 deg - No Ice		-26136.97	-45473.13	-4817742.77	2764169.87	-739.61
Member Ice	15498.00					
Total Weight Ice	122185.78			914.10	-4068.47	
Wind 0 deg - Ice		3.80	-12898.24	-1320706.46	-4668.87	-588.42
Wind 30 deg - Ice		6436.16	-11172.80	-1144039.96	-663242.67	96.49
Wind 60 deg - Ice		11227.66	-6418.23	-654975.20	-1158118.36	1014.01
Wind 90 deg - Ice		12937.97	36.12	6483.37	-1332553.74	1567.46
Wind 120 deg - Ice		11225.72	6438.36	660020.81	-1157852.35	1539.07
Wind 150 deg - Ice		6530.31	11148.52	1142143.54	-677844.97	1081.00
Wind 180 deg - Ice		42.39	12900.55	1322922.50	-10512.32	523.35
Wind 210 deg - Ice		-6500.80	11140.52	1140943.57	665243.11	-175.67
Wind 240 deg - Ice		-11207.17	6432.04	659092.17	1146906.16	-950.65
Wind 270 deg - Ice		-12919.09	22.71	4479.51	1321537.49	-1466.23
Wind 300 deg - Ice		-11191.31	-6446.19	-659204.04	1144418.29	-1537.36
Wind 330 deg - Ice		-6430.51	-11179.31	-1145011.20	654208.21	-1103.05
Total Weight	83834.50			-206.63	-1300.97	
Wind 0 deg - Service		8.98	-10491.95	-1111922.18	-1664.29	66.87
Wind 30 deg - Service		5241.16	-9090.99	-963649.22	-555968.56	259.18
Wind 60 deg - Service		9162.62	-5212.21	-550494.74	-975845.64	679.98
Wind 90 deg - Service		10547.20	35.29	5581.12	-1121703.24	807.65
Wind 120 deg - Service		9156.12	5229.16	553514.73	-974888.34	536.71
Wind 150 deg - Service		5339.53	9060.57	959248.50	-571259.69	102.55
Wind 180 deg - Service		41.38	10495.83	1112816.27	-6559.77	-137.81
Wind 210 deg - Service		-5315.72	9056.68	958677.72	567124.62	-342.48
Wind 240 deg - Service		-9140.73	5230.63	553779.53	972018.41	-603.58
Wind 270 deg - Service		-10526.62	30.34	4871.34	1118019.59	-697.30
Wind 300 deg - Service		-9118.17	-5234.33	-553827.65	968498.86	-542.18
Wind 330 deg - Service		-5226.63	-9093.25	-963970.65	553168.19	-129.61

## Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice

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Comb. No.	Description
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	164 - 131.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41239.93	-1437.28	286.55
			Max. Mx	8	-21792.47	-383711.14	-4044.81
			Max. My	14	-21807.62	-4987.44	-374020.49
			Max. Vy	8	24055.55	-383711.14	-4044.81
			Max. Vx	14	23741.77	-4987.44	-374020.49
			Max. Torque	20			2013.41
L2	131.5 - 119.29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43838.92	-1557.00	313.98
			Max. Mx	8	-23723.83	-536931.31	-5149.42
			Max. My	14	-23738.78	-6351.32	-525221.26
			Max. Vy	8	25283.08	-536931.31	-5149.42
			Max. Vx	14	24969.07	-6351.32	-525221.26
			Max. Torque	8			-1589.72
L3	119.29 - 78.79	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74351.64	-2337.78	-303.83
			Max. Mx	8	-44758.29	-1801701.9	-12355.22
			Max. My	14	-44770.45	-14788.78	-1778715.8

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L4	78.79 - 39.88	Pole	Max. Vy	8	37335.04	-1801701.9	-12355.22
			Max. Vx	14	37069.25	-14788.78	-1778715.8
			Max. Torque	8			-4087.72
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-102652.87	-3187.08	-291.77
			Max. Mx	8	-67931.34	-3370709.9	-19162.80
			Max. My	14	-67939.30	-23254.44	-3337130.9
			Max. Vy	8	44964.22	-3370709.9	-19162.80
L5	39.88 - 1.5	Pole	Max. Vx	14	44699.62	-23254.44	-3337130.9
			Max. Torque	8			-4161.20
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-141297.99	-4328.67	-872.78
			Max. Mx	8	-100585.78	-5710573.3	-27634.42
			Max. My	14	-100585.98	-33750.98	-5663975.4
			Max. Vy	8	52774.11	-5710573.3	-27634.42
			Max. Vx	14	52516.60	-33750.98	-5663975.4
			Max. Torque	8			-4244.82

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	26	141297.99	0.00	0.00
	Max. H <sub>x</sub>	20	100601.40	52641.25	-151.91
	Max. H <sub>z</sub>	2	100601.40	-44.95	52467.64
	Max. M <sub>x</sub>	2	5661221.85	-44.95	52467.64
	Max. M <sub>z</sub>	8	5710573.37	-52744.31	-176.72
	Max. Torsion	20	3693.08	52641.25	-151.91
	Min. Vert	25	75451.05	26136.97	45473.14
	Min. H <sub>x</sub>	8	100601.40	-52744.31	-176.72
	Min. H <sub>z</sub>	14	100601.40	-207.20	-52487.04
	Min. M <sub>x</sub>	14	-5663975.47	-207.20	-52487.04
	Min. M <sub>z</sub>	20	-5691333.97	52641.25	-151.91
	Min. Torsion	8	-4244.83	-52744.31	-176.72

### 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	83834.50	0.00	0.00	-206.63	-1300.97	0.00
1.2 Dead+1.0 Wind 0 deg - No	100601.40	44.95	-52467.64	-5661221.85	-8715.63	339.02

<p style="text-align: center;"><b>tnxTower</b></p> <p style="text-align: center;"><b>Fullerton Engineering</b> 1100 E. Woodfield Road, Suite 500 Schaumburg, IL 60173 Phone: (847) 908-8400 FAX:</p>	<p style="text-align: center;"><b>Job</b></p> <p style="text-align: center;">GREENWICH PERRYRIDGE RD TWR/CTL02102</p>	<p style="text-align: center;"><b>Page</b></p> <p style="text-align: center;">22 of 28</p>
	<p style="text-align: center;"><b>Project</b></p> <p style="text-align: center;">164' Monopole</p>	<p style="text-align: center;"><b>Date</b></p> <p style="text-align: center;">14:55:58 05/20/22</p>
	<p style="text-align: center;"><b>Client</b></p> <p style="text-align: center;">AT&amp;T</p>	<p style="text-align: center;"><b>Designed by</b></p> <p style="text-align: center;">FAD</p>

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						
0.9 Dead+1.0 Wind 0 deg - No Ice	75451.05	44.95	-52467.64	-5634501.12	-8271.51	337.71
1.2 Dead+1.0 Wind 30 deg - No Ice	100601.40	26209.72	-45461.82	-4906445.99	-2830416.57	1403.85
0.9 Dead+1.0 Wind 30 deg - No Ice	75451.05	26209.72	-45461.82	-4883275.90	-2816686.11	1399.59
1.2 Dead+1.0 Wind 60 deg - No Ice	100601.40	45820.51	-26064.76	-2803089.84	-4968148.70	3579.41
0.9 Dead+1.0 Wind 60 deg - No Ice	75451.05	45820.51	-26064.76	-2789848.72	-4944303.15	3573.30
1.2 Dead+1.0 Wind 90 deg - No Ice	100601.40	52744.31	176.72	27634.04	-5710573.37	4244.83
0.9 Dead+1.0 Wind 90 deg - No Ice	75451.05	52744.31	176.72	27548.78	-5683241.01	4238.54
1.2 Dead+1.0 Wind 120 deg - No Ice	100601.40	45787.97	26149.60	2816719.24	-4963257.83	2864.01
0.9 Dead+1.0 Wind 120 deg - No Ice	75451.05	45787.97	26149.60	2803529.41	-4939436.29	2859.15
1.2 Dead+1.0 Wind 150 deg - No Ice	100601.40	26702.28	45309.50	4882109.96	-2908638.85	617.23
0.9 Dead+1.0 Wind 150 deg - No Ice	75451.05	26702.28	45309.50	4859197.27	-2894483.67	615.07
1.2 Dead+1.0 Wind 180 deg - No Ice	100601.40	207.20	52487.04	5663975.47	-33750.92	-691.87
0.9 Dead+1.0 Wind 180 deg - No Ice	75451.05	207.20	52487.04	5637365.38	-33173.09	-690.64
1.2 Dead+1.0 Wind 210 deg - No Ice	100601.40	-26583.08	45290.00	4879194.90	2887090.20	-1824.78
0.9 Dead+1.0 Wind 210 deg - No Ice	75451.05	-26583.08	45290.00	4856297.60	2873843.96	-1820.44
1.2 Dead+1.0 Wind 240 deg - No Ice	100601.40	-45710.86	26156.99	2818077.35	4948179.00	-3202.87
0.9 Dead+1.0 Wind 240 deg - No Ice	75451.05	-45710.86	26156.99	2804879.63	4925232.04	-3196.74
1.2 Dead+1.0 Wind 270 deg - No Ice	100601.40	-52641.25	151.91	24007.13	5691333.97	-3693.08
0.9 Dead+1.0 Wind 270 deg - No Ice	75451.05	-52641.25	151.91	23940.53	5664898.82	-3686.79
1.2 Dead+1.0 Wind 300 deg - No Ice	100601.40	-45597.92	-26175.51	-2820137.61	4930174.85	-2887.25
0.9 Dead+1.0 Wind 300 deg - No Ice	75451.05	-45597.92	-26175.51	-2806805.02	4907326.48	-2882.45
1.2 Dead+1.0 Wind 330 deg - No Ice	100601.40	-26136.97	-45473.13	-4908089.87	2815687.97	-747.77
0.9 Dead+1.0 Wind 330 deg - No Ice	75451.05	-26136.97	-45473.14	-4884911.28	2802831.12	-745.78
1.2 Dead+1.0 Ice+1.0 Temp	141297.99	0.00	0.00	872.78	-4328.67	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	141297.99	3.81	-12898.29	-1360899.99	-5120.06	-584.68
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	141297.99	6436.19	-11172.85	-1178865.58	-683706.13	108.32
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	141297.99	11227.71	-6418.25	-674904.73	-1193686.91	1030.73
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	141297.99	12938.03	36.12	6659.33	-1373412.71	1584.67
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	141297.99	11225.77	6438.38	680022.63	-1193412.54	1552.49
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	141297.99	6530.33	11148.57	1176792.85	-698830.74	1087.03
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	141297.99	42.39	12900.61	1363086.73	-11169.59	520.05



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	<b>Client</b>	AT&T	<b>Designed by</b>	FAD

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 210	141297.99	-6500.83	11140.57	1175551.03	685212.62	-187.65
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240	141297.99	-11207.22	6432.07	679062.04	1181508.63	-967.45
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270	141297.99	-12919.15	22.71	4585.37	1361435.99	-1483.29
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	141297.99	-11191.36	-6446.21	-679282.81	1178930.81	-1550.32
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	141297.99	-6430.53	-11179.35	-1179871.00	673780.26	-1108.38
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	83834.50	8.98	-10491.95	-1129683.42	-2742.24	67.71
Dead+Wind 30 deg - Service	83834.50	5241.16	-9090.99	-979089.09	-565730.11	261.97
Dead+Wind 60 deg - Service	83834.50	9162.62	-5212.21	-559445.82	-992218.09	683.85
Dead+Wind 90 deg - Service	83834.50	10547.20	35.29	5340.20	-1140354.56	811.71
Dead+Wind 120 deg - Service	83834.50	9156.12	5229.16	561838.64	-991244.07	540.01
Dead+Wind 150 deg - Service	83834.50	5339.53	9060.57	973926.59	-581297.78	104.16
Dead+Wind 180 deg - Service	83834.50	41.38	10495.83	1129911.20	-7724.92	-138.52
Dead+Wind 210 deg - Service	83834.50	-5315.73	9056.68	973345.83	574993.24	-345.47
Dead+Wind 240 deg - Service	83834.50	-9140.73	5230.63	562108.57	986227.14	-607.67
Dead+Wind 270 deg - Service	83834.50	-10526.62	30.34	4618.17	1134509.13	-701.35
Dead+Wind 300 deg - Service	83834.50	-9118.17	-5234.33	-562838.03	982643.75	-545.26
Dead+Wind 330 deg - Service	83834.50	-5226.63	-9093.25	-979416.07	560783.37	-130.94

## 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	-83834.50	0.00	0.00	83834.50	0.00	0.000%
2	44.95	-100601.40	-52467.64	-44.95	100601.40	52467.64	0.000%
3	44.95	-75451.05	-52467.64	-44.95	75451.05	52467.64	0.000%
4	26209.72	-100601.40	-45461.82	-26209.72	100601.40	45461.82	0.000%
5	26209.72	-75451.05	-45461.82	-26209.72	75451.05	45461.82	0.000%
6	45820.51	-100601.40	-26064.76	-45820.51	100601.40	26064.76	0.000%
7	45820.51	-75451.05	-26064.76	-45820.51	75451.05	26064.76	0.000%
8	52744.31	-100601.40	176.72	-52744.31	100601.40	-176.72	0.000%
9	52744.31	-75451.05	176.72	-52744.31	75451.05	-176.72	0.000%
10	45787.96	-100601.40	26149.60	-45787.97	100601.40	-26149.60	0.000%
11	45787.96	-75451.05	26149.60	-45787.97	75451.05	-26149.60	0.000%
12	26702.28	-100601.40	45309.50	-26702.28	100601.40	-45309.50	0.000%
13	26702.28	-75451.05	45309.50	-26702.28	75451.05	-45309.50	0.000%
14	207.20	-100601.40	52487.04	-207.20	100601.40	-52487.04	0.000%
15	207.20	-75451.05	52487.04	-207.20	75451.05	-52487.04	0.000%
16	-26583.08	-100601.40	45290.00	26583.08	100601.40	-45290.00	0.000%
17	-26583.08	-75451.05	45290.00	26583.08	75451.05	-45290.00	0.000%
18	-45710.86	-100601.40	26156.99	45710.86	100601.40	-26156.99	0.000%
19	-45710.86	-75451.05	26156.99	45710.86	75451.05	-26156.99	0.000%
20	-52641.25	-100601.40	151.91	52641.25	100601.40	-151.91	0.000%
21	-52641.25	-75451.05	151.91	52641.25	75451.05	-151.91	0.000%
22	-45597.92	-100601.40	-26175.51	45597.92	100601.40	26175.51	0.000%
23	-45597.92	-75451.05	-26175.51	45597.92	75451.05	26175.51	0.000%
24	-26136.97	-100601.40	-45473.13	26136.97	100601.40	45473.13	0.000%
25	-26136.97	-75451.05	-45473.13	26136.97	75451.05	45473.14	0.000%
26	0.00	-141297.99	0.00	0.00	141297.99	0.00	0.000%
27	3.80	-141297.99	-12898.24	-3.81	141297.99	12898.29	0.000%
28	6436.16	-141297.99	-11172.80	-6436.19	141297.99	11172.85	0.000%
29	11227.66	-141297.99	-6418.23	-11227.71	141297.99	6418.25	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	
30	12937.97	-141297.99	36.12	-12938.03	141297.99	-36.12	0.000%
31	11225.72	-141297.99	6438.36	-11225.77	141297.99	-6438.38	0.000%
32	6530.31	-141297.99	11148.52	-6530.33	141297.99	-11148.57	0.000%
33	42.39	-141297.99	12900.55	-42.39	141297.99	-12900.61	0.000%
34	-6500.80	-141297.99	11140.52	6500.83	141297.99	-11140.57	0.000%
35	-11207.17	-141297.99	6432.04	11207.22	141297.99	-6432.07	0.000%
36	-12919.09	-141297.99	22.71	12919.15	141297.99	-22.71	0.000%
37	-11191.31	-141297.99	-6446.19	11191.36	141297.99	6446.21	0.000%
38	-6430.51	-141297.99	-11179.31	6430.53	141297.99	11179.35	0.000%
39	8.98	-83834.50	-10491.95	-8.98	83834.50	10491.95	0.000%
40	5241.16	-83834.50	-9090.99	-5241.16	83834.50	9090.99	0.000%
41	9162.62	-83834.50	-5212.21	-9162.62	83834.50	5212.21	0.000%
42	10547.20	-83834.50	35.29	-10547.20	83834.50	-35.29	0.000%
43	9156.12	-83834.50	5229.16	-9156.12	83834.50	-5229.16	0.000%
44	5339.53	-83834.50	9060.57	-5339.53	83834.50	-9060.57	0.000%
45	41.38	-83834.50	10495.83	-41.38	83834.50	-10495.83	0.000%
46	-5315.72	-83834.50	9056.68	5315.73	83834.50	-9056.68	0.000%
47	-9140.73	-83834.50	5230.63	9140.73	83834.50	-5230.63	0.000%
48	-10526.62	-83834.50	30.34	10526.62	83834.50	-30.34	0.000%
49	-9118.17	-83834.50	-5234.33	9118.17	83834.50	5234.33	0.000%
50	-5226.63	-83834.50	-9093.25	5226.63	83834.50	9093.25	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00007548
3	Yes	4	0.00000001	0.00004151
4	Yes	5	0.00000001	0.00002404
5	Yes	4	0.00000001	0.00072063
6	Yes	4	0.00000001	0.00099243
7	Yes	4	0.00000001	0.00065160
8	Yes	4	0.00000001	0.00022156
9	Yes	4	0.00000001	0.00014649
10	Yes	5	0.00000001	0.00002505
11	Yes	4	0.00000001	0.00075118
12	Yes	5	0.00000001	0.00002386
13	Yes	4	0.00000001	0.00071450
14	Yes	4	0.00000001	0.00009475
15	Yes	4	0.00000001	0.00005661
16	Yes	5	0.00000001	0.00002275
17	Yes	4	0.00000001	0.00068126
18	Yes	5	0.00000001	0.00002534
19	Yes	4	0.00000001	0.00076063
20	Yes	4	0.00000001	0.00019036
21	Yes	4	0.00000001	0.00012501
22	Yes	5	0.00000001	0.00002214
23	Yes	4	0.00000001	0.00066249
24	Yes	5	0.00000001	0.00002321
25	Yes	4	0.00000001	0.00069562
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00080635
28	Yes	4	0.00000001	0.00083155
29	Yes	4	0.00000001	0.00083732
30	Yes	4	0.00000001	0.00081645

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31	Yes	4	0.0000001	0.00084020
32	Yes	4	0.0000001	0.00083606
33	Yes	4	0.0000001	0.00080742
34	Yes	4	0.0000001	0.00082890
35	Yes	4	0.0000001	0.00083106
36	Yes	4	0.0000001	0.00080704
37	Yes	4	0.0000001	0.00082899
38	Yes	4	0.0000001	0.00082779
39	Yes	4	0.0000001	0.00001123
40	Yes	4	0.0000001	0.00001861
41	Yes	4	0.0000001	0.00001759
42	Yes	4	0.0000001	0.00001363
43	Yes	4	0.0000001	0.00001956
44	Yes	4	0.0000001	0.00001819
45	Yes	4	0.0000001	0.00001137
46	Yes	4	0.0000001	0.00001754
47	Yes	4	0.0000001	0.00002004
48	Yes	4	0.0000001	0.00001289
49	Yes	4	0.0000001	0.00001736
50	Yes	4	0.0000001	0.00001777

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	164 - 131.5	6.835	42	0.3148	0.0008
L2	131.5 - 119.29	4.724	42	0.2993	0.0006
L3	125.29 - 78.79	4.339	42	0.2923	0.0006
L4	87.21 - 39.88	2.235	42	0.2230	0.0003
L5	49.13 - 1.5	0.757	42	0.1369	0.0002

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
164.00	3"x12' Whip	42	6.835	0.3148	0.0008	373267
160.00	4' HP Dish	42	6.571	0.3139	0.0008	373267
154.00	DragonWave A-ANT-23G-2	42	6.175	0.3123	0.0007	186633
151.50	Samsung FDD-R6 RRH	42	6.011	0.3116	0.0007	149306
144.00	AIR 32 w/Mount Pipe	42	5.522	0.3084	0.0007	93316
134.00	RRUS-32 B30	42	4.881	0.3016	0.0006	62101
124.00	(2) DB844G65ZAXY	42	4.260	0.2907	0.0006	44201
114.00	DB586-Y	42	3.666	0.2756	0.0005	38910
51.50	GPS	42	0.823	0.1429	0.0002	17359

### Maximum Tower Deflections - Design Wind

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	164 - 131.5	34.216	8	1.5748	0.0043
L2	131.5 - 119.29	23.653	8	1.4983	0.0031
L3	125.29 - 78.79	21.726	8	1.4635	0.0029
L4	87.21 - 39.88	11.193	8	1.1169	0.0017
L5	49.13 - 1.5	3.789	8	0.6858	0.0008

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
164.00	3"x12' Whip	8	34.216	1.5748	0.0043	75477
160.00	4' HP Dish	8	32.894	1.5703	0.0042	75477
154.00	DragonWave A-ANT-23G-2	8	30.915	1.5627	0.0039	37738
151.50	Samsung FDD-R6 RRH	8	30.094	1.5588	0.0038	30190
144.00	AIR 32 w/Mount Pipe	8	27.646	1.5434	0.0035	18868
134.00	RRUS-32 B30	8	24.441	1.5098	0.0032	12554
124.00	(2) DB844G65ZAXY	8	21.332	1.4552	0.0029	8868
114.00	DB586-Y	8	18.357	1.3799	0.0026	7797
51.50	GPS	8	4.122	0.7156	0.0009	3467

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> lb	φP <sub>n</sub> lb	Ratio $\frac{P_u}{\phi P_n}$
L1	164 - 131.5 (1)	TP53.42x47x0.3125	32.50	0.00	0.0	52.6760	-21792.50	3081550.00	0.007
L2	131.5 - 119.29 (2)	TP56.15x53.42x0.375	12.21	0.00	0.0	64.7894	-23723.80	3790180.00	0.006
L3	119.29 - 78.79 (3)	TP62.97x54.0585x0.4375	46.50	0.00	0.0	84.5934	-44758.30	4948720.00	0.009
L4	78.79 - 39.88 (4)	TP69.66x60.4813x0.5625	47.33	0.00	0.0	120.162 0	-67931.30	7029490.00	0.010
L5	39.88 - 1.5 (5)	TP76x66.7412x0.5625	47.63	0.00	0.0	134.684 0	-100586.00	7879030.00	0.013

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> lb-ft	φM <sub>ux</sub> lb-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M <sub>uy</sub> lb-ft	φM <sub>uy</sub> lb-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	164 - 131.5 (1)	TP53.42x47x0.3125	383732.50	3478158.33	0.110	0.00	3478158.33	0.000
L2	131.5 - 119.29 (2)	TP56.15x53.42x0.375	536955.83	4715666.67	0.114	0.00	4715666.67	0.000

<b>tnxTower</b>  <b>Fullerton Engineering</b> 1100 E. Woodfield Road, Suite 500 Schaumburg, IL 60173 Phone: (847) 908-8400 FAX:	<b>Job</b> GREENWICH PERRYRIDGE RD TWR/CTL02102	<b>Page</b> 27 of 28
	<b>Project</b> 164' Monopole	<b>Date</b> 14:55:58 05/20/22
	<b>Client</b> AT&T	<b>Designed by</b> FAD

Section No.	Elevation ft	Size	$M_{ux}$ lb-ft	$\phi M_{ux}$ lb-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	$M_{uy}$ lb-ft	$\phi M_{uy}$ lb-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L3	119.29 - 78.79 (3)	TP62.97x54.0585x0.4375	1801741.67	7005474.67	0.257	0.00	7005474.67	0.000
L4	78.79 - 39.88 (4)	TP69.66x60.4813x0.5625	3370766.67	11587916.00	0.291	0.00	11587916.00	0.000
L5	39.88 - 1.5 (5)	TP76x66.7412x0.5625	5710641.33	14008000.00	0.408	0.00	14008000.00	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ lb	$\phi V_n$ lb	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ lb-ft	$\phi T_n$ lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	164 - 131.5 (1)	TP53.42x47x0.3125	24056.20	924464.00	0.026	1578.11	4299575.00	0.000
L2	131.5 - 119.29 (2)	TP56.15x53.42x0.375	25283.70	1137050.00	0.022	1589.72	5420350.00	0.000
L3	119.29 - 78.79 (3)	TP62.97x54.0585x0.4375	37335.50	1484610.00	0.025	4087.72	7920366.67	0.001
L4	78.79 - 39.88 (4)	TP69.66x60.4813x0.5625	44964.60	2108850.00	0.021	4161.20	12429833.33	0.000
L5	39.88 - 1.5 (5)	TP76x66.7412x0.5625	52774.40	2363710.00	0.022	4244.82	15615666.67	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{uy}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	164 - 131.5 (1)	0.007	0.110	0.000	0.026	0.000	0.118	1.000	4.8.2 ✓
L2	131.5 - 119.29 (2)	0.006	0.114	0.000	0.022	0.000	0.121	1.000	4.8.2 ✓
L3	119.29 - 78.79 (3)	0.009	0.257	0.000	0.025	0.001	0.267	1.000	4.8.2 ✓
L4	78.79 - 39.88 (4)	0.010	0.291	0.000	0.021	0.000	0.301	1.000	4.8.2 ✓
L5	39.88 - 1.5 (5)	0.013	0.408	0.000	0.022	0.000	0.421	1.000	4.8.2 ✓

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$\phi P_{allow}$ lb	% Capacity	Pass Fail
L1	164 - 131.5	Pole	TP53.42x47x0.3125	1	-21792.50	3081550.00	11.8	Pass
L2	131.5 - 119.29	Pole	TP56.15x53.42x0.375	2	-23723.80	3790180.00	12.1	Pass

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	<b>Project</b>	164' Monopole	<b>Date</b>	14:55:58 05/20/22
	<b>Client</b>	AT&T	<b>Designed by</b>	FAD

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$\emptyset P_{allow}$ lb	% Capacity	Pass Fail	
L3	119.29 - 78.79	Pole	TP62.97x54.0585x0.4375	3	-44758.30	4948720.00	26.7	Pass	
L4	78.79 - 39.88	Pole	TP69.66x60.4813x0.5625	4	-67931.30	7029490.00	30.1	Pass	
L5	39.88 - 1.5	Pole	TP76x66.7412x0.5625	5	-100586.00	7879030.00	42.1	Pass	
							Summary		
							Pole (L5)	42.1	Pass
							<b>RATING =</b>	<b>42.1</b>	<b>Pass</b>

Program Version 8.1.1.0 - 6/3/2021 File://fullertonengineering.com/PDrive/Dept 4000/SMLINK/SMLINK-ATT-NEWEN 8/CTL02102/Structural/Tower Analysis/R1 - New RFDS/Analysis/TNX/CTL02102 - tnxTower.eri

# Monopole Base Plate Connection

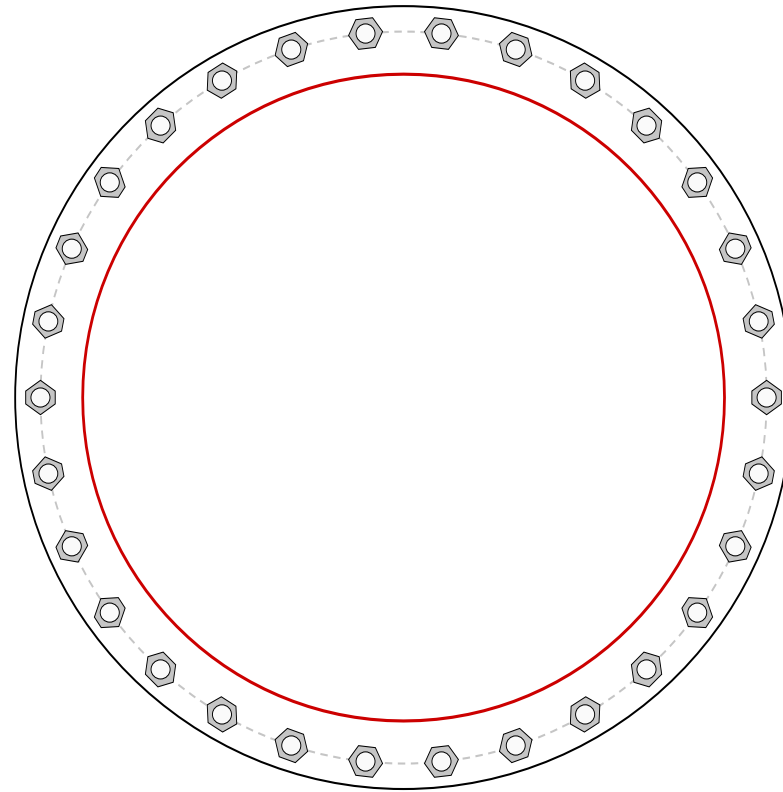


Site Info	
BU #	
Site Name	NWICH PERRYRIDGE RD
Order #	

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$l_{ar}$ (in)	0

Applied Loads	
Moment (kip-ft)	5710.64
Axial Force (kips)	100.60
Shear Force (kips)	52.75

\*TIA-222-H Section 15.5 Applied

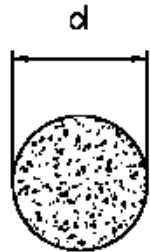


Connection Properties	Analysis Results
-----------------------	------------------

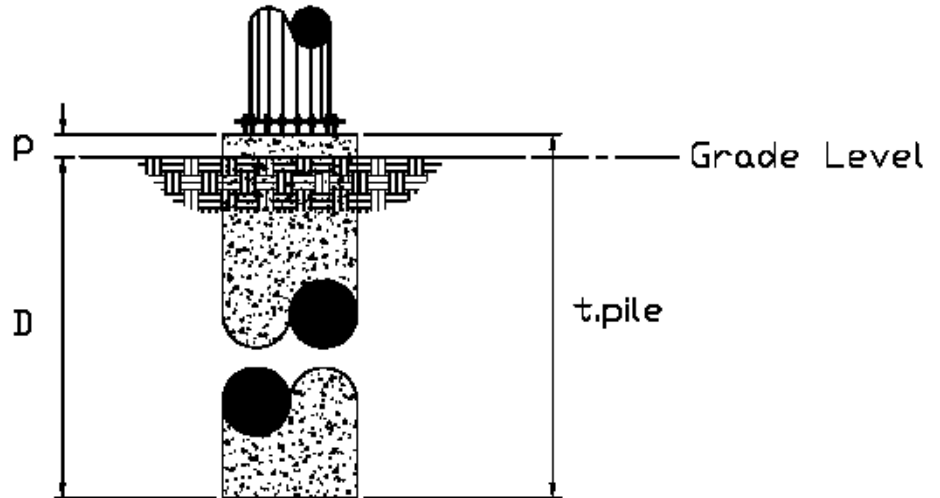
Anchor Rod Data
(30) 2-1/4" $\phi$ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 86" BC
Base Plate Data
92" OD x 3" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)
Stiffener Data
N/A
Pole Data
76" x 0.5625" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary		
(units of kips, kip-in)		
$P_{u_c} = 109.57$	$\phi P_{n_c} = 268.39$	<b>Stress Rating</b>
$V_u = 1.76$	$\phi V_n = 120.77$	<b>38.9%</b>
$M_u = n/a$	$\phi M_n = n/a$	<b>Pass</b>
Base Plate Summary		
Max Stress (ksi):	18.51	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	<b>32.6%</b>	<b>Pass</b>

**Monopole Foundation - Drilled Caisson**



Plan



Elevation

***Drilled Caisson Properties***

$d := 9 \cdot \text{ft}$

*Pile diameter*

$D := 27 \cdot \text{ft}$

*Depth of the pile below grade*

$p := 12 \cdot \text{in}$

*Height of the pile above the grade*

$t_{\text{pile}} := D + p$

$t_{\text{pile}} = 28 \cdot \text{ft}$

*Overall length of pile*

$f_c := 3 \cdot \text{ksi}$

*Concrete compressive strength*

$E_c := 57000 \sqrt{\frac{f_c}{\text{psi}}} \cdot \text{psi}$

$E_c = 3122018.578 \cdot \text{psi}$

*Elastic modulus of concrete*

$\gamma_{\text{conc}} := 150 \cdot \text{pcf}$

*Unit weight of concrete*

$c_{\text{cover}} := 3 \cdot \text{in}$

*Clear concrete cover*

$f_y := 60 \cdot \text{ksi}$

*Rebar yield strength*

$N_{\text{bar}} := 33$

*Number of vertical rebar*

$n_{\text{bar}} := 11$

*Bar size*

$n_{\text{strup}} := 4$

*Stirrup bar size*

$s_{\text{strup}} := 12 \cdot \text{in}$

*Spacing of stirrups*



### **Tower Reactions**

#### **Case 1 (wind with no ice)**

$$P1 := \frac{100601.4\text{lbf}}{1.35}$$

$$P1 = 74520 \text{ lbf}$$

*Design axial load*

$$V1 := \frac{52744.61\text{lbf}}{1.35}$$

$$V1 = 39070 \text{ lbf}$$

*Design shear*

$$M1 := \frac{5710640\text{lbf}\cdot\text{ft}}{1.35}$$

$$M1 = 50761244\cdot\text{lbf}\cdot\text{in}$$

*Design overturning moment*

#### **Case 2 (wind with ice)**

$$P2 := \frac{141298\text{lbf}}{1.35}$$

$$P2 = 104665 \text{ lbf}$$

*Design axial load*

$$V2 := \frac{12941.05\text{lbf}}{1.35}$$

$$V2 = 9586 \text{ lbf}$$

*Design shear*

$$M2 := \frac{1373559\text{lbf}\cdot\text{ft}}{1.35}$$

$$M2 = 12209413\cdot\text{lbf}\cdot\text{in}$$

*Design overturning moment*

#### **Case 3 (service wind)**

$$P3 := 83834.5\text{lbf}$$

$$P3 = 83835 \text{ lbf}$$

*Design axial load*

$$V3 := 10547.26\text{lbf}$$

$$V3 = 10547 \text{ lbf}$$

*Design shear*

$$M3 := 1140367.064\text{lbf}\cdot\text{ft}$$

$$M3 = 13684405\cdot\text{lbf}\cdot\text{in}$$

*Design overturning moment*

### **L-Pile Results**

See the "Summary of Pile Response(s)" at the end of the LPILE report for the results listed below

$$M_u := 1.35\cdot 53885657\cdot\text{lbf}\cdot\text{in}$$

$$M_u = 6062.136\cdot\text{kip}\cdot\text{ft}$$

*Maximum moment in the pile*

$$V_u := 1.35\cdot 376273\cdot\text{lbf}$$

$$V_u = 507.969\cdot\text{kips}$$

*Maximum shear in the pile*

$$\Delta_{\text{service}} := 0.17682604\text{in}$$

*Service Load deflection at pile head*

$$M_n := 145893.517\text{kips}\cdot\text{in}$$

*Nominal moment capacity from L-Pile*

=====  
LPile Plus for Windows, Version 2013-07.001

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

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=====  
This copy of LPile is licensed to:

FAD  
Fullerton Engineering

Serial Number of Security Device: 227885976  
Company Name Stored in Security Device: Fullerton Engineering Consultant

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

Path to file locations: C:\Users\fdelmundo\OneDrive\Desktop\L-Pile\  
Name of input data file: LPile - Monopole Foundation.lp7d  
Name of output report file: LPile - Monopole Foundation.lp7o  
Name of plot output file: LPile - Monopole Foundation.lp7p  
Name of runtime message file: LPile - Monopole Foundation.lp7r

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

Date: May 20, 2022 Time: 15:15:16

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

Site ID: CTL02102

Site Name: GREENWICH PERRYRIDGE RD

Client: AT7T

Prepared by: JM

Checked By: BTK

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

Engineering Units of Input Data and Computations:

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

Analysis Control Options:

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

Loading Type and Number of Cycles of Loading:

- Static loading specified

Computational Options:

- Use unfactored loads in computations
- No computation of pile-head foundation stiffness matrix
- Compute pile response under loading and nonlinear bending properties of pile (if nonlinear properties are specified)
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Input Data Options:

- Analysis does not use p-y modification factors (individual pile or shaft only)
- Analysis assumes zero shear resistance at the pile tip
- Analysis assumes no loading by soil movements acting on pile

Output Options:

- No p-y curves to be computed and reported for user-specified depths
- 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 pile sections = 1  
Total length of pile = 28.00 ft  
Depth of ground surface below top of pile = 1.00 ft

Pile diameter values used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile.

Point	Depth X ft	Pile Diameter in
1	0.00000	108.0000000
2	28.00000	108.0000000

Input Structural Properties:  
-----

Pile Section No. 1:

Section Type = Drilled Shaft (Bored Pile)  
Section Length = 28.00000 ft

Section Diameter = 108.00000 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 = 1.00000 ft  
Distance from top of pile to bottom of layer = 5.00000 ft  
Effective unit weight at top of layer = 100.00000 pcf  
Effective unit weight at bottom of layer = 100.00000 pcf  
Friction angle at top of layer = 20.00000 deg.  
Friction angle at bottom of layer = 20.00000 deg.  
Subgrade k at top of layer = 0.0000 pci  
Subgrade k at bottom of layer = 0.0000 pci

NOTE: Internal default values for subgrade k will be computed for  
the above soil layer.

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

Distance from top of pile to top of layer = 5.00000 ft  
Distance from top of pile to bottom of layer = 7.00000 ft  
Effective unit weight at top of layer = 120.00000 pcf

Effective unit weight at bottom of layer	=	120.00000	pcf
Friction angle at top of layer	=	30.00000	deg.
Friction angle at bottom of layer	=	30.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	7.00000	ft
Distance from top of pile to bottom of layer	=	12.00000	ft
Effective unit weight at top of layer	=	120.00000	pcf
Effective unit weight at bottom of layer	=	120.00000	pcf
Friction angle at top of layer	=	35.00000	deg.
Friction angle at bottom of layer	=	35.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

Distance from top of pile to top of layer	=	12.00000	ft
Distance from top of pile to bottom of layer	=	28.00000	ft
Effective unit weight at top of layer	=	130.00000	pcf
Effective unit weight at bottom of layer	=	130.00000	pcf
Friction angle at top of layer	=	42.00000	deg.
Friction angle at bottom of layer	=	42.00000	deg.
Subgrade k at top of layer	=	0.0000	pci
Subgrade k at bottom of layer	=	0.0000	pci

NOTE: Internal default values for subgrade k will be computed for the above soil layer.

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

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

Layer Num.	Layer Soil Type (p-y Curve Criteria)	Layer Depth ft	Effective Unit Wt. pcf	Angle of Friction deg.	kpy pci
1	Sand (Reese, et al.)	1.000	100.000	20.000	default
		5.000	100.000	20.000	default
2	Sand (Reese, et al.)	5.000	120.000	30.000	default
		7.000	120.000	30.000	default
3	Sand (Reese, et al.)	7.000	120.000	35.000	default
		12.000	120.000	35.000	default
4	Sand (Reese, et al.)	12.000	130.000	42.000	default
		28.000	130.000	42.000	default

-----  
 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 = 3

Load No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length
1	1	V = 39070. lbs	M = 50761244. in-lbs	74520.	No
2	1	V = 9586.00000 lbs	M = 12209413. in-lbs	104665.	No
3	1	V = 10547. lbs	M = 13684405. in-lbs	83835.	No

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 for all pile batter angles.

-----  
Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness  
-----

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 (Bored Pile):  
-----

Length of Section	=	28.00000 ft
Shaft Diameter	=	108.00000 in
Concrete Cover Thickness	=	3.00000 in
Number of Reinforcing Bars	=	33 bars
Yield Stress of Reinforcing Bars	=	60.00000 ksi
Modulus of Elasticity of Reinforcing Bars	=	29000. ksi
Gross Area of Shaft	=	9160.88418 sq. in.
Total Area of Reinforcing Steel	=	51.48000 sq. in.
Area Ratio of Steel Reinforcement	=	0.56 percent
Edge-to-Edge Bar Spacing	=	8.15169 in
Maximum Concrete Aggregate Size	=	0.75000 in
Ratio of Bar Spacing to Aggregate Size	=	10.87
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in

Axial Structural Capacities:  
-----

Nom. Axial Structural Capacity = $0.85 F_c A_c + F_y A_s$	=	26317.781 kips
Tensile Load for Cracking of Concrete	=	-3470.922 kips
Nominal Axial Tensile Capacity	=	-3088.800 kips



Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.41000	1.56000	50.29500	0.00000
2	1.41000	1.56000	49.38610	9.51839
3	1.41000	1.56000	46.69227	18.69276
4	1.41000	1.56000	42.31085	27.19153
5	1.41000	1.56000	36.40020	34.70752
6	1.41000	1.56000	29.17396	40.96910
7	1.41000	1.56000	20.89330	45.74994
8	1.41000	1.56000	11.85750	48.87726
9	1.41000	1.56000	2.39313	50.23803
10	1.41000	1.56000	-7.15772	49.78307
11	1.41000	1.56000	-16.44988	47.52882
12	1.41000	1.56000	-25.14750	43.55675
13	1.41000	1.56000	-32.93622	38.01042
14	1.41000	1.56000	-39.53454	31.09031
15	1.41000	1.56000	-44.70398	23.04650
16	1.41000	1.56000	-48.25770	14.16974
17	1.41000	1.56000	-50.06726	4.78084
18	1.41000	1.56000	-50.06726	-4.78084
19	1.41000	1.56000	-48.25770	-14.16974
20	1.41000	1.56000	-44.70398	-23.04650
21	1.41000	1.56000	-39.53454	-31.09031
22	1.41000	1.56000	-32.93622	-38.01042
23	1.41000	1.56000	-25.14750	-43.55675
24	1.41000	1.56000	-16.44988	-47.52882
25	1.41000	1.56000	-7.15772	-49.78307
26	1.41000	1.56000	2.39313	-50.23803
27	1.41000	1.56000	11.85750	-48.87726
28	1.41000	1.56000	20.89330	-45.74994
29	1.41000	1.56000	29.17396	-40.96910
30	1.41000	1.56000	36.40020	-34.70752
31	1.41000	1.56000	42.31085	-27.19153
32	1.41000	1.56000	46.69227	-18.69276
33	1.41000	1.56000	49.38610	-9.51839

NOTE: The positions of the above rebars were computed by LPILE

Minimum spacing between any two bars not equal to zero = 8.15169 inches between Bars 1 and 33

Spacing to aggregate size ratio = 10.86892

Concrete Properties:

-----

Compressive Strength of Concrete	=	3.00000 ksi
Modulus of Elasticity of Concrete	=	3122.01858 ksi
Modulus of Rupture of Concrete	=	-0.41079 ksi
Compression Strain at Peak Stress	=	0.00163
Tensile Strain at Fracture of Concrete	=	-0.0001160
Maximum Coarse Aggregate Size	=	0.75000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 3

Number	Axial Thrust Force kips
-----	-----
1	74.520
2	83.835
3	104.665

Definitions of Run Messages and Notes:

-----

- C = concrete in section has cracked in tension.
- Y = stress in reinforcing steel has reached yield stress.
- T = ACI 318-08 criteria for tension-controlled section met, tensile strain in reinforcement exceeds 0.005 while simultaneously compressive strain in concrete more than than 0.003. See ACI 318-08, Section 10.3.4.
- Z = depth of tensile zone in concrete section is less than 10 percent of section depth.

Bending Stiffness (EI) = Computed Bending Moment / Curvature.  
Position of neutral axis is measured from edge of compression side of pile.  
Compressive stresses and strains are positive in sign.  
Tensile stresses and strains are negative in sign.

Axial Thrust Force = 74.520 kips

Bending Curvature 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 Steel Stress ksi	Run Msg
0.000000250	6527.1026092	26108410437.	62.5574267	0.0000156	-0.0000114	0.0566767	0.4496263	
0.000000500	13021.	26042453435.	58.2930488	0.0000291	-0.0000249	0.1051250	0.8374192	
0.000000750	19481.	25975099061.	56.8716942	0.0000427	-0.0000383	0.1531715	1.2252144	
0.000001000	25907.	25907391914.	56.1610738	0.0000562	-0.0000518	0.2008161	1.6130111	
0.000001250	32299.	25839543277.	55.7347437	0.0000697	-0.0000653	0.2480589	2.0008095	
0.000001500	38657.	25771623870.	55.4505585	0.0000832	-0.0000788	0.2948998	2.3886093	
0.000001750	44981.	25703663968.	55.2475984	0.0000967	-0.0000923	0.3413388	2.7764106	
0.000002000	51271.	25635678749.	55.0954041	0.0001102	-0.0001058	0.3873759	3.1642134	
0.000002250	51271.	22787269999.	27.2861866	0.0000614	-0.0001816	0.2169636	-5.2313413	C
0.000002500	51271.	20508542999.	26.8781681	0.0000672	-0.0002028	0.2369736	-5.8421828	C
0.000002750	51271.	18644129999.	26.5455159	0.0000730	-0.0002240	0.2569228	-6.4529301	C
0.000003000	51271.	17090452499.	26.2601491	0.0000788	-0.0002452	0.2767141	-7.0643870	C
0.000003250	51271.	15775802307.	26.0162048	0.0000846	-0.0002664	0.2964057	-7.6760777	C
0.000003500	51271.	14648959285.	25.8080634	0.0000903	-0.0002877	0.3160374	-8.2876716	C
0.000003750	51271.	13672362000.	25.6285670	0.0000961	-0.0003089	0.3356092	-8.8991683	C
0.000004000	51271.	12817839375.	25.4723470	0.0001019	-0.0003301	0.3551209	-9.5105677	C
0.000004250	51271.	12063848823.	25.3330180	0.0001077	-0.0003513	0.3745392	-10.1221505	C
0.000004500	51271.	11393635000.	25.2057611	0.0001134	-0.0003726	0.3938334	-10.7341782	C
0.000004750	51271.	10793970000.	25.0926348	0.0001192	-0.0003938	0.4130684	-11.3461045	C
0.000005000	51271.	10254271500.	24.9915217	0.0001250	-0.0004150	0.4322440	-11.9579293	C
0.000005250	51271.	9765972857.	24.9007076	0.0001307	-0.0004363	0.4513602	-12.5696523	C
0.000005500	51271.	9322065000.	24.8187901	0.0001365	-0.0004575	0.4704169	-13.1812730	C
0.000005750	51271.	8916757826.	24.7446108	0.0001423	-0.0004787	0.4894139	-13.7927911	C
0.000006000	51271.	8545226250.	24.6772042	0.0001481	-0.0004999	0.5083512	-14.4042064	C
0.000006250	51271.	8203417200.	24.6157595	0.0001538	-0.0005212	0.5272286	-15.0155186	C
0.000006500	51271.	7887901154.	24.5595904	0.0001596	-0.0005424	0.5460462	-15.6267272	C
0.000006750	51271.	7595756666.	24.5081124	0.0001654	-0.0005636	0.5648037	-16.2378320	C
0.000007000	51271.	7324479643.	24.4608246	0.0001712	-0.0005848	0.5835011	-16.8488326	C
0.000007250	51271.	7071911379.	24.4172951	0.0001770	-0.0006060	0.6021383	-17.4597287	C
0.000007500	51271.	6836181000.	24.3771496	0.0001828	-0.0006272	0.6207151	-18.0705199	C
0.000007750	51271.	6615659032.	24.3400621	0.0001886	-0.0006484	0.6392315	-18.6812060	C
0.000008000	51271.	6408919687.	24.3057474	0.0001944	-0.0006696	0.6576874	-19.2917866	C
0.000008250	51271.	6214710000.	24.2725523	0.0002002	-0.0006908	0.6760453	-19.9025968	C
0.000008500	51271.	6031924412.	24.2414690	0.0002061	-0.0007119	0.6943353	-20.5133679	C

0.000008750	51271.	5859583714.	24.2126005	0.0002119	-0.0007331	0.7125654	-21.1240276	C
0.000009000	51271.	5696817500.	24.1857638	0.0002177	-0.0007543	0.7307354	-21.7345756	C
0.000009250	51271.	5542849459.	24.1607955	0.0002235	-0.0007755	0.7488452	-22.3450116	C
0.000009500	51271.	5396985000.	24.1375496	0.0002293	-0.0007967	0.7668948	-22.9553351	C
0.000009750	51271.	5258600769.	24.1158950	0.0002351	-0.0008179	0.7848840	-23.5655457	C
0.0000102	51271.	5002083658.	24.0768990	0.0002468	-0.0008602	0.8206809	-24.7856267	C
0.0000107	51271.	4769428605.	24.0429940	0.0002585	-0.0009025	0.8562351	-26.0052516	C
0.0000112	51271.	4557454000.	24.0135109	0.0002702	-0.0009448	0.8915456	-27.2244170	C
0.0000117	51271.	4363519787.	23.9878949	0.0002819	-0.0009871	0.9266116	-28.4431198	C
0.0000122	51271.	4185416939.	23.9656817	0.0002936	-0.0010294	0.9614322	-29.6613566	C
0.0000127	52351.	4105939890.	23.9464800	0.0003053	-0.0010717	0.9960065	-30.8791240	C
0.0000133	54291.	4097445087.	23.9299577	0.0003171	-0.0011139	1.0303336	-32.0964191	C
0.0000138	56230.	4089445970.	23.9158312	0.0003288	-0.0011562	1.0644126	-33.3132376	C
0.0000143	58167.	4081889409.	23.9038567	0.0003406	-0.0011984	1.0982426	-34.5295764	C
0.0000148	60102.	4074729673.	23.8938235	0.0003524	-0.0012406	1.1318227	-35.7454321	C
0.0000153	62036.	4067927021.	23.8855488	0.0003643	-0.0012827	1.1651518	-36.9608011	C
0.0000157	63968.	4061446750.	23.8788731	0.0003761	-0.0013249	1.1982291	-38.1756798	C
0.0000162	65898.	4055258420.	23.8736565	0.0003879	-0.0013671	1.2310536	-39.3900644	C
0.0000167	67826.	4049335216.	23.8697761	0.0003998	-0.0014092	1.2636243	-40.6039513	C
0.0000172	69753.	4043653424.	23.8671231	0.0004117	-0.0014513	1.2959402	-41.8173366	C
0.0000177	71678.	4038191995.	23.8656013	0.0004236	-0.0014934	1.3280003	-43.0302167	C
0.0000182	73601.	4032932177.	23.8651251	0.0004355	-0.0015355	1.3598037	-44.2425875	C
0.0000187	75522.	4027857213.	23.8656180	0.0004475	-0.0015775	1.3913492	-45.4544452	C
0.0000192	77442.	4022952075.	23.8670116	0.0004594	-0.0016196	1.4226360	-46.6657857	C
0.0000197	79360.	4018203251.	23.8692446	0.0004714	-0.0016616	1.4536629	-47.8766051	C
0.0000202	81275.	4013598557.	23.8722618	0.0004834	-0.0017036	1.4844289	-49.0868992	C
0.0000207	83189.	4009126974.	23.8760134	0.0004954	-0.0017456	1.5149329	-50.2966639	C
0.0000212	85102.	4004778512.	23.8804544	0.0005075	-0.0017875	1.5451739	-51.5058950	C
0.0000217	87012.	4000544093.	23.8855440	0.0005195	-0.0018295	1.5751508	-52.7145881	C
0.0000222	88920.	3996415445.	23.8912453	0.0005316	-0.0018714	1.6048624	-53.9227390	C
0.0000227	90827.	3992385019.	23.8975246	0.0005437	-0.0019133	1.6343077	-55.1303433	C
0.0000232	92731.	3988445906.	23.9043512	0.0005558	-0.0019552	1.6634856	-56.3373964	C
0.0000237	94634.	3984591770.	23.9116971	0.0005679	-0.0019971	1.6923948	-57.5438938	C
0.0000242	96535.	3980816790.	23.9195367	0.0005800	-0.0020390	1.7210343	-58.7498310	C
0.0000247	98434.	3977115611.	23.9278467	0.0005922	-0.0020808	1.7494028	-59.9552033	C
0.0000252	100330.	3973483290.	23.9366056	0.0006044	-0.0021226	1.7774993	-60.0000000	CY
0.0000257	102218.	3969635812.	23.9452251	0.0006166	-0.0021644	1.8052885	-60.0000000	CY
0.0000262	103853.	3956296474.	23.9344547	0.0006283	-0.0022067	1.8316116	-60.0000000	CY
0.0000267	105286.	3935942522.	23.9090239	0.0006396	-0.0022494	1.8567281	-60.0000000	CY
0.0000272	106604.	3912091474.	23.8760685	0.0006506	-0.0022924	1.8810547	-60.0000000	CY
0.0000277	107795.	3884497457.	23.8348090	0.0006614	-0.0023356	1.9045352	-60.0000000	CY
0.0000282	108912.	3855304142.	23.7897594	0.0006721	-0.0023789	1.9274409	-60.0000000	CY

0.0000287	109960.	3824698968.	23.7412787	0.0006826	-0.0024224	1.9497924	-60.0000000	CY
0.0000292	110946.	3793029528.	23.6900213	0.0006929	-0.0024661	1.9716297	-60.0000000	CY
0.0000297	111860.	3760011834.	23.6352254	0.0007031	-0.0025099	1.9929044	-60.0000000	CY
0.0000317	115123.	3625915168.	23.4066899	0.0007432	-0.0026858	2.0740565	-60.0000000	CY
0.0000337	117815.	3490811667.	23.1638810	0.0007818	-0.0028632	2.1490718	-60.0000000	CY
0.0000357	120085.	3359008552.	22.9080152	0.0008190	-0.0030420	2.2182248	-60.0000000	CY
0.0000377	122051.	3233147203.	22.6585876	0.0008554	-0.0032216	2.2830469	-60.0000000	CY
0.0000397	123728.	3112666539.	22.4137677	0.0008909	-0.0034021	2.3436654	-60.0000000	CY
0.0000417	125256.	3000152700.	22.1833820	0.0009262	-0.0035828	2.4009888	-60.0000000	CY
0.0000437	126586.	2893384631.	21.9482190	0.0009602	-0.0037648	2.4539231	-60.0000000	CY
0.0000457	127776.	2792909124.	21.7210236	0.0009937	-0.0039473	2.5035486	-60.0000000	CY
0.0000477	128851.	2698448374.	21.5053723	0.0010269	-0.0041301	2.5503022	-60.0000000	CY
0.0000497	129853.	2610112216.	21.3029545	0.0010598	-0.0043132	2.5944683	-60.0000000	CY
0.0000517	130717.	2525930189.	21.1058717	0.0010922	-0.0044968	2.6356695	-60.0000000	CY
0.0000537	131562.	2447657380.	20.9139275	0.0011241	-0.0046809	2.6740443	-60.0000000	CY
0.0000557	132299.	2373080104.	20.7237621	0.0011553	-0.0048657	2.7095204	-60.0000000	CY
0.0000577	132965.	2302427498.	20.5417192	0.0011863	-0.0050507	2.7426396	-60.0000000	CY
0.0000597	133626.	2236425729.	20.3736569	0.0012173	-0.0052357	2.7738628	-60.0000000	CY
0.0000617	134239.	2173910139.	20.2134674	0.0012482	-0.0054208	2.8028924	-60.0000000	CY
0.0000637	134771.	2114056595.	20.0568579	0.0012786	-0.0056064	2.8295677	-60.0000000	CY
0.0000657	135278.	2057457331.	19.9032104	0.0013086	-0.0057924	2.8539547	-60.0000000	CY
0.0000677	135773.	2004026236.	19.7532695	0.0013383	-0.0059787	2.8761887	-60.0000000	CY
0.0000697	136252.	1953436710.	19.6120208	0.0013679	-0.0061651	2.8965920	-60.0000000	CY
0.0000717	136648.	1904498146.	19.4704407	0.0013970	-0.0063520	2.9147955	-60.0000000	CY
0.0000737	137026.	1857976190.	19.3362416	0.0014260	-0.0065390	2.9312258	-60.0000000	CY
0.0000757	137400.	1813861948.	19.2104381	0.0014552	-0.0067258	2.9459468	-60.0000000	CY
0.0000777	137771.	1771977542.	19.0924781	0.0014844	-0.0069126	2.9589429	-60.0000000	CY
0.0000797	138139.	1732154496.	18.9817903	0.0015138	-0.0070992	2.9701944	-60.0000000	CY
0.0000817	138452.	1693605136.	18.8686966	0.0015425	-0.0072865	2.9794541	-60.0000000	CY
0.0000837	138734.	1656524454.	18.7511830	0.0015704	-0.0074746	2.9867966	-60.0000000	CY
0.0000857	138998.	1620963785.	18.6382511	0.0015982	-0.0076628	2.9925082	-60.0000000	CY
0.0000877	139259.	1586995391.	18.5316487	0.0016262	-0.0078508	2.9966250	-60.0000000	CY
0.0000897	139517.	1554512304.	18.4309699	0.0016542	-0.0080388	2.9991284	-60.0000000	CY
0.0000917	139773.	1523416870.	18.3358446	0.0016823	-0.0082267	2.9999993	-60.0000000	CY
0.0000937	140018.	1493524264.	18.2450618	0.0017105	-0.0084145	2.9945390	-60.0000000	CY
0.0000957	140244.	1464686539.	18.1568220	0.0017385	-0.0086025	2.9971717	-60.0000000	CY
0.0000977	140455.	1436876443.	18.0713692	0.0017665	-0.0087905	2.9992726	-60.0000000	CY
0.0000997	140640.	1409923676.	17.9869563	0.0017942	-0.0089788	2.9999990	-60.0000000	CY
0.0001017	140821.	1383994750.	17.9072747	0.0018221	-0.0091669	2.9950831	-60.0000000	CY
0.0001037	141001.	1359048192.	17.8315208	0.0018500	-0.0093550	2.9954435	-60.0000000	CY
0.0001057	141171.	1334945901.	17.7512890	0.0018772	-0.0095438	2.9980277	-60.0000000	CY
0.0001077	141337.	1311709159.	17.6733433	0.0019043	-0.0097327	2.9995421	-60.0000000	CY

0.0001097	141501.	1289304208.	17.5990767	0.0019315	-0.0099215	2.9996645	-60.0000000	CY
0.0001217	142317.	1168927670.	17.1984002	0.0020939	-0.0110551	2.9999726	-60.0000000	CY
0.0001337	142969.	1068930398.	16.8719767	0.0022566	-0.0121884	2.9991831	60.0000000	CY
0.0001457	143546.	984879124.	16.5896562	0.0024179	-0.0133231	2.9925562	60.0000000	CY
0.0001577	143935.	912427460.	16.3142738	0.0025736	-0.0144634	2.9993804	60.0000000	CY
0.0001697	144293.	850030289.	16.0941531	0.0027320	-0.0156010	2.9902303	60.0000000	CY
0.0001817	144572.	795443121.	15.9288186	0.0028951	-0.0167339	2.9997675	60.0000000	CY
0.0001937	144786.	747284189.	15.7961839	0.0030605	-0.0178645	2.9861191	60.0000000	CYT
0.0002057	144907.	704289106.	15.6804164	0.0032262	-0.0189948	2.9938624	60.0000000	CYT
0.0002177	145002.	665912329.	15.5654422	0.0033894	-0.0201276	2.9999288	60.0000000	CYT
0.0002297	145068.	631416494.	15.4746257	0.0035553	-0.0212577	2.9873789	60.0000000	CYT
0.0002417	145129.	600327801.	15.3970541	0.0037222	-0.0223868	2.9808291	60.0000000	CYT
0.0002537	145180.	572139077.	15.3343211	0.0038911	-0.0235139	2.9941883	60.0000000	CYT

Axial Thrust Force = 83.835 kips

Bending Curvature 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 Steel Stress ksi	Run Msg
0.000000250	6526.8220299	26107288120.	63.6272147	0.0000159	-0.0000111	0.0576496	0.4573823	
0.000000500	13021.	26041882443.	58.8297089	0.0000294	-0.0000246	0.1060930	0.8452008	
0.000000750	19481.	25974715077.	57.2306700	0.0000429	-0.0000381	0.1541347	1.2330221	
0.000001000	25907.	25907101768.	56.4312168	0.0000564	-0.0000516	0.2017745	1.6208453	
0.000001250	32299.	25839309497.	55.9515927	0.0000699	-0.0000651	0.2490124	2.0086702	
0.000001500	38657.	25771427671.	55.6318828	0.0000834	-0.0000786	0.2958483	2.3964969	
0.000001750	44981.	25703494636.	55.4035522	0.0000970	-0.0000920	0.3422824	2.7843252	
0.000002000	51271.	25635529557.	55.2323332	0.0001105	-0.0001055	0.3883145	3.1721553	
0.000002250	51271.	22787137384.	27.7977310	0.0000625	-0.0001805	0.2210338	-5.1979631	C
0.000002500	51271.	20508423646.	27.3498921	0.0000684	-0.0002016	0.2411290	-5.8079828	C
0.000002750	51271.	18644021496.	26.9747494	0.0000742	-0.0002228	0.2610670	-6.4186987	C
0.000003000	51271.	17090353038.	26.6632173	0.0000800	-0.0002440	0.2809441	-7.0293201	C
0.000003250	51271.	15775710497.	26.3977359	0.0000858	-0.0002652	0.3007275	-7.6401184	C
0.000003500	51271.	14648874033.	26.1626875	0.0000916	-0.0002864	0.3203477	-8.2516772	C
0.000003750	51271.	13672282431.	25.9598728	0.0000973	-0.0003077	0.3399079	-8.8631388	C
0.000004000	51271.	12817764779.	25.7832505	0.0001031	-0.0003289	0.3594080	-9.4745029	C
0.000004250	51271.	12063778615.	25.6282007	0.0001089	-0.0003501	0.3788480	-10.0857693	C
0.000004500	51271.	11393568692.	25.4911302	0.0001147	-0.0003713	0.3982277	-10.6969375	C
0.000004750	51271.	10793907182.	25.3686501	0.0001205	-0.0003925	0.4175382	-11.3080834	C
0.000005000	51271.	10254211823.	25.2540099	0.0001263	-0.0004137	0.4367019	-11.9198685	C
0.000005250	51271.	9765916022.	25.1509581	0.0001320	-0.0004350	0.4558061	-12.5315516	C

0.000005500	51271.	9322010748.	25.0579164	0.0001378	-0.0004562	0.4748507	-13.1431323	C
0.000005750	51271.	8916705933.	24.9735810	0.0001436	-0.0004774	0.4938357	-13.7546103	C
0.000006000	51271.	8545176519.	24.8968657	0.0001494	-0.0004986	0.5127609	-14.3659854	C
0.000006250	51271.	8203369458.	24.8268576	0.0001552	-0.0005198	0.5316263	-14.9772570	C
0.000006500	51271.	7887855248.	24.7627848	0.0001610	-0.0005410	0.5504317	-15.5884250	C
0.000006750	51271.	7595712461.	24.7039894	0.0001668	-0.0005622	0.5691771	-16.1994891	C
0.000007000	51271.	7324437016.	24.6499076	0.0001725	-0.0005835	0.5878623	-16.8104487	C
0.000007250	51271.	7071870223.	24.6000533	0.0001784	-0.0006046	0.6064872	-17.4213038	C
0.000007500	51271.	6836141215.	24.5540055	0.0001842	-0.0006258	0.6250518	-18.0320538	C
0.000007750	51271.	6615620531.	24.5113971	0.0001900	-0.0006470	0.6435560	-18.6426985	C
0.000008000	51271.	6408882389.	24.4719073	0.0001958	-0.0006682	0.6619996	-19.2532375	C
0.000008250	51271.	6214673832.	24.4352540	0.0002016	-0.0006894	0.6803826	-19.8636705	C
0.000008500	51271.	6031889308.	24.4011882	0.0002074	-0.0007106	0.6987047	-20.4739971	C
0.000008750	51271.	5859549613.	24.3694896	0.0002132	-0.0007318	0.7169661	-21.0842170	C
0.000009000	51271.	5696784346.	24.3399623	0.0002191	-0.0007529	0.7351665	-21.6943298	C
0.000009250	51271.	5542817202.	24.3124314	0.0002249	-0.0007741	0.7533058	-22.3043352	C
0.000009500	51271.	5396953591.	24.2860221	0.0002307	-0.0007953	0.7713623	-22.9144309	C
0.000009750	51271.	5258570166.	24.2607285	0.0002365	-0.0008165	0.7893386	-23.5245940	C
0.0000102	51271.	5002054548.	24.2149892	0.0002482	-0.0008588	0.8251097	-24.7445794	C
0.0000107	51271.	4769400848.	24.1749705	0.0002599	-0.0009011	0.8606378	-25.9641079	C
0.0000112	51271.	4557427477.	24.1399197	0.0002716	-0.0009434	0.8959222	-27.1831762	C
0.0000117	51271.	4363494393.	24.1092120	0.0002833	-0.0009857	0.9309620	-28.4017810	C
0.0000122	51271.	4185392581.	24.0823251	0.0002950	-0.0010280	0.9657562	-29.6199190	C
0.0000127	52635.	4128225938.	24.0588185	0.0003067	-0.0010703	1.0003040	-30.8375868	C
0.0000133	54575.	4118867313.	24.0383184	0.0003185	-0.0011125	1.0346044	-32.0547811	C
0.0000138	56513.	4110066821.	24.0205054	0.0003303	-0.0011547	1.0686566	-33.2714984	C
0.0000143	58450.	4101764799.	24.0051052	0.0003421	-0.0011969	1.1024596	-34.4877356	C
0.0000148	60385.	4093910191.	23.9918806	0.0003539	-0.0012391	1.1360125	-35.7034883	C
0.0000153	62318.	4086458080.	23.9806257	0.0003657	-0.0012813	1.1693143	-36.9187535	C
0.0000157	64250.	4079369436.	23.9711610	0.0003775	-0.0013235	1.2023642	-38.1335273	C
0.0000162	66180.	4072610023.	23.9633289	0.0003894	-0.0013656	1.2351610	-39.3478063	C
0.0000167	68108.	4066149687.	23.9569910	0.0004013	-0.0014077	1.2677039	-40.5615867	C
0.0000172	70034.	4059961759.	23.9520249	0.0004132	-0.0014498	1.2999919	-41.7748646	C
0.0000177	71959.	4054022569.	23.9483221	0.0004251	-0.0014919	1.3320240	-42.9876362	C
0.0000182	73882.	4048311031.	23.9457861	0.0004370	-0.0015340	1.3637991	-44.1998977	C
0.0000187	75803.	4042808301.	23.9443309	0.0004490	-0.0015760	1.3953163	-45.4116450	C
0.0000192	77722.	4037497485.	23.9438794	0.0004609	-0.0016181	1.4265744	-46.6228743	C
0.0000197	79639.	4032363392.	23.9443624	0.0004729	-0.0016601	1.4575726	-47.8335814	C
0.0000202	81555.	4027392322.	23.9457177	0.0004849	-0.0017021	1.4883097	-49.0437622	C
0.0000207	83468.	4022571890.	23.9478892	0.0004969	-0.0017441	1.5187846	-50.2534126	C
0.0000212	85380.	4017890866.	23.9508261	0.0005090	-0.0017860	1.5489963	-51.4625284	C
0.0000217	87290.	4013339048.	23.9544826	0.0005210	-0.0018280	1.5789437	-52.6711051	C

0.0000222	89198.	4008907140.	23.9588167	0.0005331	-0.0018699	1.6086257	-53.8791386	C
0.0000227	91104.	4004586659.	23.9637905	0.0005452	-0.0019118	1.6380411	-55.0866243	C
0.0000232	93009.	4000369840.	23.9693694	0.0005573	-0.0019537	1.6671890	-56.2935577	C
0.0000237	94911.	3996249568.	23.9755218	0.0005694	-0.0019956	1.6960680	-57.4999345	C
0.0000242	96811.	3992219305.	23.9822188	0.0005816	-0.0020374	1.7246770	-58.7057498	C
0.0000247	98710.	3988273033.	23.9894338	0.0005937	-0.0020793	1.7530150	-59.9109990	C
0.0000252	100606.	3984405206.	23.9971427	0.0006059	-0.0021211	1.7810806	-60.0000000	CY
0.0000257	102494.	3980347808.	24.0047878	0.0006181	-0.0021629	1.8088409	-60.0000000	CY
0.0000262	104143.	3967363309.	23.9942233	0.0006298	-0.0022052	1.8352051	-60.0000000	CY
0.0000267	105581.	3946953351.	23.9681606	0.0006411	-0.0022479	1.8603121	-60.0000000	CY
0.0000272	106906.	3923164597.	23.9348524	0.0006522	-0.0022908	1.8846451	-60.0000000	CY
0.0000277	108097.	3895395631.	23.8927333	0.0006630	-0.0023340	1.9080999	-60.0000000	CY
0.0000282	109219.	3866160352.	23.8471392	0.0006737	-0.0023773	1.9309979	-60.0000000	CY
0.0000287	110268.	3835395356.	23.7978597	0.0006842	-0.0024208	1.9533246	-60.0000000	CY
0.0000292	111259.	3803723117.	23.7461879	0.0006946	-0.0024644	1.9751596	-60.0000000	CY
0.0000297	112173.	3770518409.	23.6905510	0.0007048	-0.0025082	1.9964041	-60.0000000	CY
0.0000317	115443.	3636008006.	23.4595897	0.0007448	-0.0026842	2.0774806	-60.0000000	CY
0.0000337	118144.	3500572134.	23.2179883	0.0007836	-0.0028614	2.1526402	-60.0000000	CY
0.0000357	120417.	3368301640.	22.9597277	0.0008208	-0.0030402	2.2216873	-60.0000000	CY
0.0000377	122385.	3241975636.	22.7079964	0.0008572	-0.0032198	2.2863921	-60.0000000	CY
0.0000397	124066.	3121160760.	22.4613799	0.0008928	-0.0034002	2.3469128	-60.0000000	CY
0.0000417	125598.	3008339008.	22.2293781	0.0009281	-0.0035809	2.4041364	-60.0000000	CY
0.0000437	126930.	2901261420.	21.9957190	0.0009623	-0.0037627	2.4571748	-60.0000000	CY
0.0000457	128124.	2800535301.	21.7671478	0.0009958	-0.0039452	2.5066965	-60.0000000	CY
0.0000477	129199.	2705743231.	21.5497838	0.0010290	-0.0041280	2.5533128	-60.0000000	CY
0.0000497	130205.	2617194122.	21.3462355	0.0010620	-0.0043110	2.5973709	-60.0000000	CY
0.0000517	131069.	2532727835.	21.1476698	0.0010944	-0.0044946	2.6384329	-60.0000000	CY
0.0000537	131917.	2454265496.	20.9578458	0.0011265	-0.0046785	2.6768960	-60.0000000	CY
0.0000557	132658.	2379513323.	20.7667298	0.0011577	-0.0048633	2.7122517	-60.0000000	CY
0.0000577	133324.	2308638196.	20.5834449	0.0011887	-0.0050483	2.7452253	-60.0000000	CY
0.0000597	133985.	2242419787.	20.4141745	0.0012197	-0.0052333	2.7762975	-60.0000000	CY
0.0000617	134599.	2179736445.	20.2530857	0.0012506	-0.0054184	2.8051890	-60.0000000	CY
0.0000637	135132.	2119725443.	20.0956307	0.0012811	-0.0056039	2.8317247	-60.0000000	CY
0.0000657	135643.	2063010954.	19.9446147	0.0013114	-0.0057896	2.8561525	-60.0000000	CY
0.0000677	136137.	2009408432.	19.7936441	0.0013410	-0.0059760	2.8782213	-60.0000000	CY
0.0000697	136617.	1958664610.	19.6514875	0.0013707	-0.0061623	2.8984607	-60.0000000	CY
0.0000717	137016.	1909625320.	19.5094270	0.0013998	-0.0063492	2.9165182	-60.0000000	CY
0.0000737	137393.	1862959155.	19.3743532	0.0014289	-0.0065361	2.9327800	-60.0000000	CY
0.0000757	137767.	1818706829.	19.2477128	0.0014580	-0.0067230	2.9473299	-60.0000000	CY
0.0000777	138138.	1776691354.	19.1289635	0.0014873	-0.0069097	2.9601527	-60.0000000	CY
0.0000797	138505.	1736743724.	19.0175305	0.0015166	-0.0070964	2.9712288	-60.0000000	CY
0.0000817	138824.	1698153251.	18.9071794	0.0015457	-0.0072833	2.9803992	-60.0000000	CY



0.0000837	139108.	1660985936.	18.7899049	0.0015737	-0.0074713	2.9875750	-60.0000000	CY
0.0000857	139371.	1625315605.	18.6762514	0.0016015	-0.0076595	2.9930943	-60.0000000	CY
0.0000877	139632.	1591242468.	18.5689653	0.0016294	-0.0078476	2.9970163	-60.0000000	CY
0.0000897	139890.	1558659226.	18.4676381	0.0016575	-0.0080355	2.9993223	-60.0000000	CY
0.0000917	140145.	1527466737.	18.3719286	0.0016856	-0.0082234	2.9994764	-60.0000000	CY
0.0000937	140391.	1497498689.	18.2807785	0.0017138	-0.0084112	2.9942349	-60.0000000	CY
0.0000957	140616.	1468573101.	18.1919607	0.0017419	-0.0085991	2.9975384	-60.0000000	CY
0.0000977	140829.	1440703393.	18.1063071	0.0017699	-0.0087871	2.9994548	-60.0000000	CY
0.0000997	141013.	1413667528.	18.0214055	0.0017976	-0.0089754	2.9994845	-60.0000000	CY
0.0001017	141194.	1387660381.	17.9412092	0.0018255	-0.0091635	2.9943659	-60.0000000	CY
0.0001037	141374.	1362639234.	17.8649441	0.0018535	-0.0093515	2.9959264	-60.0000000	CY
0.0001057	141547.	1338510197.	17.7886632	0.0018812	-0.0095398	2.9983824	-60.0000000	CY
0.0001077	141713.	1315203612.	17.7102010	0.0019083	-0.0097287	2.9997046	-60.0000000	CY
0.0001097	141877.	1292728373.	17.6355545	0.0019355	-0.0099175	2.9988329	-60.0000000	CY
0.0001217	142694.	1172028146.	17.2329223	0.0020981	-0.0110509	2.9990996	-60.0000000	CY
0.0001337	143345.	1071740295.	16.9040801	0.0022609	-0.0121841	2.9994226	60.0000000	CY
0.0001457	143926.	987482883.	16.6251090	0.0024231	-0.0133179	2.9934716	60.0000000	CY
0.0001577	144317.	914843392.	16.3486077	0.0025790	-0.0144580	2.9982553	60.0000000	CY
0.0001697	144669.	852249039.	16.1278756	0.0027377	-0.0155953	2.9913933	60.0000000	CY
0.0001817	144949.	797515885.	15.9612696	0.0029010	-0.0167280	2.9999191	60.0000000	CY
0.0001937	145159.	749206171.	15.8285497	0.0030668	-0.0178582	2.9848165	60.0000000	CYT
0.0002057	145281.	706106406.	15.7121058	0.0032328	-0.0189882	2.9948978	60.0000000	CYT
0.0002177	145377.	667634515.	15.6054969	0.0033981	-0.0201189	2.9998414	60.0000000	CYT
0.0002297	145442.	633043105.	15.5138076	0.0035643	-0.0212487	2.9855091	60.0000000	CYT
0.0002417	145502.	601870578.	15.4351113	0.0037314	-0.0223776	2.9834353	60.0000000	CYT
0.0002537	145551.	573599704.	15.3723281	0.0039007	-0.0235043	2.9956428	60.0000000	CYT

Axial Thrust Force = 104.665 kips

Bending Curvature 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 Steel Stress ksi	Run Msg
0.000000250	6526.0796607	26104318643.	66.0195953	0.0000165	-0.0000105	0.0598248	0.4747271	
0.000000500	13020.	26040364711.	60.0298131	0.0000300	-0.0000240	0.1082573	0.8626023	
0.000000750	19480.	25973693531.	58.0334199	0.0000435	-0.0000375	0.1562881	1.2504819	
0.000001000	25906.	25906329630.	57.0353133	0.0000570	-0.0000510	0.2039170	1.6383641	
0.000001250	32298.	25838687332.	56.4365122	0.0000705	-0.0000645	0.2511439	2.0262486	
0.000001500	38656.	25770905502.	56.0373609	0.0000841	-0.0000779	0.2979689	2.4141352	
0.000001750	44980.	25703043893.	55.7522951	0.0000976	-0.0000914	0.3443918	2.8020240	
0.000002000	51270.	25635132416.	55.5385331	0.0001111	-0.0001049	0.3904128	3.1899149	

0.000002250	51270.	22786784370.	28.9041993	0.0000650	-0.0001780	0.2298276	-5.1257660	C
0.000002500	51270.	20508105933.	28.3668361	0.0000709	-0.0001991	0.2500766	-5.7342544	C
0.000002750	51270.	18643732666.	27.9177126	0.0000768	-0.0002202	0.2701601	-6.3434974	C
0.000003000	51270.	17090088277.	27.5445223	0.0000826	-0.0002414	0.2901813	-6.9526466	C
0.000003250	51270.	15775466102.	27.2150809	0.0000884	-0.0002626	0.3099744	-7.5630836	C
0.000003500	51270.	14648647095.	26.9334589	0.0000943	-0.0002837	0.3297041	-8.1734439	C
0.000003750	51270.	13672070622.	26.6902658	0.0001001	-0.0003049	0.3493726	-8.7837086	C
0.000004000	51270.	12817566208.	26.4782983	0.0001059	-0.0003261	0.3689797	-9.3938774	C
0.000004250	51270.	12063591725.	26.2838478	0.0001117	-0.0003473	0.3884060	-10.0049608	C
0.000004500	51270.	11393392185.	26.1109636	0.0001175	-0.0003685	0.4077596	-10.6160492	C
0.000004750	51270.	10793739965.	25.9569940	0.0001233	-0.0003897	0.4270529	-11.2270391	C
0.000005000	51270.	10254052966.	25.8191038	0.0001291	-0.0004109	0.4462857	-11.8379299	C
0.000005250	51270.	9765764730.	25.6949980	0.0001349	-0.0004321	0.4654579	-12.4487215	C
0.000005500	51270.	9321866333.	25.5827987	0.0001407	-0.0004533	0.4845693	-13.0594136	C
0.000005750	51270.	8916567797.	25.4809546	0.0001465	-0.0004745	0.5036200	-13.6700058	C
0.000006000	51270.	8545044139.	25.3881731	0.0001523	-0.0004957	0.5226098	-14.2804979	C
0.000006250	51270.	8203242373.	25.2994175	0.0001581	-0.0005169	0.5414565	-14.8916056	C
0.000006500	51270.	7887733051.	25.2176526	0.0001639	-0.0005381	0.5602348	-15.5026825	C
0.000006750	51270.	7595594790.	25.1424774	0.0001697	-0.0005593	0.5789530	-16.1136550	C
0.000007000	51270.	7324323547.	25.0731875	0.0001755	-0.0005805	0.5976109	-16.7245229	C
0.000007250	51270.	7071760667.	25.0091758	0.0001813	-0.0006017	0.6162085	-17.3352858	C
0.000007500	51270.	6836035311.	24.9499158	0.0001871	-0.0006229	0.6347457	-17.9459433	C
0.000007750	51270.	6615518043.	24.8949494	0.0001929	-0.0006441	0.6532224	-18.5564951	C
0.000008000	51270.	6408783104.	24.8438754	0.0001988	-0.0006652	0.6716385	-19.1669409	C
0.000008250	51270.	6214577555.	24.7963415	0.0002046	-0.0006864	0.6899938	-19.7772803	C
0.000008500	51270.	6031795863.	24.7520367	0.0002104	-0.0007076	0.7082883	-20.3875129	C
0.000008750	51270.	5859458838.	24.7106856	0.0002162	-0.0007288	0.7265219	-20.9976385	C
0.000009000	51270.	5696696092.	24.6720434	0.0002220	-0.0007500	0.7446945	-21.6076567	C
0.000009250	51270.	5542731333.	24.6358917	0.0002279	-0.0007711	0.7628059	-22.2175670	C
0.000009500	51270.	5396869982.	24.6020353	0.0002337	-0.0007923	0.7808561	-22.8273692	C
0.000009750	51270.	5258488701.	24.5702989	0.0002396	-0.0008134	0.7988450	-23.4370630	C
0.0000102	51270.	5001977057.	24.5125702	0.0002513	-0.0008557	0.8346383	-24.6561235	C
0.0000107	51270.	4769326961.	24.4616177	0.0002630	-0.0008980	0.8701849	-25.8747456	C
0.0000112	51270.	4557356874.	24.4165470	0.0002747	-0.0009403	0.9054840	-27.0929265	C
0.0000117	51270.	4363426794.	24.3766158	0.0002864	-0.0009826	0.9405348	-28.3106631	C
0.0000122	51329.	4190105945.	24.3412033	0.0002982	-0.0010248	0.9753364	-29.5279525	C
0.0000127	53270.	4178040497.	24.3097863	0.0003099	-0.0010671	1.0098879	-30.7447915	C
0.0000133	55209.	4166753092.	24.2809213	0.0003217	-0.0011093	1.0441491	-31.9615610	C
0.0000138	57147.	4156161185.	24.2548563	0.0003335	-0.0011515	1.0781412	-33.1780510	C
0.0000143	59083.	4146193274.	24.2317877	0.0003453	-0.0011937	1.1118838	-34.3940587	C
0.0000148	61018.	4136785172.	24.2114192	0.0003571	-0.0012359	1.1453759	-35.6095804	C
0.0000153	62950.	4127881100.	24.1934933	0.0003690	-0.0012780	1.1786166	-36.8246125	C

0.0000157	64881.	4119432351.	24.1777855	0.0003808	-0.0013202	1.2116050	-38.0391514	C
0.0000162	66810.	4111396055.	24.1640988	0.0003927	-0.0013623	1.2443400	-39.2531938	C
0.0000167	68738.	4103734926.	24.1522600	0.0004046	-0.0014044	1.2768207	-40.4667350	C
0.0000172	70663.	4096415497.	24.1421160	0.0004165	-0.0014465	1.3090462	-41.6797716	C
0.0000177	72587.	4089408236.	24.1335312	0.0004284	-0.0014886	1.3410153	-42.8922999	C
0.0000182	74509.	4082686842.	24.1263848	0.0004403	-0.0015307	1.3727272	-44.1043159	C
0.0000187	76429.	4076227809.	24.1205689	0.0004523	-0.0015727	1.4041807	-45.3158157	C
0.0000192	78348.	4070010066.	24.1159872	0.0004642	-0.0016148	1.4353748	-46.5267951	C
0.0000197	80264.	4064014667.	24.1125531	0.0004762	-0.0016568	1.4663086	-47.7372502	C
0.0000202	82179.	4058224529.	24.1101885	0.0004882	-0.0016988	1.4969808	-48.9471767	C
0.0000207	84092.	4052624209.	24.1088233	0.0005003	-0.0017407	1.5273905	-50.1565706	C
0.0000212	86003.	4047199710.	24.1083936	0.0005123	-0.0017827	1.5575366	-51.3654274	C
0.0000217	87912.	4041938311.	24.1088420	0.0005244	-0.0018246	1.5874180	-52.5737429	C
0.0000222	89819.	4036828429.	24.1101159	0.0005365	-0.0018665	1.6170336	-53.7815126	C
0.0000227	91725.	4031859492.	24.1121678	0.0005486	-0.0019084	1.6463822	-54.9887322	C
0.0000232	93628.	4027021829.	24.1149541	0.0005607	-0.0019503	1.6754627	-56.1953972	C
0.0000237	95530.	4022306574.	24.1184351	0.0005728	-0.0019922	1.7042740	-57.4015028	C
0.0000242	97429.	4017705586.	24.1225744	0.0005850	-0.0020340	1.7328150	-58.6070445	C
0.0000247	99327.	4013211375.	24.1273388	0.0005972	-0.0020758	1.7610843	-59.8120176	C
0.0000252	101223.	4008817033.	24.1326976	0.0006094	-0.0021176	1.7890809	-60.0000000	CY
0.0000257	103110.	4004290372.	24.1381620	0.0006216	-0.0021594	1.8167762	-60.0000000	CY
0.0000262	104793.	3992100846.	24.1280671	0.0006334	-0.0022016	1.8432322	-60.0000000	CY
0.0000267	106239.	3971566160.	24.1005923	0.0006447	-0.0022443	1.8683178	-60.0000000	CY
0.0000272	107573.	3947648881.	24.0659072	0.0006558	-0.0022872	1.8926287	-60.0000000	CY
0.0000277	108773.	3919757516.	24.0224562	0.0006666	-0.0023304	1.9160621	-60.0000000	CY
0.0000282	109905.	3890428920.	23.9756461	0.0006773	-0.0023737	1.9389427	-60.0000000	CY
0.0000287	110955.	3859306716.	23.9245789	0.0006878	-0.0024172	1.9612136	-60.0000000	CY
0.0000292	111952.	3827429620.	23.8715069	0.0006982	-0.0024608	1.9830136	-60.0000000	CY
0.0000297	112872.	3794005989.	23.8144631	0.0007085	-0.0025045	2.0042202	-60.0000000	CY
0.0000317	116160.	3658571471.	23.5780764	0.0007486	-0.0026804	2.0851269	-60.0000000	CY
0.0000337	118875.	3522215294.	23.3315756	0.0007874	-0.0028576	2.1601070	-60.0000000	CY
0.0000357	121160.	3389077223.	23.0755802	0.0008250	-0.0030360	2.2294164	-60.0000000	CY
0.0000377	123130.	3261712619.	22.8186920	0.0008614	-0.0032156	2.2938581	-60.0000000	CY
0.0000397	124821.	3140150974.	22.5680561	0.0008971	-0.0033959	2.3541595	-60.0000000	CY
0.0000417	126361.	3026605604.	22.3323042	0.0009324	-0.0035766	2.4111498	-60.0000000	CY
0.0000437	127701.	2918870962.	22.1021697	0.0009670	-0.0037580	2.4644267	-60.0000000	CY
0.0000457	128905.	2817584972.	21.8705222	0.0010006	-0.0039404	2.5137153	-60.0000000	CY
0.0000477	129978.	2722052075.	21.6493218	0.0010338	-0.0041232	2.5600237	-60.0000000	CY
0.0000497	130993.	2633027231.	21.4432466	0.0010668	-0.0043062	2.6038389	-60.0000000	CY
0.0000517	131855.	2547925329.	21.2413590	0.0010992	-0.0044898	2.6445887	-60.0000000	CY
0.0000537	132711.	2469038683.	21.0563120	0.0011318	-0.0046732	2.6832441	-60.0000000	CY
0.0000557	133460.	2393895812.	20.8630722	0.0011631	-0.0048579	2.7183291	-60.0000000	CY

0.0000577	134126.	2322523163.	20.6770058	0.0011941	-0.0050429	2.7509759	-60.0000000	CY
0.0000597	134785.	2255820335.	20.5050287	0.0012252	-0.0052278	2.7817091	-60.0000000	CY
0.0000617	135403.	2192762075.	20.3419285	0.0012561	-0.0054129	2.8102899	-60.0000000	CY
0.0000637	135940.	2132399163.	20.1825824	0.0012866	-0.0055984	2.8365121	-60.0000000	CY
0.0000657	136453.	2075336963.	20.0324147	0.0013171	-0.0057839	2.8607581	-60.0000000	CY
0.0000677	136953.	2021440677.	19.8842226	0.0013472	-0.0059698	2.8827202	-60.0000000	CY
0.0000697	137432.	1970351877.	19.7400331	0.0013769	-0.0061561	2.9025912	-60.0000000	CY
0.0000717	137838.	1921087674.	19.5969044	0.0014061	-0.0063429	2.9203196	-60.0000000	CY
0.0000737	138215.	1874099043.	19.4598706	0.0014352	-0.0065298	2.9362028	-60.0000000	CY
0.0000757	138587.	1829537935.	19.3313551	0.0014644	-0.0067166	2.9503683	-60.0000000	CY
0.0000777	138957.	1787229364.	19.2108373	0.0014936	-0.0069034	2.9628018	-60.0000000	CY
0.0000797	139324.	1747003137.	19.0977346	0.0015230	-0.0070900	2.9734835	-60.0000000	CY
0.0000817	139647.	1708221041.	18.9865317	0.0015521	-0.0072769	2.9822778	-60.0000000	CY
0.0000837	139943.	1670959471.	18.8768592	0.0015809	-0.0074641	2.9892368	-60.0000000	CY
0.0000857	140205.	1635043924.	18.7615891	0.0016088	-0.0076522	2.9943237	-60.0000000	CY
0.0000877	140465.	1600736553.	18.6527710	0.0016368	-0.0078402	2.9978074	-60.0000000	CY
0.0000897	140722.	1567929331.	18.5499912	0.0016649	-0.0080281	2.9996689	-60.0000000	CY
0.0000917	140976.	1536519131.	18.4529910	0.0016931	-0.0082159	2.9979315	-60.0000000	CY
0.0000937	141223.	1506383336.	18.3610015	0.0017213	-0.0084037	2.9953823	-60.0000000	CY
0.0000957	141448.	1477261255.	18.2708888	0.0017494	-0.0085916	2.9982693	-60.0000000	CY
0.0000977	141665.	1449258423.	18.1847949	0.0017776	-0.0087794	2.9997685	-60.0000000	CY
0.0000997	141848.	1422035466.	18.0988367	0.0018054	-0.0089676	2.9978802	-60.0000000	CY
0.0001017	142028.	1395854939.	18.0174406	0.0018333	-0.0091557	2.9936747	-60.0000000	CY
0.0001037	142207.	1370666985.	17.9400301	0.0018613	-0.0093437	2.9969125	-60.0000000	CY
0.0001057	142383.	1346414990.	17.8663899	0.0018894	-0.0095316	2.9990075	-60.0000000	CY
0.0001077	142555.	1323014743.	17.7930774	0.0019172	-0.0097198	2.9999404	-60.0000000	CY
0.0001097	142717.	1300382766.	17.7175653	0.0019445	-0.0099085	2.9969634	-60.0000000	CY
0.0001217	143538.	1178959379.	17.3105571	0.0021076	-0.0110414	2.9971363	-60.0000000	CY
0.0001337	144185.	1078021673.	16.9762935	0.0022706	-0.0121744	2.9998099	60.0000000	CY
0.0001457	144774.	993303254.	16.7049590	0.0024347	-0.0133063	2.9953134	60.0000000	CY
0.0001577	145169.	920244467.	16.4259463	0.0025912	-0.0144458	2.9957212	60.0000000	CY
0.0001697	145511.	857208642.	16.2039025	0.0027506	-0.0155824	2.9937450	60.0000000	CY
0.0001817	145790.	802147062.	16.0346636	0.0029143	-0.0167147	2.9989912	60.0000000	CY
0.0001937	145991.	753502230.	15.9015733	0.0030809	-0.0178441	2.9832661	60.0000000	CYT
0.0002057	146117.	710168502.	15.7836555	0.0032475	-0.0189735	2.9968841	60.0000000	CYT
0.0002177	146211.	671461630.	15.6889603	0.0034163	-0.0201007	2.9960664	60.0000000	CYT
0.0002297	146277.	636678121.	15.6026542	0.0035847	-0.0212283	2.9812691	60.0000000	CYT
0.0002417	146336.	605318020.	15.5214622	0.0037523	-0.0223567	2.9886428	60.0000000	CYT
0.0002537	146336.	576692143.	15.6279394	0.0039656	-0.0234394	2.9994587	60.0000000	CYT

Summary of Results for Nominal (Unfactored) Moment Capacity for Section 1

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	74.520	144707.852	0.00300000
2	83.835	145074.048	0.00300000
3	104.665	145893.517	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 tied hoops (0.65) or spirals (0.70).

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.

The following table presents factored moment capacities and corresponding bending stiffnesses computed for common resistance factor values used for reinforced concrete sections.

Axial Load No.	Resistance Factor for Moment	Nominal Moment Capacity in-kip	Ultimate (Factored) Axial Thrust kips	Ultimate (Factored) Moment Capacity in-kip	Bending Stiffness at Ult. Mom. Cap. kip-in <sup>2</sup>
1	0.65	144707.852	48.438	94060.100	3985754387.292
2	0.65	145074.048	54.493	94298.128	3997576837.091
3	0.65	145893.517	68.032	94830.783	4024039897.256
1	0.70	144707.852	52.164	101295.495	3971516327.025
2	0.70	145074.048	58.684	101551.832	3982372771.167
3	0.70	145893.517	73.265	102125.460	4006652235.416
1	0.75	144707.852	55.890	108530.889	3865268800.479
2	0.75	145074.048	62.876	108805.536	3876936427.365
3	0.75	145893.517	78.499	109420.138	3902988374.580

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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)

Shear force at pile head = 39070.0 lbs  
 Applied moment at pile head = 50761244.0 in-lbs  
 Axial thrust load on pile head = 74520.0 lbs

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in^2	Soil Res. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.7595	50761244.	39070.	-0.004211	0.000	2.564E+13	0.000	0.000	0.000
0.280	0.7454	50893573.	39070.	-0.004204	0.000	2.564E+13	0.000	0.000	0.000
0.560	0.7313	51025900.	39070.	-0.004197	0.000	2.564E+13	0.000	0.000	0.000
0.840	0.7172	51158225.	39070.	-0.004191	0.000	2.564E+13	0.000	0.000	0.000
1.120	0.7031	51290549.	39065.	-0.004183	0.000	2.330E+13	-3.1389	15.0003	0.000
1.400	0.6891	51422835.	39042.	-0.004173	0.000	1.193E+13	-10.2540	50.0009	0.000
1.680	0.6751	51555002.	38996.	-0.004151	0.000	6.121E+12	-17.0777	85.0016	0.000
1.960	0.6612	51686969.	38928.	-0.004116	0.000	4.154E+12	-23.6132	120.0023	0.000
2.240	0.6474	51818659.	38838.	-0.004074	0.000	4.144E+12	-29.8656	155.0029	0.000
2.520	0.6338	51950001.	38728.	-0.004032	0.000	4.135E+12	-35.8393	190.0036	0.000
2.800	0.6203	52080928.	38598.	-0.003990	0.000	4.125E+12	-41.5388	225.0043	0.000
3.080	0.6070	52211376.	38449.	-0.003947	0.000	4.116E+12	-46.9686	260.0049	0.000
3.360	0.5938	52341282.	38283.	-0.003905	0.000	4.107E+12	-52.1331	295.0056	0.000
3.640	0.5807	52470590.	38099.	-0.003862	0.000	4.105E+12	-57.0370	330.0062	0.000
3.920	0.5678	52599242.	37900.	-0.003819	0.000	4.105E+12	-61.6846	365.0069	0.000
4.200	0.5551	52727188.	37685.	-0.003776	0.000	4.104E+12	-66.0807	400.0076	0.000
4.480	0.5425	52854377.	37456.	-0.003732	0.000	4.104E+12	-70.2298	435.0082	0.000
4.760	0.5300	52980762.	37214.	-0.003689	0.000	4.103E+12	-74.1364	470.0089	0.000
5.040	0.5177	53106299.	36103.	-0.003646	0.000	4.103E+12	-586.8872	3809.3031	0.000
5.320	0.5055	53225199.	34065.	-0.003602	0.000	4.102E+12	-626.0732	4161.5298	0.000
5.600	0.4935	53337021.	31900.	-0.003558	0.000	4.102E+12	-662.9031	4513.7566	0.000
5.880	0.4816	53441347.	29614.	-0.003515	0.000	4.101E+12	-697.4236	4865.9833	0.000
6.160	0.4698	53537789.	27217.	-0.003471	0.000	4.101E+12	-729.6813	5218.2100	0.000

6.440	0.4583	53625983.	24715.	-0.003427	0.000	4.100E+12	-759.7228	5570.4368	0.000
6.720	0.4468	53705588.	22115.	-0.003383	0.000	4.100E+12	-787.5951	5922.6635	0.000
7.000	0.4355	53776290.	18828.	-0.003339	0.000	4.100E+12	-1168.8332	9017.4528	0.000
7.280	0.4244	53833786.	13767.	-0.003295	0.000	4.099E+12	-1843.8970	14599.	0.000
7.560	0.4134	53870454.	7476.6039	-0.003251	0.000	4.099E+12	-1900.3643	15446.	0.000
7.840	0.4025	53885657.	1004.6234	-0.003206	0.000	4.099E+12	-1952.0051	16294.	0.000
8.120	0.3918	53878811.	-5632.9505	-0.003162	0.000	4.099E+12	-1998.9317	17141.	0.000
8.400	0.3813	53849387.	-12420.	-0.003118	0.000	4.099E+12	-2041.2564	17988.	0.000
8.680	0.3709	53796907.	-19343.	-0.003074	0.000	4.100E+12	-2079.0910	18836.	0.000
8.960	0.3606	53720944.	-26385.	-0.003030	0.000	4.100E+12	-2112.5466	19683.	0.000
9.240	0.3505	53621120.	-33532.	-0.002986	0.000	4.100E+12	-2141.7342	20530.	0.000
9.520	0.3406	53497106.	-40770.	-0.002942	0.000	4.101E+12	-2166.7637	21378.	0.000
9.800	0.3307	53348618.	-48086.	-0.002898	0.000	4.101E+12	-2187.7444	22225.	0.000
10.080	0.3211	53175421.	-55465.	-0.002855	0.000	4.102E+12	-2204.7848	23072.	0.000
10.360	0.3116	52977322.	-62895.	-0.002811	0.000	4.103E+12	-2217.9924	23920.	0.000
10.640	0.3022	52754172.	-70364.	-0.002768	0.000	4.104E+12	-2227.4737	24767.	0.000
10.920	0.2930	52505864.	-77858.	-0.002725	0.000	4.105E+12	-2233.3339	25614.	0.000
11.200	0.2839	52232332.	-85366.	-0.002682	0.000	4.114E+12	-2235.6773	26462.	0.000
11.480	0.2749	51933549.	-92876.	-0.002640	0.000	4.136E+12	-2234.6043	27309.	0.000
11.760	0.2661	51609528.	-100377.	-0.002598	0.000	4.163E+12	-2230.2103	28156.	0.000
12.040	0.2575	51260318.	-110448.	-0.002573	0.000	2.383E+13	-3764.6215	49126.	0.000
12.320	0.2488	50868605.	-123111.	-0.002566	0.000	2.564E+13	-3772.6226	50939.	0.000
12.600	0.2402	50434299.	-135785.	-0.002560	0.000	2.564E+13	-3771.6604	52751.	0.000
12.880	0.2316	49957411.	-148441.	-0.002553	0.000	2.565E+13	-3761.7679	54564.	0.000
13.160	0.2231	49438052.	-161049.	-0.002547	0.000	2.565E+13	-3742.9774	56376.	0.000
13.440	0.2145	48876436.	-173579.	-0.002540	0.000	2.566E+13	-3715.3205	58189.	0.000
13.720	0.2060	48272873.	-186001.	-0.002534	0.000	2.567E+13	-3678.8278	60001.	0.000
14.000	0.1975	47627775.	-198286.	-0.002528	0.000	2.567E+13	-3633.5293	61814.	0.000
14.280	0.1890	46941656.	-210404.	-0.002521	0.000	2.568E+13	-3579.4538	63626.	0.000
14.560	0.1806	46215124.	-222325.	-0.002515	0.000	2.569E+13	-3516.6291	65439.	0.000
14.840	0.1721	45448889.	-234021.	-0.002509	0.000	2.570E+13	-3445.0822	67251.	0.000
15.120	0.1637	44643759.	-245462.	-0.002503	0.000	2.571E+13	-3364.8389	69064.	0.000
15.400	0.1553	43800641.	-256618.	-0.002498	0.000	2.571E+13	-3275.9239	70876.	0.000
15.680	0.1469	42920536.	-267461.	-0.002492	0.000	2.572E+13	-3178.3607	72689.	0.000
15.960	0.1386	42004548.	-277962.	-0.002486	0.000	2.573E+13	-3072.1717	74502.	0.000
16.240	0.1302	41053875.	-288092.	-0.002481	0.000	2.574E+13	-2957.3782	76314.	0.000
16.520	0.1219	40069813.	-297821.	-0.002476	0.000	2.575E+13	-2834.0002	78127.	0.000
16.800	0.1136	39053755.	-307122.	-0.002470	0.000	2.577E+13	-2702.0563	79939.	0.000
17.080	0.1053	38007191.	-315965.	-0.002465	0.000	2.578E+13	-2561.5638	81752.	0.000
17.360	0.0970	36931706.	-324321.	-0.002461	0.000	2.579E+13	-2412.5390	83564.	0.000
17.640	0.0887	35828984.	-332163.	-0.002456	0.000	2.580E+13	-2254.9966	85377.	0.000
17.920	0.0805	34700802.	-339461.	-0.002451	0.000	2.581E+13	-2088.9501	87189.	0.000

18.200	0.0723	33549036.	-346186.	-0.002447	0.000	2.582E+13	-1914.4116	89002.	0.000
18.480	0.0641	32375655.	-352311.	-0.002443	0.000	2.584E+13	-1731.3918	90814.	0.000
18.760	0.0559	31182727.	-357807.	-0.002438	0.000	2.585E+13	-1539.9002	92627.	0.000
19.040	0.0477	29972414.	-362645.	-0.002434	0.000	2.586E+13	-1339.9447	94439.	0.000
19.320	0.0395	28746971.	-366797.	-0.002431	0.000	2.587E+13	-1131.5322	96252.	0.000
19.600	0.0313	27508753.	-370235.	-0.002427	0.000	2.589E+13	-914.6679	98064.	0.000
19.880	0.0232	26260208.	-372930.	-0.002423	0.000	2.590E+13	-689.3561	99877.	0.000
20.160	0.0151	25003880.	-374853.	-0.002420	0.000	2.591E+13	-455.5993	101689.	0.000
20.440	0.006928	23742407.	-375977.	-0.002417	0.000	2.593E+13	-213.3991	103502.	0.000
20.720	-0.001188	22478525.	-376273.	-0.002414	0.000	2.594E+13	37.2442	105314.	0.000
21.000	-0.009294	21215062.	-375713.	-0.002411	0.000	2.595E+13	296.3317	107127.	0.000
21.280	-0.0174	19954944.	-374267.	-0.002408	0.000	2.597E+13	563.8654	108939.	0.000
21.560	-0.0255	18701191.	-371909.	-0.002406	0.000	2.598E+13	839.8488	110752.	0.000
21.840	-0.0336	17456919.	-368609.	-0.002404	0.000	2.599E+13	1124.2860	112564.	0.000
22.120	-0.0416	16225339.	-364340.	-0.002401	0.000	2.600E+13	1417.1826	114377.	0.000
22.400	-0.0497	15009758.	-359072.	-0.002399	0.000	2.602E+13	1718.5448	116189.	0.000
22.680	-0.0578	13813578.	-352777.	-0.002398	0.000	2.603E+13	2028.3798	118002.	0.000
22.960	-0.0658	12640298.	-345427.	-0.002396	0.000	2.604E+13	2346.6958	119814.	0.000
23.240	-0.0739	11493510.	-336993.	-0.002394	0.000	2.605E+13	2673.5016	121627.	0.000
23.520	-0.0819	10376905.	-327447.	-0.002393	0.000	2.606E+13	3008.8067	123439.	0.000
23.800	-0.0899	9294267.	-316759.	-0.002392	0.000	2.607E+13	3352.6210	125252.	0.000
24.080	-0.0980	8249479.	-304903.	-0.002391	0.000	2.608E+13	3704.9551	127065.	0.000
24.360	-0.1060	7246518.	-291848.	-0.002390	0.000	2.610E+13	4065.8199	128877.	0.000
24.640	-0.1140	6289459.	-277566.	-0.002389	0.000	2.611E+13	4435.2266	130690.	0.000
24.920	-0.1221	5382471.	-262029.	-0.002388	0.000	2.611E+13	4813.1864	132502.	0.000
25.200	-0.1301	4529822.	-245207.	-0.002387	0.000	2.611E+13	5199.7107	134315.	0.000
25.480	-0.1381	3735876.	-227072.	-0.002387	0.000	2.611E+13	5594.8107	136127.	0.000
25.760	-0.1461	3005092.	-207595.	-0.002386	0.000	2.611E+13	5998.4971	137940.	0.000
26.040	-0.1541	2342029.	-186748.	-0.002386	0.000	2.611E+13	6410.7807	139752.	0.000
26.320	-0.1621	1751341.	-164501.	-0.002386	0.000	2.611E+13	6831.6713	141565.	0.000
26.600	-0.1702	1237780.	-140825.	-0.002386	0.000	2.611E+13	7261.1782	143377.	0.000
26.880	-0.1782	806195.	-115691.	-0.002385	0.000	2.611E+13	7699.3098	145190.	0.000
27.160	-0.1862	461532.	-89071.	-0.002385	0.000	2.611E+13	8146.0734	147002.	0.000
27.440	-0.1942	208834.	-60935.	-0.002385	0.000	2.611E+13	8601.4750	148815.	0.000
27.720	-0.2022	53244.	-31254.	-0.002385	0.000	2.611E+13	9065.5192	150627.	0.000
28.000	-0.2102	0.000	0.000	-0.002385	0.000	2.611E+13	9538.2089	76220.	0.000

\* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.



Output Summary for Load Case No. 1:

Pile-head deflection = 0.7595080 inches  
 Computed slope at pile head = -0.0042106 radians  
 Maximum bending moment = 53885657. inch-lbs  
 Maximum shear force = -376273. lbs  
 Depth of maximum bending moment = 7.8400000 feet below pile head  
 Depth of maximum shear force = 20.7200000 feet below pile head  
 Number of iterations = 262  
 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)

Shear force at pile head = 9586.0 lbs  
 Applied moment at pile head = 12209413.0 in-lbs  
 Axial thrust load on pile head = 104665.0 lbs

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in <sup>2</sup>	Soil Res. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.1583	12209413.	9586.0000	-0.000696	0.000	2.604E+13	0.000	0.000	0.000
0.280	0.1560	12241866.	9586.0010	-0.000694	0.000	2.604E+13	0.000	0.000	0.000
0.560	0.1536	12274319.	9586.0000	-0.000693	0.000	2.604E+13	0.000	0.000	0.000
0.840	0.1513	12306772.	9586.0000	-0.000691	0.000	2.604E+13	0.000	0.000	0.000
1.120	0.1490	12339223.	9584.8827	-0.000690	0.000	2.604E+13	-0.6651	15.0003	0.000
1.400	0.1467	12371667.	9580.0987	-0.000688	0.000	2.604E+13	-2.1825	50.0009	0.000
1.680	0.1444	12404086.	9570.2970	-0.000686	0.000	2.604E+13	-3.6518	85.0016	0.000
1.960	0.1420	12436462.	9555.6388	-0.000685	0.000	2.604E+13	-5.0733	120.0023	0.000
2.240	0.1398	12468781.	9536.2849	-0.000683	0.000	2.604E+13	-6.4469	155.0029	0.000
2.520	0.1375	12501027.	9512.3954	-0.000682	0.000	2.604E+13	-7.7730	190.0036	0.000
2.800	0.1352	12533184.	9484.1299	-0.000680	0.000	2.604E+13	-9.0517	225.0043	0.000
3.080	0.1329	12565239.	9451.6474	-0.000678	0.000	2.604E+13	-10.2831	260.0049	0.000

3.360	0.1306	12597176.	9415.1064	-0.000677	0.000	2.604E+13	-11.4675	295.0056	0.000
3.640	0.1283	12628984.	9374.6647	-0.000675	0.000	2.604E+13	-12.6049	330.0062	0.000
3.920	0.1261	12660649.	9330.4796	-0.000674	0.000	2.604E+13	-13.6957	365.0069	0.000
4.200	0.1238	12692159.	9282.7079	-0.000672	0.000	2.604E+13	-14.7399	400.0076	0.000
4.480	0.1216	12723501.	9231.5057	-0.000670	0.000	2.604E+13	-15.7377	435.0082	0.000
4.760	0.1193	12754666.	9177.0285	-0.000669	0.000	2.604E+13	-16.6893	470.0089	0.000
5.040	0.1171	12785641.	8926.0240	-0.000667	0.000	2.604E+13	-132.7182	3809.3031	0.000
5.320	0.1148	12815118.	8464.1317	-0.000665	0.000	2.604E+13	-142.2177	4161.5298	0.000
5.600	0.1126	12842988.	7971.0969	-0.000664	0.000	2.604E+13	-151.2554	4513.7566	0.000
5.880	0.1104	12869150.	7448.4686	-0.000662	0.000	2.604E+13	-159.8329	4865.9833	0.000
6.160	0.1081	12893508.	6897.7895	-0.000660	0.000	2.604E+13	-167.9523	5218.2100	0.000
6.440	0.1059	12915968.	6320.5964	-0.000659	0.000	2.604E+13	-175.6150	5570.4368	0.000
6.720	0.1037	12936445.	5718.4203	-0.000657	0.000	2.604E+13	-182.8231	5922.6635	0.000
7.000	0.1015	12954858.	4953.5834	-0.000655	0.000	2.604E+13	-272.4370	9017.4528	0.000
7.280	0.0993	12970194.	3770.9441	-0.000654	0.000	2.604E+13	-431.5149	14599.	0.000
7.560	0.0971	12980658.	2295.9201	-0.000652	0.000	2.604E+13	-446.4755	15446.	0.000
7.840	0.0949	12986082.	772.4414	-0.000650	0.000	2.604E+13	-460.3570	16294.	0.000
8.120	0.0927	12986307.	-795.8735	-0.000649	0.000	2.604E+13	-473.1638	17141.	0.000
8.400	0.0906	12981189.	-2405.4205	-0.000647	0.000	2.604E+13	-484.8999	17988.	0.000
8.680	0.0884	12970597.	-4052.6096	-0.000645	0.000	2.604E+13	-495.5698	18836.	0.000
8.960	0.0862	12954410.	-5733.8653	-0.000644	0.000	2.604E+13	-505.1776	19683.	0.000
9.240	0.0841	12932518.	-7445.6261	-0.000642	0.000	2.604E+13	-513.7276	20530.	0.000
9.520	0.0819	12904827.	-9184.3446	-0.000640	0.000	2.604E+13	-521.2239	21378.	0.000
9.800	0.0798	12871250.	-10946.	-0.000639	0.000	2.604E+13	-527.6707	22225.	0.000
10.080	0.0776	12831716.	-12729.	-0.000637	0.000	2.604E+13	-533.0721	23072.	0.000
10.360	0.0755	12786162.	-14527.	-0.000635	0.000	2.604E+13	-537.4323	23920.	0.000
10.640	0.0734	12734541.	-16338.	-0.000634	0.000	2.604E+13	-540.7553	24767.	0.000
10.920	0.0712	12676814.	-18159.	-0.000632	0.000	2.604E+13	-543.0451	25614.	0.000
11.200	0.0691	12612956.	-19986.	-0.000630	0.000	2.604E+13	-544.3056	26462.	0.000
11.480	0.0670	12542953.	-21815.	-0.000629	0.000	2.604E+13	-544.5409	27309.	0.000
11.760	0.0649	12466801.	-23643.	-0.000627	0.000	2.604E+13	-543.7548	28156.	0.000
12.040	0.0628	12384510.	-26099.	-0.000626	0.000	2.604E+13	-917.9579	49126.	0.000
12.320	0.0607	12291855.	-29187.	-0.000624	0.000	2.604E+13	-920.0004	50939.	0.000
12.600	0.0586	12188813.	-32278.	-0.000622	0.000	2.604E+13	-919.8618	52751.	0.000
12.880	0.0565	12075385.	-35365.	-0.000621	0.000	2.605E+13	-917.5498	54564.	0.000
13.160	0.0544	11951598.	-38440.	-0.000619	0.000	2.605E+13	-913.0723	56376.	0.000
13.440	0.0523	11817503.	-41497.	-0.000618	0.000	2.605E+13	-906.4368	58189.	0.000
13.720	0.0503	11673173.	-44528.	-0.000616	0.000	2.605E+13	-897.6505	60001.	0.000
14.000	0.0482	11518709.	-47526.	-0.000615	0.000	2.605E+13	-886.7207	61814.	0.000
14.280	0.0461	11354234.	-50483.	-0.000613	0.000	2.605E+13	-873.6543	63626.	0.000
14.560	0.0441	11179895.	-53393.	-0.000612	0.000	2.605E+13	-858.4578	65439.	0.000
14.840	0.0420	10995863.	-56248.	-0.000610	0.000	2.605E+13	-841.1379	67251.	0.000

15.120	0.0400	10802336.	-59042.	-0.000609	0.000	2.605E+13	-821.7007	69064.	0.000
15.400	0.0379	10599531.	-61767.	-0.000608	0.000	2.606E+13	-800.1521	70876.	0.000
15.680	0.0359	10387692.	-64415.	-0.000606	0.000	2.606E+13	-776.4978	72689.	0.000
15.960	0.0339	10167086.	-66981.	-0.000605	0.000	2.606E+13	-750.7432	74502.	0.000
16.240	0.0318	9938004.	-69457.	-0.000604	0.000	2.606E+13	-722.8933	76314.	0.000
16.520	0.0298	9700761.	-71835.	-0.000602	0.000	2.606E+13	-692.9531	78127.	0.000
16.800	0.0278	9455694.	-74110.	-0.000601	0.000	2.606E+13	-660.9270	79939.	0.000
17.080	0.0258	9203165.	-76273.	-0.000600	0.000	2.607E+13	-626.8192	81752.	0.000
17.360	0.0237	8943559.	-78319.	-0.000599	0.000	2.607E+13	-590.6336	83564.	0.000
17.640	0.0217	8677285.	-80239.	-0.000598	0.000	2.607E+13	-552.3739	85377.	0.000
17.920	0.0197	8404774.	-82027.	-0.000597	0.000	2.608E+13	-512.0432	87189.	0.000
18.200	0.0177	8126482.	-83676.	-0.000595	0.000	2.608E+13	-469.6446	89002.	0.000
18.480	0.0157	7842887.	-85180.	-0.000594	0.000	2.608E+13	-425.1805	90814.	0.000
18.760	0.0137	7554492.	-86530.	-0.000593	0.000	2.609E+13	-378.6534	92627.	0.000
19.040	0.0117	7261822.	-87721.	-0.000592	0.000	2.609E+13	-330.0653	94439.	0.000
19.320	0.009754	6965425.	-88745.	-0.000592	0.000	2.610E+13	-279.4176	96252.	0.000
19.600	0.007768	6665874.	-89595.	-0.000591	0.000	2.610E+13	-226.7119	98064.	0.000
19.880	0.005785	6363763.	-90265.	-0.000590	0.000	2.610E+13	-171.9490	99877.	0.000
20.160	0.003804	6059710.	-90747.	-0.000589	0.000	2.610E+13	-115.1297	101689.	0.000
20.440	0.001826	5754357.	-91035.	-0.000588	0.000	2.610E+13	-56.2544	103502.	0.000
20.720	-0.000149	5448368.	-91122.	-0.000588	0.000	2.610E+13	4.6768	105314.	0.000
21.000	-0.002122	5142433.	-91000.	-0.000587	0.000	2.610E+13	67.6641	107127.	0.000
21.280	-0.004093	4837261.	-90663.	-0.000586	0.000	2.610E+13	132.7080	108939.	0.000
21.560	-0.006062	4533587.	-90105.	-0.000586	0.000	2.610E+13	199.8093	110752.	0.000
21.840	-0.008029	4232168.	-89317.	-0.000585	0.000	2.610E+13	268.9688	112564.	0.000
22.120	-0.009994	3933786.	-88294.	-0.000585	0.000	2.610E+13	340.1880	114377.	0.000
22.400	-0.0120	3639244.	-87028.	-0.000584	0.000	2.610E+13	413.4683	116189.	0.000
22.680	-0.0139	3349370.	-85512.	-0.000584	0.000	2.610E+13	488.8114	118002.	0.000
22.960	-0.0159	3065014.	-83739.	-0.000583	0.000	2.610E+13	566.2192	119814.	0.000
23.240	-0.0178	2787051.	-81703.	-0.000583	0.000	2.610E+13	645.6940	121627.	0.000
23.520	-0.0198	2516377.	-79397.	-0.000582	0.000	2.610E+13	727.2378	123439.	0.000
23.800	-0.0218	2253913.	-76813.	-0.000582	0.000	2.610E+13	810.8532	125252.	0.000
24.080	-0.0237	2000604.	-73945.	-0.000582	0.000	2.610E+13	896.5427	127065.	0.000
24.360	-0.0257	1757415.	-70785.	-0.000582	0.000	2.610E+13	984.3088	128877.	0.000
24.640	-0.0276	1525340.	-67326.	-0.000581	0.000	2.610E+13	1074.1544	130690.	0.000
24.920	-0.0296	1305390.	-63563.	-0.000581	0.000	2.610E+13	1166.0821	132502.	0.000
25.200	-0.0315	1098606.	-59487.	-0.000581	0.000	2.610E+13	1260.0946	134315.	0.000
25.480	-0.0335	906047.	-55092.	-0.000581	0.000	2.610E+13	1356.1947	136127.	0.000
25.760	-0.0354	728799.	-50370.	-0.000581	0.000	2.610E+13	1454.3850	137940.	0.000
26.040	-0.0374	567971.	-45315.	-0.000581	0.000	2.610E+13	1554.6681	139752.	0.000
26.320	-0.0393	424694.	-39919.	-0.000581	0.000	2.610E+13	1657.0464	141565.	0.000
26.600	-0.0413	300125.	-34176.	-0.000581	0.000	2.610E+13	1761.5220	143377.	0.000

26.880	-0.0432	195442.	-28078.	-0.000581	0.000	2.610E+13	1868.0972	145190.	0.000
27.160	-0.0452	111849.	-21619.	-0.000581	0.000	2.610E+13	1976.7736	147002.	0.000
27.440	-0.0471	50574.	-14790.	-0.000581	0.000	2.610E+13	2087.5527	148815.	0.000
27.720	-0.0491	12866.	-7586.6425	-0.000581	0.000	2.610E+13	2200.4356	150627.	0.000
28.000	-0.0510	0.000	0.000	-0.000581	0.000	2.610E+13	2315.4230	76220.	0.000

\* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

Output Summary for Load Case No. 2:

Pile-head deflection = 0.1582888 inches  
 Computed slope at pile head = -0.0006960 radians  
 Maximum bending moment = 12986307. inch-lbs  
 Maximum shear force = -91122. lbs  
 Depth of maximum bending moment = 8.1200000 feet below pile head  
 Depth of maximum shear force = 20.7200000 feet below pile head  
 Number of iterations = 6  
 Number of zero deflection points = 1

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 Computed Values of Pile Loading and Deflection  
 for Lateral Loading for Load Case Number 3  
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Pile-head conditions are Shear and Moment (Loading Type 1)

Shear force at pile head = 10547.0 lbs  
 Applied moment at pile head = 13684405.0 in-lbs  
 Axial thrust load on pile head = 83835.0 lbs

Depth X feet	Deflect. y inches	Bending Moment in-lbs	Shear Force lbs	Slope S radians	Total Stress psi*	Bending Stiffness lb-in <sup>2</sup>	Soil Res. p lb/in	Soil Spr. Es*h lb/inch	Distrib. Lat. Load lb/inch
0.00	0.1768	13684405.	10547.	-0.000778	0.000	2.603E+13	0.000	0.000	0.000

0.280	0.1742	13720062.	10547.	-0.000776	0.000	2.603E+13	0.000	0.000	0.000
0.560	0.1716	13755718.	10547.	-0.000774	0.000	2.603E+13	0.000	0.000	0.000
0.840	0.1690	13791374.	10547.	-0.000773	0.000	2.603E+13	0.000	0.000	0.000
1.120	0.1664	13827029.	10546.	-0.000771	0.000	2.603E+13	-0.7430	15.0003	0.000
1.400	0.1638	13862675.	10540.	-0.000769	0.000	2.603E+13	-2.4380	50.0009	0.000
1.680	0.1613	13898294.	10529.	-0.000767	0.000	2.603E+13	-4.0794	85.0016	0.000
1.960	0.1587	13933866.	10513.	-0.000765	0.000	2.603E+13	-5.6672	120.0023	0.000
2.240	0.1561	13969373.	10491.	-0.000764	0.000	2.603E+13	-7.2016	155.0029	0.000
2.520	0.1535	14004798.	10465.	-0.000762	0.000	2.603E+13	-8.6829	190.0036	0.000
2.800	0.1510	14040125.	10433.	-0.000760	0.000	2.603E+13	-10.1111	225.0043	0.000
3.080	0.1484	14075338.	10397.	-0.000758	0.000	2.603E+13	-11.4866	260.0049	0.000
3.360	0.1459	14110420.	10356.	-0.000756	0.000	2.603E+13	-12.8095	295.0056	0.000
3.640	0.1434	14145357.	10311.	-0.000754	0.000	2.603E+13	-14.0800	330.0062	0.000
3.920	0.1408	14180134.	10262.	-0.000753	0.000	2.603E+13	-15.2983	365.0069	0.000
4.200	0.1383	14214739.	10208.	-0.000751	0.000	2.602E+13	-16.4646	400.0076	0.000
4.480	0.1358	14249156.	10151.	-0.000749	0.000	2.602E+13	-17.5790	435.0082	0.000
4.760	0.1333	14283375.	10090.	-0.000747	0.000	2.602E+13	-18.6418	470.0089	0.000
5.040	0.1308	14317383.	9809.7978	-0.000745	0.000	2.602E+13	-148.2446	3809.3031	0.000
5.320	0.1283	14349717.	9293.8716	-0.000743	0.000	2.602E+13	-158.8543	4161.5298	0.000
5.600	0.1258	14380257.	8743.1636	-0.000742	0.000	2.602E+13	-168.9481	4513.7566	0.000
5.880	0.1233	14408889.	8159.4043	-0.000740	0.000	2.602E+13	-178.5277	4865.9833	0.000
6.160	0.1208	14435505.	7544.3175	-0.000738	0.000	2.602E+13	-187.5954	5218.2100	0.000
6.440	0.1183	14460002.	6899.6204	-0.000736	0.000	2.602E+13	-196.1529	5570.4368	0.000
6.720	0.1158	14482285.	6227.0234	-0.000734	0.000	2.602E+13	-204.2024	5922.6635	0.000
7.000	0.1134	14502262.	5372.7504	-0.000732	0.000	2.602E+13	-304.2934	9017.4528	0.000
7.280	0.1109	14518802.	4051.8298	-0.000730	0.000	2.602E+13	-481.9688	14599.	0.000
7.560	0.1085	14529901.	2404.3489	-0.000729	0.000	2.602E+13	-498.6746	15446.	0.000
7.840	0.1060	14535370.	702.7617	-0.000727	0.000	2.602E+13	-514.1749	16294.	0.000
8.120	0.1036	14535033.	-1048.8890	-0.000725	0.000	2.602E+13	-528.4743	17141.	0.000
8.400	0.1012	14528730.	-2846.5764	-0.000723	0.000	2.602E+13	-541.5777	17988.	0.000
8.680	0.0987	14516312.	-4686.2899	-0.000721	0.000	2.602E+13	-553.4899	18836.	0.000
8.960	0.0963	14497644.	-6564.0348	-0.000719	0.000	2.602E+13	-564.2154	19683.	0.000
9.240	0.0939	14472606.	-8475.8321	-0.000717	0.000	2.602E+13	-573.7592	20530.	0.000
9.520	0.0915	14441091.	-10418.	-0.000715	0.000	2.602E+13	-582.1258	21378.	0.000
9.800	0.0891	14403002.	-12386.	-0.000714	0.000	2.602E+13	-589.3200	22225.	0.000
10.080	0.0867	14358260.	-14376.	-0.000712	0.000	2.602E+13	-595.3463	23072.	0.000
10.360	0.0843	14306797.	-16385.	-0.000710	0.000	2.602E+13	-600.2093	23920.	0.000
10.640	0.0819	14248556.	-18407.	-0.000708	0.000	2.602E+13	-603.9136	24767.	0.000
10.920	0.0796	14183497.	-20441.	-0.000706	0.000	2.603E+13	-606.4637	25614.	0.000
11.200	0.0772	14111591.	-22481.	-0.000704	0.000	2.603E+13	-607.8641	26462.	0.000
11.480	0.0748	14032822.	-24524.	-0.000703	0.000	2.603E+13	-608.1191	27309.	0.000
11.760	0.0725	13947187.	-26566.	-0.000701	0.000	2.603E+13	-607.2330	28156.	0.000

12.040	0.0701	13854696.	-29308.	-0.000699	0.000	2.603E+13	-1025.1062	49126.	0.000
12.320	0.0678	13750632.	-32756.	-0.000697	0.000	2.603E+13	-1027.3718	50939.	0.000
12.600	0.0654	13634968.	-36208.	-0.000695	0.000	2.603E+13	-1027.2007	52751.	0.000
12.880	0.0631	13507707.	-39655.	-0.000694	0.000	2.603E+13	-1024.6018	54564.	0.000
13.160	0.0608	13368879.	-43089.	-0.000692	0.000	2.604E+13	-1019.5837	56376.	0.000
13.440	0.0584	13218539.	-46502.	-0.000690	0.000	2.604E+13	-1012.1549	58189.	0.000
13.720	0.0561	13056772.	-49887.	-0.000688	0.000	2.604E+13	-1002.3234	60001.	0.000
14.000	0.0538	12883688.	-53234.	-0.000687	0.000	2.604E+13	-990.0974	61814.	0.000
14.280	0.0515	12699426.	-56536.	-0.000685	0.000	2.604E+13	-975.4844	63626.	0.000
14.560	0.0492	12504151.	-59785.	-0.000684	0.000	2.604E+13	-958.4921	65439.	0.000
14.840	0.0469	12298055.	-62973.	-0.000682	0.000	2.605E+13	-939.1277	67251.	0.000
15.120	0.0446	12081356.	-66092.	-0.000680	0.000	2.605E+13	-917.3980	69064.	0.000
15.400	0.0423	11854299.	-69134.	-0.000679	0.000	2.605E+13	-893.3096	70876.	0.000
15.680	0.0401	11617157.	-72091.	-0.000677	0.000	2.605E+13	-866.8691	72689.	0.000
15.960	0.0378	11370227.	-74956.	-0.000676	0.000	2.605E+13	-838.0823	74502.	0.000
16.240	0.0355	11113836.	-77719.	-0.000674	0.000	2.605E+13	-806.9549	76314.	0.000
16.520	0.0333	10848334.	-80374.	-0.000673	0.000	2.606E+13	-773.4924	78127.	0.000
16.800	0.0310	10574099.	-82913.	-0.000672	0.000	2.606E+13	-737.6999	79939.	0.000
17.080	0.0288	10291536.	-85328.	-0.000670	0.000	2.606E+13	-699.5819	81752.	0.000
17.360	0.0265	10001074.	-87610.	-0.000669	0.000	2.606E+13	-659.1429	83564.	0.000
17.640	0.0243	9703170.	-89753.	-0.000668	0.000	2.606E+13	-616.3869	85377.	0.000
17.920	0.0220	9398307.	-91749.	-0.000666	0.000	2.607E+13	-571.3176	87189.	0.000
18.200	0.0198	9086994.	-93589.	-0.000665	0.000	2.607E+13	-523.9381	89002.	0.000
18.480	0.0175	8769766.	-95266.	-0.000664	0.000	2.607E+13	-474.2516	90814.	0.000
18.760	0.0153	8447183.	-96772.	-0.000663	0.000	2.608E+13	-422.2604	92627.	0.000
19.040	0.0131	8119832.	-98099.	-0.000662	0.000	2.608E+13	-367.9669	94439.	0.000
19.320	0.0109	7788327.	-99241.	-0.000661	0.000	2.609E+13	-311.3728	96252.	0.000
19.600	0.008651	7453307.	-100188.	-0.000660	0.000	2.609E+13	-252.4797	98064.	0.000
19.880	0.006435	7115436.	-100934.	-0.000659	0.000	2.610E+13	-191.2887	99877.	0.000
20.160	0.004223	6775405.	-101470.	-0.000658	0.000	2.610E+13	-127.8005	101689.	0.000
20.440	0.002013	6433931.	-101788.	-0.000657	0.000	2.611E+13	-62.0156	103502.	0.000
20.720	-0.000194	6091757.	-101882.	-0.000656	0.000	2.611E+13	6.0659	105314.	0.000
21.000	-0.002398	5749651.	-101744.	-0.000656	0.000	2.611E+13	76.4442	107127.	0.000
21.280	-0.004599	5408407.	-101365.	-0.000655	0.000	2.611E+13	149.1199	108939.	0.000
21.560	-0.006799	5068847.	-100738.	-0.000654	0.000	2.611E+13	224.0938	110752.	0.000
21.840	-0.008996	4731817.	-99855.	-0.000654	0.000	2.611E+13	301.3670	112564.	0.000
22.120	-0.0112	4398189.	-98709.	-0.000653	0.000	2.611E+13	380.9410	114377.	0.000
22.400	-0.0134	4068862.	-97291.	-0.000652	0.000	2.611E+13	462.8175	116189.	0.000
22.680	-0.0156	3744759.	-95595.	-0.000652	0.000	2.611E+13	546.9983	118002.	0.000
22.960	-0.0178	3426831.	-93612.	-0.000651	0.000	2.611E+13	633.4856	119814.	0.000
23.240	-0.0200	3116056.	-91334.	-0.000651	0.000	2.611E+13	722.2817	121627.	0.000
23.520	-0.0221	2813434.	-88754.	-0.000651	0.000	2.611E+13	813.3893	123439.	0.000

23.800	-0.0243	2519995.	-85864.	-0.000650	0.000	2.611E+13	906.8109	125252.	0.000
24.080	-0.0265	2236794.	-82656.	-0.000650	0.000	2.611E+13	1002.5495	127065.	0.000
24.360	-0.0287	1964911.	-79123.	-0.000650	0.000	2.611E+13	1100.6080	128877.	0.000
24.640	-0.0309	1705453.	-75256.	-0.000650	0.000	2.611E+13	1200.9893	130690.	0.000
24.920	-0.0331	1459554.	-71049.	-0.000649	0.000	2.611E+13	1303.6965	132502.	0.000
25.200	-0.0352	1228373.	-66492.	-0.000649	0.000	2.611E+13	1408.7327	134315.	0.000
25.480	-0.0374	1013096.	-61578.	-0.000649	0.000	2.611E+13	1516.1009	136127.	0.000
25.760	-0.0396	814935.	-56300.	-0.000649	0.000	2.611E+13	1625.8041	137940.	0.000
26.040	-0.0418	635129.	-50649.	-0.000649	0.000	2.611E+13	1737.8451	139752.	0.000
26.320	-0.0440	474942.	-44617.	-0.000649	0.000	2.611E+13	1852.2267	141565.	0.000
26.600	-0.0461	335666.	-38198.	-0.000649	0.000	2.611E+13	1968.9512	143377.	0.000
26.880	-0.0483	218619.	-31382.	-0.000649	0.000	2.611E+13	2088.0211	145190.	0.000
27.160	-0.0505	125145.	-24162.	-0.000649	0.000	2.611E+13	2209.4383	147002.	0.000
27.440	-0.0527	56614.	-16531.	-0.000649	0.000	2.611E+13	2333.2044	148815.	0.000
27.720	-0.0549	14425.	-8479.1424	-0.000649	0.000	2.611E+13	2459.3207	150627.	0.000
28.000	-0.0570	0.000	0.000	-0.000649	0.000	2.611E+13	2587.7879	76220.	0.000

\* This analysis computed pile response using nonlinear moment-curvature relationships. Values of total stress due to combined axial and bending stresses are computed only for elastic sections only and do not equal the actual stresses in concrete and steel. Stresses in concrete and steel may be interpolated from the output for nonlinear bending properties relative to the magnitude of bending moment developed in the pile.

#### Output Summary for Load Case No. 3:

Pile-head deflection = 0.1768260 inches  
 Computed slope at pile head = -0.0007778 radians  
 Maximum bending moment = 14535370. inch-lbs  
 Maximum shear force = -101882. lbs  
 Depth of maximum bending moment = 7.8400000 feet below pile head  
 Depth of maximum shear force = 20.7200000 feet below pile head  
 Number of iterations = 6  
 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 Pile in-lbs	Maximum Shear in Pile lbs	Pile-head Rotation radians
1	1	V = 39070.	M = 50761244.	74520.	0.75950797	53885657.	-376273.	-0.00421058
2	1	V = 9586.0000	M = 12209413.	104665.	0.15828883	12986307.	-91122.	-0.00069602
3	1	V = 10547.	M = 13684405.	83835.	0.17682604	14535370.	-101882.	-0.00077783

The analysis ended normally.



## Foundation Review

### Check lateral displacement

$$\Delta_{\text{allow}} := 0.75 \text{ in}$$

Maximum displacement at grade level per TIA-222-G Section 9.5

$$\frac{\Delta_{\text{service}}}{\Delta_{\text{allow}}} = 0.236$$

Displacement check = "Displacement of foundation is acceptable."

### Check moment capacity

$$\phi_m := 0.65$$

Strength reduction factor in moment (horizontal ties)

$$\phi M_n := \phi_m \cdot M_n$$

$$\phi M_n = 7903 \cdot \text{kip} \cdot \text{ft}$$

$$\frac{M_u}{\phi M_n} = 0.767$$

Moment check = "Moment capacity of foundation is adequate."

### Check shear capacity

$$\phi_s := 0.75$$

Strength reduction factor in shear

$$\lambda := 1$$

Concrete Modification Factor

$$V_c := 2 \cdot \lambda \cdot \sqrt{\frac{f_c}{\text{psi}}} \cdot 0.8 \cdot d^2 \cdot \text{psi}$$

$$V_c = 1022.182 \cdot \text{kips}$$

Shear capacity of concrete

$$V_s := \frac{2 A_{\text{strup}} \cdot f_y \cdot 0.8 d}{S_{\text{strup}}}$$

$$V_s = 172.8 \cdot \text{kips}$$

Shear capacity of reinforcing steel

$$V_n := V_c + V_s$$

$$V_n = 1194.982 \cdot \text{kips}$$

Nominal shear capacity

$$\phi V_n := \phi_s \cdot V_n$$

$$\phi V_n = 896 \cdot \text{kip}$$

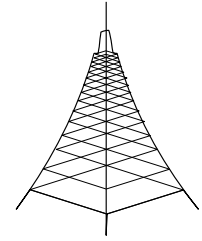
$$\frac{V_u}{\phi V_n} = 0.567$$

Shear check = "Shear capacity of foundation is adequate."



# AT&T LETTER OF EXPLANATION

MUST PROVIDE WITH EACH STRUCTURAL ANALYSIS



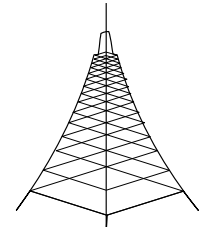
Site Name	Greenwich Perryridge Rd TWR
Site Number	CTL02102
PE of Record	Barbara T. Kotecki, P.E.

ALL STRUCTURES	Statement in COL A is Correct	VARIANCE from Col A	N/A	Alternate Value / Concept Used	Explanation	Yes	No	N/A	Comments / Reference
Structure Analyzed to H Code	X								
Guy Tensions Adjusted Within Code to Find Optimum tension / Minimum Reinforcement (Applies to Guyed Tower Failures Only). Note : AT&T requires a pulse chart for altered Tensions			X						
Antenna Azimuths Inputted Per AT&T Information Note Default Azimuths in PL	X								
All Yield Stresses > = 50 ksi (legs)			X						
All Yield Stresses > = 36 ksi (Diagonals and Horizontals))			X						
Structures Designated Class II - if site meets criteria for Class III, AT&T must approve justification in advance of completing the analysis.		X							
Exposure B Rating Used (Topography) - Exposure C or higher requires written memo with LOE with details per EBP Document. Same applies for Topography rating higher than 2 also requires memo from PE with details per EBP document. IF PE is CHANGING TOPO cat from last SA of record - MEMO with LOE also required!		X							
K value for Slenderness ratio < 1.0 (provide memo if K value 1.0 or greater).			X						
Shielding of All Appurtenances Used when Appropriate PER 2.6.9.4	X								
0.75 Reduction "Shape" Factor (Figure 2.6) for platform mounts, 0.8 for T-Boom Mounts Used			X						
Pipes and round Members have 1.0 Drag Factors. Note if Pipe is attached to flat antenna, these must be considered separately if differing Drag factors are Used			X						
Are Tower Diagonals Designed as "Tension Only"			X						



# AT&T LETTER OF EXPLANATION

MUST PROVIDE WITH EACH STRUCTURAL ANALYSIS



Site Name	GREENWICH PERRYRIDGE RD TWR
Site Number	CTL02102
PE of Record	Barbara T. Kotecki, P.E.

MODIFICATION SECTION	Statement in COL A is Correct	Deviation from Col A	N/A	Alternate Value / Concept Used	Explanation	Yes	No	N/A	Comments / Reference
<b>Guyed</b>									
Guyed Only: Reinforcement Recommendation accompanies Optimum Guy Tensioning Scenario.			X						
Compression Failing Legs / Diagonals / Horizontals: Effective Length Reduced by U-Bolted Member			X						
<i>NOTE: Welded Solution Must be Explained and will only be considered in cases where other reinforcing methods will not work.</i>									
<b>Self Supporting</b>									
Compression Failing Legs / Diagonals / Horizontals: Effective Length Reduced by U-Bolted Member			X						
<i>NOTE: Welded Solution Must be Explained and will only be considered in cases where other reinforcing methods will not work.</i>									
<b>Monopole</b>									
Compression Collars			X						
<i>NOTE: Welded Solution Must be Explained and will only be considered in cases where other reinforcing methods will not work.</i>									
<b>Foundation</b>									
Guyed Anchor Failure: Berm Solution			X						
SS Foundation Pad and Pier Failure Berm			X						
SS Foundation Caisson / Concrete Cap			X						
Monopole: Cap			X						

June 15, 2022

Scope: **MOUNT ANALYSIS REPORT**  
Prepared for: SmartLink  
Carrier: AT&T  
Site Number: CTL02102  
FA Number: 10128691  
Site Name: GREENWICH PERRYRIDGE RD TWR  
Site Address: 5 Perryridge Road Dup  
Greenwich, CT 06830  
Latitude/ Longitude: 41.0339361° / -73.6308333°  
  
Structure Type: MONOPOLE  
Mount Type: Proposed Site Pro 1 RMQLP-4120H10 Low-Profile Platform  
AT&T CONMAT Number: ANT.44987  
Rad Center: 134'-0"

Fullerton Engineering, P.C. is pleased to submit this "Mount Analysis Report" to determine the adequacy of the antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned structure.

**Analysis Criteria:**

Reference Standard:	TIA-222-H Standard	
Wind Parameters:	Basic Wind Speed:	127 mph (3-Sec gust)
	Ice Wind Speed:	50 mph (3-Sec gust)
	Design Ice Thickness:	1.00 in.
	Risk Category	III
	Exposure Category:	C
	Topographic Feature:	None
	Topographic Method:	Method 2
Seismic Parameters:	Ground Elevation Factor, $K_e$ :	0.99
	$S_s$ :	0.275
	$S_1$ :	0.059
Analysis Software:	RISA-3D (V17)	

**Appurtenance Loads:**

The antenna mounting system was analyzed with the final loading configuration shown in Page 2 of this report.

**Summary of Analysis Result: PASS (MAX STRESS RATIO = 57.3%)**

**Barbara T. Kotecki, P.E.**

**Summary:**

This structural assessment is in regards to the adequacy of the antenna mounting system for the final loading configuration described below. The purpose was to determine conformance of the antenna mounting system under the applicable codes and standards.

This PE certification completed by Fullerton Engineering, P.C. is inclusive of the antenna mounting system that will support the existing and proposed loading provided by the client.

This certification assumes that all structural members of the antenna mounting system are in good condition and have not been altered from the manufacturer's original design. Prior to installation of new equipment, contractor shall inspect the condition of all relevant members and connectors. The contractor shall be responsible for the means and methods of construction.

**Sources:**

Reference Document	Date
RFDS Ver. 3.00 provided by AT&T	03/21/2022
RMQLP-4120-H10 Assembly Drawings by Site Pro 1	10/18/2019
Site Visit Photos	02/09/2022

**Final Loading Configuration:**

Mount Elevation (ft)	Antenna Rad Center (Ft)	QTY.	MANUFACTURER	MODEL	Status
134'-0"	134'-0"	3	CCI	DMP65R-BU6DA	Proposed
		3	Ericsson	AIR6419 B77G & AIR6449 B77D Stacked	
		3	Quintel	QD6616-7	
		3	Ericsson	RRUS-4449 B5/B12	
		1	Raycap	DC9-48-60-24-8C-EV	
		3	Ericsson	RRUS-32 B30	Existing
		3	Ericsson	RRUS-4478 B14	
		3	Ericsson	RRUS-32 B66A	
		3	Ericsson	RRUS-32 B2	
		2	Raycap	DC6-48-60-18-8F	

**Member Component Capacity Table:**

Component	% Capacity	Pass / Fail
Face Horizontals	31.8%	Pass
Standoff Members	57.3%	Pass
Mounting Pipes	46.3%	Pass
Mount-to-Tower Connection, Collar Mount Threaded Rods	22.4%	Pass
<b>Structural Rating (max from all components) = 57.3%</b>		<b>PASS</b>

**Site Number:** CT102102  
**Site Name:** GREENWICH PERRYRIDGE RD TWR  
**Created By:** GO  
**Checked By:** BTK  
**Date:** 6/14/2022  
**Code:** ANS/71A-222-H

Base Structure Type		Type	Monopole
Structure Height Above Grade (ft)	Ht	164.00	
RAD Center (ft)	Z	134.00	
Windspeed no ice (mph, 3-sec gust)	V	127.00	see wind maps
Windspeed with ice (mph, 3-sec gust)	Vl	50.00	see ice maps
Windspeed for maintenance (mph, 3-sec gust)	Vm	30.00	Section 16.6
Ice Thickness	ti	1.00	see ice maps
Exposure Category (B/C/D)	Exposure	C	Section 2.6.5.1.2
Risk Category (I,II,III, IV)	Cat	III	Table 2-1
Topographic Feature	K.1'	None	Figure 2-1
Crest Height	H	5.00	Section 2.6.6.2.1
Length of Feature	L	5.00	
Distance from Crest to Tower	x	0.00	
Escarpment Downwind?	No		
Height above sea level	Zs	142.08	
Exposure Category Coefficient	zg	900.00	Table 2-4
Mid-Point of Structure	Htmid	82.00	
Min Velocity Pressure Coefficient	Kzmin	0.85	Table 2-4
Exposure Category Coefficient	z	9.50	Table 2-4
Velocity Pressure Coefficient	Kz	1.35	Section 2.6.5.2
Ground Elevation Factor	Ke	0.99	Section 2.6.8
Topographic Feature Factor Adjusted for Slope	K1	1.00	Figure 2-1
Horizontal Distance Factor	K2	1.00	Figure 2-1
Vertical Distance Factor	K3	0.00	Figure 2-1
Topographic Factor	Kat	1.00	Section 2.6.6.2.1
Rooftop Wind Speed-Up Factor	Ks	1.00	Section 2.6.7
Ice Load Importance Factor	Ib	1.15	Table 2-3
Wind Direction Probability Factor	Kd	0.95	Table 2-2
Height Escalation Factor	Kiz	1.15	Section 2.6.10
Gust Effect Factor	Gh	1.00	Section 16.6
Design Ice Thickness	tiz	1.32	Section 2.6.10
Ice Density	p.ice	56.00	lbf/ft³
Velocity Pressure for Maintenance	qzm	2.93	Section 2.6.11.6
Velocity Pressure With Ice	qzi	8.14	Section 2.6.11.6
Velocity Pressure No Ice	qz	52.53	Section 2.6.11.6

Kg= 0.9

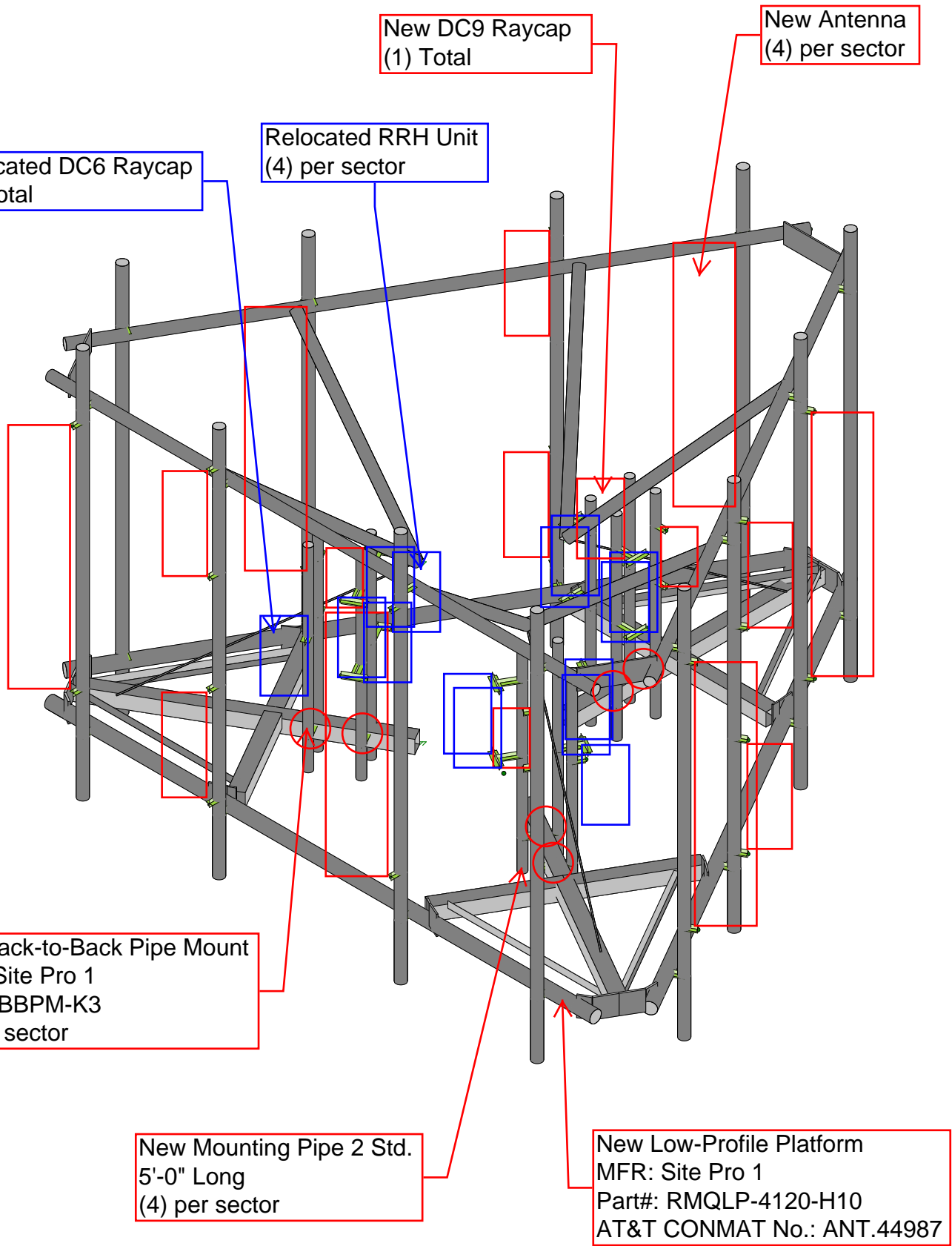
Importance Factor (Earthquake)	I <sub>a</sub>	1.25	Table 2-3
Site Class	Class	D - Default	
Seismic Design Category	Cat	B	
MCE <sub>s</sub> Ground Motion (period=0.2s)	S <sub>s</sub>	0.275	
MCE <sub>s</sub> Ground Motion (period=1.0s)	S <sub>1</sub>	0.059	
Seismic Design Value at 0.2s	S <sub>DS</sub>	0.290	
Long-Period Site Coefficient Fv	Fv	0.80	Table 2-12
Seismic Design Value at 1.0s	S <sub>DS1</sub>	0.031	Sec. 2.7.5
Long-period Transition Period (s)	T <sub>l</sub>	6	

Seismic Shear	
R	2.000 See 16.7
C <sub>s-calc</sub>	0.181 See 2.7.7.1.1
C <sub>s-min</sub>	0.016 See 2.7.7.1.1
C <sub>s</sub>	0.181 See 2.7.7.1.1
A <sub>s</sub>	1.000 See 16.7

Rooftop Wind Speed-Up Factor		Ks	No	
Horizontal distance from windward face to center of structure	Xb (ft)	1		Section 2.6.7
Width of windward face of the building	Ws (ft)	100		Section 2.6.7
Height of the parapet wall	Hp (ft)	5		Section 2.6.7
Height of windward face of the building	Hs (ft)	164.00		Section 2.6.7
Height of structure above roof	Z' (ft)	10.00		Section 2.6.7
	H1 (ft)	5.2		Section 2.6.7
	H2 (ft)	105.00		Section 2.6.7

Appurtenance Properties										Loads (force per connection)									
Manufacturer	Model	R/F	L	W	D	Weight	# Conn	Wt	Ice Wt	F no ice	S no ice	F ice	S ice	Fm	Sm	Eh	Ev	EPA.F	
CCIAntennas	DMP65R-BU6DA	Flat	71.2	20.7	7.7	79.4	2	39.7	52.6	300	133	54	27	17	7	7	7	2	13
Ericsson	AIR 6419 B77G	Flat	28.3	16.1	7.9	77	2	38.5	24.1	90	46	18	10	5	3	7	2	4	4
Ericsson	AIR 6449 B77D	Flat	30.4	15.9	8.1	81.6	2	40.8	25.8	95	51	19	11	5	3	7	2	4	4
Quintel	QD6616-7	Flat	72	22	9.6	59.1	2	29.6	63.2	321	161	57	32	18	9	5	2	14	4
Ericsson	RRUS-4449 BS & B12	Flat	15	13.2	9.3	70	2	35.0	17.1	39	27	9	6	2	2	6	2	2	2
Ericsson	RRUS-32 B30	Flat	27.2	12.1	7	60	2	30.0	20.2	65	39	13	9	4	2	5	2	3	3
Ericsson	RRUS-4478 B14	Flat	16.5	13.4	7.7	44	2	22.0	15.7	44	25	9	6	2	1	4	1	2	2
Ericsson	RRUS-32 B2	Flat	27.2	12.1	7	60	2	30.0	20.2	65	39	13	9	4	2	5	2	3	3
Ericsson	RRUS-32 B66A	Flat	27.2	12.1	7	60	2	30.0	20.2	65	39	13	9	4	2	5	2	3	3
Raycap	DC6-48-60-18-8F	Round	24	9.7	9.7	32.8	1	32.8	18.3	38	38	8	8	2	2	6	2	1	1
Raycap	DC9-48-60-24-8C-EV	Round	17.91	10.24	10.24	26.2	1	26.2	20.1	30	30	7	7	2	2	5	2	1	1

Shape Properties							Loads (force per connection)											
Shape Type	Shape	R/F	L	W	D	Wt (plf)	# Conn	Wt	Ice Wt	F no ice	S no ice	F ice	S ice	Fm	Sm	Eh	Ev	EPA.F
Pipe	Pipe 3 Std.	Round	169	3.5	3.5	7.58	14.0833	106.75	7.8	15	15	4	4	1	1	1	0.4	4
Pipe	Pipe 2½ Std.	Round	169	2.88	2.88	5.80	14.0833	81.68	6.8	14	14	4	4	1	1	1	0.3	4
HSS	HSS4x4x¼	Flat	78	4	4	12.21	6.5	79.37	11.3	29	29	7	7	2	2	2	1	4
HSS	HSS4x4x¼	Flat	31	4	4	12.21	2.58333	31.54	11.3	22	22	6	6	1	1	1	1	1
Angle	L2x2x¼	Flat	52	2	2	3.19	4.33333	13.82	6.7	16	16	5	5	1	1	1	0.2	1
Pipe	Pipe 2½ Std.	Round	62	2.88	2.88	5.80	5.16667	29.97	6.8	13	13	3	3	1	1	1	0.9	1
Plate	PL3/8"x6"	Flat	18	6	0.375	7.66	1.5	11.48	11.9	29	3	7	3	2	0.2	1	0.4	1
Plate	PL5/8"x6"	Flat	12	6	0.5	10.21	1	10.21	11.9	28	4	8	3	2	0.2	2	1	1
Solid_Rod	SR 5/16" Dia. Cable	Round	84	0.3125	0.3125	0.15	7	1.05	2.6	1	1	2	2	0.1	0.1	0.03	0.01	0.2
Pipe	Pipe 2½ Std.	Round	120	2.88	2.88	5.80	10	58.00	6.8	14	14	4	4	1	1	1	0.3	3
Pipe	Pipe 2 Std.	Round	60	2.38	2.38	3.66	5	18.30	6.0	11	11	3	3	1	1	1	0.2	1



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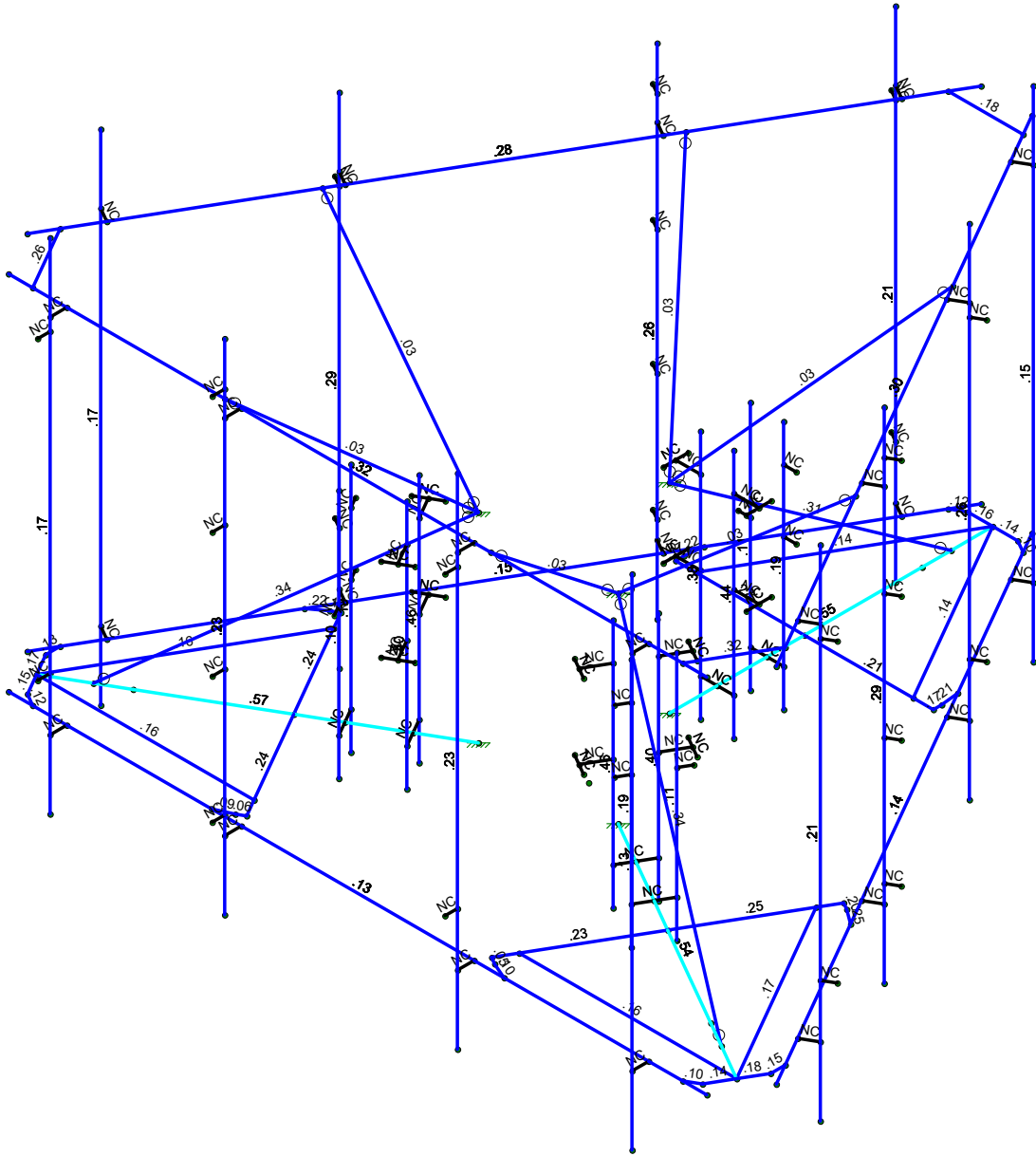
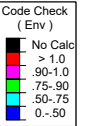
CTL02120

Mount Analysis  
3D Render

SK - 1

June 14, 2022 at 3:21 PM

CTL02102-Mount Analysis.r3d



Member Code Checks Displayed (Enveloped)  
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CTL02120

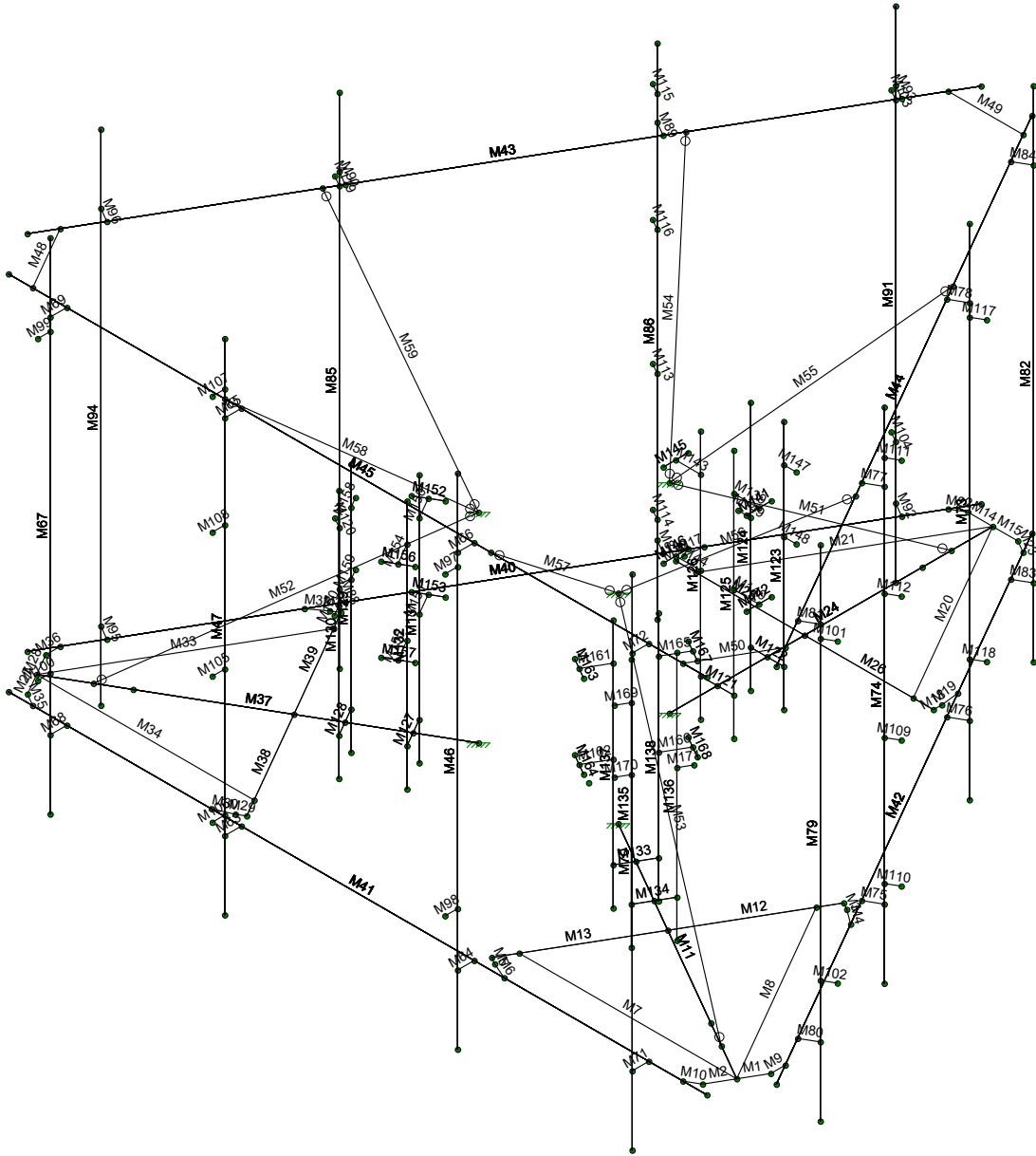
Mount Analysis  
Unity Graphic

SK - 2

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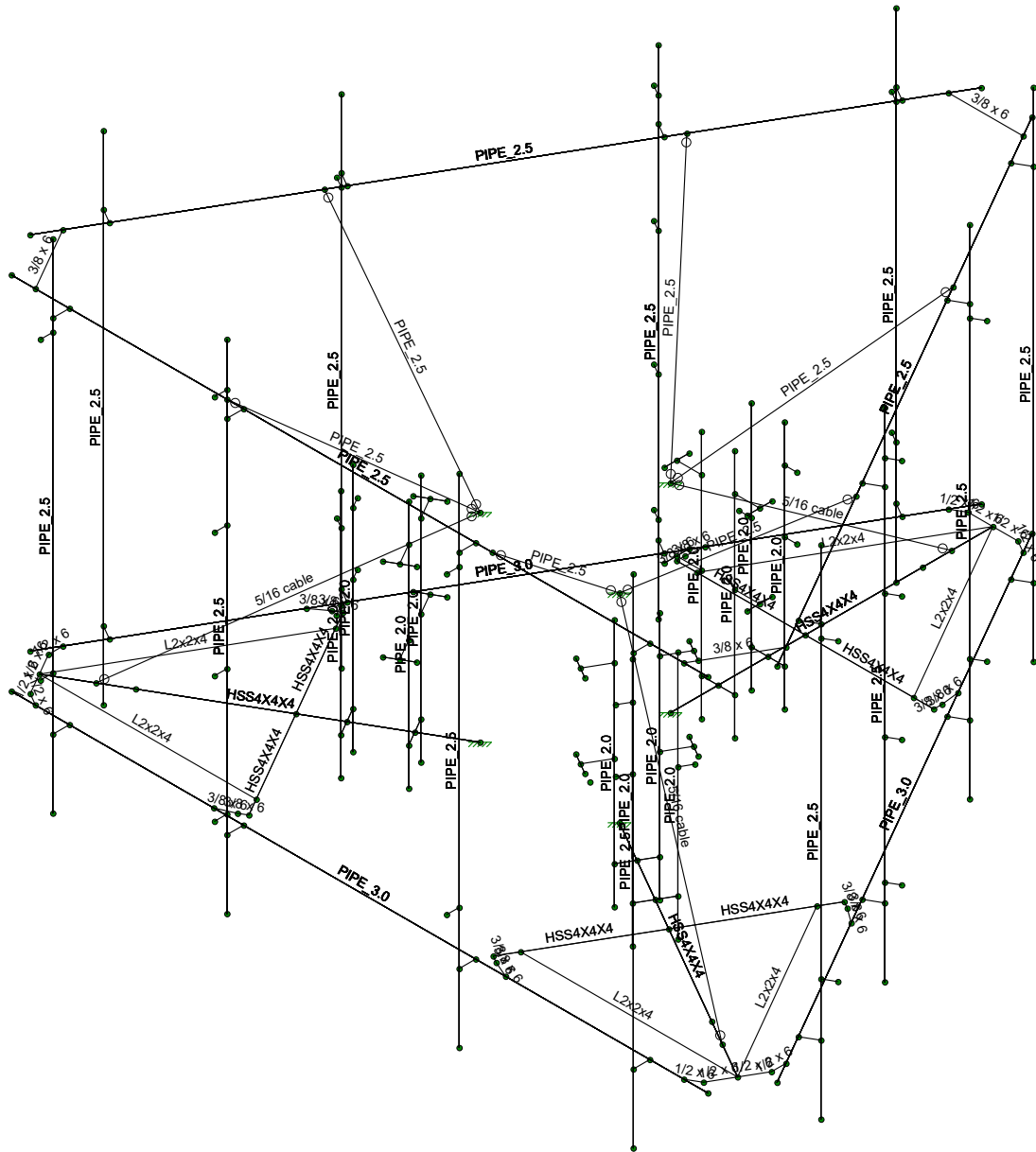
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Mount Analysis  
Member Label

SK - 3

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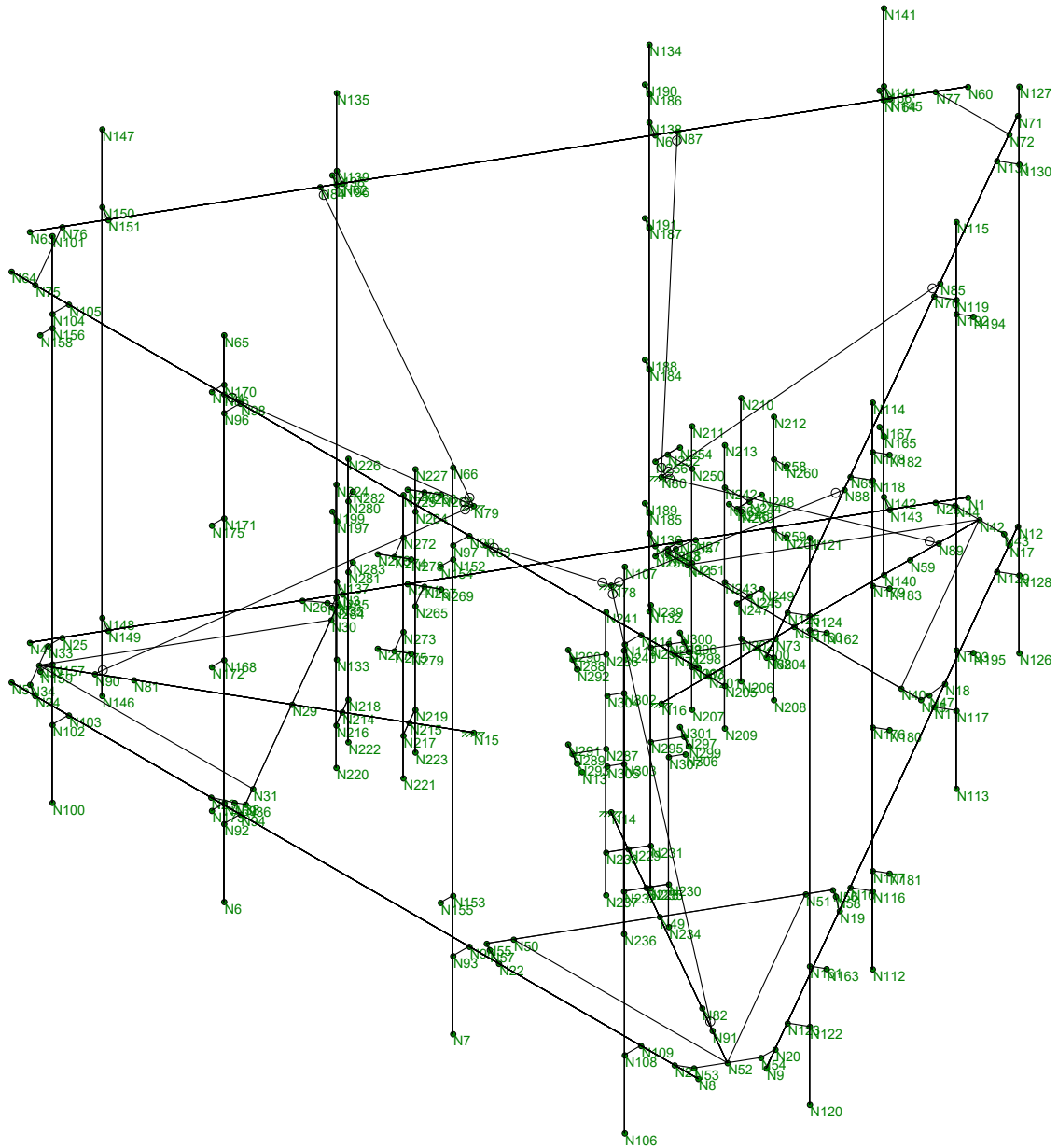
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Mount Analysis  
Shape

SK - 4

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CTL02120

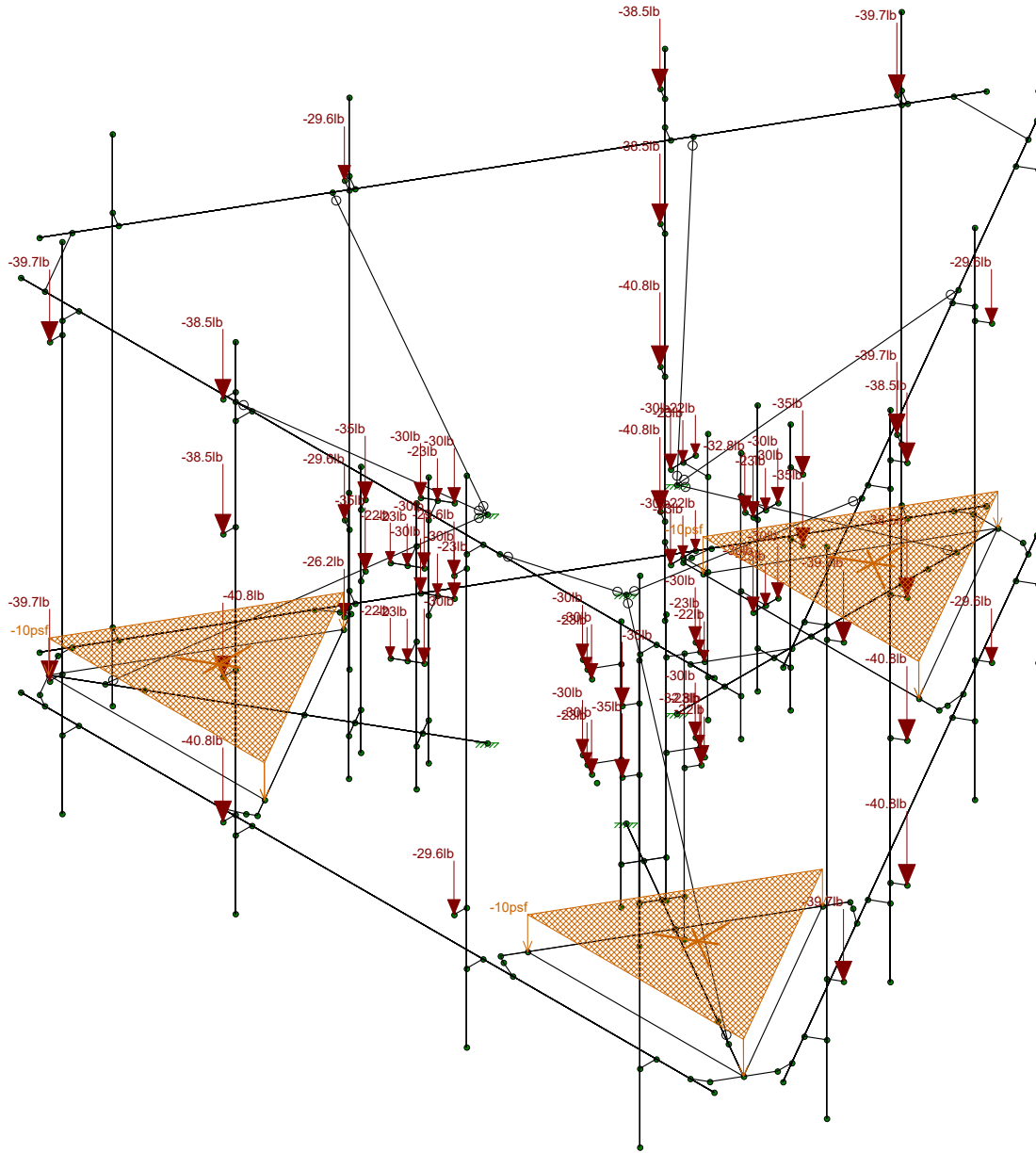
Mount Analysis

Nodes

SK - 5

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CTL02102-Mount Analysis.r3d



Loads: BLC 1, DL  
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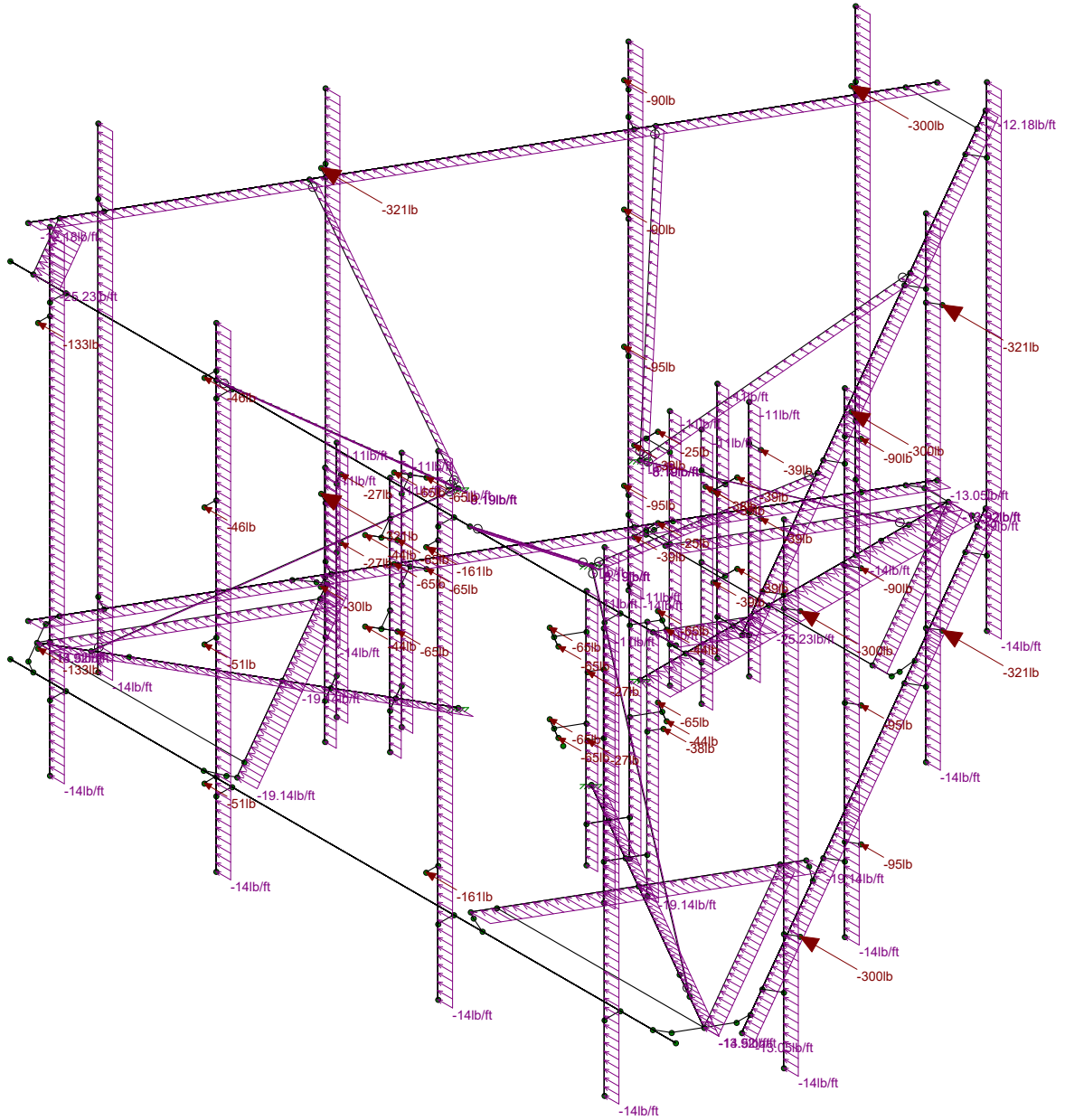
Mount Analysis  
Dead Load

SK - 6

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CTL02102-Mount Analysis.r3d





Loads: BLC 4, WL(90)  
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GO

CTL02120

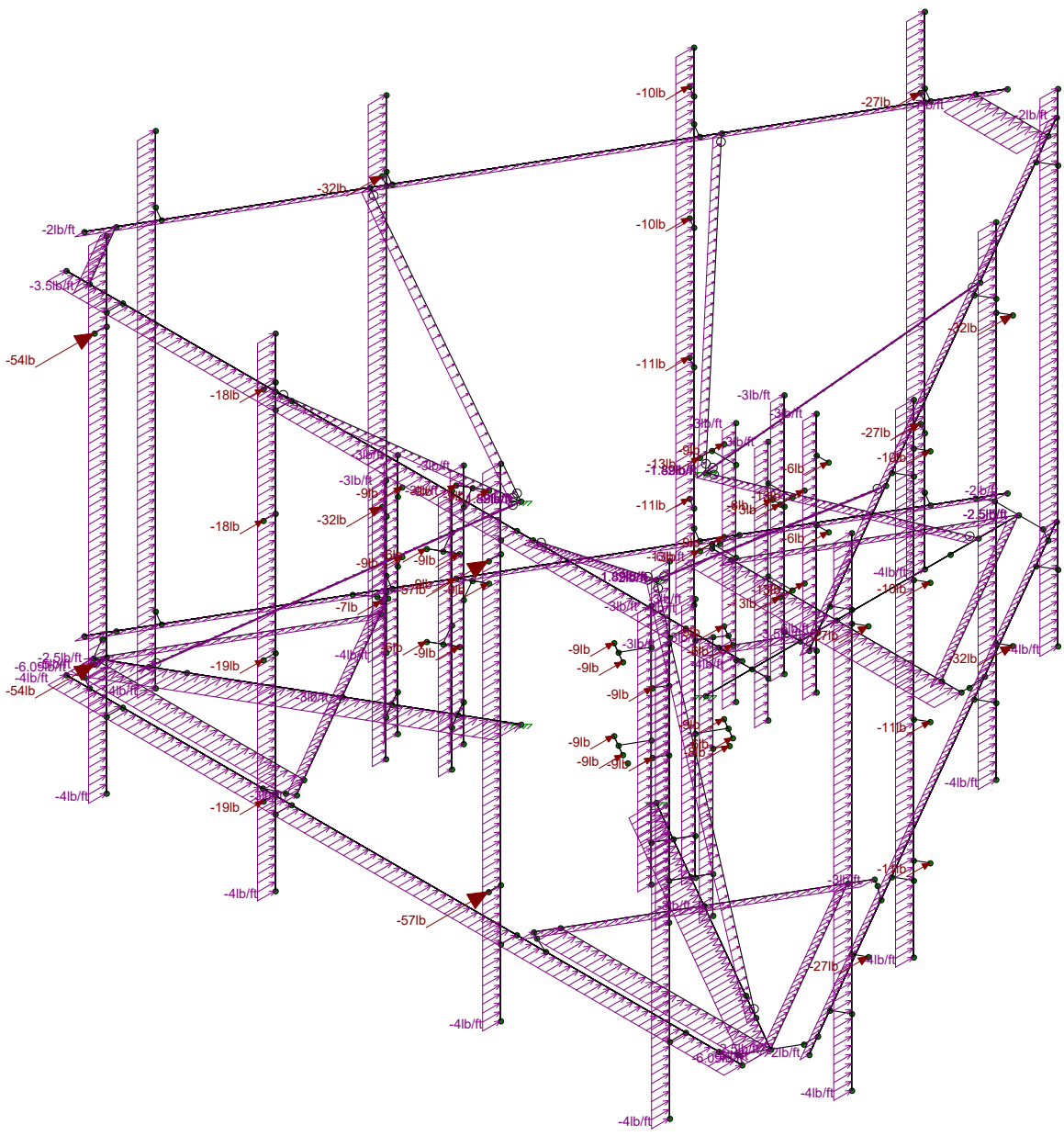
Mount Analysis  
Wind Load (X-Direction)

SK - 8

June 14, 2022 at 3:29 PM

CTL02102-Mount Analysis.r3d

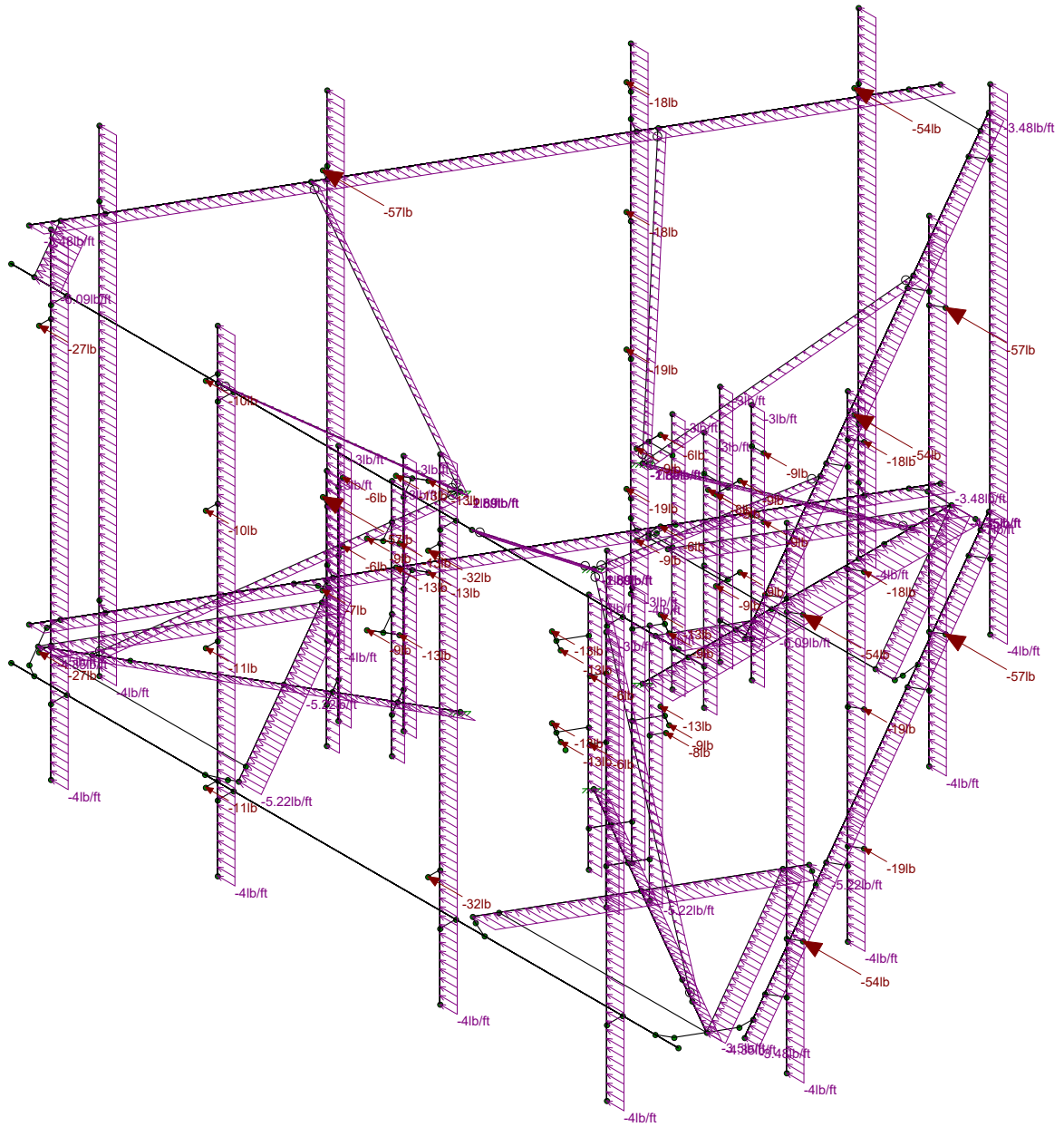
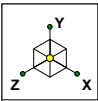




Loads: BLC 5, WL.i(0)  
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Fullerton Engineering, P.C.		SK - 10
GO	Mount Analysis Wind Load with Ice (Z-Direction)	June 14, 2022 at 3:29 PM
CTL02120		CTL02102-Mount Analysis.r3d



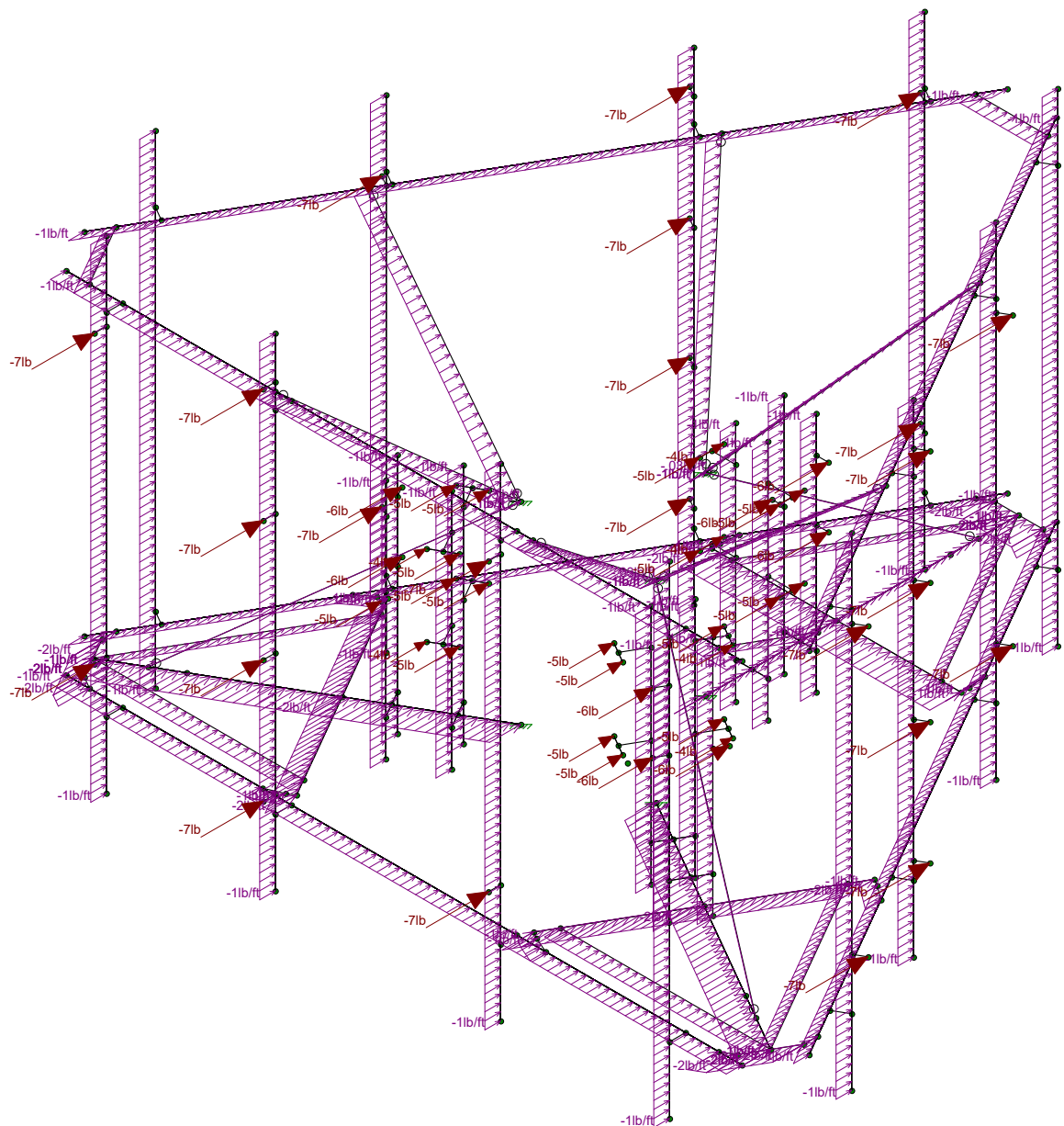
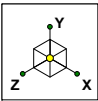


Loads: BLC 6, WL.i(90)  
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Mount Analysis  
Wind Load with Ice (X-Direction)

SK - 11  
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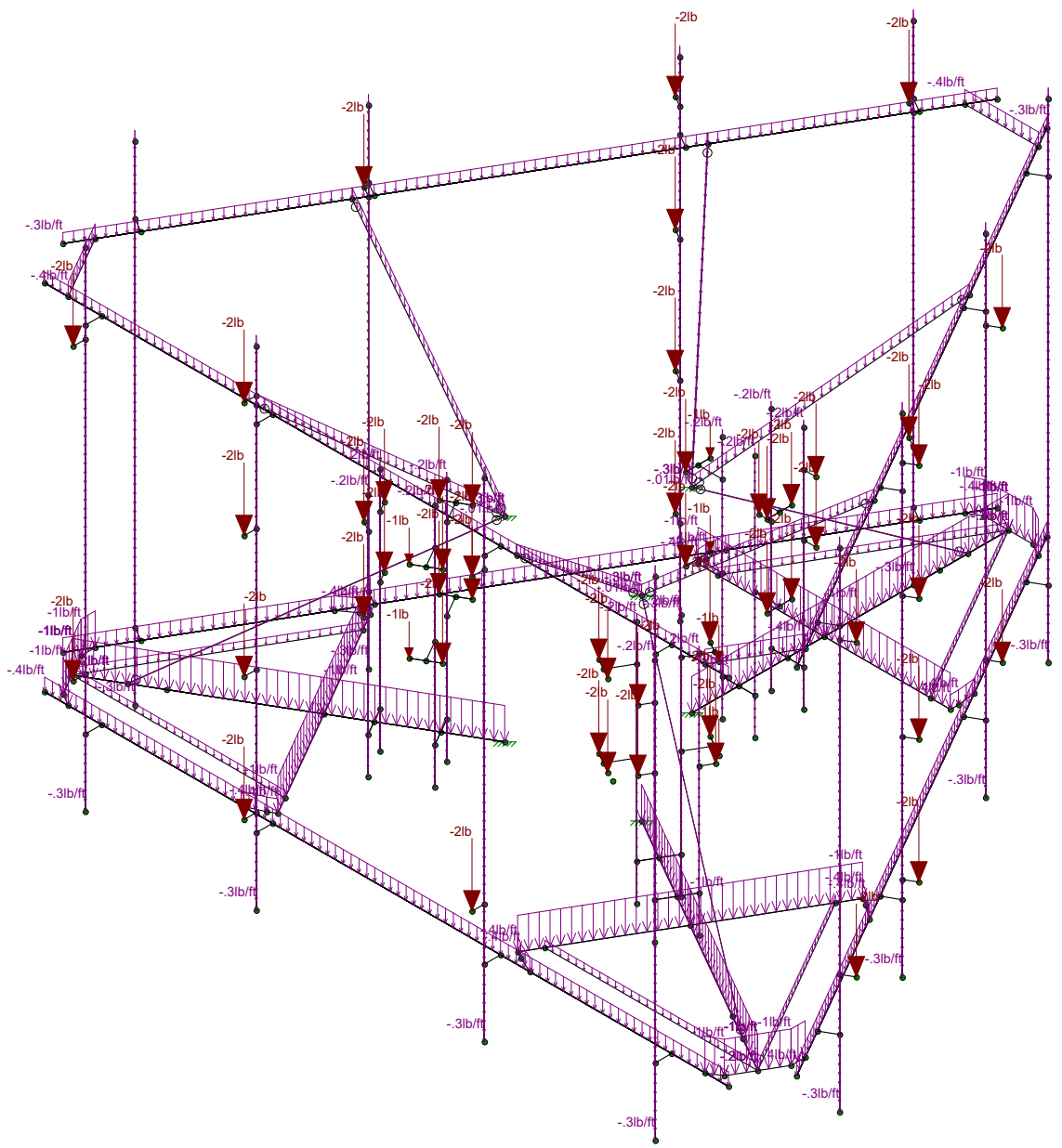


Loads: BLC 8, EH(0)  
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CTL02120

Mount Analysis  
Horizontal Seismic Load

SK - 12  
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CTL02102-Mount Analysis.r3d



Loads: BLC 10, EV  
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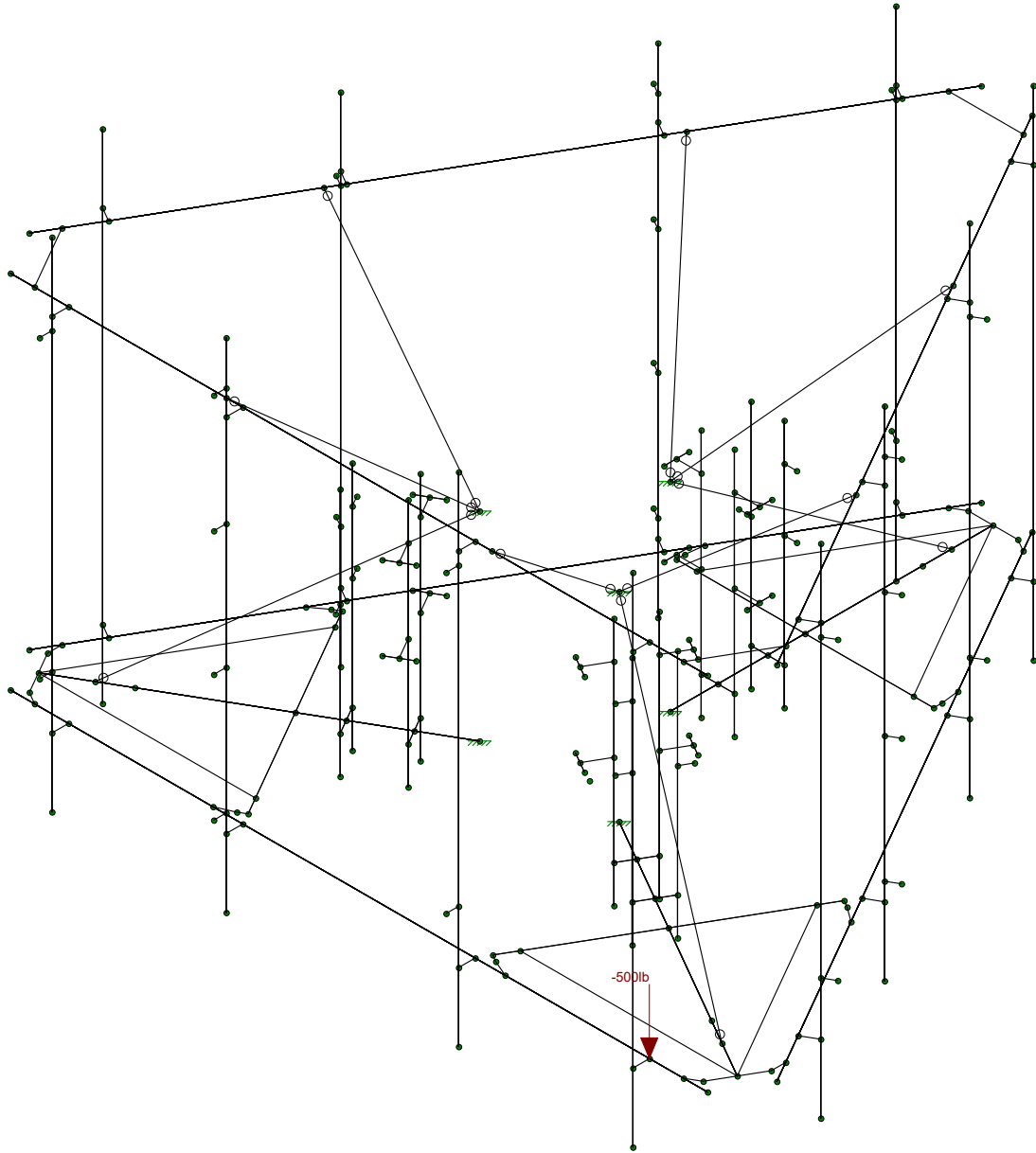
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Mount Analysis  
Vertical Seismic Load

SK - 13

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CTL02102-Mount Analysis.r3d



Loads: BLC 13, LM1  
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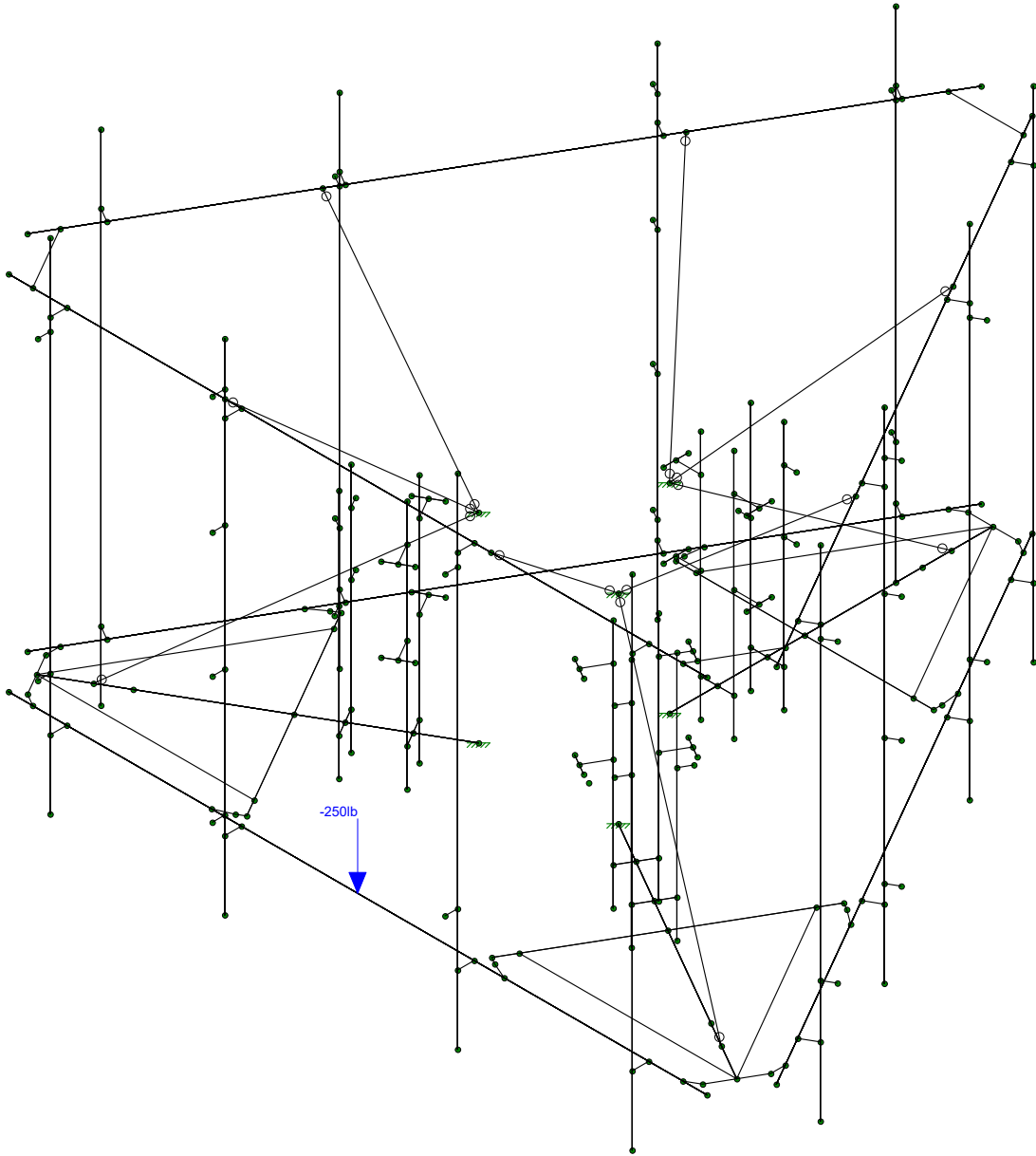
CTL02120

Mount Analysis  
500lb Live Load

SK - 14

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CTL02102-Mount Analysis.r3d



Loads: BLC 25, LV1  
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CTL02120

Mount Analysis  
250lb Live Load

SK - 15

June 14, 2022 at 3:31 PM

CTL02102-Mount Analysis.r3d

**(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?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Standard Skyline
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	No
RISACONNECTION CODE	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-16: LRFD
Wood Code	AF&PA NDS-91/97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
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 7-16
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	No
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	Not Entered
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

**Hot Rolled Steel Design Parameters**

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp to...	Lcomp b...	L-torque[j...	Kyy	Kzz	Cb	Func...
1	M1	1/2 x 6	6			Lbyy			.65	.65		Lateral
2	M2	1/2 x 6	6			Lbyy			.65	.65		Lateral
3	M3	3/8 x 6	2			Lbyy			.65	.65		Lateral
4	M4	3/8 x 6	4.366			Lbyy			.65	.65		Lateral
5	M5	3/8 x 6	2			Lbyy			.65	.65		Lateral
6	M6	3/8 x 6	4.366			Lbyy			.65	.65		Lateral
7	M7	L2x2x4	52.309			Lbyy			.65	.65		Lateral
8	M8	L2x2x4	52.309			Lbyy			.65	.65		Lateral
9	M9	1/2 x 6	3.473			Lbyy			.65	.65		Lateral
10	M10	1/2 x 6	3.473			Lbyy			.65	.65		Lateral
11	M11	HSS4X4X4	77.782			Lbyy			.65	.65		Lateral
12	M12	HSS4X4X4	31			Lbyy			.65	.65		Lateral
13	M13	HSS4X4X4	31			Lbyy			.65	.65		Lateral
14	M14	1/2 x 6	5.996			Lbyy			.65	.65		Lateral
15	M15	1/2 x 6	6.004			Lbyy			.65	.65		Lateral
16	M16	3/8 x 6	2			Lbyy			.65	.65		Lateral
17	M17	3/8 x 6	4.366			Lbyy			.65	.65		Lateral
18	M18	3/8 x 6	2			Lbyy			.65	.65		Lateral
19	M19	3/8 x 6	4.366			Lbyy			.65	.65		Lateral
20	M20	L2x2x4	52.311			Lbyy			.65	.65		Lateral
21	M21	L2x2x4	52.307			Lbyy			.65	.65		Lateral
22	M22	1/2 x 6	3.473			Lbyy			.65	.65		Lateral
23	M23	1/2 x 6	3.473			Lbyy			.65	.65		Lateral
24	M24	HSS4X4X4	77.814			Lbyy			.65	.65		Lateral
25	M25	HSS4X4X4	30.996			Lbyy			.65	.65		Lateral
26	M26	HSS4X4X4	31.004			Lbyy			.65	.65		Lateral
27	M27	1/2 x 6	5.989			Lbyy			.65	.65		Lateral
28	M28	1/2 x 6	6.011			Lbyy			.65	.65		Lateral
29	M29	3/8 x 6	2			Lbyy			.65	.65		Lateral
30	M30	3/8 x 6	4.366			Lbyy			.65	.65		Lateral



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

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp to...	Lcomp b...	L-torque[ji...	Kyy	Kzz	Cb	Func...
31	M31	3/8 x 6	2			Lbyy			.65	.65		Lateral
32	M32	3/8 x 6	4.366			Lbyy			.65	.65		Lateral
33	M33	L2x2x4	52.315			Lbyy			.65	.65		Lateral
34	M34	L2x2x4	52.304			Lbyy			.65	.65		Lateral
35	M35	1/2 x 6	3.473			Lbyy			.65	.65		Lateral
36	M36	1/2 x 6	3.473			Lbyy			.65	.65		Lateral
37	M37	HSS4X4X4	77.814			Lbyy			.65	.65		Lateral
38	M38	HSS4X4X4	30.989			Lbyy			.65	.65		Lateral
39	M39	HSS4X4X4	31.011			Lbyy			.65	.65		Lateral
40	M40	PIPE 3.0	167.989	56	56	56	56	56	2.1	2.1		Lateral
41	M41	PIPE 3.0	167.989	56	56	56	56	56	2.1	2.1		Lateral
42	M42	PIPE 3.0	167.989	56	56	56	56	56	2.1	2.1		Lateral
43	M43	PIPE 2.5	167.989	56	56	56	56	56	2.1	2.1		Lateral
44	M44	PIPE 2.5	167.989	56	56	56	56	56	2.1	2.1		Lateral
45	M45	PIPE 2.5	167.989	56	56	56	56	56	2.1	2.1		Lateral
46	M46	PIPE 2.5	120	87	87	87	87	87	2.1	2.1		Lateral
47	M47	PIPE 2.5	120	87	87	87	87	87	2.1	2.1		Lateral
48	M48	3/8 x 6	18.031			Lbyy			.65	.65		Lateral
49	M49	3/8 x 6	18.031			Lbyy			.65	.65		Lateral
50	M50	3/8 x 6	18.031			Lbyy			.65	.65		Lateral
51	M51	5/16 cable	83.082			Lbyy			1	1		Lateral
52	M52	5/16 cable	83.083			Lbyy			1	1		Lateral
53	M53	5/16 cable	83.056			Lbyy			1	1		Lateral
54	M54	PIPE 2.5	62.079			Lbyy			1	1		Lateral
55	M55	PIPE 2.5	62.084			Lbyy			1	1		Lateral
56	M56	PIPE 2.5	62.061			Lbyy			1	1		Lateral
57	M57	PIPE 2.5	62.061			Lbyy			1	1		Lateral
58	M58	PIPE 2.5	62.076			Lbyy			1	1		Lateral
59	M59	PIPE 2.5	62.087			Lbyy			1	1		Lateral
60	M60	PIPE 2.0	64.234			Lbyy			1	1		Lateral
61	M61	PIPE 2.0	64.24			Lbyy			1	1		Lateral
62	M62	PIPE 2.0	64.234			Lbyy			1	1		Lateral
63	M67	PIPE 2.5	120	87	87	87	87	87	2.1	2.1		Lateral
64	M70	PIPE 2.5	120	87	87	87	87	87	2.1	2.1		Lateral
65	M73	PIPE 2.5	120	87	87	87	87	87	2.1	2.1		Lateral
66	M74	PIPE 2.5	120	87	87	87	87	87	2.1	2.1		Lateral
67	M79	PIPE 2.5	120	87	87	87	87	87	2.1	2.1		Lateral
68	M82	PIPE 2.5	120	87	87	87	87	87	2.1	2.1		Lateral
69	M85	PIPE 2.5	120	87	87	87	87	87	2.1	2.1		Lateral
70	M86	PIPE 2.5	120	87	87	87	87	87	2.1	2.1		Lateral
71	M91	PIPE 2.5	120	87	87	87	87	87	2.1	2.1		Lateral
72	M94	PIPE 2.5	120	87	87	87	87	87	2.1	2.1		Lateral
73	M123	PIPE 2.0	60			Lbyy			2.1	2.1		Lateral
74	M124	PIPE 2.0	60			Lbyy			2.1	2.1		Lateral
75	M125	PIPE 2.0	60			Lbyy			2.1	2.1		Lateral
76	M126	PIPE 2.0	60			Lbyy			2.1	2.1		Lateral
77	M129	PIPE 2.0	60			Lbyy			2.1	2.1		Lateral
78	M130	PIPE 2.0	60			Lbyy			2.1	2.1		Lateral
79	M131	PIPE 2.0	60			Lbyy			2.1	2.1		Lateral
80	M132	PIPE 2.0	60			Lbyy			2.1	2.1		Lateral
81	M135	PIPE 2.0	60			Lbyy			2.1	2.1		Lateral
82	M136	PIPE 2.0	60			Lbyy			2.1	2.1		Lateral
83	M137	PIPE 2.0	60			Lbyy			2.1	2.1		Lateral
84	M138	PIPE 2.0	60			Lbyy			2.1	2.1		Lateral



### Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		87	386.9	0
3	Total General		87	386.9	0
4					
5	Hot Rolled Steel				
6	A53 Gr.B	PIPE 3.0	3	504	.296
7	A53 Gr.B	PIPE 2.5	21	2316.4	1.058
8	A53 Gr.B	PIPE 2.0	15	912.7	.264
9	Cable	5/16 cable	3	249.2	0
10	Q235	1/2 x 6	12	56.8	.048
11	Q235	3/8 x 6	15	92.3	.059
12	Q235	HSS4X4X4	9	419.4	.401
13	Q235	L2x2x4	6	313.9	.084
14	Total HR Steel		84	4864.7	2.209

### Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	DL	None		-1		69			3	
2	DLi	None				57		81	3	
3	WL(0)	None				57		56		
4	WL(90)	None				57		50		
5	WL.i(0)	None				57		56		
6	WL.i(90)	None				57		50		
7	T	None								
8	EH(0)	None				57		81		
9	EH(90)	None				57		81		
10	EV	None				57		81		
11	WM(0)	None				57		56		
12	WM(90)	None				57		50		
13	LM1	None				1				
14	LM2	None				1				
15	LM3	None				1				
16	LM4	None				1				
17	LM5	None				1				
18	LM6	None				1				
19	LM7	None				1				
20	LM8	None				1				
21	LM9	None				1				
22	LM10	None				1				
23	LM11	None				1				
24	LM12	None				1				
25	LV1	None					1			
26	LV2	None					1			
27	LV3	None					1			
28	LV4	None					1			
29	LV5	None					1			
30	LV6	None					1			
31	LV7	None					1			
32	LV8	None					1			
33	LV9	None					1			
34	BLC 1 Transient Area Loads	None						21		
35	BLC 2 Transient Area Loads	None						21		









### Load Combinations (Continued)

Description	S...	PD...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...
171 1.2*DL+1.5*LM11+1.0*WM(270)	Y	Y		1	1.2	23	1.5	12	-1									
172 1.2*DL+1.5*LM11+1.0*WM(300)	Y	Y		1	1.2	23	1.5	11	.5	12	-8...							
173 1.2*DL+1.5*LM11+1.0*WM(330)	Y	Y		1	1.2	23	1.5	11	.866	12	-.5							
174 1.2*DL+1.5*LM12+1.0*WM(0)	Y	Y		1	1.2	24	1.5	11	1									
175 1.2*DL+1.5*LM12+1.0*WM(30)	Y	Y		1	1.2	24	1.5	11	.866	12	.5							
176 1.2*DL+1.5*LM12+1.0*WM(60)	Y	Y		1	1.2	24	1.5	11	.5	12	.866							
177 1.2*DL+1.5*LM12+1.0*WM(90)	Y	Y		1	1.2	24	1.5	12	1									
178 1.2*DL+1.5*LM12+1.0*WM(120)	Y	Y		1	1.2	24	1.5	11	-.5	12	.866							
179 1.2*DL+1.5*LM12+1.0*WM(150)	Y	Y		1	1.2	24	1.5	11	-.8	12	.5							
180 1.2*DL+1.5*LM12+1.0*WM(180)	Y	Y		1	1.2	24	1.5	11	-1									
181 1.2*DL+1.5*LM12+1.0*WM(210)	Y	Y		1	1.2	24	1.5	11	-.8	12	-.5							
182 1.2*DL+1.5*LM12+1.0*WM(240)	Y	Y		1	1.2	24	1.5	11	-.5	12	-8...							
183 1.2*DL+1.5*LM12+1.0*WM(270)	Y	Y		1	1.2	24	1.5	12	-1									
184 1.2*DL+1.5*LM12+1.0*WM(300)	Y	Y		1	1.2	24	1.5	11	.5	12	-8...							
185 1.2*DL+1.5*LM12+1.0*WM(330)	Y	Y		1	1.2	24	1.5	11	.866	12	-.5							
186 1.2*DL+1.5*LV1	Y	Y		1	1.2	25	1.5											
187 1.2*DL+1.5*LV2	Y	Y		1	1.2	26	1.5											
188 1.2*DL+1.5*LV3	Y	Y		1	1.2	27	1.5											
189 1.2*DL+1.5*LV4	Y	Y		1	1.2	28	1.5											
190 1.2*DL+1.5*LV5	Y	Y		1	1.2	29	1.5											
191 1.2*DL+1.5*LV6	Y	Y		1	1.2	30	1.5											
192 1.2*DL+1.5*LV7	Y	Y		1	1.2	31	1.5											
193 1.2*DL+1.5*LV8	Y	Y		1	1.2	32	1.5											
194 1.2*DL+1.5*LV9	Y	Y		1	1.2	33	1.5											

### Envelope Joint Reactions

Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC	
1	N15	max	692.602	5	2409.711	18	2067.987	13	2.227	13	1.745	13	3.564	12
2		min	-2400.353	12	-447.49	12	-1119.969	8	-3.449	8	-1.736	7	-5.053	5
3	N16	max	1758.944	5	2385.417	14	689.902	2	5.184	2	3.01	11	2.174	11
4		min	-1765.107	11	-91.297	8	-2613.851	8	-3.167	8	-3.015	5	-2.239	5
5	N14	max	2502.139	4	2415.708	22	1892.598	3	2.168	3	1.103	9	5.152	11
6		min	-742.385	11	-458.881	4	-945.006	8	-3.334	8	-1.115	3	-3.635	4
7	N78	max	1219.874	4	1477.726	4	758.57	3	.063	5	.019	8	.064	11
8		min	-3231.79	10	398.657	34	-1837.17	9	-.041	11	-.032	2	-.131	4
9	N79	max	3130.924	6	1459.675	12	897.215	13	.044	11	.065	13	.142	12
10		min	-1132.903	12	397.853	38	-1982.804	7	-.031	3	-.07	7	-.089	7
11	N80	max	650.588	5	1188.385	8	3227.627	2	.067	3	.093	11	.094	5
12		min	-649.172	11	398.31	36	-1101.792	8	-.124	8	-.102	5	-.086	11
13	Totals:	max	9750.891	5	10063.743	25	8885.12	2						
14		min	-9750.768	11	3844.626	36	-8884.45	8						

Stress ratio <1.0, members are adequate

### Envelope AISC 15th(360-16): LRFD Steel Code Checks

Member	Shape	Code Check	Loc[in]	LC	Shear Ch	Loc[in]	LC	phi*Pn	phi*Pn	phi*M	phi*M	...	Eqn	
1	M37	HSS4X4X4	.573	77.814	6	.258	77.814	y	9	97607...	103122	11.96	11.96	H1-1b
2	M24	HSS4X4X4	.549	77.814	13	.284	77.814	z	5	97607...	103122	11.96	11.96	H1-1b
3	M11	HSS4X4X4	.539	77.782	10	.260	77.782	y	12	97612...	103122	11.96	11.96	H1-1b
4	M131	PIPE 2.0	.463	50.625	5	.100	50.625		12	8922...	32130	1.872	1.872	H1-1b
5	M137	PIPE 2.0	.462	50.625	5	.100	50.625		10	8922...	32130	1.872	1.872	H1-1b
6	M125	PIPE 2.0	.436	50.625	2	.110	50.625		2	8922...	32130	1.872	1.872	H1-1b
7	M132	PIPE 2.0	.401	50.625	11	.084	50.625		6	8922...	32130	1.872	1.872	H1-1b
8	M138	PIPE 2.0	.397	50.625	11	.088	50.625		5	8922...	32130	1.872	1.872	H1-1b
9	M126	PIPE 2.0	.378	50.625	8	.093	50.625		2	8922...	32130	1.872	1.872	H1-1b
10	M53	5/16 cable	.344	0	10	.003	83.056		15	15.326	8628...	.045	.045	H1-1a*



Stress ratio < 1.0, members are adequate

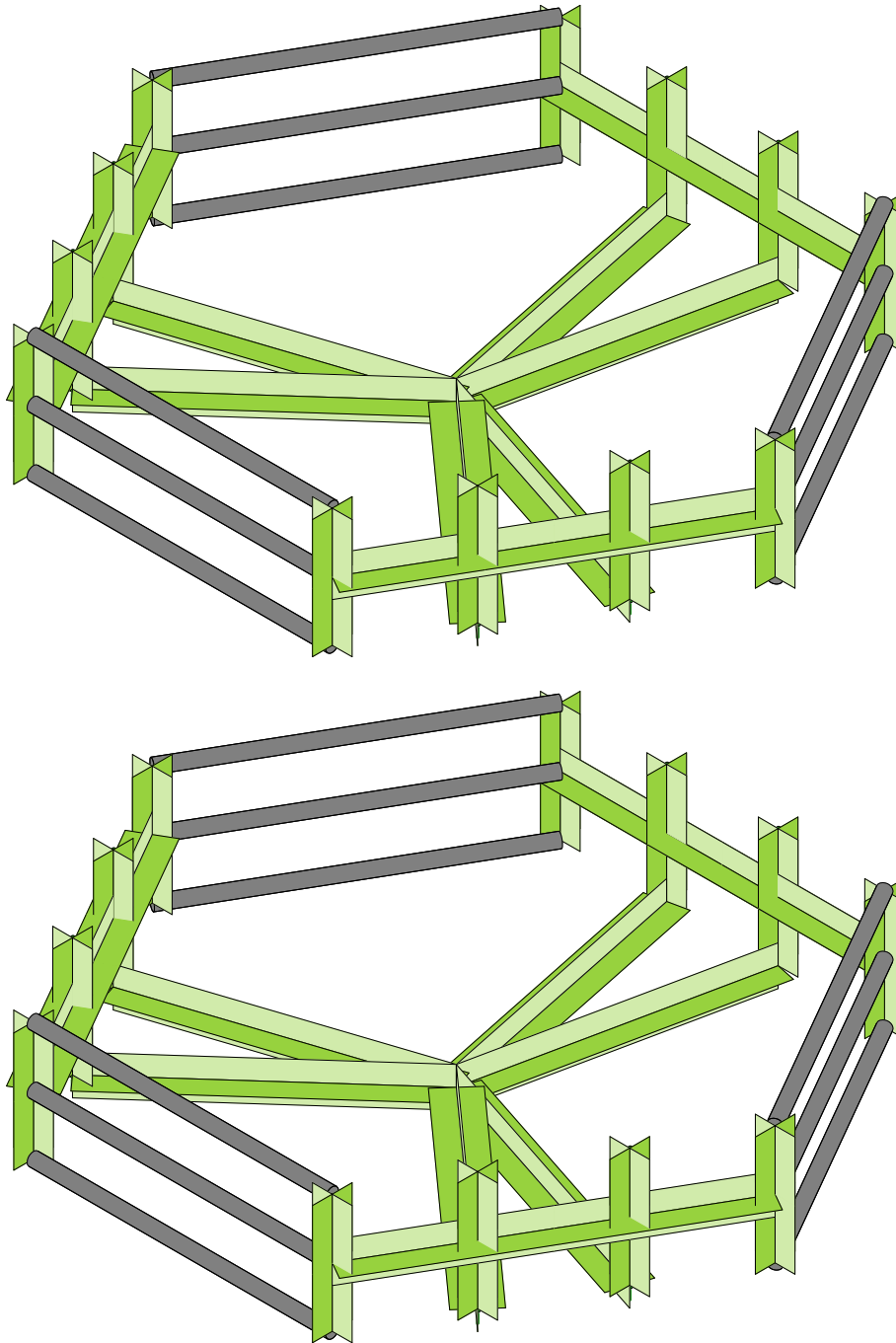
**Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)**

Member	Shape	Code Check	Loc[in]	LC	Shear Ch.	Loc[in]	LC	phi*Pn	phi*Pn	phi*M	phi*M	Eqn			
11	M52	5/16 cable	.341	0	6	.003	83.083	22	15.317	8628...	.045	.045	...	H1-1a*	
12	M50	3/8 x 6	.320	0	5	.034	8.031	y	12	38441...	68850	8.606	.538	...	H1-1b
13	M45	PIPE 2.5	.318	17.2...	12	.138	15...	13	23110...	50715	3.596	3.596	1	H1-1b	
14	M51	5/16 cable	.314	0	2	.003	83.082	18	15.317	8628...	.045	.045	...	H1-1a*	
15	M44	PIPE 2.5	.295	17.2...	5	.131	15...	5	23110...	50715	3.596	3.596	1	H1-1b	
16	M85	PIPE 2.5	.294	17.5	6	.067	17.5	7	9813...	50715	3.596	3.596	1	H1-1b	
17	M74	PIPE 2.5	.291	17.5	10	.047	17.5	8	9813...	50715	3.596	3.596	1	H1-1b	
18	M43	PIPE 2.5	.281	17.2...	9	.128	52.497	11	23110...	50715	3.596	3.596	1	H1-1b	
19	M86	PIPE 2.5	.264	17.5	13	.067	17.5	12	9813...	50715	3.596	3.596	1	H1-1b	
20	M73	PIPE 2.5	.263	17.5	3	.083	17.5	5	9813...	50715	3.596	3.596	1	H1-1b	
21	M48	3/8 x 6	.255	18.031	10	.032	0	y	9	38441...	68850	8.606	.538	...	H1-1b
22	M4	3/8 x 6	.254	4.366	11	.051	0	y	166	66537...	68850	8.606	.538	...	H1-1b
23	M12	HSS4X4X4	.250	31	11	.050	4.844	z	12	10222...	103122	11.96	11.96	...	H1-1b
24	M39	HSS4X4X4	.243	0	5	.047	26.166	z	10	10222...	103122	11.96	11.96	...	H1-1b
25	M38	HSS4X4X4	.236	30.989	7	.054	4.842	z	8	10222...	103122	11.96	11.96	...	H1-1b
26	M46	PIPE 2.5	.232	17.5	11	.058	17.5	13	9813...	50715	3.596	3.596	1	H1-1b	
27	M13	HSS4X4X4	.232	0	9	.049	26.156	z	2	10222...	103122	11.96	11.96	...	H1-1b
28	M47	PIPE 2.5	.228	17.5	6	.049	17.5	3	9813...	50715	3.596	3.596	1	H1-1b	
29	M17	3/8 x 6	.223	4.366	13	.068	0	y	11	66537...	68850	8.606	.538	...	H1-1b
30	M32	3/8 x 6	.222	4.366	6	.048	0	z	108	66537...	68850	8.606	.538	...	H1-1b
31	M25	HSS4X4X4	.217	30.996	3	.051	4.843	z	4	10222...	103122	11.96	11.96	...	H1-1b
32	M91	PIPE 2.5	.212	17.5	13	.098	17.5	10	9813...	50715	3.596	3.596	1	H1-1b	
33	M79	PIPE 2.5	.211	17.5	10	.105	102.5	5	9813...	50715	3.596	3.596	1	H1-1b	
34	M19	3/8 x 6	.210	4.366	4	.069	0	y	5	66537...	68850	8.606	.538	...	H1-1b
35	M26	HSS4X4X4	.209	0	13	.050	26.16	z	6	10222...	103122	11.96	11.96	...	H1-1b
36	M3	3/8 x 6	.198	0	11	.076	0	y	10	68358...	68850	8.606	.538	...	H1-1b
37	M123	PIPE 2.0	.189	50.625	11	.019	50.625	2	8922...	32130	1.872	1.872	...	H1-1b	
38	M135	PIPE 2.0	.187	50.625	8	.021	50.625	9	8922...	32130	1.872	1.872	...	H1-1b	
39	M129	PIPE 2.0	.187	50.625	2	.021	50.625	7	8922...	32130	1.872	1.872	...	H1-1b	
40	M1	1/2 x 6	.185	0	11	.102	0	y	10	88552...	91800	11.475	.956	...	H1-1b
41	M49	3/8 x 6	.184	0	9	.030	0	y	5	38441...	68850	8.606	.538	...	H1-1b
42	M28	1/2 x 6	.169	0	6	.112	0	y	6	88540...	91800	11.475	.956	...	H1-1b
43	M67	PIPE 2.5	.169	17.5	5	.098	102.5	13	9813...	50715	3.596	3.596	1	H1-1b	
44	M18	3/8 x 6	.168	0	4	.061	0	y	14	68358...	68850	8.606	.538	...	H1-1b
45	M16	3/8 x 6	.168	0	13	.059	0	y	2	68358...	68850	8.606	.538	...	H1-1b
46	M94	PIPE 2.5	.167	17.5	7	.077	17.5	11	9813...	50715	3.596	3.596	1	H1-1b	
47	M8	L2x2x4	.166	0	11	.010	0	z	22	19679...	28886.4	.653	1.489	...	H2-1
48	M33	L2x2x4	.165	0	5	.010	0	y	18	19677...	28886.4	.653	1.489	...	H2-1
49	M7	L2x2x4	.160	0	9	.010	0	y	22	19679...	28886.4	.653	1.489	...	H2-1
50	M34	L2x2x4	.158	0	7	.009	0	z	18	19681...	28886.4	.653	1.489	...	H2-1
51	M31	3/8 x 6	.157	0	5	.081	0	y	6	68358...	68850	8.606	.538	...	H1-1b
52	M14	1/2 x 6	.156	0	2	.096	0	y	3	88557...	91800	11.475	.956	...	H1-1b
53	M82	PIPE 2.5	.154	17.5	3	.079	17.5	7	9813...	50715	3.596	3.596	1	H1-1b	
54	M40	PIPE 3.0	.153	55.996	6	.075	7	3	38994...	65205	5.749	5.749	1	H1-1b	
55	M9	1/2 x 6	.150	3.473	11	.235	0	y	11	90698...	91800	11.475	.956	...	H1-1b
56	M27	1/2 x 6	.147	0	7	.108	0	y	6	88565...	91800	11.475	.956	...	H1-1b
57	M42	PIPE 3.0	.143	110.2...	4	.083	7	11	38994...	65205	5.749	5.749	1	H1-1b	
58	M21	L2x2x4	.141	0	3	.009	0	z	14	19680...	28886.4	.653	1.489	...	H2-1
59	M20	L2x2x4	.141	0	13	.010	0	y	14	19679...	28886.4	.653	1.489	...	H2-1
60	M15	1/2 x 6	.141	0	2	.100	0	y	2	88548...	91800	11.475	.956	...	H1-1b
61	M2	1/2 x 6	.137	0	10	.117	0	y	10	88552...	91800	11.475	.956	...	H1-1b
62	M41	PIPE 3.0	.133	55.996	11	.088	7	7	38994...	65205	5.749	5.749	1	H1-1b	
63	M36	1/2 x 6	.130	3.473	5	.193	0	y	5	90698...	91800	11.475	.956	...	H1-1b
64	M70	PIPE 2.5	.127	17.5	11	.073	17.5	3	9813...	50715	3.596	3.596	1	H1-1b	
65	M35	1/2 x 6	.122	3.473	7	.259	0	y	7	90698...	91800	11.475	.956	...	H1-1b
66	M22	1/2 x 6	.121	3.473	3	.217	0	y	3	90698...	91800	11.475	.956	...	H1-1b
67	M136	PIPE 2.0	.106	50.625	13	.015	50.625	10	8922...	32130	1.872	1.872	...	H1-1b	

**Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)**

Member	Shape	Code Check	Loc[in]	LC	Shear Ch...	Loc[in]	LC	phi*Pn...	phi*Pn...	phi*M...	phi*M...	Eqn			
68	M124	PIPE_2.0	.106	50.625	5	.014	50.625	2	8922....	32130	1.872	1.872	...	H1-1b	
69	M6	3/8 x 6	.104	4.366	11	.051	0	y	13	66537..	68850	8.606	.538	...	H1-1b
70	M10	1/2 x 6	.102	3.473	9	.212	0	y	9	90698..	91800	11.475	.956	...	H1-1b
71	M23	1/2 x 6	.100	3.473	13	.192	0	y	13	90698..	91800	11.475	.956	...	H1-1b
72	M130	PIPE_2.0	.095	50.625	9	.012	50.625	6	8922....	32130	1.872	1.872	...	H1-1b	
73	M30	3/8 x 6	.090	4.366	5	.056	0	y	3	66537..	68850	8.606	.538	...	H1-1b
74	M29	3/8 x 6	.061	0	8	.060	0	z	6	68358..	68850	8.606	.538	...	H1-1b
75	M5	3/8 x 6	.048	0	7	.067	0	z	10	68358..	68850	8.606	.538	...	H1-1b
76	M58	PIPE_2.5	.033	0	13	.055	0		12	40740..	50715	3.596	3.596	...	H1-1b*
77	M56	PIPE_2.5	.032	0	5	.041	62.061		4	40745..	50715	3.596	3.596	...	H1-1b*
78	M57	PIPE_2.5	.029	0	3	.048	62.061		4	40745..	50715	3.596	3.596	...	H1-1b*
79	M59	PIPE_2.5	.029	0	11	.031	0		11	40737..	50715	3.596	3.596	...	H1-1b*
80	M54	PIPE_2.5	.028	0	9	.044	62.079		9	40740..	50715	3.596	3.596	...	H1-1b*
81	M55	PIPE_2.5	.027	0	7	.046	0		7	40738..	50715	3.596	3.596	...	H1-1b*

Stress ratio <1.0, members are adequate



Envelope Only Solution

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GO

CTL02102

Collar Mount Analysis

3D Render

SK - 1

June 15, 2022 at 8:11 AM

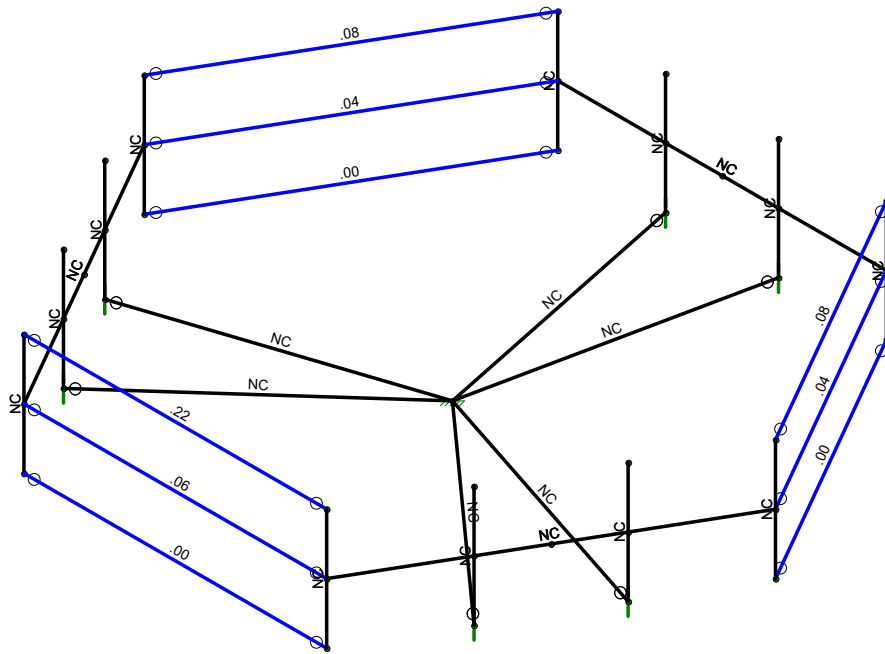
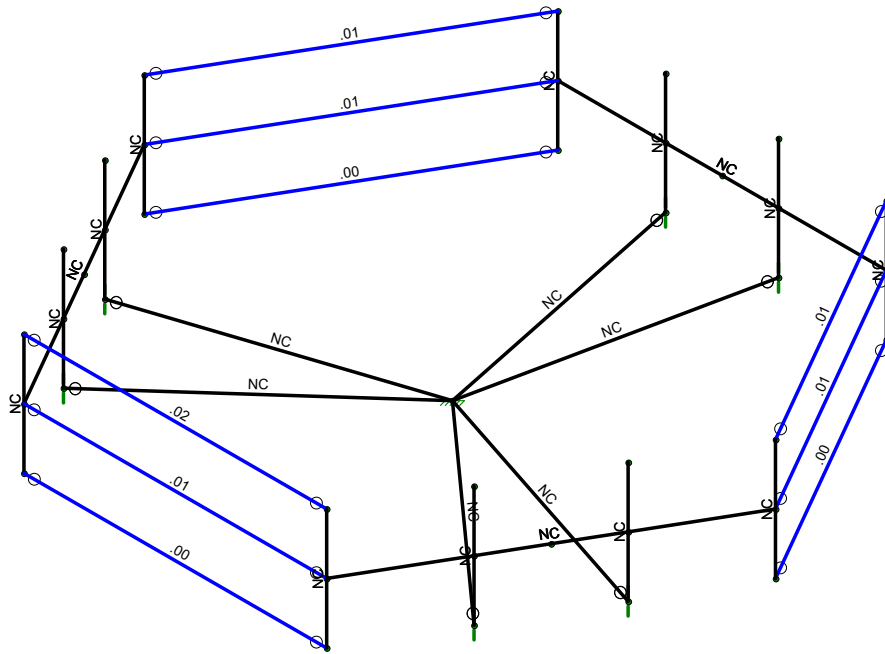
CTL02102-Collar Mount Analysis.r3d





Code Check ( Env )

Black	No Calc
Red	> 1.0
Magenta	.90-1.0
Green	.75-.90
Cyan	.50-.75
Blue	0-.50



Member Code Checks Displayed (Enveloped)  
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GO

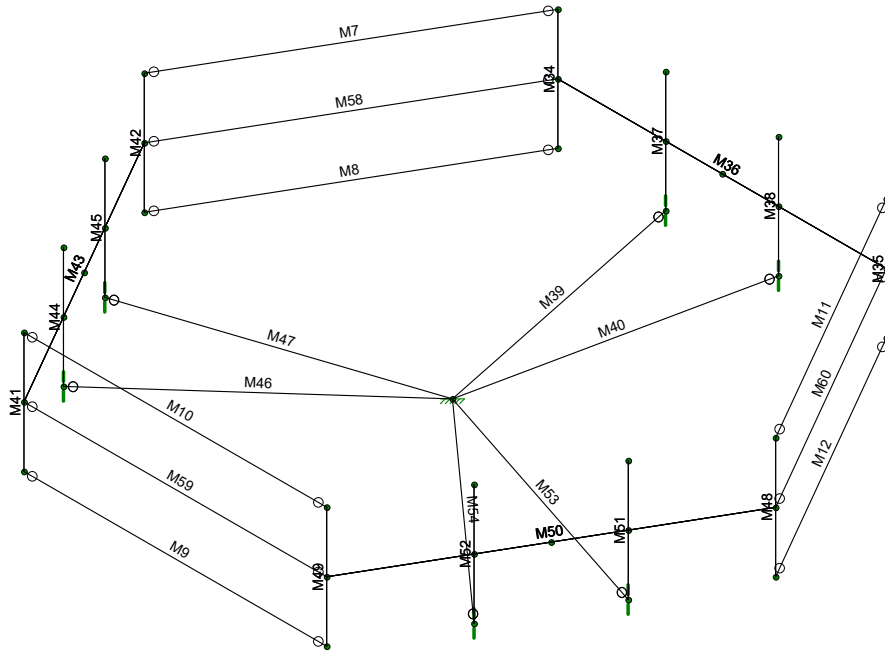
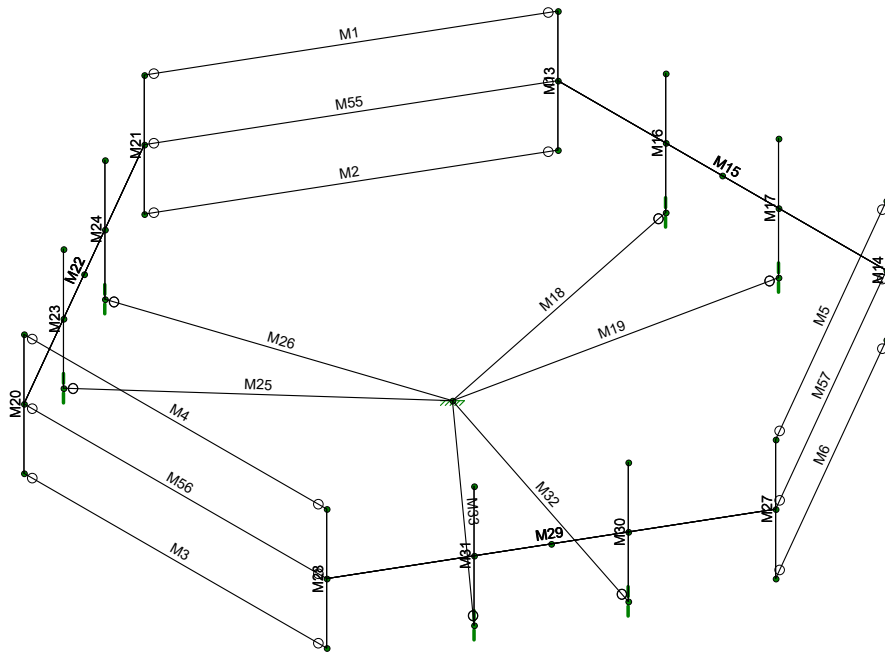
CTL02102

Collar Mount Analysis  
Unity Graphic

SK - 2

June 15, 2022 at 8:11 AM

CTL02102-Collar Mount Analysis.r3d



Envelope Only Solution

Fullerton Engineering, P.C.

GO

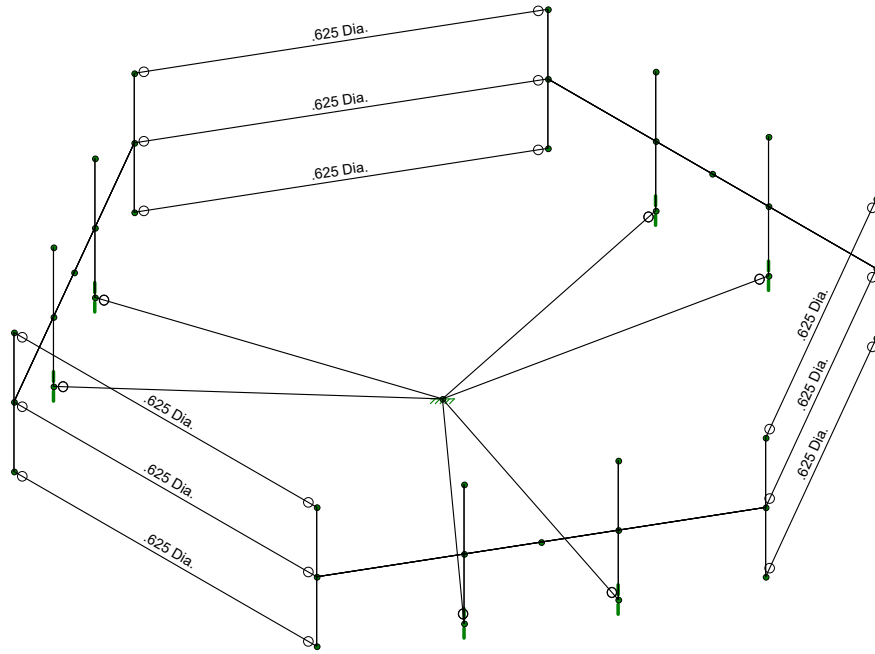
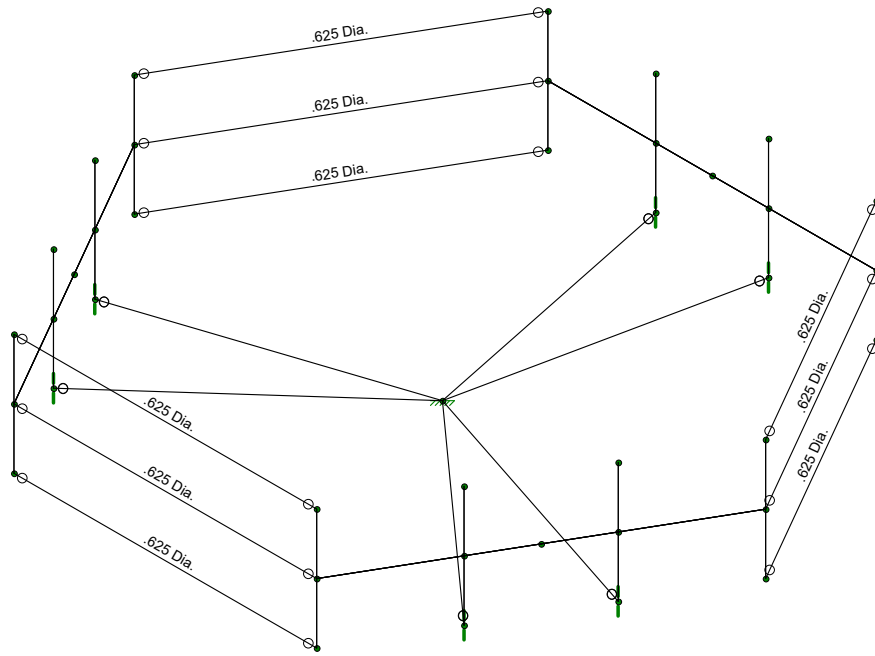
CTL02102

Collar Mount Analysis  
Member Label

SK - 3

June 15, 2022 at 8:12 AM

CTL02102-Collar Mount Analysis.r3d



Envelope Only Solution

Fullerton Engineering, P.C.

GO

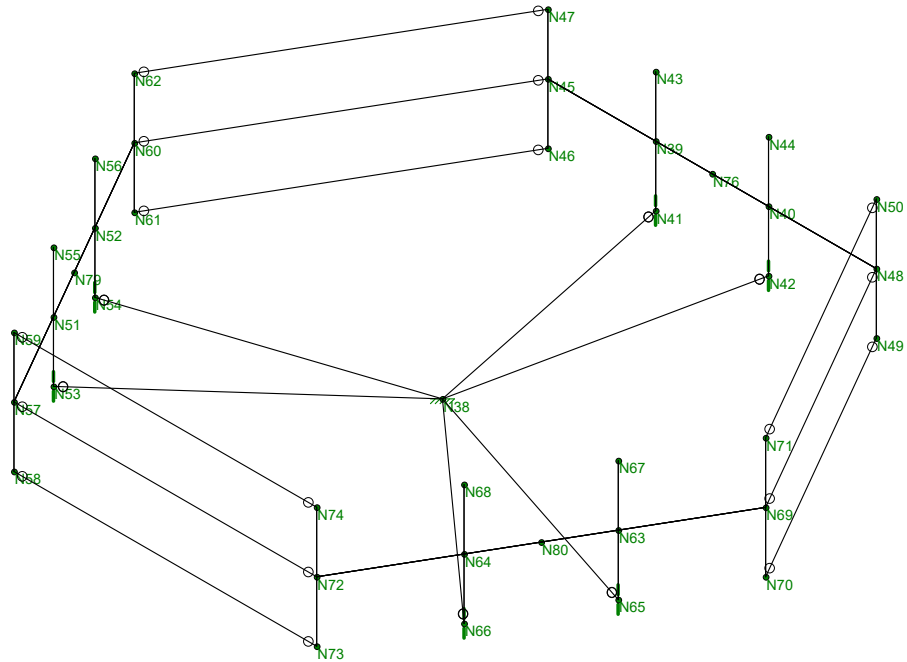
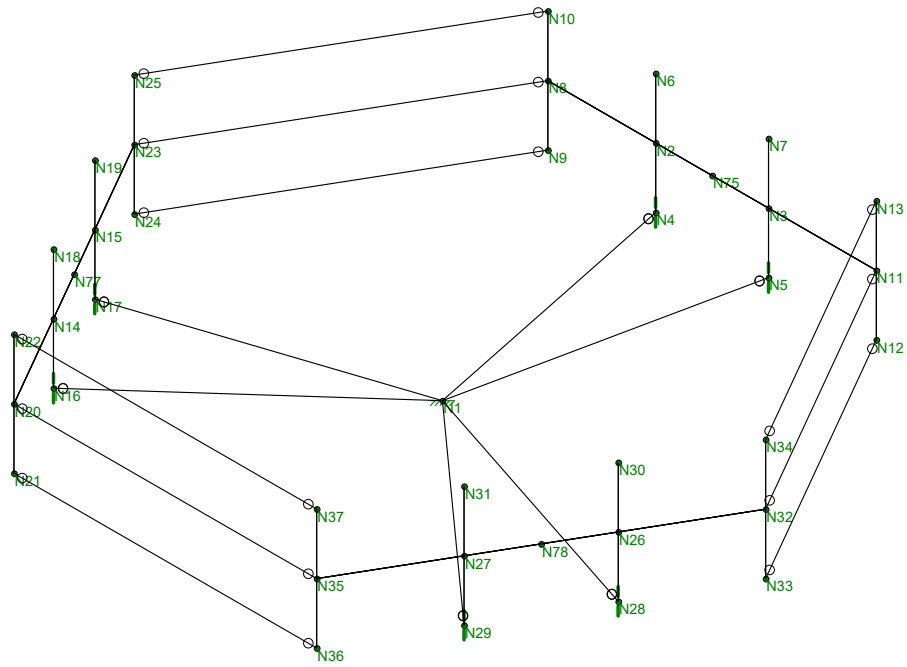
CTL02102

Collar Mount Analysis  
Shape

SK - 4

June 15, 2022 at 8:12 AM

CTL02102-Collar Mount Analysis.r3d



Envelope Only Solution

Fullerton Engineering, P.C.

GO

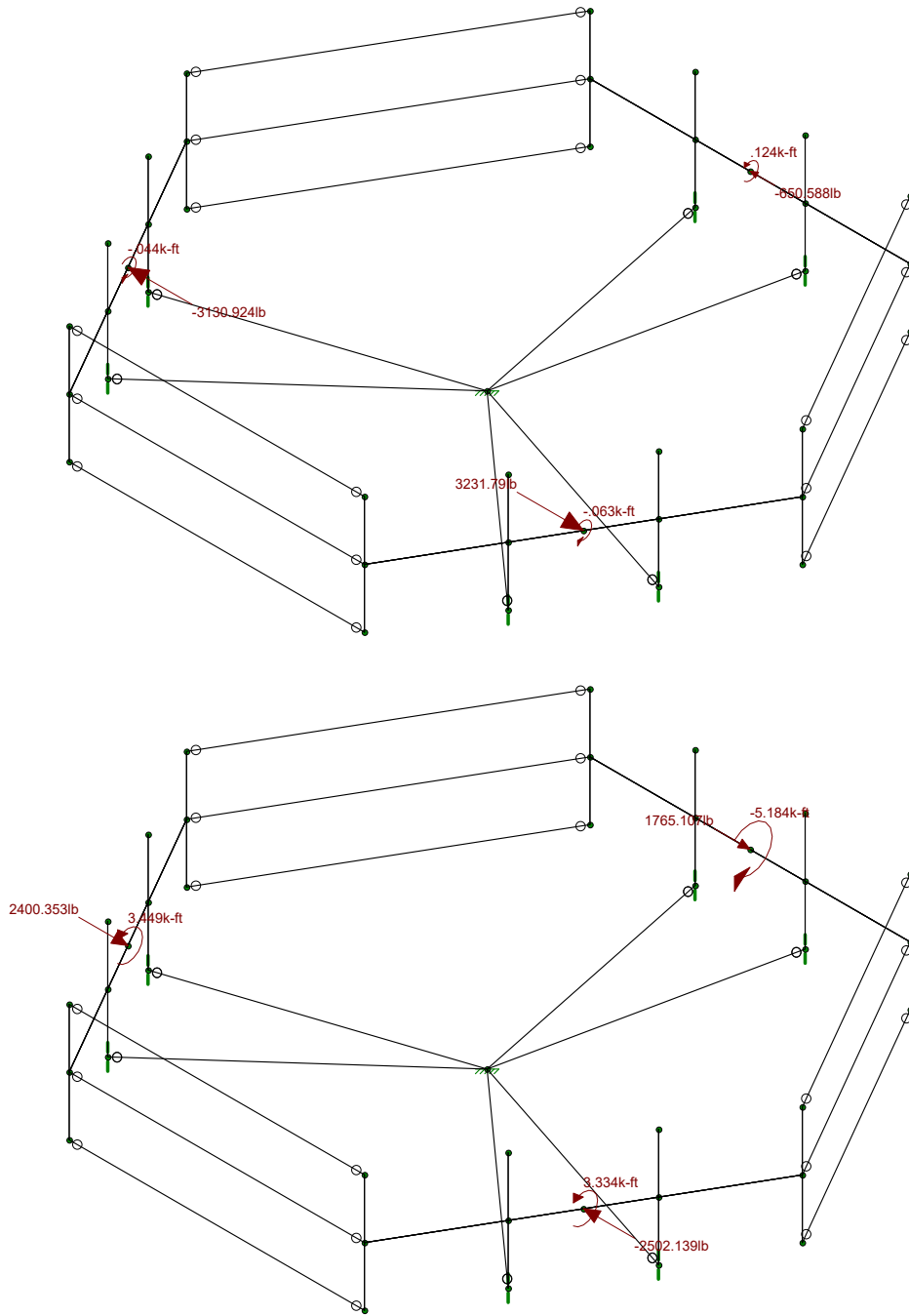
CTL02102

Collar Mount Analysis  
Nodes

SK - 5

June 15, 2022 at 8:12 AM

CTL02102-Collar Mount Analysis.r3d



Loads: BLC 1, Max X  
Envelope Only Solution

Fullerton Engineering, P.C.

GO

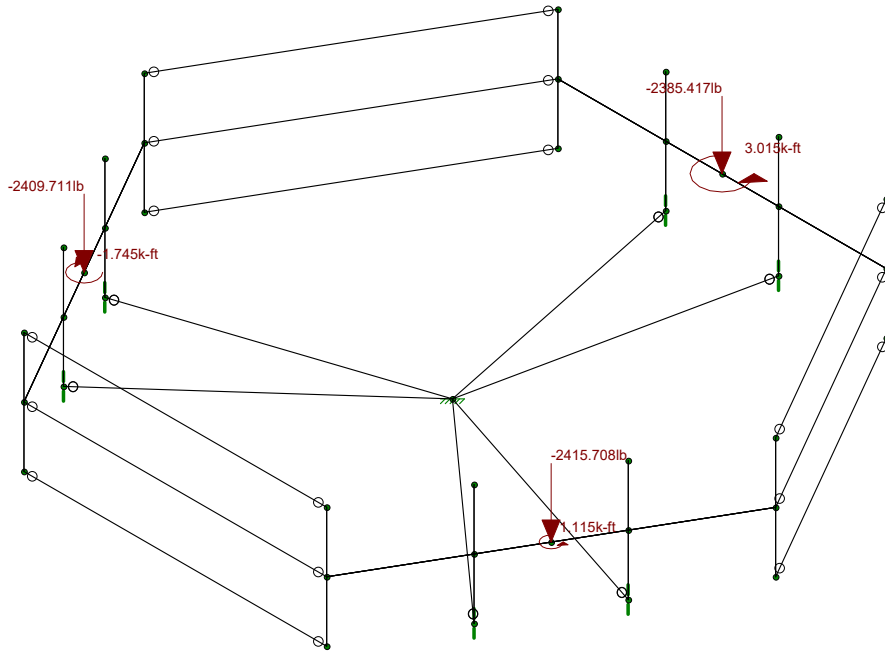
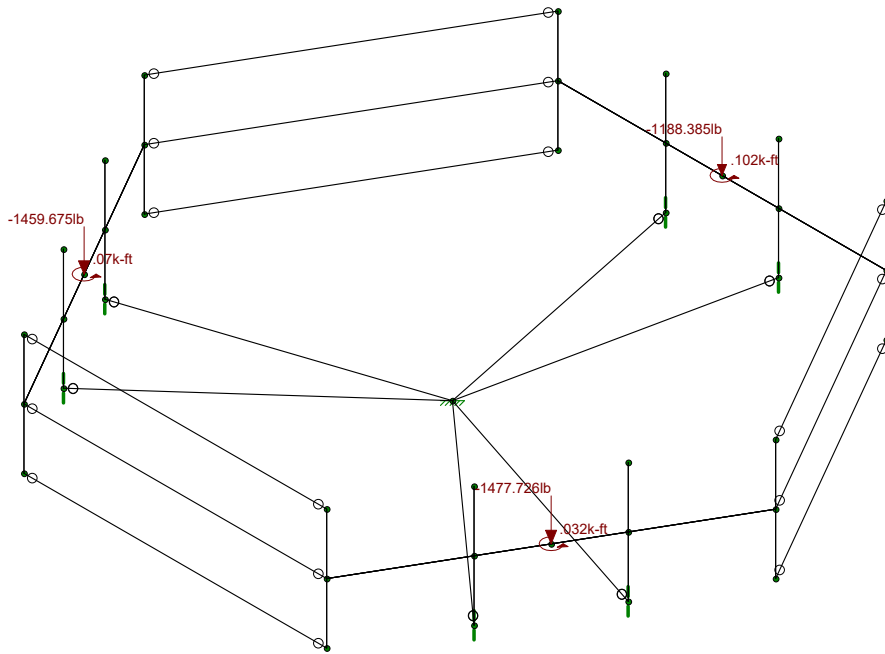
CTL02102

Collar Mount Analysis  
Max X Reactions

SK - 6

June 15, 2022 at 8:13 AM

CTL02102-Collar Mount Analysis.r3d



Loads: BLC 2, Max Y  
Envelope Only Solution

Fullerton Engineering, P.C.

GO

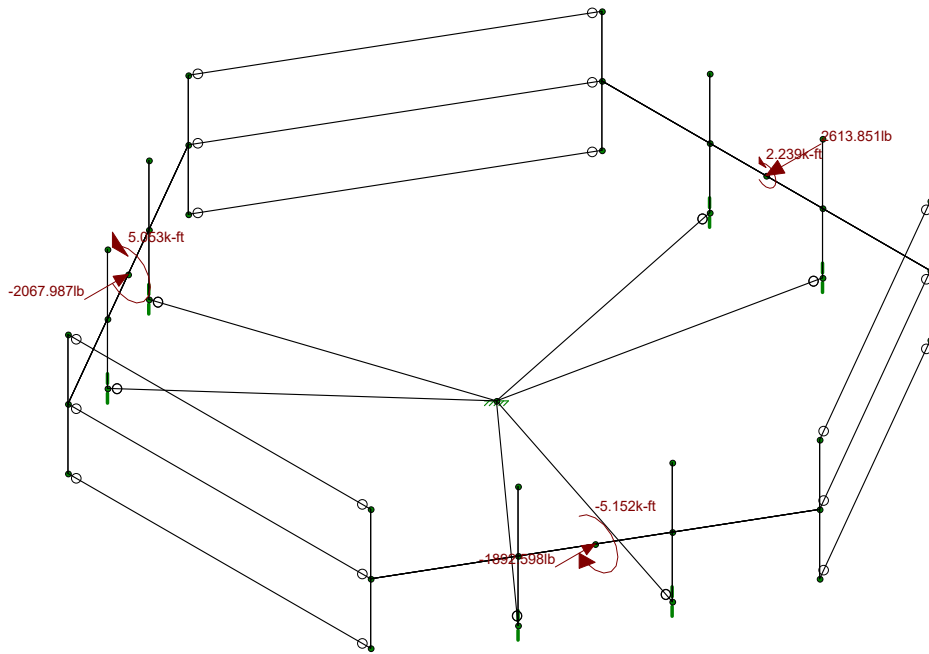
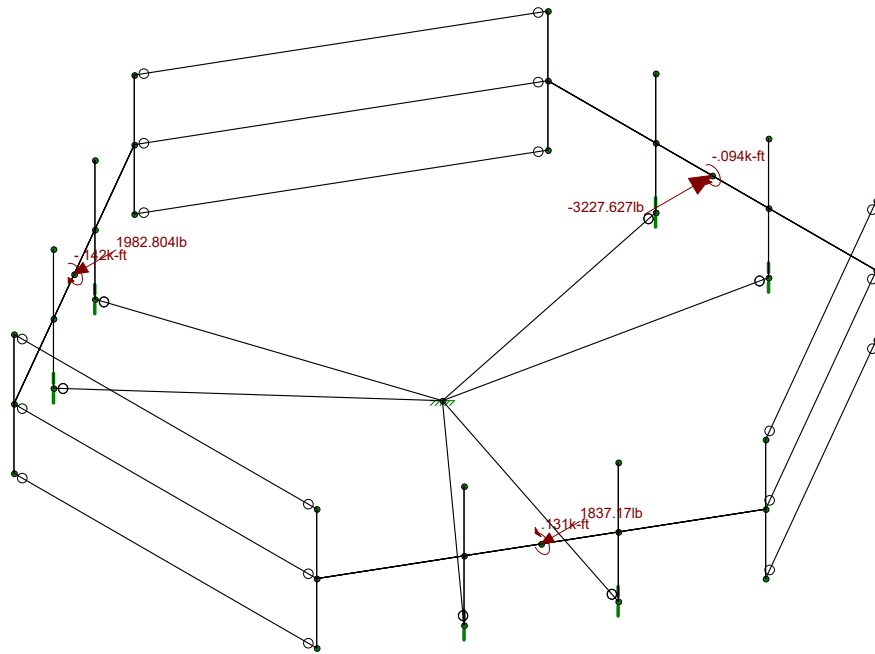
CTL02102

Collar Mount Analysis  
Max Y Reactions

SK - 7

June 15, 2022 at 8:13 AM

CTL02102-Collar Mount Analysis.r3d



Loads: BLC 3, Max Z  
Envelope Only Solution

Fullerton Engineering, P.C.

GO

CTL02102

Collar Mount Analysis  
Max Z Reactions

SK - 8

June 15, 2022 at 8:13 AM

CTL02102-Collar Mount Analysis.r3d

**(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)	12
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 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISACONNECTION CODE	AISC 15th(360-16): LRFD
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme 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 7-16
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 Design Parameters**

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp to...	Lcomp b...	L-torque[j...	Kyy	Kzz	Cb	Func...
1	M1	.625 Dia.	15.083			Lbyy			1	1		Lateral
2	M2	.625 Dia.	15.083			Lbyy			1	1		Lateral
3	M3	.625 Dia.	15.083			Lbyy			1	1		Lateral
4	M4	.625 Dia.	15.083			Lbyy			1	1		Lateral
5	M5	.625 Dia.	15.083			Lbyy			1	1		Lateral
6	M6	.625 Dia.	15.083			Lbyy			1	1		Lateral
7	M7	.625 Dia.	15.083			Lbyy			1	1		Lateral
8	M8	.625 Dia.	15.083			Lbyy			1	1		Lateral
9	M9	.625 Dia.	15.083			Lbyy			1	1		Lateral
10	M10	.625 Dia.	15.083			Lbyy			1	1		Lateral
11	M11	.625 Dia.	15.083			Lbyy			1	1		Lateral
12	M12	.625 Dia.	15.083			Lbyy			1	1		Lateral
13	M55	.625 Dia.	15.083			Lbyy			1	1		Lateral
14	M56	.625 Dia.	15.083			Lbyy			1	1		Lateral
15	M57	.625 Dia.	15.083			Lbyy			1	1		Lateral
16	M58	.625 Dia.	15.083			Lbyy			1	1		Lateral
17	M59	.625 Dia.	15.083			Lbyy			1	1		Lateral
18	M60	.625 Dia.	15.083			Lbyy			1	1		Lateral

**Material Takeoff**

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		42	407	0
3	Total General		42	407	0
4					
5	Hot Rolled Steel				
6	SAEJ429 Gr-2	.625 Dia.	18	271.5	.024
7	Total HR Steel		18	271.5	.024



### Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M... Surface...
1	Max X	None				12			
2	Max Y	None		-1		12			
3	Max Z	None				12			

### Load Combinations

	Description	S...PD...	S...	B...Fa...	B...Fa...	B...Fa...	B...Fa...	B...Fa...	B...Fa...	B...Fa...	B...Fa...	B...Fa...	B...Fa...	B...Fa...	B...Fa...	B...Fa...	B...Fa...	B...Fa...	B...Fa...
1	Max Reactions	Y...	Y	1	1	2	1	3	1										

### Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	549.722	1	0	1	-592.347	1	0	1	-1.13	1	0	1
2		min	549.722	1	0	1	-592.347	1	0	1	-1.13	1	0	1
3	N4	max	0	1	738.133	1	0	1	0	1	0	1	0	1
4		min	0	1	738.133	1	0	1	0	1	0	1	0	1
5	N5	max	0	1	454.189	1	0	1	0	1	0	1	0	1
6		min	0	1	454.189	1	0	1	0	1	0	1	0	1
7	N16	max	0	1	1007.972	1	0	1	0	1	0	1	0	1
8		min	0	1	1007.972	1	0	1	0	1	0	1	0	1
9	N17	max	0	1	455.639	1	0	1	0	1	0	1	0	1
10		min	0	1	455.639	1	0	1	0	1	0	1	0	1
11	N28	max	0	1	610.246	1	0	1	0	1	0	1	0	1
12		min	0	1	610.246	1	0	1	0	1	0	1	0	1
13	N29	max	0	1	871.417	1	0	1	0	1	0	1	0	1
14		min	0	1	871.417	1	0	1	0	1	0	1	0	1
15	N38	max	-1663.321	1	0	1	1346.735	1	0	1	-181	1	0	1
16		min	-1663.321	1	0	1	1346.735	1	0	1	-181	1	0	1
17	N41	max	0	1	4995.399	1	0	1	0	1	0	1	0	1
18		min	0	1	4995.399	1	0	1	0	1	0	1	0	1
19	N42	max	0	1	-2606.046	1	0	1	0	1	0	1	0	1
20		min	0	1	-2606.046	1	0	1	0	1	0	1	0	1
21	N53	max	0	1	2884.571	1	0	1	0	1	0	1	0	1
22		min	0	1	2884.571	1	0	1	0	1	0	1	0	1
23	N54	max	0	1	-470.923	1	0	1	0	1	0	1	0	1
24		min	0	1	-470.923	1	0	1	0	1	0	1	0	1
25	N65	max	0	1	-222.883	1	0	1	0	1	0	1	0	1
26		min	0	1	-222.883	1	0	1	0	1	0	1	0	1
27	N66	max	0	1	2642.528	1	0	1	0	1	0	1	0	1
28		min	0	1	2642.528	1	0	1	0	1	0	1	0	1
29	Totals:	max	-1113.599	1	11360.242	1	754.388	1						
30		min	-1113.599	1	11360.242	1	754.388	1						

Stress ratio <1.0, members are adequate

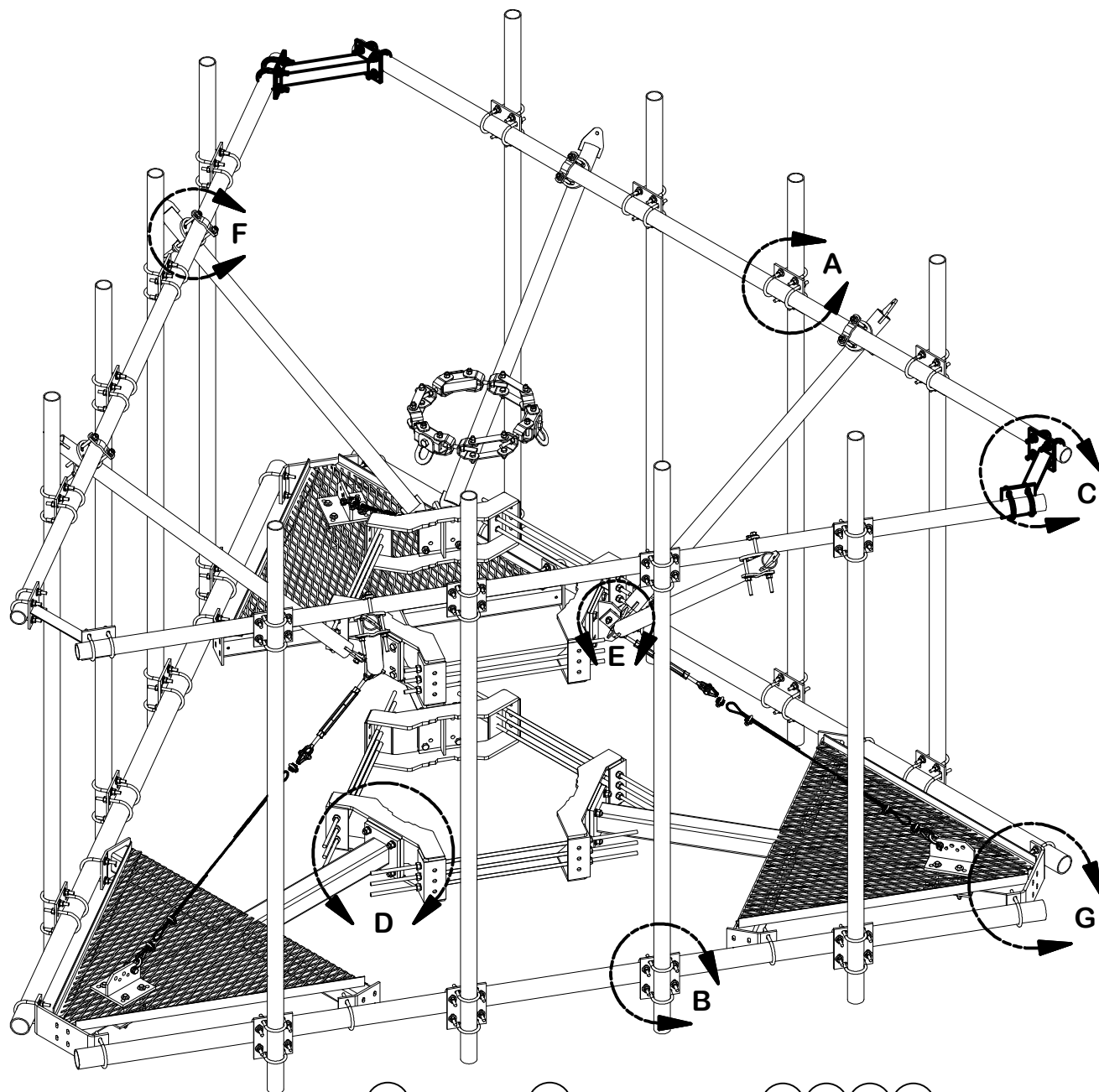
### Envelope AISC 15th(360-16): LRFD Steel Code Checks

Member	Shape	Code Check	Loc[in]	LC	Shear Ch...	Loc[in]	LC	phi*Pn...	phi*Pn...	phi*M...	phi*M...	Eqn
1	M10	.224	7.542	1	.000	5.083	1	7437....	25402...	.265	.265	H1-1a
2	M11	.084	7.542	1	.001	5.083	1	7437....	25402...	.265	.265	H1-1b
3	M7	.083	7.542	1	.001	5.083	1	7437....	25402...	.265	.265	H1-1b
4	M59	.057	7.542	1	.000	5.083	1	7437....	25402...	.265	.265	H1-1b
5	M60	.042	7.542	1	.001	5.083	1	7437....	25402...	.265	.265	H1-1b
6	M58	.042	7.542	1	.001	5.083	1	7437....	25402...	.265	.265	H1-1b
7	M4	.017	7.542	1	.000	5.083	1	7437....	25402...	.265	.265	H1-1b
8	M5	.013	7.542	1	.000	5.083	1	7437....	25402...	.265	.265	H1-1b

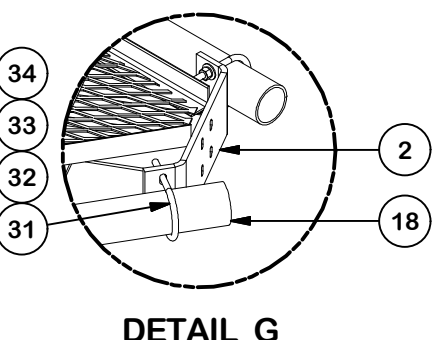
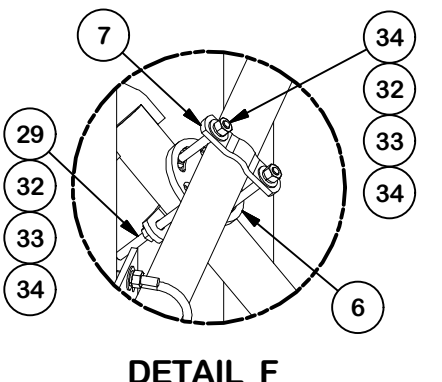
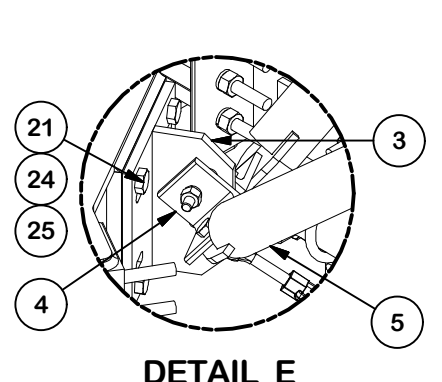
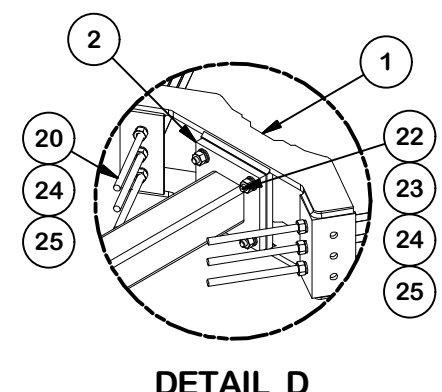
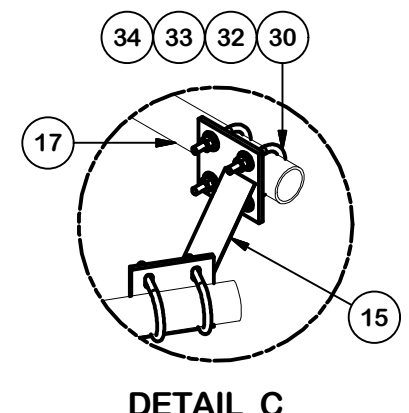
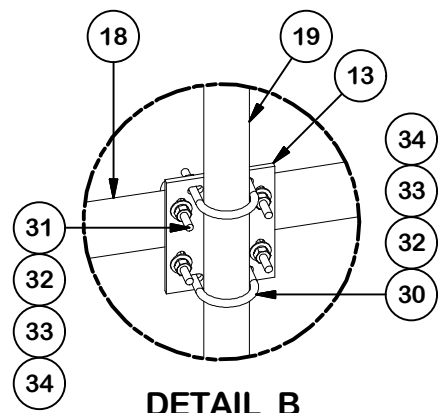
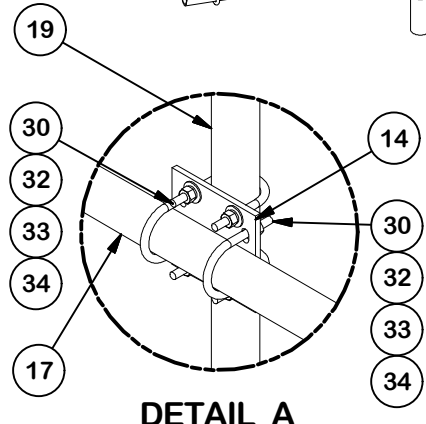
**Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)**

Member	Shape	Code Check	Loc[in]	LC	Shear Ch...	Loc[in]	LC	phi*Pn...	phi*Pn...	phi*M...	phi*M...	Eqn		
9	M1	.625 Dia.	.013	7.542	1	.000	15.083	1	7437....	25402...	.265	.265	...	H1-1b
10	M56	.625 Dia.	.009	7.542	1	.000	15.083	1	7437....	25402...	.265	.265	...	H1-1b
11	M57	.625 Dia.	.007	7.542	1	.000	15.083	1	7437....	25402...	.265	.265	...	H1-1b
12	M55	.625 Dia.	.007	7.542	1	.000	15.083	1	7437....	25402...	.265	.265	...	H1-1b
13	M8	.625 Dia.	.001	7.542	1	.001	15.083	1	7437....	25402...	.265	.265	...	H1-1b
14	M9	.625 Dia.	.001	7.542	1	.000	15.083	1	7437....	25402...	.265	.265	...	H1-1b
15	M3	.625 Dia.	.001	7.542	1	.000	15.083	1	7437....	25402...	.265	.265	...	H1-1b
16	M12	.625 Dia.	.001	7.542	1	.001	15.083	1	7437....	25402...	.265	.265	...	H1-1b
17	M2	.625 Dia.	.001	7.542	1	.000	15.083	1	7437....	25402...	.265	.265	...	H1-1b
18	M6	.625 Dia.	.001	7.542	1	.000	15.083	1	7437....	25402...	.265	.265	...	H1-1b

Stress ratio <1.0, members are adequate



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	6	X-LWRM	RING MOUNT WELDMENT		68.81	412.85
2	3	X-SV196L	LONG PLATFORM WELDMENT		230.94	692.81
3	6	X-TBW	T-BRACKET WELDMENT		13.60	81.60
4	6	SHCM-T	CHAIN MOUNT TIGHTENER BRACKET	3 in	1.86	11.15
5	6	X-VSKL	LONG SUPPORT WELDMENT FOR VSK REINFORCEMENTS		37.05	222.33
6	6	X-127594	FLAT DISK CLAMP PLATE 4" CENTERS (GALV.)		2.51	15.04
7	12	X-100064	CLAMP (4" V-CLAMP) GALVANIZED		0.92	11.06
8	3	320751-I	1/2" CHAIN SHACKLE		0.76	2.29
9	3	320601-I	5/8" TURNBUCKLE		2.63	7.89
10	6	320777-I	5/16" THIMBLE		0.06	0.36
11	12	320152-I	5/16" WIRE ROPE CLIP		1.32	15.78
12	3	AC516-10	5/16" AIRECRAFT CABLE		1.25	3.76
13	15	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	90.32
14	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
15	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
17	3	P30174	2-7/8" O.D. x 174" SCH. 40 PIPE	174 in	84.20	252.59
18	3	P3174	3-1/2" X 174" SCH 40 GALVANIZED PIPE	174 in	109.97	329.90
19	12	P30120	2-7/8" x 120" (2-1/2" SCH. 40) GALVANIZED PIPE	120 in	58.07	696.79
20	18	G58R-48	5/8" x 48" THREADED ROD (HDG.)		4.18	75.27
20	18	G58R-24	5/8" x 24" THREADED ROD (HDG.)		2.09	37.63
21	12	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	3.75
22	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	4.27
23	12	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.41
24	60	G58LW	5/8" HDG LOCKWASHER		0.03	1.57
25	60	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	7.79
26	6	G12112	1/2" x 1-1/2" HDG HEX BOLT GR5	1/2 in	0.15	0.89
27	3	G12212	1/2" x 2-1/2" HDG HEX BOLT GR5	2 1/2 in	0.20	0.61
28	12	G1204	1/2" x 4" HDG HEX BOLT GR5 FULL THREAD	4 in	0.27	3.24
29	24	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	5 1/2 in	0.41	9.83
30	84	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.70	58.53
31	36	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.83	29.82
32	288	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	9.82
33	285	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	3.96
34	285	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	20.41
35	1	HALO40	5,000 LB. MAINTENANCE TIE-OFF POINT		41.12	41.12
					TOTAL WT. #	3249.41



**TOLERANCE NOTES**

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:  
 SAWED, SHEARED AND GAS CUT EDGES (± 0.030")  
 DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES  
 LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES  
 BENDS AND ANGLES ARE ± 1/2 DEGREE  
 ALL OTHER MACHINING (± 0.030")  
 ALL OTHER ASSEMBLY (± 0.060")

PROPRIETARY NOTE:  
 THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION  
**14' 6" LOW PROFILE PLATFORM  
 WITH TWELVE 2-7/8" ANTENNA MOUTING  
 PIPES, REINFORCED HANDRAIL, AND CABLE**

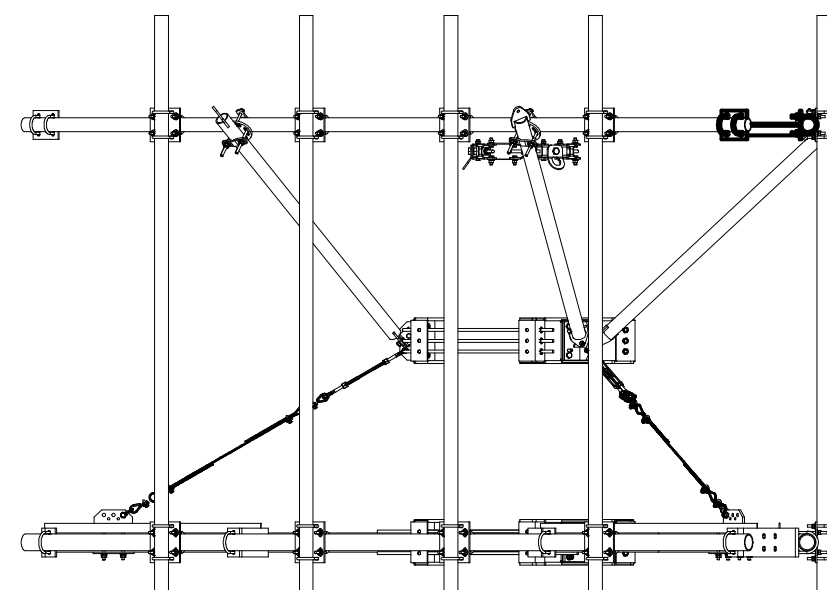
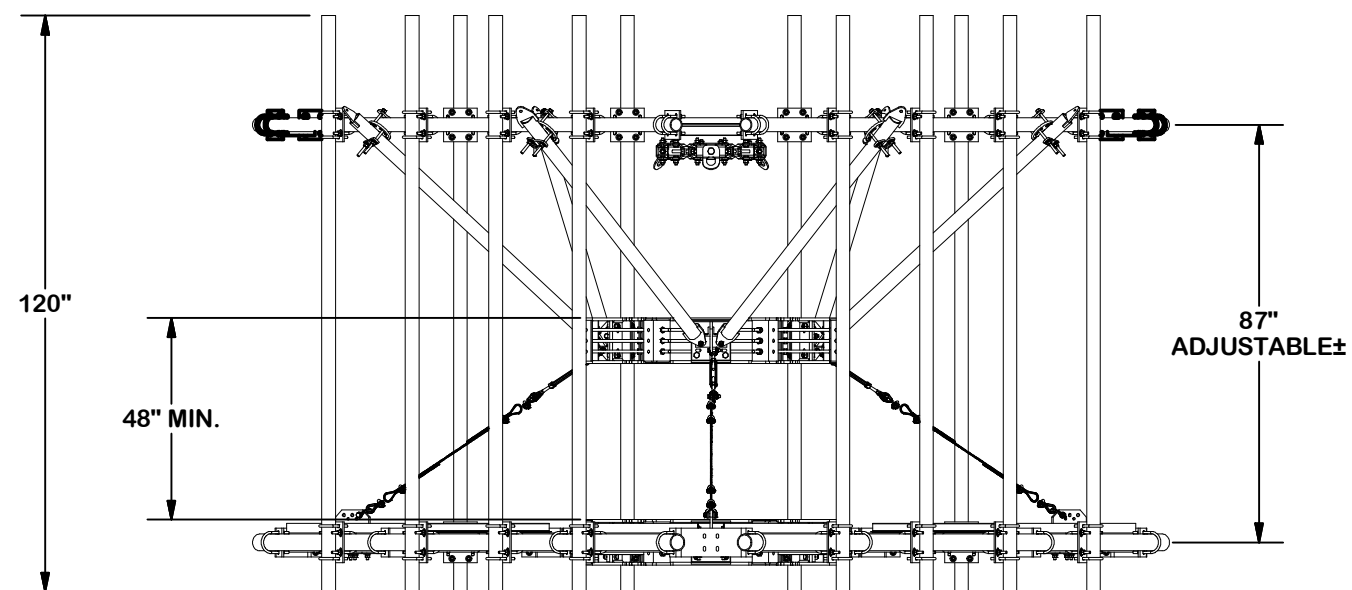
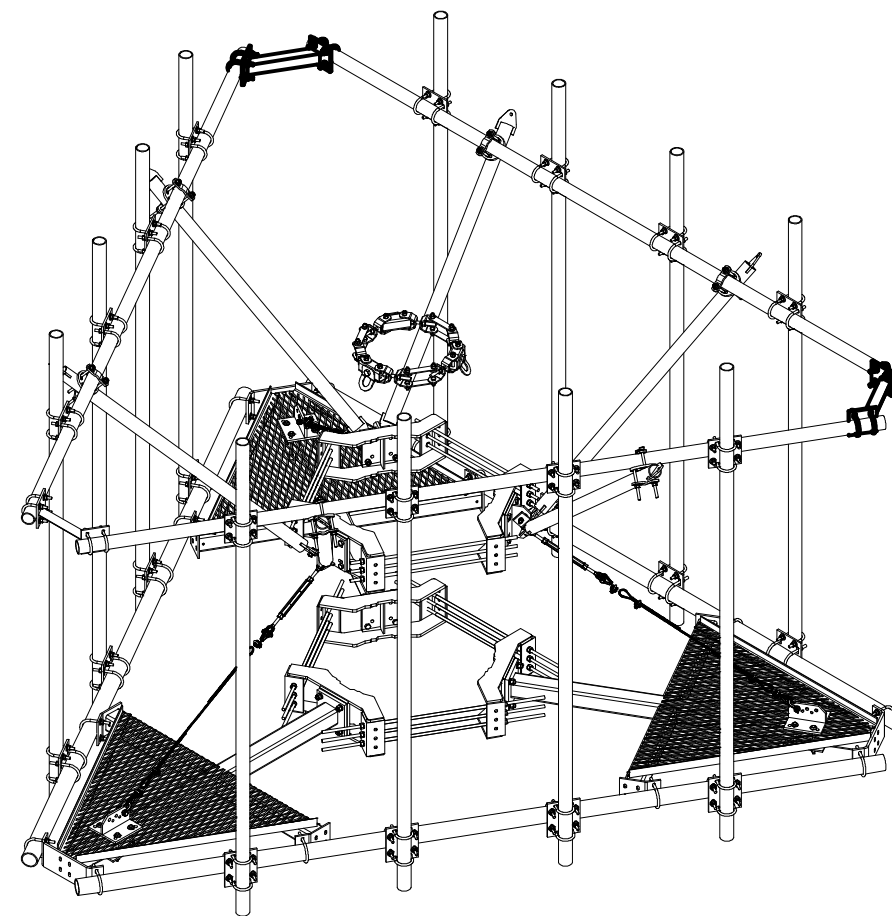
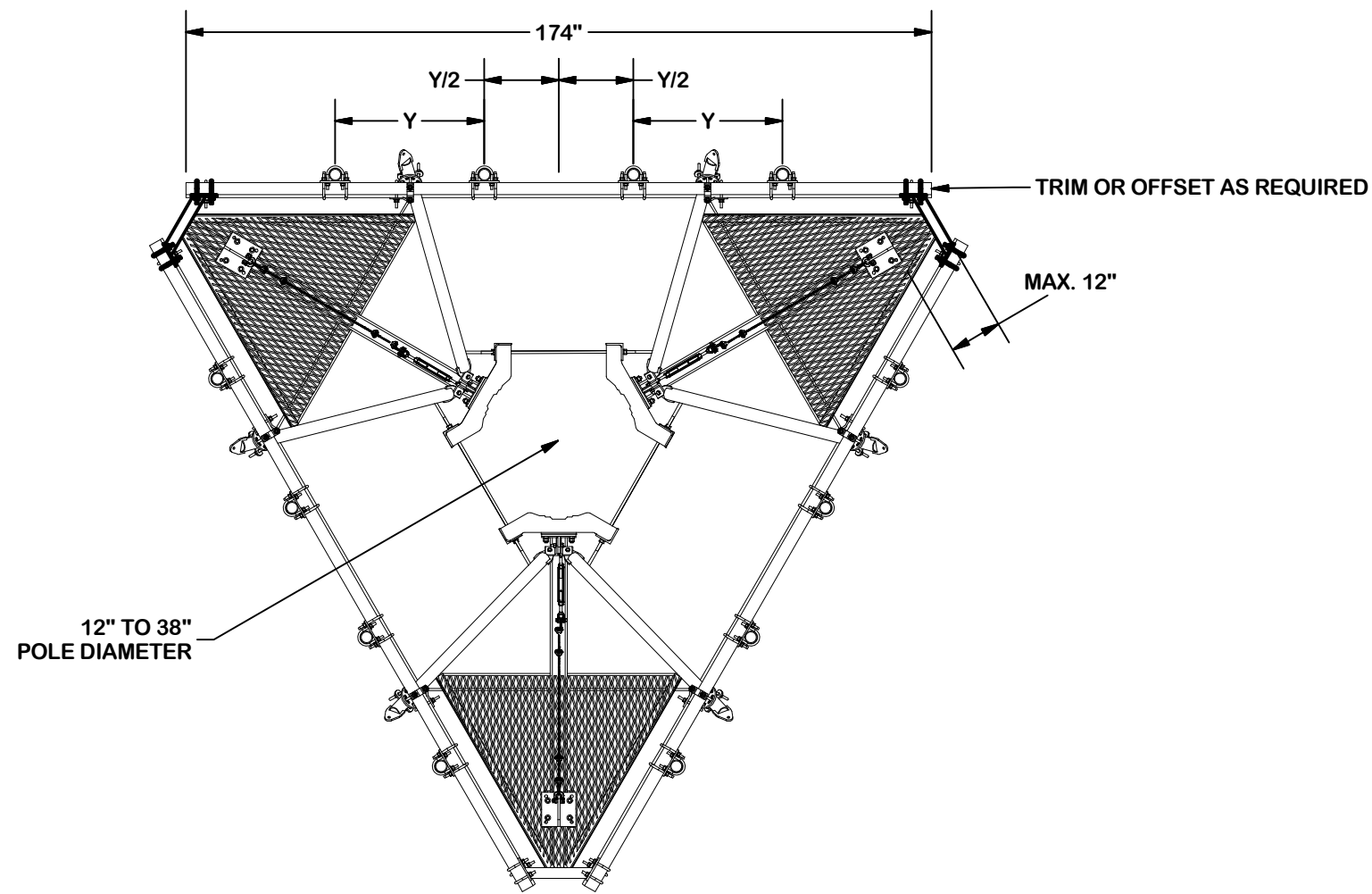
**SITE PRO 1**  
 Engineering Support Team:  
 1-888-753-7446

Locations:  
 New York, NY  
 Atlanta, GA  
 Los Angeles, CA  
 Plymouth, IN  
 Salem, OR  
 Dallas, TX  
 Tampa, FL

A valmont COMPANY

CPD NO.	DRAWN BY	ENG. APPROVAL
	CSL 10/17/2019	10/18/2019
CLASS	DRAWING USAGE	CHECKED BY
87	CUSTOMER	BMC 10/18/2019

PART NO.	RMQLP-4120-H10
DWG. NO.	RMQLP-4120-H10



**TOLERANCE NOTES**

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:  
 SAWED, SHEARED AND GAS CUT EDGES ( $\pm 0.030''$ )  
 DRILLED AND GAS CUT HOLES ( $\pm 0.030''$ ) - NO CONING OF HOLES  
 LASER CUT EDGES AND HOLES ( $\pm 0.010''$ ) - NO CONING OF HOLES  
 BENDS AND ANGLES ARE  $\pm 1/2$  DEGREE  
 ALL OTHER MACHINING ( $\pm 0.030''$ )  
 ALL OTHER ASSEMBLY ( $\pm 0.060''$ )

PROPRIETARY NOTE:  
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DESCRIPTION  
**14' 6" LOW PROFILE PLATFORM  
 WITH TWELVE 2-7/8" ANTENNA MOUNTING  
 PIPES, REINFORCED HANDRAIL, AND CABLE**

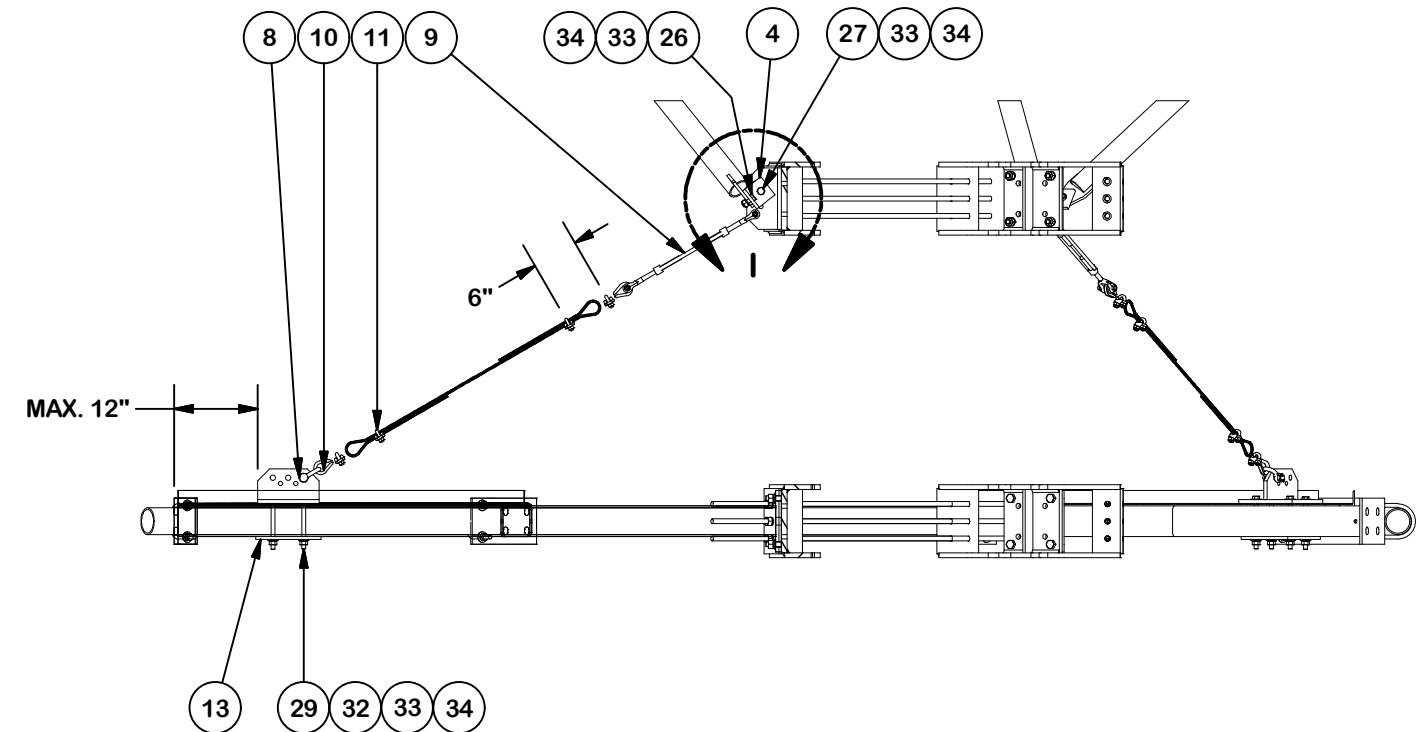
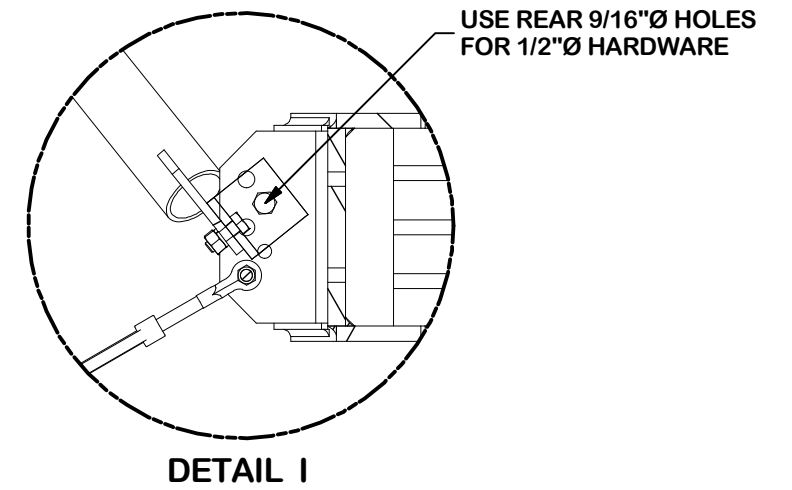
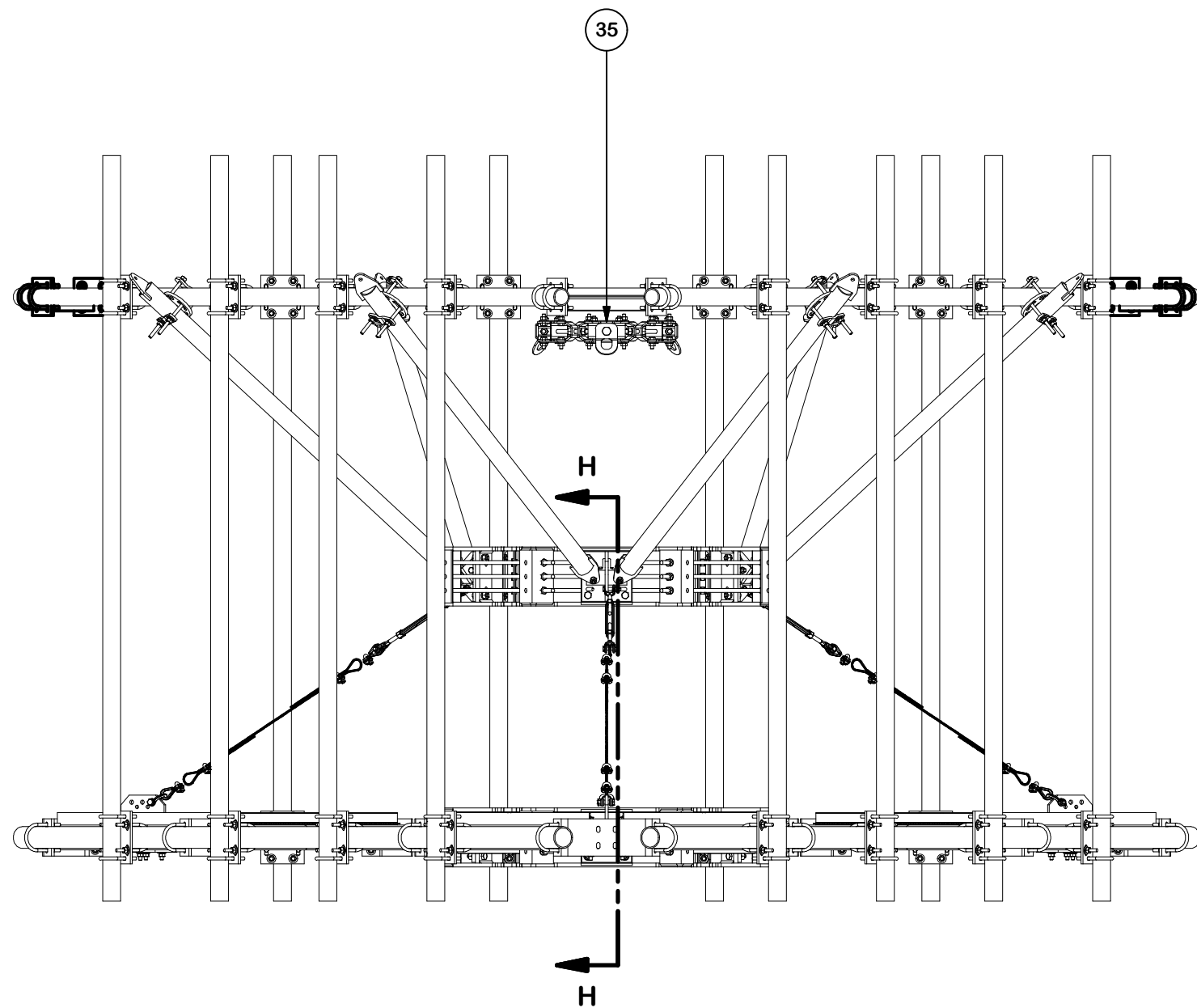
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CLASS <b>87</b>	SUB <b>02</b>	DRAWING USAGE <b>CUSTOMER</b>
	CHECKED BY <b>BMC 10/18/2019</b>	



Locations:  
 New York, NY  
 Atlanta, GA  
 Los Angeles, CA  
 Plymouth, IN  
 Salem, OR  
 Dallas, TX  
 Tampa, FL

Engineering  
 Support Team:  
 1-888-753-7446

PART NO. <b>RMQLP-4120-H10</b>
DWG. NO. <b>RMQLP-4120-H10</b>



**NOTE:**  
SOME OBJECTS ARE TRANSPARENT FOR CLARITY

**TOLERANCE NOTES**

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:  
 SAWED, SHEARED AND GAS CUT EDGES ( $\pm 0.030"$ )  
 DRILLED AND GAS CUT HOLES ( $\pm 0.030"$ ) - NO CONING OF HOLES  
 LASER CUT EDGES AND HOLES ( $\pm 0.010"$ ) - NO CONING OF HOLES  
 BENDS AND ANGLES ARE  $\pm 1/2$  DEGREE  
 ALL OTHER MACHINING ( $\pm 0.030"$ )  
 ALL OTHER ASSEMBLY ( $\pm 0.060"$ )

PROPRIETARY NOTE:  
 THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION  
**14' 6" LOW PROFILE PLATFORM  
 WITH TWELVE 2-7/8" ANTENNA MOUTING  
 PIPES, REINFORCED HANDRAIL, AND CABLE**

CPD NO.	DRAWN BY CSL 10/17/2019	ENG. APPROVAL 10/18/2019
CLASS 87	SUB 02	DRAWING USAGE CUSTOMER
	CHECKED BY BMC 10/18/2019	

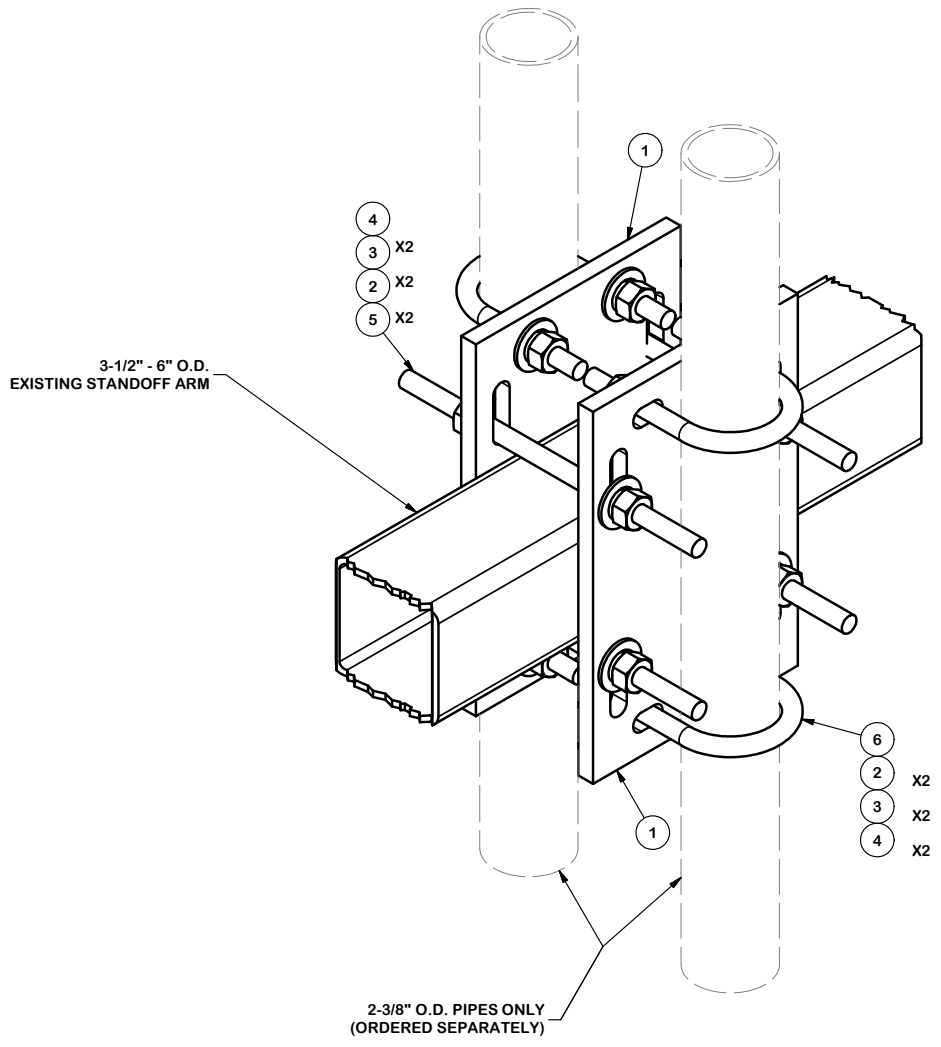


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 Support Team:  
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PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	SCX6	CROSSOVER PLATE	11 in	10.62	21.23
2	16	G12FW	1/2" HDG USS FLATWASHER		0.03	0.54
3	16	G12LW	1/2" HDG LOCKWASHER		0.01	0.22
4	16	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.14
5	4	G12R-10	1/2" x 10" THREADED ROD (HDG.)		3.23	12.91
6	4	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.66	2.63
					TOTAL WT. #	38.67



**TOLERANCE NOTES**  
**TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:**  
**SAWED, SHEARED AND GAS CUT EDGES ( $\pm 0.030$ " )**  
**DRILLED AND GAS CUT HOLES ( $\pm 0.030$ " ) - NO CONING OF HOLES**  
**LASER CUT EDGES AND HOLES ( $\pm 0.010$ " ) - NO CONING OF HOLES**  
**BENDS ARE  $\pm 1/2$  DEGREE**  
**ALL OTHER MACHINING ( $\pm 0.030$ " )**  
**ALL OTHER ASSEMBLY ( $\pm 0.060$ " )**

PROPRIETARY NOTE:  
 THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION		BACK TO BACK PIPE MOUNT 2-3/8" PIPES	
CPD NO.	DRAWN BY	ENG. APPROVAL	
	CEK 4/26/2013		
CLASS	SUB	DRAWING USAGE	CHECKED BY
81	03	CUSTOMER	BMC 4/26/2013

 <b>A valmont COMPANY</b>	Locations: New York, NY Atlanta, GA Los Angeles, CA Plymouth, IN Salem, OR Dallas, TX
	Engineering Support Team: 1-888-753-7446
PART NO.	<b>BBPM-K3</b>
DWG. NO.	<b>BBPM-K3</b>



**PROJECT:** LTE 5G NR CBAND + DoD +5G NR 1DR-1  
**SITE NUMBER:** CTL02102  
**USID:** 100184  
**FA NUMBER:** 10128691  
**PTN NUMBER:** 2051A11N8G, 2051A11M47, 2051A11LNT, 2051A11NG6, 2051A11P2E  
**PACE NUMBER:** MRCTB055165, MRCTB053523, MRCTB053518, MRCTB056366, MRCTB055567, MRCTB056611, MRCTB056417  
**SITE NAME:** GREENWICH PERRYRIDGE RD TWR  
**SITE ADDRESS:** 5 PERRYRIDGE ROAD DUP GREENWICH, CT 06830



**PROJECT INFORMATION**

**SITE NAME:** GREENWICH PERRYRIDGE RD TWR  
**SITE NUMBER:** CTL02102  
**SITE ADDRESS:** 5 PERRYRIDGE ROAD DUP GREENWICH, CT 06830  
**FA NUMBER:** 10128691  
**PTN NUMBER:** 2051A11N8G, 2051A11M47, 2051A11LNT, 2051A11NG6, 2051A11P2E  
**PACE NUMBER:** MRCTB055165, MRCTB053523, MRCTB053518, MRCTB056366, MRCTB055567, MRCTB056611, MRCTB056417  
**USID NUMBER:** 100184  
  
**APPLICANT:** AT&T WIRELESS  
 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701  
  
**OWNER:**  
  
**JURISDICTION/ ZONING:** TOWN OF EAST GREENWICH  
**COUNTY:** FAIRFIELD  
**SITE COORDINATES FROM (RFDS):** LATITUDE: 41.0339361° LONGITUDE: -73.6308333° GROUND ELEV.: 340' PROPOSED USE: TELECOMMUNICATIONS FACILITY  
  
**AT&T RF MANAGER:** MOHAMMAD MINHAJ HUSSAIN  
**PHONE:** (510) 493-3024  
**EMAIL:** mh705r@att.com

**SCOPE OF WORK**

**PROJECT SCOPE HEREIN BASED ON RFDS ID # 4541471, VERSION 3.00 LAST UPDATED 05/31/2022.**  
**EXISTING TOWER EQUIPMENT TO BE REMOVED:**  
 (3) KATHREIN 800 10965 K ANTENNAS  
 (3) POWERWAVE 7770 ANTENNAS  
 (3) QUINTEL QD6616-7 ANTENNAS  
 (3) CCI DMP65R-BU6DA ANTENNAS  
 (3) RRUS-11 B12, (6) LGP2140 TMAS  
 (1) DC6-48-60-8F RAYCAP  
  
**EXISTING TOWER EQUIPMENT TO BE RELOCATED:**  
 (3) RRUS-32 B30  
 (3) RRUS-4478 B14, (3) RRUS 32 B66A  
  
**EXISTING TOWER EQUIPMENT TO REMAIN:**  
 (3) RRUS-32 B2  
 (2) DC6 RAYCAPS  
 (2) FIBER AND (6) DC POWER CABLES  
 (6) COAX  
  
**NEW TOWER EQUIPMENT TO BE INSTALLED:**  
 • CONTRACTOR SHALL FURNISH ALL MATERIAL WITH THE EXCEPTION OF AT&T SUPPLIED MATERIAL.  
 • ALL MATERIAL SHALL BE INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE.

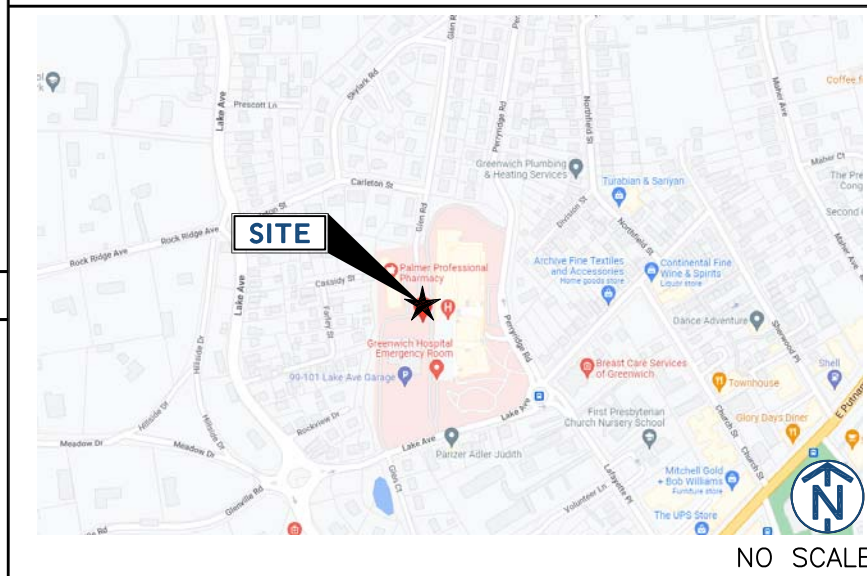
**APPLICABLE BUILDING CODES AND STANDARDS**

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.  
  
**BUILDING CODE:** 2015 INTERNATIONAL BUILDING CODE  
 2018 CONNECTICUT STATE BUILDING CODE SUPPLEMENT  
  
**ELECTRICAL CODE:** 2017 NATIONAL ELECTRIC CODE  
  
 • FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.  
 • ADA ACCESS REQUIREMENTS ARE NOT REQUIRED.  
 • THIS FACILITY DOES NOT REQUIRE POTABLE WATER AND WILL NOT PRODUCE ANY SEWAGE

REV	DATE	DESCRIPTION	BY
0	04/20/22	90% REVIEW	SP
1	05/16/22	REVISION	JS
2	06/14/22	REVISION	CB

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

**SITE LOCATION MAP**



NO SCALE

**DRAWING INDEX**

TITLE	DESCRIPTION
T1	TITLE SHEET
SP1	NOTES AND SPECIFICATIONS
SP2	NOTES AND SPECIFICATIONS
A1	COMPOUND PLAN
A2	EQUIPMENT PLAN
A3	ELEVATIONS
A4	ANTENNA PLANS
A5	EQUIPMENT DETAILS
A5A	EQUIPMENT DETAILS
A5B	EQUIPMENT DETAILS
A5C	EQUIPMENT DETAILS
A6	ANTENNA & CABLE CONFIGURATION
A7	CABLE NOTES AND COLOR CODING
A8	GROUNDING DETAILS
A9	PLUMBING DIAGRAMS

**PROJECT CONSULTANTS**

**PROJECT MANAGER:** SMARTLINK  
 85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862  
**CONTACT:** SHARON KEEFE (978) 930-3918  
**EMAIL:** Sharon.Keefe@smartlinkllc.com  
  
**SITE ACQUISITION:** SMARTLINK  
 85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862  
**CONTACT:** KRISTINA COTTONE (978) 551-8627  
**EMAIL:** Kristina.Cottone@smartlinkllc.com  
  
**ENGINEER/ARCHITECT:** FULLERTON ENGINEERING, P.C.  
 1100 E. WOODFIELD ROAD, SUITE 500 SCHAUMBURG, IL 60173  
**CONTACT:** KIP HITTER (847) 908-8400  
**EMAIL:** KHitter@FullertonEngineering.com  
  
**CONSTRUCTION:** SMARTLINK  
 85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862  
**CONTACT:** KRISTINA COTTONE (978) 551-8627  
**EMAIL:** kristina.cottone@smartlinkgroup.com

**DIRECTIONS**

SCAN QR CODE FOR LINK TO SITE LOCATION MAP



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

<b>SITE NAME</b> GREENWICH PERRYRIDGE RD TWR
<b>SITE NUMBER:</b> CTL02102
<b>SITE ADDRESS</b> 5 PERRYRIDGE ROAD DUP GREENWICH, CT 06830
<b>SHEET NAME</b> TITLE SHEET
<b>SHEET NUMBER</b> T1



GENERAL CONSTRUCTION

- FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:  
CONTRACTOR/CM – SMARTLINK  
OWNER – AT&T WIRELESS
- ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.
- GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
- 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.
- PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.
- THE CONTRACTOR 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 CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.
- GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
- GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.
- ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
- SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
- WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
- CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.

- THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
- THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2-A OT 2-A:10-B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
- 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.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
- THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE-APPROVED BY THE LOCAL JURISDICTION.
- ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
- ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.
- CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS-BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.
- CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
- THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).
- OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
- NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.
- ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
- CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.
- CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
- INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
- NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.

ANTENNA MOUNTING

- DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANS/TIA-222 OR APPLICABLE LOCAL CODES.

- ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
- DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
- ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
- CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
- ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50-OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
- PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/- 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/- 0.5% AS DEFINED BY THE RFDS. REFER TO ND-00246.
- JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
- CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
- TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

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

FIBER & POWER CABLE MOUNTING

- THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.
- THE TYPE TC-ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC-ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.
- WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC-ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

- TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
- CONTRACTOR SHALL VERIFY THE DOWN-TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
- CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.
- ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'-0".

- ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'-0" OC.
- CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
- CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.
- CONTRACTOR SHALL PROVIDE STRAIN-RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN-RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
- CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

- CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
- ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.
- CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
- ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE-HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.
- IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:  
A. TEMPERATURE SHALL BE ABOVE 50° F.  
B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.  
C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.  
D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS
- ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.  
A. GROUNDING AT THE ANTENNA LEVEL.  
B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'-0", ADDITIONAL CABLE GROUNDING REQUIRED.  
C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.  
D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.  
E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
- ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWNLEADS A MINIMUM DISTANCE OF 4'-0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.



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



1362 MELLON ROAD  
SUITE 140  
HANOVER, MD 21076



1100 E. WOODFIELD ROAD, SUITE 500  
SCHAUMBURG, ILLINOIS 60173  
TEL: 847-908-8400  
COA# PEC.0001899  
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Jun 14 2022

SITE NAME  
**GREENWICH  
PERRYRIDGE RD  
TWR**

SITE NUMBER:  
**CTL02102**

SITE ADDRESS  
**5 PERRYRIDGE ROAD DUP  
GREENWICH, CT 06830**

SHEET NAME  
**NOTES AND  
SPECIFICATIONS**

SHEET NUMBER  
**SP1**

**NOTICE**

**Beyond This Point** you are entering a controlled area where RF emissions *may exceed* the FCC General Population Exposure Limits.

Follow all posted signs and site guidelines for working in a RF environment.

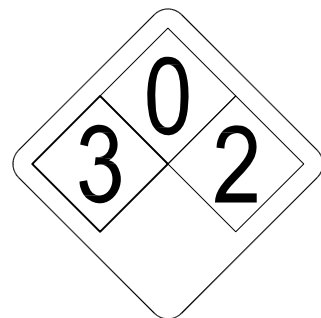
Ref: 47CFR 1.1307(b)

**CAUTION**

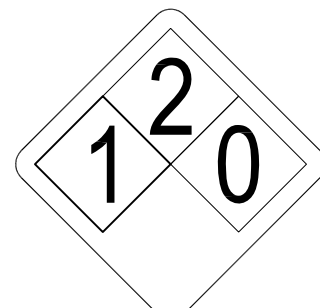
**Beyond This Point** you are entering a controlled area where RF emissions *may exceed* the FCC Occupational Exposure Limits.

Obey all posted signs and site guidelines for working in a RF environment.

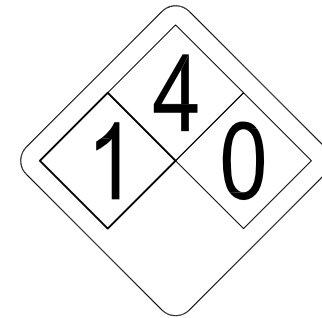
Ref: 47CFR 1.1307(b)



ALERTING SIGN  
(FOR CELL SITE BATTERIES)



ALERTING SIGN  
(FOR DIESEL FUEL)



ALERTING SIGN  
(FOR PROPANE)

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ALERTING SIGNS

**WARNING!**

DANGER DO NOT TOUCH TOWER!

SERIOUS "RF" BURN HAZARD!

MAINTAIN AN ADEQUATE CLEARANCE BETWEEN TOWER SUPPORTS AND GUY WIRES

FAILURE TO OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN A RADIO FREQUENCY ENVIRONMENT COULD RESULT IN SERIOUS INJURY. CONTACT CURRENT MAY EXCEED LIMITS PRESCRIBED IN ANSI, IEEE C95.1-1992 FOR CONTROLLED ENVIRONMENTS.

PROPERTY OF AT&T

**AUTHORIZED PERSONNEL ONLY**

IN CASE OF EMERGENCY, OR PRIOR TO PERFORMING MAINTENANCE ON THIS SITE, CALL 800-638-2822 AND REFERENCE CELL SITE NUMBER \_\_\_\_\_

ALERTING SIGN

INFO SIGN #4

GENERAL SIGNAGE GUIDELINES

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

STAY BACK 3 FEET FROM ANTENNA

**INFORMATION**

AT&T operates telecommunications antennas at this location. Remain at least 3 feet away from any antenna and obey all posted signs.

Contact the owner(s) of the antenna(s) before working closer than 3 feet from the antenna.

Contact AT&T at \_\_\_\_\_ prior to performing any maintenance or repairs near AT&T antennas. This is Site # \_\_\_\_\_

Contact the management office if this door/hatch/gate is found unlocked.

**INFORMACION**

En esta propiedad se ubican antenas de telecomunicaciones operadas por AT&T. Favor mantener una distancia de no menos de 3 pies y obedecer todos los avisos.

Comuníquese con el propietario o los propietarios de las antenas antes de trabajar o caminar a una distancia de menos de 3 pies de la antena.

Comuníquese con AT&T \_\_\_\_\_ antes de realizar cualquier mantenimiento o reparaciones cerca de la antena de AT&T.

Esta es la estación base número \_\_\_\_\_

Favor comunicarse con la oficina de la administración del edificio si esta puerta o compuerta se encuentra sin candado.

**INFORMATION**

ACTIVE ANTENNAS ARE MOUNTED

ON THE OUTSIDE OF THIS BUILDING

BEHIND THIS PANEL

ON THIS STRUCTURE

STAY BACK A MINIMUM OF 3 FEET FROM THESE ANTENNAS

Contact AT&T at \_\_\_\_\_ and follow their instructions prior to performing any maintenance or repairs closer than 3 feet from the antennas.

This is AT&T site # \_\_\_\_\_

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Jun 14 2022

SITE NAME  
**GREENWICH PERRYRIDGE RD TWR**

SITE NUMBER:  
**CTL02102**

SITE ADDRESS  
**5 PERRYRIDGE ROAD DUP GREENWICH, CT 06830**

SHEET NAME  
**NOTES AND SPECIFICATIONS**

SHEET NUMBER  
**SP2**

INFO SIGN #1

INFO SIGN #2

INFO SIGN #3

SIGNAGE GUIDELINES CHART

NOTES FOR ROOFTOP SITES:

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

**ABBREVIATIONS**

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

**SYMBOLS**

	REVISION
	WORK POINT
	UTILITY POLE
	COMPRESSED STONE
	BRICK
	CONCRETE
	EARTH
	GRAVEL
	MASONRY
	STEEL
	CENTERLINE
	PROPERTY LINE
	LEASE LINE
	EASEMENT LINE
	CHAIN LINK FENCE
	WOOD FENCE
	BELOW GRADE ELECTRIC
	BELOW GRADE TELEPHONE
	OVERHEAD ELECTRIC/TELEPHONE
	SECTION REFERENCE

550 COCHITUATE ROAD  
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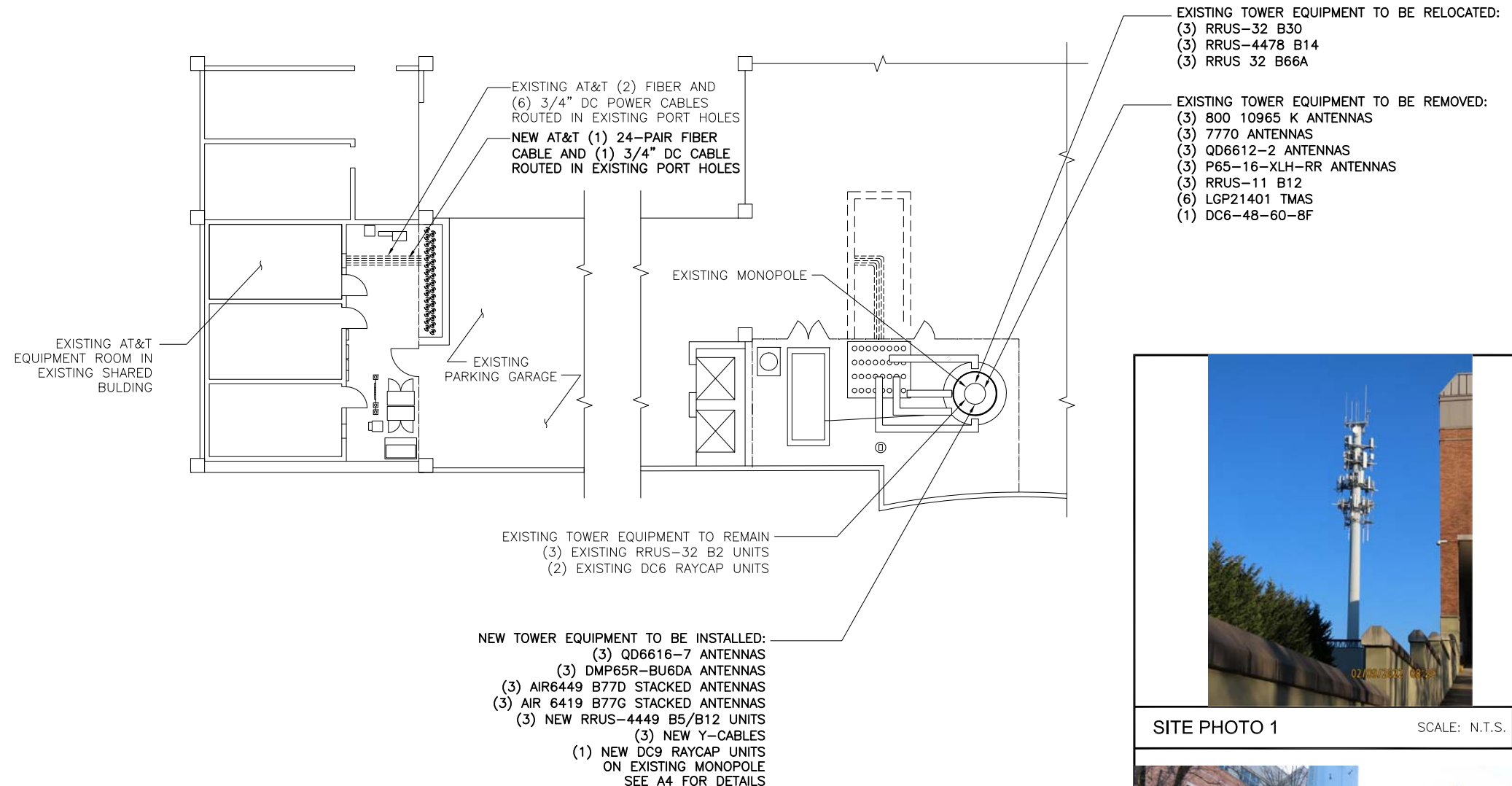
SITE NAME  
**GREENWICH  
PERRYRIDGE RD  
TWR**

SITE NUMBER:  
**CTL02102**

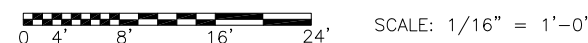
SITE ADDRESS  
**5 PERRYRIDGE ROAD DUP  
GREENWICH, CT 06830**

SHEET NAME  
**COMPOUND  
PLAN**

SHEET NUMBER  
**A1**



COMPOUND PLAN





550 COCHITUATE ROAD  
SUITE 550 13 AND 14  
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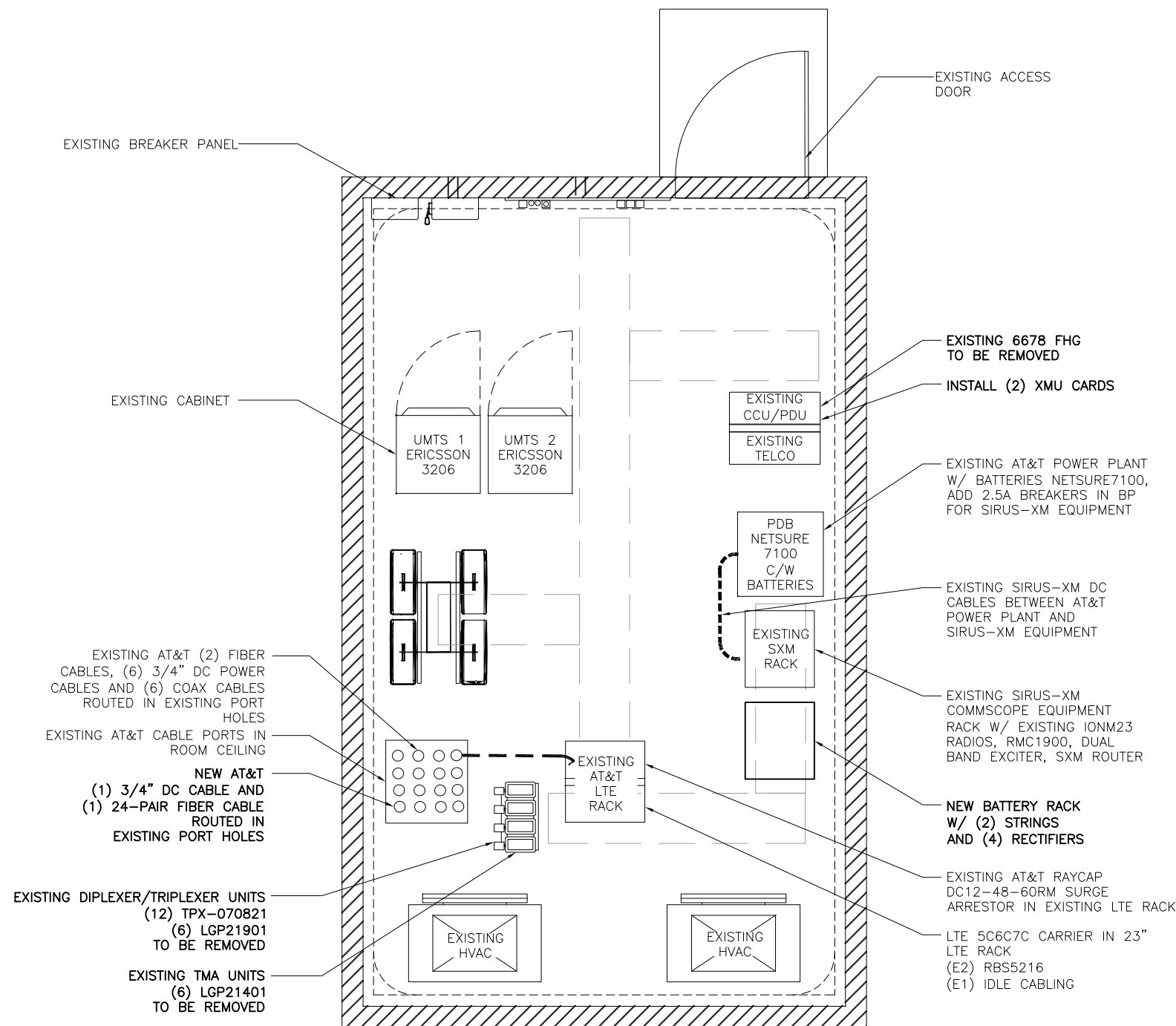
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SITE NUMBER:  
**CTL02102**

SITE ADDRESS  
**5 PERRYRIDGE ROAD DUP  
GREENWICH, CT 06830**

SHEET NAME  
**EQUIPMENT  
PLAN**

SHEET NUMBER  
**A2**

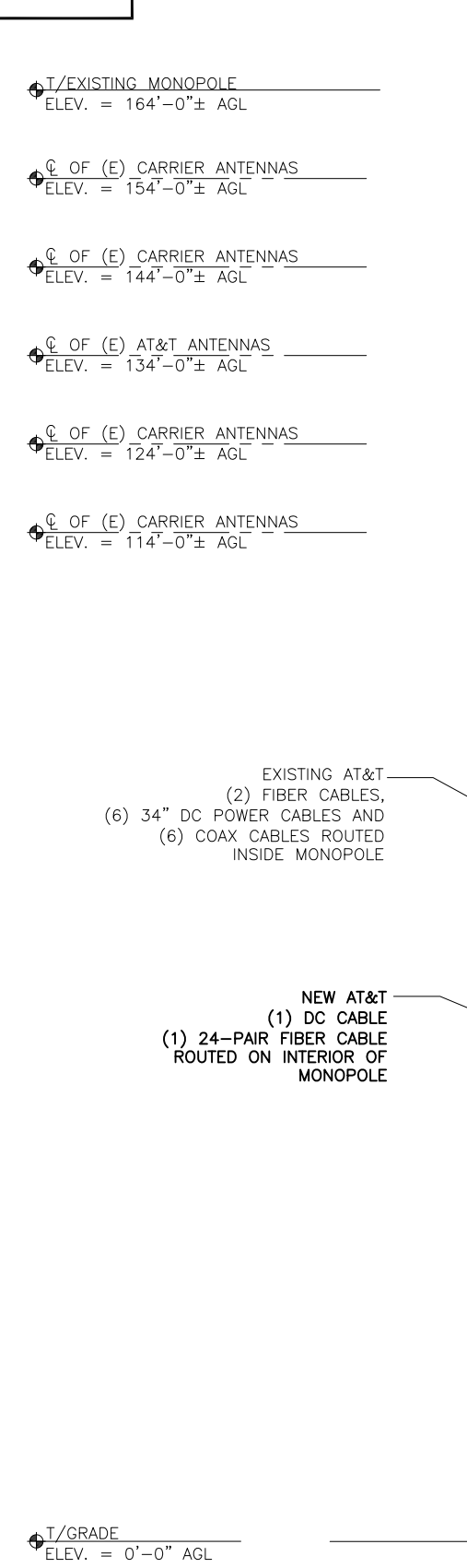
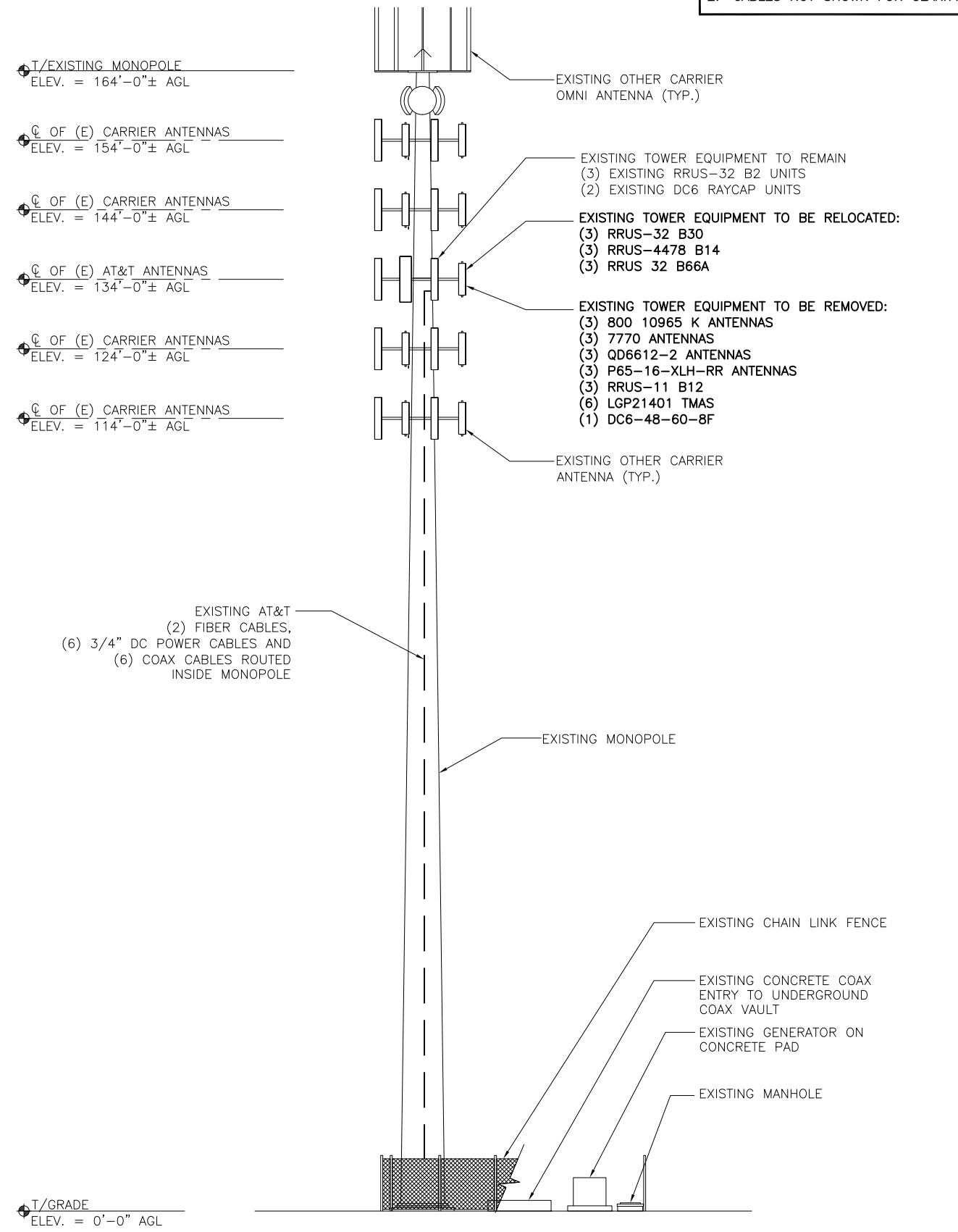


**NOTES:**

- CALCULATIONS FOR THE STRUCTURE AND ANTENNA MOUNTS WERE PREPARED BY FULLERTON AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
- CABLES NOT SHOWN FOR CLARITY

**NOTES:**

- 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
- 6 FEET MINIMUM SEPARATION BETWEEN 700DE & 700BC
- 4 FEET MINIMUM INTERSECTOR SEPARATION BETWEEN ANTENNAS EDGE TO EDGE



EXISTING ELEVATION



SCALE: 1" = 20'-0"

1

NEW ELEVATION



SCALE: 1" = 20'-0"

2

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SHEET NAME  
**ELEVATIONS**

SHEET NUMBER  
**A3**



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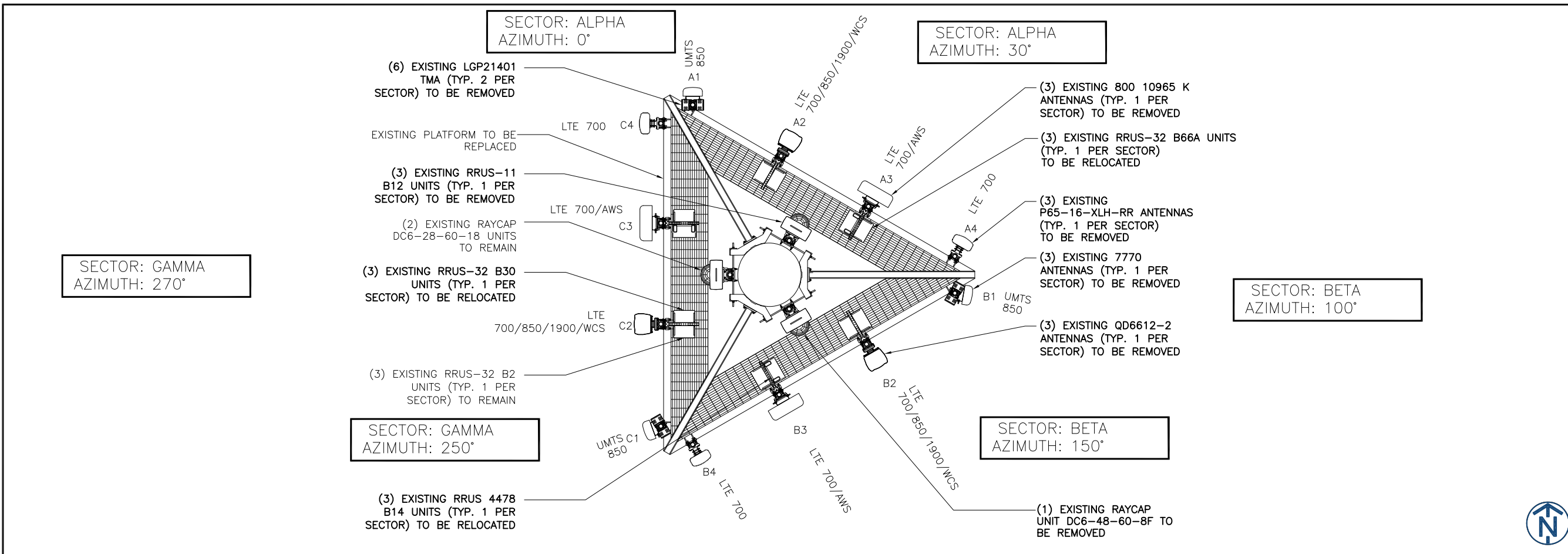
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SITE NUMBER:  
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SITE ADDRESS  
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GREENWICH, CT 06830**

SHEET NAME  
**ANTENNA  
PLANS**

SHEET NUMBER  
**A4**



EXISTING ANTENNA PLAN

SCALE: 3/16" = 1'-0" 1

**NOTES:**

- EXISTING ANTENNA MOUNTING PIPE TO BE REUSED, RELOCATED OR REPLACED AS REQUIRED
- IF REQUIRED INSTALL NEW GALV. MOUNTING PIPE(S) 2.5 STD. (2-7/8" O.D.)

NEW LOW-PROFILE PLATFORM  
MFR: SITE PRO 1  
PART#: RMQLP-4120-H10  
AT&T COMMAT No: ANT.44987  
SEE A5B FOR DETAILS

(3) NEW RRUS 4449 B5/B12  
(TYP. 1 PER SECTOR)

(1) NEW RAYCAP UNIT  
DC9-48-60-24-8C-EV

(3) NEW ANTENNAS STACKED  
ERICSSON AIR6419 B77G  
(TYP. 1 PER SECTOR)  
SEE A5 FOR DETAILS

(3) NEW ANTENNAS STACKED  
ERICSSON AIR6449 B77D  
(TYP. 1 PER SECTOR)  
SEE A5 FOR DETAILS

(3) EXISTING RELOCATED  
RRUS-32 B30 UNITS  
(TYP. 1 PER SECTOR)

(3) EXISTING RELOCATED  
RRUS 4478 B14 UNITS  
(TYP. OF 1 PER SECTOR)

(3) EXISTING RRUS-32 B2  
UNITS TO BE RELOCATED  
(TYP. OF 1 PER SECTOR)

**SECTOR: ALPHA  
AZIMUTH: 30°**

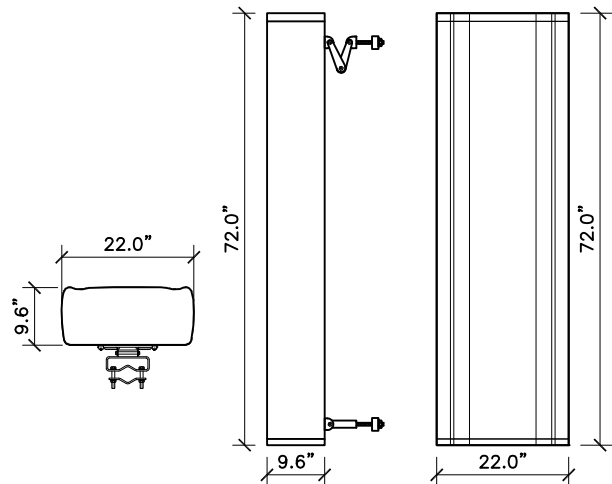
**NOTES:**

- 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
- 6 FEET MINIMUM SEPARATION BETWEEN 700DE & 700BC
- 4 FEET MINIMUM INTERSECTOR SEPARATION BETWEEN ANTENNAS EDGE TO EDGE

**SECTOR: GAMMA  
AZIMUTH: 270°**

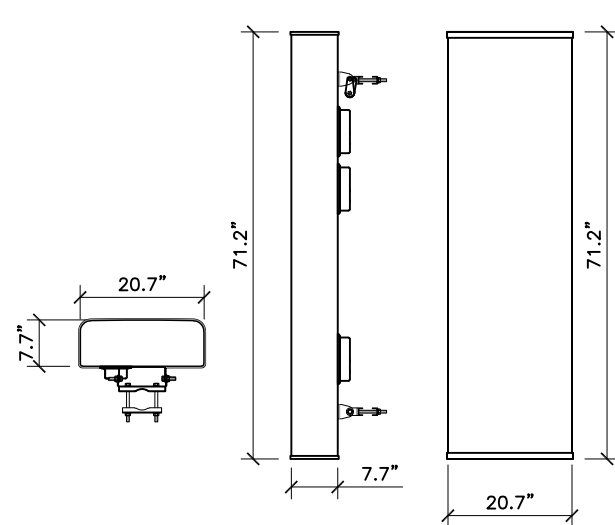
FINAL ANTENNA PLAN

SCALE: 3/16" = 1'-0" 2



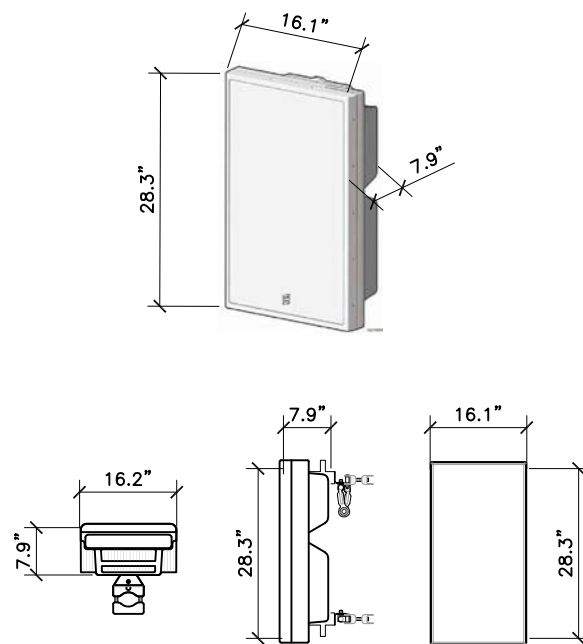
PLAN VIEW SIDE VIEW FRONT VIEW

**QUILTEL – QD6616-7**  
 MULTISERVE MULTIBAND 16 PORT ANTENNA  
 FREQUENCY RANGE 2 x 698-728 MHz  
 4 x 758-798 MHz  
 2 x 824-894 MHz  
 8 x 1695-2400 MHz  
 ANTENNA WEIGHT 114 Lbs



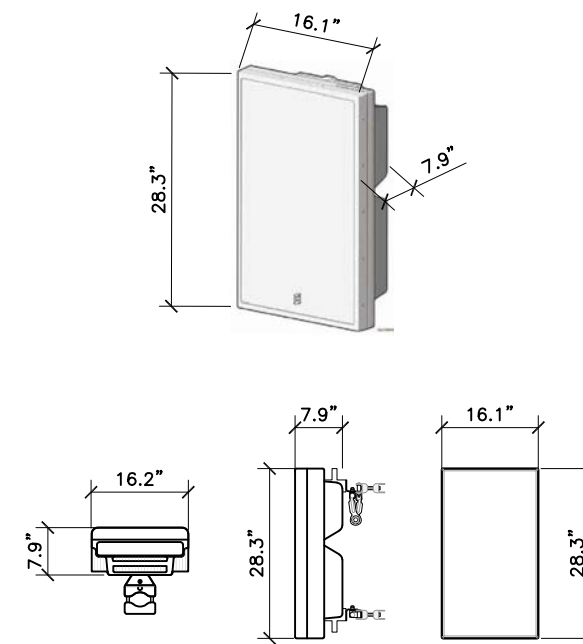
PLAN VIEW SIDE VIEW FRONT VIEW

**CCI – DMP65R-BU6DA**  
 8-PORT DUPLEXED MULTI-BAND ANTENNA  
 FREQUENCY RANGE 4 x 698-896 MHz  
 4 x 1695-2400 MHz  
 ANTENNA WEIGHT 79.4 Lbs



PLAN VIEW SIDE VIEW FRONT VIEW

**ERICSSON – AIR6449 B77D**  
 MASSIVE MIMO MID-BAND  
 WEIGHT W/ HARDWARE 77 Lbs



PLAN VIEW SIDE VIEW FRONT VIEW

**ERICSSON – AIR6419 B77G**  
 MASSIVE MIMO MID-BAND  
 WEIGHT W/ HARDWARE 77 Lbs



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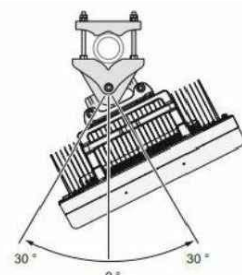
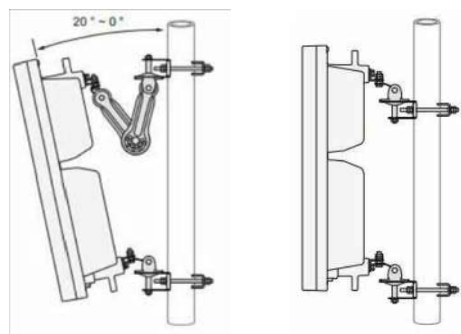
I HEREBY CERTIFY THAT THESE DRAWINGS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

ANTENNA SPEC SCALE: N.T.S. 1

ANTENNA SPEC SCALE: N.T.S. 2

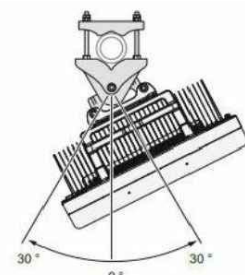
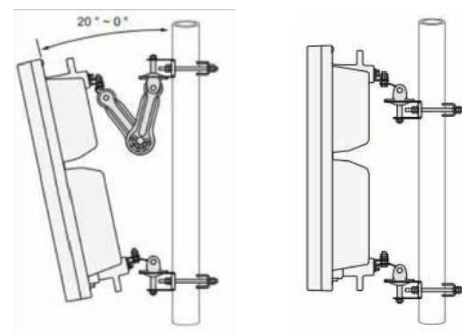
ANTENNA SPEC SCALE: N.T.S. 3

ANTENNA SPEC SCALE: N.T.S. 4



Pole	Circular	Square	90° Angle
Minimum outer dimension	Ø76 mm	50 x 50 mm	50 x 50 mm
Maximum outer dimension	Ø114 mm	80 x 80 mm	80 x 80 mm

**ERICSSON – AIR 6449 B77D MOUNT**  
 BRACKET SUPPORTING AIR WITH TILTING +/-20 DEGREE AND RIGHT/LEFT 30 DEGREE

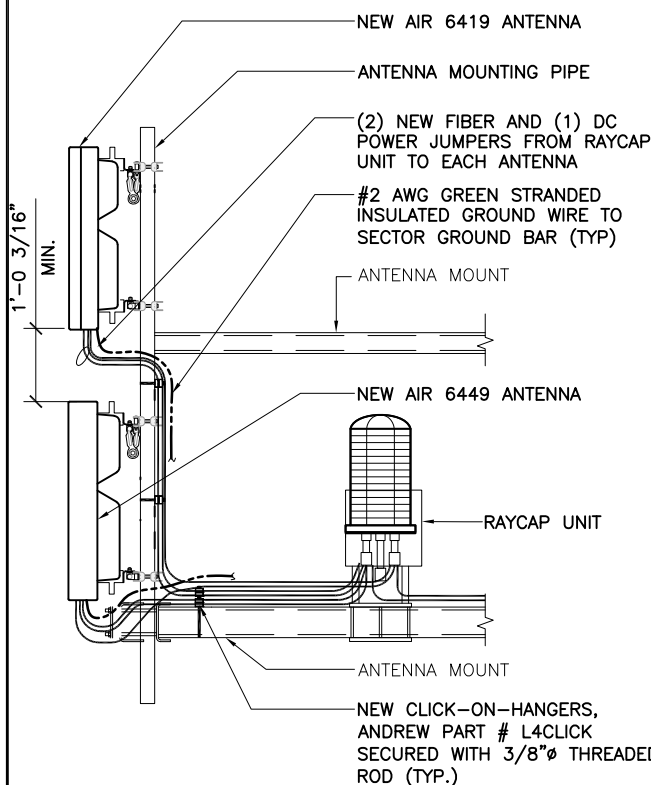


Pole	Circular	Square	90° Angle
Minimum outer dimension	Ø76 mm	50 x 50 mm	50 x 50 mm
Maximum outer dimension	Ø114 mm	80 x 80 mm	80 x 80 mm

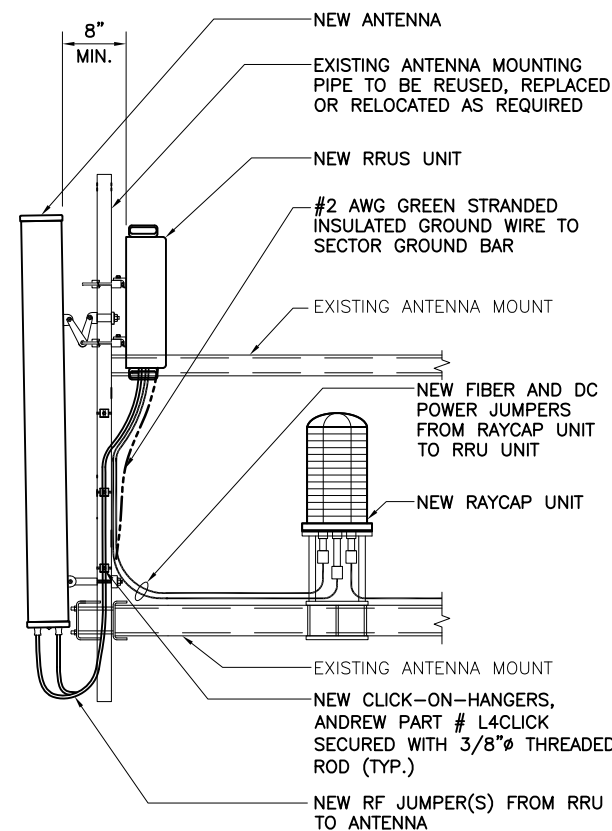
**ERICSSON – AIR 6419 B77G MOUNT**  
 BRACKET SUPPORTING AIR WITH TILTING +/-20 DEGREE AND RIGHT/LEFT 30 DEGREE

ANTENNA SPEC SCALE: N.T.S. 5

ANTENNA SPEC SCALE: N.T.S. 6



ANTENNA SCHEMATIC SCALE: N.T.S. 7



ANTENNA SCHEMATIC SCALE: N.T.S. 8



Jun 14 2022

SITE NAME  
**GREENWICH PERRYRIDGE RD TWR**

SITE NUMBER:  
**CTL02102**

SITE ADDRESS  
 5 PERRYRIDGE ROAD DUP  
 GREENWICH, CT 06830

SHEET NAME  
**EQUIPMENT DETAILS**

SHEET NUMBER  
**A5**



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



1362 MELLON ROAD  
SUITE 140  
HANOVER, MD 21076



1100 E. WOODFIELD ROAD, SUITE 500  
SCHAUMBURG, ILLINOIS 60173  
TEL: 847-908-8400  
COA# PEC.0001899  
www.FullertonEngineering.com

REV	DATE	DESCRIPTION	BY
0	04/20/22	90% REVIEW	SP
1	05/16/22	REVISION	JS
2	06/14/22	REVISION	CB

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Jun 14 2022

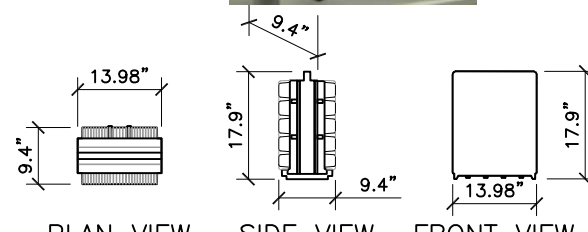
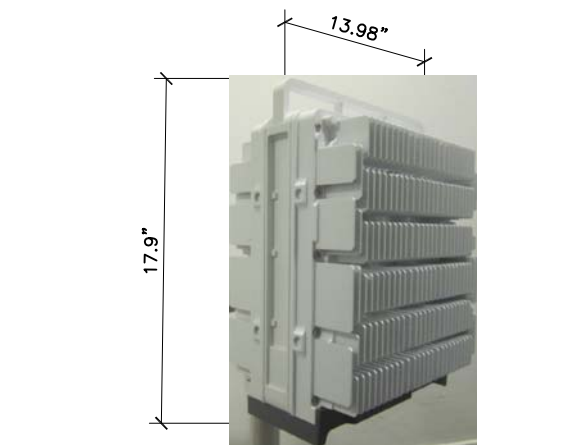
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PERRYRIDGE RD  
TWR**

SITE NUMBER:  
**CTL02102**

SITE ADDRESS  
**5 PERRYRIDGE ROAD DUP  
GREENWICH, CT 06830**

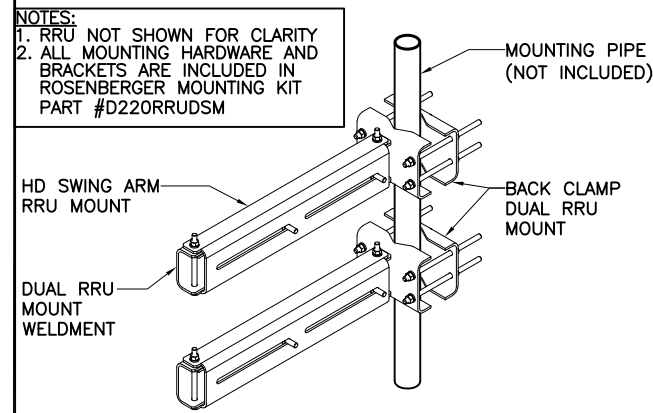
SHEET NAME  
**EQUIPMENT  
DETAILS**

SHEET NUMBER  
**A5A**

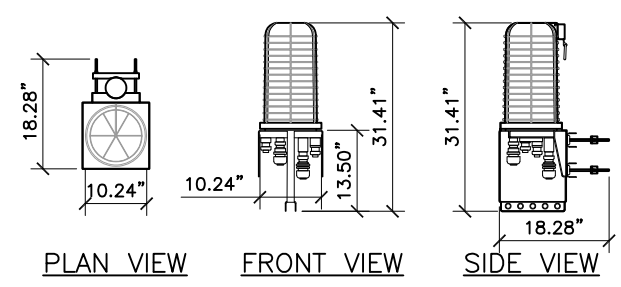


**ERICSSON –  
Dual Band Radio 4449 B5, B12**

FREQUENCY RANGE	B5 TX	869–894 MHz
	B12 TX	729–746 MHz
	B5 RX	824–849 MHz
	B12 RX	699–716 MHz
TOTAL WEIGHT		71 Lbs



NOTES:  
1. RRU NOT SHOWN FOR CLARITY  
2. ALL MOUNTING HARDWARE AND BRACKETS ARE INCLUDED IN ROSENBERGER MOUNTING KIT PART #D220RRUDSM



**RAYCAP – DC9-48-60-24-8C-EV**

SYSTEM WEIGHT	16.0 Lbs
MOUNT WEIGHT	10.2 Lbs
TOTAL WEIGHT	26.2 Lbs
DIMENSIONS (LxWxH)	18.28"x10.24"x31.4"

RRU SPEC SCALE: N.T.S. 1

RRH MOUNT DETAIL SCALE: N.T.S. 2

SQUID SPEC SCALE: N.T.S. 3

NOT USED SCALE: N.T.S. 4

NOT USED SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

NOT USED SCALE: N.T.S. 7

NOT USED SCALE: N.T.S. 8





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



1100 E. WOODFIELD ROAD, SUITE 500  
SCHAUMBURG, ILLINOIS 60173  
TEL: 847-908-8400  
COA# PEC.0001899  
www.FullertonEngineering.com

REV	DATE	DESCRIPTION	BY
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2	06/14/22	REVISION	CB

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Jun 14 2022

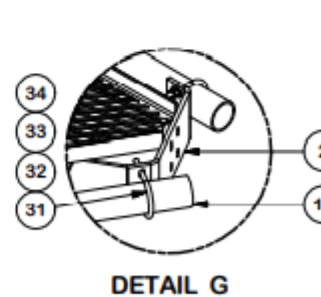
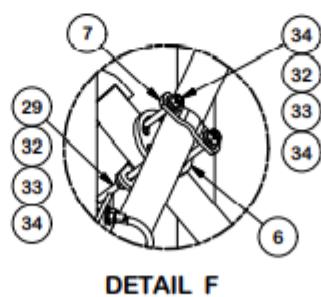
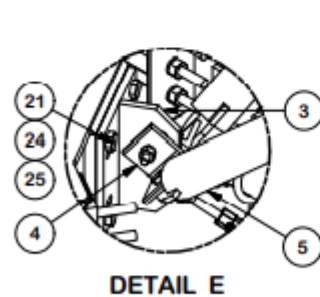
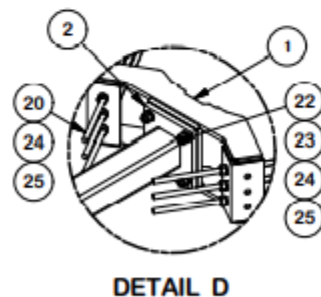
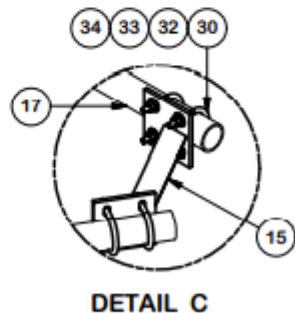
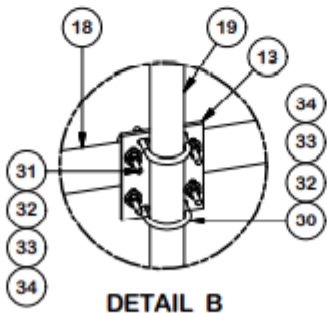
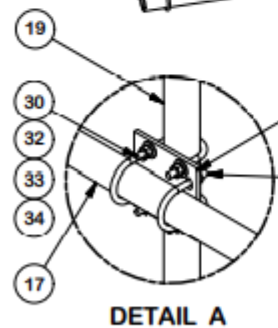
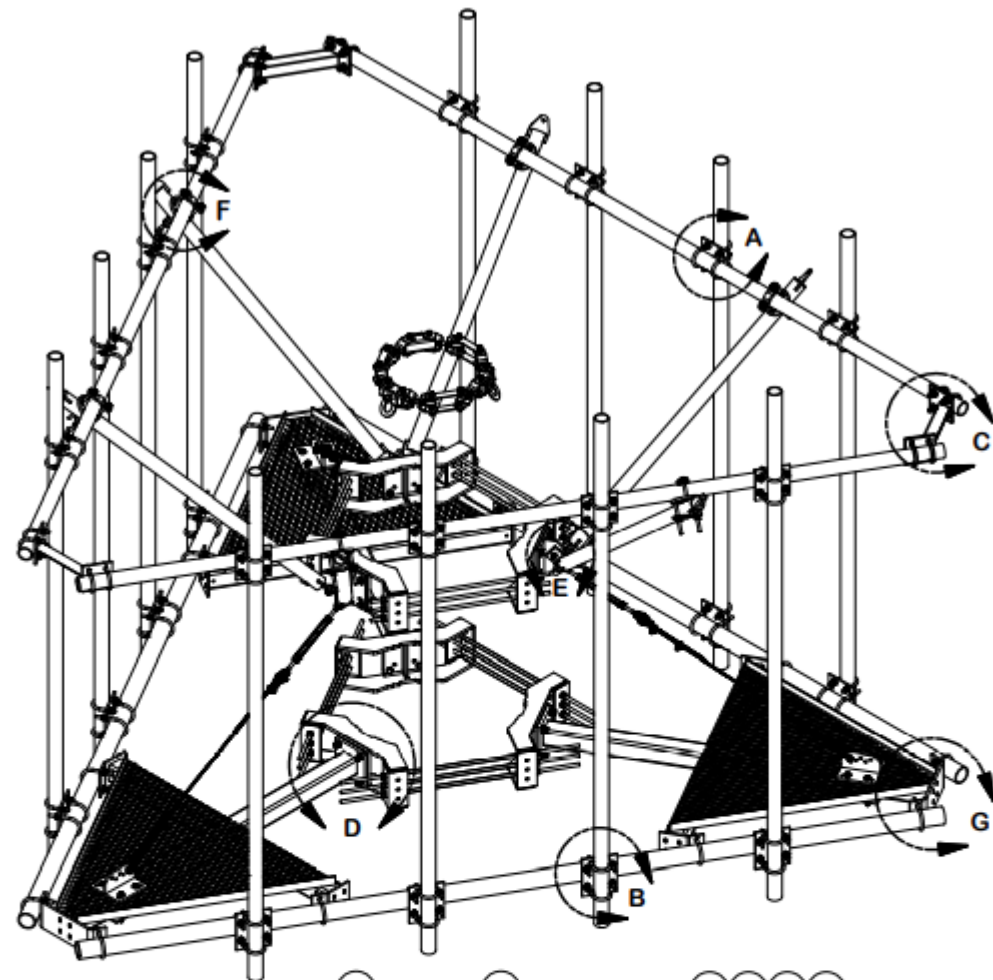
SITE NAME  
**GREENWICH  
PERRYRIDGE RD  
TWR**

SITE NUMBER:  
**CTL02102**

SITE ADDRESS  
**5 PERRYRIDGE ROAD DUP  
GREENWICH, CT 06830**

SHEET NAME  
**EQUIPMENT  
DETAILS**

SHEET NUMBER  
**A5B**



ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	6	X-LWRM	RING MOUNT WELDMENT		68.81	412.85
2	3	X-SV196L	LONG PLATFORM WELDMENT		230.94	692.81
3	6	X-TBW	T-BRACKET WELDMENT		13.60	81.60
4	6	SHCM-T	CHAIN MOUNT TIGHTENER BRACKET	3 in	1.86	11.15
5	6	X-VSKL	LONG SUPPORT WELDMENT FOR VSK REINFORCEMENTS		37.05	222.33
6	6	X-127594	FLAT DISK CLAMP PLATE 4" CENTERS (GALV.)		2.51	15.04
7	12	X-100064	CLAMP (4" V-CLAMP) GALVANIZED		0.92	11.06
8	3	320751-I	1/2" CHAIN SHACKLE		0.76	2.29
9	3	320601-I	5/8" TURNBUCKLE		2.63	7.89
10	6	320777-I	5/16" THIMBLE		0.06	0.36
11	12	320152-I	5/16" WIRE ROPE CLIP		1.32	15.78
12	3	AC516-10	5/16" AIRCRAFT CABLE		1.25	3.76
13	15	SCX4	CROSSOVER CABLE	8 1/2 in	6.02	90.32
14	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
15	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
17	3	P30174	2-7/8" O.D. x 174" SCH. 40 PIPE	174 in	84.20	252.59
18	3	P3174	3-1/2" X 174" SCH 40 GALVANIZED PIPE	174 in	109.97	329.90
19	12	P30120	2-7/8" x 120" (2-1/2" SCH. 40) GALVANIZED PIPE	120 in	58.07	696.79
20	18	G58R-48	5/8" x 48" THREADED ROD (HDG.)		4.18	75.27
20	18	G58R-24	5/8" x 24" THREADED ROD (HDG.)		2.09	37.63
21	12	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	3.75
22	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	4.27
23	12	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.41
24	60	G58LW	5/8" HDG LOCKWASHER		0.03	1.57
25	60	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	7.79
26	6	G12112	1/2" x 1-1/2" HDG HEX BOLT GR5	1 1/2 in	0.15	0.89
27	3	G12212	1/2" x 2-1/2" HDG HEX BOLT GR5	2 1/2 in	0.20	0.61
28	12	G1204	1/2" x 4" HDG HEX BOLT GR5 FULL THREAD	4 in	0.27	3.24
29	24	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	5 1/2 in	0.41	9.83
30	84	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.67	56.19
31	36	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.83	29.82
32	288	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	9.82
33	285	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	3.96
34	285	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	20.41
35	1	HALO40	5,000 LB. MAINTENANCE TIE-OFF POINT		41.12	41.12
<b>TOTAL WT. #</b>						<b>3249.41</b>

**TOLERANCE NOTES**  
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:  
SAWED, SHEARED AND GAS CUT EDGES (± 0.030")  
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES  
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES  
BENDS AND ANGLES ARE ± 1/2 DEGREE  
ALL OTHER MACHINING (± 0.030")  
ALL OTHER ASSEMBLY (± 0.060")

PROPRIETARY NOTE:  
THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION  
**14' 6" LOW PROFILE PLATFORM  
WITH TWELVE 2-7/8" ANTENNA MOUNTING  
PIPES, REINFORCED HANDRAIL, AND CABLE**

CPD NO.	DRAWN BY	ENG. APPROVAL
	CSL 10/17/2019	10/18/2019
CLASS	DRAWING USAGE	CHECKED BY
87	CUSTOMER	BMC 10/18/2019

**SITE PRO 1**  
Locations:  
New York, NY  
Atlanta, GA  
Los Angeles, CA  
Plymouth, IN  
Salem, OR  
Dallas, TX  
Tampa, FL  
Engineering Support Team:  
1-888-753-7446  
A valmont COMPANY

PART NO.	RMQLP-4120-H10
DWG. NO.	RMQLP-4120-H10

1 OF 3  
PAGE



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



1362 MELLON ROAD  
SUITE 140  
HANOVER, MD 21076



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SCHAUMBURG, ILLINOIS 60173  
TEL: 847-908-8400  
COA# PEC.0001899  
www.FullertonEngineering.com

REV	DATE	DESCRIPTION	BY
0	04/20/22	90% REVIEW	SP
1	05/16/22	REVISION	JS
2	06/14/22	REVISION	CB

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Jun 14 2022

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**GREENWICH  
PERRYRIDGE RD  
TWR**

SITE NUMBER:  
**CTL02102**

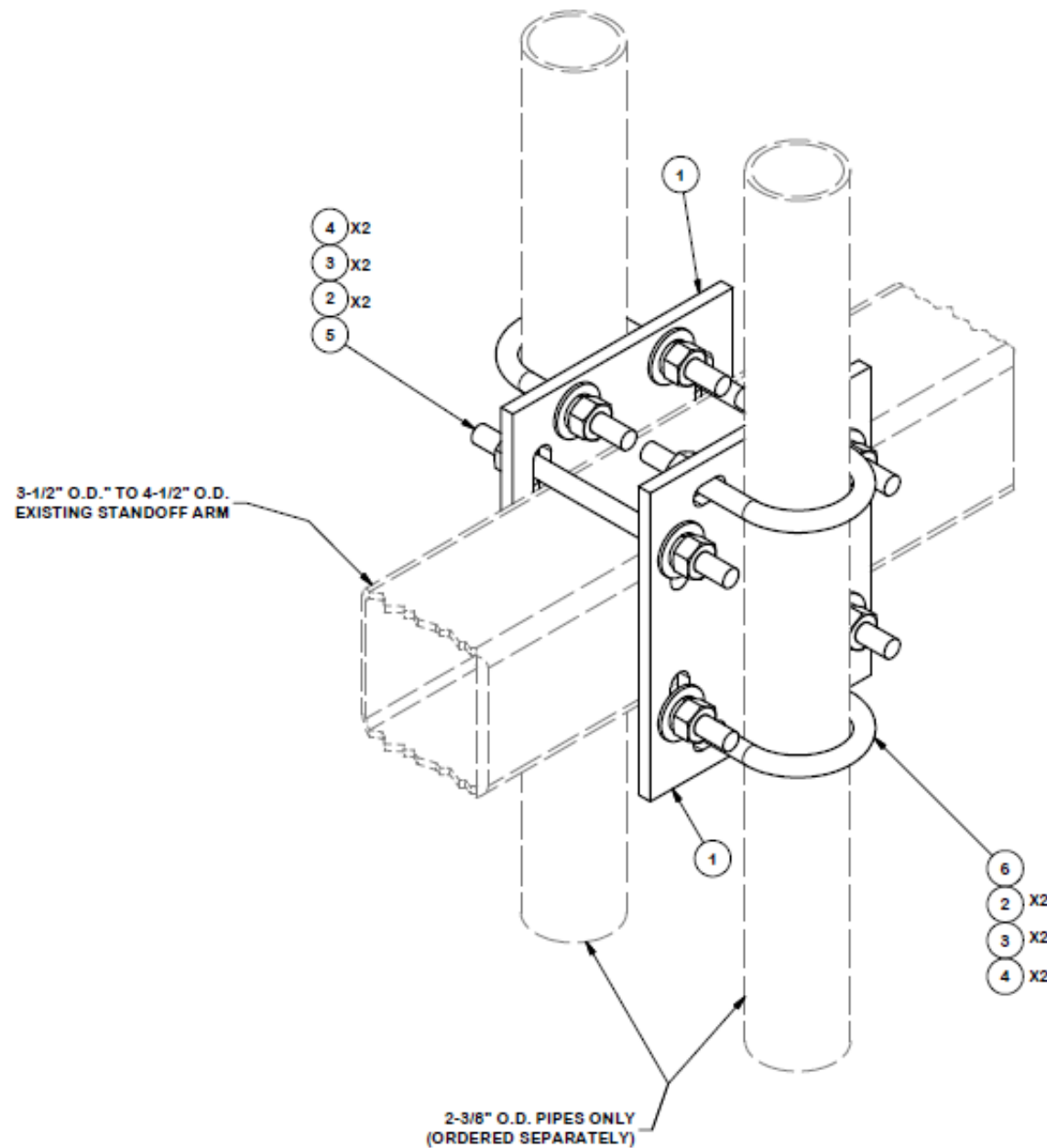
SITE ADDRESS  
**5 PERRYRIDGE ROAD DUP  
GREENWICH, CT 06830**

SHEET NAME  
**EQUIPMENT  
DETAILS**

SHEET NUMBER  
**A5C**

PARTS LIST

ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	12.04
2	16	G12FW	1/2" HDG USS FLATWASHER		0.03	0.55
3	16	G12LW	1/2" HDG LOCKWASHER		0.01	0.22
4	16	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.15
5	4	G12R-8	1/2" x 8" THREADED ROD (HDG.)		0.35	1.41
6	4	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	2.50
<b>TOTAL WT. #</b>						<b>17.87</b>



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:  
SAWED, SHEARED AND GAS CUT EDGES ( $\pm 0.030"$ )  
DRILLED AND GAS CUT HOLES ( $\pm 0.030"$ ) - NO CONING OF HOLES  
LASER CUT EDGES AND HOLES ( $\pm 0.010"$ ) - NO CONING OF HOLES  
BENDS ARE  $\pm 1/2$  DEGREE  
ALL OTHER MACHINING ( $\pm 0.030"$ )  
ALL OTHER ASSEMBLY ( $\pm 0.060"$ )

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DESCRIPTION  
**BACK TO BACK  
PIPE MOUNT**

**SITE PRO 1**  
Engineering Support Team: 1-888-753-7446  
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX  
A valmont COMPANY

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE 1 OF 1
CLASS	DRAWING USAGE	CHECKED BY	DWG. NO.	
81	03	CUSTOMER	BBPM-K1	
			BBPM-K1	



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Jun 14 2022

SITE NAME  
**GREENWICH  
PERRYRIDGE RD  
TWR**

SITE NUMBER:  
**CTL02102**

SITE ADDRESS  
**5 PERRYRIDGE ROAD DUP  
GREENWICH, CT 06830**

SHEET NAME  
**ANTENNA &  
CABLE  
CONFIGURATION**

SHEET NUMBER  
**A6**

FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (05/31/2022)										
SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER		RAYCAP UNIT
								TYPE	LENGTH	
ALPHA	A-1	-	-	-	-	-	-	-	-	(1) (E) DC6-28-60-18 UNIT
	A-2	(N)LTE 700/1900/ AWS/ 5G1900	QD6616-7	QUINTEL	(1) RELOCATED 4478 B14 (1) RELOCATED RRUS-32 B2 (1) RELOCATED RRUS-32 B66A (1) RELOCATED RRUS-E2 B9	30°	134'-0"	(1) EXISTING DC CABLE	300'-0"	
	A-3	(N) 5G CBAND/5G DOD	AIR6449 B77D + AIR6419 B77G STACKED	ERICSSON	-	30°	134'-0"	(1) EXISTING FIBER CABLE	300'-0"	
	A-4	(N)LTE 700/ WCS/ 5G 850	DMP65R-BU6DA	CCI	(1) NEW RRUS-4449 B5/B12 (1) RELOCATED RRUS-32 B30 (1) NEW Y-CABLE	30°	134'-0"	(1) EXISTING DC CABLE (2) EXISTING COAX CABLES	300'-0"	
BETA	B-1	-	-	-	-	-	-	-	-	(1) (E) DC6-28-60-18 UNIT
	B-2	(N)LTE 700/1900/ AWS/ 5G1900	QD6616-7	QUINTEL	(1) RELOCATED 4478 B14 (1) RELOCATED RRUS-32 B2 (1) RELOCATED RRUS-32 B66A (1) RELOCATED RRUS-E2 B9	150°	134'-0"	(1) EXISTING DC CABLE	300'-0"	
	B-3	(N) 5G CBAND/5G DOD	AIR6449 B77D + AIR6419 B77G STACKED	ERICSSON	-	150°	134'-0"	(1) EXISTING FIBER CABLE	300'-0"	
	B-4	(N)LTE 700/ WCS/ 5G 850	DMP65R-BU6DA	CCI	(1) NEW RRUS-4449 B5/B12 (1) RELOCATED RRUS-32 B30 (1) NEW Y-CABLE	150°	134'-0"	(1) EXISTING DC CABLE (2) EXISTING COAX CABLES	300'-0"	
GAMMA	C-1	-	-	-	-	-	-	-	-	(1) (N) DC9-48-60-24-8C-EV UNIT
	C-2	(N)LTE 700/1900/ AWS/ 5G1900	QD6616-7	QUINTEL	(1) RELOCATED 4478 B14 (1) RELOCATED RRUS-32 B2 (1) RELOCATED RRUS-32 B66A (1) RELOCATED RRUS-E2 B9	270°	134'-0"	(1) EXISTING DC CABLE	300'-0"	
	C-3	(N) 5G CBAND/5G DOD	AIR6449 B77D + AIR6419 B77G STACKED	ERICSSON	-	270°	134'-0"	(1) NEW FIBER CABLE (1) NEW DC CABLE	300'-0"	
	C-4	(N)LTE 700/ WCS/ 5G 850	DMP65R-BU6DA	CCI	(1) NEW RRUS-4449 B5/B12 (1) RELOCATED RRUS-32 B30 (1) NEW Y-CABLE	270°	134'-0"	(1) EXISTING DC CABLE (2) EXISTING COAX CABLES	300'-0"	

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

ANTENNA AND CABLING NOTES

SCALE: N.T.S. 1

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

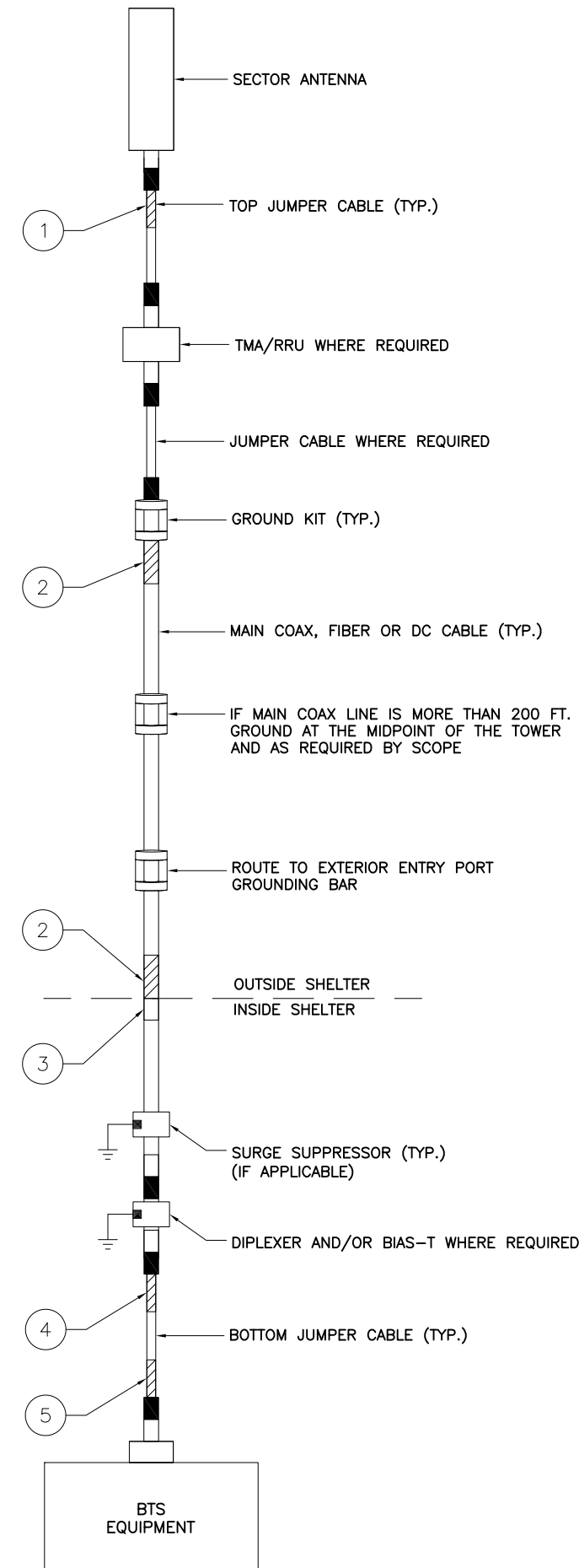
CABLE MARKING DIAGRAM

SCALE: N.T.S. 2

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

CABLE MARKING NOTES

SCALE: N.T.S. 3



CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. 4



REV	DATE	DESCRIPTION	BY
0	04/20/22	90% REVIEW	SP
1	05/16/22	REVISION	JS
2	06/14/22	REVISION	CB

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Jun 14 2022

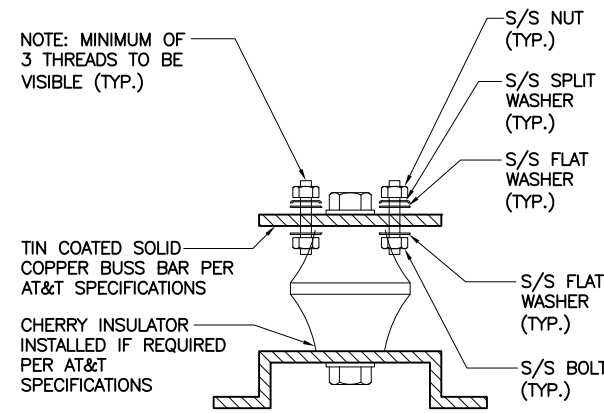
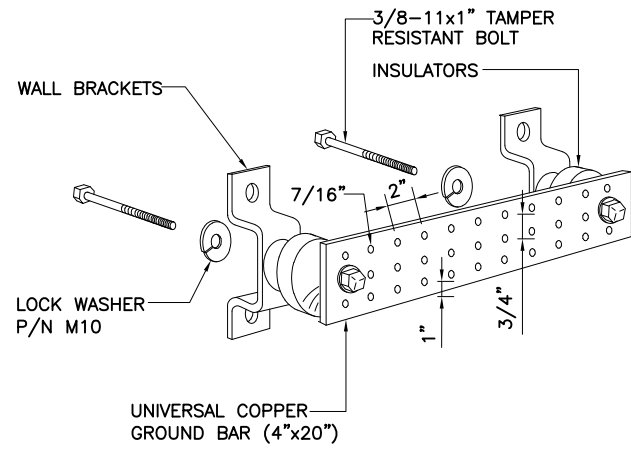
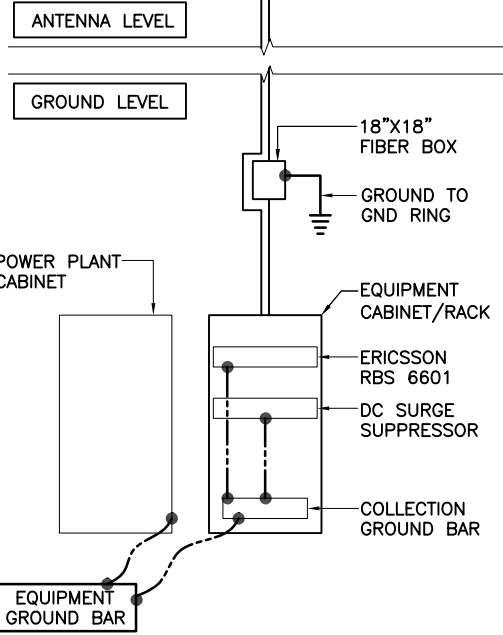
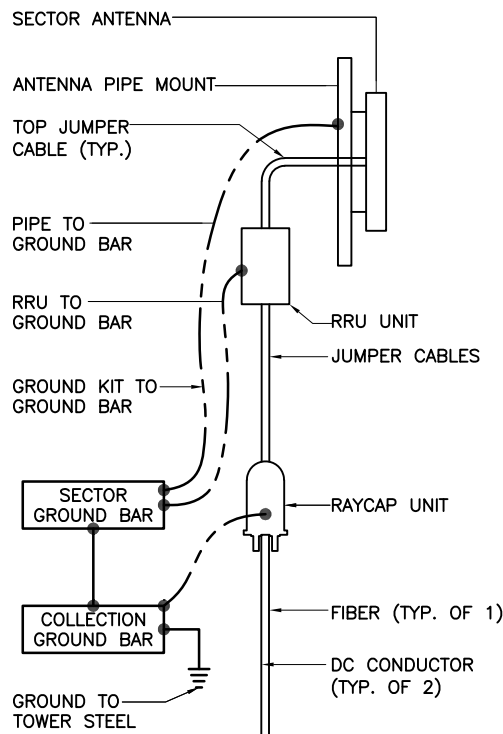
SITE NAME  
**GREENWICH  
PERRYRIDGE RD  
TWR**

SITE NUMBER:  
**CTL02102**

SITE ADDRESS  
**5 PERRYRIDGE ROAD DUP  
GREENWICH, CT 06830**

SHEET NAME  
**CABLE NOTES  
AND COLOR  
CODING**

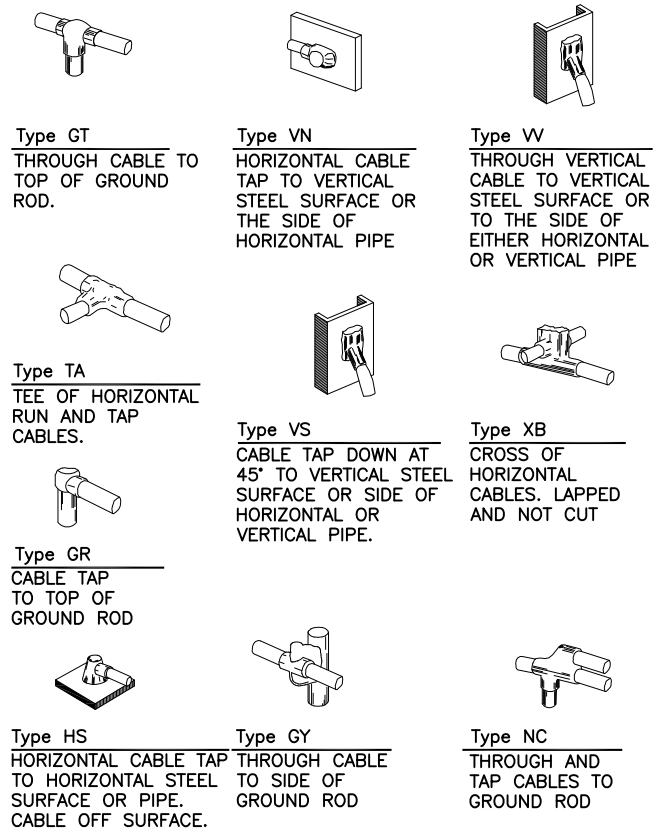
SHEET NUMBER  
**A7**



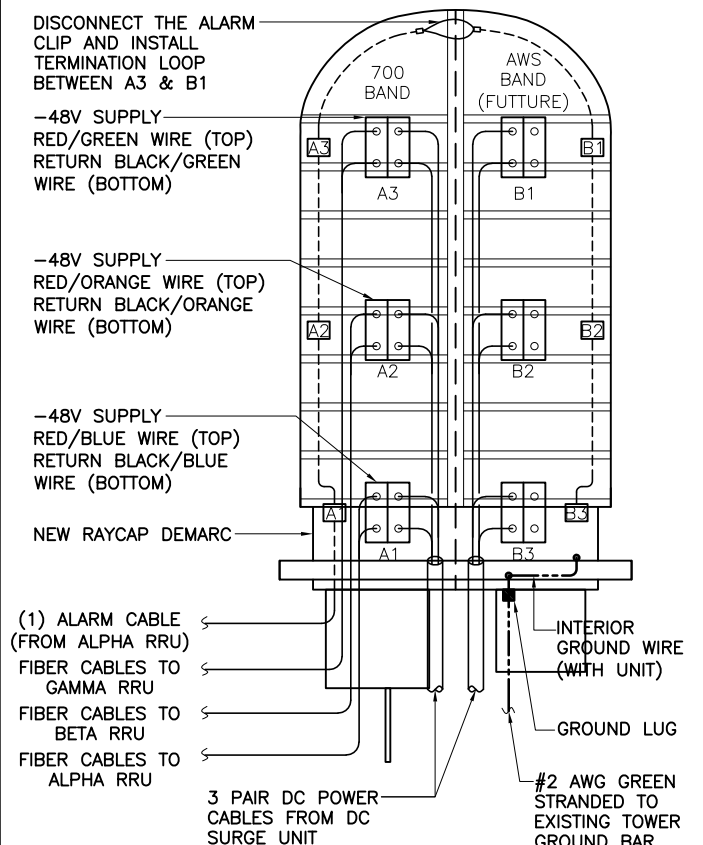
- NOTES:**
1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
  2. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
  3. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

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

LUG DETAIL SCALE: N.T.S. 3



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



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

NOT USED SCALE: N.T.S. 6

GROUNDING SCHEMATIC SCALE: N.T.S. 1



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



1362 MELLON ROAD  
SUITE 140  
HANOVER, MD 21076



1100 E. WOODFIELD ROAD, SUITE 500  
SCHAUMBURG, ILLINOIS 60173  
TEL: 847-908-8400  
COA# PEC.0001899  
www.FullertonEngineering.com

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Jun 14 2022

SITE NAME  
**GREENWICH  
PERRYRIDGE RD  
TWR**

SITE NUMBER:  
**CTL02102**

SITE ADDRESS  
**5 PERRYRIDGE ROAD DUP  
GREENWICH, CT 06830**

SHEET NAME  
**GROUNDING  
DETAILS**

SHEET NUMBER  
**A8**



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



1100 E. WOODFIELD ROAD, SUITE 500  
SCHAUMBURG, ILLINOIS 60173  
TEL: 847-908-8400  
COA# PEC.0001899  
www.FullertonEngineering.com

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Jun 14 2022

SITE NAME  
**GREENWICH  
PERRYRIDGE RD  
TWR**

SITE NUMBER:  
**CTL02102**

SITE ADDRESS  
**5 PERRYRIDGE ROAD DUP  
GREENWICH, CT 06830**

SHEET NAME  
**PLUMBING DIAGRAMS**

SHEET NUMBER  
**A9**

Diagram - Sector A Diagram File Name - Monopole\_C\_Band\_DoD\_700DE\_Bottom\_44x\_2xDCFiber\_1xDC-9\_5216+2xXMU+H948.vsd  
Abt Site Name - CTL02102 Location Name - TWR Market - CONNECTICUT Market Cluster - NEW ENGLAND

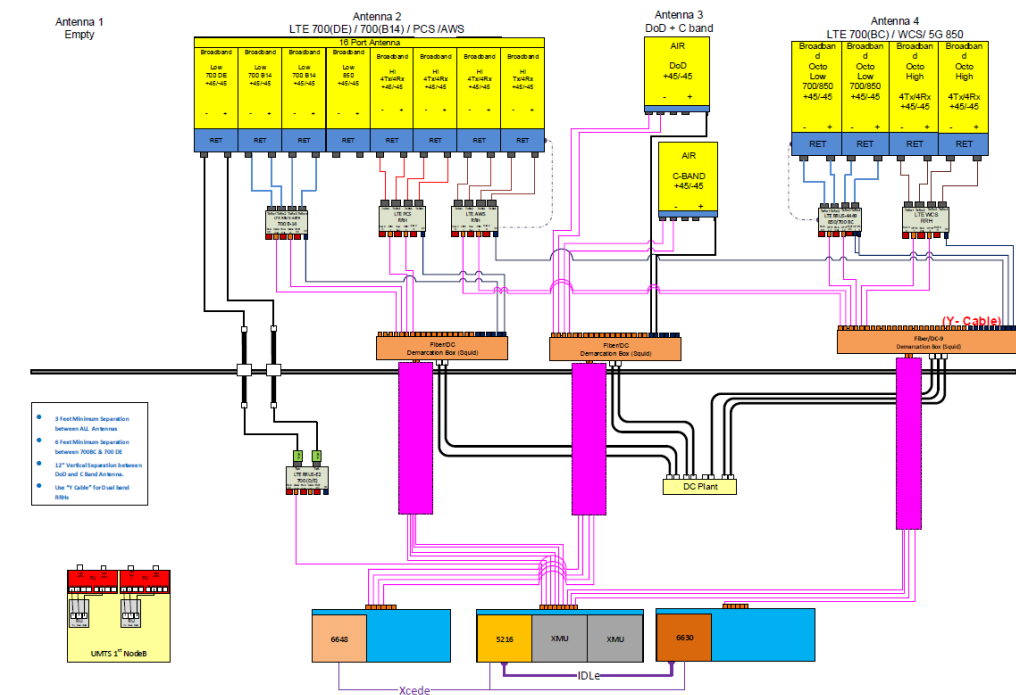


Diagram - Sector B Diagram File Name - Monopole\_C\_Band\_DoD\_700DE\_Bottom\_44x\_2xDCFiber\_1xDC-9\_5216+2xXMU+H948.vsd  
Abt Site Name - CTL02102 Location Name - TWR Market - CONNECTICUT Market Cluster - NEW ENGLAND

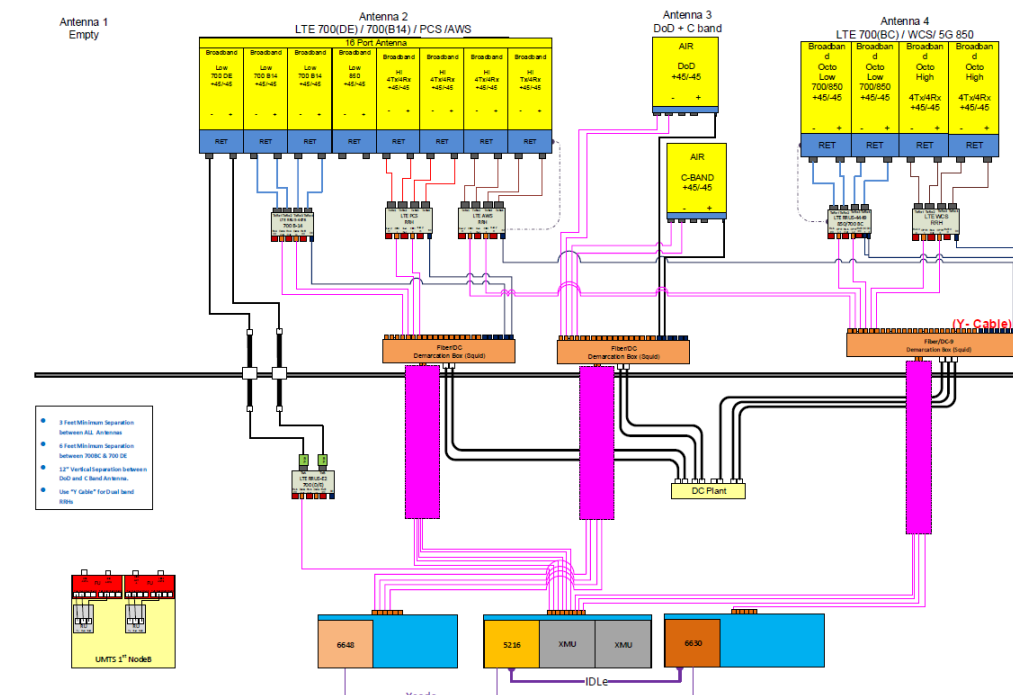
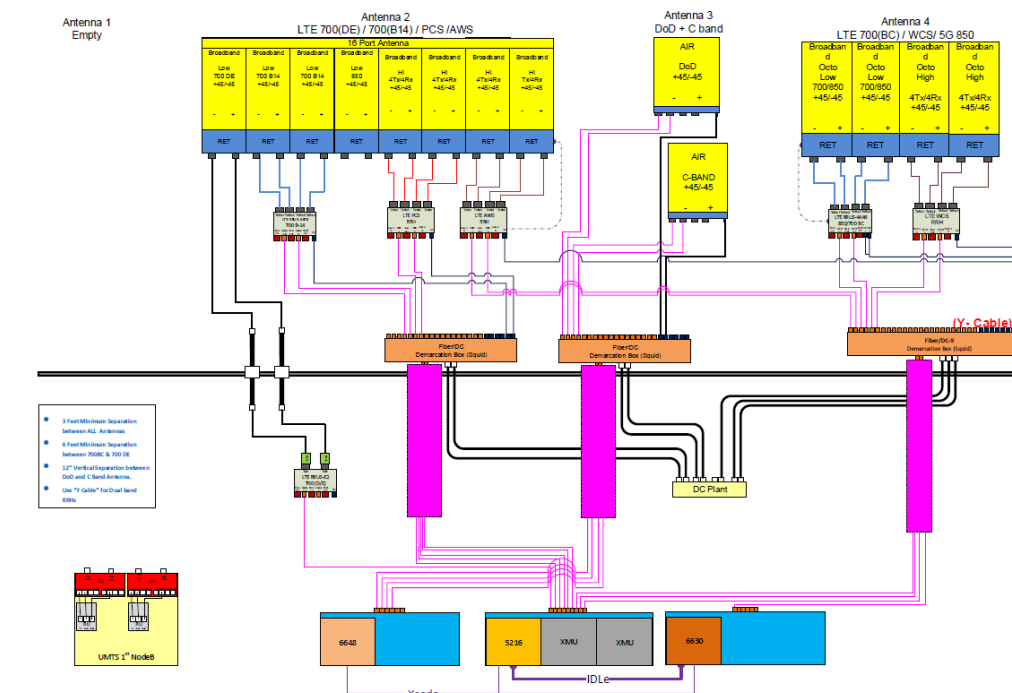


Diagram - Sector C Diagram File Name - Monopole\_C\_Band\_DoD\_700DE\_Bottom\_44x\_2xDCFiber\_1xDC-9\_5216+2xXMU+H948.vsd  
Abt Site Name - CTL02102 Location Name - TWR Market - CONNECTICUT Market Cluster - NEW ENGLAND



\*BASED ON RFDS V3.0, DATED (05/31/22)

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Fred Camillo, First Selectman  
Town of Greenwich

28 Hartford Ave  
GREENWICH, CT US 06830  
203-622-7710

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Friday, June 17, 2022

11:32 AM	GREENWICH, CT	Delivered Package delivered to recipient address - release authorized
9:22 AM	ELMSFORD, NY	On FedEx vehicle for delivery
8:32 AM	ELMSFORD, NY	At local FedEx facility
4:09 AM	NEWARK, NJ	Departed FedEx hub

Thursday, June 16, 2022

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10:28 AM	GREENWICH, CT	Delivered Unable to deliver to pharmacy: Restricted access
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4:09 AM	NEWARK, NJ	Departed FedEx hub

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Carolyn Seeley

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Katie DeLuca, Planning & Zoning  
Town of Greenwich

28 Hartford Ave  
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