



10/11/2022

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

**Re:** Notice of Exempt Modification – Antenna Swap  
**Property Address:** 83 Windham St Willimantic, CT 06226  
**Applicant:** AT&T Mobility, LLC

Dear Ms. Bachman:

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

AT&T currently maintains a wireless telecommunications facility consisting of nine (9) wireless telecommunication antennas at an antenna center line height of 137-feet on an existing 175 –monopole tower, owned by the City of Willimantic located at 83 Windham St Willimantic, CT 06226. AT&T now intends to:

Remove 12 existing antennas, 3 Radios 3 PDU's and 3 TMA's. Install 12 new antennas (3 Quintel QD8616-7, 3 CCI DMP65R-BU8DA, 6 AIR6449 B77D+AIR6419 B77G STACKED 2 per sector) 6 RRUS (3 4426 B66 and 3 4449 B5/B12), 3 Y-cables, 1 Squid, 1 Fiber cable, and 3 DC cables.

This facility was approved the application dated December 30, 2003 and related plans dated August 13, 2003 for Project # CT-11-506A by the Office of the State Building who issued Building Permit #09-03 for structural/ electrical work to erect telecommunications antennas and associated equipment to an existing 175 foot monopole tower.

Note: Any changes to the approved plans shall be submitted to the office of the State Building Inspector for review.

[85 Range way Rd Bldg. #3 Suite 102 North Billerica | MA 01862-2105](#)



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

EM-AT&T-163-191104 – AT&T Mobility, LLC notice of intent to modify an existing telecommunications facility located at 193 Windham Center Road, Windham, Connecticut.

EM-AT&T-163-190606 – AT&T Mobility, LLC notice of intent to modify an existing telecommunications facility located at 83 Windham Street, Willimantic, Connecticut.

EM-AT&T-163-170511 – AT&T notice of intent to modify an existing telecommunications facility located at 83 Windham Street, Willimantic, Connecticut.

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-510j-72(b) (2). In accordance with R.C.S.A. A copy of this letter is being sent Renee Theroux-Keech, AIA Interim Director of Facilities Management & Planning Eastern Connecticut State University 83 Windham Street, Willimantic, CT 06226  
A copy of this letter is also being sent Theresa O'Brien, Director of Fiscal Affairs and Acquisitions to the same address and the Office of the Connecticut State Building Inspector, 165 Capitol Avenue, Room 265  
Hartford, CT 06106.

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 137-foot level of the 175-Monopole tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require an extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety



standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

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

Sincerely,

David Barbagallo

Enclosures  
CC w/enclosures:

Town Manager James Rivers, Elected Official,  
Eastern Connecticut State University – property and tower  
owner  
Office of the State Building Inspector



September 24, 2003

## STATE OF CONNECTICUT

### CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@po.state.ct.us](mailto:siting.council@po.state.ct.us)

Web Site: [www.state.ct.us/csc/index.htm](http://www.state.ct.us/csc/index.htm)

Stephen J. Humes  
LeBoeuf, Lamb, Greene & MacRae  
Goodwin Square  
225 Asylum Street  
Hartford, CT 06103

RE: **TS-T-MOBILE-163-030912** - Omnipoint Communications, Inc., request for an order to approve tower sharing of an existing telecommunications facility located at Eastern Road, Willimantic, Connecticut.

Dear Attorney Humes:

At a public meeting held September 23, 2003, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

The proposed shared use is to be implemented as specified in your letter dated September 12, 2003.

Thank you for your attention and cooperation.

Very truly yours,

Pamela B. Katz, P.E.  
Chairman

PBK/laf

c: Honorable Michael T. Paulhus, First Selectman, Town of Windham  
James E. Finger, Town Planner, Town of Windham  
Thomas J. Regan, Esq., Brown Rudnick Berlack Israels  
Michele G. Briggs, Southwestern Bell Mobile Systems  
Sandy M. Carter, Verizon Wireless

CURRENT OWNER		TOPO.	UTILITIES	STRT./ROAD	LOCATION	CURRENT ASSESSMENT			
CONNECTICUT STATE OF ECSU HI RISE 83 WINDHAM ST		2	Public Water			Description	Code	Appraised Value	Assessed Value
WILLIMANTIC, CT 06226 Additional Owners:		3	Public Sewer			EX COM BL	22	11,575,500	8,102,850
		0	None						
SUPPLEMENTAL DATA									
Other ID:	12- 3/ 19/ 98X2	LCI	C						
Zoning	R6	ParcelStatus	UO						
Neighborhood	310 - 0	Cost Flag							
Living Units	0	Lot Number	0						
Census	8003	A_D							
District No	2	ASSOC PID#							
GIS ID:	6685								
							Total	11,575,500	8,102,850

6163  
WINDHAM, CT

**VISION**

RECORD OF OWNERSHIP		BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.	PREVIOUS ASSESSMENTS (HISTORY)								
CONNECTICUT STATE OF		149/ 42		U	I	0		Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
								2017	22	8,943,970	2016	22	8,943,970	2015	200	8,943,970
													2015	200	0	
								Total:		8,943,970	Total:		8,943,970	Total:		8,943,970

EXEMPTIONS				OTHER ASSESSMENTS				
Year	Type	Description	Amount	Code	Description	Number	Amount	Comm. Int.
Total:								

*This signature acknowledges a visit by a Data Collector or Assessor*

ASSESSING NEIGHBORHOOD				
NBHD/SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A			900	E

APPRAISED VALUE SUMMARY	
Appraised Bldg. Value (Card)	11,489,700
Appraised XF (B) Value (Bldg)	85,800
Appraised OB (L) Value (Bldg)	0
Appraised Land Value (Bldg)	0
Special Land Value	0
Total Appraised Parcel Value	11,575,500
Valuation Method:	C
Adjustment:	0
<b>Net Total Appraised Parcel Value</b>	<b>11,575,500</b>

NOTES									

BUILDING PERMIT RECORD									VISIT/ CHANGE HISTORY					
Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments	Date	Type	IS	ID	Cd.	Purpose/Result

LAND LINE VALUATION SECTION																			
B #	Use Code	Use Description	Zone	D	Front	Depth	Units	Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing	S Adj Fact	Adj. Unit Price	Land Value
1	925	Exempt Comm	R6				0.00	AC	0.00	1.0000	0	1.0000	1.00	310	1.00			.00	0



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**TRACKING ID**

770164147846

**FROM**

Smartlink LLC  
Dave Barbagallo  
265 Lincoln St  
KENSINGTON, CT US 06037  
8606817708

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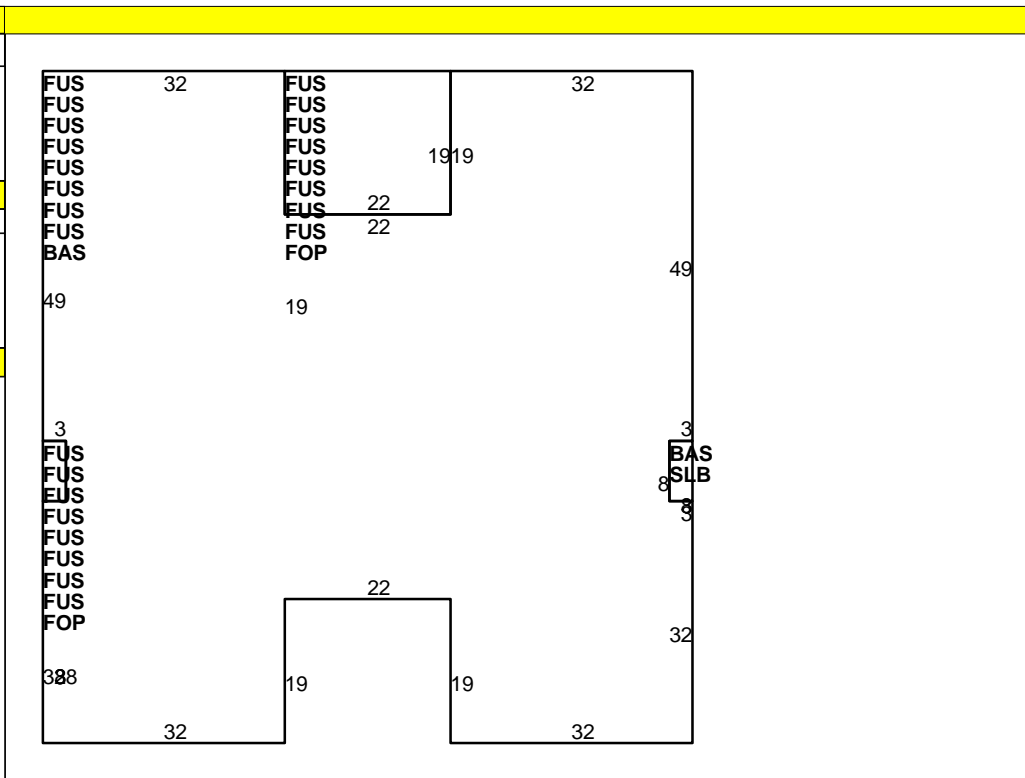
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<b>CONSTRUCTION DETAIL</b>				<b>CONSTRUCTION DETAIL (CONTINUED)</b>			
Element	Cd.	Ch.	Description	Element	Cd.	Ch.	Description
Style	70		Dormitory				
Model	94		Commercial				
Grade	12		Prime +				
Stories	9						
Occupancy	50						
Exterior Wall 1	20		Brick/Masonry				
Level From	01	01					
Level To	09	09					
Uncov Parking	0						
Perimeter	382						
Identical Units	1						
Efficiency	0						
1 Bedroom	16						
2 Bedroom	2						
3 Bedroom	32						
AC Type	01		None				
Structure Type	620	620					
Bldg Use	925		Exempt Comm				
Percent Finish	100						
Heating	07		Electr Basebrd				
Frame Type	03		Masonry				
Plumbing	02		Average				
Local Modifier	2.75						
Partitions	02		Average				
Wall Height	9						
Size	64490						

<b>MIXED USE</b>		
Code	Description	Percentage
925	Exempt Comm	100

<b>COST/MARKET VALUATION</b>		
Adj. Base Rate:		228.18
AYB		1970
Dep Code		G
Remodel Rating		
Year Remodeled		
Dep %		22
Functional Obslnc		
External Obslnc		
Cost Trend Factor		
Condition		
% Complete		
Overall % Cond		78
Apprais Val		11,489,700
Dep % Ovr		0
Dep Ovr Comment		
Misc Imp Ovr		0
Misc Imp Ovr Comment		
Cost to Cure Ovr		0
Cost to Cure Ovr Comment		



**OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)**

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
EL2X	ELEVATOR EI			B	1	55,000.00	1996		1		100	42,900
EL2X	ELEVATOR EI			B	1	55,000.00	1996		1		100	42,900

**BUILDING SUB-AREA SUMMARY SECTION**

Code	Description	Gross Area	Living Area	Eff. Area
BAS	First Floor	6,794	6,794	
FOP	Framed Open Porch	442	0	
FUS	Finished Upper Story	57,696	57,696	
SLB	Slab	24	0	
<b>Ttl. Gross Liv/Lease Area:</b>		<b>64,956</b>	<b>64,490</b>	





**PROJECT:** LTE 5G NR CBAND + DoD 5G NR 1 SR; 7C (AWS)  
**SITE NUMBER:** CTL01051  
**USID:** 10035388  
**FA NUMBER:** 2051A11KSP/2051A11KZH/2051A11LZK /2051A11KNQ/2051A11MB4  
**PTN NUMBER:** MRCTB055027/MRCTB055801/MRCTB055358/  
**PACE NUMBER:** MRCTB054360/MRCTB056719  
**SITE NAME:** WILLIMANTIC ECSU  
**SITE ADDRESS:** 83 WINDHAM STREET  
 WILLIMANTIC, CT 06226



**PROJECT INFORMATION**

**SITE NAME:** WILLIMANTIC ECSU  
**SITE NUMBER:** CTL01051  
**SITE ADDRESS:** 83 WINDHAM STREET WILLIMANTIC, CT 06226  
**FA NUMBER:** 10035388  
**PTN NUMBER:** 2051A11KSP/2051A11KZH/2051A11LZK /2051A11KNQ/2051A11MB4  
**PACE NUMBER:** MRCTB055027/MRCTB055801/MRCTB055358/ MRCTB054360/MRCTB056719  
**USID NUMBER:** 71313  
**APPLICANT:** AT&T WIRELESS 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701  
**OWNER:** EASTERN CONNECTICUT UNIVERSITY 83 WINDHAM STREET WILLIMANTIC, CT 06226  
**JURISDICTION/ ZONING:** COUNTY OF WINDHAM  
**COUNTY:** WINDHAM  
**SITE COORDINATES FROM (RFDS):** 41.7205889° / 41°43'14.12004" LONGITUDE: -72.2181800° / -72°13'5.448"  
**GROUND ELEV.:** -72.2181800° / -72°13'5.448"  
**PROPOSED USE:** TELECOMMUNICATIONS FACILITY  
**AT&T RF MANAGER:** DEEPAK RATHORE (860) 965-3068 dr701e@att.com

**SCOPE OF WORK**

**PROJECT SCOPE HEREIN BASED ON RFDS ID # 4475559, VERSION 2.00 LAST UPDATED 08/15/22**  
**EXISTING TOWER EQUIPMENT TO BE REMOVED:**  
 (3) KMW AM-X-CD-17-65-00T-RET ANTENNAS  
 (3) CCI OPA-65R-BUB8 ANTENNAS  
 (3) KATHREIN 800-10965 ANTENNAS  
 (3) POWERWAVE 7770  
 (3) RRUS-11  
 (3) LGP18104 PDU  
 (6) LGP17201 TMAS  
**NEW TOWER EQUIPMENT TO BE INSTALLED:**  
 (3) QUINTEL QD8616-7 ANTENNAS  
 (3) CCI DMP65R-BUB8A ANTENNAS  
 (3) ERICSSON AIR6419 B77G STACKED ANTENNAS  
 (3) ERICSSON AIR6449 B77D STACKED ANTENNAS  
 (3) RRUS-4449 B5/B12  
 (3) RRUS 4426 B66  
 (3) Y-CABLES  
 (1) DC9-48-60-24-8C-EV RAYCAP  
 (1) 24 PAIR FIBER CABLE  
 (3) 6AWG6 DC POWER CABLES  
**EXISTING TOWER EQUIPMENT TO REMAIN:**  
 (2) DC6-48-60-18-8F RAYCAP UNITS  
 (6) 1-5/8" COAX CABLES  
 (2) FIBER AND (4) DC CABLES  
**GROUND EQUIPMENT TO BE REMOVED:**  
 DECOMMISSION EXISTING UMTS  
**GROUND EQUIPMENT TO BE INSTALLED:**  
 (1) NEW RBS 6648 AND XCEDE CABLES  
 (3) NEW RBS 6630 AND IDLE CABLEST  
 • 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 ELECTRICAL 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

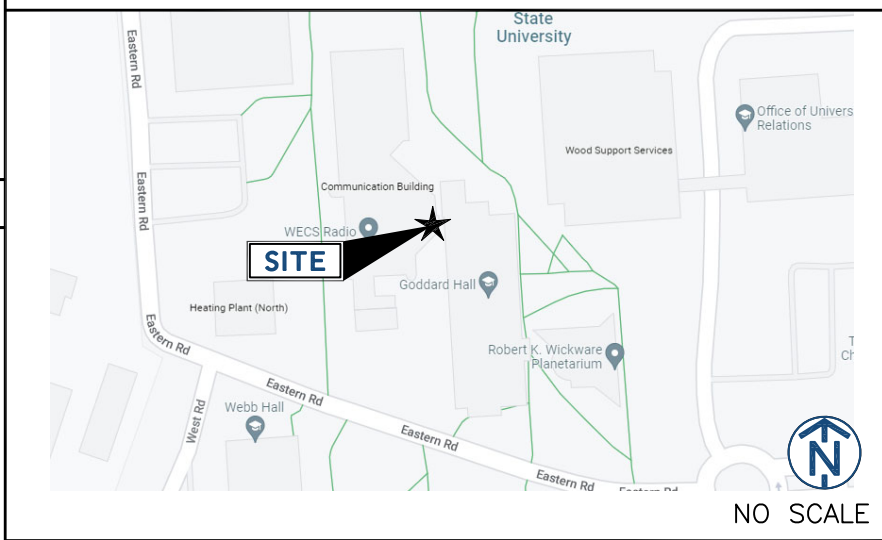
REV	DATE	DESCRIPTION	BY
0	03/11/22	90% REVIEW	SM
1	08/23/22	FINAL	KC

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.

**DRAWING INDEX**

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

**SITE LOCATION MAP**



**DIRECTIONS**

SCAN QR CODE FOR LINK TO SITE LOCATION MAP

**PROJECT CONSULTANTS**

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

**SITE NAME:** WILLIMANTIC ECSU  
**SITE NUMBER:** CTL01051  
**SITE ADDRESS:** 83 WINDHAM STREET WILLIMANTIC, CT 06226  
**SHEET NAME:** TITLE SHEET  
**SHEET NUMBER:** T1



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

**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 OR 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 ANSI/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, TMA'S, 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  
www.FullertonEngineering.com

REV	DATE	DESCRIPTION	BY
0	03/11/22	90% REVIEW	SM
1	08/23/22	FINAL	KC

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 NAME  
**WILLIMANTIC  
ECSU**

SITE NUMBER:  
**CTL01051**


SITE ADDRESS  
**83 WINDHAM STREET  
WILLIMANTIC, CT 06226**

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(h)

### CAUTION

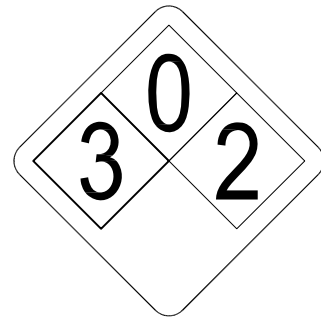


**Beyond This Point** you are entering a controlled area where RF emissions *may exceed* the FCC Occupational Exposure Limits.

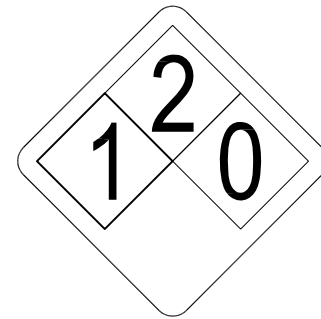
Obey all posted signs and site guidelines for working in a RF environment.



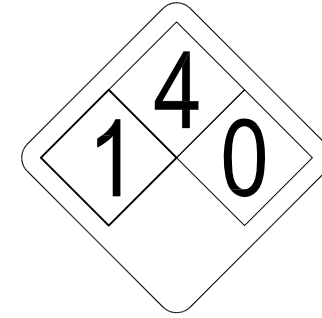
Ref: 47CFR 1.1307(h)



ALERTING SIGN  
(FOR CELL SITE BATTERIES)



ALERTING SIGN  
(FOR DIESEL FUEL)



ALERTING SIGN  
(FOR PROPANE)



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  
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SITE NAME  
**WILLIMANTIC ECSU**

SITE NUMBER:  
**CTL01051**

SITE ADDRESS  
**83 WINDHAM STREET  
WILLIMANTIC, CT 06226**

SHEET NAME  
**NOTES AND SPECIFICATIONS**

SHEET NUMBER  
**SP2**


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

### 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 # \_\_\_\_\_



STAY BACK 3 FEET FROM ANTENNA



### 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			
RADIATION AREA IS BEYOND 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X	DIAGONAL, YELLOW STRIPING AS TO ROOFVIEW GRAPH		EITHER NOTICE OR CAUTION SIGN (BASED ON ROOFVIEW RESULTS) AT ANTENNA /BARRIER
CHURCH STEEPLES	ACCESS TO STEEPLE	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO STEEPLE			CAUTION SIGN AT THE ANTENNAS
WATER STATIONS	ACCESS TO LADDER	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO LADDER			CAUTION SIGN BESIDE INFO SIGN #1, MIN. 9FT ABOVE GROUND

NOTES FOR ROOFTOP SITES:

- 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.

INFO SIGN #1

INFO SIGN #2

INFO SIGN #3

SIGNAGE GUIDELINES CHART



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SITE NAME  
**WILLIMANTIC ECSU**

SITE NUMBER:  
**CTL01051**

SITE ADDRESS  
**83 WINDHAM STREET  
WILLIMANTIC, CT 06226**

SHEET NAME  
**COMPOUND PLAN**

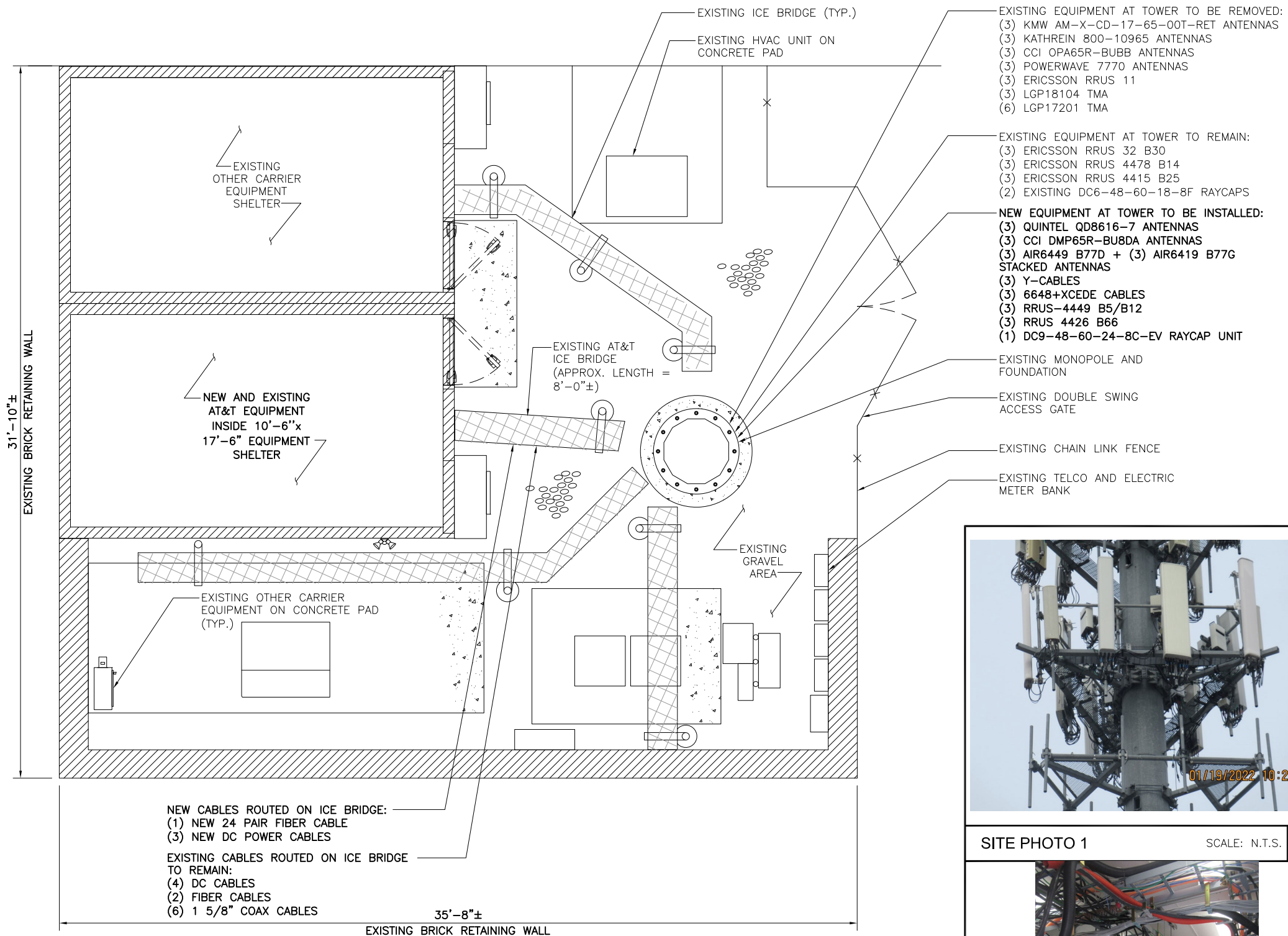
SHEET NUMBER  
**A1**

**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
C	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



SITE PHOTO 1 SCALE: N.T.S. 2



SITE PHOTO 2 SCALE: N.T.S. 3

COMPOUND PLAN

0 1' 2' 4' 8' SCALE: 3/16" = 1'-0" 1





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ECSU**

SITE NUMBER:

**CTL01051**

SITE ADDRESS

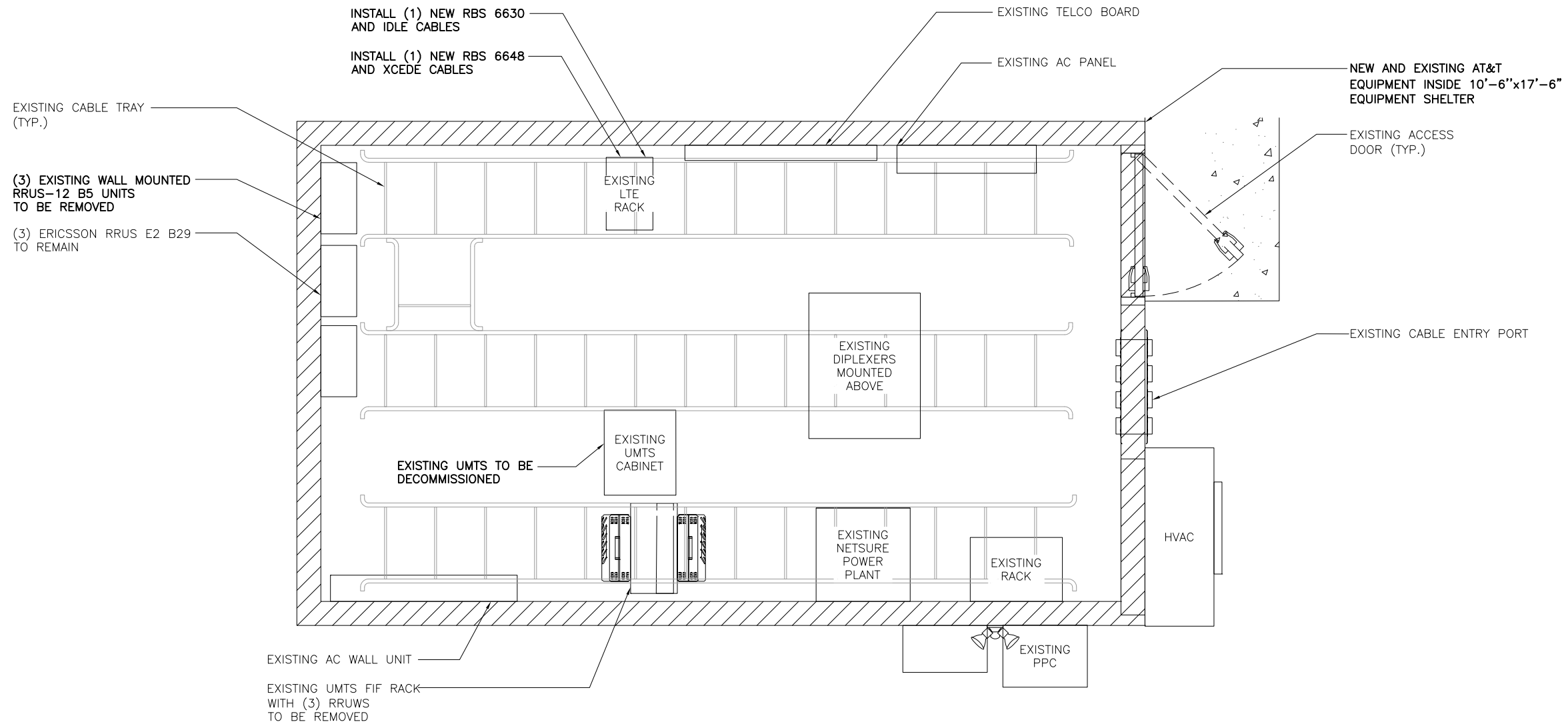
**83 WINDHAM STREET  
WILLIMANTIC, CT 06226**

SHEET NAME

**EQUIPMENT  
PLAN**

SHEET NUMBER

**A2**



EXISTING OTHER CARRIER WHIP ANTENNA (TYP.)  
 EXISTING LIGHTNING ROD  
 T/EXISTING MONOPOLE  
 ELEV. = 175'-0"± AGL

CL OF (E) AT&T ANTENNAS  
 ELEV. = 138'-0"± AGL

EXISTING EQUIPMENT AT TOWER TO BE REMOVED:  
 (3) KMW AM-X-CD-17-65-00T-RET ANTENNAS  
 (3) KATHREIN 800-10965 ANTENNAS  
 (3) CCI OPA65R-BUBB ANTENNAS  
 (3) POWERWAVE 7770 ANTENNAS  
 (3) ERICSSON RRUS 11  
 (3) LGP18104 TMA  
 (6) LGP17201 TMA

EXISTING EQUIPMENT AT TOWER TO REMAIN:  
 (3) ERICSSON RRUS 32 B30  
 (3) ERICSSON RRUS 4478 B14  
 (3) ERICSSON RRUS 4415 B25  
 (2) EXISTING DC6-48-60-18-8F RAYCAPS

EXISTING OTHER CARRIER ANTENNA (TYP.)

EXISTING OTHER CARRIER ANTENNA (TYP.)

EXISTING MONOPOLE

EXISTING TOWER LIGHT

EXISTING CABLES ROUTED ON INTERIOR OF MONOPOLE TO REMAIN:  
 (4) DC CABLES  
 (2) FIBER CABLES  
 (6) 1 5/8" COAX CABLES

EXISTING AT&T ICE BRIDGE  
 EXISTING AT&T EQUIPMENT IN EXISTING 10'-6" X 17'-6" SHELTER

T/GRADE  
 ELEV. = 0'-0" AGL

**NOTES:**

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

**NOTES:**

1. 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
2. 6 FEET MINIMUM SEPARATION BETWEEN 700DE & 700BC

T/EXISTING MONOPOLE  
 ELEV. = 175'-0"± AGL

EXISTING OTHER CARRIER WHIP ANTENNA (TYP.)  
 EXISTING LIGHTNING ROD

CL OF (N) AT&T ANTENNAS  
 ELEV. = 138'-0" AGL

NEW EQUIPMENT AT TOWER TO BE INSTALLED:  
 (3) QUINTEL QD8616-7 ANTENNAS  
 (3) CCI DMP65R-BUBDA ANTENNAS  
 (3) AIR6449 B77D + (3) AIR6419 B77G  
 STACKED ANTENNAS  
 (3) Y-CABLES  
 (3) 6648+XCEDE CABLES  
 (3) RRUS-4449 B5/B12  
 (3) RRUS 4426 B66  
 (1) DC9-48-60-24-8C-EV RAYCAP UNIT

EXISTING OTHER CARRIER ANTENNA (TYP.)

EXISTING MONOPOLE

EXISTING TOWER LIGHT

EXISTING CABLES ROUTED ON INTERIOR OF MONOPOLE TO REMAIN:  
 (4) DC CABLES  
 (2) FIBER CABLES  
 (6) 1 5/8" COAX CABLES

NEW CABLES ROUTED ON INTERIOR OF MONOPOLE:  
 (1) NEW 24 PAIR FIBER CABLE  
 (3) NEW DC POWER CABLES

EXISTING AT&T ICE BRIDGE  
 NEW AND EXISTING AT&T EQUIPMENT IN EXISTING 10'-6" X 17'-6" SHELTER

T/GRADE  
 ELEV. = 0'-0" AGL



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SHEET NAME  
**ELEVATIONS**

SHEET NUMBER  
**A3**

EXISTING ELEVATION



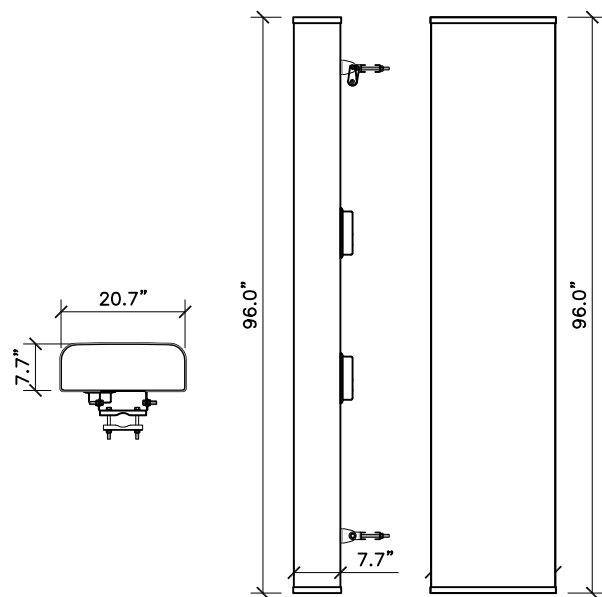
SCALE: 1" = 20'-0" 1

NEW ELEVATION



SCALE: 1" = 20'-0" 2

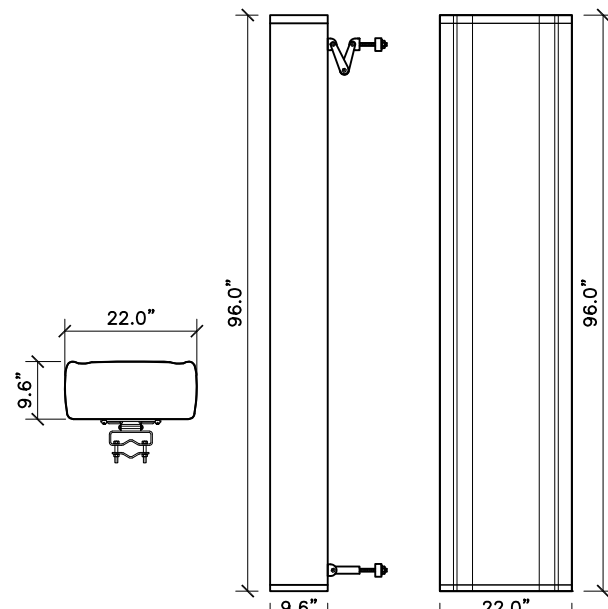




PLAN VIEW SIDE VIEW FRONT VIEW

**CCI - DMP65R-BU8DA**  
DIPLEXED MULTI-BAND ANTENNA

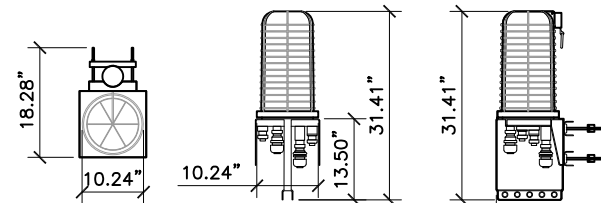
FREQUENCY RANGE	4 LOW x 698-896 MHz
	4 HIGH 1695-2400 MHz
ANTENNA	95.7 Lbs
(3) RETS	15 Lbs
BRACKET	16.1 Lbs
TOTAL WEIGHT	126.8 Lbs



PLAN VIEW SIDE VIEW FRONT VIEW

**QUINTEL - QD8616-7**  
MULTISERVE MULTIBAND 16 PORT ANTENNA

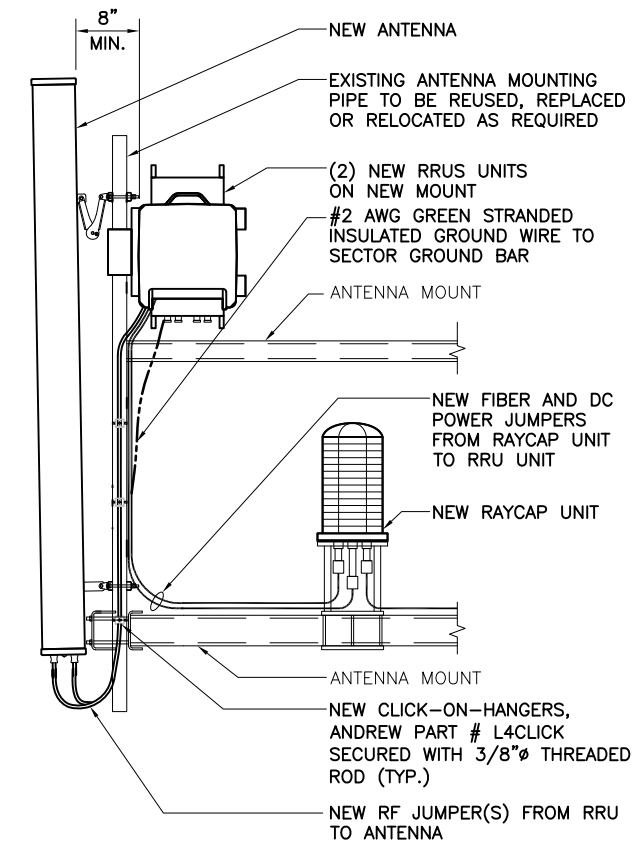
FREQUENCY RANGE	2 x 698-728 MHz
	4 x 758-798 MHz
	2 x 824-894 MHz
	8 x 1695-2400 MHz
ANTENNA	132 Lbs
BRACKET	15 Lbs
TOTAL WEIGHT	147 Lbs



PLAN VIEW FRONT VIEW SIDE VIEW

**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"



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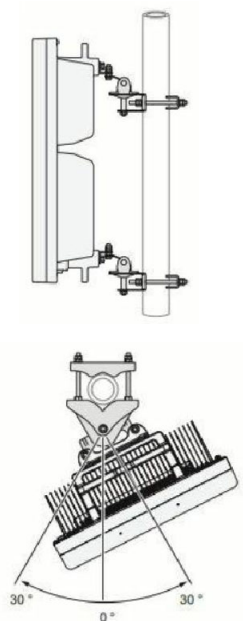
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ANTENNA SPEC SCALE: N.T.S. 1

ANTENNA SPEC SCALE: N.T.S. 2

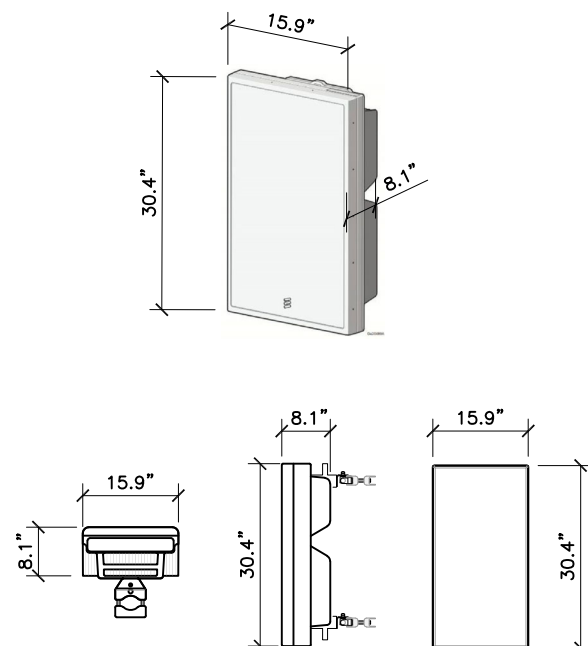
RAYCAP SPEC SCALE: N.T.S. 3

ANTENNA SCHEMATIC 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

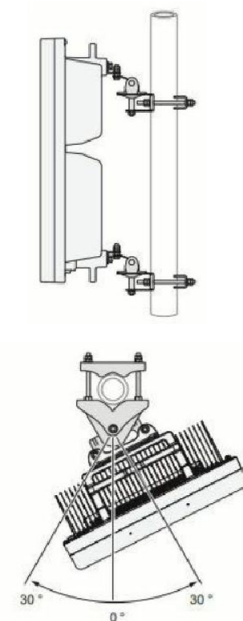
**ERICSSON - AIR 6449 B77D MOUNT**  
BRACKET SUPPORTING AIR WITH TILTING +/-20 DEGREE AND RIGHT/LEFT 30 DEGREE



PLAN VIEW SIDE VIEW FRONT VIEW

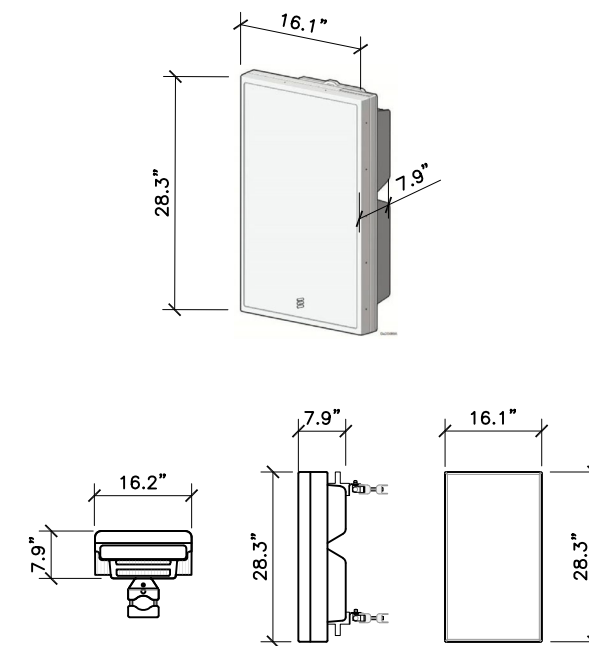
**ERICSSON - AIR6449 B77D**  
MASSIVE MIMO MID-BAND

WEIGHT W/ HARDWARE 81.6 Lbs



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



PLAN VIEW SIDE VIEW FRONT VIEW

**ERICSSON - AIR6419 B77G**  
MASSIVE MIMO MID-BAND

WEIGHT W/ HARDWARE 77 Lbs

ANTENNA SPEC SCALE: N.T.S. 5

ANTENNA SPEC SCALE: N.T.S. 6

ANTENNA SPEC SCALE: N.T.S. 7

ANTENNA SPEC SCALE: N.T.S. 8



SITE NAME  
**WILLIMANTIC ECSU**

SITE NUMBER:  
**CTL01051**

SITE ADDRESS  
**83 WINDHAM STREET  
WILLIMANTIC, CT 06226**

SHEET NAME  
**EQUIPMENT  
DETAILS**

SHEET NUMBER  
**A5**



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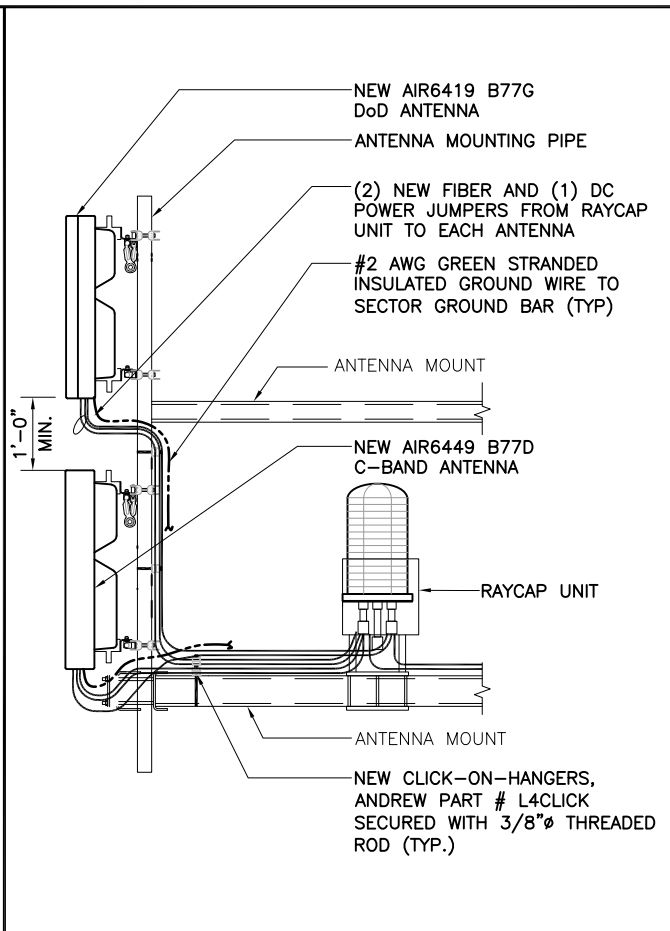
SITE ADDRESS  
**83 WINDHAM STREET  
WILLIMANTIC, CT 06226**

SHEET NAME  
**EQUIPMENT DETAILS**

SHEET NUMBER  
**A5A**

**ERICSSON**  
**RADIO 4449 DUAL B5 & B12**  
AISG TMA & RET SUPPORT  
4TX/4RX PER BAND (B5 & B12)  
WEIGHT ~73 Lbs

**Ericsson - RRUS 4426 B66**  
FREQUENCY RANGE TX = 2110-2180 MHz  
RX = 1710-1780 MHz  
TOTAL WEIGHT 48.4 Lbs



RRU SPEC	SCALE: N.T.S.	1
NOT USED	SCALE: N.T.S.	5

RRU SPEC	SCALE: N.T.S.	2
NOT USED	SCALE: N.T.S.	6

NOT USED	SCALE: N.T.S.	3
NOT USED	SCALE: N.T.S.	7

NOT USED	SCALE: N.T.S.	4
NOT USED	SCALE: N.T.S.	8



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SITE ADDRESS

**83 WINDHAM STREET  
WILLIMANTIC, CT 06226**

SHEET NAME

**ANTENNA &  
CABLE  
CONFIGURATION**

SHEET NUMBER

**A6**

**FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE  
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (02/10/22)**

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT (BY ANTENNAS)	TMA/RRU UNIT (BY EQUIPMENT ON GROUND)	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER		RAYCAP UNIT
									TYPE	LENGTH	
ALPHA	A-1	-	-	-	-	-	-	-	-	-	(1) DC6-48-60-18-8F UNIT
	A-2	(N) LTE 700/ 1900/5G 1900/AWS	QD8616-7	QUINTEL	(1) EXISTING RRUS-4478 B14 (1) EXISTING RRUS-4415 B25 (1) NEW RRUS-4426 B66	(1) EXISTING RRUS-E2 B29 UNIT(S)	0°	138'-0"	(1) 1-5/8"ø LDF7-50A	200'-0"	
	A-3	(N) 5G CBAND 5G DoD	AIR6449 B77D + AIR6419 B77G STACKED	ERICSSON	-	-	0°	138'-0"	(1) EXISTING FIBER CABLE	200'-0"	
	A-4	(N) LTE 700/WCS/ 5G 850	DMP65R-BU8DA	CCI	(1) EXISTING RRUS-32 B30 (1) NEW RRUS-4449 B5/B12	-	0°	138'-0"	SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH		
BETA	B-1	-	-	-	-	-	-	-	-	-	(1) DC6-48-60-18-8F UNIT
	B-2	(N) LTE 700/ 1900/5G 1900/AWS	QD8616-7	QUINTEL	(1) EXISTING RRUS-4478 B14 (1) EXISTING RRUS-4415 B25 (1) NEW RRUS-4426 B66	(1) EXISTING RRUS-E2 B29 UNIT(S)	120°	138'-0"	(1) 1-5/8"ø LDF7-50A	200'-0"	
	B-3	(N) 5G CBAND 5G DoD	AIR6449 B77D + AIR6419 B77G STACKED	ERICSSON	-	-	120°	138'-0"	(1) EXISTING FIBER CABLE	200'-0"	
	B-4	(N) LTE 700/WCS/ 5G 850	DMP65R-BU8DA	CCI	(1) EXISTING RRUS-32 B30 (1) NEW RRUS-4449 B5/B12	-	120°	138'-0"	SEE ANTENNA B-3 FOR CABLE TYPE AND LENGTH		
GAMMA	C-1	-	-	-	-	-	-	-	-	-	(1) NEW DC9-48-60-24-8C-EV UNIT
	C-2	(N) LTE 700/ 1900/5G 1900/AWS	QD8616-7	QUINTEL	(1) EXISTING RRUS-4478 B14 (1) EXISTING RRUS-4415 B25 (1) NEW RRUS-4426 B66	(1) EXISTING RRUS-E2 B29 UNIT(S)	240°	138'-0"	(1) 1-5/8"ø LDF7-50A	200'-0"	
	C-3	(N) 5G CBAND 5G DoD	AIR6449 B77D + AIR6419 B77G STACKED	ERICSSON	-	-	240°	138'-0"	SEE ANTENNA C-4 FOR CABLE TYPE AND LENGTH		
	C-4	(N) LTE 700/WCS/ 5G 850	DMP65R-BU8DA	CCI	(1) EXISTING RRUS-32 B30 (1) NEW RRUS-4449 B5/B12	-	240°	138'-0"	(1) NEW 24 PAIR FIBER CABLE	200'-0"	
									(3) NEW 6AWG6 DC POWER CABLES	200'-0"	



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

ANTENNA AND CABLING NOTES

SCALE: N.T.S. 1

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

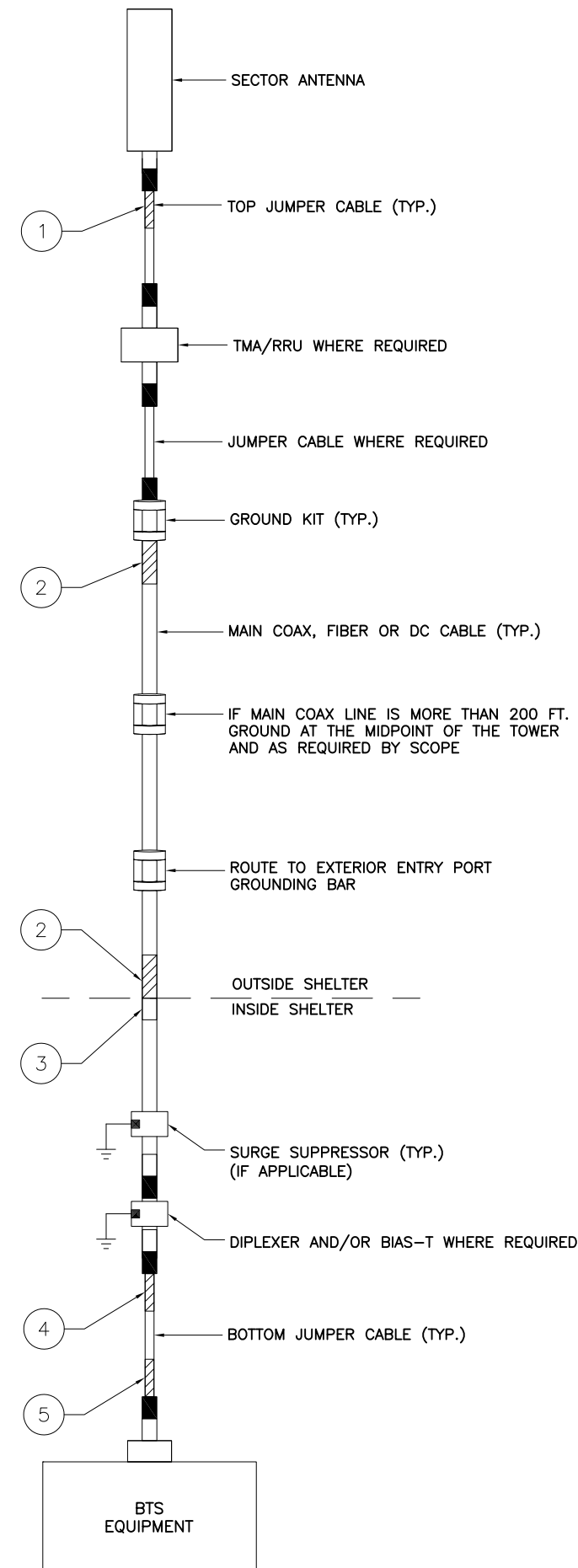
CABLE MARKING DIAGRAM

SCALE: N.T.S. 2

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

CABLE MARKING NOTES

SCALE: N.T.S. 3



CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. 4



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	03/11/22	90% REVIEW	SM
1	08/23/22	FINAL	KC

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 NAME  
**WILLIMANTIC ECSU**

SITE NUMBER:  
**CTL01051**

SITE ADDRESS  
**83 WINDHAM STREET  
WILLIMANTIC, CT 06226**

SHEET NAME  
**CABLE NOTES  
AND COLOR  
CODING**

SHEET NUMBER  
**A7**



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  
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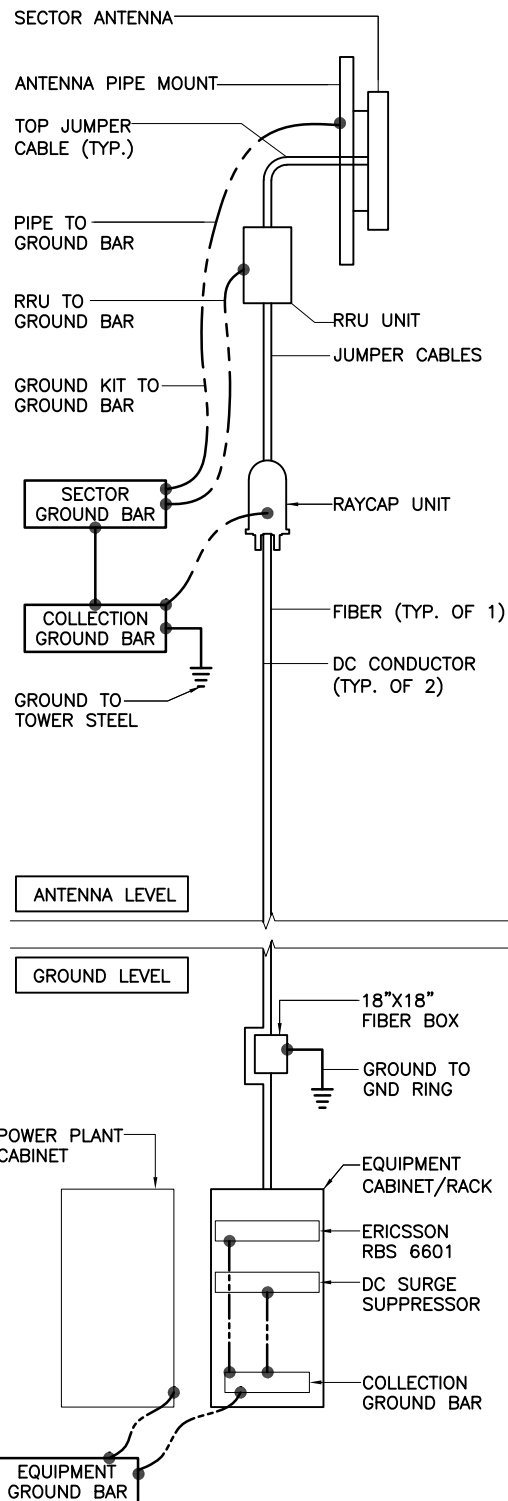
SITE NAME  
**WILLIMANTIC ECSU**

SITE NUMBER:  
**CTL01051**

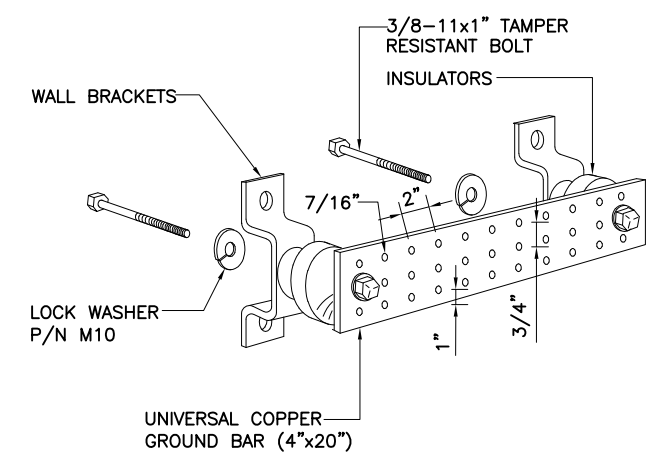
SITE ADDRESS  
**83 WINDHAM STREET  
WILLIMANTIC, CT 06226**

SHEET NAME  
**GROUNDING DETAILS**

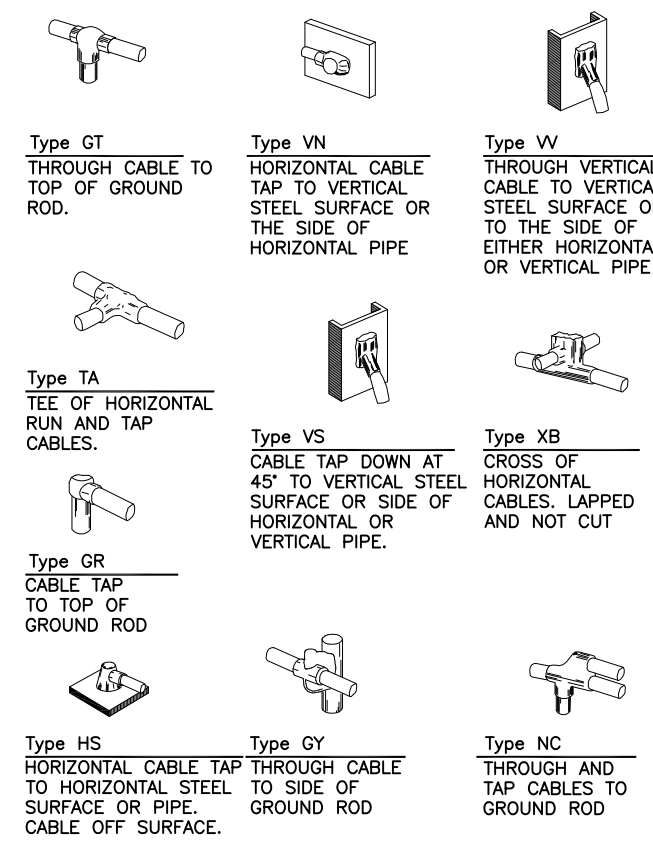
SHEET NUMBER  
**A8**



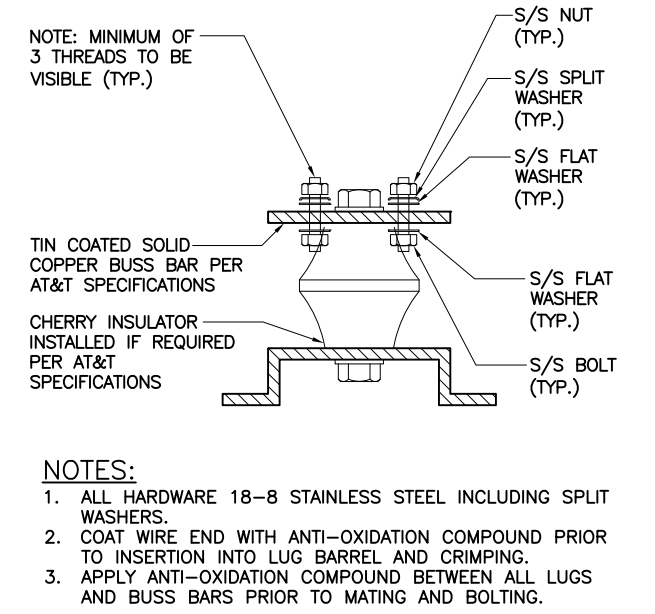
GROUNDING SCHEMATIC SCALE: N.T.S. 1



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



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



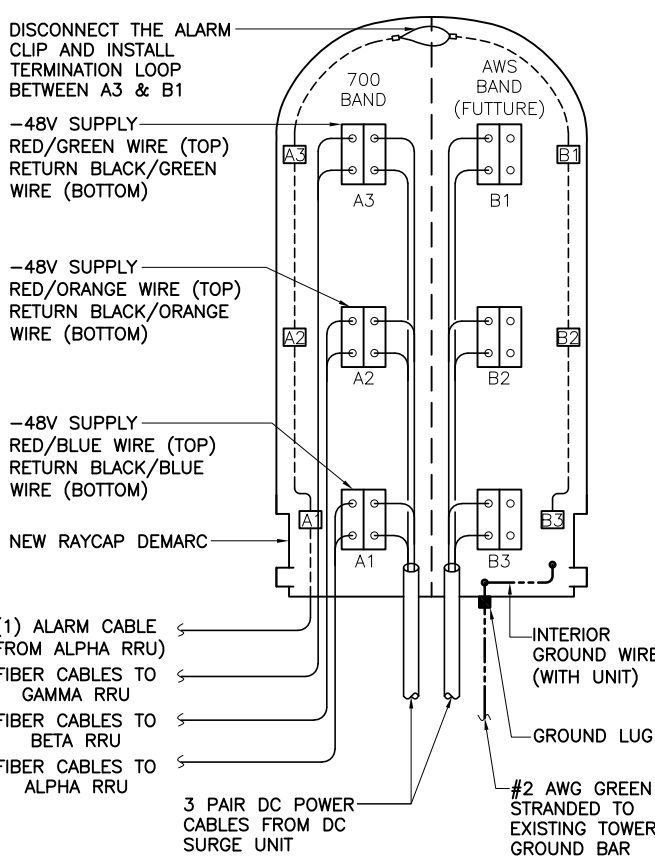
NOTE: MINIMUM OF 3 THREADS TO BE VISIBLE (TYP.)

TIN COATED SOLID COPPER BUSS BAR PER AT&T SPECIFICATIONS

CHERRY INSULATOR INSTALLED IF REQUIRED PER AT&T SPECIFICATIONS

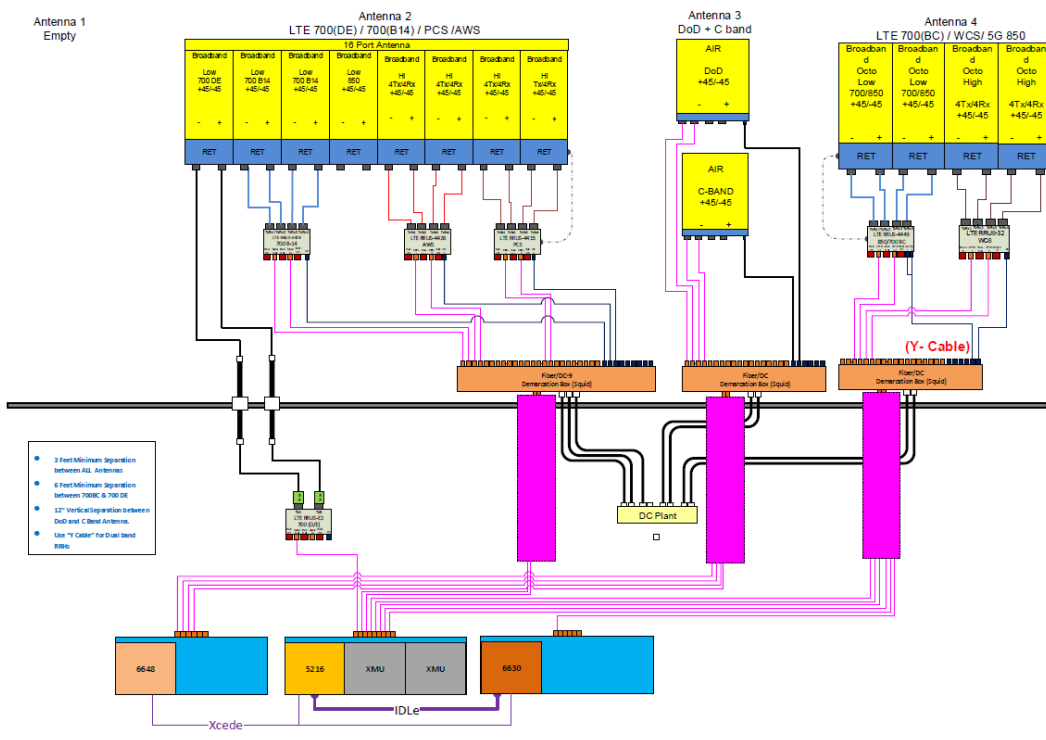
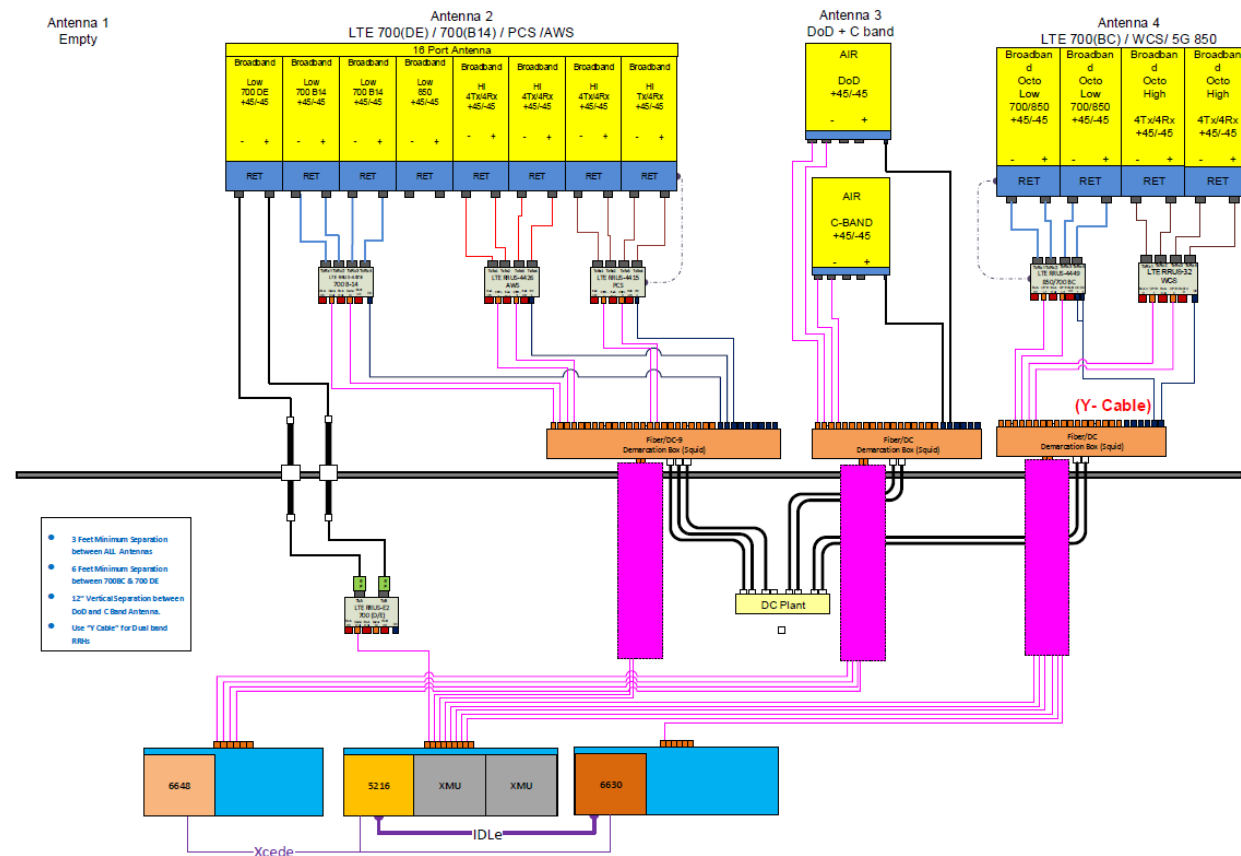
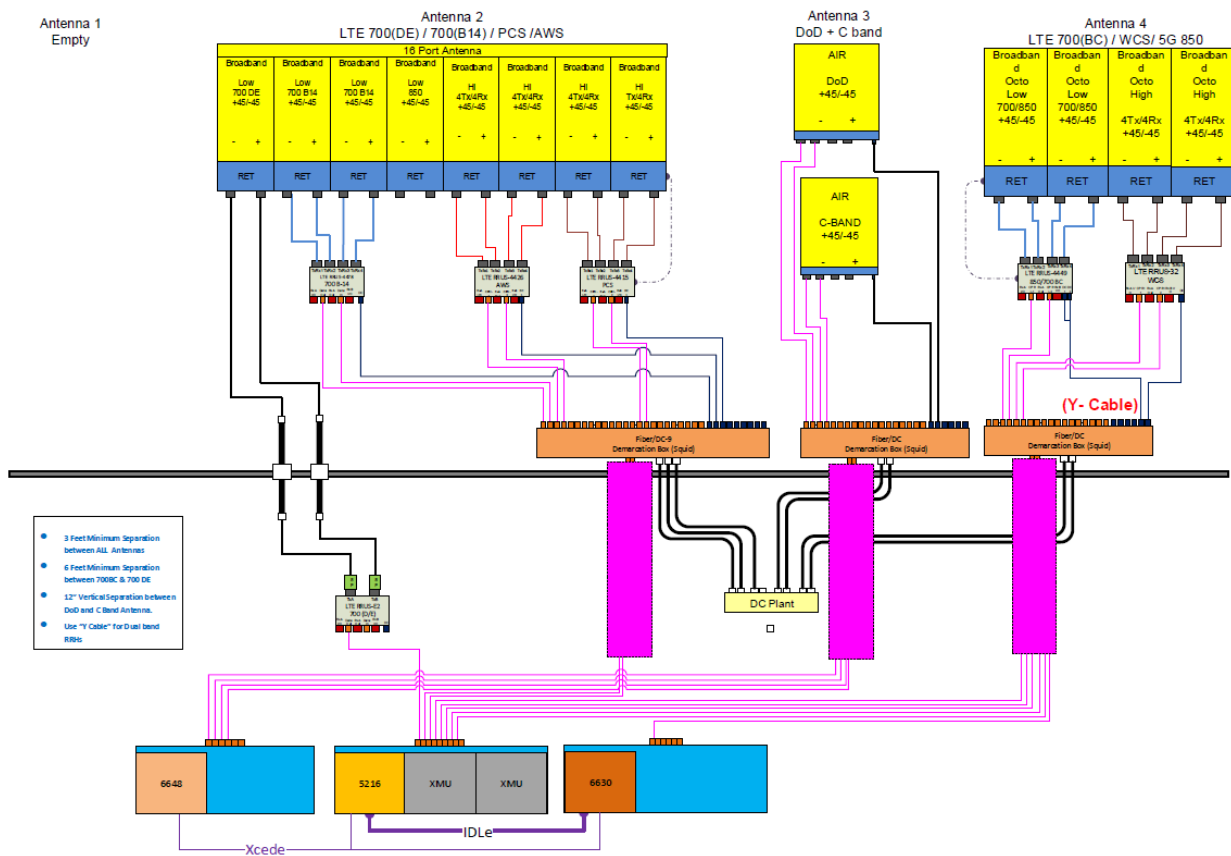
NOTES:  
1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.  
2. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.  
3. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

LUG DETAIL SCALE: N.T.S. 3



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

NOT USED SCALE: N.T.S. 6



\*BASED ON RFDS V2.0, DATED (08/15/22)

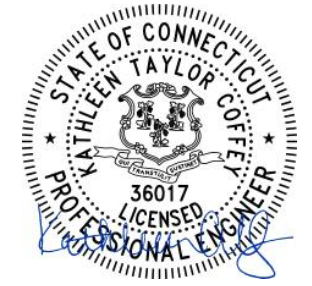


550 COCHITUATE ROAD  
 SUITE 550 13 AND 14  
 FRAMINGHAM, MA 01701



REV	DATE	DESCRIPTION	BY
0	03/11/22	90% REVIEW	SM
1	08/23/22	FINAL	KC

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SITE NAME  
**WILLIMANTIC ECSU**

SITE NUMBER:  
**CTL01051**

SITE ADDRESS  
**83 WINDHAM STREET  
 WILLIMANTIC, CT 06226**

SHEET NAME  
**PLUMBING DIAGRAMS**

SHEET NUMBER  
**A9**

---

# STRUCTURAL ANALYSIS REPORT

STRUCTURE: MONOPOLE

PREPARED FOR: SMARTLINK

CARRIER: AT&T

SITE NUMBER : CTL01051

SITE LOCATION:

83 Windham Street

Willimantic, CT 06226

N41.7205889, W72.2181800

DATE: November 11, 2022

REV. 3: Other Carrier Loading Updated

## **RESULTS**

PASS (MAX STRESS RATIO: 90.1%)

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



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

Project Number: 2021.0215.0001

## 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	73.7%	PASS
Anchor Rods	67.9%	PASS
Base Plate	89.6%*	PASS
Foundation	90.1%	PASS
<b>Structural Rating (max from all components) = 90.1%</b>		<b>PASS</b>

\*Base plate check excludes stiffeners due to weld thickness. It is recommended for the weld thickness to be measured and confirmed to have at least 7/16" throat thickness.

## Analysis Criteria

Reference Standard:	2015 International Building Code TIA-222-H Standard	
Wind Parameters:	Basic Wind Speed:	120 mph (3-Sec gust)
	Ice Wind Speed:	50 mph (3-Sec gust)
	Design Ice Thickness:	1.0 in.
	Risk Category	II
	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 Maser Consulting	11/09/2018
Structural Analysis Report by Hudson Design Group LLC	12/01/2020
Construction Drawings by Fullerton Engineering	Latest edition
Site Walk Photos	01/19/2022
AT&T RFDS Ver. 2	08/15/2022

## Modification History

This analysis assumes that the following modifications were installed.

Elevation	Modification Description
Baseplate	Remove existing stiffener plates and install 10" long 1/2" thick stiffener plates between each bolt

## Final Proposed Appurtenance Loading Schedule

ANTENNA/EQUIPMENT				COAXIAL	
Elev. (Ft)	QTY.	MANUFACTURER/MODEL	MOUNT TYPE	QTY.	SIZE/TYPE.
138.0	3	(N) Quintel QD8616-7	(E) Low Profile Platform with Handrails	4	(E) DC Power Cables
	3	(N) Ericsson AIR6449 B77D + AIR6419 B77G Stacked			
	3	(N) CCI DMP65R-BU8DA			
	3	(N) Ericsson RRUS 4426 B66			
	3	(N) Ericsson Radio 4449 B5/B12			
	3	(E) Ericsson Radio 4478 B14			
	3	(E) Ericsson RRUS 32 B30			
	3	(E) Ericsson RRUS 4415 B25			
	1	(N) Raycap DC9-48-60-24-8C-EV			
	2	(E) Raycap DC6-48-60-18-8F			

*(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	175 - 128.66	Pole	TP33.375x23x0.25	1	-12600.70	1489020.0	31.4	Pass	
L2	128.66 - 85.09	Pole	TP42.5625x31.8272x0.3125	2	-28439.40	2376410.0	65.6	Pass	
L3	85.09 - 42.03	Pole	TP51.4688x40.6426x0.375	3	-41905.10	3450610.0	73.7	Pass	
L4	42.03 - 0	Pole	TP60x49.1817x0.4375	4	-62752.30	4838530.0	73.4	Pass	
							Summary		
							Pole (L3)	73.7	Pass
							<b>RATING =</b>	<b>73.7</b>	<b>Pass</b>

## Foundation

Components	%Capacity	PASS/FAIL
ANCHOR RODS	67.9%	PASS
BASE PLATE	89.6%	PASS
FOUNDATION	90.1%	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

---

The engineering services rendered by Fullerton Engineering, P.C. (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

### DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
ERI--A-1 Lightning Spur	175	RRUS-4415 B25	138
PIROD 13' Low Profile Platform	173	RRUS-4415 B25	138
Yagi	173	Ericsson Radio 4426 B66	138
8' Whip	173	Ericsson Radio 4426 B66	138
10' DiPole	173	Ericsson Radio 4426 B66	138
8' Dish	169	Ericsson Radio 4449 B5/B12	138
6' Grid Dish	162.2	Ericsson Radio 4449 B5/B12	138
4' Grid Dish	157.5	Ericsson Radio 4449 B5/B12	138
Pirod 6' Side Mount Standoff (1)	155.67	Raycap DC6-48-60-18-8F	138
20'x2" Whip	155.67	Raycap DC6-48-60-18-8F	138
RRH4X45-19	148.67	Raycap DC9-48-60-24-8C-EV	138
RRH2x40-07L-DE	148.67	PIROD 13' Platform w/handrails (Monopole)	138
RRH2x40-07L-DE	148.67	Quintel QD8616-7	138
RRH4x25-WCS	148.67	Quintel QD8616-7	138
RRH4x25-WCS	148.67	PIROD 13' Low Profile Platform	127.5
RFS APXVERR18-C	148.67	Ericsson AIR32 B66A/B2A	117
RFS APXVERR18-C	148.67	Ericsson AIR6449 B41	117
RFS APXVERR18-C	148.67	Ericsson AIR6449 B41	117
RFS APXVERR18-C	148.67	Ericsson AIR6449 B41	117
Capstan Panel CT33XC614	148.67	RFS APXVAARR24_43-U-NA20	117
Capstan Panel CT33XC614	148.67	RFS APXVAARR24_43-U-NA20	117
Capstan Panel CT33XC614	148.67	RFS APXVAARR24_43-U-NA20	117
RRH4X45-19	148.67	RRUS-4449	117
RRH4X45-19	148.67	RRUS-4449	117
PIROD 13' Low Profile Platform	148.67	RRUS-4449	117
Quintel QD8616-7	138	RRUS-4415 B25	117
CCI DMP65R-BU8DA	138	RRUS-4415 B25	117
CCI DMP65R-BU8DA	138	RRUS-4415 B25	117
CCI DMP65R-BU8DA	138	AWC-TTMA-700C-VG TMA	117
Ericsson Air6449 B77D	138	AWC-TTMA-700C-VG TMA	117
Ericsson Air6449 B77D	138	AWC-TTMA-700C-VG TMA	117
Ericsson Air6449 B77D	138	Commscope SDX1926Q-43	117
Ericsson Air6419 B77G	138	Commscope SDX1926Q-43	117
Ericsson Air6419 B77G	138	Commscope SDX1926Q-43	117
Ericsson Air6419 B77G	138	Ericsson AIR32 B66A/B2A	117
Ericsson RRUS 4478 B14	138	PIROD 13' Platform w/handrails (Monopole)	117
Ericsson RRUS 4478 B14	138	Ericsson AIR32 B66A/B2A	117
Ericsson RRUS 4478 B14	138	Ericsson AIR32 B66A/B2A	117
RRUS-32 B30	138	PIROD 13' Low Profile Platform	104.5
RRUS-32 B30	138	Yagi	104.5
RRUS-32 B30	138	GPS	104.5
RRUS-4415 B25	138		

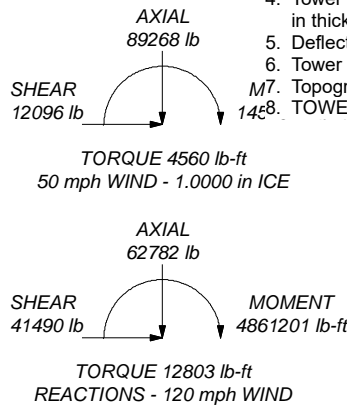
### MATERIAL STRENGTH

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

### TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
  2. Tower designed for Exposure C to the TIA-222-H Standard.
  3. Tower designed for a 120 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 II.
  - M7. Topographic Category 1 with Crest Height of 0.00 ft
- TOWER RATING: 73.7%

ALL REACTIONS ARE FACTORED



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	46.34	18	0.2500	4.68	23.0000	33.3750	A572-65	3495.6
2	46.25	18	0.3125	5.82	31.8272	42.5625	A572-65	6006.3
3	48.88	18	0.3750	6.94	40.6426	51.4688	A572-65	9043.5
4	48.97	18	0.4375	49.1817	60.0000		A572-65	12530.7
								31076.2

<b>Fullerton Engineering</b> 1100 E. Woodfield Road, Suite 500 Schaumburg, IL 60173 Phone: (847) 908-8400 FAX:		Job: <b>CTL01051</b>			
		Project:	Client: Smartlink / AT&T	Drawn by: AS	App'd:
		Code: TIA-222-H	Date:	Page 2 of 66	Scale: NTS
		Path:	P:\Dept 4000\SM\INC\SM\INK\AT\NEWEN\CTL01051\Structure\Structure_Analysis\R2\Analysis\Drawn\CTL01051.dwg		

<b>tnxTower</b>  <b>Fullerton Engineering</b> 1100 E. Woodfield Road, Suite 500 Schaumburg, IL 60173 Phone: (847) 908-8400 FAX:	<b>Job</b>	CTL01051	<b>Page</b>	1 of 24
	<b>Project</b>		<b>Date</b>	12:46:06 11/11/22
	<b>Client</b>	Smartlink / AT&T	<b>Designed by</b>	AS

## 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 Windham County, Connecticut.
- Tower base elevation above sea level: 354.08 ft.
- Basic wind speed of 120 mph.
- Risk Category II.
- 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>Retention 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

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	175.00-128.66	46.34	4.68	18	23.0000	33.3750	0.2500	1.0000	A572-65

<b>tnxTower</b>  <b>Fullerton Engineering</b> 1100 E. Woodfield Road, Suite 500 Schaumburg, IL 60173 Phone: (847) 908-8400 FAX:	<b>Job</b> CTL01051	<b>Page</b> 2 of 24
	<b>Project</b>	<b>Date</b> 12:46:06 11/11/22
	<b>Client</b> Smartlink / AT&T	<b>Designed by</b> AS

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L2	128.66-85.09	48.25	5.82	18	31.8272	42.5625	0.3125	1.2500	(65 ksi) A572-65
L3	85.09-42.03	48.88	6.94	18	40.6426	51.4688	0.3750	1.5000	(65 ksi) A572-65
L4	42.03-0.00	48.97		18	49.1817	60.0000	0.4375	1.7500	(65 ksi) A572-65

### 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 <sub>t</sub> /Q in <sup>2</sup>	w in	w/t
L1	23.3162	18.0521	1180.3983	8.0762	11.6840	101.0269	2362.3498	9.0278	3.6080	14.432
	33.8513	26.2847	3643.7791	11.7594	16.9545	214.9152	7292.3528	13.1448	5.4340	21.736
L2	33.3273	31.2586	3922.2382	11.1877	16.1682	242.5894	7849.6374	15.6323	5.0516	16.165
	43.1709	41.9067	9450.9297	14.9987	21.6217	437.1029	18914.2952	20.9573	6.9410	22.211
L3	42.5206	47.9285	9818.4407	14.2950	20.6464	475.5514	19649.8008	23.9688	6.4931	17.315
	52.2049	60.8144	20057.6594	18.1383	26.1462	767.1362	40141.7111	30.4130	8.3985	22.396
L4	51.4297	67.6874	20318.4713	17.3042	24.9843	813.2496	40663.6782	33.8501	7.8860	18.025
	60.8581	82.7100	37071.5875	21.1447	30.4800	1216.2594	74191.9547	41.3628	9.7900	22.377

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 175.00-128.66				1	1	1			
L2 128.66-85.09				1	1	1			
L3 85.09-42.03				1	1	1			
L4 42.03-0.00				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
Step Rungs 3/4	C	No	Surface Ar (CaAa)	175.00 - 0.00	1	1	0.000 - 0.000	0.7500		0.48

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

Description	Face or Shield 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
Safety Line 3/8	C	No	No	CaAa (Out)	175.00 - 0.00	1	No Ice 0.04	0.22

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	CAAA	Weight
							ft <sup>2</sup> /ft	plf
				Of Face)			1/2" Ice	0.75
							1" Ice	1.28
LDF7-50A (1-5/8 FOAM)	C	No	No	Inside Pole	175.00 - 0.00	1	No Ice	0.82
							1/2" Ice	0.82
							1" Ice	0.82
LDF4P-50A (1/2 FOAM)	C	No	No	Inside Pole	104.50 - 0.00	1	No Ice	0.15
							1/2" Ice	0.15
							1" Ice	0.15
1 1/2" Rigid Conduit	A	No	No	Inside Pole	115.40 - 0.00	1	No Ice	1.00
							1/2" Ice	1.00
							1" Ice	1.00
1 1/2" Rigid Conduit	C	No	No	Inside Pole	115.60 - 0.00	1	No Ice	1.00
							1/2" Ice	1.00
							1" Ice	1.00
2" Rigid Conduit	A	No	No	Inside Pole	139.20 - 0.00	1	No Ice	2.80
							1/2" Ice	2.80
							1" Ice	2.80
2" Rigid Conduit	B	No	No	Inside Pole	139.20 - 0.00	1	No Ice	2.80
							1/2" Ice	2.80
							1" Ice	2.80
2" Rigid Conduit	C	No	No	Inside Pole	139.20 - 0.00	1	No Ice	2.80
							1/2" Ice	2.80
							1" Ice	2.80
7/8" DC power cable (AT&T)	A	No	No	Inside Pole	139.20 - 0.00	4	No Ice	0.40
							1/2" Ice	0.40
							1" Ice	0.40
1" Fiber (AT&T)	B	No	No	Inside Pole	139.20 - 0.00	2	No Ice	0.95
							1/2" Ice	0.95
							1" Ice	0.95
LDF7-50A (1-5/8 FOAM) (AT&T)	C	No	No	Inside Pole	139.20 - 0.00	6	No Ice	0.82
							1/2" Ice	0.82
							1" Ice	0.82
1-5/8" Fiber (AT&T)	A	No	No	Inside Pole	139.20 - 0.00	1	No Ice	0.82
							1/2" Ice	0.82
							1" Ice	0.82
DC Cable (1") (AT&T)	A	No	No	Inside Pole	139.20 - 0.00	3	No Ice	0.31
							1/2" Ice	0.31
							1" Ice	0.31
FLC 114-50J (1-1/4 FOAM)	A	No	No	Inside Pole	151.20 - 0.00	3	No Ice	0.70
							1/2" Ice	0.70
							1" Ice	0.70
FLC 114-50J (1-1/4 FOAM)	B	No	No	Inside Pole	151.20 - 0.00	9	No Ice	0.70
							1/2" Ice	0.70
							1" Ice	0.70
FLC 114-50J (1-1/4 FOAM)	C	No	No	Inside Pole	151.20 - 0.00	3	No Ice	0.70
							1/2" Ice	0.70
							1" Ice	0.70
VXL6-50 (1-1/4 FOAM)	C	No	No	Inside Pole	157.60 - 0.00	2	No Ice	0.50
							1/2" Ice	0.50
							1" Ice	0.50
FLC 12-50J (1/2 FOAM)	C	No	No	Inside Pole	162.20 - 0.00	1	No Ice	0.17
							1/2" Ice	0.17
							1" Ice	0.17
E65 (ELLIPTICAL AIR)	C	No	No	Inside Pole	169.00 - 0.00	1	No Ice	0.67
							1/2" Ice	0.67
							1" Ice	0.67
VXL6-50 (1-1/4 FOAM)	C	No	No	Inside Pole	173.60 - 0.00	2	No Ice	0.50
							1/2" Ice	0.50
							1" Ice	0.50
VXL7-50 (1-5/8)	C	No	No	Inside Pole	175.00 - 0.00	3	No Ice	0.75

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C <sub>AA</sub>	Weight
							ft <sup>2</sup> /ft	plf
FOAM)							1/2" Ice 0.00	0.75
							1" Ice 0.00	0.75
FLC 158-50J (1-5/8 FOAM)	B	No	No	Inside Pole	116.20 - 0.00	4	No Ice 0.00	0.92
							1/2" Ice 0.00	0.92
							1" Ice 0.00	0.92
FLC 158-50J (1-5/8 FOAM)	C	No	No	Inside Pole	116.20 - 0.00	4	No Ice 0.00	0.92
							1/2" Ice 0.00	0.92
							1" Ice 0.00	0.92
LDF7-50A (1-5/8 FOAM)	C	No	No	Inside Pole	117.00 - 0.00	6	No Ice 0.00	0.82
							1/2" Ice 0.00	0.82
							1" Ice 0.00	0.82
Fiber Cable	C	No	No	Inside Pole	117.00 - 0.00	4	No Ice 0.00	0.15
							1/2" Ice 0.00	0.15
							1" Ice 0.00	0.15

### 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>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight lb
L1	175.00-128.66	A	0.000	0.000	0.000	0.000	112.16
		B	0.000	0.000	0.000	0.000	191.54
		C	0.000	0.000	3.475	1.738	410.01
L2	128.66-85.09	A	0.000	0.000	0.000	0.000	389.76
		B	0.000	0.000	0.000	0.000	593.75
		C	0.000	0.000	3.268	1.634	1039.90
L3	85.09-42.03	A	0.000	0.000	0.000	0.000	398.31
		B	0.000	0.000	0.000	0.000	632.12
		C	0.000	0.000	3.229	1.615	1153.15
L4	42.03-0.00	A	0.000	0.000	0.000	0.000	388.78
		B	0.000	0.000	0.000	0.000	617.00
		C	0.000	0.000	3.152	1.576	1125.56

### 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>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight lb
L1	175.00-128.66	A	1.164	0.000	0.000	0.000	0.000	112.16
		B		0.000	0.000	0.000	0.000	191.54
		C		0.000	0.000	14.263	12.525	593.31
L2	128.66-85.09	A	1.124	0.000	0.000	0.000	0.000	389.76
		B		0.000	0.000	0.000	0.000	593.75
		C		0.000	0.000	13.410	11.777	1212.24
L3	85.09-42.03	A	1.067	0.000	0.000	0.000	0.000	398.31
		B		0.000	0.000	0.000	0.000	632.12
		C		0.000	0.000	12.909	11.294	1315.25
L4	42.03-0.00	A	0.957	0.000	0.000	0.000	0.000	388.78
		B		0.000	0.000	0.000	0.000	617.00
		C		0.000	0.000	12.123	10.547	1272.68

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### Feed Line Center of Pressure

Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub> Ice	CP <sub>z</sub> Ice
	ft	in	in	in	in
L1	175.00-128.66	-0.2472	0.7289	-0.8991	1.7328
L2	128.66-85.09	-0.2511	0.7363	-0.9538	1.8298
L3	85.09-42.03	-0.2533	0.7406	-0.9623	1.8460
L4	42.03-0.00	-0.2548	0.7435	-0.9480	1.8226

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	2	Step Rungs 3/4	128.66 - 175.00	1.0000	1.0000
L2	2	Step Rungs 3/4	85.09 - 128.66	1.0000	1.0000
L3	2	Step Rungs 3/4	42.03 - 85.09	1.0000	1.0000
L4	2	Step Rungs 3/4	0.00 - 42.03	1.0000	1.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight lb	
ERI---A-1 Lightning Spur	A	None		0.0000	175.00	No Ice	2.00	2.00	50.00
						1/2" Ice	4.00	4.00	75.00
						1" Ice	6.00	6.00	100.00
PiROD 13' Low Profile Platform	C	None		0.0000	173.00	No Ice	15.70	15.70	1300.00
						1/2" Ice	20.10	20.10	1765.00
						1" Ice	24.50	24.50	2230.00
Yagi	C	From Leg	3.00	0.0000	173.00	No Ice	0.80	1.50	40.00
			0.00			1/2" Ice	1.06	1.85	52.00
			5.00			1" Ice	1.35	2.23	64.00
8' Whip	C	From Leg	3.00	0.0000	173.00	No Ice	0.80	0.80	10.00
			0.00			1/2" Ice	1.62	1.62	17.43
			3.00			1" Ice	2.45	2.45	30.01
10' DiPole	C	From Leg	3.00	0.0000	173.00	No Ice	4.50	4.50	25.00
			0.00			1/2" Ice	5.24	5.24	57.00
			3.00			1" Ice	5.85	5.85	89.00
Pirod 6' Side Mount Standoff (1)	C	None		0.0000	155.67	No Ice	4.97	4.97	70.00
						1/2" Ice	6.12	6.12	130.00
						1" Ice	7.27	7.27	190.00



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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA		Weight
			Horz	Vert			Front	Side	
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
20'x2" Whip	C	From Leg	6.00	0.0000	155.67	No Ice	4.76	4.76	73.20
			0.00			1/2" Ice	6.79	6.79	108.68
			10.00			1" Ice	8.83	8.83	156.77
PiROD 13' Low Profile Platform	C	None		0.0000	148.67	No Ice	15.70	15.70	1300.00
						1/2" Ice	20.10	20.10	1765.00
						1" Ice	24.50	24.50	2230.00
RRH4X45-19	A	From Leg	3.00	0.0000	148.67	No Ice	2.70	2.77	59.50
			0.00			1/2" Ice	2.94	3.01	83.40
			3.00			1" Ice	3.18	3.25	107.30
RRH4X45-19	B	From Leg	3.00	0.0000	148.67	No Ice	2.70	2.77	59.50
			0.00			1/2" Ice	2.94	3.01	83.40
			3.00			1" Ice	3.18	3.25	107.30
RRH4X45-19	C	From Leg	3.00	0.0000	148.67	No Ice	2.70	2.77	59.50
			0.00			1/2" Ice	2.94	3.01	83.40
			3.00			1" Ice	3.18	3.25	107.30
RRH2x40-07L-DE	A	From Leg	3.00	0.0000	148.67	No Ice	3.50	2.21	74.00
			0.00			1/2" Ice	3.74	2.41	102.30
			3.00			1" Ice	3.99	2.62	134.18
RRH2x40-07L-DE	B	From Leg	3.00	0.0000	148.67	No Ice	3.50	2.21	74.00
			0.00			1/2" Ice	3.74	2.41	102.30
			3.00			1" Ice	3.99	2.62	134.18
RRH2x40-07L-DE	C	From Leg	3.00	0.0000	148.67	No Ice	3.50	2.21	74.00
			0.00			1/2" Ice	3.74	2.41	102.30
			3.00			1" Ice	3.99	2.62	134.18
RRH4x25-WCS	A	From Leg	3.00	0.0000	148.67	No Ice	3.80	3.27	70.00
			0.00			1/2" Ice	4.05	3.50	106.81
			-2.67			1" Ice	4.31	3.75	147.60
RRH4x25-WCS	B	From Leg	3.00	0.0000	148.67	No Ice	3.80	3.27	70.00
			0.00			1/2" Ice	4.05	3.50	106.81
			-2.67			1" Ice	4.31	3.75	147.60
RRH4x25-WCS	C	From Leg	3.00	0.0000	148.67	No Ice	3.80	3.27	70.00
			0.00			1/2" Ice	4.05	3.50	106.81
			-2.67			1" Ice	4.31	3.75	147.60
RFS APXVERR18-C	A	From Leg	3.00	0.0000	148.67	No Ice	8.02	6.71	79.40
			0.00			1/2" Ice	8.48	7.66	144.81
			1.25			1" Ice	8.94	8.49	217.97
RFS APXVERR18-C	B	From Leg	3.00	0.0000	148.67	No Ice	8.02	6.71	79.40
			0.00			1/2" Ice	8.48	7.66	144.81
			1.25			1" Ice	8.94	8.49	217.97
RFS APXVERR18-C	C	From Leg	3.00	0.0000	148.67	No Ice	8.02	6.71	79.40
			0.00			1/2" Ice	8.48	7.66	144.81
			1.25			1" Ice	8.94	8.49	217.97
Capstan Panel CT33XC614	A	From Leg	3.00	0.0000	148.67	No Ice	7.14	4.90	71.29
			0.00			1/2" Ice	7.69	5.72	126.02
			0.00			1" Ice	8.24	6.54	180.75
Capstan Panel CT33XC614	B	From Leg	3.00	0.0000	148.67	No Ice	7.14	4.90	71.29
			0.00			1/2" Ice	7.69	5.72	126.02
			0.00			1" Ice	8.24	6.54	180.75
Capstan Panel CT33XC614	C	From Leg	3.00	0.0000	148.67	No Ice	7.14	4.90	71.29
			0.00			1/2" Ice	7.69	5.72	126.02
			0.00			1" Ice	8.24	6.54	180.75
PiROD 13' Platform w/handrails (Monopole)	C	None		0.0000	138.00	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
Quintel QD8616-7	A	From Leg	3.00	0.0000	138.00	No Ice	18.81	9.60	147.00
			0.00			1/2" Ice	19.45	10.20	256.32
			0.00			1" Ice	20.10	10.81	374.11

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Lateral					
Quintel QD8616-7	B	From Leg	3.00	0.0000	138.00	No Ice	18.81	9.60	147.00
			0.00			1/2" Ice	19.45	10.20	256.32
			0.00			1" Ice	20.10	10.81	374.11
Quintel QD8616-7	C	From Leg	3.00	0.0000	138.00	No Ice	18.81	9.60	147.00
			0.00			1/2" Ice	19.45	10.20	256.32
			0.00			1" Ice	20.10	10.81	374.11
CCI DMP65R-BU8DA	A	From Leg	3.00	0.0000	138.00	No Ice	17.87	8.12	126.80
			0.00			1/2" Ice	18.50	8.72	224.38
			0.00			1" Ice	19.14	9.32	330.23
CCI DMP65R-BU8DA	B	From Leg	3.00	0.0000	138.00	No Ice	17.87	8.12	126.80
			0.00			1/2" Ice	18.50	8.72	224.38
			0.00			1" Ice	19.14	9.32	330.23
CCI DMP65R-BU8DA	C	From Leg	3.00	0.0000	138.00	No Ice	17.87	8.12	126.80
			0.00			1/2" Ice	18.50	8.72	224.38
			0.00			1" Ice	19.14	9.32	330.23
Ericsson Air6449 B77D	A	From Leg	3.00	0.0000	138.00	No Ice	4.03	2.15	81.60
			0.00			1/2" Ice	4.29	2.36	111.21
			3.00			1" Ice	4.56	2.57	144.55
Ericsson Air6449 B77D	B	From Leg	3.00	0.0000	138.00	No Ice	4.03	2.15	81.60
			0.00			1/2" Ice	4.29	2.36	111.21
			3.00			1" Ice	4.56	2.57	144.55
Ericsson Air6449 B77D	C	From Leg	3.00	0.0000	138.00	No Ice	4.03	2.15	81.60
			0.00			1/2" Ice	4.29	2.36	111.21
			3.00			1" Ice	4.56	2.57	144.55
Ericsson Air6419 B77G	A	From Leg	3.00	0.0000	138.00	No Ice	3.80	1.94	77.00
			0.00			1/2" Ice	4.05	2.14	104.86
			-3.00			1" Ice	4.31	2.34	136.30
Ericsson Air6419 B77G	B	From Leg	3.00	0.0000	138.00	No Ice	3.80	1.94	77.00
			0.00			1/2" Ice	4.05	2.14	104.86
			-3.00			1" Ice	4.31	2.34	136.30
Ericsson Air6419 B77G	C	From Leg	3.00	0.0000	138.00	No Ice	3.80	1.94	77.00
			0.00			1/2" Ice	4.05	2.14	104.86
			-3.00			1" Ice	4.31	2.34	136.30
Ericsson RRUS 4478 B14	A	From Leg	3.00	0.0000	138.00	No Ice	1.84	1.06	59.90
			0.00			1/2" Ice	2.01	1.20	75.78
			0.00			1" Ice	2.19	1.34	94.29
Ericsson RRUS 4478 B14	B	From Leg	3.00	0.0000	138.00	No Ice	1.84	1.06	59.90
			0.00			1/2" Ice	2.01	1.20	75.78
			0.00			1" Ice	2.19	1.34	94.29
Ericsson RRUS 4478 B14	C	From Leg	3.00	0.0000	138.00	No Ice	1.84	1.06	59.90
			0.00			1/2" Ice	2.01	1.20	75.78
			0.00			1" Ice	2.19	1.34	94.29
RRUS-32 B30	A	From Leg	3.00	0.0000	138.00	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 Leg	3.00	0.0000	138.00	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 Leg	3.00	0.0000	138.00	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-4415 B25	A	From Leg	3.00	0.0000	138.00	No Ice	1.64	0.68	46.00
			0.00			1/2" Ice	1.80	0.79	58.43
			0.00			1" Ice	1.97	0.91	73.23
RRUS-4415 B25	B	From Leg	3.00	0.0000	138.00	No Ice	1.64	0.68	46.00
			0.00			1/2" Ice	1.80	0.79	58.43
			0.00			1" Ice	1.97	0.91	73.23

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
RRUS-4415 B25	C	From Leg	3.00	0.0000		138.00	No Ice 1.64	0.68	46.00
			0.00				1/2" Ice 1.80	0.79	58.43
			0.00				1" Ice 1.97	0.91	73.23
Ericsson Radio 4426 B66	A	From Leg	3.00	0.0000		138.00	No Ice 1.64	0.73	48.40
			0.00				1/2" Ice 1.80	0.84	61.22
			0.00				1" Ice 1.97	0.97	76.43
Ericsson Radio 4426 B66	B	From Leg	3.00	0.0000		138.00	No Ice 1.64	0.73	48.40
			0.00				1/2" Ice 1.80	0.84	61.22
			0.00				1" Ice 1.97	0.97	76.43
Ericsson Radio 4426 B66	C	From Leg	3.00	0.0000		138.00	No Ice 1.64	0.73	48.40
			0.00				1/2" Ice 1.80	0.84	61.22
			0.00				1" Ice 1.97	0.97	76.43
Ericsson Radio 4449 B5/B12	A	From Leg	3.00	0.0000		138.00	No Ice 1.64	1.30	73.00
			0.00				1/2" Ice 1.80	1.45	90.19
			0.00				1" Ice 1.97	1.60	110.08
Ericsson Radio 4449 B5/B12	B	From Leg	3.00	0.0000		138.00	No Ice 1.64	1.30	73.00
			0.00				1/2" Ice 1.80	1.45	90.19
			0.00				1" Ice 1.97	1.60	110.08
Ericsson Radio 4449 B5/B12	C	From Leg	3.00	0.0000		138.00	No Ice 1.64	1.30	73.00
			0.00				1/2" Ice 1.80	1.45	90.19
			0.00				1" Ice 1.97	1.60	110.08
Raycap DC6-48-60-18-8F	C	From Leg	3.00	0.0000		138.00	No Ice 0.83	0.83	22.00
			0.00				1/2" Ice 1.34	1.34	37.91
			0.00				1" Ice 1.52	1.52	56.21
Raycap DC6-48-60-18-8F	A	From Leg	3.00	0.0000		138.00	No Ice 0.83	0.83	22.00
			0.00				1/2" Ice 1.34	1.34	37.91
			0.00				1" Ice 1.52	1.52	56.21
Raycap DC9-48-60-24-8C-EV	B	From Leg	3.00	0.0000		138.00	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
PiROD 13' Low Profile Platform	C	None		0.0000		127.50	No Ice 15.70	15.70	1300.00
							1/2" Ice 20.10	20.10	1765.00
							1" Ice 24.50	24.50	2230.00
PiROD 13' Platform w/handrails (Monopole)	C	None		0.0000		117.00	No Ice 31.30	31.30	1822.00
							1/2" Ice 40.20	40.20	2452.00
							1" Ice 49.10	49.10	3082.00
Ericsson AIR32 B66A/B2A	A	From Leg	3.00	0.0000		117.00	No Ice 7.12	6.39	160.90
			4.00				1/2" Ice 7.60	7.26	224.46
			0.00				1" Ice 8.06	8.00	295.12
Ericsson AIR32 B66A/B2A	B	From Leg	3.00	0.0000		117.00	No Ice 7.12	6.39	160.90
			4.00				1/2" Ice 7.60	7.26	224.46
			0.00				1" Ice 8.06	8.00	295.12
Ericsson AIR32 B66A/B2A	C	From Leg	3.00	0.0000		117.00	No Ice 7.12	6.39	160.90
			4.00				1/2" Ice 7.60	7.26	224.46
			0.00				1" Ice 8.06	8.00	295.12
Ericsson AIR6449 B41	A	From Leg	3.00	0.0000		117.00	No Ice 5.68	2.49	104.00
			-4.00				1/2" Ice 5.98	2.72	143.12
			0.00				1" Ice 6.29	2.95	186.46
Ericsson AIR6449 B41	B	From Leg	3.00	0.0000		117.00	No Ice 5.68	2.49	104.00
			-4.00				1/2" Ice 5.98	2.72	143.12
			0.00				1" Ice 6.29	2.95	186.46
Ericsson AIR6449 B41	C	From Leg	3.00	0.0000		117.00	No Ice 5.68	2.49	104.00
			-4.00				1/2" Ice 5.98	2.72	143.12
			0.00				1" Ice 6.29	2.95	186.46
RFS APXVAARR24_43-U-NA20	A	From Leg	3.00	0.0000		117.00	No Ice 20.24	8.89	69.50
			0.00				1/2" Ice 20.89	9.49	182.09
			0.00				1" Ice 21.54	10.09	303.22

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
RFS	B	From Leg	3.00	0.0000		117.00	No Ice	20.24	8.89	69.50
APXVAARR24_43-U-NA20			0.00				1/2" Ice	20.89	9.49	182.09
			0.00				1" Ice	21.54	10.09	303.22
RFS	C	From Leg	3.00	0.0000		117.00	No Ice	20.24	8.89	69.50
APXVAARR24_43-U-NA20			0.00				1/2" Ice	20.89	9.49	182.09
			0.00				1" Ice	21.54	10.09	303.22
RRUS-4449	A	From Leg	3.00	0.0000		117.00	No Ice	1.64	1.15	74.00
			0.00				1/2" Ice	1.80	1.29	90.07
			0.00				1" Ice	1.97	1.44	108.76
RRUS-4449	B	From Leg	3.00	0.0000		117.00	No Ice	1.64	1.15	74.00
			0.00				1/2" Ice	1.80	1.29	90.07
			0.00				1" Ice	1.97	1.44	108.76
RRUS-4449	C	From Leg	3.00	0.0000		117.00	No Ice	1.64	1.15	74.00
			0.00				1/2" Ice	1.80	1.29	90.07
			0.00				1" Ice	1.97	1.44	108.76
RRUS-4415 B25	A	From Leg	3.00	0.0000		117.00	No Ice	1.64	0.68	46.00
			0.00				1/2" Ice	1.80	0.79	58.43
			0.00				1" Ice	1.97	0.91	73.23
RRUS-4415 B25	B	From Leg	3.00	0.0000		117.00	No Ice	1.64	0.68	46.00
			0.00				1/2" Ice	1.80	0.79	58.43
			0.00				1" Ice	1.97	0.91	73.23
RRUS-4415 B25	C	From Leg	3.00	0.0000		117.00	No Ice	1.64	0.68	46.00
			0.00				1/2" Ice	1.80	0.79	58.43
			0.00				1" Ice	1.97	0.91	73.23
AWC-TTMA-700C-VG TMA	A	From Leg	3.00	0.0000		117.00	No Ice	0.69	0.91	28.00
			0.00				1/2" Ice	0.80	1.03	37.37
			0.00				1" Ice	0.91	1.16	48.76
AWC-TTMA-700C-VG TMA	B	From Leg	3.00	0.0000		117.00	No Ice	0.69	0.91	28.00
			0.00				1/2" Ice	0.80	1.03	37.37
			0.00				1" Ice	0.91	1.16	48.76
AWC-TTMA-700C-VG TMA	C	From Leg	3.00	0.0000		117.00	No Ice	0.69	0.91	28.00
			0.00				1/2" Ice	0.80	1.03	37.37
			0.00				1" Ice	0.91	1.16	48.76
Commscope SDX1926Q-43	A	From Leg	3.00	0.0000		117.00	No Ice	0.24	0.10	6.61
			0.00				1/2" Ice	0.31	0.14	9.09
			0.00				1" Ice	0.38	0.19	12.66
Commscope SDX1926Q-43	B	From Leg	3.00	0.0000		117.00	No Ice	0.24	0.10	6.61
			0.00				1/2" Ice	0.31	0.14	9.09
			0.00				1" Ice	0.38	0.19	12.66
Commscope SDX1926Q-43	C	From Leg	3.00	0.0000		117.00	No Ice	0.24	0.10	6.61
			0.00				1/2" Ice	0.31	0.14	9.09
			0.00				1" Ice	0.38	0.19	12.66
PiROD 13' Low Profile Platform	C	None		0.0000		104.50	No Ice	15.70	15.70	1300.00
							1/2" Ice	20.10	20.10	1765.00
							1" Ice	24.50	24.50	2230.00
Yagi	C	From Leg	3.00	0.0000		104.50	No Ice	0.80	1.50	40.00
			0.00				1/2" Ice	1.06	1.85	52.00
			1.50				1" Ice	1.35	2.23	64.00
GPS	C	From Leg	3.00	0.0000		104.50	No Ice	0.76	0.76	17.30
			0.00				1/2" Ice	1.02	1.02	27.45
			0.00				1" Ice	1.30	1.30	40.15

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### Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				ft	°	°	ft	ft	ft <sup>2</sup>	lb	
8' Dish	C	Paraboloid w/Radome	From Leg	3.50	0.0000		169.00	8.00	No Ice	50.27	112.00
				0.00					1/2" Ice	51.32	375.44
				0.00					1" Ice	52.37	638.89
6' Grid Dish	C	Grid	From Leg	3.50	0.0000		162.20	6.00	No Ice	9.43	80.00
				0.00					1/2" Ice	29.07	229.23
				0.00					1" Ice	48.71	378.45
4' Grid Dish	A	Grid	From Leg	2.50	0.0000		157.50	4.00	No Ice	6.00	70.00
				0.00					1/2" Ice	13.10	140.00
				0.00					1" Ice	20.20	210.00

### Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F <sub>a</sub>	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face
ft	ft		psf	ft <sup>2</sup>	e	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 175.00-128.66	150.59	1.38	48	110.381	A	0.000	110.381	110.381	100.00	0.000	0.000
					B	0.000	110.381	100.00	0.000	0.000	
					C	0.000	110.381	100.00	3.475	1.738	
L2 128.66-85.09	106.17	1.282	44	138.876	A	0.000	138.876	138.876	100.00	0.000	0.000
					B	0.000	138.876	100.00	0.000	0.000	
					C	0.000	138.876	100.00	3.268	1.634	
L3 85.09-42.03	63.21	1.149	40	169.953	A	0.000	169.953	169.953	100.00	0.000	0.000
					B	0.000	169.953	100.00	0.000	0.000	
					C	0.000	169.953	100.00	3.229	1.615	
L4 42.03-0.00	21.24	0.913	32	196.644	A	0.000	196.644	196.644	100.00	0.000	0.000
					B	0.000	196.644	100.00	0.000	0.000	
					C	0.000	196.644	100.00	3.152	1.576	

### Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	t <sub>z</sub>	A <sub>G</sub>	F <sub>a</sub>	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face
ft	ft		psf	in	ft <sup>2</sup>	e	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 175.00-128.66	150.59	1.38	8	1.1639	119.370	A	0.000	119.370	119.370	100.00	0.000	0.000
						B	0.000	119.370	100.00	0.000	0.000	
						C	0.000	119.370	100.00	14.263	12.525	
L2 128.66-85.09	106.17	1.282	8	1.1240	147.328	A	0.000	147.328	147.328	100.00	0.000	0.000
						B	0.000	147.328	100.00	0.000	0.000	
						C	0.000	147.328	100.00	13.410	11.777	
L3 85.09-42.03	63.21	1.149	7	1.0672	178.020	A	0.000	178.020	178.020	100.00	0.000	0.000
						B	0.000	178.020	100.00	0.000	0.000	
						C	0.000	178.020	100.00	12.909	11.294	
L4 42.03-0.00	21.24	0.913	6	0.9569	204.120	A	0.000	204.120	204.120	100.00	0.000	0.000

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Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	t <sub>z</sub>	A <sub>G</sub>	F <sub>a</sub>	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>AA</sub> In Face	C <sub>AA</sub> Out Face
ft	ft		psf	in	ft <sup>2</sup>	c	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
						B	0.000	204.120		100.00	0.000	0.000
						C	0.000	204.120		100.00	12.123	10.547

### Tower Pressure - Service

$G_H = 1.100$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F <sub>a</sub>	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>AA</sub> In Face	C <sub>AA</sub> Out Face
ft	ft		psf	ft <sup>2</sup>	c	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 175.00-128.66	150.59	1.38	11	110.381	A	0.000	110.381	110.381	100.00	0.000	0.000
					B	0.000	110.381		100.00	0.000	0.000
					C	0.000	110.381		100.00	3.475	1.738
L2 128.66-85.09	106.17	1.282	10	138.876	A	0.000	138.876	138.876	100.00	0.000	0.000
					B	0.000	138.876		100.00	0.000	0.000
					C	0.000	138.876		100.00	3.268	1.634
L3 85.09-42.03	63.21	1.149	9	169.953	A	0.000	169.953	169.953	100.00	0.000	0.000
					B	0.000	169.953		100.00	0.000	0.000
					C	0.000	169.953		100.00	3.229	1.615
L4 42.03-0.00	21.24	0.913	7	196.644	A	0.000	196.644	196.644	100.00	0.000	0.000
					B	0.000	196.644		100.00	0.000	0.000
					C	0.000	196.644		100.00	3.152	1.576

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

Section Elevation	Add Weight	Self Weight	F <sub>a</sub>	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb	c			psf			ft <sup>2</sup>	lb	plf	
L1 175.00-128.66	713.71	3495.63	A	1	0.73	48	1	1	110.381	4315.67	93.13	C
			B	1	0.73		1	1	110.381			
			C	1	0.73		1	1	110.381			
L2 128.66-85.09	2023.42	6006.32	A	1	0.73	44	1	1	138.876	5014.73	115.10	C
			B	1	0.73		1	1	138.876			
			C	1	0.73		1	1	138.876			
L3 85.09-42.03	2183.57	9043.52	A	1	0.73	40	1	1	169.953	5472.29	127.09	C
			B	1	0.73		1	1	169.953			
			C	1	0.73		1	1	169.953			
L4 42.03-0.00	2131.34	12530.71	A	1	0.73	32	1	1	196.644	5065.73	120.53	C
			B	1	0.73		1	1	196.644			
			C	1	0.73		1	1	196.644			
Sum Weight:	7052.05	31076.18						OTM	1635832.8 6 lb-ft	19868.42		

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

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb				psf			ft <sup>2</sup>	lb	plf	
L1 175.00-128.66	713.71	3495.63	A	1	0.73	48	1	1	110.381	4315.67	93.13	C
			B	1	0.73							
			C	1	0.73							
L2 128.66-85.09	2023.42	6006.32	A	1	0.73	44	1	1	138.876	5014.73	115.10	C
			B	1	0.73							
			C	1	0.73							
L3 85.09-42.03	2183.57	9043.52	A	1	0.73	40	1	1	169.953	5472.29	127.09	C
			B	1	0.73							
			C	1	0.73							
L4 42.03-0.00	2131.34	12530.71	A	1	0.73	32	1	1	196.644	5065.73	120.53	C
			B	1	0.73							
			C	1	0.73							
Sum Weight:	7052.05	31076.18						OTM	1635832.8 6 lb-ft	19868.42		

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

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb				psf			ft <sup>2</sup>	lb	plf	
L1 175.00-128.66	713.71	3495.63	A	1	0.73	48	1	1	110.381	4315.67	93.13	C
			B	1	0.73							
			C	1	0.73							
L2 128.66-85.09	2023.42	6006.32	A	1	0.73	44	1	1	138.876	5014.73	115.10	C
			B	1	0.73							
			C	1	0.73							
L3 85.09-42.03	2183.57	9043.52	A	1	0.73	40	1	1	169.953	5472.29	127.09	C
			B	1	0.73							
			C	1	0.73							
L4 42.03-0.00	2131.34	12530.71	A	1	0.73	32	1	1	196.644	5065.73	120.53	C
			B	1	0.73							
			C	1	0.73							
Sum Weight:	7052.05	31076.18						OTM	1635832.8 6 lb-ft	19868.42		

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

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb				psf			ft <sup>2</sup>	lb	plf	
L1 175.00-128.66	897.00	5449.73	A	1	1.2	8	1	1	119.370	1417.83	30.60	C
			B	1	1.2							
			C	1	1.2							
L2	2195.76	8354.02	A	1	1.2	8	1	1	147.038	1590.75	36.51	C

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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
128.66-85.09			B	1	1.2		1	1	147.038			
			C	1	1.2		1	1	147.038			
L3 85.09-42.03	2345.68	11752.89	A	1	1.2	7	1	1	177.612	1696.51	39.40	C
			B	1	1.2		1	1	177.612			
			C	1	1.2		1	1	177.612			
L4 42.03-0.00	2278.46	15326.24	A	1	1.2	6	1	1	203.347	1542.66	36.70	C
			B	1	1.2		1	1	203.347			
			C	1	1.2		1	1	203.347			
Sum Weight:	7716.90	40882.88						OTM	522411.27 lb-ft	6247.75		

### 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 175.00-128.66	897.00	5449.73	A	1	1.2	8	1	1	119.370	1417.83	30.60	C
			B	1	1.2		1	1	119.370			
			C	1	1.2		1	1	119.370			
L2 128.66-85.09	2195.76	8354.02	A	1	1.2	8	1	1	147.038	1590.75	36.51	C
			B	1	1.2		1	1	147.038			
			C	1	1.2		1	1	147.038			
L3 85.09-42.03	2345.68	11752.89	A	1	1.2	7	1	1	177.612	1696.51	39.40	C
			B	1	1.2		1	1	177.612			
			C	1	1.2		1	1	177.612			
L4 42.03-0.00	2278.46	15326.24	A	1	1.2	6	1	1	203.347	1542.66	36.70	C
			B	1	1.2		1	1	203.347			
			C	1	1.2		1	1	203.347			
Sum Weight:	7716.90	40882.88						OTM	522411.27 lb-ft	6247.75		

### 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 175.00-128.66	897.00	5449.73	A	1	1.2	8	1	1	119.370	1417.83	30.60	C
			B	1	1.2		1	1	119.370			
			C	1	1.2		1	1	119.370			
L2 128.66-85.09	2195.76	8354.02	A	1	1.2	8	1	1	147.038	1590.75	36.51	C
			B	1	1.2		1	1	147.038			
			C	1	1.2		1	1	147.038			
L3 85.09-42.03	2345.68	11752.89	A	1	1.2	7	1	1	177.612	1696.51	39.40	C
			B	1	1.2		1	1	177.612			
			C	1	1.2		1	1	177.612			
L4 42.03-0.00	2278.46	15326.24	A	1	1.2	6	1	1	203.347	1542.66	36.70	C
			B	1	1.2		1	1	203.347			
			C	1	1.2		1	1	203.347			



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Section Elevation	Add Weight	Self Weight	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
Sum Weight:	7716.90	40882.88	C	1	1.2		1	1 OTM	203.347 522411.27 lb-ft	6247.75		

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

Section Elevation	Add Weight	Self Weight	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 175.00-128.66	713.71	3495.63	A B C	1 1 1	0.73 0.73 0.73	11	1 1 1	1 1 1	110.381 110.381 110.381	965.35	20.83	C
L2 128.66-85.09	2023.42	6006.32	A B C	1 1 1	0.73 0.73 0.73	10	1 1 1	1 1 1	138.876 138.876 138.876	1121.72	25.75	C
L3 85.09-42.03	2183.57	9043.52	A B C	1 1 1	0.73 0.73 0.73	9	1 1 1	1 1 1	169.953 169.953 169.953	1224.07	28.43	C
L4 42.03-0.00	2131.34	12530.71	A B C	1 1 1	0.73 0.73 0.73	7	1 1 1	1 1 1	196.644 196.644 196.644	1133.12	26.96	C
Sum Weight:	7052.05	31076.18						1 OTM	365909.98 lb-ft	4444.25		

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

Section Elevation	Add Weight	Self Weight	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 175.00-128.66	713.71	3495.63	A B C	1 1 1	0.73 0.73 0.73	11	1 1 1	1 1 1	110.381 110.381 110.381	965.35	20.83	C
L2 128.66-85.09	2023.42	6006.32	A B C	1 1 1	0.73 0.73 0.73	10	1 1 1	1 1 1	138.876 138.876 138.876	1121.72	25.75	C
L3 85.09-42.03	2183.57	9043.52	A B C	1 1 1	0.73 0.73 0.73	9	1 1 1	1 1 1	169.953 169.953 169.953	1224.07	28.43	C
L4 42.03-0.00	2131.34	12530.71	A B C	1 1 1	0.73 0.73 0.73	7	1 1 1	1 1 1	196.644 196.644 196.644	1133.12	26.96	C
Sum Weight:	7052.05	31076.18						1 OTM	365909.98 lb-ft	4444.25		

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

Section Elevation	Add Weight	Self Weight	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 175.00-128.66	713.71	3495.63	A	1	0.73	11	1	1	110.381	965.35	20.83	C
			B	1	0.73		1	1	110.381			
			C	1	0.73		1	1	110.381			
L2 128.66-85.09	2023.42	6006.32	A	1	0.73	10	1	1	138.876	1121.72	25.75	C
			B	1	0.73		1	1	138.876			
			C	1	0.73		1	1	138.876			
L3 85.09-42.03	2183.57	9043.52	A	1	0.73	9	1	1	169.953	1224.07	28.43	C
			B	1	0.73		1	1	169.953			
			C	1	0.73		1	1	169.953			
L4 42.03-0.00	2131.34	12530.71	A	1	0.73	7	1	1	196.644	1133.12	26.96	C
			B	1	0.73		1	1	196.644			
			C	1	0.73		1	1	196.644			
Sum Weight:	7052.05	31076.18						OTM	365909.98 lb-ft	4444.25		

**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	31076.18					
Bracing Weight	0.00					
Total Member Self-Weight	31076.18					
Total Weight	52318.63			915.22	1736.01	
Wind 0 deg - No Ice		302.68	-40872.49	-4553199.36	-49985.52	-10585.86
Wind 30 deg - No Ice		20774.42	-35914.79	-4030761.35	-2333589.92	-5717.01
Wind 60 deg - No Ice		35868.25	-20742.07	-2328320.56	-4023472.62	-369.57
Wind 90 deg - No Ice		41403.86	-69.74	-11361.50	-4643842.68	5127.61
Wind 120 deg - No Ice		35473.92	20154.26	2230052.11	-3956443.98	10209.80
Wind 150 deg - No Ice		20364.55	34625.30	3814608.68	-2263574.80	12900.92
Wind 180 deg - No Ice		71.11	40160.42	4434862.61	-9812.26	12142.29
Wind 210 deg - No Ice		-20414.72	35254.65	3921139.67	2276079.92	7469.60
Wind 240 deg - No Ice		-35492.76	20514.63	2291727.75	3963298.28	376.06
Wind 270 deg - No Ice		-40652.27	46.01	9446.35	4520296.31	-6847.25
Wind 300 deg - No Ice		-34685.24	-20141.18	-2225961.82	3826557.56	-11772.71
Wind 330 deg - No Ice		-19778.42	-34963.64	-3870075.73	2167790.63	-12933.88
Member Ice	9806.70					
Total Weight Ice	77724.79			4274.77	7177.75	
Wind 0 deg - Ice		718.85	-11822.97	-1307832.19	-109920.81	-2962.71
Wind 30 deg - Ice		6372.52	-10220.50	-1129846.98	-724419.14	-1560.91
Wind 60 deg - Ice		10457.70	-6077.90	-679320.88	-1165892.90	-458.67
Wind 90 deg - Ice		11929.11	-421.01	-64214.67	-1323732.23	816.02
Wind 120 deg - Ice		10458.91	5521.94	595615.55	-1165718.62	2857.03
Wind 150 deg - Ice		5613.62	9938.73	1090294.94	-601062.61	4570.14
Wind 180 deg - Ice		-63.21	11588.32	1276970.47	17451.50	4462.42
Wind 210 deg - Ice		-5759.57	10252.00	1141941.67	639294.39	2899.37
Wind 240 deg - Ice		-10119.20	6155.86	699064.11	1125055.18	105.69
Wind 270 deg - Ice		-11553.14	26.68	8818.06	1276175.50	-2597.37
Wind 300 deg - Ice		-9883.25	-5673.25	-612754.66	1085499.81	-4003.75

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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
Wind 330 deg - Ice		-5598.49	-9835.72	-1066244.94	611781.08	-4127.25
Total Weight	52318.63			915.22	1736.01	
Wind 0 deg - Service		67.70	-9146.17	-1018452.71	-9891.13	-2367.82
Wind 30 deg - Service		4648.73	-8036.73	-901524.24	-520948.69	-1278.73
Wind 60 deg - Service		8026.32	-4641.50	-520531.13	-899132.75	-82.60
Wind 90 deg - Service		9265.03	-15.60	-2012.65	-1037967.08	1147.01
Wind 120 deg - Service		7938.11	4510.01	499607.50	-884139.50	2283.77
Wind 150 deg - Service		4557.05	7748.29	854231.76	-505287.41	2885.69
Wind 180 deg - Service		15.91	8986.89	993040.11	-905.00	2715.97
Wind 210 deg - Service		-4568.27	7889.06	878061.06	510664.30	1670.75
Wind 240 deg - Service		-7942.32	4590.62	513403.36	888252.39	84.05
Wind 270 deg - Service		-9096.91	10.29	2641.73	1012911.39	-1531.66
Wind 300 deg - Service		-7761.70	-4507.08	-497635.10	857665.65	-2633.37
Wind 330 deg - Service		-4425.94	-7823.97	-865581.40	486441.70	-2893.07

## 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
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

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Comb. No.	Description
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	175 - 128.66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25742.71	6977.83	-3316.25
			Max. Mx	8	-12615.76	-343841.39	2197.33
			Max. My	2	-12714.24	-10174.54	324183.53
			Max. Vy	8	19918.67	-343841.39	2197.33
			Max. Vx	2	-19340.35	-10174.54	324183.53
			Max. Torque	24			11983.01
L2	128.66 - 85.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49917.97	8034.74	-4120.04
			Max. Mx	8	-28451.88	-1478476.2	5396.37
			Max. My	2	-28531.87	-23739.05	1434218.33
			Max. Vy	8	31995.37	-1478476.2	5396.37
			Max. Vx	2	-31422.76	-23739.05	1434218.33
			Max. Torque	25			12566.15
L3	85.09 - 42.03	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65687.19	8396.20	-4577.01
			Max. Mx	8	-41911.67	-2923031.1	8379.73
			Max. My	2	-41953.22	-37119.28	2854918.21
			Max. Vy	8	36781.64	-2923031.1	8379.73
			Max. Vx	2	-36222.05	-37119.28	2854918.21
			Max. Torque	25			12666.87
L4	42.03 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-89268.49	8530.07	-4986.91
			Max. Mx	8	-62752.43	-4846827.0	11818.87
			Max. My	2	-62753.39	-52370.31	4751825.68
			Max. Vy	8	41449.20	-4846827.0	11818.87
			Max. Vx	2	-40916.94	-52370.31	4751825.68
			Max. Torque	25			12803.37

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### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	29	89268.49	-10457.77	6077.94
	Max. H <sub>x</sub>	20	62782.35	40652.27	-46.01
	Max. H <sub>z</sub>	2	62782.35	-302.68	40872.49
	Max. M <sub>x</sub>	2	4751825.65	-302.68	40872.49
	Max. M <sub>z</sub>	8	4846827.08	-41403.86	69.74
	Max. Torsion	25	12803.28	19778.42	34963.65
	Min. Vert	13	47086.77	-20364.55	-34625.30
	Min. H <sub>x</sub>	8	62782.35	-41403.86	69.74
	Min. H <sub>z</sub>	14	62782.35	-71.11	-40160.43
	Min. M <sub>x</sub>	14	-4627982.63	-71.11	-40160.43
	Min. M <sub>z</sub>	20	-4717960.21	40652.27	-46.01
	Min. Torsion	13	-12769.59	-20364.55	-34625.30

### 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	52318.63	-0.00	0.00	926.69	1761.06	0.03
1.2 Dead+1.0 Wind 0 deg - No Ice	62782.35	302.68	-40872.49	-4751825.65	-52372.55	-10478.66
0.9 Dead+1.0 Wind 0 deg - No Ice	47086.77	302.68	-40872.49	-4698892.61	-52187.90	-10480.17
1.2 Dead+1.0 Wind 30 deg - No Ice	62782.35	20774.42	-35914.79	-4207075.47	-2435526.89	-5668.66
0.9 Dead+1.0 Wind 30 deg - No Ice	47086.77	20774.42	-35914.79	-4160026.95	-2408644.79	-5666.09
1.2 Dead+1.0 Wind 60 deg - No Ice	62782.35	35868.25	-20742.07	-2430128.84	-4199289.14	-386.71
0.9 Dead+1.0 Wind 60 deg - No Ice	47086.77	35868.25	-20742.07	-2403066.91	-4152599.08	-381.11
1.2 Dead+1.0 Wind 90 deg - No Ice	62782.35	41403.86	-69.74	-11819.97	-4846827.08	5049.24
0.9 Dead+1.0 Wind 90 deg - No Ice	47086.77	41403.86	-69.74	-11936.62	-4792856.64	5056.45
1.2 Dead+1.0 Wind 120 deg - No Ice	62782.35	35473.92	20154.26	2327111.27	-4129061.27	10085.52
0.9 Dead+1.0 Wind 120 deg - No Ice	47086.77	35473.92	20154.26	2300895.48	-4083314.96	10092.67
1.2 Dead+1.0 Wind 150 deg - No Ice	62782.35	20364.55	34625.30	3980409.04	-2362211.23	12764.37
0.9 Dead+1.0 Wind 150 deg - No Ice	47086.77	20364.55	34625.30	3935873.44	-2336313.58	12769.59
1.2 Dead+1.0 Wind 180 deg - No Ice	62782.35	71.11	40160.43	4627982.63	-10024.08	12020.95
0.9 Dead+1.0 Wind 180 deg - No Ice	47086.77	71.11	40160.42	4576146.73	-10426.56	12023.07
1.2 Dead+1.0 Wind 210 deg - No Ice	62782.35	-20414.72	35254.65	4092476.41	2375893.56	7399.86
0.9 Dead+1.0 Wind 210 deg - No Ice	47086.77	-20414.72	35254.65	4046383.29	2348720.84	7398.21
1.2 Dead+1.0 Wind 240 deg - No Ice	62782.35	-35492.76	20514.63	2392144.22	4136955.94	393.53
0.9 Dead+1.0 Wind 240 deg - No Ice	47086.77	-35492.76	20514.63	2365008.87	4089986.17	387.97

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Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
No Ice						
1.2 Dead+1.0 Wind 270 deg - No Ice	62782.35	-40652.27	46.01	10123.19	4717960.21	-6748.48
0.9 Dead+1.0 Wind 270 deg - No Ice	47086.77	-40652.27	46.01	9699.92	4664614.30	-6756.19
1.2 Dead+1.0 Wind 300 deg - No Ice	62782.35	-34685.25	-20141.18	-2322761.24	3993272.24	-11635.87
0.9 Dead+1.0 Wind 300 deg - No Ice	47086.77	-34685.24	-20141.18	-2297142.98	3948277.98	-11643.25
1.2 Dead+1.0 Wind 330 deg - No Ice	62782.35	-19778.42	-34963.64	-4038568.45	2261880.43	-12798.20
0.9 Dead+1.0 Wind 330 deg - No Ice	47086.77	-19778.42	-34963.65	-3993789.14	2236286.80	-12803.28
1.2 Dead+1.0 Ice+1.0 Temp	89268.49	-0.01	0.00	4986.91	8530.07	0.57
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	89268.49	718.85	-11823.04	-1407688.47	-119324.43	-2966.32
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	89268.49	6372.56	-10220.56	-1216055.37	-780298.55	-1574.54
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	89268.49	10457.77	-6077.94	-731431.19	-1255039.88	-478.33
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	89268.49	11929.18	-421.02	-69783.44	-1424726.40	794.72
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	89268.49	10458.98	5521.98	640629.48	-1254843.99	2836.92
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	89268.49	5613.66	9938.79	1173508.70	-645501.12	4559.91
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	89268.49	-63.21	11588.39	1374700.00	19900.12	4462.41
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	89268.49	-5759.61	10252.07	1230004.53	688952.25	2910.63
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	89268.49	-10119.26	6155.90	753732.44	1212095.88	127.11
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	89268.49	-11553.22	26.68	10045.35	1374406.81	-2574.21
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	89268.49	-9883.31	-5673.28	-658659.26	1168796.56	-3984.65
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	89268.49	-5598.52	-9835.78	-1146512.82	658803.32	-4117.24
Dead+Wind 0 deg - Service	52318.63	67.70	-9146.18	-1056082.86	-10247.17	-2368.23
Dead+Wind 30 deg - Service	52318.63	4648.73	-8036.73	-934979.43	-540307.52	-1281.36
Dead+Wind 60 deg - Service	52318.63	8026.32	-4641.50	-539762.78	-932590.13	-86.62
Dead+Wind 90 deg - Service	52318.63	9265.04	-15.60	-1900.65	-1076604.80	1142.66
Dead+Wind 120 deg - Service	52318.63	7938.11	4510.01	518288.90	-916910.46	2280.19
Dead+Wind 150 deg - Service	52318.63	4557.05	7748.29	885933.40	-523928.40	2883.64
Dead+Wind 180 deg - Service	52318.63	15.91	8986.90	1029923.35	-842.71	2715.81
Dead+Wind 210 deg - Service	52318.63	-4568.27	7889.07	910861.16	529759.14	1672.79
Dead+Wind 240 deg - Service	52318.63	-7942.33	4590.62	532726.37	921422.57	88.07
Dead+Wind 270 deg - Service	52318.63	-9096.92	10.29	2973.73	1050612.93	-1526.88
Dead+Wind 300 deg - Service	52318.63	-7761.70	-4507.09	-515816.85	889429.13	-2629.45
Dead+Wind 330 deg - Service	52318.63	-4425.94	-7823.97	-897393.61	504417.55	-2891.14

## 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	-52318.63	0.00	0.00	52318.63	-0.00	0.000%
2	302.68	-62782.35	-40872.49	-302.68	62782.35	40872.49	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	
3	302.68	-47086.77	-40872.49	-302.68	47086.77	40872.49	0.000%
4	20774.42	-62782.35	-35914.79	-20774.42	62782.35	35914.79	0.000%
5	20774.42	-47086.77	-35914.79	-20774.42	47086.77	35914.79	0.000%
6	35868.25	-62782.35	-20742.07	-35868.25	62782.35	20742.07	0.000%
7	35868.25	-47086.77	-20742.07	-35868.25	47086.77	20742.07	0.000%
8	41403.86	-62782.35	-69.74	-41403.86	62782.35	69.74	0.000%
9	41403.86	-47086.77	-69.74	-41403.86	47086.77	69.74	0.000%
10	35473.92	-62782.35	20154.26	-35473.92	62782.35	-20154.26	0.000%
11	35473.92	-47086.77	20154.26	-35473.92	47086.77	-20154.26	0.000%
12	20364.55	-62782.35	34625.30	-20364.55	62782.35	-34625.30	0.000%
13	20364.55	-47086.77	34625.30	-20364.55	47086.77	-34625.30	0.000%
14	71.11	-62782.35	40160.42	-71.11	62782.35	-40160.42	0.000%
15	71.11	-47086.77	40160.42	-71.11	47086.77	-40160.42	0.000%
16	-20414.72	-62782.35	35254.65	20414.72	62782.35	-35254.65	0.000%
17	-20414.72	-47086.77	35254.65	20414.72	47086.77	-35254.65	0.000%
18	-35492.76	-62782.35	20514.63	35492.76	62782.35	-20514.63	0.000%
19	-35492.76	-47086.77	20514.63	35492.76	47086.77	-20514.63	0.000%
20	-40652.27	-62782.35	46.01	40652.27	62782.35	-46.01	0.000%
21	-40652.27	-47086.77	46.01	40652.27	47086.77	-46.01	0.000%
22	-34685.24	-62782.35	-20141.18	34685.24	62782.35	20141.18	0.000%
23	-34685.24	-47086.77	-20141.18	34685.24	47086.77	20141.18	0.000%
24	-19778.42	-62782.35	-34963.64	19778.42	62782.35	34963.64	0.000%
25	-19778.42	-47086.77	-34963.64	19778.42	47086.77	34963.64	0.000%
26	0.00	-89268.49	0.00	0.01	89268.49	-0.00	0.000%
27	718.85	-89268.49	-11822.97	-718.85	89268.49	11823.04	0.000%
28	6372.52	-89268.49	-10220.50	-6372.56	89268.49	10220.56	0.000%
29	10457.70	-89268.49	-6077.90	-10457.77	89268.49	6077.94	0.000%
30	11929.11	-89268.49	-421.01	-11929.18	89268.49	421.02	0.000%
31	10458.91	-89268.49	5521.94	-10458.98	89268.49	-5521.98	0.000%
32	5613.62	-89268.49	9938.73	-5613.66	89268.49	-9938.79	0.000%
33	-63.21	-89268.49	11588.32	63.21	89268.49	-11588.39	0.000%
34	-5759.57	-89268.49	10252.00	5759.61	89268.49	-10252.07	0.000%
35	-10119.20	-89268.49	6155.86	10119.26	89268.49	-6155.90	0.000%
36	-11553.14	-89268.49	26.68	11553.22	89268.49	-26.68	0.000%
37	-9883.25	-89268.49	-5673.25	9883.31	89268.49	5673.28	0.000%
38	-5598.49	-89268.49	-9835.72	5598.52	89268.49	9835.78	0.000%
39	67.70	-52318.63	-9146.17	-67.70	52318.63	9146.18	0.000%
40	4648.73	-52318.63	-8036.73	-4648.73	52318.63	8036.73	0.000%
41	8026.32	-52318.63	-4641.50	-8026.32	52318.63	4641.50	0.000%
42	9265.03	-52318.63	-15.60	-9265.04	52318.63	15.60	0.000%
43	7938.11	-52318.63	4510.01	-7938.11	52318.63	-4510.01	0.000%
44	4557.05	-52318.63	7748.29	-4557.05	52318.63	-7748.29	0.000%
45	15.91	-52318.63	8986.89	-15.91	52318.63	-8986.90	0.000%
46	-4568.27	-52318.63	7889.06	4568.27	52318.63	-7889.07	0.000%
47	-7942.32	-52318.63	4590.62	7942.33	52318.63	-4590.62	0.000%
48	-9096.91	-52318.63	10.29	9096.92	52318.63	-10.29	0.000%
49	-7761.70	-52318.63	-4507.08	7761.70	52318.63	4507.09	0.000%
50	-4425.94	-52318.63	-7823.97	4425.94	52318.63	7823.97	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00024834
3	Yes	5	0.00000001	0.00011757

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4	Yes	6	0.00000001	0.00005776
5	Yes	5	0.00000001	0.00050425
6	Yes	6	0.00000001	0.00006168
7	Yes	5	0.00000001	0.00053914
8	Yes	5	0.00000001	0.00012880
9	Yes	5	0.00000001	0.00006043
10	Yes	6	0.00000001	0.00006694
11	Yes	5	0.00000001	0.00058833
12	Yes	5	0.00000001	0.00096606
13	Yes	5	0.00000001	0.00043209
14	Yes	5	0.00000001	0.00031770
15	Yes	5	0.00000001	0.00015119
16	Yes	6	0.00000001	0.00006441
17	Yes	5	0.00000001	0.00056492
18	Yes	6	0.00000001	0.00005893
19	Yes	5	0.00000001	0.00051493
20	Yes	5	0.00000001	0.00019086
21	Yes	5	0.00000001	0.00009017
22	Yes	5	0.00000001	0.00094774
23	Yes	5	0.00000001	0.00042380
24	Yes	6	0.00000001	0.00006648
25	Yes	5	0.00000001	0.00058573
26	Yes	4	0.00000001	0.00005308
27	Yes	5	0.00000001	0.00033244
28	Yes	5	0.00000001	0.00046018
29	Yes	5	0.00000001	0.00046071
30	Yes	5	0.00000001	0.00032528
31	Yes	5	0.00000001	0.00044312
32	Yes	5	0.00000001	0.00039062
33	Yes	5	0.00000001	0.00034674
34	Yes	5	0.00000001	0.00046214
35	Yes	5	0.00000001	0.00045739
36	Yes	5	0.00000001	0.00032481
37	Yes	5	0.00000001	0.00039446
38	Yes	5	0.00000001	0.00042225
39	Yes	4	0.00000001	0.00030869
40	Yes	4	0.00000001	0.00031715
41	Yes	4	0.00000001	0.00035548
42	Yes	4	0.00000001	0.00016087
43	Yes	4	0.00000001	0.00052663
44	Yes	4	0.00000001	0.00036868
45	Yes	4	0.00000001	0.00035188
46	Yes	4	0.00000001	0.00046667
47	Yes	4	0.00000001	0.00033303
48	Yes	4	0.00000001	0.00021030
49	Yes	4	0.00000001	0.00034118
50	Yes	4	0.00000001	0.00056727

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 128.66	26.980	40	1.2572	0.0271
L2	133.34 - 85.09	16.303	40	1.1446	0.0116
L3	90.91 - 42.03	7.481	40	0.7916	0.0047
L4	48.97 - 0	2.140	40	0.3983	0.0017



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

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection in</i>	<i>Tilt °</i>	<i>Twist °</i>	<i>Radius of Curvature ft</i>
175.00	ERI---A-1 Lightning Spur	40	26.980	1.2572	0.0272	81684
173.00	PiROD 13' Low Profile Platform	40	26.450	1.2546	0.0264	81684
169.00	8' Dish	40	25.392	1.2492	0.0247	68070
162.20	6' Grid Dish	40	23.601	1.2388	0.0218	31907
157.50	4' Grid Dish	40	22.372	1.2300	0.0200	23338
155.67	PiROD 6' Side Mount Standoff (1)	40	21.897	1.2261	0.0192	21128
148.67	PiROD 13' Low Profile Platform	40	20.097	1.2081	0.0166	15511
138.00	PiROD 13' Platform w/handrails (Monopole)	40	17.431	1.1681	0.0130	11037
127.50	PiROD 13' Low Profile Platform	40	14.927	1.1092	0.0102	9032
117.00	PiROD 13' Platform w/handrails (Monopole)	40	12.570	1.0314	0.0081	7914
104.50	PiROD 13' Low Profile Platform	40	9.984	0.9217	0.0062	6897

### Maximum Tower Deflections - Design Wind

<i>Section No.</i>	<i>Elevation ft</i>	<i>Horz. Deflection in</i>	<i>Gov. Load Comb.</i>	<i>Tilt °</i>	<i>Twist °</i>
L1	175 - 128.66	121.650	4	5.6951	0.1229
L2	133.34 - 85.09	73.474	4	5.1706	0.0525
L3	90.91 - 42.03	33.714	4	3.5717	0.0212
L4	48.97 - 0	9.639	4	1.7951	0.0077

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

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection in</i>	<i>Tilt °</i>	<i>Twist °</i>	<i>Radius of Curvature ft</i>
175.00	ERI---A-1 Lightning Spur	4	121.650	5.6951	0.1232	18206
173.00	PiROD 13' Low Profile Platform	4	119.260	5.6823	0.1194	18206
169.00	8' Dish	4	114.484	5.6562	0.1118	15171
162.20	6' Grid Dish	4	106.399	5.6063	0.0990	7110
157.50	4' Grid Dish	4	100.855	5.5647	0.0904	5199
155.67	PiROD 6' Side Mount Standoff (1)	4	98.710	5.5464	0.0871	4707
148.67	PiROD 13' Low Profile Platform	4	90.590	5.4623	0.0751	3453
138.00	PiROD 13' Platform w/handrails (Monopole)	4	78.560	5.2781	0.0588	2455
127.50	PiROD 13' Low Profile Platform	4	67.270	5.0096	0.0460	2011
117.00	PiROD 13' Platform w/handrails (Monopole)	4	56.644	4.6567	0.0363	1766
104.50	PiROD 13' Low Profile Platform	4	44.989	4.1599	0.0279	1541

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### 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	175 - 128.66 (1)	TP33.375x23x0.25	46.34	0.00	0.0	25.4533	-12600.70	1489020.00	0.008
L2	128.66 - 85.09 (2)	TP42.5625x31.8272x0.3125	48.25	0.00	0.0	40.6223	-28439.40	2376410.00	0.012
L3	85.09 - 42.03 (3)	TP51.4688x40.6426x0.375	48.88	0.00	0.0	58.9849	-41905.10	3450610.00	0.012
L4	42.03 - 0 (4)	TP60x49.1817x0.4375	48.97	0.00	0.0	82.7100	-62752.30	4838530.00	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	175 - 128.66 (1)	TP33.375x23x0.25	346222.50	1143441.67	0.303	0.00	1143441.67	0.000
L2	128.66 - 85.09 (2)	TP42.5625x31.8272x0.3125	1484733.33	2312816.67	0.642	0.00	2312816.67	0.000
L3	85.09 - 42.03 (3)	TP51.4688x40.6426x0.375	2933100.00	4051591.67	0.724	0.00	4051591.67	0.000
L4	42.03 - 0 (4)	TP60x49.1817x0.4375	4861200.00	6754450.00	0.720	0.00	6754450.00	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V <sub>u</sub> lb	φV <sub>n</sub> lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T <sub>u</sub> lb-ft	φT <sub>n</sub> lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	175 - 128.66 (1)	TP33.375x23x0.25	20009.50	446705.00	0.045	5262.62	1254866.67	0.004
L2	128.66 - 85.09 (2)	TP42.5625x31.8272x0.3125	32088.00	712922.00	0.045	5550.54	2556991.67	0.002
L3	85.09 - 42.03 (3)	TP51.4688x40.6426x0.375	36872.30	1035180.00	0.036	5600.48	4492625.00	0.001
L4	42.03 - 0 (4)	TP60x49.1817x0.4375	41535.80	1451560.00	0.029	5668.68	7571608.00	0.001

### 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

<b>tnxTower</b>  <b>Fullerton Engineering</b> 1100 E. Woodfield Road, Suite 500 Schaumburg, IL 60173 Phone: (847) 908-8400 FAX:	<b>Job</b>	CTL01051	<b>Page</b>	24 of 24
	<b>Project</b>		<b>Date</b>	12:46:06 11/11/22
	<b>Client</b>	Smartlink / AT&T	<b>Designed by</b>	AS

Section No.	Elevation ft	Ratio $P_u$ $\phi P_n$	Ratio $M_{ux}$ $\phi M_{nx}$	Ratio $M_{uy}$ $\phi M_{ny}$	Ratio $V_u$ $\phi V_n$	Ratio $T_u$ $\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	175 - 128.66 (1)	0.008	0.303	0.000	0.045	0.004	0.314	1.000	4.8.2 ✓
L2	128.66 - 85.09 (2)	0.012	0.642	0.000	0.045	0.002	0.656	1.000	4.8.2 ✓
L3	85.09 - 42.03 (3)	0.012	0.724	0.000	0.036	0.001	0.737	1.000	4.8.2 ✓
L4	42.03 - 0 (4)	0.013	0.720	0.000	0.029	0.001	0.734	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	175 - 128.66	Pole	TP33.375x23x0.25	1	-12600.70	1489020.00	31.4	Pass
L2	128.66 - 85.09	Pole	TP42.5625x31.8272x0.3125	2	-28439.40	2376410.00	65.6	Pass
L3	85.09 - 42.03	Pole	TP51.4688x40.6426x0.375	3	-41905.10	3450610.00	73.7	Pass
L4	42.03 - 0	Pole	TP60x49.1817x0.4375	4	-62752.30	4838530.00	73.4	Pass
Summary								
Pole (L3)							73.7	Pass
<b>RATING =</b>							<b>73.7</b>	<b>Pass</b>

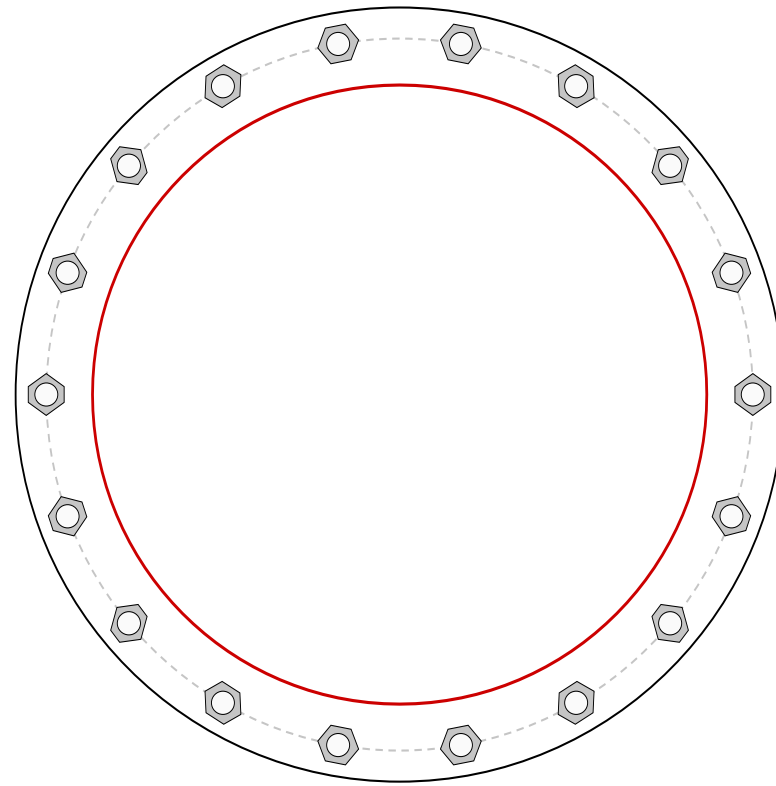
# Monopole Base Plate Connection

Site Info	
BU #	
Site Name	CT01051
Order #	

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

Applied Loads	
Moment (kip-ft)	4861.20
Axial Force (kips)	62.78
Shear Force (kips)	41.49

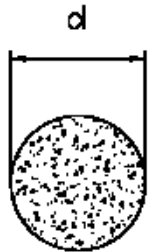
\*TIA-222-H Section 15.5 Applied



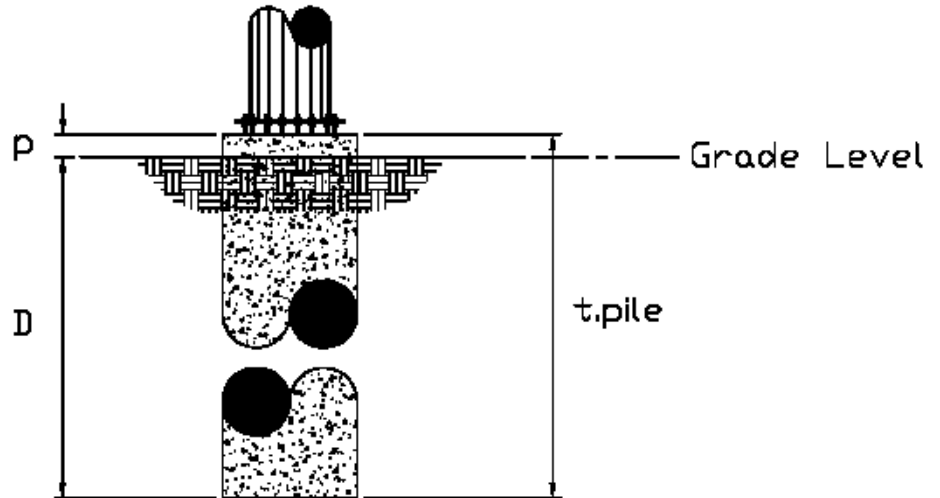
Connection Properties	Analysis Results	
<b>Anchor Rod Data</b>	<b>Anchor Rod Summary</b> <span style="float: right;"><i>(units of kips, kip-in)</i></span>	
(18) 2-1/4" $\phi$ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 69" BC	$P_{u\_c} = 191.28$	$\phi P_{n\_c} = 268.39$ <b>Stress Rating</b>
<b>Base Plate Data</b>	$V_u = 2.31$	$\phi V_n = 120.77$ <b>67.9%</b>
75" OD x 2" Plate (A572-60; $F_y=60$ ksi, $F_u=75$ ksi)	$M_u = n/a$	$\phi M_n = n/a$ <b>Pass</b>
<b>Stiffener Data</b>	<b>Base Plate Summary</b>	
N/A	Max Stress (ksi):	50.82 (Flexural)
<b>Pole Data</b>	Allowable Stress (ksi):	54
60" x 0.4375" 18-sided pole (A572-65; $F_y=65$ ksi, $F_u=80$ ksi)	Stress Rating:	<b>89.6%</b> <b>Pass</b>

Base plate check excludes stiffeners due to weld thickness. It is recommended for the weld thickness to be measured and confirmed to have at least 7/16" throat thickness.

**Monopole Foundation -  
 Drilled Caisson**



Plan



Elevation

***Drilled Caisson Properties***

$d := 8 \cdot \text{ft}$

*Pile diameter*

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

*Depth of the pile below grade*

$p := 12 \text{in}$

*Height of the pile above the grade*

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

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

*Overall length of pile*

$f_c := 4 \cdot \text{ksi}$

*Concrete compressive strength*

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

$E_c = 3604996.533 \cdot \text{psi}$

*Elastic modulus of concrete*

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

*Unit weight of concrete*

$c_{\text{cover}} := 6 \cdot \text{in}$

*Clear concrete cover*

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

*Rebar yield strength*

$N_{\text{bar}} := 27$

*Number of vertical rebar*

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

*Bar size*

$n_{\text{strup}} := 6$

*Stirrup bar size*

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

*Spacing of stirrups*

## Tower Reactions

### Case 1 (wind with no ice)

$$P1 := \frac{62782.35 \text{ lbf}}{1.35}$$

$$P1 = 46505 \text{ lbf}$$

*Design axial load*

$$V1 := \frac{41490.34426 \text{ lbf}}{1.35}$$

$$V1 = 30734 \text{ lbf}$$

*Design shear*

$$M1 := \frac{4861201.008 \text{ lbf} \cdot \text{ft}}{1.35}$$

$$M1 = 43210676 \cdot \text{lbf} \cdot \text{in}$$

*Design overturning moment*

### Case 2 (wind with ice)

$$P2 := \frac{89268.49 \text{ lbf}}{1.35}$$

$$P2 = 66125 \text{ lbf}$$

*Design axial load*

$$V2 := \frac{12095.71445 \text{ lbf}}{1.35}$$

$$V2 = 8960 \text{ lbf}$$

*Design shear*

$$M2 := \frac{1452624.069 \text{ lbf} \cdot \text{ft}}{1.35}$$

$$M2 = 12912214 \cdot \text{lbf} \cdot \text{in}$$

*Design overturning moment*

### Case 3 (service wind)

$$P3 := 52318.63 \text{ lbf}$$

$$P3 = 52319 \text{ lbf}$$

*Design axial load*

$$V3 := 9284.380416 \text{ lbf}$$

$$V3 = 9284 \text{ lbf}$$

*Design shear*

$$M3 := 1079869.784 \text{ lbf} \cdot \text{ft}$$

$$M3 = 12958437 \cdot \text{lbf} \cdot \text{in}$$

*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

$$M_u := 1.35 \cdot 46050072 \cdot \text{lbf} \cdot \text{in}$$

$$M_u = 5180.633 \cdot \text{kip} \cdot \text{ft}$$

*Maximum moment in the pile*

$$V_u := 1.35 \cdot 323775 \cdot \text{lbf}$$

$$V_u = 437.096 \cdot \text{kips}$$

*Maximum shear in the pile*

$$\Delta_{\text{service}} := 0.22409313 \text{ in}$$

*Service Load deflection at pile head*

$$M_n := 106191.620 \text{ kips} \cdot \text{in}$$

*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:

Project Engineer  
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: P:\Dept 4000\SMLINK\SMLINK-ATT-NEWEN 8\CTL01051\Structural\Structural  
Analysis\R2\Analysis\Foundation\  
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: November 11, 2022 Time: 13:34:33

-----  
Problem Title

-----  
Site ID: CTL01051  
Site Name: WILLIMANTIC ECSU  
Client: SMARTLINK / AT&T  
Prepared by: KLP/AS  
Checked By: BK

-----  
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	96.0000000
2	28.00000	96.0000000

Input Structural Properties:  
-----

Pile Section No. 1:

Section Type = Drilled Shaft (Bored Pile)  
Section Length = 28.00000 ft  
Section Diameter = 96.00000 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 3 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 = 6.00000 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 = 1.00000 deg.  
Friction angle at bottom of layer = 1.00000 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 = 6.00000 ft  
Distance from top of pile to bottom of layer = 15.00000 ft  
Effective unit weight at top of layer = 110.00000 pcf  
Effective unit weight at bottom of layer = 110.00000 pcf  
Friction angle at top of layer = 38.00000 deg.  
Friction angle at bottom of layer = 38.00000 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 = 15.00000 ft  
 Distance from top of pile to bottom of layer = 28.00000 ft  
 Effective unit weight at top of layer = 53.00000 pcf  
 Effective unit weight at bottom of layer = 53.00000 pcf  
 Friction angle at top of layer = 38.00000 deg.  
 Friction angle at bottom of layer = 38.00000 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	1.000	default
		6.000	100.000	1.000	default
2	Sand (Reese, et al.)	6.000	110.000	38.000	default
		15.000	110.000	38.000	default
3	Sand (Reese, et al.)	15.000	53.000	38.000	default
		28.000	53.000	38.000	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 = 30734. lbs	M = 43210676. in-lbs	46505.	No
2	1	V = 8960.00000 lbs	M = 12912214. in-lbs	66125.	No
3	1	V = 9284.00000 lbs	M = 12958437. in-lbs	52319.	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 = 96.00000 in  
 Concrete Cover Thickness = 3.00000 in  
 Number of Reinforcing Bars = 27 bars

Yield Stress of Reinforcing Bars = 60.00000 ksi  
 Modulus of Elasticity of Reinforcing Bars = 29000. ksi  
 Gross Area of Shaft = 7238.22947 sq. in.  
 Total Area of Reinforcing Steel = 42.12000 sq. in.  
 Area Ratio of Steel Reinforcement = 0.58 percent  
 Edge-to-Edge Bar Spacing = 8.87467 in  
 Maximum Concrete Aggregate Size = 0.75000 in  
 Ratio of Bar Spacing to Aggregate Size = 11.83  
 Offset of Center of Rebar Cage from Center of Pile = 0.0000 in

Axial Structural Capacities:

-----

Nom. Axial Structural Capacity =  $0.85 F_c A_c + F_y A_s$  = 26993.973 kips  
 Tensile Load for Cracking of Concrete = -3133.853 kips  
 Nominal Axial Tensile Capacity = -2527.200 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	44.29500	0.00000
2	1.41000	1.56000	43.10102	10.21513
3	1.41000	1.56000	39.58346	19.87956
4	1.41000	1.56000	33.93194	28.47228
5	1.41000	1.56000	26.45114	35.53005
6	1.41000	1.56000	17.54435	40.67238
7	1.41000	1.56000	7.69175	43.62206
8	1.41000	1.56000	-2.57553	44.22006
9	1.41000	1.56000	-12.70395	42.43415
10	1.41000	1.56000	-22.14750	38.36060
11	1.41000	1.56000	-30.39707	32.21902
12	1.41000	1.56000	-37.00793	24.34050
13	1.41000	1.56000	-41.62368	15.14978
14	1.41000	1.56000	-43.99549	5.14234
15	1.41000	1.56000	-43.99549	-5.14234
16	1.41000	1.56000	-41.62368	-15.14978
17	1.41000	1.56000	-37.00793	-24.34050
18	1.41000	1.56000	-30.39707	-32.21902
19	1.41000	1.56000	-22.14750	-38.36060

20	1.41000	1.56000	-12.70395	-42.43415
21	1.41000	1.56000	-2.57553	-44.22006
22	1.41000	1.56000	7.69175	-43.62206
23	1.41000	1.56000	17.54435	-40.67238
24	1.41000	1.56000	26.45114	-35.53005
25	1.41000	1.56000	33.93194	-28.47228
26	1.41000	1.56000	39.58346	-19.87956
27	1.41000	1.56000	43.10102	-10.21513

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

Minimum spacing between any two bars not equal to zero = 8.87467 inches between Bars 18 and 19

Spacing to aggregate size ratio = 11.83290

Concrete Properties:

-----

Compressive Strength of Concrete = 4.00000 ksi  
 Modulus of Elasticity of Concrete = 3604.99653 ksi  
 Modulus of Rupture of Concrete = -0.47434 ksi  
 Compression Strain at Peak Stress = 0.00189  
 Tensile Strain at Fracture of Concrete = -0.0001154  
 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	46.505
2	52.319
3	66.125

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 = 46.505 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
0.000000313	5831.0079172	18659225335.	52.7036777	0.0000165	-0.0000135	0.0689161	0.4732771	
0.000000625	11633.	18612579524.	50.3594798	0.0000315	-0.0000285	0.1311246	0.9040656	
0.000000938	17405.	18565559865.	49.5781219	0.0000465	-0.0000435	0.1928371	1.3348552	
0.000001250	23148.	18518446409.	49.1874700	0.0000615	-0.0000585	0.2540536	1.7656458	
0.000001563	28861.	18471295380.	48.9530995	0.0000765	-0.0000735	0.3147741	2.1964373	
0.000001875	34545.	18424125561.	48.7968698	0.0000915	-0.0000885	0.3749985	2.6272298	
0.000002188	40200.	18376945006.	48.6852922	0.0001065	-0.0001035	0.4347269	3.0580232	
0.000002500	40200.	16079826880.	22.5623252	0.0000564	-0.0001836	0.2307111	-5.2894314	C
0.000002813	40200.	14293179449.	22.2493700	0.0000626	-0.0002074	0.2554572	-5.9761358	C
0.000003125	40200.	12863861504.	21.9999749	0.0000687	-0.0002313	0.2801342	-6.6627523	C
0.000003438	40200.	11694419549.	21.7968950	0.0000749	-0.0002551	0.3047431	-7.3492720	C
0.000003750	40200.	10719884587.	21.6285540	0.0000811	-0.0002789	0.3292841	-8.0356947	C
0.000004063	40200.	9895278080.	21.4808668	0.0000873	-0.0003027	0.3536569	-8.7227354	C
0.000004375	40200.	9188472503.	21.3537598	0.0000934	-0.0003266	0.3779395	-9.4098417	C
0.000004688	40200.	8575907670.	21.2443442	0.0000996	-0.0003504	0.4021549	-10.0968470	C
0.000005000	40200.	8039913440.	21.1493048	0.0001057	-0.0003743	0.4263032	-10.7837508	C
0.000005313	40200.	7566977356.	21.0661068	0.0001119	-0.0003981	0.4503841	-11.4705529	C
0.000005625	40200.	7146589725.	20.9927782	0.0001181	-0.0004219	0.4743976	-12.1572530	C
0.000005938	40200.	6770453423.	20.9277626	0.0001243	-0.0004457	0.4983437	-12.8438509	C
0.000006250	40200.	6431930752.	20.8698146	0.0001304	-0.0004696	0.5222221	-13.5303461	C
0.000006563	40200.	6125648335.	20.8179263	0.0001366	-0.0004934	0.5460328	-14.2167384	C
0.000006875	40200.	5847209775.	20.7712727	0.0001428	-0.0005172	0.5697757	-14.9030275	C
0.000007188	40200.	5592983263.	20.7291727	0.0001490	-0.0005410	0.5934507	-15.5892131	C

0.000007500	40200.	5359942293.	20.6910583	0.0001552	-0.0005648	0.6170577	-16.2752948	C
0.000007813	40200.	5145544602.	20.6564528	0.0001614	-0.0005886	0.6405965	-16.9612724	C
0.000008125	40200.	4947639040.	20.6241023	0.0001676	-0.0006124	0.6640404	-17.6473459	C
0.000008438	40200.	4764393150.	20.5937371	0.0001738	-0.0006362	0.6873888	-18.3335199	C
0.000008750	40200.	4594236252.	20.5659747	0.0001800	-0.0006600	0.7106698	-19.0195839	C
0.000009063	40200.	4435814312.	20.5405473	0.0001861	-0.0006839	0.7338833	-19.7055374	C
0.000009375	40200.	4287953835.	20.5172227	0.0001923	-0.0007077	0.7570292	-20.3913800	C
0.000009688	40200.	4149632743.	20.4957987	0.0001986	-0.0007314	0.7801073	-21.0771118	C
0.0000100	40200.	4019956720.	20.4760982	0.0002048	-0.0007552	0.8031176	-21.7627317	C
0.0000103	40200.	3898139850.	20.4579659	0.0002110	-0.0007790	0.8260600	-22.4482398	C
0.0000106	40200.	3783488678.	20.4412645	0.0002172	-0.0008028	0.8489344	-23.1336355	C
0.0000109	40200.	3675389001.	20.4258726	0.0002234	-0.0008266	0.8717406	-23.8189187	C
0.0000113	40200.	3573294862.	20.4116821	0.0002296	-0.0008504	0.8944785	-24.5040889	C
0.0000116	40200.	3476719326.	20.3985967	0.0002359	-0.0008741	0.9171481	-25.1891457	C
0.0000119	40200.	3385226712.	20.3865303	0.0002421	-0.0008979	0.9397491	-25.8740887	C
0.0000122	40200.	3298426027.	20.3754055	0.0002483	-0.0009217	0.9622816	-26.5589177	C
0.0000128	40200.	3137527196.	20.3557093	0.0002608	-0.0009692	1.0071402	-27.9282317	C
0.0000134	40200.	2991595699.	20.3390282	0.0002733	-0.0010167	1.0517229	-29.2970852	C
0.0000141	40200.	2858635890.	20.3249677	0.0002858	-0.0010642	1.0960290	-30.6654743	C
0.0000147	40200.	2736991809.	20.3132006	0.0002984	-0.0011116	1.1400574	-32.0333963	C
0.0000153	40542.	2647671363.	20.3034531	0.0003109	-0.0011591	1.1838071	-33.4008479	C
0.0000159	42128.	2643340896.	20.2954946	0.0003235	-0.0012065	1.2272774	-34.7678262	C
0.0000166	43713.	2639263187.	20.2891291	0.0003360	-0.0012540	1.2704670	-36.1343277	C
0.0000172	45296.	2635410242.	20.2841894	0.0003486	-0.0013014	1.3133752	-37.5003493	C
0.0000178	46878.	2631757994.	20.2805320	0.0003612	-0.0013488	1.3560009	-38.8658877	C
0.0000184	48459.	2628285632.	20.2780325	0.0003739	-0.0013961	1.3983432	-40.2309395	C
0.0000191	50039.	2624975072.	20.2765833	0.0003865	-0.0014435	1.4404010	-41.5955012	C
0.0000197	51617.	2621810520.	20.2760903	0.0003992	-0.0014908	1.4821733	-42.9595696	C
0.0000203	53194.	2618778123.	20.2764712	0.0004119	-0.0015381	1.5236591	-44.3231411	C
0.0000209	54770.	2615865676.	20.2776535	0.0004246	-0.0015854	1.5648574	-45.6862122	C
0.0000216	56344.	2613062388.	20.2795731	0.0004373	-0.0016327	1.6057671	-47.0487794	C
0.0000222	57917.	2610358676.	20.2821735	0.0004500	-0.0016800	1.6463872	-48.4108390	C
0.0000228	59489.	2607746005.	20.2854041	0.0004628	-0.0017272	1.6867167	-49.7723873	C
0.0000234	61060.	2605216747.	20.2892200	0.0004755	-0.0017745	1.7267544	-51.1334208	C
0.0000241	62629.	2602764060.	20.2935810	0.0004883	-0.0018217	1.7664993	-52.4939355	C
0.0000247	64197.	2600381793.	20.2984509	0.0005011	-0.0018689	1.8059502	-53.8539278	C
0.0000253	65764.	2598064397.	20.3037974	0.0005139	-0.0019161	1.8451061	-55.2133938	C
0.0000259	67329.	2595806855.	20.3095911	0.0005268	-0.0019632	1.8839659	-56.5723295	C
0.0000266	68893.	2593604618.	20.3158056	0.0005396	-0.0020104	1.9225284	-57.9307311	C
0.0000272	70455.	2591453550.	20.3224170	0.0005525	-0.0020575	1.9607924	-59.2885945	C
0.0000278	72016.	2589349885.	20.3294036	0.0005654	-0.0021046	1.9987569	-60.0000000	CY
0.0000284	73576.	2587290182.	20.3367456	0.0005783	-0.0021517	2.0364207	-60.0000000	CY



0.0000291	75052.	2582417700.	20.3368554	0.0005910	-0.0021990	2.0731350	-60.0000000	CY
0.0000297	76282.	2569495608.	20.3154650	0.0006031	-0.0022469	2.1076417	-60.0000000	CY
0.0000303	77388.	2552994876.	20.2842325	0.0006149	-0.0022951	2.1408969	-60.0000000	CY
0.0000309	78382.	2533560354.	20.2446724	0.0006263	-0.0023437	2.1730069	-60.0000000	CY
0.0000316	79303.	2512556275.	20.2003978	0.0006376	-0.0023924	2.2042740	-60.0000000	CY
0.0000322	80150.	2490101606.	20.1516402	0.0006486	-0.0024414	2.2347087	-60.0000000	CY
0.0000328	80955.	2467192672.	20.1011885	0.0006596	-0.0024904	2.2645578	-60.0000000	CY
0.0000334	81683.	2442855325.	20.0460051	0.0006703	-0.0025397	2.2935394	-60.0000000	CY
0.0000341	82400.	2419069813.	19.9921476	0.0006810	-0.0025890	2.3222116	-60.0000000	CY
0.0000347	83059.	2394497505.	19.9352884	0.0006915	-0.0026385	2.3501739	-60.0000000	CY
0.0000353	83669.	2369388019.	19.8762126	0.0007019	-0.0026881	2.3774978	-60.0000000	CY
0.0000359	84276.	2345068608.	19.8192380	0.0007123	-0.0027377	2.4045981	-60.0000000	CY
0.0000366	84862.	2321018322.	19.7626124	0.0007226	-0.0027874	2.4313148	-60.0000000	CY
0.0000372	85370.	2295662125.	19.7008675	0.0007326	-0.0028374	2.4571182	-60.0000000	CY
0.0000397	87295.	2199560413.	19.4522699	0.0007720	-0.0030380	2.5560622	-60.0000000	CY
0.0000422	88915.	2107623791.	19.2069273	0.0008103	-0.0032397	2.6490037	-60.0000000	CY
0.0000447	90267.	2019950882.	18.9663175	0.0008476	-0.0034424	2.7364349	-60.0000000	CY
0.0000472	91508.	1939245972.	18.7436146	0.0008845	-0.0036455	2.8201169	-60.0000000	CY
0.0000497	92526.	1862165030.	18.5105048	0.0009197	-0.0038503	2.8973041	-60.0000000	CY
0.0000522	93504.	1791701352.	18.2964489	0.0009548	-0.0040552	2.9715123	-60.0000000	CY
0.0000547	94293.	1724216299.	18.0842385	0.0009890	-0.0042610	3.0411240	-60.0000000	CY
0.0000572	95076.	1662525024.	17.8921720	0.0010232	-0.0044668	3.1084787	-60.0000000	CY
0.0000597	95771.	1604547867.	17.7048323	0.0010568	-0.0046732	3.1720727	-60.0000000	CY
0.0000622	96355.	1549432583.	17.5122701	0.0010890	-0.0048810	3.2309699	-60.0000000	CY
0.0000647	96936.	1498520504.	17.3359983	0.0011214	-0.0050886	3.2878569	-60.0000000	CY
0.0000672	97485.	1450944314.	17.1709352	0.0011537	-0.0052963	3.3423377	-60.0000000	CY
0.0000697	97944.	1405470086.	17.0084782	0.0011853	-0.0055047	3.3935883	-60.0000000	CY
0.0000722	98376.	1362786108.	16.8558179	0.0012168	-0.0057132	3.4425938	-60.0000000	CY
0.0000747	98798.	1322813224.	16.7063583	0.0012478	-0.0059222	3.4887402	-60.0000000	CY
0.0000772	99205.	1285241378.	16.5617854	0.0012784	-0.0061316	3.5323565	-60.0000000	CY
0.0000797	99565.	1249447578.	16.4215115	0.0013086	-0.0063414	3.5735020	-60.0000000	CY
0.0000822	99870.	1215145493.	16.2836584	0.0013383	-0.0065517	3.6120898	-60.0000000	CY
0.0000847	100171.	1182827077.	16.1547574	0.0013681	-0.0067619	3.6489348	-60.0000000	CY
0.0000872	100470.	1152341221.	16.0342711	0.0013980	-0.0069720	3.6840478	-60.0000000	CY
0.0000897	100767.	1123534362.	15.9215061	0.0014280	-0.0071820	3.7174127	-60.0000000	CY
0.0000922	101058.	1096220218.	15.8129652	0.0014578	-0.0073922	3.7487308	-60.0000000	CY
0.0000947	101306.	1069893426.	15.6978737	0.0014864	-0.0076036	3.7770472	-60.0000000	CY
0.0000972	101521.	1044589530.	15.5850036	0.0015147	-0.0078153	3.8033333	-60.0000000	CY
0.0000997	101722.	1020409580.	15.4766662	0.0015428	-0.0080272	3.8278722	-60.0000000	CY
0.0001022	101922.	997398890.	15.3744520	0.0015711	-0.0082389	3.8508453	-60.0000000	CY
0.0001047	102120.	975473482.	15.2779307	0.0015994	-0.0084506	3.8722380	-60.0000000	CY
0.0001072	102317.	954557208.	15.1867126	0.0016278	-0.0086622	3.8920354	-60.0000000	CY

0.0001097	102512.	934580860.	15.1004435	0.0016563	-0.0088737	3.9102223	-60.0000000	CY
0.0001122	102706.	915481393.	15.0188011	0.0016849	-0.0090851	3.9267833	-60.0000000	CY
0.0001147	102887.	897107032.	14.9397653	0.0017134	-0.0092966	3.9416012	-60.0000000	CY
0.0001172	103038.	879260340.	14.8583189	0.0017412	-0.0095088	3.9544394	-60.0000000	CY
0.0001197	103177.	862052540.	14.7730247	0.0017681	-0.0097219	3.9653443	-60.0000000	CY
0.0001222	103302.	845436402.	14.6896909	0.0017949	-0.0099351	3.9746968	-60.0000000	CY
0.0001247	103425.	829477470.	14.6103589	0.0018217	-0.0101483	3.9826046	-60.0000000	CY
0.0001272	103548.	814136850.	14.5348000	0.0018486	-0.0103614	3.9890535	-60.0000000	CY
0.0001297	103669.	799378644.	14.4628036	0.0018756	-0.0105744	3.9940293	-60.0000000	CY
0.0001322	103790.	785169667.	14.3941749	0.0019027	-0.0107873	3.9975176	-60.0000000	CY
0.0001347	103909.	771479196.	14.3287341	0.0019299	-0.0110001	3.9995033	-60.0000000	CY
0.0001372	104026.	758277294.	14.2663801	0.0019572	-0.0112128	3.9984173	-60.0000000	CY
0.0001522	104632.	687520651.	13.9354938	0.0021208	-0.0124892	3.9951758	-60.0000000	CY
0.0001672	105032.	628227435.	13.6187056	0.0022769	-0.0137731	3.9998726	60.0000000	CY
0.0001822	105396.	578504377.	13.3664414	0.0024352	-0.0150548	3.9955064	60.0000000	CY
0.0001972	105719.	536135783.	13.1596909	0.0025949	-0.0163351	3.9855448	60.0000000	CY
0.0002122	105945.	499297764.	12.9732911	0.0027528	-0.0176172	3.9971725	60.0000000	CY
0.0002272	106105.	467038731.	12.7933917	0.0029065	-0.0189035	3.9878422	60.0000000	CY
0.0002422	106249.	438704581.	12.6428628	0.0030619	-0.0201881	3.9880551	60.0000000	CYT
0.0002572	106373.	413599546.	12.5219762	0.0032205	-0.0214695	3.9993672	60.0000000	CYT
0.0002722	106466.	391148640.	12.4312302	0.0033836	-0.0227464	3.9811244	60.0000000	CYT
0.0002872	106542.	370984107.	12.3507034	0.0035470	-0.0240230	3.9806030	60.0000000	CYT
0.0003022	106575.	352679890.	12.2765413	0.0037098	-0.0253002	3.9956640	60.0000000	CYT
0.0003172	106596.	336065531.	12.2182308	0.0038755	-0.0265745	3.9968807	60.0000000	CYT

Axial Thrust Force = 52.319 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
0.000000313	5830.9141027	18658925129.	53.2917494	0.0000167	-0.0000133	0.0696887	0.4786065	
0.000000625	11633.	18612427819.	50.6544661	0.0000317	-0.0000283	0.1318935	0.9094122	
0.000000938	17405.	18565457995.	49.7754208	0.0000467	-0.0000433	0.1936024	1.3402193	
0.000001250	23148.	18518369480.	49.3359289	0.0000617	-0.0000583	0.2548152	1.7710274	
0.000001563	28861.	18471233428.	49.0722573	0.0000767	-0.0000733	0.3155319	2.2018366	
0.000001875	34545.	18424073591.	48.8964957	0.0000917	-0.0000883	0.3757527	2.6326469	
0.000002188	40199.	18376900162.	48.7709686	0.0001067	-0.0001033	0.4354773	3.0634583	
0.000002500	40199.	16079787642.	22.9060387	0.0000573	-0.0001827	0.2342480	-5.2645122	C
0.000002813	40199.	14293144571.	22.5703782	0.0000635	-0.0002065	0.2591611	-5.9499535	C

0.000003125	40199.	12863830113.	22.2896271	0.0000697	-0.0002303	0.2838353	-6.6365025	C
0.000003438	40199.	11694391012.	22.0604554	0.0000758	-0.0002542	0.3084354	-7.3229983	C
0.000003750	40199.	10719858428.	21.8703720	0.0000820	-0.0002780	0.3329674	-8.0093970	C
0.000004063	40199.	9895253933.	21.7103587	0.0000882	-0.0003018	0.3574312	-8.6956984	C
0.000004375	40199.	9188450081.	21.5725749	0.0000944	-0.0003256	0.3818020	-9.3820796	C
0.000004688	40199.	8575886742.	21.4487705	0.0001005	-0.0003495	0.4060083	-10.0690577	C
0.000005000	40199.	8039893821.	21.3411418	0.0001067	-0.0003733	0.4301473	-10.7559344	C
0.000005313	40199.	7566958890.	21.2468360	0.0001129	-0.0003971	0.4542190	-11.4427093	C
0.000005625	40199.	7146572285.	21.1636345	0.0001190	-0.0004210	0.4782233	-12.1293821	C
0.000005938	40199.	6770436902.	21.0897857	0.0001252	-0.0004448	0.5021601	-12.8159525	C
0.000006250	40199.	6431915057.	21.0238885	0.0001314	-0.0004686	0.5260292	-13.5024202	C
0.000006563	40199.	6125633387.	20.9648084	0.0001376	-0.0004924	0.5498306	-14.1887849	C
0.000006875	40199.	5847195506.	20.9116174	0.0001438	-0.0005162	0.5735642	-14.8750463	C
0.000007188	40199.	5592969615.	20.8635489	0.0001500	-0.0005400	0.5972299	-15.5612040	C
0.000007500	40199.	5359929214.	20.8199639	0.0001561	-0.0005639	0.6208275	-16.2472578	C
0.000007813	40199.	5145532045.	20.7803258	0.0001623	-0.0005877	0.6443569	-16.9332074	C
0.000008125	40199.	4947626967.	20.7441805	0.0001685	-0.0006115	0.6678181	-17.6190524	C
0.000008438	40199.	4764381524.	20.7111413	0.0001748	-0.0006352	0.6912110	-18.3047926	C
0.000008750	40199.	4594225041.	20.6808765	0.0001810	-0.0006590	0.7145354	-18.9904276	C
0.000009063	40199.	4435803487.	20.6531004	0.0001872	-0.0006828	0.7377912	-19.6759570	C
0.000009375	40199.	4287943371.	20.6268593	0.0001934	-0.0007066	0.7609531	-20.3615726	C
0.000009688	40199.	4149622617.	20.6020126	0.0001996	-0.0007304	0.7840215	-21.0472721	C
0.0000100	40199.	4019946910.	20.5791037	0.0002058	-0.0007542	0.8070220	-21.7328599	C
0.0000103	40199.	3898130337.	20.5579579	0.0002120	-0.0007780	0.8299546	-22.4183357	C
0.0000106	40199.	3783479445.	20.5384206	0.0002182	-0.0008018	0.8528190	-23.1036994	C
0.0000109	40199.	3675380032.	20.5203552	0.0002244	-0.0008256	0.8756153	-23.7889500	C
0.0000113	40199.	3573286143.	20.5036402	0.0002307	-0.0008493	0.8983434	-24.4740876	C
0.0000116	40199.	3476710841.	20.4881671	0.0002369	-0.0008731	0.9210030	-25.1591116	C
0.0000119	40199.	3385218451.	20.4738390	0.0002431	-0.0008969	0.9435941	-25.8440219	C
0.0000122	40199.	3298417978.	20.4605688	0.0002494	-0.0009206	0.9661165	-26.5288178	C
0.0000128	40199.	3137519540.	20.4368969	0.0002618	-0.0009682	1.0109551	-27.8980655	C
0.0000134	40199.	2991588398.	20.4166111	0.0002743	-0.0010157	1.0555177	-29.2668518	C
0.0000141	40199.	2858628914.	20.3992677	0.0002869	-0.0010631	1.0998035	-30.6351740	C
0.0000147	40199.	2736985131.	20.3844982	0.0002994	-0.0011106	1.1438115	-32.0030280	C
0.0000153	40705.	2658268735.	20.3719947	0.0003119	-0.0011581	1.1875409	-33.3704113	C
0.0000159	42290.	2653513123.	20.3614973	0.0003245	-0.0012055	1.2309905	-34.7373206	C
0.0000166	43875.	2649042291.	20.3527858	0.0003371	-0.0012529	1.2741596	-36.1037527	C
0.0000172	45458.	2644824754.	20.3456718	0.0003497	-0.0013003	1.3170470	-37.4697043	C
0.0000178	47040.	2640833437.	20.3399937	0.0003623	-0.0013477	1.3596518	-38.8351720	C
0.0000184	48621.	2637044937.	20.3356116	0.0003749	-0.0013951	1.4019731	-40.2001527	C
0.0000191	50200.	2633438910.	20.3324042	0.0003876	-0.0014424	1.4440098	-41.5646428	C
0.0000197	51778.	2629997595.	20.3302657	0.0004003	-0.0014897	1.4857609	-42.9286389	C

0.0000203	53355.	2626705410.	20.3291032	0.0004129	-0.0015371	1.5272254	-44.2921376	C
0.0000209	54931.	2623548632.	20.3288353	0.0004256	-0.0015844	1.5684023	-45.6551352	C
0.0000216	56505.	2620515123.	20.3293898	0.0004384	-0.0016316	1.6092905	-47.0176284	C
0.0000222	58078.	2617594107.	20.3307028	0.0004511	-0.0016789	1.6498889	-48.3796133	C
0.0000228	59650.	2614775988.	20.3327176	0.0004638	-0.0017262	1.6901966	-49.7410865	C
0.0000234	61220.	2612052187.	20.3353834	0.0004766	-0.0017734	1.7302124	-51.1020440	C
0.0000241	62789.	2609415014.	20.3386549	0.0004894	-0.0018206	1.7699352	-52.4624823	C
0.0000247	64357.	2606857551.	20.3424915	0.0005022	-0.0018678	1.8093640	-53.8223975	C
0.0000253	65923.	2604373562.	20.3468564	0.0005150	-0.0019150	1.8484977	-55.1817857	C
0.0000259	67488.	2601957407.	20.3517168	0.0005279	-0.0019621	1.8873350	-56.5406431	C
0.0000266	69052.	2599603973.	20.3570428	0.0005407	-0.0020093	1.9258750	-57.8989656	C
0.0000272	70614.	2597308612.	20.3628073	0.0005536	-0.0020564	1.9641164	-59.2567492	C
0.0000278	72175.	2595067091.	20.3689859	0.0005665	-0.0021035	2.0020581	-60.0000000	CY
0.0000284	73735.	2592875546.	20.3755563	0.0005794	-0.0021506	2.0396989	-60.0000000	CY
0.0000291	75217.	2588108696.	20.3755432	0.0005922	-0.0021978	2.0764433	-60.0000000	CY
0.0000297	76450.	2575162295.	20.3536951	0.0006043	-0.0022457	2.1109511	-60.0000000	CY
0.0000303	77560.	2558676113.	20.3221309	0.0006160	-0.0022940	2.1442170	-60.0000000	CY
0.0000309	78555.	2539145788.	20.2819425	0.0006275	-0.0023425	2.1763104	-60.0000000	CY
0.0000316	79479.	2518141097.	20.2373295	0.0006387	-0.0023913	2.2075849	-60.0000000	CY
0.0000322	80326.	2495574589.	20.1879189	0.0006498	-0.0024402	2.2379972	-60.0000000	CY
0.0000328	81133.	2472612762.	20.1370031	0.0006607	-0.0024893	2.2678391	-60.0000000	CY
0.0000334	81862.	2448222611.	20.0813662	0.0006715	-0.0025385	2.2968132	-60.0000000	CY
0.0000341	82579.	2424350146.	20.0269620	0.0006822	-0.0025878	2.3254673	-60.0000000	CY
0.0000347	83242.	2399757705.	19.9697800	0.0006927	-0.0026373	2.3534311	-60.0000000	CY
0.0000353	83852.	2374558882.	19.9101644	0.0007031	-0.0026869	2.3807347	-60.0000000	CY
0.0000359	84458.	2350146996.	19.8526486	0.0007135	-0.0027365	2.4078125	-60.0000000	CY
0.0000366	85045.	2326026826.	19.7955657	0.0007238	-0.0027862	2.4345132	-60.0000000	CY
0.0000372	85556.	2300653019.	19.7335489	0.0007338	-0.0028362	2.4603177	-60.0000000	CY
0.0000397	87484.	2204333183.	19.4854717	0.0007733	-0.0030367	2.5594179	-60.0000000	CY
0.0000422	89106.	2112141924.	19.2384704	0.0008116	-0.0032384	2.6522816	-60.0000000	CY
0.0000447	90459.	2024262967.	18.9964681	0.0008489	-0.0034411	2.7396445	-60.0000000	CY
0.0000472	91704.	1943386804.	18.7726015	0.0008858	-0.0036442	2.8232654	-60.0000000	CY
0.0000497	92723.	1866131744.	18.5403165	0.0009212	-0.0038488	2.9006001	-60.0000000	CY
0.0000522	93704.	1795528987.	18.3252816	0.0009564	-0.0040536	2.9747458	-60.0000000	CY
0.0000547	94493.	1727865867.	18.1118692	0.0009905	-0.0042595	3.0442592	-60.0000000	CY
0.0000572	95275.	1666011894.	17.9187077	0.0010247	-0.0044653	3.1115145	-60.0000000	CY
0.0000597	95975.	1607957357.	17.7328347	0.0010584	-0.0046716	3.1752946	-60.0000000	CY
0.0000622	96559.	1552711074.	17.5393198	0.0010907	-0.0048793	3.2340949	-60.0000000	CY
0.0000647	97139.	1501668722.	17.3621024	0.0011231	-0.0050869	3.2908755	-60.0000000	CY
0.0000672	97690.	1453992307.	17.1963304	0.0011554	-0.0052946	3.3452687	-60.0000000	CY
0.0000697	98150.	1408424948.	17.0332117	0.0011870	-0.0055030	3.3964313	-60.0000000	CY
0.0000722	98582.	1365635569.	16.8797765	0.0012185	-0.0057115	3.4453286	-60.0000000	CY

0.0000747	99005.	1325595707.	16.7318518	0.0012497	-0.0059203	3.4916231	-60.0000000	CY
0.0000772	99413.	1287938186.	16.5866218	0.0012803	-0.0061297	3.5351324	-60.0000000	CY
0.0000797	99775.	1252083098.	16.4459371	0.0013105	-0.0063395	3.5761933	-60.0000000	CY
0.0000822	100080.	1217699180.	16.3074292	0.0013403	-0.0065497	3.6146658	-60.0000000	CY
0.0000847	100380.	1185302940.	16.1779047	0.0013701	-0.0067599	3.6513935	-60.0000000	CY
0.0000872	100679.	1154743700.	16.0568323	0.0014000	-0.0069700	3.6863881	-60.0000000	CY
0.0000897	100976.	1125867523.	15.9435157	0.0014299	-0.0071801	3.7196335	-60.0000000	CY
0.0000922	101269.	1098514357.	15.8367756	0.0014600	-0.0073900	3.7510587	-60.0000000	CY
0.0000947	101519.	1072146470.	15.7214520	0.0014886	-0.0076014	3.7792771	-60.0000000	CY
0.0000972	101735.	1046788014.	15.6081366	0.0015169	-0.0078131	3.8054419	-60.0000000	CY
0.0000997	101936.	1022550978.	15.4992962	0.0015451	-0.0080249	3.8298512	-60.0000000	CY
0.0001022	102135.	999485975.	15.3966054	0.0015733	-0.0082367	3.8526936	-60.0000000	CY
0.0001047	102333.	977508827.	15.2996321	0.0016017	-0.0084483	3.8739542	-60.0000000	CY
0.0001072	102529.	956543208.	15.2079847	0.0016301	-0.0086599	3.8936183	-60.0000000	CY
0.0001097	102725.	936519743.	15.1213076	0.0016586	-0.0088714	3.9116705	-60.0000000	CY
0.0001122	102918.	917375239.	15.0392772	0.0016872	-0.0090828	3.9280954	-60.0000000	CY
0.0001147	103101.	898971477.	14.9601203	0.0017157	-0.0092943	3.9427914	-60.0000000	CY
0.0001172	103255.	881105489.	14.8807722	0.0017438	-0.0095062	3.9556226	-60.0000000	CY
0.0001197	103394.	863865138.	14.7953344	0.0017708	-0.0097192	3.9663904	-60.0000000	CY
0.0001222	103519.	847210353.	14.7116252	0.0017976	-0.0099324	3.9755928	-60.0000000	CY
0.0001247	103642.	831214308.	14.6319346	0.0018244	-0.0101456	3.9833488	-60.0000000	CY
0.0001272	103764.	815838016.	14.5560332	0.0018513	-0.0103587	3.9896445	-60.0000000	CY
0.0001297	103886.	801045495.	14.4837092	0.0018784	-0.0105716	3.9944653	-60.0000000	CY
0.0001322	104006.	786803484.	14.4147673	0.0019055	-0.0107845	3.9977968	-60.0000000	CY
0.0001347	104124.	773081186.	14.3490267	0.0019326	-0.0109974	3.9996241	-60.0000000	CY
0.0001372	104242.	759847832.	14.2864206	0.0019599	-0.0112101	3.9975553	-60.0000000	CY
0.0001522	104848.	688938715.	13.9543496	0.0021237	-0.0124863	3.9942761	-60.0000000	CY
0.0001672	105250.	629533240.	13.6391478	0.0022803	-0.0137697	3.9999413	60.0000000	CY
0.0001822	105614.	579697015.	13.3856873	0.0024387	-0.0150513	3.9959910	60.0000000	CY
0.0001972	105936.	537235001.	13.1780393	0.0025985	-0.0163315	3.9844105	60.0000000	CY
0.0002122	106163.	500324237.	12.9910015	0.0027565	-0.0176135	3.9975803	60.0000000	CY
0.0002272	106324.	468002835.	12.8143623	0.0029113	-0.0188987	3.9863485	60.0000000	CY
0.0002422	106467.	439607088.	12.6628659	0.0030668	-0.0201832	3.9891515	60.0000000	CYT
0.0002572	106589.	414440713.	12.5421580	0.0032257	-0.0214643	3.9996138	60.0000000	CYT
0.0002722	106681.	391940384.	12.4509035	0.0033890	-0.0227410	3.9794456	60.0000000	CYT
0.0002872	106759.	371738918.	12.3703350	0.0035526	-0.0240174	3.9822324	60.0000000	CYT
0.0003022	106791.	353391834.	12.2962784	0.0037158	-0.0252942	3.9964569	60.0000000	CYT
0.0003172	106810.	336741022.	12.2377255	0.0038817	-0.0265683	3.9949420	60.0000000	CYT

Axial Thrust Force = 66.125 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
0.000000313	5830.6477194	18658072702.	54.6882246	0.0000171	-0.0000129	0.0715231	0.4912620	
0.000000625	11632.	18611996288.	51.3549529	0.0000321	-0.0000279	0.1337193	0.9221085	
0.000000938	17405.	18565168113.	50.2439331	0.0000471	-0.0000429	0.1954194	1.3529569	
0.000001250	23148.	18518150542.	49.6884633	0.0000621	-0.0000579	0.2566234	1.7838068	
0.000001563	28861.	18471057097.	49.3552122	0.0000771	-0.0000729	0.3173313	2.2146581	
0.000001875	34545.	18423925670.	49.1330697	0.0000921	-0.0000879	0.3775432	2.6455106	
0.000002188	40199.	18376772526.	48.9744178	0.0001071	-0.0001029	0.4372589	3.0763646	
0.000002500	40199.	16079675960.	23.7132788	0.0000593	-0.0001807	0.2425481	-5.2059873	C
0.000002813	40199.	14293045298.	23.2969651	0.0000655	-0.0002045	0.2675378	-5.8906913	C
0.000003125	40199.	12863740768.	22.9573855	0.0000717	-0.0002283	0.2923609	-6.5759869	C
0.000003438	40199.	11694309789.	22.6805003	0.0000780	-0.0002520	0.3171144	-7.2611876	C
0.000003750	40199.	10719783973.	22.4449804	0.0000842	-0.0002758	0.3417124	-7.9469084	C
0.000004063	40199.	9895185206.	22.2412535	0.0000904	-0.0002996	0.3661549	-8.6331523	C
0.000004375	40199.	9188386263.	22.0674017	0.0000965	-0.0003235	0.3905291	-9.3192984	C
0.000004688	40199.	8575827179.	21.9174518	0.0001027	-0.0003473	0.4148349	-10.0053464	C
0.000005000	40199.	8039837980.	21.7869242	0.0001089	-0.0003711	0.4390722	-10.6912960	C
0.000005313	40199.	7566906334.	21.6723931	0.0001151	-0.0003949	0.4632408	-11.3771469	C
0.000005625	40199.	7146522649.	21.5696379	0.0001213	-0.0004187	0.4873059	-12.0631528	C
0.000005938	40199.	6770389878.	21.4747997	0.0001275	-0.0004425	0.5112206	-12.7496579	C
0.000006250	40199.	6431870384.	21.3900131	0.0001337	-0.0004663	0.5350677	-13.4360601	C
0.000006563	40199.	6125590842.	21.3138440	0.0001399	-0.0004901	0.5588470	-14.1223591	C
0.000006875	40199.	5847154895.	21.2451186	0.0001461	-0.0005139	0.5825584	-14.8085545	C
0.000007188	40199.	5592930769.	21.1828677	0.0001523	-0.0005377	0.6062018	-15.4946460	C
0.000007500	40199.	5359891987.	21.1262832	0.0001584	-0.0005616	0.6297772	-16.1806334	C
0.000007813	40199.	5145496307.	21.0746867	0.0001646	-0.0005854	0.6532843	-16.8665163	C
0.000008125	40199.	4947592603.	21.0275038	0.0001708	-0.0006092	0.6767232	-17.5522944	C
0.000008438	40199.	4764348433.	20.9842456	0.0001771	-0.0006329	0.7000936	-18.2379674	C
0.000008750	40199.	4594193131.	20.9444927	0.0001833	-0.0006567	0.7233955	-18.9235350	C
0.000009063	40199.	4435772679.	20.9078837	0.0001895	-0.0006805	0.7466288	-19.6089968	C
0.000009375	40199.	4287913589.	20.8741055	0.0001957	-0.0007043	0.7697934	-20.2943525	C
0.000009688	40199.	4149593796.	20.8428852	0.0002019	-0.0007281	0.7928892	-20.9796019	C
0.0000100	40199.	4019918990.	20.8139842	0.0002081	-0.0007519	0.8159160	-21.6647446	C
0.0000103	40199.	3898103263.	20.7871927	0.0002144	-0.0007756	0.8388738	-22.3497802	C
0.0000106	40199.	3783453167.	20.7623256	0.0002206	-0.0007994	0.8617624	-23.0347084	C
0.0000109	40199.	3675354505.	20.7392191	0.0002268	-0.0008232	0.8845818	-23.7195289	C
0.0000113	40199.	3573261324.	20.7177274	0.0002331	-0.0008469	0.9073318	-24.4042414	C
0.0000116	40199.	3476686694.	20.6977206	0.0002393	-0.0008707	0.9300122	-25.0888455	C

0.0000119	40199.	3385194939.	20.6790824	0.0002456	-0.0008944	0.9526231	-25.7733413	C
0.0000122	40199.	3298395069.	20.6617086	0.0002518	-0.0009182	0.9751643	-26.4577276	C
0.0000128	40199.	3137497748.	20.6298348	0.0002643	-0.0009657	1.0200112	-27.8263770	C
0.0000134	40199.	2991567620.	20.6009835	0.0002768	-0.0010132	1.0645260	-29.1950042	C
0.0000141	40199.	2858609060.	20.5758388	0.0002893	-0.0010607	1.1087637	-30.5631657	C
0.0000147	40199.	2736966121.	20.5539350	0.0003019	-0.0011081	1.1527234	-31.9308583	C
0.0000153	41090.	2683427777.	20.5348822	0.0003144	-0.0011556	1.1964041	-33.2980788	C
0.0000159	42675.	2677662607.	20.5183521	0.0003270	-0.0012030	1.2398048	-34.6648245	C
0.0000166	44259.	2672258436.	20.5040658	0.0003396	-0.0012504	1.2829248	-36.0310912	C
0.0000172	45842.	2667175290.	20.4917851	0.0003522	-0.0012978	1.3257628	-37.3968761	C
0.0000178	47424.	2662378965.	20.4813053	0.0003648	-0.0013452	1.3683181	-38.7621759	C
0.0000184	49004.	2657839893.	20.4724495	0.0003775	-0.0013925	1.4105895	-40.1269873	C
0.0000191	50583.	2653532374.	20.4650643	0.0003901	-0.0014399	1.4525760	-41.4913067	C
0.0000197	52161.	2649433972.	20.4590156	0.0004028	-0.0014872	1.4942768	-42.8551308	C
0.0000203	53737.	2645525004.	20.4541860	0.0004155	-0.0015345	1.5356906	-44.2184561	C
0.0000209	55312.	2641788136.	20.4504721	0.0004282	-0.0015818	1.5768165	-45.5812790	C
0.0000216	56886.	2638208037.	20.4477826	0.0004409	-0.0016291	1.6176535	-46.9435959	C
0.0000222	58459.	2634771100.	20.4460367	0.0004536	-0.0016764	1.6582004	-48.3054032	C
0.0000228	60030.	2631465206.	20.4451623	0.0004664	-0.0017236	1.6984563	-49.6666972	C
0.0000234	61600.	2628279523.	20.4450952	0.0004792	-0.0017708	1.7384201	-51.0274743	C
0.0000241	63169.	2625204340.	20.4457780	0.0004920	-0.0018180	1.7780905	-52.3877305	C
0.0000247	64736.	2622230927.	20.4471589	0.0005048	-0.0018652	1.8174667	-53.7474621	C
0.0000253	66302.	2619351412.	20.4491916	0.0005176	-0.0019124	1.8565474	-55.1066652	C
0.0000259	67867.	2616558676.	20.4518342	0.0005305	-0.0019595	1.8953315	-56.4653359	C
0.0000266	69430.	2613846267.	20.4550488	0.0005433	-0.0020067	1.9338179	-57.8234702	C
0.0000272	70992.	2611208322.	20.4588011	0.0005562	-0.0020538	1.9720054	-59.1810640	C
0.0000278	72553.	2608639502.	20.4630599	0.0005691	-0.0021009	2.0098930	-60.0000000	CY
0.0000284	74112.	2606134933.	20.4677969	0.0005821	-0.0021479	2.0474793	-60.0000000	CY
0.0000291	75610.	2601619347.	20.4674947	0.0005948	-0.0021952	2.0842949	-60.0000000	CY
0.0000297	76850.	2588615439.	20.4445601	0.0006069	-0.0022431	2.1188052	-60.0000000	CY
0.0000303	77969.	2572164092.	20.4122098	0.0006187	-0.0022913	2.1520966	-60.0000000	CY
0.0000309	78965.	2552406352.	20.3705286	0.0006302	-0.0023398	2.1841504	-60.0000000	CY
0.0000316	79897.	2531400455.	20.3251131	0.0006415	-0.0023885	2.2154424	-60.0000000	CY
0.0000322	80745.	2508568405.	20.2741506	0.0006526	-0.0024374	2.2458015	-60.0000000	CY
0.0000328	81555.	2485481112.	20.2221329	0.0006635	-0.0024865	2.2756263	-60.0000000	CY
0.0000334	82289.	2460965705.	20.1654191	0.0006743	-0.0025357	2.3045824	-60.0000000	CY
0.0000341	83006.	2436886811.	20.1097158	0.0006850	-0.0025850	2.3331935	-60.0000000	CY
0.0000347	83675.	2412246744.	20.0517678	0.0006955	-0.0026345	2.3611607	-60.0000000	CY
0.0000353	84285.	2386835816.	19.9908697	0.0007059	-0.0026841	2.3884159	-60.0000000	CY
0.0000359	84892.	2362204358.	19.9320675	0.0007163	-0.0027337	2.4154404	-60.0000000	CY
0.0000366	85480.	2337918302.	19.8738980	0.0007266	-0.0027834	2.4421030	-60.0000000	CY
0.0000372	85996.	2312499963.	19.8112261	0.0007367	-0.0028333	2.4679092	-60.0000000	CY

0.0000397	87934.	2215664970.	19.5644043	0.0007765	-0.0030335	2.5673801	-60.0000000	CY
0.0000422	89559.	2122869264.	19.3134613	0.0008148	-0.0032352	2.6600588	-60.0000000	CY
0.0000447	90917.	2034501207.	19.0681505	0.0008521	-0.0034379	2.7472591	-60.0000000	CY
0.0000472	92168.	1953218583.	18.8415198	0.0008891	-0.0036409	2.8307345	-60.0000000	CY
0.0000497	93191.	1875549826.	18.6112040	0.0009247	-0.0038453	2.9084177	-60.0000000	CY
0.0000522	94178.	1804617097.	18.3938440	0.0009599	-0.0040501	2.9824143	-60.0000000	CY
0.0000547	94967.	1736531166.	18.1775743	0.0009941	-0.0042559	3.0516939	-60.0000000	CY
0.0000572	95749.	1674290871.	17.9818096	0.0010283	-0.0044617	3.1187130	-60.0000000	CY
0.0000597	96455.	1616000201.	17.7962648	0.0010622	-0.0046678	3.1825694	-60.0000000	CY
0.0000622	97043.	1560495263.	17.6036564	0.0010947	-0.0048753	3.2415020	-60.0000000	CY
0.0000647	97623.	1509143580.	17.4241909	0.0011271	-0.0050829	3.2980295	-60.0000000	CY
0.0000672	98176.	1461229250.	17.2567349	0.0011594	-0.0052906	3.3522140	-60.0000000	CY
0.0000697	98639.	1415440818.	17.0920441	0.0011911	-0.0054989	3.4031668	-60.0000000	CY
0.0000722	99070.	1372401163.	16.9367662	0.0012226	-0.0057074	3.4518069	-60.0000000	CY
0.0000747	99499.	1332202379.	16.7925048	0.0012542	-0.0059158	3.4984495	-60.0000000	CY
0.0000772	99907.	1294341197.	16.6457127	0.0012848	-0.0061252	3.5417036	-60.0000000	CY
0.0000797	100274.	1258340684.	16.5040543	0.0013152	-0.0063348	3.5825626	-60.0000000	CY
0.0000822	100578.	1223762453.	16.3639893	0.0013449	-0.0065451	3.6207607	-60.0000000	CY
0.0000847	100878.	1191181418.	16.2329819	0.0013747	-0.0067553	3.6572090	-60.0000000	CY
0.0000872	101177.	1160447922.	16.1105158	0.0014046	-0.0069654	3.6919219	-60.0000000	CY
0.0000897	101473.	1131407145.	15.9958874	0.0014346	-0.0071754	3.7248828	-60.0000000	CY
0.0000922	101766.	1103903397.	15.8882444	0.0014647	-0.0073853	3.7560536	-60.0000000	CY
0.0000947	102025.	1077495818.	15.7775763	0.0014939	-0.0075961	3.7845398	-60.0000000	CY
0.0000972	102242.	1052007831.	15.6632026	0.0015223	-0.0078077	3.8104155	-60.0000000	CY
0.0000997	102442.	1027635238.	15.5531661	0.0015505	-0.0080195	3.8345162	-60.0000000	CY
0.0001022	102641.	1004441263.	15.4493418	0.0015787	-0.0082313	3.8570470	-60.0000000	CY
0.0001047	102839.	982341257.	15.3512932	0.0016071	-0.0084429	3.8779931	-60.0000000	CY
0.0001072	103035.	961258461.	15.2586248	0.0016355	-0.0086545	3.8973394	-60.0000000	CY
0.0001097	103229.	941123113.	15.1709774	0.0016641	-0.0088659	3.9150708	-60.0000000	CY
0.0001122	103422.	921871663.	15.0880241	0.0016927	-0.0090773	3.9311716	-60.0000000	CY
0.0001147	103608.	903398150.	15.0085832	0.0017213	-0.0092887	3.9455758	-60.0000000	CY
0.0001172	103762.	885433640.	14.9283686	0.0017494	-0.0095006	3.9580793	-60.0000000	CY
0.0001197	103909.	868168549.	14.8484776	0.0017772	-0.0097128	3.9688176	-60.0000000	CY
0.0001222	104033.	851422034.	14.7638753	0.0018040	-0.0099260	3.9776621	-60.0000000	CY
0.0001247	104156.	835337856.	14.6833319	0.0018308	-0.0101392	3.9850563	-60.0000000	CY
0.0001272	104278.	819876853.	14.6066156	0.0018578	-0.0103522	3.9909863	-60.0000000	CY
0.0001297	104399.	805002846.	14.5335127	0.0018848	-0.0105652	3.9954374	-60.0000000	CY
0.0001322	104518.	790682388.	14.4638258	0.0019119	-0.0107781	3.9983950	-60.0000000	CY
0.0001347	104637.	776884512.	14.3973725	0.0019391	-0.0109909	3.9998441	-60.0000000	CY
0.0001372	104753.	763576523.	14.3341648	0.0019665	-0.0112035	3.9955018	-60.0000000	CY
0.0001522	105360.	692305474.	13.9992790	0.0021305	-0.0124795	3.9921323	-60.0000000	CY
0.0001672	105768.	632632881.	13.6879330	0.0022885	-0.0137615	3.9997083	60.0000000	CY



0.0001822	106129.	582528439.	13.4315897	0.0024471	-0.0150429	3.9970353	60.0000000	CY
0.0001972	106451.	539844713.	13.2218011	0.0026072	-0.0163228	3.9817050	60.0000000	CY
0.0002122	106680.	502761262.	13.0332563	0.0027655	-0.0176045	3.9984252	60.0000000	CY
0.0002272	106844.	470291677.	12.8644666	0.0029226	-0.0188874	3.9827797	60.0000000	CY
0.0002422	106986.	441749673.	12.7106683	0.0030784	-0.0201716	3.9915579	60.0000000	CYT
0.0002572	107102.	416437417.	12.5904332	0.0032381	-0.0214519	3.9999579	60.0000000	CYT
0.0002722	107193.	393819892.	12.4979484	0.0034018	-0.0227282	3.9754309	60.0000000	CYT
0.0002872	107273.	373530769.	12.4173163	0.0035661	-0.0240039	3.9858416	60.0000000	CYT
0.0003022	107301.	355081753.	12.3435562	0.0037301	-0.0252799	3.9980308	60.0000000	CYT
0.0003172	107319.	338344542.	12.2844000	0.0038965	-0.0265535	3.9903004	60.0000000	CYT

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

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
1	46.505	106191.620	0.00300000
2	52.319	106405.955	0.00300000
3	66.125	106914.859	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	Resistance Factor	Nominal Moment Capacity	Ultimate (Factored) Axial Thrust	Ultimate (Factored) Moment Capacity	Bending Stiffness at Ult. Mom. Cap.
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No.	for Moment	in-kip	kips	in-kip	kip-in <sup>2</sup>
1	0.65	106191.620	30.228	69024.551	2593422997.011
2	0.65	106405.955	34.007	69163.868	2599439590.412
3	0.65	106914.859	42.981	69494.656	2613737561.789
1	0.70	106191.620	32.553	74334.133	2584786759.354
2	0.70	106405.955	36.623	74484.167	2590465541.462
3	0.70	106914.859	46.287	74840.400	2603938535.935
1	0.75	106191.620	34.879	79643.715	2503518171.872
2	0.75	106405.955	39.239	79804.466	2509470072.656
3	0.75	106914.859	49.594	80186.144	2523616991.099

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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 = 30734.0 lbs  
 Applied moment at pile head = 43210676.0 in-lbs  
 Axial thrust load on pile head = 46505.0 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	1.0066	43210676.	30734.	-0.005978	0.000	2.641E+12	0.000	0.000	0.000
0.280	0.9866	43314872.	30734.	-0.005923	0.000	2.641E+12	0.000	0.000	0.000
0.560	0.9668	43419060.	30734.	-0.005868	0.000	2.640E+12	0.000	0.000	0.000
0.840	0.9472	43523238.	30734.	-0.005813	0.000	2.640E+12	0.000	0.000	0.000
1.120	0.9277	43627409.	30734.	-0.005757	0.000	2.639E+12	-1.616E-07	5.854E-07	0.000
1.400	0.9085	43731570.	30734.	-0.005702	0.000	2.639E+12	-5.276E-07	1.951E-06	0.000
1.680	0.8894	43835723.	30734.	-0.005646	0.000	2.639E+12	-8.781E-07	3.317E-06	0.000
1.960	0.8706	43939867.	30734.	-0.005590	0.000	2.639E+12	-1.213E-06	4.683E-06	0.000
2.240	0.8519	44044002.	30734.	-0.005534	0.000	2.638E+12	-1.534E-06	6.049E-06	0.000
2.520	0.8334	44148129.	30734.	-0.005478	0.000	2.638E+12	-1.839E-06	7.415E-06	0.000

2.800	0.8151	44252247.	30734.	-0.005421	0.000	2.638E+12	-2.130E-06	8.780E-06	0.000
3.080	0.7969	44356356.	30734.	-0.005365	0.000	2.638E+12	-2.407E-06	1.015E-05	0.000
3.360	0.7790	44460456.	30734.	-0.005308	0.000	2.637E+12	-2.669E-06	1.151E-05	0.000
3.640	0.7613	44564547.	30734.	-0.005252	0.000	2.637E+12	-2.918E-06	1.288E-05	0.000
3.920	0.7437	44668630.	30734.	-0.005195	0.000	2.637E+12	-3.153E-06	1.424E-05	0.000
4.200	0.7264	44772703.	30734.	-0.005138	0.000	2.637E+12	-3.374E-06	1.561E-05	0.000
4.480	0.7092	44876768.	30734.	-0.005081	0.000	2.636E+12	-3.583E-06	1.698E-05	0.000
4.760	0.6922	44980823.	30734.	-0.005024	0.000	2.636E+12	-3.779E-06	1.834E-05	0.000
5.040	0.6754	45084870.	30734.	-0.004966	0.000	2.636E+12	-3.962E-06	1.971E-05	0.000
5.320	0.6588	45188908.	30734.	-0.004909	0.000	2.636E+12	-4.132E-06	2.107E-05	0.000
5.600	0.6424	45292937.	30734.	-0.004851	0.000	2.635E+12	-4.290E-06	2.244E-05	0.000
5.880	0.6262	45396956.	30734.	-0.004793	0.000	2.635E+12	-4.437E-06	2.380E-05	0.000
6.160	0.6102	45500967.	30104.	-0.004735	0.000	2.635E+12	-374.9580	2064.5595	0.000
6.440	0.5944	45600735.	28609.	-0.004677	0.000	2.635E+12	-514.8976	2910.5009	0.000
6.720	0.5788	45694682.	26638.	-0.004619	0.000	2.634E+12	-658.2502	3821.2080	0.000
7.000	0.5634	45781188.	24181.	-0.004561	0.000	2.634E+12	-804.4455	4797.7160	0.000
7.280	0.5482	45858603.	21229.	-0.004502	0.000	2.634E+12	-952.9310	5841.1392	0.000
7.560	0.5331	45925250.	17774.	-0.004444	0.000	2.634E+12	-1103.1679	6952.6601	0.000
7.840	0.5183	45979434.	13813.	-0.004385	0.000	2.634E+12	-1254.6300	8133.5210	0.000
8.120	0.5037	46019445.	9341.9519	-0.004326	0.000	2.634E+12	-1406.8015	9385.0177	0.000
8.400	0.4892	46043564.	4359.1100	-0.004267	0.000	2.634E+12	-1559.1759	10708.	0.000
8.680	0.4750	46050072.	-1135.2145	-0.004209	0.000	2.634E+12	-1711.2554	12105.	0.000
8.960	0.4609	46037251.	-7139.2075	-0.004150	0.000	2.634E+12	-1862.5500	13577.	0.000
9.240	0.4471	46003393.	-13649.	-0.004091	0.000	2.634E+12	-2012.5770	15125.	0.000
9.520	0.4334	45946805.	-20666.	-0.004033	0.000	2.634E+12	-2164.1236	16776.	0.000
9.800	0.4200	45865776.	-28194.	-0.003974	0.000	2.634E+12	-2316.8697	18535.	0.000
10.080	0.4067	45758581.	-36233.	-0.003916	0.000	2.634E+12	-2468.1668	20389.	0.000
10.360	0.3937	45623513.	-44777.	-0.003857	0.000	2.635E+12	-2617.6328	22341.	0.000
10.640	0.3808	45458883.	-53820.	-0.003799	0.000	2.635E+12	-2764.8912	24395.	0.000
10.920	0.3681	45263030.	-63353.	-0.003741	0.000	2.635E+12	-2909.5712	26555.	0.000
11.200	0.3557	45034320.	-73260.	-0.003684	0.000	2.636E+12	-2987.3494	28221.	0.000
11.480	0.3434	44771874.	-83356.	-0.003627	0.000	2.637E+12	-3022.5154	29574.	0.000
11.760	0.3313	44475297.	-93558.	-0.003570	0.000	2.637E+12	-3049.5519	30928.	0.000
12.040	0.3194	44144283.	-103836.	-0.003513	0.000	2.638E+12	-3068.6779	32281.	0.000
12.320	0.3077	43778616.	-114166.	-0.003457	0.000	2.639E+12	-3080.1087	33635.	0.000
12.600	0.2962	43378167.	-124522.	-0.003402	0.000	2.640E+12	-3084.0557	34988.	0.000
12.880	0.2848	42942892.	-134879.	-0.003347	0.000	2.641E+12	-3080.7258	36341.	0.000
13.160	0.2737	42472828.	-145213.	-0.003293	0.000	2.642E+12	-3070.3214	37695.	0.000
13.440	0.2627	41968093.	-155500.	-0.003239	0.000	2.644E+12	-3053.0401	39048.	0.000
13.720	0.2519	41428881.	-165718.	-0.003186	0.000	2.645E+12	-3029.0740	40402.	0.000
14.000	0.2413	40855465.	-175844.	-0.003134	0.000	2.647E+12	-2998.6100	41755.	0.000
14.280	0.2309	40248187.	-185858.	-0.003103	0.000	1.517E+13	-2961.8290	43108.	0.000

14.560	0.2204	39607471.	-195734.	-0.003095	0.000	1.838E+13	-2917.0318	44462.	0.000
14.840	0.2101	38933821.	-205447.	-0.003088	0.000	1.839E+13	-2864.1781	45815.	0.000
15.120	0.1997	38227834.	-214947.	-0.003081	0.000	1.839E+13	-2790.8497	46959.	0.000
15.400	0.1893	37490339.	-224210.	-0.003074	0.000	1.840E+13	-2722.5965	48313.	0.000
15.680	0.1790	36722105.	-233230.	-0.003067	0.000	1.840E+13	-2646.3528	49666.	0.000
15.960	0.1687	35923994.	-241980.	-0.003061	0.000	1.841E+13	-2562.1392	51020.	0.000
16.240	0.1585	35096957.	-250434.	-0.003054	0.000	1.842E+13	-2469.9750	52373.	0.000
16.520	0.1482	34242034.	-258565.	-0.003048	0.000	1.843E+13	-2369.8787	53726.	0.000
16.800	0.1380	33360355.	-266346.	-0.003042	0.000	1.843E+13	-2261.8675	55080.	0.000
17.080	0.1278	32453139.	-273751.	-0.003036	0.000	1.844E+13	-2145.9575	56433.	0.000
17.360	0.1176	31521695.	-280754.	-0.003030	0.000	1.845E+13	-2022.1639	57787.	0.000
17.640	0.1074	30567421.	-287327.	-0.003024	0.000	1.846E+13	-1890.5004	59140.	0.000
17.920	0.0973	29591803.	-293445.	-0.003019	0.000	1.846E+13	-1750.9796	60493.	0.000
18.200	0.0871	28596417.	-299080.	-0.003014	0.000	1.847E+13	-1603.6131	61847.	0.000
18.480	0.0770	27582925.	-304208.	-0.003008	0.000	1.848E+13	-1448.4110	63200.	0.000
18.760	0.0669	26553081.	-308801.	-0.003004	0.000	1.849E+13	-1285.3826	64554.	0.000
19.040	0.0568	25508724.	-312832.	-0.002999	0.000	1.850E+13	-1114.5355	65907.	0.000
19.320	0.0468	24451784.	-316277.	-0.002994	0.000	1.851E+13	-935.8767	67261.	0.000
19.600	0.0367	23384278.	-319108.	-0.002990	0.000	1.852E+13	-749.4114	68614.	0.000
19.880	0.0267	22308311.	-321300.	-0.002986	0.000	1.852E+13	-555.1441	69967.	0.000
20.160	0.0166	21226075.	-322826.	-0.002982	0.000	1.853E+13	-353.0779	71321.	0.000
20.440	0.006621	20139853.	-323660.	-0.002978	0.000	1.854E+13	-143.2148	72674.	0.000
20.720	-0.003379	19052013.	-323775.	-0.002975	0.000	1.855E+13	74.4441	74028.	0.000
21.000	-0.0134	17965014.	-323146.	-0.002971	0.000	1.856E+13	299.8992	75381.	0.000
21.280	-0.0233	16881399.	-321747.	-0.002968	0.000	1.857E+13	533.1516	76734.	0.000
21.560	-0.0333	15803803.	-319550.	-0.002965	0.000	1.858E+13	774.2035	78088.	0.000
21.840	-0.0433	14734947.	-316531.	-0.002962	0.000	1.858E+13	1023.0582	79441.	0.000
22.120	-0.0532	13677641.	-312662.	-0.002960	0.000	1.859E+13	1279.7196	80795.	0.000
22.400	-0.0632	12634782.	-307918.	-0.002957	0.000	1.860E+13	1544.1929	82148.	0.000
22.680	-0.0731	11609356.	-302272.	-0.002955	0.000	1.861E+13	1816.4838	83501.	0.000
22.960	-0.0830	10604436.	-295698.	-0.002953	0.000	1.862E+13	2096.5989	84855.	0.000
23.240	-0.0929	9623187.	-288170.	-0.002951	0.000	1.862E+13	2384.5453	86208.	0.000
23.520	-0.1029	8668857.	-279661.	-0.002950	0.000	1.863E+13	2680.3308	87562.	0.000
23.800	-0.1128	7744787.	-270145.	-0.002948	0.000	1.864E+13	2983.9637	88915.	0.000
24.080	-0.1227	6854405.	-259595.	-0.002947	0.000	1.865E+13	3295.4528	90268.	0.000
24.360	-0.1326	6001227.	-247986.	-0.002946	0.000	1.866E+13	3614.8072	91622.	0.000
24.640	-0.1425	5188858.	-235291.	-0.002945	0.000	1.866E+13	3942.0362	92975.	0.000
24.920	-0.1524	4420993.	-221482.	-0.002944	0.000	1.866E+13	4277.1492	94329.	0.000
25.200	-0.1622	3701416.	-206535.	-0.002943	0.000	1.866E+13	4620.1557	95682.	0.000
25.480	-0.1721	3033998.	-190422.	-0.002943	0.000	1.866E+13	4971.0650	97036.	0.000
25.760	-0.1820	2422701.	-173116.	-0.002942	0.000	1.866E+13	5329.8862	98389.	0.000
26.040	-0.1919	1871577.	-154592.	-0.002942	0.000	1.866E+13	5696.6281	99742.	0.000

26.320	-0.2018	1384765.	-134822.	-0.002941	0.000	1.866E+13	6071.2989	101096.	0.000
26.600	-0.2117	966495.	-113779.	-0.002941	0.000	1.866E+13	6453.9063	102449.	0.000
26.880	-0.2215	621088.	-91780.	-0.002941	0.000	1.866E+13	6640.8966	100715.	0.000
27.160	-0.2314	350654.	-69302.	-0.002941	0.000	1.866E+13	6739.0354	97840.	0.000
27.440	-0.2413	156300.	-46502.	-0.002941	0.000	1.866E+13	6832.4090	95134.	0.000
27.720	-0.2512	39082.	-23396.	-0.002941	0.000	1.866E+13	6921.0539	92577.	0.000
28.000	-0.2611	0.000	0.000	-0.002941	0.000	1.866E+13	7004.9920	45077.	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 = 1.0066115 inches  
 Computed slope at pile head = -0.0059782 radians  
 Maximum bending moment = 46050072. inch-lbs  
 Maximum shear force = -323775. lbs  
 Depth of maximum bending moment = 8.6800000 feet below pile head  
 Depth of maximum shear force = 20.7200000 feet below pile head  
 Number of iterations = 122  
 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 = 8960.0 lbs  
 Applied moment at pile head = 12912214.0 in-lbs  
 Axial thrust load on pile head = 66125.0 lbs

Depth	Deflect.	Bending	Shear	Slope	Total	Bending	Soil Res.	Soil Spr.	Distrib.
X	y	Moment	Force	S	Stress	Stiffness	p	Es*h	Lat. Load
feet	inches	in-lbs	lbs	radians	psi*	lb-in^2	lb/in	lb/inch	lb/inch

0.00	0.2223	12912214.	8960.0000	-0.000986	0.000	1.860E+13	0.000	0.000	0.000
0.280	0.2190	12942538.	8960.0001	-0.000983	0.000	1.860E+13	0.000	0.000	0.000
0.560	0.2157	12972862.	8959.9999	-0.000981	0.000	1.860E+13	0.000	0.000	0.000
0.840	0.2124	13003185.	8959.9999	-0.000979	0.000	1.860E+13	0.000	0.000	0.000
1.120	0.2091	13033508.	8959.9999	-0.000976	0.000	1.860E+13	-3.643E-08	5.854E-07	0.000
1.400	0.2058	13063830.	8959.9999	-0.000974	0.000	1.860E+13	-1.195E-07	1.951E-06	0.000
1.680	0.2025	13094152.	8960.0000	-0.000972	0.000	1.860E+13	-2.000E-07	3.317E-06	0.000
1.960	0.1993	13124473.	8960.0000	-0.000969	0.000	1.860E+13	-2.777E-07	4.683E-06	0.000
2.240	0.1960	13154794.	8960.0000	-0.000967	0.000	1.860E+13	-3.529E-07	6.049E-06	0.000
2.520	0.1928	13185114.	8960.0000	-0.000964	0.000	1.860E+13	-4.254E-07	7.415E-06	0.000
2.800	0.1896	13215434.	8960.0000	-0.000962	0.000	1.860E+13	-4.953E-07	8.780E-06	0.000
3.080	0.1863	13245753.	8960.0000	-0.000960	0.000	1.859E+13	-5.626E-07	1.015E-05	0.000
3.360	0.1831	13276071.	8960.0000	-0.000957	0.000	1.859E+13	-6.274E-07	1.151E-05	0.000
3.640	0.1799	13306389.	8960.0001	-0.000955	0.000	1.859E+13	-6.895E-07	1.288E-05	0.000
3.920	0.1767	13336707.	8960.0001	-0.000952	0.000	1.859E+13	-7.490E-07	1.424E-05	0.000
4.200	0.1735	13367024.	8960.0000	-0.000950	0.000	1.859E+13	-8.060E-07	1.561E-05	0.000
4.480	0.1703	13397340.	8960.0000	-0.000948	0.000	1.859E+13	-8.604E-07	1.698E-05	0.000
4.760	0.1671	13427656.	8960.0000	-0.000945	0.000	1.859E+13	-9.123E-07	1.834E-05	0.000
5.040	0.1640	13457971.	8960.0000	-0.000943	0.000	1.859E+13	-9.616E-07	1.971E-05	0.000
5.320	0.1608	13488286.	8960.0000	-0.000940	0.000	1.859E+13	-1.008E-06	2.107E-05	0.000
5.600	0.1576	13518600.	8960.0000	-0.000938	0.000	1.859E+13	-1.053E-06	2.244E-05	0.000
5.880	0.1545	13548914.	8960.0000	-0.000935	0.000	1.859E+13	-1.094E-06	2.380E-05	0.000
6.160	0.1513	13579227.	8667.9372	-0.000933	0.000	1.859E+13	-173.8470	3859.5326	0.000
6.440	0.1482	13607577.	7989.5546	-0.000931	0.000	1.859E+13	-229.9522	5212.9437	0.000
6.720	0.1451	13633331.	7126.8682	-0.000928	0.000	1.859E+13	-283.5516	6566.3548	0.000
7.000	0.1420	13655882.	6088.2812	-0.000926	0.000	1.859E+13	-334.6550	7919.7659	0.000
7.280	0.1389	13674655.	4882.1628	-0.000923	0.000	1.859E+13	-383.2726	9273.1770	0.000
7.560	0.1358	13689101.	3516.8487	-0.000921	0.000	1.859E+13	-429.4144	10627.	0.000
7.840	0.1327	13698697.	2000.6407	-0.000918	0.000	1.859E+13	-473.0904	11980.	0.000
8.120	0.1296	13702953.	341.8066	-0.000916	0.000	1.859E+13	-514.3108	13333.	0.000
8.400	0.1265	13701401.	-1451.4192	-0.000913	0.000	1.859E+13	-553.0856	14687.	0.000
8.680	0.1235	13693605.	-3370.8366	-0.000911	0.000	1.859E+13	-589.4248	16040.	0.000
8.960	0.1204	13679154.	-5408.2790	-0.000908	0.000	1.859E+13	-623.3385	17394.	0.000
9.240	0.1174	13657665.	-7555.6133	-0.000906	0.000	1.859E+13	-654.8367	18747.	0.000
9.520	0.1143	13628783.	-9804.7402	-0.000903	0.000	1.859E+13	-683.9293	20100.	0.000
9.800	0.1113	13592179.	-12148.	-0.000901	0.000	1.859E+13	-710.6263	21454.	0.000
10.080	0.1083	13547551.	-14576.	-0.000898	0.000	1.859E+13	-734.9374	22807.	0.000
10.360	0.1053	13494626.	-17082.	-0.000896	0.000	1.859E+13	-756.8726	24161.	0.000
10.640	0.1023	13433156.	-19658.	-0.000894	0.000	1.859E+13	-776.4414	25514.	0.000
10.920	0.0993	13362919.	-22296.	-0.000891	0.000	1.859E+13	-793.6534	26868.	0.000
11.200	0.0963	13283722.	-24988.	-0.000889	0.000	1.859E+13	-808.5183	28221.	0.000

11.480	0.0933	13195396.	-27725.	-0.000886	0.000	1.860E+13	-821.0453	29574.	0.000
11.760	0.0903	13097801.	-30501.	-0.000884	0.000	1.860E+13	-831.2436	30928.	0.000
12.040	0.0873	12990821.	-33307.	-0.000882	0.000	1.860E+13	-839.1225	32281.	0.000
12.320	0.0844	12874366.	-36136.	-0.000879	0.000	1.860E+13	-844.6908	33635.	0.000
12.600	0.0814	12748375.	-38980.	-0.000877	0.000	1.860E+13	-847.9574	34988.	0.000
12.880	0.0785	12612811.	-41831.	-0.000875	0.000	1.860E+13	-848.9308	36341.	0.000
13.160	0.0756	12467662.	-44681.	-0.000872	0.000	1.860E+13	-847.6195	37695.	0.000
13.440	0.0726	12312943.	-47523.	-0.000870	0.000	1.860E+13	-844.0317	39048.	0.000
13.720	0.0697	12148695.	-50349.	-0.000868	0.000	1.861E+13	-838.1754	40402.	0.000
14.000	0.0668	11974983.	-53152.	-0.000866	0.000	1.861E+13	-830.0584	41755.	0.000
14.280	0.0639	11791900.	-55923.	-0.000864	0.000	1.861E+13	-819.6882	43108.	0.000
14.560	0.0610	11599563.	-58656.	-0.000862	0.000	1.861E+13	-807.0722	44462.	0.000
14.840	0.0581	11398114.	-61343.	-0.000859	0.000	1.861E+13	-792.2173	45815.	0.000
15.120	0.0552	11187720.	-63970.	-0.000857	0.000	1.861E+13	-771.6902	46959.	0.000
15.400	0.0523	10968614.	-66531.	-0.000855	0.000	1.861E+13	-752.5570	48313.	0.000
15.680	0.0495	10741011.	-69024.	-0.000853	0.000	1.862E+13	-731.2041	49666.	0.000
15.960	0.0466	10505153.	-71441.	-0.000852	0.000	1.862E+13	-707.6373	51020.	0.000
16.240	0.0437	10261306.	-73775.	-0.000850	0.000	1.862E+13	-681.8624	52373.	0.000
16.520	0.0409	10009760.	-76019.	-0.000848	0.000	1.862E+13	-653.8847	53726.	0.000
16.800	0.0380	9750832.	-78166.	-0.000846	0.000	1.862E+13	-623.7092	55080.	0.000
17.080	0.0352	9484862.	-80207.	-0.000844	0.000	1.862E+13	-591.3405	56433.	0.000
17.360	0.0324	9212216.	-82136.	-0.000843	0.000	1.862E+13	-556.7830	57787.	0.000
17.640	0.0295	8933283.	-83945.	-0.000841	0.000	1.863E+13	-520.0409	59140.	0.000
17.920	0.0267	8648479.	-85627.	-0.000839	0.000	1.863E+13	-481.1176	60493.	0.000
18.200	0.0239	8358243.	-87174.	-0.000838	0.000	1.863E+13	-440.0167	61847.	0.000
18.480	0.0211	8063039.	-88580.	-0.000836	0.000	1.863E+13	-396.7411	63200.	0.000
18.760	0.0183	7763355.	-89837.	-0.000835	0.000	1.864E+13	-351.2935	64554.	0.000
19.040	0.0155	7459706.	-90937.	-0.000834	0.000	1.864E+13	-303.6762	65907.	0.000
19.320	0.0127	7152627.	-91874.	-0.000832	0.000	1.864E+13	-253.8913	67261.	0.000
19.600	0.009889	6842682.	-92640.	-0.000831	0.000	1.864E+13	-201.9403	68614.	0.000
19.880	0.007099	6530457.	-93227.	-0.000830	0.000	1.865E+13	-147.8245	69967.	0.000
20.160	0.004313	6216563.	-93630.	-0.000829	0.000	1.865E+13	-91.5450	71321.	0.000
20.440	0.001530	5901635.	-93839.	-0.000828	0.000	1.866E+13	-33.1024	72674.	0.000
20.720	-0.001248	5586333.	-93848.	-0.000827	0.000	1.866E+13	27.5029	74028.	0.000
21.000	-0.004024	5271342.	-93650.	-0.000826	0.000	1.866E+13	90.2710	75381.	0.000
21.280	-0.006796	4957369.	-93238.	-0.000825	0.000	1.866E+13	155.2022	76734.	0.000
21.560	-0.009565	4645148.	-92604.	-0.000824	0.000	1.866E+13	222.2969	78088.	0.000
21.840	-0.0123	4335437.	-91741.	-0.000823	0.000	1.866E+13	291.5560	79441.	0.000
22.120	-0.0151	4029017.	-90641.	-0.000822	0.000	1.866E+13	362.9806	80795.	0.000
22.400	-0.0179	3726695.	-89298.	-0.000821	0.000	1.866E+13	436.5722	82148.	0.000
22.680	-0.0206	3429301.	-87704.	-0.000821	0.000	1.866E+13	512.3322	83501.	0.000
22.960	-0.0234	3137692.	-85851.	-0.000820	0.000	1.866E+13	590.2626	84855.	0.000

23.240	-0.0261	2852746.	-83733.	-0.000820	0.000	1.866E+13	670.3652	86208.	0.000
23.520	-0.0289	2575368.	-81343.	-0.000819	0.000	1.866E+13	752.6424	87562.	0.000
23.800	-0.0316	2306487.	-78672.	-0.000819	0.000	1.866E+13	837.0965	88915.	0.000
24.080	-0.0344	2047056.	-75714.	-0.000818	0.000	1.866E+13	923.7300	90268.	0.000
24.360	-0.0371	1798054.	-72461.	-0.000818	0.000	1.866E+13	1012.5454	91622.	0.000
24.640	-0.0399	1560483.	-68906.	-0.000818	0.000	1.866E+13	1103.5454	92975.	0.000
24.920	-0.0426	1335370.	-65041.	-0.000817	0.000	1.866E+13	1196.7329	94329.	0.000
25.200	-0.0454	1123768.	-60860.	-0.000817	0.000	1.866E+13	1292.1104	95682.	0.000
25.480	-0.0481	926754.	-56355.	-0.000817	0.000	1.866E+13	1389.6807	97036.	0.000
25.760	-0.0509	745428.	-51518.	-0.000817	0.000	1.866E+13	1489.4465	98389.	0.000
26.040	-0.0536	580918.	-46342.	-0.000817	0.000	1.866E+13	1591.4104	99742.	0.000
26.320	-0.0564	434374.	-40820.	-0.000817	0.000	1.866E+13	1695.5748	101096.	0.000
26.600	-0.0591	306972.	-34944.	-0.000817	0.000	1.866E+13	1801.9420	102449.	0.000
26.880	-0.0618	199914.	-28707.	-0.000817	0.000	1.866E+13	1910.5141	103803.	0.000
27.160	-0.0646	114424.	-22102.	-0.000817	0.000	1.866E+13	2021.2928	105156.	0.000
27.440	-0.0673	51754.	-15120.	-0.000817	0.000	1.866E+13	2134.2797	106509.	0.000
27.720	-0.0701	13179.	-7755.4811	-0.000817	0.000	1.866E+13	2249.4758	107863.	0.000
28.000	-0.0728	0.000	0.000	-0.000817	0.000	1.866E+13	2366.8820	54608.	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 = 0.2222743 inches  
 Computed slope at pile head = -0.0009856 radians  
 Maximum bending moment = 13702953. inch-lbs  
 Maximum shear force = -93848. 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 = 9284.0 lbs  
 Applied moment at pile head = 12958437.0 in-lbs  
 Axial thrust load on pile head = 52319.0 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	0.2241	12958437.	9284.0000	-0.000993	0.000	1.860E+13	0.000	0.000	0.000
0.280	0.2208	12989806.	9284.0002	-0.000991	0.000	1.860E+13	0.000	0.000	0.000
0.560	0.2174	13021174.	9284.0001	-0.000989	0.000	1.860E+13	0.000	0.000	0.000
0.840	0.2141	13052542.	9284.0001	-0.000986	0.000	1.860E+13	0.000	0.000	0.000
1.120	0.2108	13083909.	9284.0001	-0.000984	0.000	1.860E+13	-3.673E-08	5.854E-07	0.000
1.400	0.2075	13115276.	9284.0000	-0.000981	0.000	1.860E+13	-1.205E-07	1.951E-06	0.000
1.680	0.2042	13146643.	9284.0000	-0.000979	0.000	1.860E+13	-2.016E-07	3.317E-06	0.000
1.960	0.2009	13178009.	9284.0000	-0.000977	0.000	1.860E+13	-2.800E-07	4.683E-06	0.000
2.240	0.1976	13209374.	9283.9999	-0.000974	0.000	1.860E+13	-3.558E-07	6.049E-06	0.000
2.520	0.1944	13240740.	9283.9999	-0.000972	0.000	1.860E+13	-4.289E-07	7.415E-06	0.000
2.800	0.1911	13272105.	9283.9999	-0.000969	0.000	1.859E+13	-4.994E-07	8.780E-06	0.000
3.080	0.1879	13303469.	9283.9999	-0.000967	0.000	1.859E+13	-5.673E-07	1.015E-05	0.000
3.360	0.1846	13334833.	9283.9999	-0.000965	0.000	1.859E+13	-6.325E-07	1.151E-05	0.000
3.640	0.1814	13366197.	9283.9998	-0.000962	0.000	1.859E+13	-6.952E-07	1.288E-05	0.000
3.920	0.1782	13397560.	9283.9998	-0.000960	0.000	1.859E+13	-7.552E-07	1.424E-05	0.000
4.200	0.1749	13428923.	9283.9997	-0.000957	0.000	1.859E+13	-8.127E-07	1.561E-05	0.000
4.480	0.1717	13460285.	9283.9997	-0.000955	0.000	1.859E+13	-8.676E-07	1.698E-05	0.000
4.760	0.1685	13491647.	9283.9997	-0.000953	0.000	1.859E+13	-9.199E-07	1.834E-05	0.000
5.040	0.1653	13523008.	9283.9997	-0.000950	0.000	1.859E+13	-9.696E-07	1.971E-05	0.000
5.320	0.1621	13554369.	9283.9996	-0.000948	0.000	1.859E+13	-1.017E-06	2.107E-05	0.000
5.600	0.1589	13585730.	9283.9996	-0.000945	0.000	1.859E+13	-1.062E-06	2.244E-05	0.000
5.880	0.1558	13617090.	9283.9996	-0.000943	0.000	1.859E+13	-1.104E-06	2.380E-05	0.000
6.160	0.1526	13648450.	8989.4906	-0.000940	0.000	1.859E+13	-175.3030	3859.5326	0.000
6.440	0.1495	13677830.	8305.4223	-0.000938	0.000	1.859E+13	-231.8806	5212.9437	0.000
6.720	0.1463	13704592.	7435.4962	-0.000935	0.000	1.859E+13	-285.9325	6566.3548	0.000
7.000	0.1432	13728126.	6388.1817	-0.000933	0.000	1.859E+13	-337.4689	7919.7659	0.000
7.280	0.1400	13747849.	5171.9144	-0.000930	0.000	1.859E+13	-386.4997	9273.1770	0.000
7.560	0.1369	13763208.	3795.0958	-0.000928	0.000	1.859E+13	-433.0352	10627.	0.000
7.840	0.1338	13773678.	2266.0932	-0.000925	0.000	1.859E+13	-477.0854	11980.	0.000
8.120	0.1307	13778761.	593.2403	-0.000923	0.000	1.859E+13	-518.6604	13333.	0.000

8.400	0.1276	13777989.	-1215.1635	-0.000920	0.000	1.859E+13	-557.7704	14687.	0.000
8.680	0.1245	13770919.	-3150.8526	-0.000918	0.000	1.859E+13	-594.4255	16040.	0.000
8.960	0.1214	13757138.	-5205.5955	-0.000915	0.000	1.859E+13	-628.6358	17394.	0.000
9.240	0.1184	13736259.	-7371.1946	-0.000913	0.000	1.859E+13	-660.4113	18747.	0.000
9.520	0.1153	13707925.	-9639.4858	-0.000911	0.000	1.859E+13	-689.7620	20100.	0.000
9.800	0.1122	13671802.	-12002.	-0.000908	0.000	1.859E+13	-716.6980	21454.	0.000
10.080	0.1092	13627588.	-14452.	-0.000906	0.000	1.859E+13	-741.2291	22807.	0.000
10.360	0.1062	13575006.	-16979.	-0.000903	0.000	1.859E+13	-763.3652	24161.	0.000
10.640	0.1031	13513804.	-19577.	-0.000901	0.000	1.859E+13	-783.1160	25514.	0.000
10.920	0.1001	13443762.	-22238.	-0.000898	0.000	1.859E+13	-800.4912	26868.	0.000
11.200	0.0971	13364681.	-24953.	-0.000896	0.000	1.859E+13	-815.5003	28221.	0.000
11.480	0.0941	13276394.	-27714.	-0.000893	0.000	1.859E+13	-828.1528	29574.	0.000
11.760	0.0911	13178756.	-30514.	-0.000891	0.000	1.860E+13	-838.4580	30928.	0.000
12.040	0.0881	13071653.	-33345.	-0.000889	0.000	1.860E+13	-846.4250	32281.	0.000
12.320	0.0851	12954993.	-36198.	-0.000886	0.000	1.860E+13	-852.0629	33635.	0.000
12.600	0.0821	12828713.	-39067.	-0.000884	0.000	1.860E+13	-855.3806	34988.	0.000
12.880	0.0792	12692776.	-41942.	-0.000882	0.000	1.860E+13	-856.3866	36341.	0.000
13.160	0.0762	12547170.	-44818.	-0.000879	0.000	1.860E+13	-855.0895	37695.	0.000
13.440	0.0733	12391911.	-47685.	-0.000877	0.000	1.860E+13	-851.4975	39048.	0.000
13.720	0.0703	12227038.	-50536.	-0.000875	0.000	1.861E+13	-845.6187	40402.	0.000
14.000	0.0674	12052617.	-53363.	-0.000873	0.000	1.861E+13	-837.4610	41755.	0.000
14.280	0.0645	11868742.	-56160.	-0.000871	0.000	1.861E+13	-827.0318	43108.	0.000
14.560	0.0615	11675530.	-58917.	-0.000868	0.000	1.861E+13	-814.3387	44462.	0.000
14.840	0.0586	11473123.	-61628.	-0.000866	0.000	1.861E+13	-799.3886	45815.	0.000
15.120	0.0557	11261692.	-64280.	-0.000864	0.000	1.861E+13	-778.7170	46959.	0.000
15.400	0.0528	11041468.	-66864.	-0.000862	0.000	1.861E+13	-759.4540	48313.	0.000
15.680	0.0499	10812671.	-69379.	-0.000860	0.000	1.862E+13	-737.9533	49666.	0.000
15.960	0.0470	10575542.	-71819.	-0.000858	0.000	1.862E+13	-714.2208	51020.	0.000
16.240	0.0442	10330349.	-74175.	-0.000856	0.000	1.862E+13	-688.2624	52373.	0.000
16.520	0.0413	10077385.	-76440.	-0.000855	0.000	1.862E+13	-660.0832	53726.	0.000
16.800	0.0384	9816970.	-78607.	-0.000853	0.000	1.862E+13	-629.6884	55080.	0.000
17.080	0.0355	9549445.	-80668.	-0.000851	0.000	1.862E+13	-597.0827	56433.	0.000
17.360	0.0327	9275179.	-82616.	-0.000849	0.000	1.862E+13	-562.2706	57787.	0.000
17.640	0.0298	8994565.	-84443.	-0.000848	0.000	1.863E+13	-525.2559	59140.	0.000
17.920	0.0270	8708020.	-86142.	-0.000846	0.000	1.863E+13	-486.0425	60493.	0.000
18.200	0.0242	8415989.	-87705.	-0.000845	0.000	1.863E+13	-444.6338	61847.	0.000
18.480	0.0213	8118937.	-89126.	-0.000843	0.000	1.863E+13	-401.0328	63200.	0.000
18.760	0.0185	7817357.	-90397.	-0.000842	0.000	1.864E+13	-355.2421	64554.	0.000
19.040	0.0157	7511767.	-91510.	-0.000840	0.000	1.864E+13	-307.2642	65907.	0.000
19.320	0.0128	7202707.	-92458.	-0.000839	0.000	1.864E+13	-257.1010	67261.	0.000
19.600	0.0100	6890745.	-93234.	-0.000838	0.000	1.864E+13	-204.7541	68614.	0.000
19.880	0.007214	6576471.	-93830.	-0.000836	0.000	1.865E+13	-150.2250	69967.	0.000

20.160	0.004406	6260500.	-94240.	-0.000835	0.000	1.865E+13	-93.5146	71321.	0.000
20.440	0.001601	5943474.	-94455.	-0.000834	0.000	1.866E+13	-34.6236	72674.	0.000
20.720	-0.001200	5626057.	-94469.	-0.000833	0.000	1.866E+13	26.4478	74028.	0.000
21.000	-0.003998	5308938.	-94274.	-0.000832	0.000	1.866E+13	89.6994	75381.	0.000
21.280	-0.006793	4992831.	-93862.	-0.000831	0.000	1.866E+13	155.1316	76734.	0.000
21.560	-0.009584	4678476.	-93227.	-0.000830	0.000	1.866E+13	222.7449	78088.	0.000
21.840	-0.0124	4366635.	-92362.	-0.000830	0.000	1.866E+13	292.5402	79441.	0.000
22.120	-0.0152	4058097.	-91258.	-0.000829	0.000	1.866E+13	364.5186	80795.	0.000
22.400	-0.0179	3753674.	-89908.	-0.000828	0.000	1.866E+13	438.6814	82148.	0.000
22.680	-0.0207	3454204.	-88306.	-0.000827	0.000	1.866E+13	515.0303	83501.	0.000
22.960	-0.0235	3160547.	-86444.	-0.000827	0.000	1.866E+13	593.5670	84855.	0.000
23.240	-0.0263	2873592.	-84314.	-0.000826	0.000	1.866E+13	674.2937	86208.	0.000
23.520	-0.0291	2594249.	-81909.	-0.000826	0.000	1.866E+13	757.2126	87562.	0.000
23.800	-0.0318	2323455.	-79222.	-0.000825	0.000	1.866E+13	842.3259	88915.	0.000
24.080	-0.0346	2062170.	-76245.	-0.000825	0.000	1.866E+13	929.6363	90268.	0.000
24.360	-0.0374	1811381.	-72971.	-0.000825	0.000	1.866E+13	1019.1463	91622.	0.000
24.640	-0.0401	1572097.	-69392.	-0.000824	0.000	1.866E+13	1110.8586	92975.	0.000
24.920	-0.0429	1345354.	-65502.	-0.000824	0.000	1.866E+13	1204.7760	94329.	0.000
25.200	-0.0457	1132213.	-61293.	-0.000824	0.000	1.866E+13	1300.9012	95682.	0.000
25.480	-0.0485	933758.	-56756.	-0.000824	0.000	1.866E+13	1399.2369	97036.	0.000
25.760	-0.0512	751100.	-51886.	-0.000824	0.000	1.866E+13	1499.7859	98389.	0.000
26.040	-0.0540	585374.	-46674.	-0.000823	0.000	1.866E+13	1602.5508	99742.	0.000
26.320	-0.0568	437740.	-41113.	-0.000823	0.000	1.866E+13	1707.5340	101096.	0.000
26.600	-0.0595	309383.	-35196.	-0.000823	0.000	1.866E+13	1814.7377	102449.	0.000
26.880	-0.0623	201515.	-28914.	-0.000823	0.000	1.866E+13	1924.1642	103803.	0.000
27.160	-0.0650	115369.	-22262.	-0.000823	0.000	1.866E+13	2035.8151	105156.	0.000
27.440	-0.0678	52206.	-15230.	-0.000823	0.000	1.866E+13	2149.6921	106509.	0.000
27.720	-0.0706	13313.	-7811.8731	-0.000823	0.000	1.866E+13	2265.7962	107863.	0.000
28.000	-0.0733	0.000	0.000	-0.000823	0.000	1.866E+13	2384.1282	54608.	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 = 0.2240931 inches  
 Computed slope at pile head = -0.0009932 radians  
 Maximum bending moment = 13778761. inch-lbs

Maximum shear force = -94469. 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

-----  
 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 = 30734.	M = 43210676.	46505.	1.00661150	46050072.	-323775.	-0.00597823
2	1	V = 8960.0000	M = 12912214.	66125.	0.22227432	13702953.	-93848.	-0.00098563
3	1	V = 9284.0000	M = 12958437.	52319.	0.22409313	13778761.	-94469.	-0.00099319

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

$$\frac{\Delta_{\text{service}}}{\Delta_{\text{allow}}} = 0.299$$

Displacement check = "Displacement of foundation is acceptable."

### Check moment capacity

$$\phi_m := 0.65$$

Strength reduction factor in moment (horizontal ties)

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

$$\phi M_n = 5752 \cdot \text{kip} \cdot \text{ft}$$

$$\frac{M_u}{\phi M_n} = 0.901$$

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

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

$$V_c = 932.594 \cdot \text{kips}$$

Shear capacity of concrete

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

$$V_s = 337.92 \cdot \text{kips}$$

Shear capacity of reinforcing steel

$$V_n := V_c + V_s$$

$$V_n = 1270.514 \cdot \text{kips}$$

Nominal shear capacity

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

$$\phi V_n = 953 \cdot \text{kip}$$

$$\frac{V_u}{\phi V_n} = 0.459$$

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

March 16, 2022

Scope: **MOUNT ANALYSIS REPORT**

Prepared for: SmartLink  
Carrier: AT&T  
Site Number: CTL01051  
FA Number: 10035388  
Site Name: Willimantic ECSU  
Site Address: 83 Windham Street  
Willimantic, CT 06226  
Latitude/ Longitude: 41.7205889° / -72.21818°

Structure Type: MONOPOLE  
Mount Type: Existing Low-Profile Platform w/ handrails  
Rad Center: 138'-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:	120 mph (3-Sec gust)
	Ice Wind Speed:	50 mph (3-Sec gust)
	Design Ice Thickness:	1.00 in.
	Risk Category	II
	Exposure Category:	C
	Topographic Feature:	None
	Topographic Method:	Method 2
	Ground Elevation Factor, $K_e$ :	0.99
Seismic Parameters:	$S_s$ :	0.191
	$S_1$ :	0.055
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 = 83.8%)**

**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. 2.00 provided by AT&T	02/10/2022
Site Visit Photos	01/19/2022
Previous MA Report by Maser Consulting Connecticut	03/01/2019

**Final Loading Configuration:**

Mount Elevation (ft)	Antenna Rad Center (Ft)	QTY.	MANUFACTURER	MODEL	Status
138'-0"	138'-0"	3	Quintel	QD8616-7	Proposed
		3	Ericsson	AIR6449 B77D+AIR6419 B77G Stacked	Proposed
		3	CCI	DMP65R-BU8DA	Proposed
		3	Ericsson	Radio 4478 B14	Existing
		3	Ericsson	RRUS 4426 B66	Proposed
		3	Ericsson	RRUS 32 B30	Existing
		3	Ericsson	Radio 4449 B5/B12	Proposed
		2	Raycap	DC6-48-60-18-8F	Existing
		1	Raycap	DC9-48-60-24-8C-EV	Proposed
		3	Ericsson	RRUS 4415 B25	Existing

**Member Component Capacity Table:**

Component	% Capacity	Pass / Fail
Face Horizontals	49.3%	Pass
Standoff Members	72.3%	Pass
Mounting Pipes	50.2%	Pass
Mount-to-Tower, Collar Threaded Rods	83.8%	Pass
<b>Structural Rating (max from all components) =</b>		<b>83.8%</b>

**Site Number:** CTL01051  
**Site Name:** WILLIMANTIC ECSU  
 Created By: GM  
 Checked By: BTX  
 Date: 3/15/2022  
 Code: ANSI/TIA-222-H

Base Structure Type	Type	Monopole
Structure Height Above Grade (ft)	Ht	175.00
RAD Center (ft)	z	138.00
Windspeed no ice (mph, 3-sec gust)	V	120.00 see wind maps
Windspeed with ice (mph, 3-sec gust)	Vi	40.00 see ice maps
Windspeed for maintenance (mph, 3-sec gust)	Vm	50.00 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 II	Table 2-1
Topographic Feature	K.1'	None Figure 2-1
Crest Height	H	0.00 Section 2.6.6.2.1
Length of Feature	L	0.00
Distance from Crest to Tower	x	0.00
Escarpment Downwind?	No	
Height above sea level	Zs	354.08
Exposure Category Coefficient	zg	900.00 Table 2-4
Mid-Point of Structure	Ht.mid	87.50
Min Velocity Pressure Coefficient	Kzmin	0.85 Table 2-4
Exposure Category Coefficient	α'	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 #DIV/0!	Figure 2-1
Horizontal Distance Factor	K2 #DIV/0!	Figure 2-1
Vertical Distance Factor	K3 #DIV/0!	Figure 2-1
Topographic Factor	Kzt	1.00 Section 2.6.6.2.1
Rooftop Wind Speed-Up Factor	Ks	1.00 Section 2.6.7
Ice Load Importance Factor	Iti	1.00 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	1.73 Section 2.6.10
Ice Density	p.ice	56.00 lbf/ft <sup>3</sup>
Velocity Pressure for Maintenance	qzm	8.13 Section 2.6.11.6
Velocity Pressure With Ice	qzi	5.20 Section 2.6.11.6
Velocity Pressure No Ice	qz	46.83 Section 2.6.11.6

**Ka= 0.9**

Importance Factor (Earthquake)	I <sub>e</sub>	1.00	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>	0.191	
MCE <sub>s</sub> Ground Motion (period=1.0s)	S <sub>1</sub>	0.055	
Seismic Design Value at 0.2s	S <sub>DS</sub>	0.204	
Long-Period Site Coefficient Fv	Fv	0.80	Table 2-12
Seismic Design Value at 1.0s	S <sub>D1</sub>	0.029	Sec. 2.7.5
Long-period Transition Period (s)	T <sub>l</sub>	6	

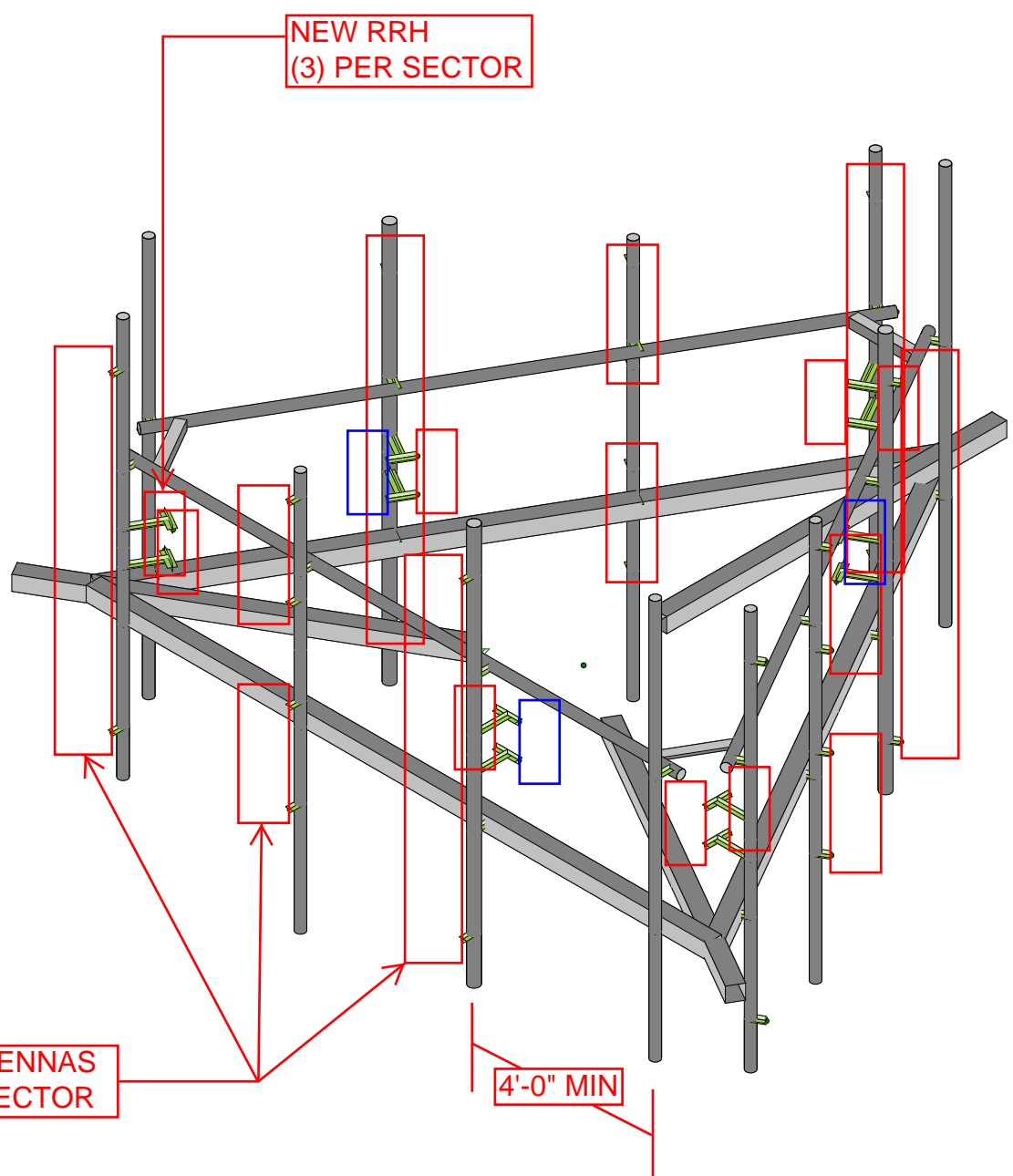
Seismic Shear	
R	2.000 See 16.7
C <sub>s-calc</sub>	0.102 See 2.7.7.1.1
C <sub>s-min</sub>	0.009 See 2.7.7.1.1
C <sub>s</sub>	0.102 See 2.7.7.1.1
A <sub>s</sub>	1.000 See 16.7

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)	175.00	Section 2.6.7
Height of structure above roof	Zr (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
Quintel	QD8616-7	Flat	96	22	9.6	68.2	2	34.1	115.3	396	202	52	30	69	35	3	1	19
Ericsson	AIR 6419 B77G	Flat	28.3	16.1	7.9	77	2	38.5	34.3	80	41	12	7	14	7	4	2	4
Ericsson	AIR 6449 B77D	Flat	30.4	15.9	8.1	81.6	2	40.8	36.7	85	45	13	8	15	8	4	2	4
CCIAntennas	DMP65R-BU8DA	Flat	96	20.7	7.7	95.7	2	47.9	98.3	377	171	50	26	65	30	5	2	18
Ericsson	Radio 4478 B14	Flat	16.5	13.4	7.7	44	2	22.0	22.6	39	22	7	4	7	4	2	1	2
Ericsson	RRUS 4426 B66	Flat	14.96	13.19	5.8	48.4	2	24.2	17.7	35	15	6	3	6	3	2	1	2
Ericsson	RRUS 32	Flat	27.2	12.1	7	60	2	30.0	29.0	58	35	9	6	10	6	3	1	3
Ericsson	Radio 4449 B5 & B12	Flat	15	13.2	9.3	70	2	35.0	24.4	35	24	6	5	6	4	4	1	2

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
HSS	HSS4X4X4	Flat	92	4	4	12.21	7.66667	93.61	15.6	27	27	5	5	5	5	1	0.5	5
HSS	HSS4X4X4	Flat	168	4	4	12.21	14	170.94	15.6	28	28	6	6	5	5	1	0.5	9
Pipe	Pipe 2 Std.	Round	150	2.38	2.38	3.66	12.5	45.75	8.7	10	10	3	3	2	2	0.4	0.1	3
Pipe	Pipe 2 Std.	Round	108	2.38	2.38	3.66	9	32.94	8.7	10	10	3	3	2	2	0.4	0.1	2
Pipe	Pipe 2 1/2 Std.	Round	108	2.88	2.88	5.80	9	52.20	9.7	12	12	3	3	2	2	1	0.2	3
Angle	L2 1/2 X 2 1/2 X 1/4	Flat	18	2.5	2.5	4.10	1.5	6.15	11.1	12	12	3	3	2	2	0.4	0.2	0.4





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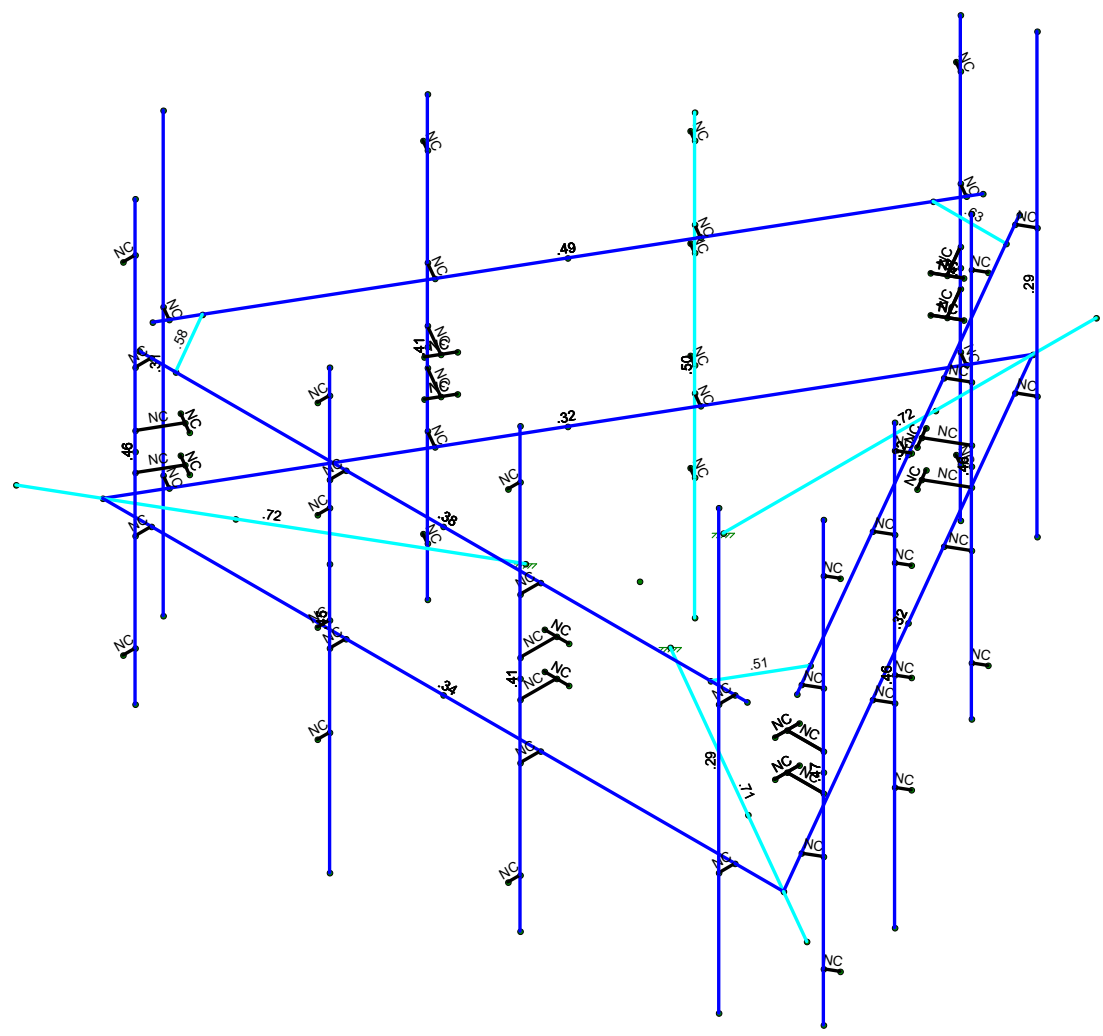
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GM  
CTL01051

Mount Analysis  
3D Render

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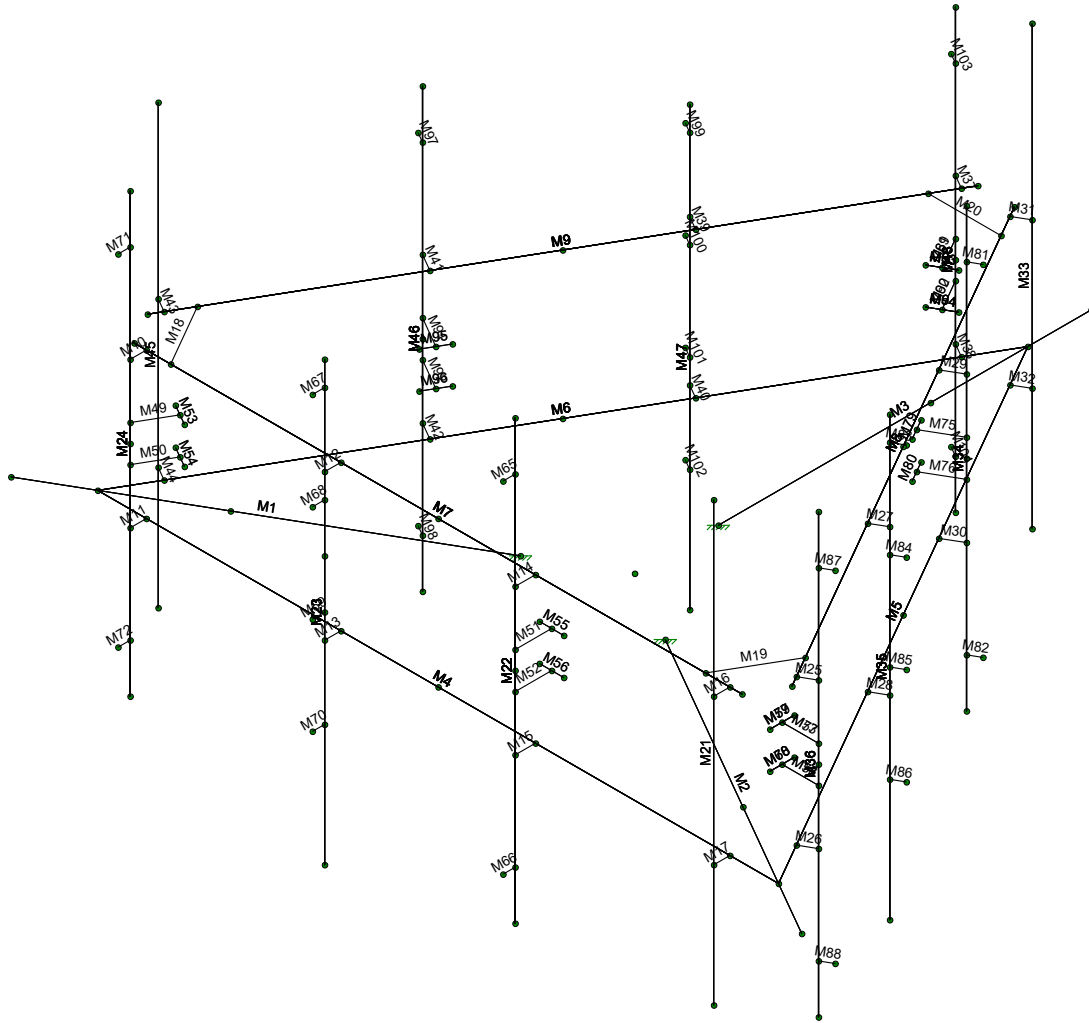


Code Check (Env)	
■	No Calc
■	> 1.0
■	.90-1.0
■	.75-.90
■	.50-.75
■	0-.50



Member Code Checks Displayed (Enveloped)  
Envelope Only Solution

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CTL01051		CTL01051 - Mount Analysis - Rev ...



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GM

CTL01051

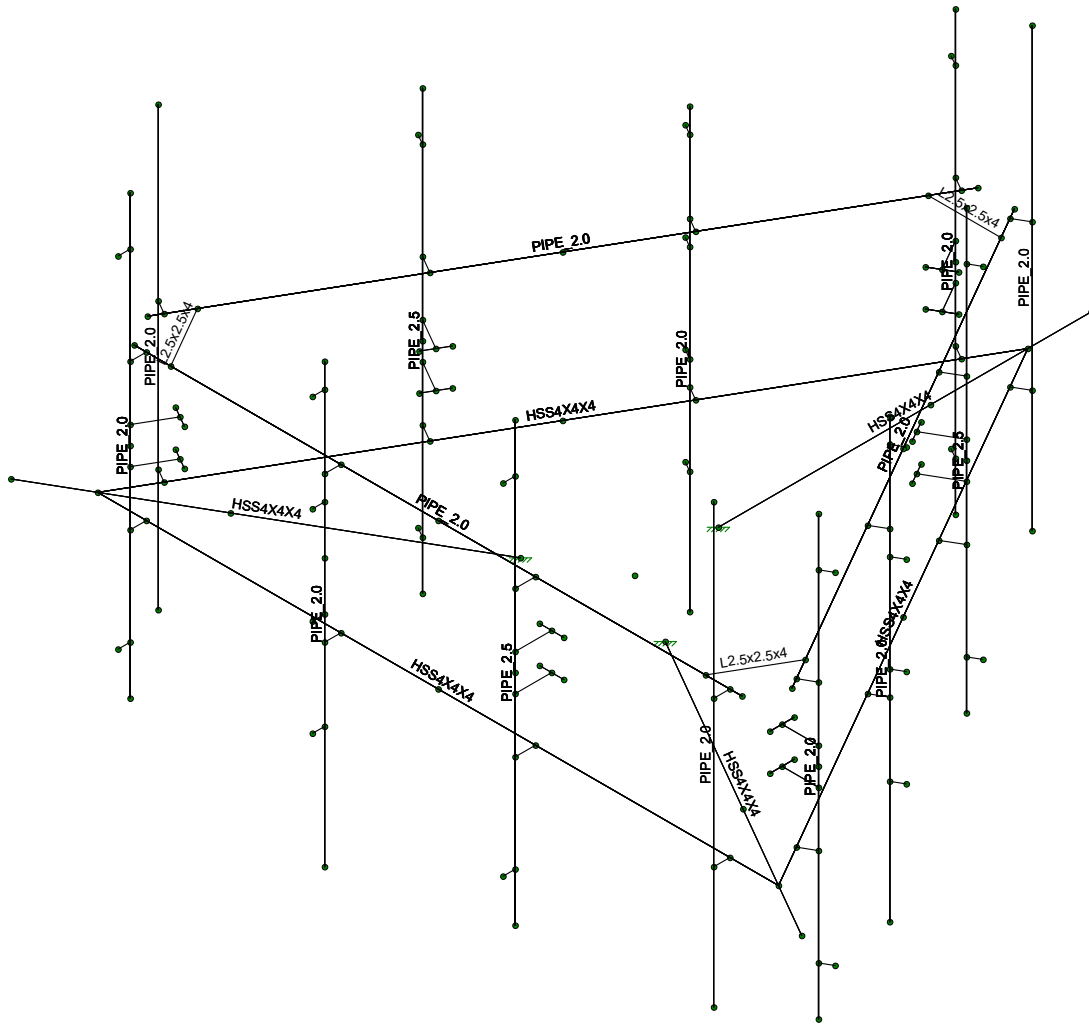
Mount Analysis

Member Label

SK - 3

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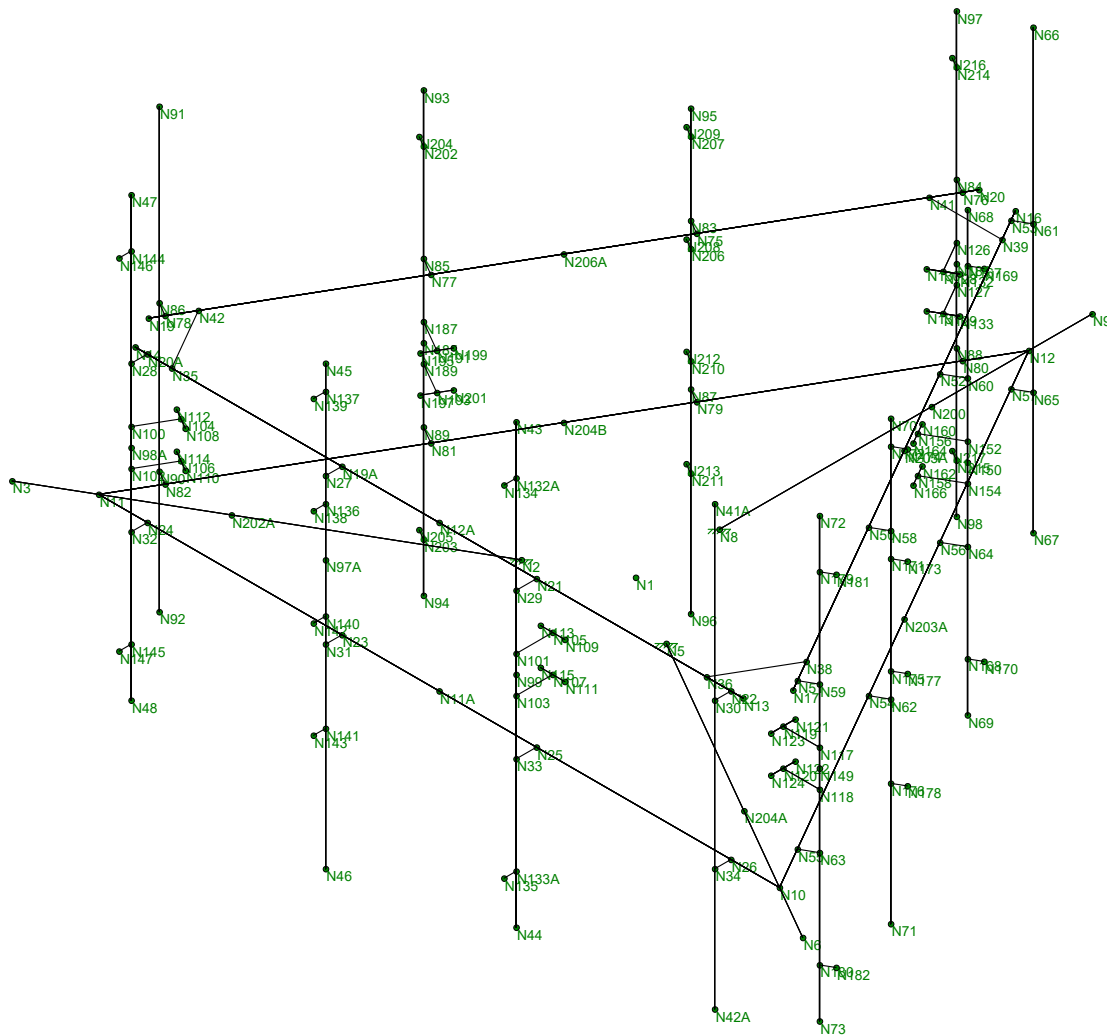
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Mount Analysis  
Shapes

SK - 4

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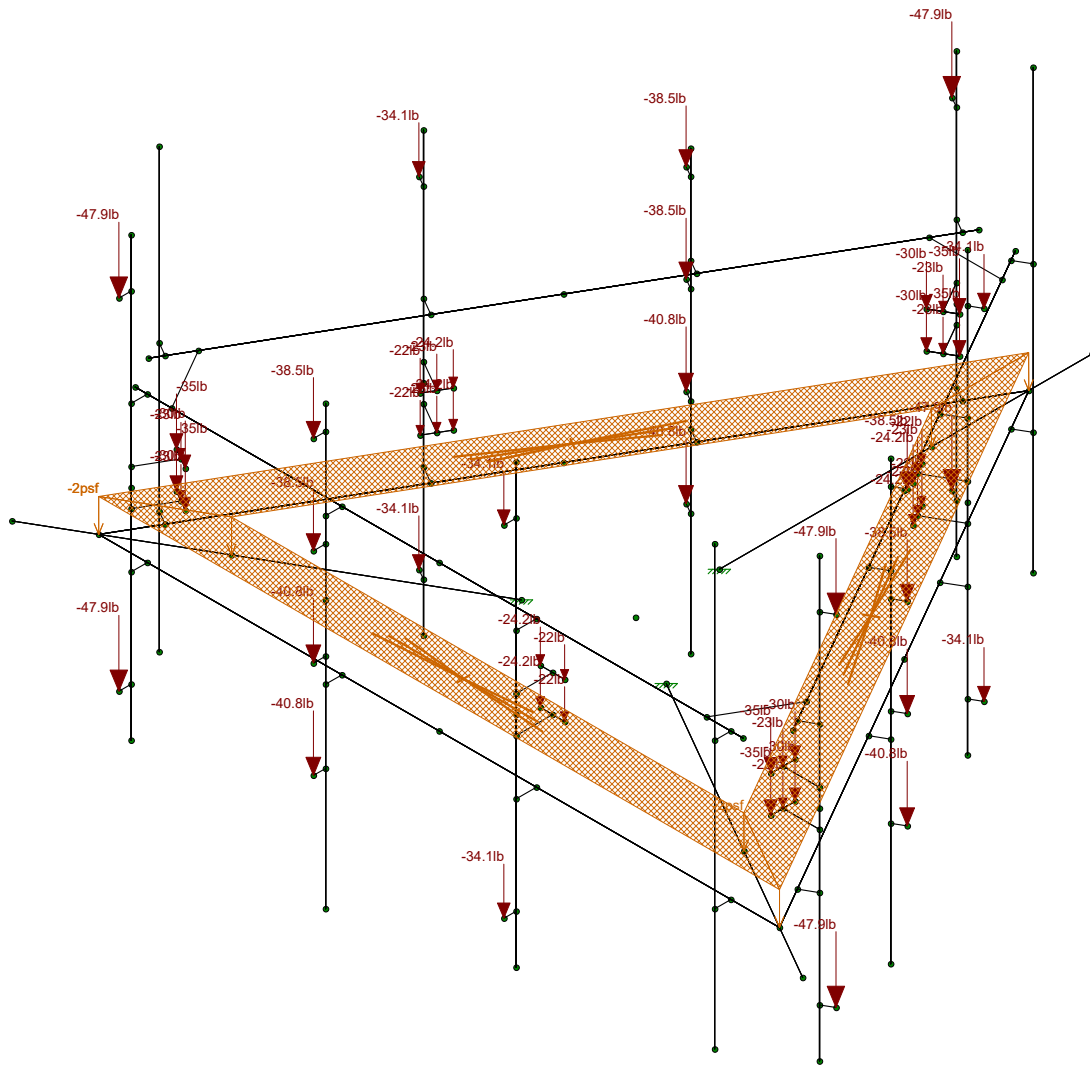
CTL01051

Mount Analysis  
Nodes

SK - 5

Mar 15, 2022 at 12:10 PM

CTL01051 - Mount Analysis - Rev ...

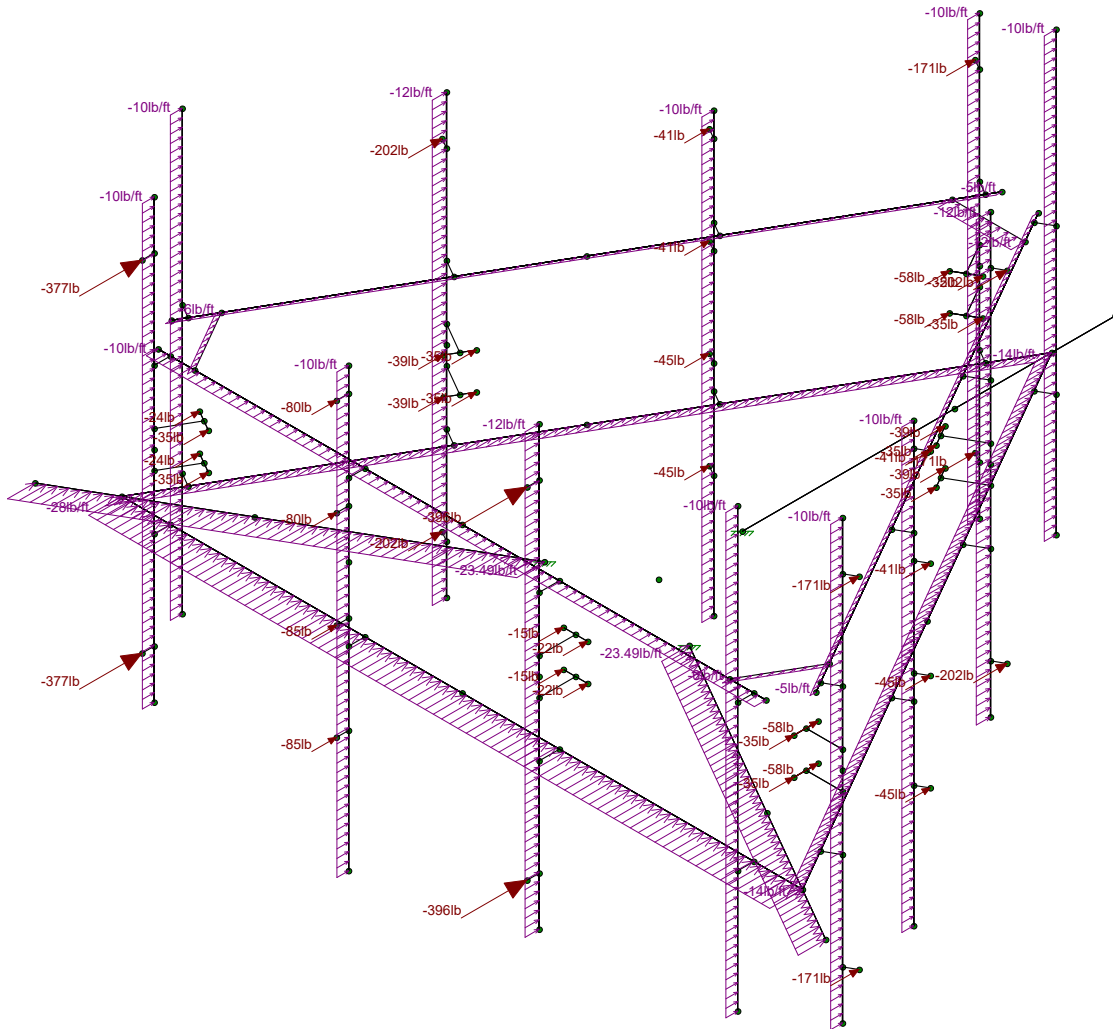


Loads: BLC 1, DL  
Envelope Only Solution

Fullerton Engineering, P.C.  
GM  
CTL01051

Mount Analysis  
Dead Load

SK - 6  
Mar 15, 2022 at 12:10 PM  
CTL01051 - Mount Analysis - Rev ...

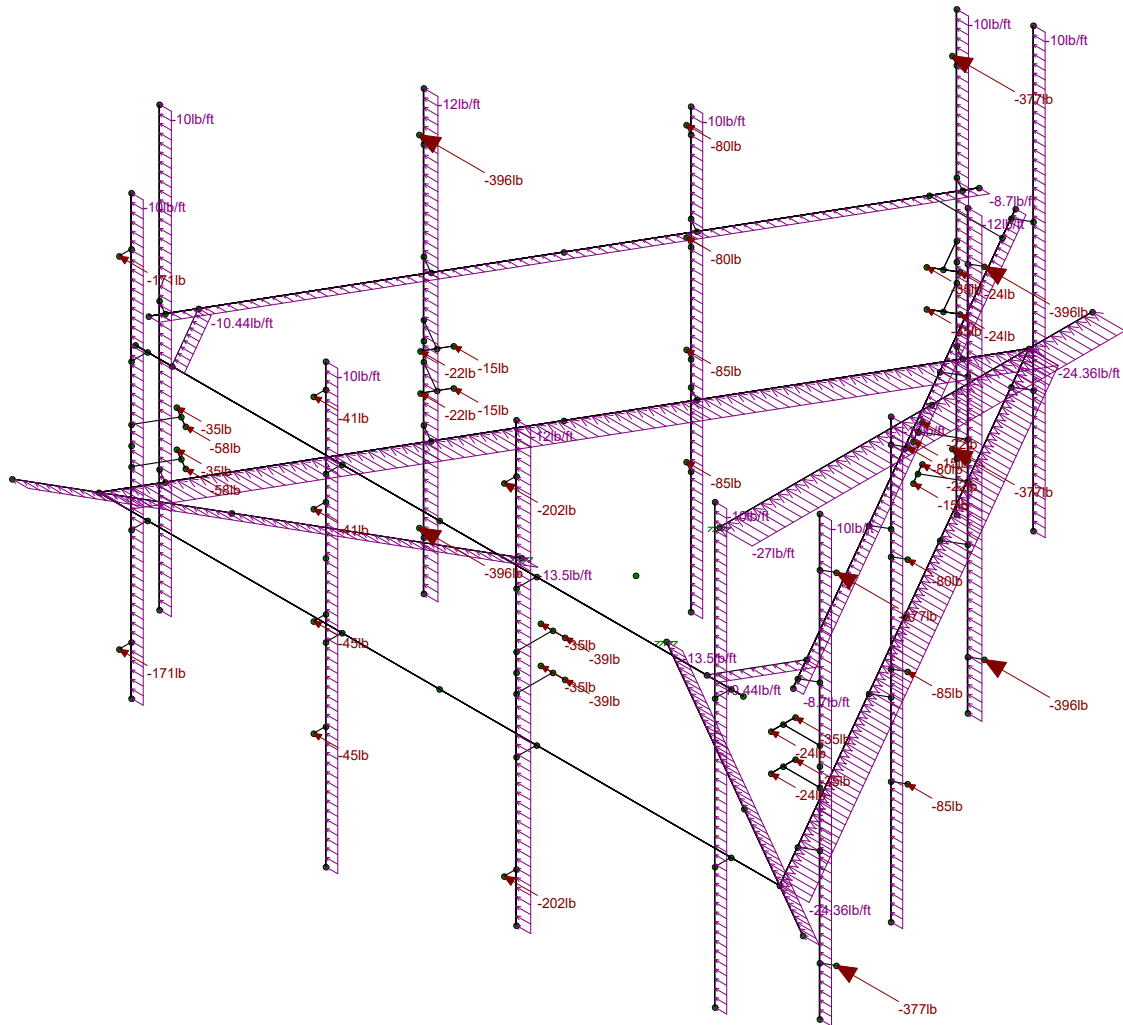


Loads: BLC 3, WL(0)  
Envelope Only Solution

Fullerton Engineering, P.C.  
GM  
CTL01051

Mount Analysis  
Wind Load (Z-Direction)

SK - 7  
Mar 15, 2022 at 12:11 PM  
CTL01051 - Mount Analysis - Rev ...



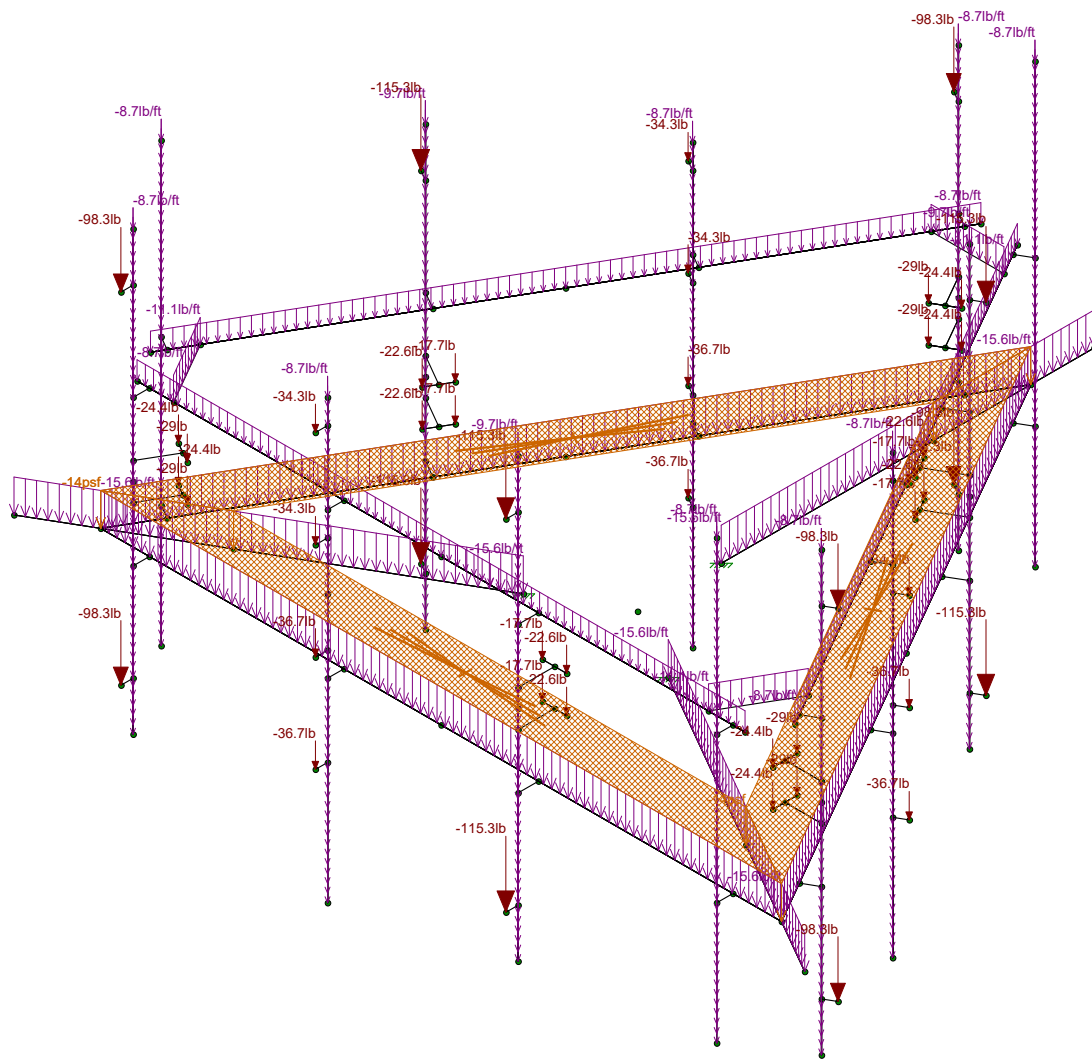
Loads: BLC 4, WL(90)  
Envelope Only Solution

Fullerton Engineering, P.C.
GM
CTL01051

Mount Analysis  
Wind Load (X-Direction)

SK - 8
Mar 15, 2022 at 12:11 PM
CTL01051 - Mount Analysis - Rev ...



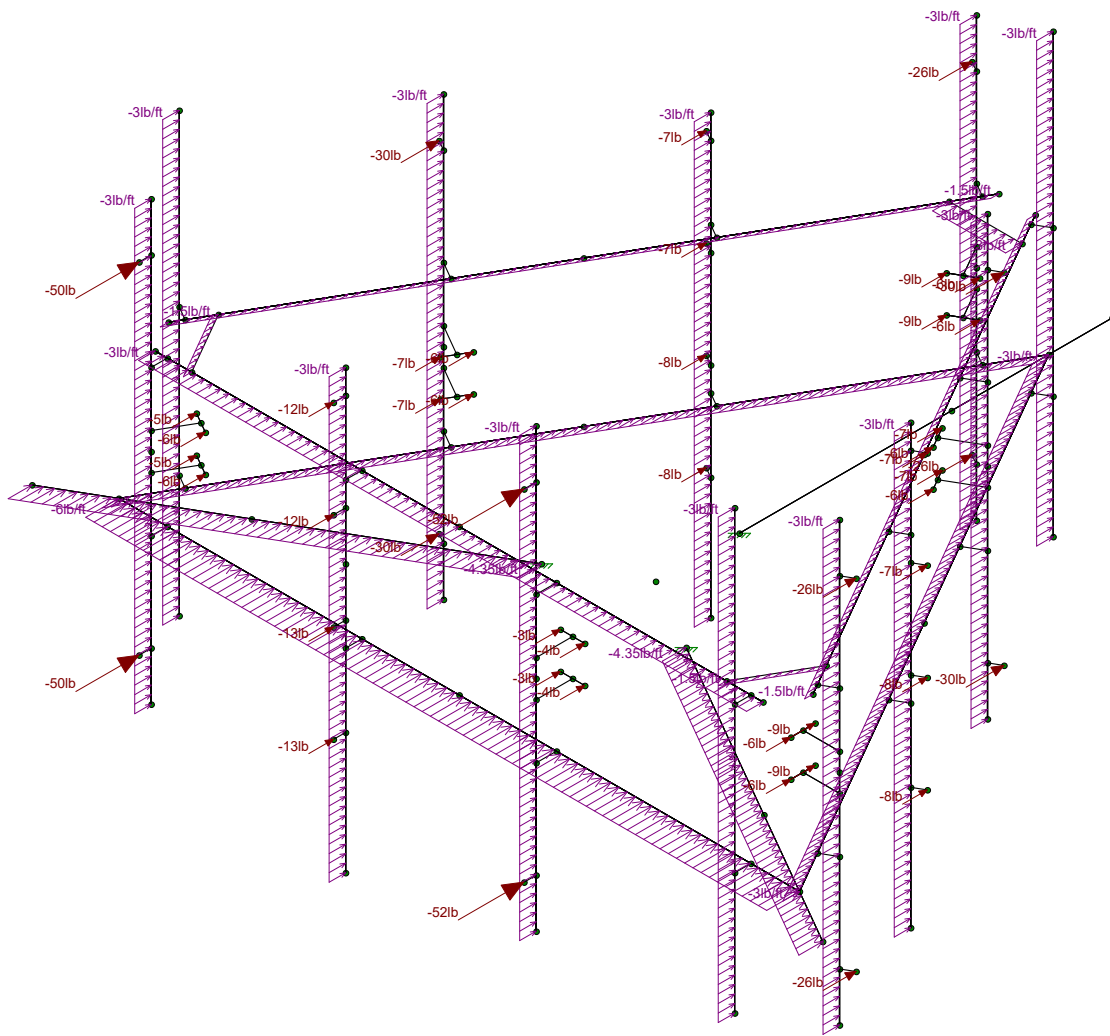


Loads: BLC 2, DL1  
Envelope Only Solution

Fullerton Engineering, P.C.  
GM  
CTL01051

Mount Analysis  
Ice Load

SK - 9  
Mar 15, 2022 at 12:11 PM  
CTL01051 - Mount Analysis - Rev ...

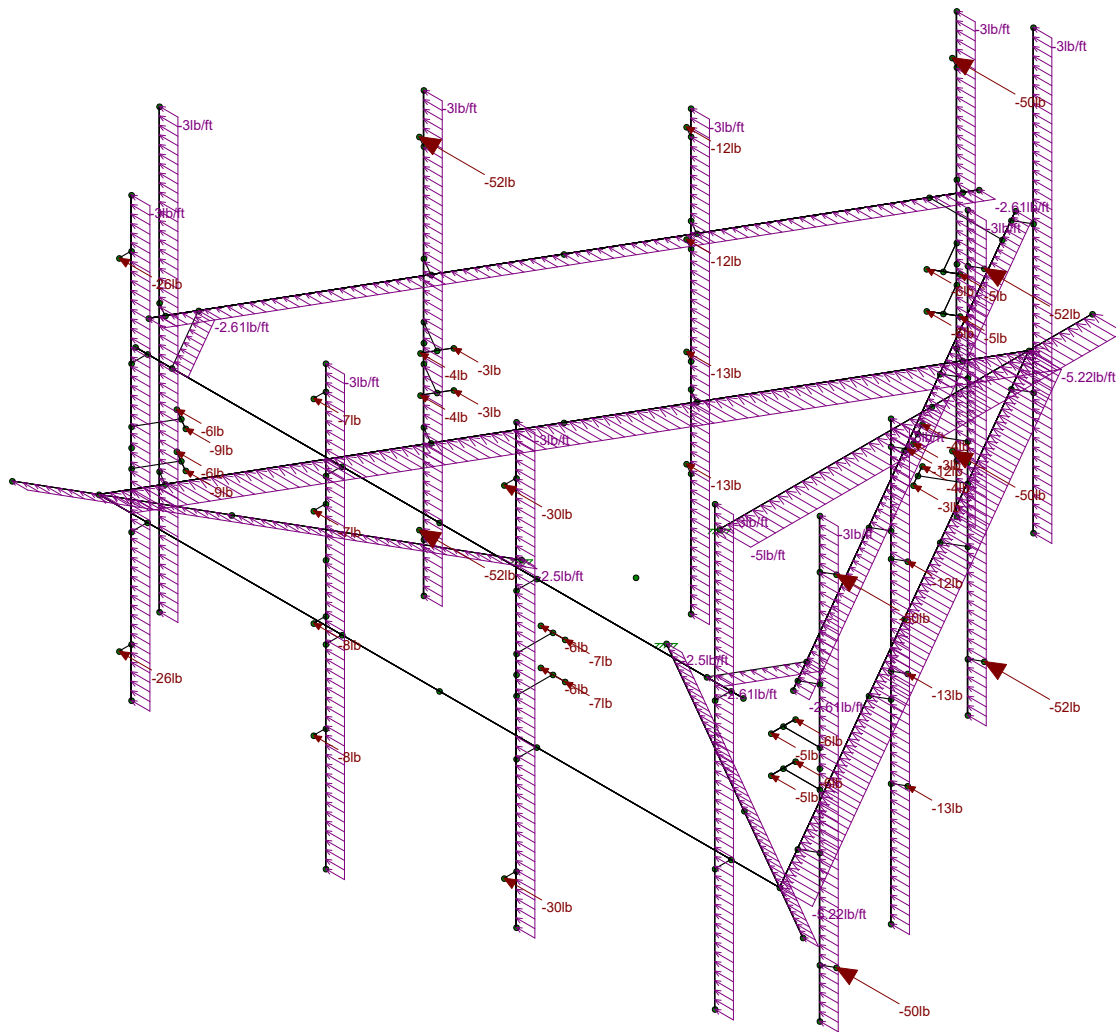


Loads: BLC 5, WL.i(0)  
Envelope Only Solution

Fullerton Engineering, P.C.  
GM  
CTL01051

Mount Analysis  
Wind Load w/ Ice (Z-Direction)

SK - 10  
Mar 15, 2022 at 12:12 PM  
CTL01051 - Mount Analysis - Rev ...



Loads: BLC 6, WL.i(90)  
Envelope Only Solution

Fullerton Engineering, P.C.

GM

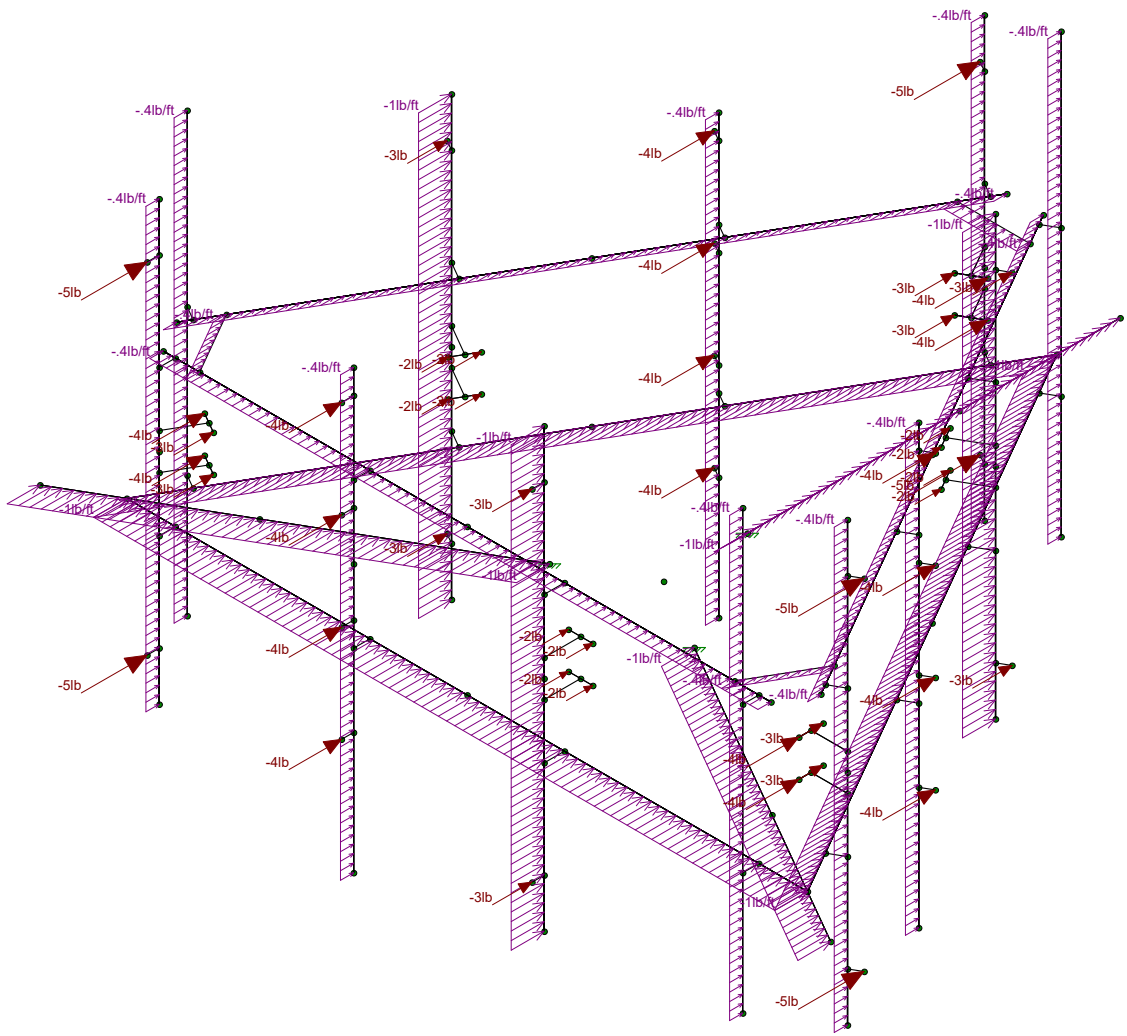
CTL01051

Mount Analysis  
Wind Load w/ Ice (X-Direction)

SK - 11

Mar 15, 2022 at 12:12 PM

CTL01051 - Mount Analysis - Rev ...

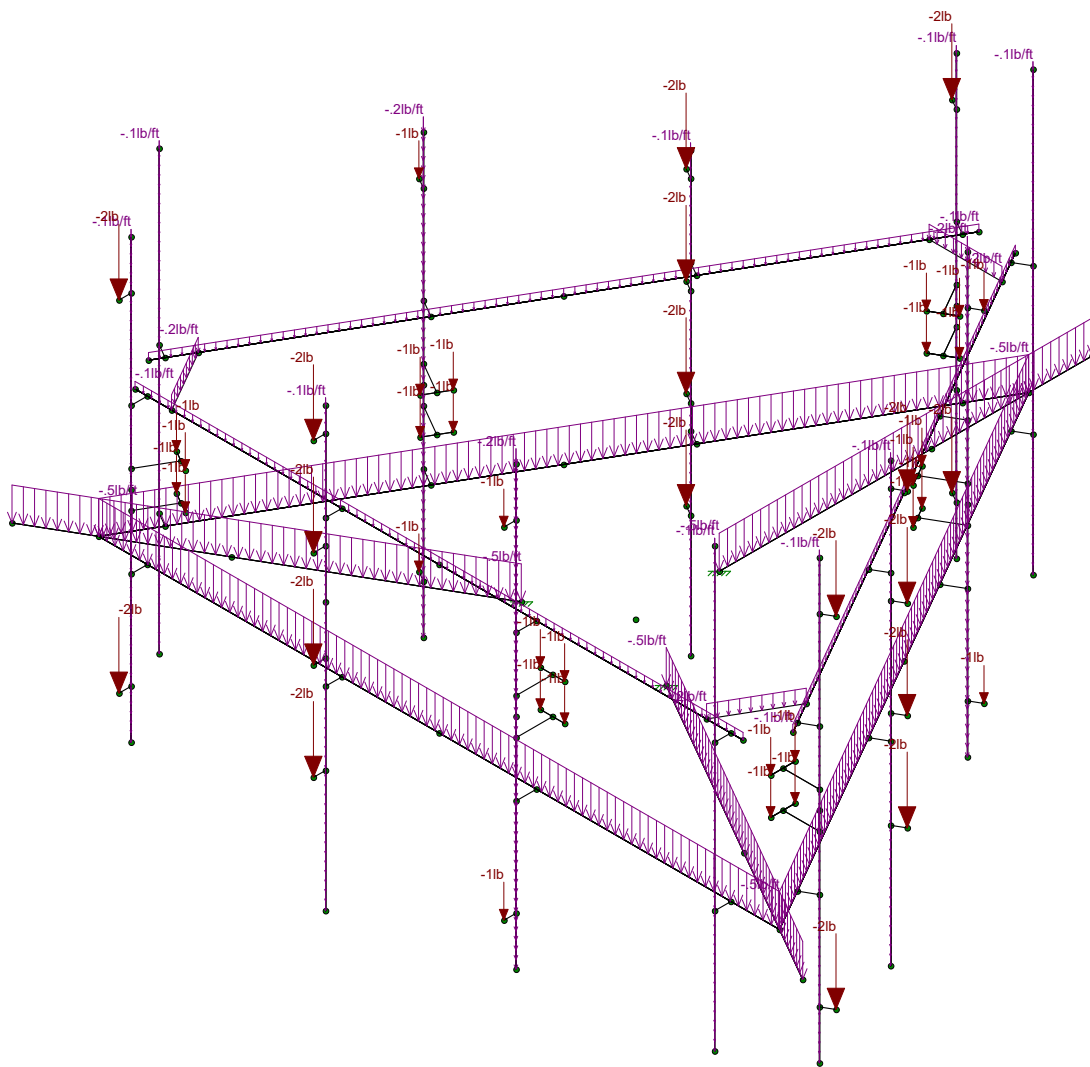


Loads: BLC 8, EH(0)  
Envelope Only Solution

Fullerton Engineering, P.C.  
GM  
CTL01051

Mount Analysis  
Horizontal Seismic

SK - 12  
Mar 15, 2022 at 12:12 PM  
CTL01051 - Mount Analysis - Rev ...

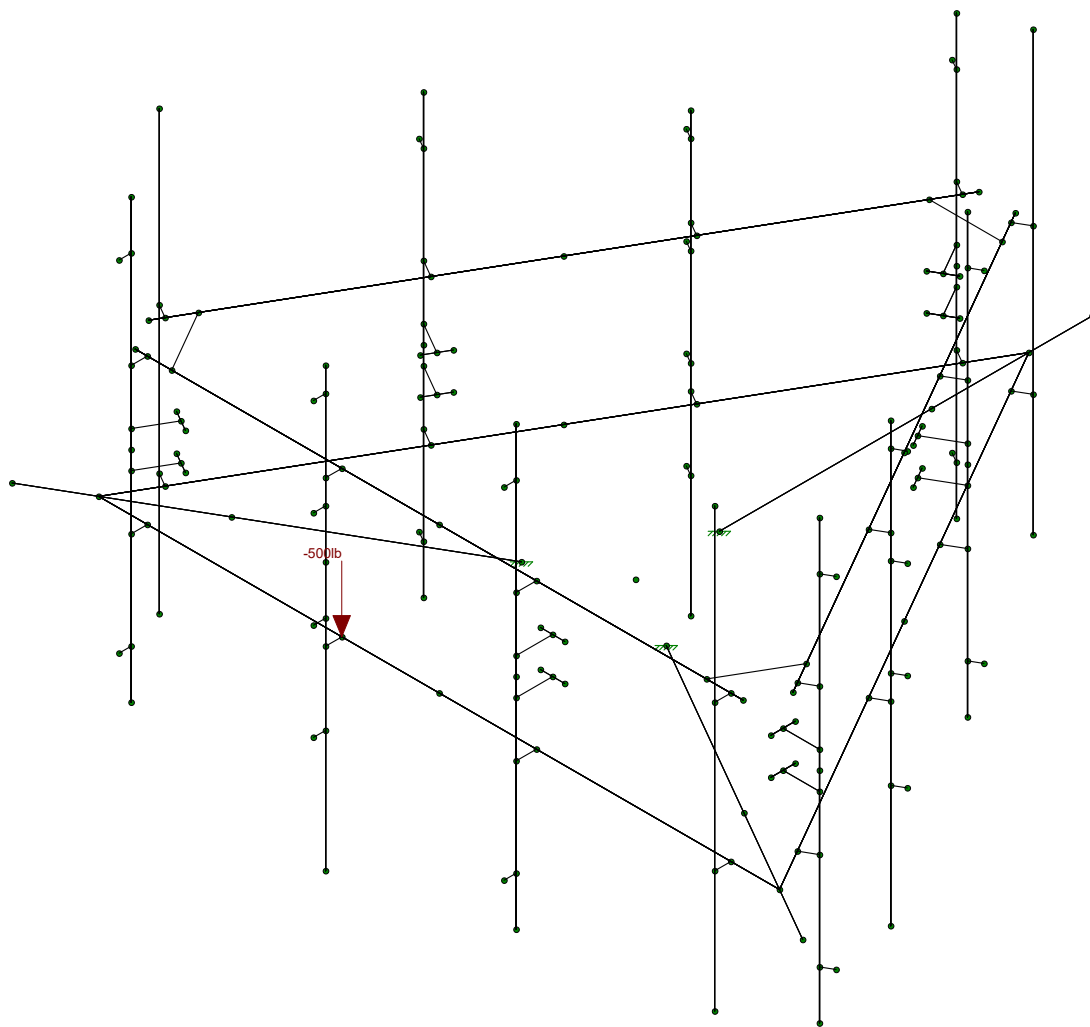


Loads: BLC 10, EV  
Envelope Only Solution

Fullerton Engineering, P.C.  
GM  
CTL01051

Mount Analysis  
Vertical Seismic

SK - 13  
Mar 15, 2022 at 12:13 PM  
CTL01051 - Mount Analysis - Rev ...



Loads: BLC 15, LM3  
Envelope Only Solution

Fullerton Engineering, P.C.

GM

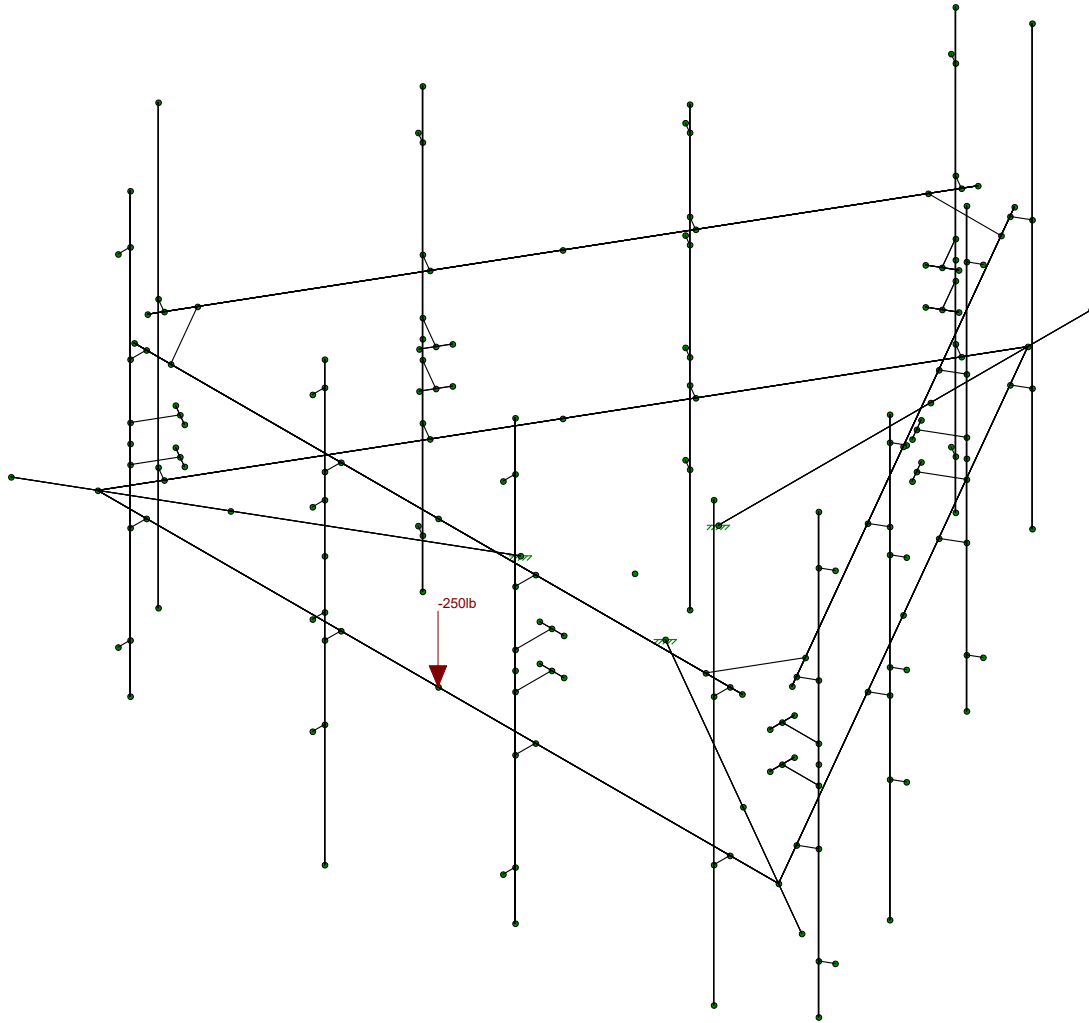
CTL01051

Mount Analysis  
500lb Live Load

SK - 14

Mar 15, 2022 at 12:13 PM

CTL01051 - Mount Analysis - Rev ...



Loads: BLC 25, LV1  
Envelope Only Solution

Fullerton Engineering, P.C.

GM

CTL01051

Mount Analysis  
250lb Live Load

SK - 15

Mar 15, 2022 at 12:13 PM

CTL01051 - Mount Analysis - Rev ...









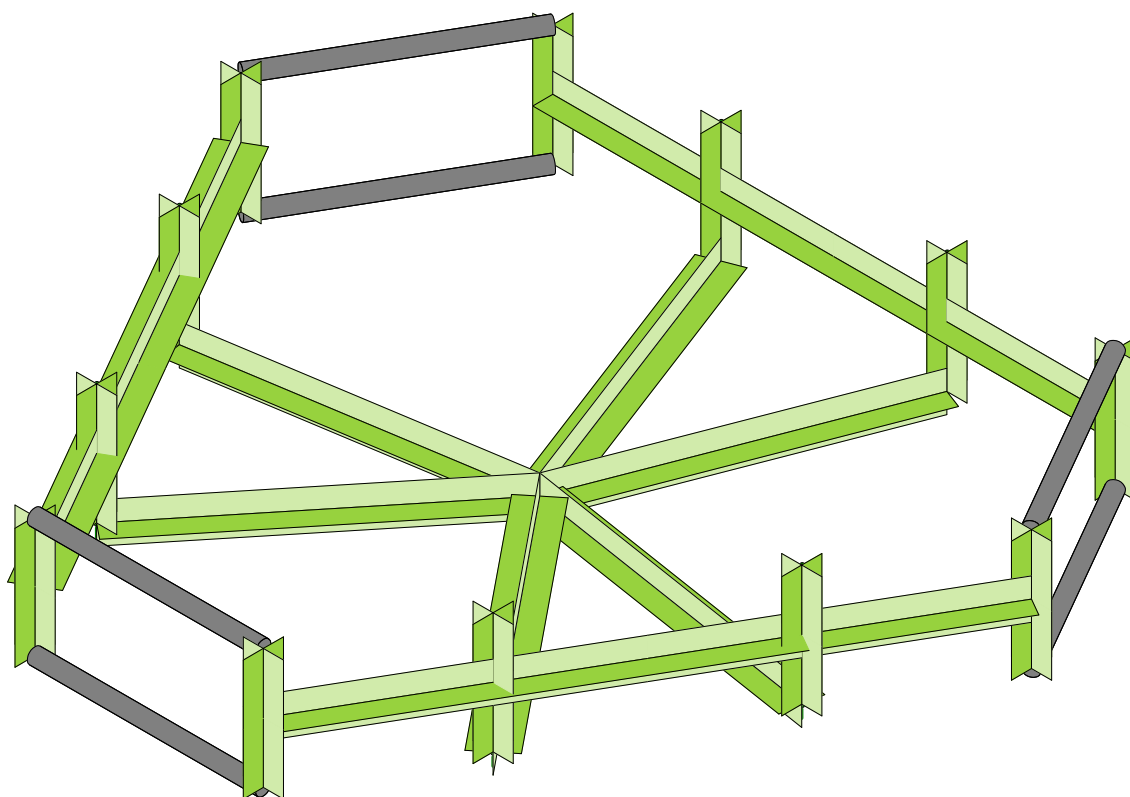












Envelope Only Solution

Fullerton Engineering, P.C.  
GM  
CTL01051

Collar Mount Analysis  
3D Render

SK - 1

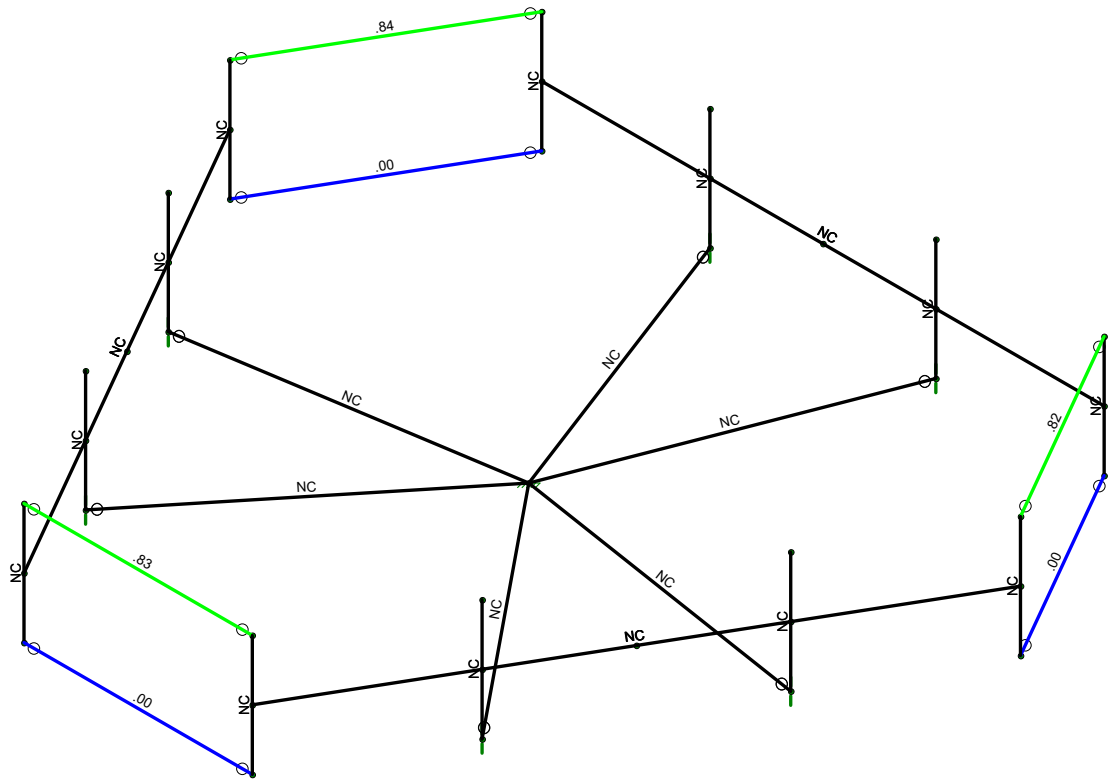
Mar 15, 2022 at 12:23 PM

CTL01051 - Collar Mount Analysis...



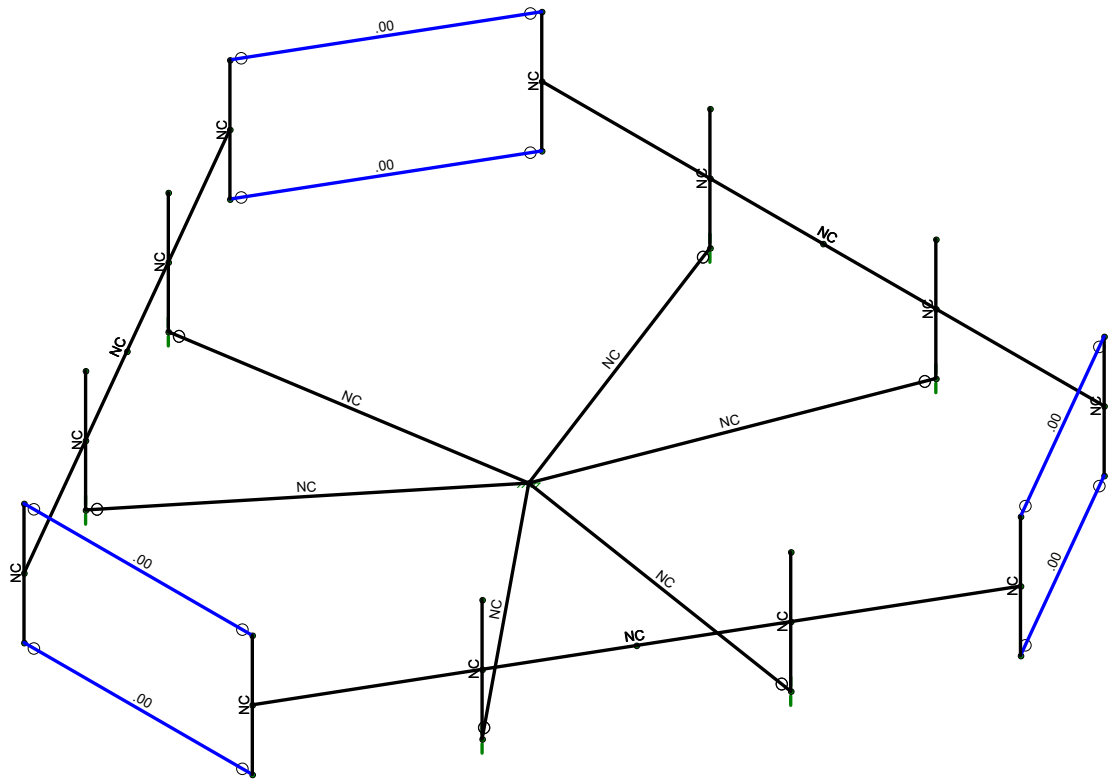
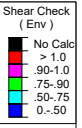


Code Check (Env)	
Black	No Calc
Red	> 1.0
Pink	.90-1.0
Green	.75-.90
Cyan	.50-.75
Blue	0-.50



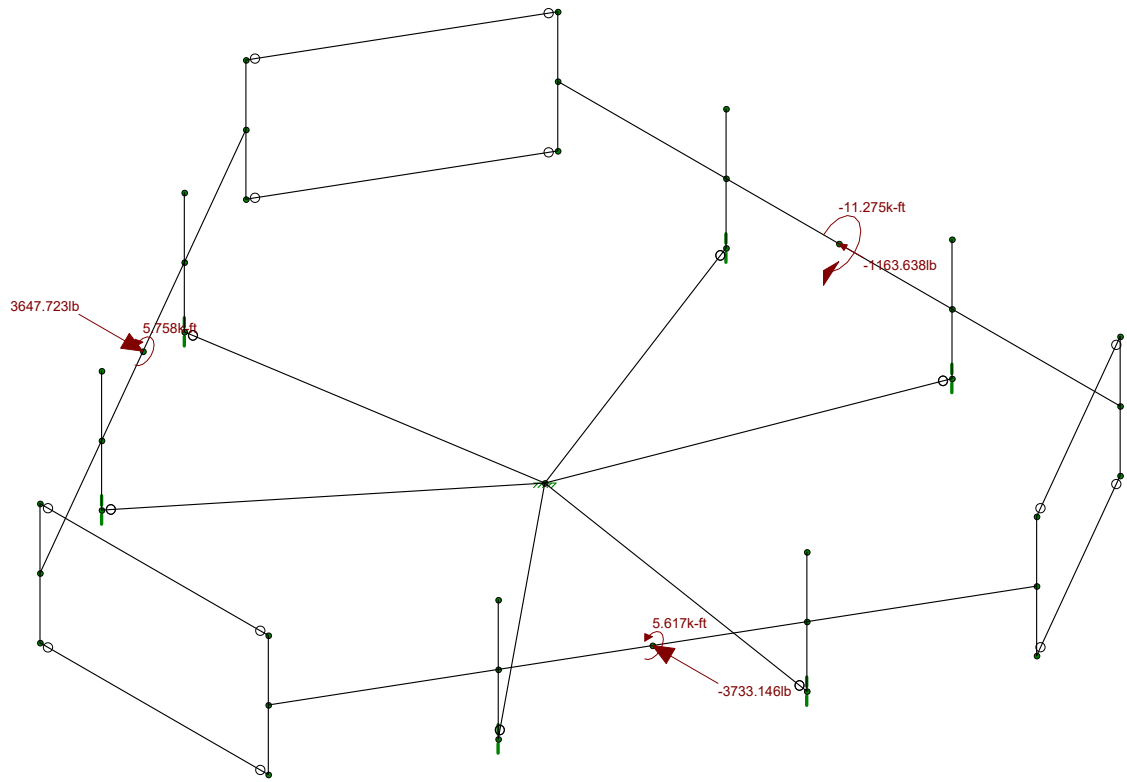
Member Code Checks Displayed (Enveloped)  
Envelope Only Solution

Fullerton Engineering, P.C.	Collar Mount Analysis Unity Graphic	SK - 2
GM		Mar 15, 2022 at 12:23 PM
CTL01051		CTL01051 - Collar Mount Analysis....



Member Shear Checks Displayed (Enveloped)  
Envelope Only Solution

Fullerton Engineering, P.C.	Collar Mount Analysis Shear Graphic	SK - 3
GM		Mar 15, 2022 at 12:24 PM
CTL01051		CTL01051 - Collar Mount Analysis....



Loads: BLC 1, Max X  
Envelope Only Solution

Fullerton Engineering, P.C.

GM

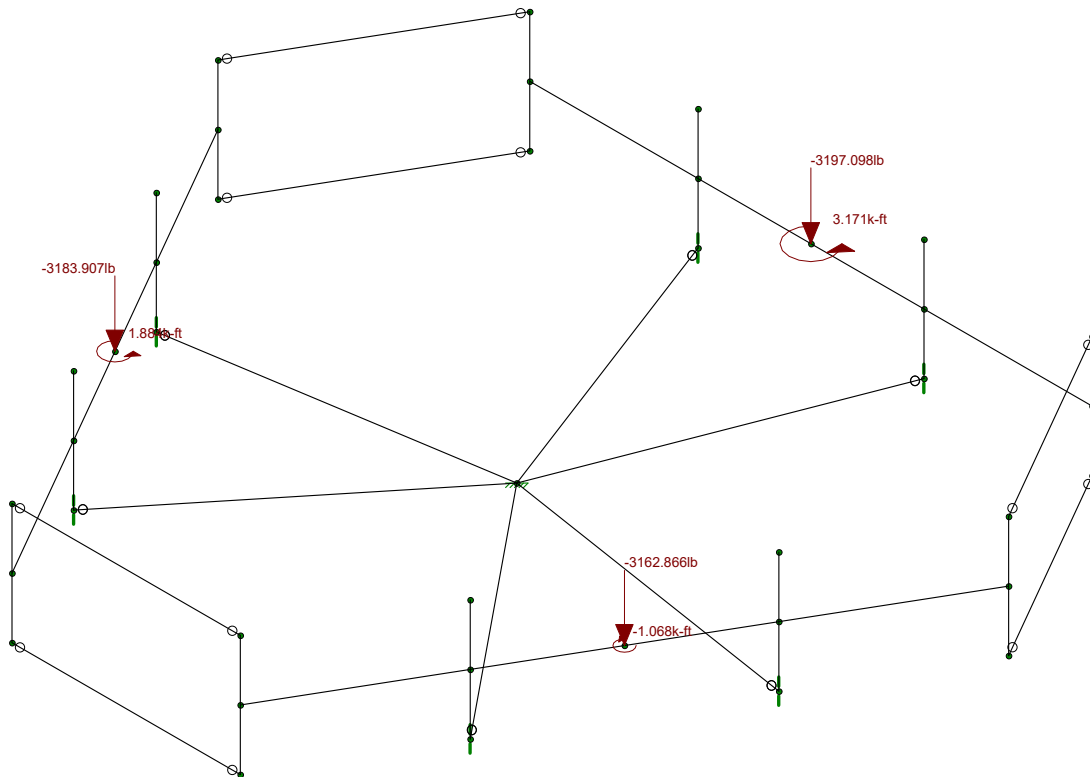
CTL01051

Collar Mount Analysis  
Max X Reactions

SK - 4

Mar 15, 2022 at 12:24 PM

CTL01051 - Collar Mount Analysis....



Loads: BLC 2, Max Y  
Envelope Only Solution

Fullerton Engineering, P.C.

GM

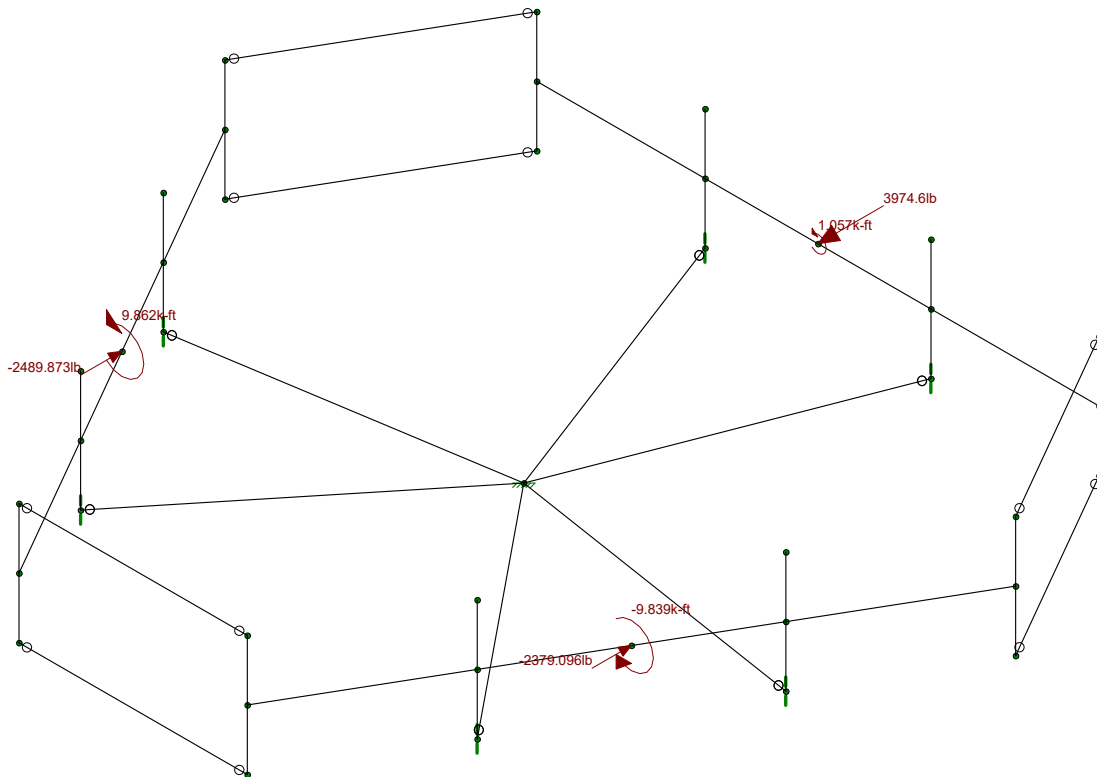
CTL01051

Collar Mount Analysis  
Max Y Reactions

SK - 5

Mar 15, 2022 at 12:24 PM

CTL01051 - Collar Mount Analysis....



Loads: BLC 3, Max Z  
Envelope Only Solution

Fullerton Engineering, P.C.

GM

CTL01051

Collar Mount Analysis  
Max Z Reactions

SK - 6

Mar 15, 2022 at 12:24 PM

CTL01051 - Collar Mount Analysis....











# ANTENNA MOUNT MAPPING CHECKLIST

## Mount Detail

Mount Type	Platform
Mount Model Number	
If RT, then how is it attached	
If WT, then how is it attached	

## Mount Mapping Detail

Material condition (discoloration, cracks, pitting)	Good
Mfg. drawing, cutsheet, spec. available?	No
Date of mount mapping (if one exists)	
Searched prior OOM for material?	
Photos of installation available?	No
Original tower drawings show mounts?	
Searched for previous mapping?	
Is latest mod design (dwgs) available?	Yes
Is the latest structural analysis available?	Yes

## Project Detail

Market	Connecticut
PACE Project ID	MRCTB055027/MRCTB055801 MRCTB055358/MRCTB054360 MRCTB056719
Site Name	Willimatic ECSU
City, State	Willimatic, CT
RFDS Version Number	2
Initiative (list mult., if applicable)	
Tower Owner	
SA Vendor	
A&E firm (for structural analysis)	Fullerton Engineering Consultants, LLC
A&E firm (for mapping, if different)	
Last amendment date or last site visit	
Is a site audit required on this project	

## Site Information

Original Lease Date	
FA Code	10035388
Tower Type	Monopole
Tower Height (Ft)	175
AT&T Rad Center # 1	138
AT&T Rad Center # 2	

## Measurements and Deliverables on sketches

Pipe / Angle dimensions and lengths	
bolt diameters and lengths	
U-Bolt diameters and lengths	
Steel Grade if indicated	
welds :length and sizes	
appurtenance relative locations	
Grounding Condition	

Equipment Detail	Model	Height	Approz Az	mount location
Antennas	Quintel QD8616-7	138'-0"	0/120/240	A2/B2/C2
Antennas	Ericsson AIR6449 B77D	138'-0"	0/120/240	A3/B3/C3
Antennas	Ericsson AIR6419 B77G	138'-0"	0/120/240	A3/B3/C3
Antennas	CCI DMP65R-BU8DA	138'-0"	0/120/240	A4/B4/C4
RRU	Ericsson Radio 4478 B14	138'-0"	0/120/240	A2/B2/C2
RRU	Ericsson Radio 4426 B66	138'-0"	0/120/240	A2/B2/C2
RRU	Ericsson RRUS-32 B30	138'-0"	0/120/240	A4/B4/C4
RRU	Ericsson Radio 4449 B5/B12	138'-0"	0/120/240	A4/B4/C4
RRU	Ericsson RRUS 4415 B25	138'-0"		Tower
Coax				
RET (not imbedded in antenna)				
DC Cable				
Fiber Cable				
Squid	Raycap DC6-48-60-18F	138'-0"		Tower
Squid	Raycap DC9-48-60-24-8C-EV	138'-0"		Tower

## Comments



October 05, 2022

### Emissions Analysis for Site: **CTL01051– WILLIMANTIC ECSU**

MobileComm Professionals, Inc was directed to analyze the proposed AT&T facility located at **83 WINDHAM STREET, WILLIMANTIC, CT 06226**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was 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 milliwatts per square centimeter ( $\text{mW}/\text{cm}^2$ ). The number of  $\text{mW}/\text{cm}^2$  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 milliwatts per square centimeter ( $\text{mW}/\text{cm}^2$ ). The general population exposure limits for the 700 and 850 MHz Bands are approximately  $0.467 \text{ mW}/\text{cm}^2$  and  $0.567 \text{ mW}/\text{cm}^2$  respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS), 2300 MHz (WCS), 3450 MHz (DoD Band) and 3840 MHz (C Band) bands is  $1 \text{ mW}/\text{cm}^2$ . 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 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 and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

## 1. Theoretical Calculations

Calculations were done for the proposed AT&T Wireless antenna facility located at **83 WINDHAM STREET, WILLIMANTIC, CT 06226** using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 4 LTE channels (700 MHz Band 14) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 2) 2 LTE channels (700 MHz Band 29) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 3) 4 LTE/5G channels (1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 4) 4 5G channels (2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 5) 1 NR channel (DoD Band - 3450 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 108.44 Watts per Channel.
- 6) 1 NR channel (C Band - 3840 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 108.44 Watts per Channel.
- 7) 4 LTE channels (700 MHz Band 12) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 8) 4 5G channels (850 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 9) 4 LTE channels (WCS Band – 2300 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 25 Watts per Channel.

- 10) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 11) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 12) The antennas used in this modeling are the Quintel QD8616-7 for the 700 MHz(Band 14) / 700 MHz(Band 29) / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR6419 for the DoD Band (3450 MHz) channel(s), the Ericsson AIR6449 for the C Band (3840 MHz) channel(s), the CCI DMP65R-BU8D for the 700 MHz(Band 12) / 850 MHz / WCS Band (2300 MHz) channel(s) in Sector A, Quintel QD8616-7 for the 700 MHz(Band 14) / 700 MHz(Band 29) / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR6419 for the DoD Band (3450 MHz) channel(s), the Ericsson AIR6449 for the C Band (3840 MHz) channel(s), the CCI DMP65R-BU8D for the 700 MHz(Band 12) / 850 MHz / WCS Band (2300 MHz) channel(s) in Sector B, Quintel QD8616-7 for the 700 MHz(Band 14) / 700 MHz(Band 29) / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR6419 for the DoD Band (3450 MHz) channel(s), the Ericsson AIR6449 for the C Band (3840 MHz) channel(s), the CCI DMP65R-BU8D for the 700 MHz(Band 12) / 850 MHz / WCS Band (2300 MHz) channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 13) The antenna mounting height centerline of the proposed antennas is 138 feet above ground level (AGL).
- 14) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 15) All calculations were done with respect to uncontrolled / general population threshold limits.

## 2. Antenna Inventory & Power Data

Sector	Ant ID	Operator	Antenna Mfg	Antenna Model	Antenna Type	FREQ. (MHz)	TECH.	AZ. (°)	H B W (°)	Antenna Gain (dBd)	Antenna Aperture (ft)	#of Channels	Transmitter Power (Watts)	Total ERP (Watts)	Total EIRP (Watts)	Total Ant Transmitter Power (Watts)	Total Ant ERP(Watts)	Ant MPE%
A	1	AT&T	Quintel	QD8616-7	Panel	700	LTE(FN)	0	72	12.75	8	4	160.00	3014.92	4944.47	640	17871.84	4.35%
A	1	AT&T	Quintel	QD8616-7	Panel	700	LTE(B29)	0	72	12.75	8	2	80.00	1507.46	2472.24			
A	1	AT&T	Quintel	QD8616-7	Panel	1900	LTE/5G	0	62	15.05	8	4	160.00	5120.07	8396.92			
A	1	AT&T	Quintel	QD8616-7	Panel	2100	5G	0	62	15.35	8	4	240.00	8229.39	13496.19	108.44	24277.05	4.41%
A	2-1	AT&T	Ericsson	AIR 6419 B77G	Panel	3450	5G	0	11	23.5	2.55	1	108.44	24277.05	39828.68			
A	2-2	AT&T	Ericsson	AIR 6449 B77D	Panel	3840	5G	0	11	23.5	2.55	1	108.44	24277.05	39828.68	108.44	24277.05	4.64%
A	3	AT&T	CCI	DMP65R-BU8D	Panel	700	LTE(B12)	0	75	12.95	8	4	160.00	3157.01	5177.50	420	10977.90	3.32%
A	3	AT&T	CCI	DMP65R-BU8D	Panel	850	5G	0	64	13.85	8	4	160.00	3883.97	6369.71			
A	3	AT&T	CCI	DMP65R-BU8D	Panel	2300	LTE	0	64	15.95	8	4	100.00	3936.92	6456.54			
B	4	AT&T	Quintel	QD8616-7	Panel	700	LTE(FN)	120	72	12.75	8	4	160.00	3014.92	4944.47	640	17871.84	4.35%
B	4	AT&T	Quintel	QD8616-7	Panel	700	LTE(B29)	120	72	12.75	8	2	80.00	1507.46	2472.24			
B	4	AT&T	Quintel	QD8616-7	Panel	1900	LTE/5G	120	62	15.05	8	4	160.00	5120.07	8396.92			
B	4	AT&T	Quintel	QD8616-7	Panel	2100	5G	120	62	15.35	8	4	240.00	8229.39	13496.19	108.44	24277.05	4.41%
B	5-1	AT&T	Ericsson	AIR 6419 B77G	Panel	3450	5G	120	11	23.5	2.55	1	108.44	24277.05	39828.68			
B	5-2	AT&T	Ericsson	AIR 6449 B77D	Panel	3840	5G	120	11	23.5	2.55	1	108.44	24277.05	39828.68	108.44	24277.05	4.64%
B	6	AT&T	CCI	DMP65R-BU8D	Panel	700	LTE(B12)	120	75	12.95	8	4	160.00	3157.01	5177.50	420	10977.90	3.32%
B	6	AT&T	CCI	DMP65R-BU8D	Panel	850	5G	120	64	13.85	8	4	160.00	3883.97	6369.71			
B	6	AT&T	CCI	DMP65R-BU8D	Panel	2300	LTE	120	64	15.95	8	4	100.00	3936.92	6456.54			
C	7	AT&T	Quintel	QD8616-7	Panel	700	LTE(FN)	240	72	12.75	8	4	160.00	3014.92	4944.47	640	17871.84	4.35%
C	7	AT&T	Quintel	QD8616-7	Panel	700	LTE(B29)	240	72	12.75	8	2	80.00	1507.46	2472.24			
C	7	AT&T	Quintel	QD8616-7	Panel	1900	LTE/5G	240	62	15.05	8	4	160.00	5120.07	8396.92			
C	7	AT&T	Quintel	QD8616-7	Panel	2100	5G	240	62	15.35	8	4	240.00	8229.39	13496.19	108.44	24277.05	4.41%
C	8-1	AT&T	Ericsson	AIR 6419 B77G	Panel	3450	5G	240	11	23.5	2.55	1	108.44	24277.05	39828.68			
C	8-2	AT&T	Ericsson	AIR 6449 B77D	Panel	3840	5G	240	11	23.5	2.55	1	108.44	24277.05	39828.68	108.44	24277.05	4.64%
C	9	AT&T	CCI	DMP65R-BU8D	Panel	700	LTE(B12)	240	75	12.95	8	4	160.00	3157.01	5177.50	420	10977.90	3.32%
C	9	AT&T	CCI	DMP65R-BU8D	Panel	850	5G	240	64	13.85	8	4	160.00	3883.97	6369.71			
C	9	AT&T	CCI	DMP65R-BU8D	Panel	2300	LTE	240	64	15.95	8	4	100.00	3936.92	6456.54			

**Table 2.1: Antenna Inventory & Power Data**

\*NOTE: 75% Duty Cycle and adjusted power reduction factor of 0.32 was applied to the AIR6449 & AIR6419 antennas per guidance from AT&T. Specifications were not available for the Ericsson AIR 6419 antenna. Per AT&T, specifications for the AIR 6449 antenna were used to model the 6419 due to its similarity.

Cumulative Site MPE%	
Carrier	MPE%
AT&T (Max MPE% at Sector A)	16.72%
T-Mobile	19.85%
Nextel	0.52%
Sprint	0.75%
Cingular Various (FM, UHP & VHF Whip, Parabolic Dish, CPTV MW)	5.44%
<b>Site Total MPE%</b>	<b>43.28%</b>

**Table 2.2: Cumulative Site MPE%**

AT&T Max MPE% Per Sector	
AT&T Sector A Total	16.72%
AT&T Sector B Total	16.72%
AT&T Sector C Total	16.72%
<b>Site Total MPE%</b>	<b>43.28%</b>

**Table 2.3: AT&T MPE% Per Sector**

Sector	Ant ID	Operator	Antenna Mfg	Antenna Model	FREQ. (MHz)	TECH.	#of Channels	Transmitter Power (Watts)	Total ERP (Watts)	Total EIRP (Watts)	Height (ft)	Total Power Density (mW/cm <sup>2</sup> )	Allowable MPE (mW/cm <sup>2</sup> )	Calculated MPE%
A	1	AT&T	Quintel	QD8616-7	700	LTE(B14)	4	160.00	3014.92	4944.47	138.00	0.005695	0.467	1.22%
A	1	AT&T	Quintel	QD8616-7	700	LTE(B29)	2	80.00	1507.46	2472.24	138.00	0.002848	0.467	0.61%
A	1	AT&T	Quintel	QD8616-7	1900	LTE/5G	4	160.00	5120.07	8396.92	138.00	0.009672	1.000	0.97%
A	1	AT&T	Quintel	QD8616-7	2100	5G	4	240.00	8229.39	13496.19	138.00	0.015546	1.000	1.55%
A	2-1	AT&T	Ericsson	AIR 6419 B77G	3450	5G	1	108.44	24277.05	39828.68	140.72	0.044121	1.000	4.41%
A	2-2	AT&T	Ericsson	AIR 6449 B77D	3840	5G	1	108.44	24277.05	39828.68	137.17	0.046434	1.000	4.64%
A	3	AT&T	CCI	DMP65R-BU8D	700	LTE(B12)	4	160.00	3157.01	5177.50	138.00	0.005964	0.467	1.28%
A	3	AT&T	CCI	DMP65R-BU8D	850	5G	4	160.00	3883.97	6369.71	138.00	0.007337	0.567	1.29%
A	3	AT&T	CCI	DMP65R-BU8D	2300	LTE	4	100.00	3936.92	6456.54	138.00	0.007437	1.000	0.74%
													<b>Total</b>	<b>16.72%</b>

**Table 2.4: Detailed MPE% at AT&T Sector A**

### 3. Compliance Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC’s allowable limits for general public exposure to RF Emissions are shown here:

or	Power Density Value (%)
Sector A	16.72%
Sector B	16.72%
Sector C	16.72%
AT&T Maximum Total (per sector)	16.72%
<b>Site Total MPE%</b>	<b>43.28%</b>
<b>Site Compliance Status</b>	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is 43.28% of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were within the allowable 100% threshold standard per the federal government.