March 9, 2018

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

Re: **Notice of Exempt Modification – Antenna Swap**
Property Address: **4286 WHITNEY AVENUE HAMDEN, CT 06518**
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 116-feet on an existing 116'-6" –utility mono- pole, owned by EVERSOURCE f/k/a CL&P 107 SELDEN STREET BERLIN, CT 06037. AT&T now intends install (3) NEW ANTENNAS TO REPLACE (3) EXISTING ANTENNAS, INSTALL NEW HANDRAIL KIT, (3) NEW RRUS-32 B2 UNITS, (6) NEW TMA UNITS (TOP), UPGRADE DUL TO 5216, (1) NEW XMU CARD (6) NEW COAX CABLES (6) NEW DIPLEXERS at the (BOTTOM).

This site was originally approved by the Connecticut siting Council to replace/ expand an existing wood H frame with a steel utility pole on Petition No.744 New Cingular Wireless PCS, LLC (Cingular)Hamden, Connecticut Staff Report November 17, 2005 at height of 116'-6" with up to 12 panel antennas at 116 feet. A 12x20 equipment shelter was also approved. SEE ATTACHED.

The following is a subsequent decision by the Connecticut Siting Council:

EM-AT&T-062-121019 - AT&T Mobility notice of intent to modify an existing telecommunications facility located at 4286 Whitney Avenue, Hamden, 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. § 16-5I0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to Mayor, Curt B. Leng Hamden CT and Daniel W. Kops, Jr., Hamden CT Town Planner at the Government Center 2750 Dixwell Avenue Hamden, CT 06518. A copy of this letter is also being sent to Joel Szarkowicz – Transmission Line Engineer, Eversource 107 Selden Street Berlin Connecticut 6037.

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 116-foot level of the 116-utility monopole.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

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

Sincerely,

David Barbagallo

Enclosures
CC w/enclosures:

Mayor, Curt B. Leng Hamden CT - as elected official
Daniel W. Kops, Jr., Hamden CT Town Planner
Joel Szarkowicz, Eversource Transmission Line Engineer

Connecticut Siting Council

Staff Reports

Petition No. 744
New Cingular Wireless PCS, LLC (Cingular)
Hamden, Connecticut
Staff Report
November 17, 2005

On November 9, 2005, Connecticut Siting Council (Council) member Gerald J. Heffernan and Christina Lepage of Council staff met with New Cingular Wireless PCS (Cingular) representatives Christopher Fisher and Doug Drost at the proposed site off of Whitney Avenue (State Route 10) in Hamden to review this petition. Cingular proposes to replace and expand an existing and approved Connecticut Light & Power (CL&P) transmission structure (#5215). Cingular is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for this facility.

CL&P's easement is 165 feet wide as it crosses Route 10 in Hamden. The easement currently consists of three 115-kV transmission lines, two of which are located on separate 57 foot wood H-frame structures and the third is located on an 80 foot lattice structure. The Council's Decision and Order for Docket 272 approved the replacement of the wood H-frame structures, the consolidation of two 115-kV transmission lines onto new steel monopole structures, the addition of a 345-kV transmission line onto a second set of new steel monopole structures and the demolition of the lattice towers and denergizing of the third 115-kV line. The Council approved structures up to 123 feet in height along this section of the easement.

Cingular proposes to replace one existing wood H-frame structure with a steel monopole, as approved in Docket 272. CL&P requires a 95 foot steel monopole in this location to accommodate two relocated 115-kV transmission circuits.

Cingular would construct a 116 foot steel monopole, with the total height of the structure including appurtenances not exceeding 119 feet above ground level (agl). Cingular proposes to install 12 panel antennas on a low profile platform to be mounted at the 116 foot level of the structure. The proposed monopole would accommodate a future wireless carrier to be located at the 106 foot level.

Equipment would be installed within an irregularly shaped approximately 1,280 square foot compound. Cingular would construct a 12 foot by 20 foot equipment shelter located on a concrete pad near the base of the structure. The equipment compound would be approximately 43 feet from Route 10 and would be surrounded by a six foot chain link fence.

Access to the site would be along a gravel access road extending from Route 10. The existing guardrail would be reworked in compliance with Connecticut Department of Transportation requirements. Erosion and sediment control measures would be installed in accordance with the "Connecticut Guidelines for Soil Erosion and Sediment Control."

The proposed cumulative radio frequency electromagnetic radiation is approximately 11.5 percent of the ANSI/IEEE standard.

Content Last Modified on 12/15/2005 1:38:32 PM

Town of Hamden, CT

Property Listing Report

Map Block Lot **3429-001-00-0000** Account

Property Information

Property Location	**4280 WHITNEY AVE**
Owner	**HAMDEN TOWN OF**
Co-Owner	
Mailing Address	**2750 DIXWELL AVE** **HAMDEN CT 06518**
Land Use	**903V MUNICIPAL MDL-00**
Land Class	**E**
Zoning Code	**T1**
Census Tract	**W**
Sub Lot	
Neighborhood	**130**
Acreage	**38.92**
Lot Setting/Desc	**Suburban Below Street**
Survey Map	
Utilities	**Public Water,Public Sewer,Gas/Electric**
Additional Info	

Photo

3429-001-00-0000 04/22/2015

Sketch

Primary Construction Details

Year Built		Bedrooms		Exterior Walls	
Stories		Full Bathrooms		Interior Walls	
Building Style		Half Bathrooms		Heating Type	
Building Use		Bath Style		Heating Fuel	
Building Condition		Kitchen Style		AC Type	
Floors		Roof Style		Gross Bldg Area	
Total Rooms		Roof Cover		Total Living Area	

Report Created On **3/9/2018**

Town of Hamden, CT

Property Listing Report | Map Block Lot **3429-001-00-0000** | Account

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings		
Extras		
Outbuildings		
Land		
Total		

Outbuilding and Extra Items

Type	Description

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area		0

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
HAMDEN TOWN OF	3656/ 309	10/29/2009	700000
JUNIPER ASSOCIATES	599/ 833	8/20/1974	0

Report Created On **3/9/2018**

IMPORTANT!
FedEx is closely monitoring the winter storms across portions of the U.S. Learn More

771764886205

Ship date:
Tue 3/13/2018

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

Delivered
Signed for by: V.TRIPP

Actual delivery:
Wed 3/14/2018 11:3

Town of Hamden
Daniel W. Kops Jr.
Government Center
2750 Dixwell Ave.
HAMDEN, CT US 065
203 287-7070

Travel History

Date/Time	Activity	Loca
3/14/2018 - Wednesday		
11:32 am	Delivered	HAMDE
9:02 am	On FedEx vehicle for delivery	NORTH
8:45 am	At local FedEx facility	NORTH
3/13/2018 - Tuesday		
7:45 pm	At destination sort facility	EAST G
7:35 pm	Left FedEx origin facility	WINDSC
3:20 pm	Picked up	WINDSC
3/09/2018 - Friday		

-

1:00 pm Shipment information sent to FedEx

Shipment Facts

Tracking Number	771764886205	**Service**	FedEx Express Saver
Weight	0.5 lbs / 0.23 kgs	**Delivery attempts**	1
Delivered To	Receptionist/Front Desk	**Total pieces**	1
Total shipment weight	0.5 lbs / 0.23 kgs	**Terms**	Not Available
Packaging	FedEx Envelope	**Special handling section**	Deliver Weekday
Standard transit	3/16/2018 by 4:30 pm		

FOLLOW FEDEX

IMPORTANT!
FedEx is closely monitoring the winter storms across portions of the U.S. Learn More

771764945366

Ship date:
Tue 3/13/2018

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

Delivered
Signed for by: S.WING

Actual delivery:
Fri 3/16/2018 9:28 a

Eversource
Joel. Szarkowicz
107 Selden Street
BERLIN, CT US 0603
860 728-4503

Travel History

▲ Date/Time	Activity	Loca
▬ 3/16/2018 - Friday		
9:28 am	Delivered	BERLIN
8:35 am	On FedEx vehicle for delivery	WINDSC
7:20 am	At local FedEx facility	WINDSC
▬ 3/15/2018 - Thursday		
9:13 am	At local FedEx facility	WINDSC
8:38 am	At local FedEx facility	WINDSC
	Package not due for delivery	WINDSC

7:32 am	At local FedEx facility	

- 3/14/2018 - Wednesday

9:21 am	At local FedEx facility	WINDSC
9:06 am	At local FedEx facility Package not due for delivery	WINDSC
7:47 am	At local FedEx facility	WINDSC

- 3/13/2018 - Tuesday

10:18 pm	At local FedEx facility	WINDSC
3:20 pm	Picked up	WINDSC

- 3/09/2018 - Friday

1:03 pm	Shipment information sent to FedEx	

Shipment Facts

Tracking Number	771764945366	**Service**	FedEx Express Saver
Weight	0.5 lbs / 0.23 kgs	**Delivery attempts**	1
Delivered To	Mailroom	**Total pieces**	1
Total shipment weight	0.5 lbs / 0.23 kgs	**Terms**	Not Available
Packaging	FedEx Envelope	**Special handling section**	Deliver Weekday
Standard transit	3/16/2018 by 4:30 pm		

Change Country

English

FOLLOW FEDEX

IMPORTANT!
FedEx is closely monitoring the winter storms across portions of the U.S. Learn More

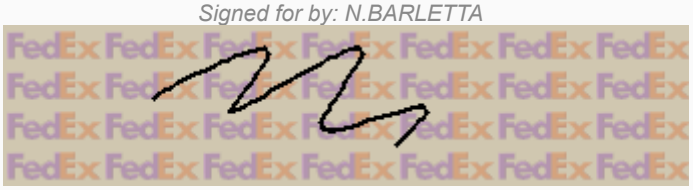
771764827397

Ship date:
Tue 3/13/2018

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

Delivered

Signed for by: N.BARLETTA



Actual delivery:
Wed 3/14/2018 11:3

Town of Hamden
Mayor Curt B. Leng
Government Center
2750 Dixwell Av
HAMDEN, CT US 065
203 287-7100

Travel History

▲ Date/Time	Activity	Loca
▬ 3/14/2018 - Wednesday		
11:32 am	Delivered	HAMDE
9:39 am	On FedEx vehicle for delivery	NORTH
8:44 am	At local FedEx facility	NORTH
▬ 3/13/2018 - Tuesday		
7:45 pm	At destination sort facility	EAST G
7:35 pm	Left FedEx origin facility	WINDSC
3:20 pm	Picked up	WINDSC

- 3/09/2018 - Friday

12:57 pm Shipment information sent to FedEx

Shipment Facts

Tracking Number	771764827397	**Service**	FedEx Express Saver
Weight	1 lbs / 0.45 kgs	**Delivery attempts**	1
Delivered To	Receptionist/Front Desk	**Total pieces**	1
Total shipment weight	1 lbs / 0.45 kgs	**Terms**	Not Available
Packaging	FedEx Pak	**Special handling section**	Deliver Weekday
Standard transit	3/16/2018 by 4:30 pm		

FOLLOW FEDEX

PROJECT:	LTE 2C
SITE NUMBER:	CTL02255
FA NUMBER:	10035414
PTN NUMBER:	2051A0D6T5
PACE NUMBER:	MRCTB025391
SITE NAME:	TOWN OF HAMDEN
SITE ADDRESS:	4286 WHITNEY AVENUE HAMDEN, CT 06518

PROJECT INFORMATION

SITE NAME:	TOWN OF HAMDEN
SITE NUMBER:	CTL02255
SITE ADDRESS:	4286 WHITNEY AVENUE HAMDEN, CT 06518
FA NUMBER:	10035414
PTN NUMBER:	2051A0D6T5
PACE NUMBER:	MRCTB025391
USID NUMBER:	88366
APPLICANT:	AT&T WIRELESS 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701
OWNER:	EVERSOURCE LIGHT FKA CL&P 107 SELDEN STREET BERLIN, CT 6037 CONTACT: JOEL SWARKOWICS PHONE: (860) 728-4503 EMAIL: joel.swarkowics.com
JURISDICTION:	TOWN OF HAMDEN
COUNTY:	NEW HAVEN
SITE COORDINATES FROM	(RFDS)
LATITUDE:	41.4482481°
LONGITUDE:	-72.9101381°
GROUND ELEV.:	112'
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
AT&T RF MANAGER:	DEEPAK RATHORE
PHONE:	(860) 965-3068
EMAIL:	dr701e@att.com

PROJECT CONSULTANTS

PROJECT MANAGER:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	EDWARD WEISSMAN (917) 528-1857
EMAIL:	Edward.Weissman@smartlinkllc.com
SITE AQUISITION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	SHARON KEEFE (978) 930-3918
EMAIL:	Sharon.Keefe@smartlinkllc.com
ENGINEER/ARCHITECT:	FULLERTON ENGINEERING
ADDRESS:	1100 E. WOODFIELD ROAD, SUITE 500 SCHAUMBURG, IL 60173
CONTACT:	MILEN DIMITROV (847) 908-8439
EMAIL:	MDimitrov@FullertonEngineering.com
CONSTRUCTION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	MARK DONNELLY (617) 515-2080
EMAIL:	mark.donnelly@smartlinkllc.com

SCOPE OF WORK

LTE 1900 WILL BE 2C AT THE SITE WITH BRONZE CONFIGURATION.
PROPOSED 2C PROJECT SCOPE HEREIN BASED ON RFDS ID # 1831443, VERSION 2.00 LAST UPDATED 11/29/17.

- (3) NEW ANTENNAS TO REPLACE (3) EXISTING ANTENNAS
- INSTALL NEW HANDRAIL KIT
- (3) NEW RRUS-32 B2 UNIT
- (6) NEW TMA UNITS (TOP)
- UPGRADE DUL TO 5216
- (1) NEW XMU CARD
- (6) NEW COAX CABLES
- (6) NEW DIPLEXERS (BOTTOM)

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

SITE LOCATION MAP

NO SCALE

DIRECTIONS

SCAN QR CODE FOR LINK TO SITE LOCATION MAP

APPLICABLE BUILDING CODES AND STANDARDS

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

BUILDING CODE:	2012 INTERNATIONAL BUILDING CODE 2016 CONNECTICUT STATE BUILDING CODE SUPPLEMENT
ELECTRICAL CODE:	2014 NATIONAL ELECTRIC CODE

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

DRAWING INDEX

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

at&t
550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

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

REV	DATE	DESCRIPTION	BY
0	10/23/17	90% REVIEW	EB
1	11/17/17	FOR PERMIT	EB
2	01/08/18	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
TOWN OF HAMDEN

SITE NUMBER:
CTL02255

SITE ADDRESS
4286 WHITNEY AVENUE
HAMDEN, CT 06518

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

PROJECT# 2017.0278.0027

GENERAL CONSTRUCTION

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR/CM – SMARTLINK
   OWNER – AT&T WIRELESS
2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.
3. GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.
12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
15. CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
16. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
17. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.
19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.
20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
21. THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2-A OT 2-A:10-B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.
23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
24. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
25. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE-APPROVED BY THE LOCAL JURISDICTION.
28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.
30. CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS-BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.
31. CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).
33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.
35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
36. CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.
37. CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
38. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
39. NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.

ANTENNA MOUNTING

40. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA-222 OR APPLICABLE LOCAL CODES.
41. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
42. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
43. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
44. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
45. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
46. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50-OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
47. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/- 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/- 0.5% AS DEFINED BY THE RFDS. REFER TO ND-00246.
48. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
49. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
50. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

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

FIBER & POWER CABLE MOUNTING

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

COAXIAL CABLE NOTES

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

    ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
63. CONTRACTOR SHALL VERIFY THE DOWN-TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
64. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.
65. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'-0".
66. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'-0" OC.
67. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
68. CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.
69. CONTRACTOR SHALL PROVIDE STRAIN-RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN-RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
70. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

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

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

SITE NAME
TOWN OF HAMDEN

SITE NUMBER:
CTL02255

SITE ADDRESS
4286 WHITNEY AVENUE
HAMDEN, CT 06518

SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP1

PROJECT# 2017.0278.0027

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.

at&t

Ref: 47CFR 1.1307(b)

ALERTING SIGNS

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.

at&t

Ref: 47CFR 1.1307(b)

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/EEE C95.1-1992 FOR CONTROLLED ENVIRONMENTS.

at&t

ALERTING SIGN

PROPERTY OF AT&T

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_____

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 telecomunicationes operadas por AT&T. Favor mantener una distancia de no menos de 3 pies y obedecer todos los avisos.

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

Comuniquese con AT&T _____antes de realizar cualquier mantenimiento o reparaciones cerca de la antenas de AT&T.

Esta es la estacion base numero_____

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

at&t

INFO SIGN #1

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# _____

at&t

INFO SIGN #2

STAY BACK 3 FEET FROM ANTENNA

at&t

INFO SIGN #3

ALERTING SIGN
(FOR CELL SITE BATTERIES)

ALERTING SIGN
(FOR DIESEL FUEL)

ALERTING SIGN
(FOR PROPANE)

GENERAL SIGNAGE GUIDELINES

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

NOTES FOR ROOFTOP SITES:

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

SIGNAGE GUIDELINES CHART

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SITE NUMBER:
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SITE ADDRESS
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HAMDEN, CT 06518

SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP2

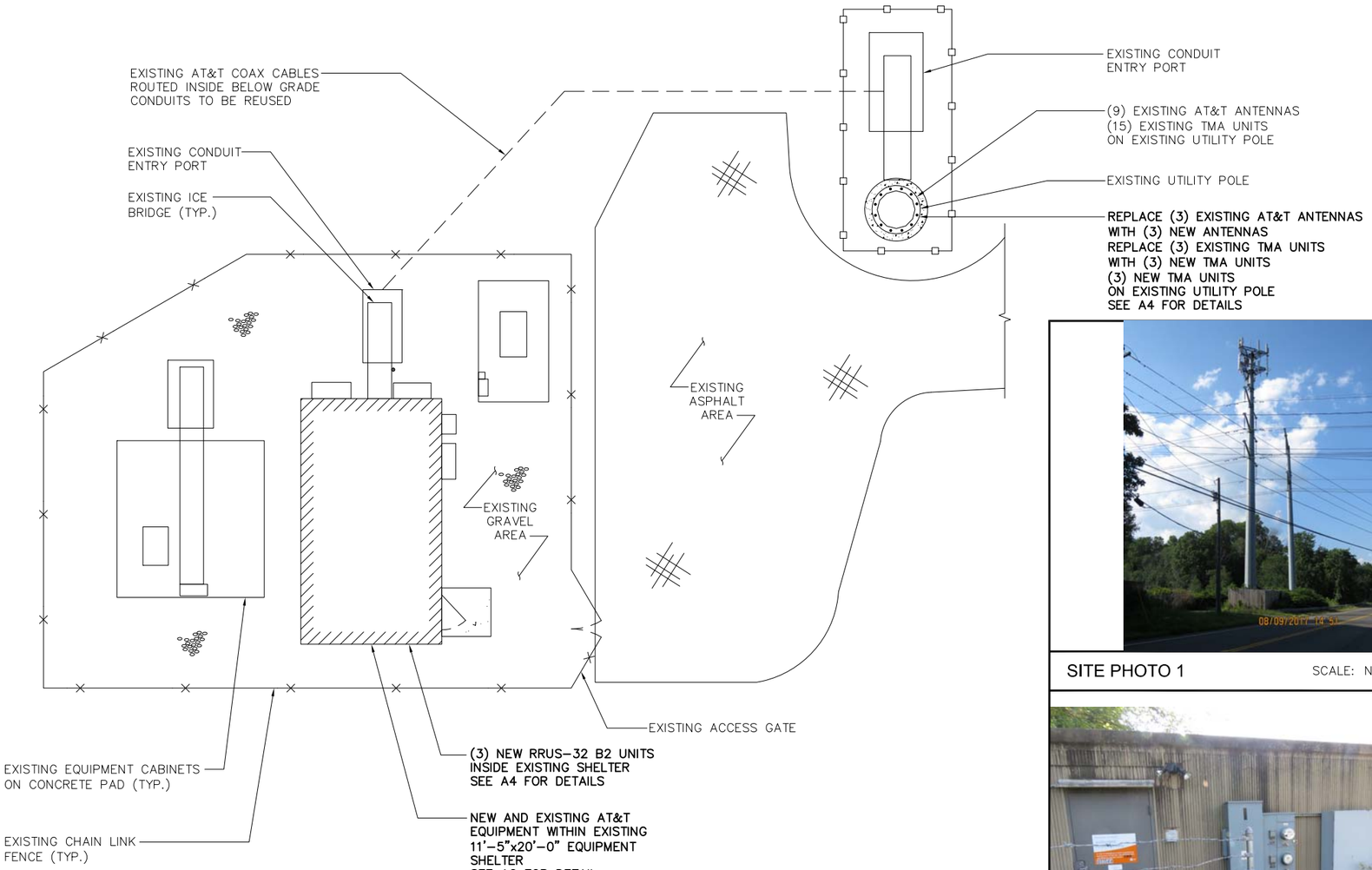
PROJECT# 2017.0278.0027

ABBREVIATIONS

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

SYMBOLS

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



COMPOUND PLAN — SCALE: 3/32" = 1'-0" — 1

SITE PHOTO 1 — SCALE: N.T.S. — 2

SITE PHOTO 2 — SCALE: N.T.S. — 3

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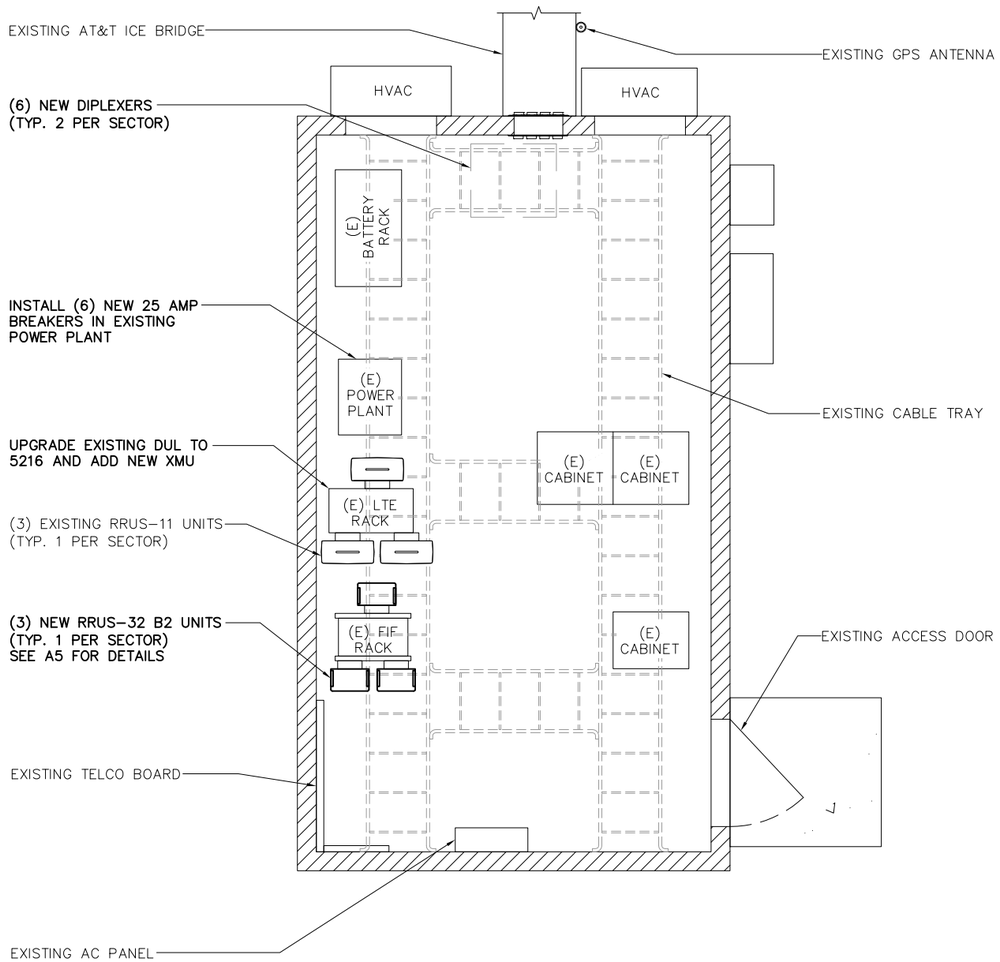
4286 WHITNEY AVENUE
HAMDEN, CT 06518

SHEET NAME
COMPOUND PLAN

SHEET NUMBER
A1

PROJECT# 2017.0278.0027



EQUIPMENT PLAN

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

1

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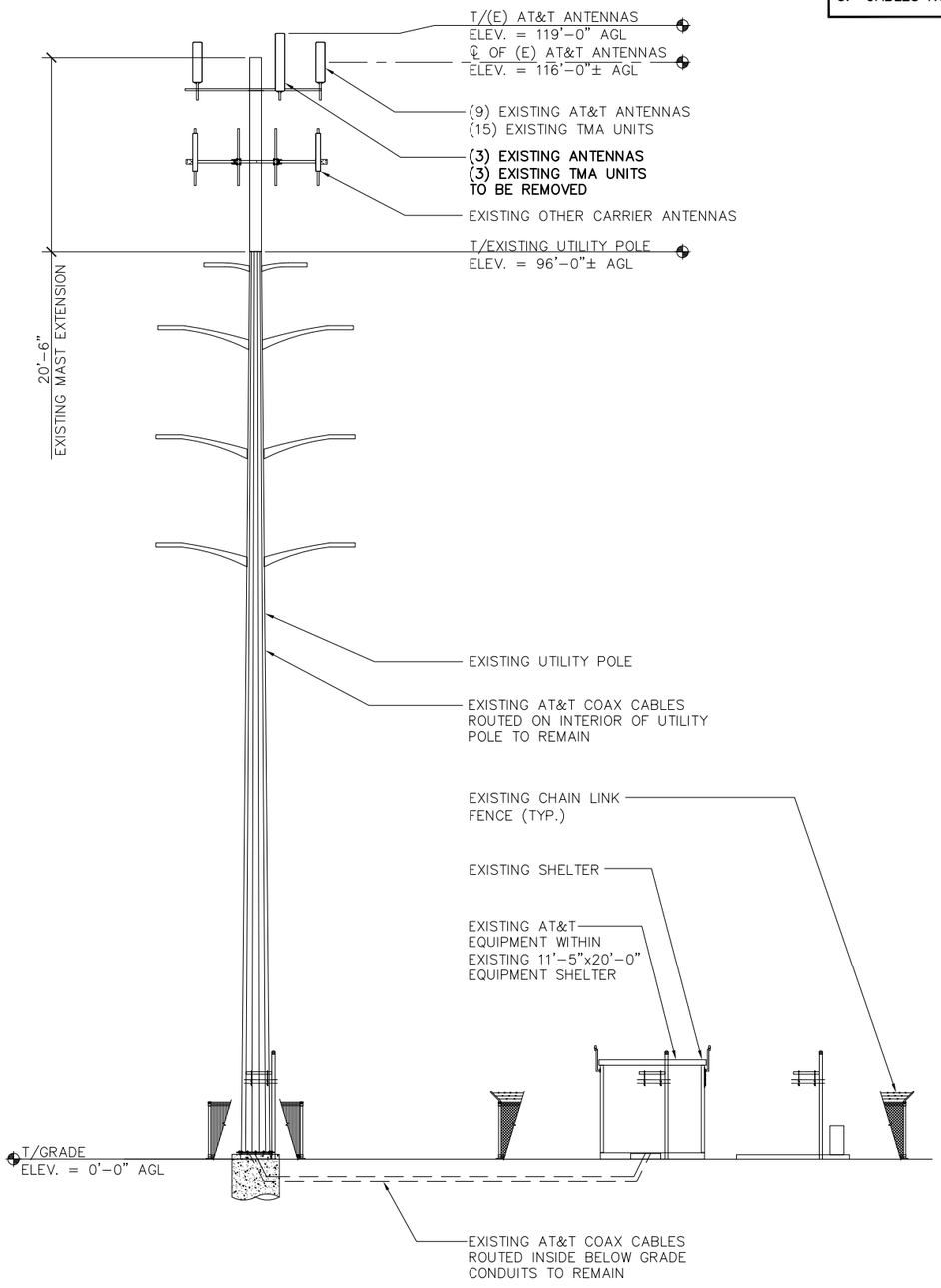
SHEET NAME
EQUIPMENT PLAN

SHEET NUMBER
A2

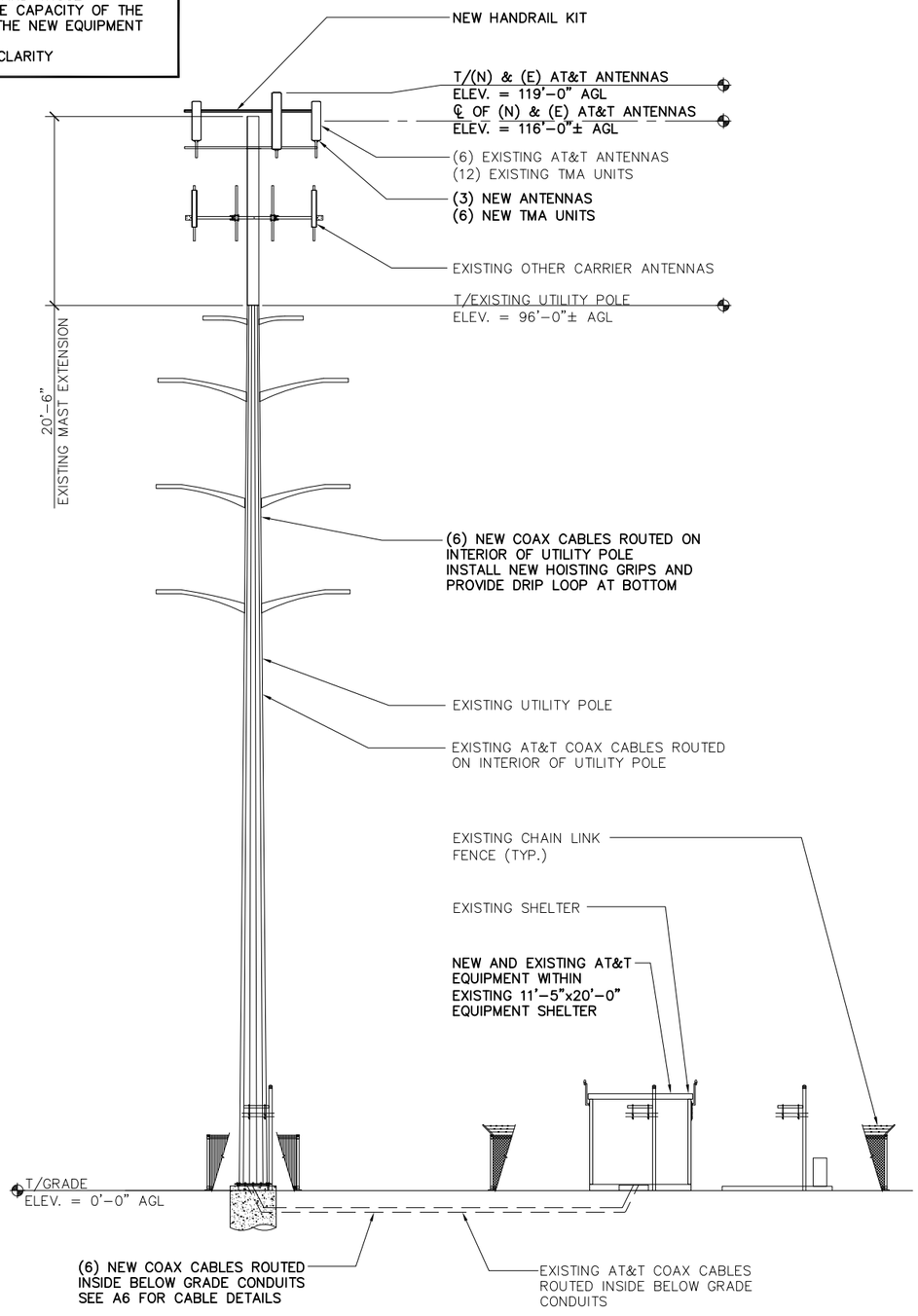
PROJECT# 2017.0278.0027

NOTES:

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



EXISTING ELEVATION — SCALE: 1/16" = 1'-0" — 1



NEW ELEVATION — SCALE: 1/16" = 1'-0" — 2

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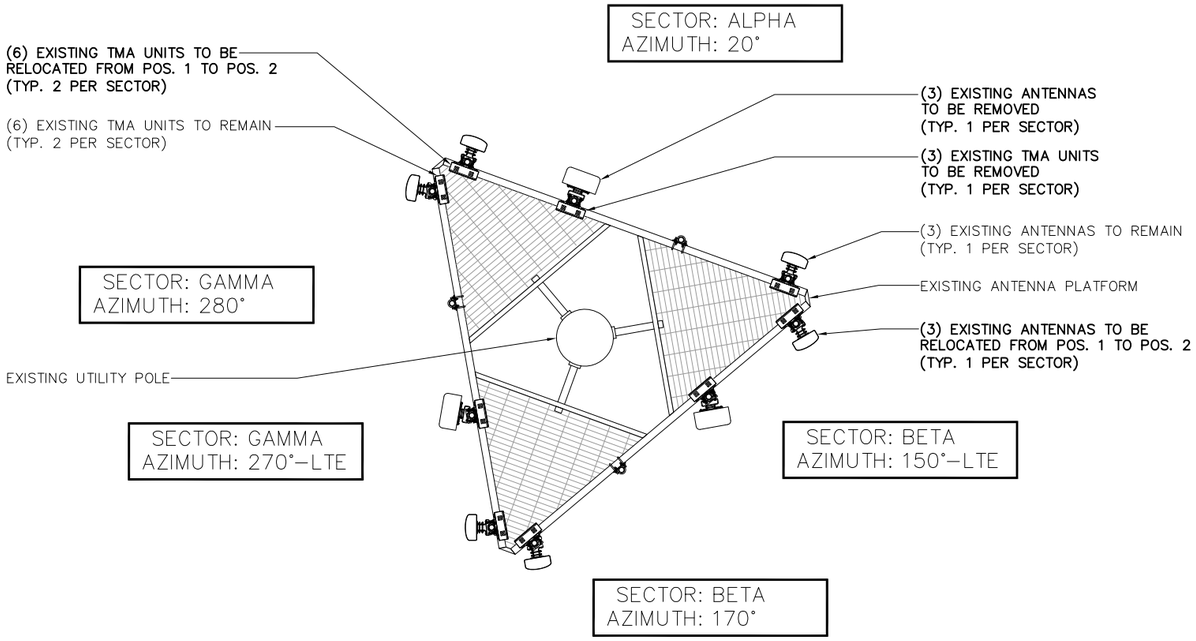
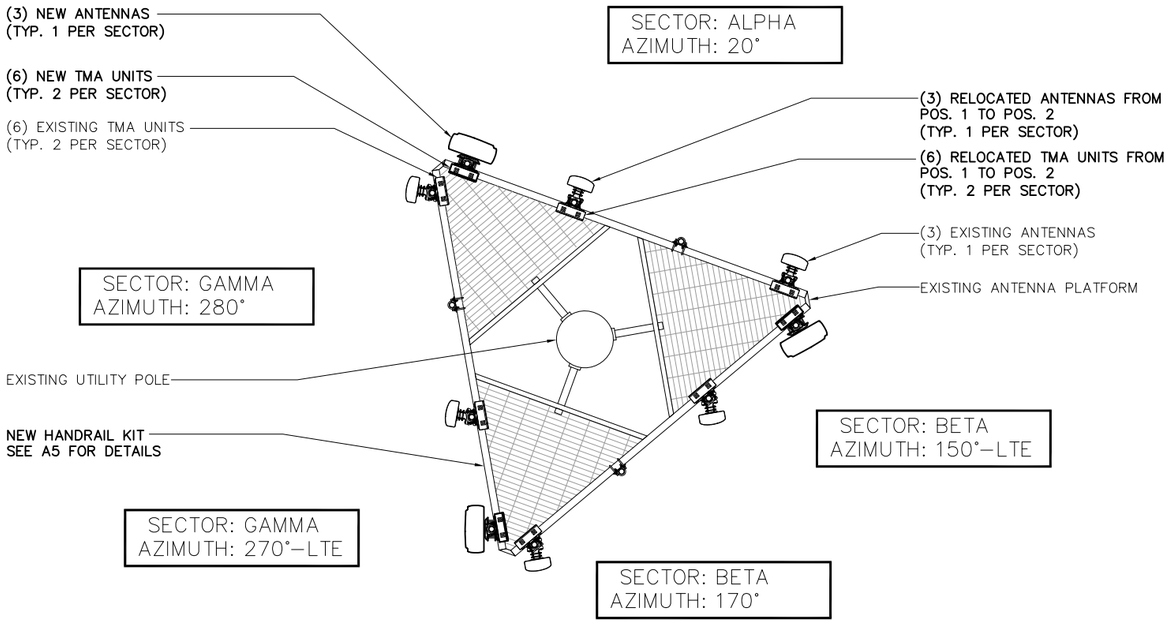
SHEET NAME
ELEVATIONS

SHEET NUMBER
A3

PROJECT# 2017.0278.0027



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



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

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2	01/08/18	FINAL	KC

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TOWN OF HAMDEN

SITE NUMBER:
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SITE ADDRESS
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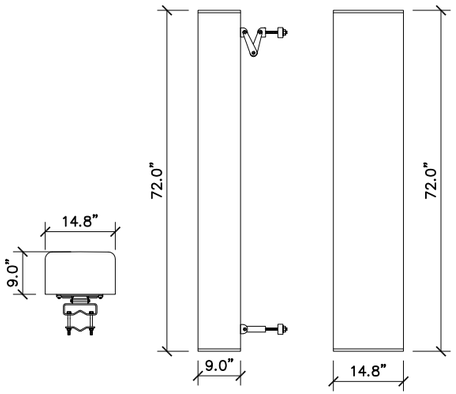
HAMDEN, CT 06518

SHEET NAME
ANTENNA PLANS

SHEET NUMBER
A4

PROJECT# 2017.0278.0027



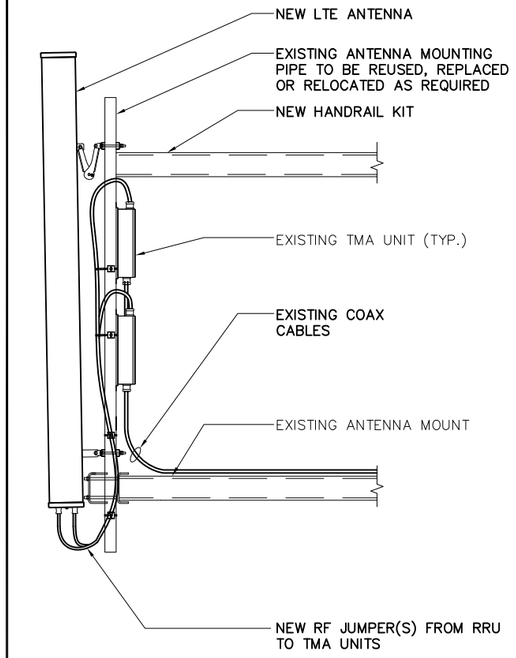
PLAN VIEW SIDE VIEW FRONT VIEW

CCI – HPA–65R–BUU–H6

HEXPORT MULTI–BAND ANTENNA

FREQUENCY RANGE	698–806 MHz
	824–894 MHz
	1850–1990 MHz
	1710–1755/2110–2170 MHz
	2305–2360 MHz
ANTENNA	51 Lbs
WITH BRACKET	61 Lbs

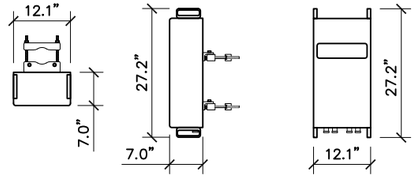
ANTENNA SPEC SCALE: N.T.S. 1



ANTENNA SCHEMATIC SCALE: N.T.S. 2

NOT USED SCALE: N.T.S. 3

NOT USED SCALE: N.T.S. 4



PLAN VIEW SIDE VIEW FRONT VIEW

ERICSSON – RRUS 32 B30

UNIT WEIGHT	60 Lbs

RRU SPEC SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

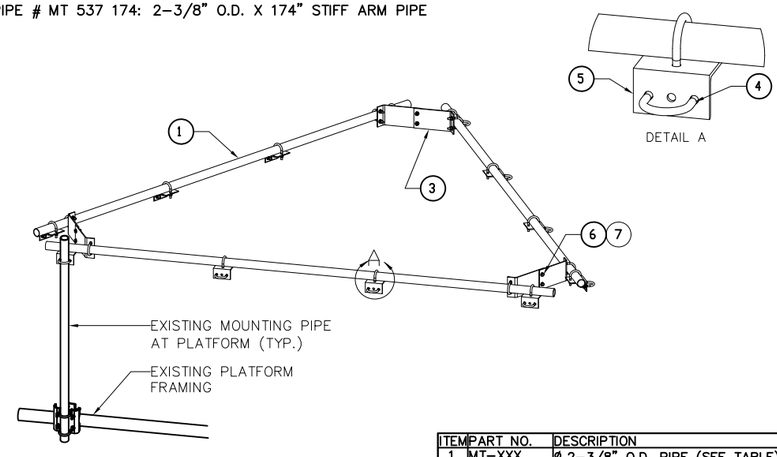
PRODUCT INFORMATION:

MFR: COMMSCOPE

P/N: MT–195 SERIES OR APPROVED EQUIVALENT

PRODUCT:

1. MT195 12
   – PIPE # MT 651 150: 2–3/8" O.D. X 150" STIFF ARM PIPE
2. MT195 14
   – PIPE # MT 537 174: 2–3/8" O.D. X 174" STIFF ARM PIPE



ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	MT–XXX	Ø 2–3/8" O.D. PIPE (SEE TABLE)	3	–
2	MT195HK	HARDWARE KIT (ITEMS 3–7)	1	–
3	MT195.03	END PLATE	6	5.63 LBS
4	GUB–4240	1/2" X 2–1/2" X 4" GALV U–BOLT KIT	30	0.56 LBS
5	XA2020.01	CROSS OVER ANGLE	12	2.66 LBS
6	GB–04145	1/2" X 1–1/2" GALV BOLT KIT	6	0.13 LBS
7	GWF–04	1/2" GALV FLAT WASHER	12	0.02 LBS

NEW HANDRAIL KIT DETAIL SCALE: N.T.S. 7

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TOWN OF HAMDEN

SITE NUMBER:

CTL02255

SITE ADDRESS

4286 WHITNEY AVENUE
HAMDEN, CT 06518

SHEET NAME

EQUIPMENT DETAILS

SHEET NUMBER

A5

PROJECT# 2017.0278.0027

FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (11/29/17)

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT (BY ANTENNAS)	TMA/RRU UNIT (BY EQUIPMENT)	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A-1	(E) LTE1C **(N) 2C ANTENNA**	**HPA-65R-BUU-H6**	**CCI**	**(2) NEW TMA UNITS**	(1) EXISTING RRUS-11 UNIT **(1) NEW RRUS-32 B2 UNIT**	**20°**	**116'-0"**	(E) (2) 1-5/8"ø LDF7-50A	240'-0"	
									(N) (2) 1-5/8"ø LDF7-50A	**240'-0"**	
	A-2	(E) GSM ANTENNA	7770	POWERWAVE	(2) EXISTING TMA UNITS	–	20°	116'-0"	(E) 1-5/8"ø LDF7-50A	240'-0"	
									(E) 1-5/8"ø LDF7-50A	240'-0"	
	A-3	–	–	–	–	–	–	–	–	–	
	A-4	(E) UMTS ANTENNA	7770	POWERWAVE	(2) EXISTING TMA UNITS	–	20°	116'-0"	(E) 1-5/8"ø LDF7-50A	240'-0"	
									(E) 1-5/8"ø LDF7-50A	240'-0"	
BETA	B-1	(E) LTE1C **(N) 2C ANTENNA**	**HPA-65R-BUU-H6**	**CCI**	**(2) NEW TMA UNITS**	(1) EXISTING RRUS-11 UNIT **(1) NEW RRUS-32 B2 UNIT**	150°	**116'-0"**	(E) (2) 1-5/8"ø LDF7-50A	240'-0"	
									(N) (2) 1-5/8"ø LDF7-50A	**240'-0"**	
	B-2	(E) GSM ANTENNA	7770	POWERWAVE	(2) EXISTING TMA UNITS	–	**170°**	116'-0"	(E) 1-5/8"ø LDF7-50A	240'-0"	
									(E) 1-5/8"ø LDF7-50A	240'-0"	
	B-3	–	–	–	–	–	–	–	–	–	
	B-4	(E) UMTS ANTENNA	7770	POWERWAVE	(2) EXISTING TMA UNITS	–	170°	116'-0"	(E) 1-5/8"ø LDF7-50A	240'-0"	
									(E) 1-5/8"ø LDF7-50A	240'-0"	
GAMMA	C-1	(E) LTE1C **(N) 2C ANTENNA**	**HPA-65R-BUU-H6**	**CCI**	**(2) NEW TMA UNITS**	(1) EXISTING RRUS-11 UNIT **(1) NEW RRUS-32 B2 UNIT**	270°	**116'-0"**	(E) (2) 1-5/8"ø LDF7-50A	240'-0"	
									(N) (2) 1-5/8"ø LDF7-50A	**240'-0"**	
	C-2	(E) GSM ANTENNA	7770	POWERWAVE	(2) EXISTING TMA UNITS	–	**280°**	116'-0"	(E) 1-5/8"ø LDF7-50A	240'-0"	
									(E) 1-5/8"ø LDF7-50A	240'-0"	
	C-3	–	–	–	–	–	–	–	–	–	
	C-4	(E) UMTS ANTENNA	7770	POWERWAVE	(2) EXISTING TMA UNITS	–	280°	116'-0"	(E) 1-5/8"ø LDF7-50A	240'-0"	
									(E) 1-5/8"ø LDF7-50A	240'-0"	

ANTENNA & CABLE CONFIGURATION

SCALE: N.T.S.

1

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TOWN OF HAMDEN

SITE NUMBER:
CTL02255

SITE ADDRESS
4286 WHITNEY AVENUE
HAMDEN, CT 06518

SHEET NAME
ANTENNA & CABLE CONFIGURATION

SHEET NUMBER
A6

PROJECT# 2017.0278.0027

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

ANTENNA AND CABLING NOTES

SCALE: N.T.S. | 1

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

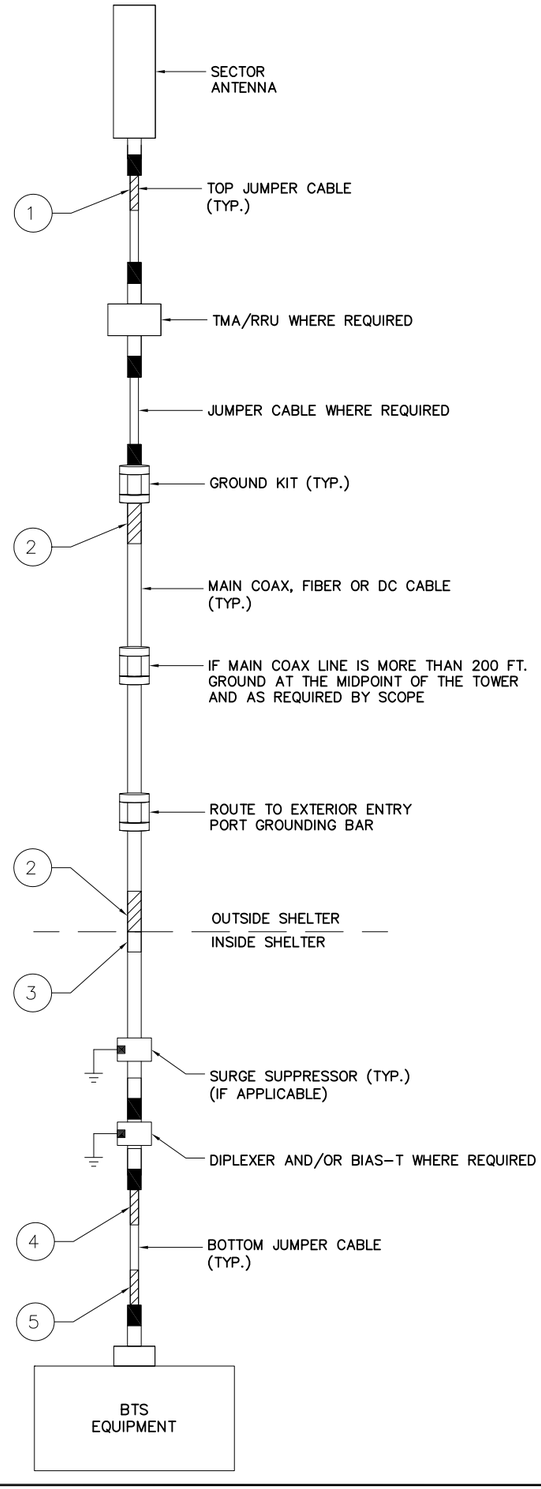
CABLE MARKING DIAGRAM

SCALE: N.T.S. | 2

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

CABLE MARKING NOTES

SCALE: N.T.S. | 3



CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. | 4

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SITE NAME
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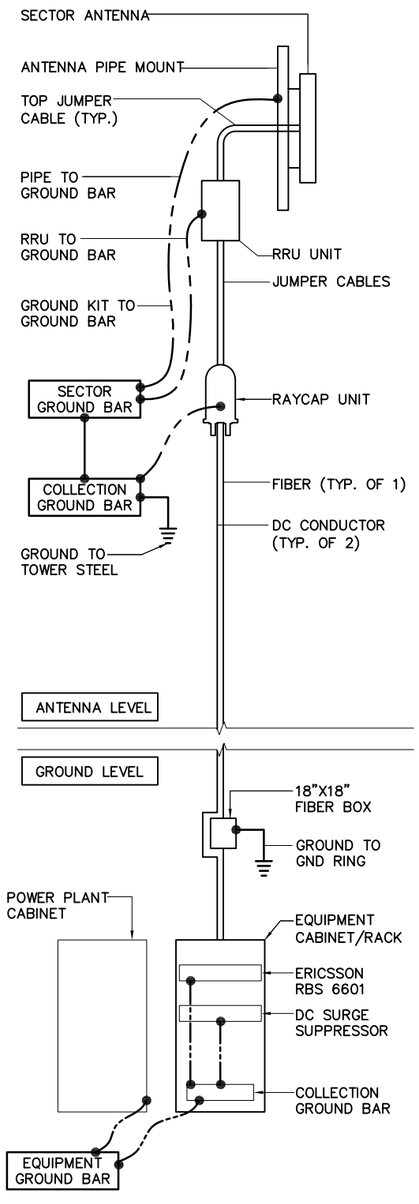
HAMDEN, CT 06518

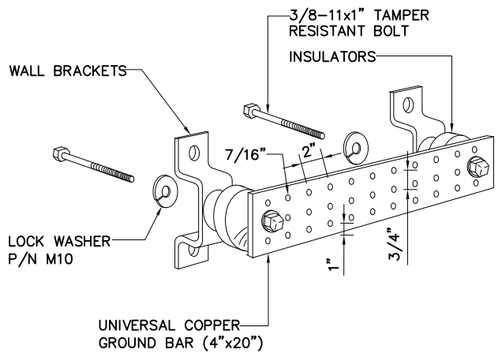
SHEET NAME
CABLE NOTES AND COLOR CODING

SHEET NUMBER
A7

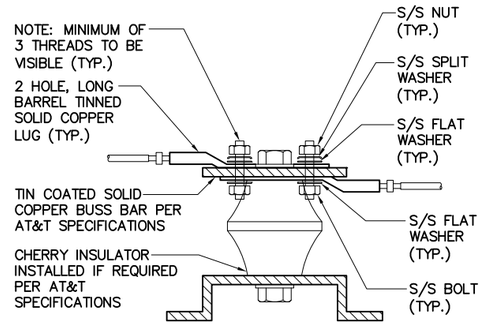
PROJECT# 2017.0278.0027



GROUNDING SCHEMATIC SCALE: N.T.S. 1



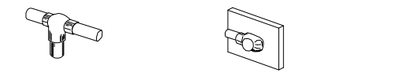
GROUND BAR DETAIL SCALE: N.T.S. 2



NOTES:

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

LUG DETAIL SCALE: N.T.S. 3



Type GT
THROUGH CABLE TO TOP OF GROUND ROD.

Type VN
HORIZONTAL CABLE TAP TO VERTICAL STEEL SURFACE OR THE SIDE OF HORIZONTAL PIPE

Type VV
THROUGH VERTICAL CABLE TO VERTICAL STEEL SURFACE OR TO THE SIDE OF EITHER HORIZONTAL OR VERTICAL PIPE

Type TA
TEE OF HORIZONTAL RUN AND TAP CABLES.

Type VS
CABLE TAP DOWN AT 45° TO VERTICAL STEEL SURFACE OR SIDE OF HORIZONTAL OR VERTICAL PIPE.

Type XB
CROSS OF HORIZONTAL CABLES. LAPPED AND NOT CUT

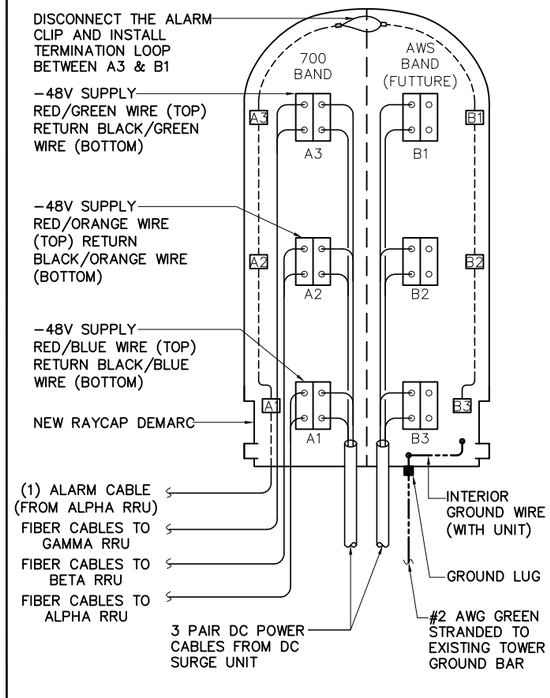
Type GR
CABLE TAP TO TOP OF GROUND ROD

Type HS
HORIZONTAL CABLE TAP TO HORIZONTAL STEEL SURFACE OR PIPE. CABLE OFF SURFACE.

Type GY
THROUGH CABLE TO SIDE OF GROUND ROD

Type NC
THROUGH AND TAP CABLES TO GROUND ROD

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



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

NOT USED SCALE: N.T.S. 6

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SITE ADDRESS
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HAMDEN, CT 06518

SHEET NAME
GROUNDING DETAILS

SHEET NUMBER
A8

PROJECT# 2017.0278.0027

Structural Analysis Report

Transmission Pole #4008

Town of Hamden Site #CTL02255 / FA #10035414

Prepared on behalf of:

550 Cochituate Road, Suite 550 13 and 14
Framingham, MA 01701

PJF Project #A80617-0015.001.6000_6050

REVISION	DATE	DESCRIPTION	ENGINEER	PJF TRACKING
0	1/11/2018	ORIGINAL ISSUE DATE	JRA	.001.6000_6050

PAUL J. FORD & COMPANY

Report Date:	January 11, 2018
Client:	Smartlink, LLC 85 Rangeway Rd North Billerica, MA 01862-2105 Attn: David Barbagallo 860-681-7708 david.barbagallo@smartlinkllc.com
Utility Name:	Eversource Energy
Structure:	Existing 116.5-ft Transmission Pole #4008
Site Name:	AT&T - Town of Hamden
Site Reference #:	CTL02255 / FA #10035414
Site Address:	4286 Whitney Ave
City, County, State:	Hamden, New Haven County, CT
Latitude, Longitude:	41.448248, -72.910138
PJF Project:	A80617-0015.001.6000_6050

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

Analysis Criteria:

Reference Standard:	IEEE Standards Association, "National Electrical Safety Code" (NESC) C2-2007 ANSI/TIA-222-G-2-2009 Standard, "Structural Standard for Antenna Supporting Structures and Antennas – Addendum 2" ASCE Standard 48-05, "Design of Steel Transmission Pole Structures"
Utility Specification:	Northeast Utilities OTRM 059.1 (3/12/2014)

Proposed Appurtenance Loads:

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

Summary of Analysis Results:

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

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

Respectfully Submitted by:
Paul J. Ford and Company

James R. Antoszewski, P.E.
Project Manager
jantoszewski@pjfweb.com

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50 Years 1965 - 2015

TABLE OF CONTENTS

1) INTRODUCTION

The purpose of this analysis is to determine if the existing structure and existing foundations have sufficient capacity to support the existing and proposed equipment along with the existing wire loads described herein. The existing structure is a 116.5' tall double circuit steel transmission pole designated as a 115kV type "0°-2° Tangent". The existing pole consists of 96' tall 12-sided round polygonal pole shaft and base plate. A 20.5' 12-sided round polygonal mast has been added to the top of the standard pole using a bolted flange connection.

The existing antenna mounting system consists of a 14' low profile platform banded to the mast. In addition, a second T-Mobile platform has also been taken into account as part of this current analysis. Refer to Tables 1 and 2 below and drawing SK-1 located in Appendix A for further antenna equipment and mount information.

2) ANALYSIS CRITERIA

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

Utility Specification: Northeast Utilities OTRM 059.1 (3/12/2014)

Table 1 – Proposed Antenna and Cable Information[1]

Mounting Level (feet)	Center Line Elevation (feet)	Quantity	Manufacturer	Model	Number of Feed Lines[2]	Feed Line Size (inches)	Note
114.0	116.0	3	CCI	HPA-65R-BUU-H6 (Antenna)	6 (I)	1-5/8	-
		6	Kaelus	TMA2061F1V1-1 (TMA)			-
114.0	116.0	1	SitePro1	Handrail Kit	-	-	3

Notes:
1. See drawing SK-1 in "Appendix A – Structure Profile Sheet" for further details.
2. (E) – Coax mounted externally and exposed to the wind. (I) – Coax mounted internally and shielded from the wind.
3. As per referenced mount analysis report.

Table 2 – Existing and Reserved Antenna and Cable Information[1]

Mounting Level (feet)	Center Line Elevation (feet)	Quantity	Manufacturer	Model	Number of Feed Lines[2]	Feed Line Size (inches)	Note
114.0	116.0	6	Powerwave	7770 (Antenna)	18 (I)	1-5/8	3
		12	Powerwave	LGP 21401 (TMA)			
	114.0	1	-	14' Low Profile Platform w/ 12 mounting pipes	-	-	
106.0	106.0	3	RFS	APX16PV-16PVL-E (Antenna)	6 (I)	1-5/8	3
		6	Remec	G20057A1 (TMA)			
		1	-	14' Low Profile Platform w/ 12 mounting pipes	-	-	

Notes:
1. See drawing SK-1 in "Appendix A – Structure Profile Sheet" for further details.
2. (E) – Coax mounted externally and exposed to the wind. (I) – Coax mounted internally and shielded from the wind.
3. Existing equipment to remain – all other existing equipment to be removed.

Table 3 – Existing Electrical Utility Wire Information[1]

Wire Designation	Wire Type	Tension Angle (degrees)	Wind Span		Weight Span	
			Back (feet)	Ahead (feet)	Back (feet)	Ahead (feet)
Shield Wire	(2) – OPGW - S1-81 144 Fibers	2	400	400	600	600
Conductor	(6) - 1590 kcmil 45/7 ACSR (Lapwing)					

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

Table 4a – Utility Tower Analysis - Load Case Information[1]

Load Case Name	Radial Ice (inches)	Wind Speed (mph)	Overload Capacity Factors				Note
			Vertical	Wind	Wire Tension		
					Long.	Trans.	
NESC 250B (Heavy)	0.5	39.5	1.5	2.5	1.1	1.65	-
NESC 250C (Extreme Wind)	0	110	1.0	1.0	1.0	1.0	2
NESC 250D (Extreme Wind w/ Concurrent Ice)	1.0	40	1.0	1.0	1.0	1.0	3

Notes:
1. As per the requirements of NU Design Criteria Table, NESC C2-2007 – Construction Grade B, and ASCE 48-05, "Design of Steel Transmission Poles".
2. Apply a 1.25 X Gust Response Factor to all telecommunication equipment projected above top of tower/pole and a 1.0 X Gust Response Factor to the tower/pole structure as per NU Design Criteria Table.
3. As per NU OTRM 060. Only for structures installed after 2007.

Table 4b – Antenna Mast Analysis - Load Case Information[1]

Load Case Name	Radial Ice (inches)	Wind Speed (mph)	Note
TIA/EIA – High Wind	0	97	-
TIA/EIA – Wind and Ice	0.75	50	2

Notes:
1. As per the requirements of the 2016 CT State Building Code (Appendix N) and TIA/EIA-222-G for Exposure C and Topographic Category 1.

3) ANALYSIS PROCEDURE

Table 5 – Documents Provided

Document	Remarks	Reference	Source
Structure Design Drawings	Burns & McDonnell, 6/1/2005	Cingular (11-DCSP-02-UGC.TTT)	Eversource
Structure Fabrication Drawings	PennSummit Tubular,LLC, 10/7/2006 PennSummit Tubular,LLC, 8/22/2006 PennSummit Tubular,LLC, 8/22/2006	25050-D1 2-25050-004 25050-D100	
Structure Foundation Drawings	Paul J. Ford and Company, Rev. 1 – 3/15/2006	29205-0284	PJF
Geotechnical Report	JGI, Eastern, Inc., 10/22/2005	05559G	
Construction Documents (CD's)	Smartlink, Rev. 1 – 10/26/2017	CTL02255	Smartlink
RF Data Sheet	AT&T, 6/21/2017	CTV2255 / FA #10035414	
Mount Analysis Report	Fullerton Engineering Consultants, Inc., 11/9/2017	CTL02255	
Previous SA Report	Centek, Rev. 2 – 4/30/2012	Centek Project #12014.CO2	Eversource

3.1) Analysis Method

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

PLS-Pole™ is a commercially available analysis software package made by Powerline Systems, Inc. PLS-Pole™ was used to create a three dimensional model of the pole and calculate member stresses for various load cases. Equipment and wire load calculations were completed using MathCAD and applied to the structure model as point loads. Load Calculations are included in Appendix B. Selected output from the analysis is included in Appendix C.

Lpile (version 6.0.22) is a commercially available software package by Ensoft, Inc. LPile was used to create a three dimensional model of the foundation and calculate member stresses for various load cases. Calculations were completed using MathCAD and applied to the foundation model as point loads. Load Calculations are included in Appendix D. Selected output from the analysis is included in Appendix D.

3.2) Assumptions

1) *The structure was built in accordance with the manufacturer's specifications.*
2) *The structure has been maintained in accordance with the manufacturer's specifications.*
3) *The analysis assumes that no physical deterioration has occurred in any of the structural components and that all members have the same load carrying capacity as the day the structure was erected. No allowance was made for any damaged, missing, or rusted members.*
4) *All bolts have been torqued to the snug-tight condition as defined by AISC.*
5) *No residual stresses exist due to incorrect tower erection.*
6) *All welds conform to the requirements of AWS D1.1.*
7) *The configuration of antennas, cables, mounts and other appurtenances are as specified in Tables 1 and 2 of this report and as per the referenced documents in Table 5.*
8) *The wind loads applied to the structure, due to the antenna installations, are based on the full projected area of all antenna equipment in all directions (i.e. no shielding used).*
9) *Utility pole is in plumb condition.*
10) *Pole shaft steel material assumed to be A572 with minimum yield stress of 65ksi.*
11) *Pole flange plate and base plate steel material assumed to be A572 with a minimum yield stress of 50ksi.*
12) *No further modifications to the structure have been made other than those referenced herein.*
13) *This analysis does not imply to meet any serviceability criteria such as deflections, twist, sway, etc. unless expressly agreed to in writing.*

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

4) ANALYSIS RESULTS

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

Table 6 – Maximum Structure Element Usages

Pole – Analysis		
Element Type	**Load Case**	**Usage (%)**
Pole Shaft	NESC 250C (Extreme Wind)	70.9
Base Plate	NESC 250C (Extreme Wind)	69.3
Davit Arms	NESC 250B (Heavy)	46.0
Pole – Supplemental Analysis		
Element Type	**Load Case**	**Usage (%)**
Anchor Bolts	NESC 250C (Extreme Wind)	59.4
	Maximum Structure Element Usage =	**70.9**
	Existing Structure Result =	**Pass**

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

Table 7 – Maximum Structure Foundation Usages

Foundation Analysis

	Load Case	Usage (%)
Axial Check	NESC 250C (Extreme Wind)	1.2
Moment Check	NESC 250C (Extreme Wind)	52.0
	Maximum Foundation Usage =	**52.0**
	Existing Foundation Result =	**Pass**

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

Table 8 – Maximum Antenna Mast Usages

Antenna Mount – Analysis		
Member	**Load Case**	**Usage (%)**
20.5' Mast	TIA/222-G	30.5
Mast Flange Bolts	TIA/222-G	32.4
Mast Flange Plate	TIA/222-G	21.4
	Maximum Antenna Mast Usage =	**30.5**
	Existing Antenna Mast Result =	**Pass**

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

4.1) Recommendations

None Required.

5) CONCLUSION

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

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

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

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

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

1) It is the responsibility of the client to ensure that the information provided to Paul J. Ford and Company is accurate and complete. Paul J. Ford and Company will rely on the accuracy and completeness of such information in performing or furnishing services under this project.

2) If the existing conditions are not as represented on the referenced drawings and/or documents, Paul J. Ford and Company should be contacted immediately to evaluate the significance of the deviation.

3) The structure has been analyzed according to the minimum design loads recommended by the Reference Standard. If additional design loads are required, Paul J. Ford and Company should be made aware of this prior to the start of the project.

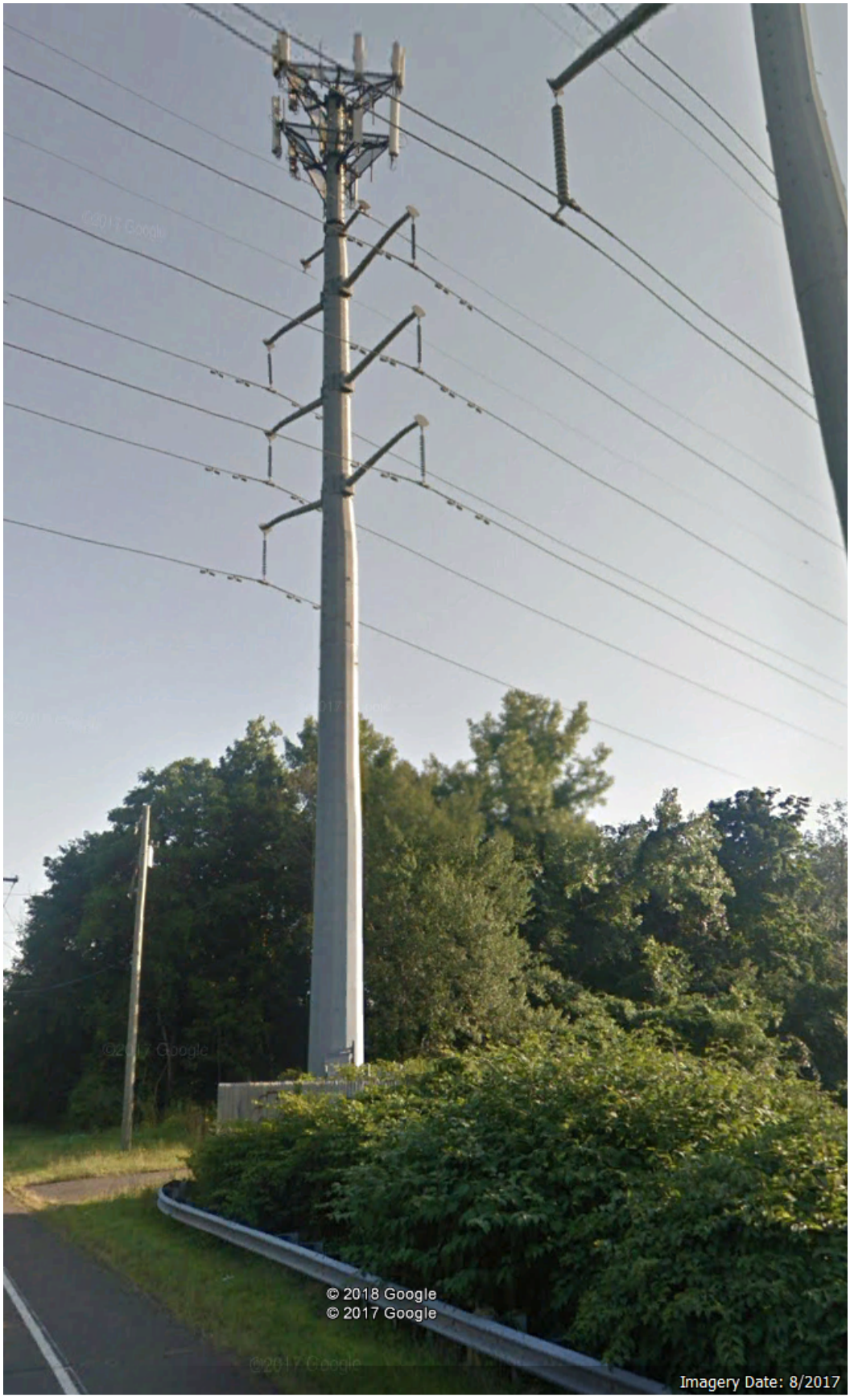
4) The standard of care for all Professional Engineering Services performed or furnished by Paul J. Ford and Company under this project will be the skill and care used by members of the Consultant's profession practicing under similar circumstances at the same time and in the same locality.

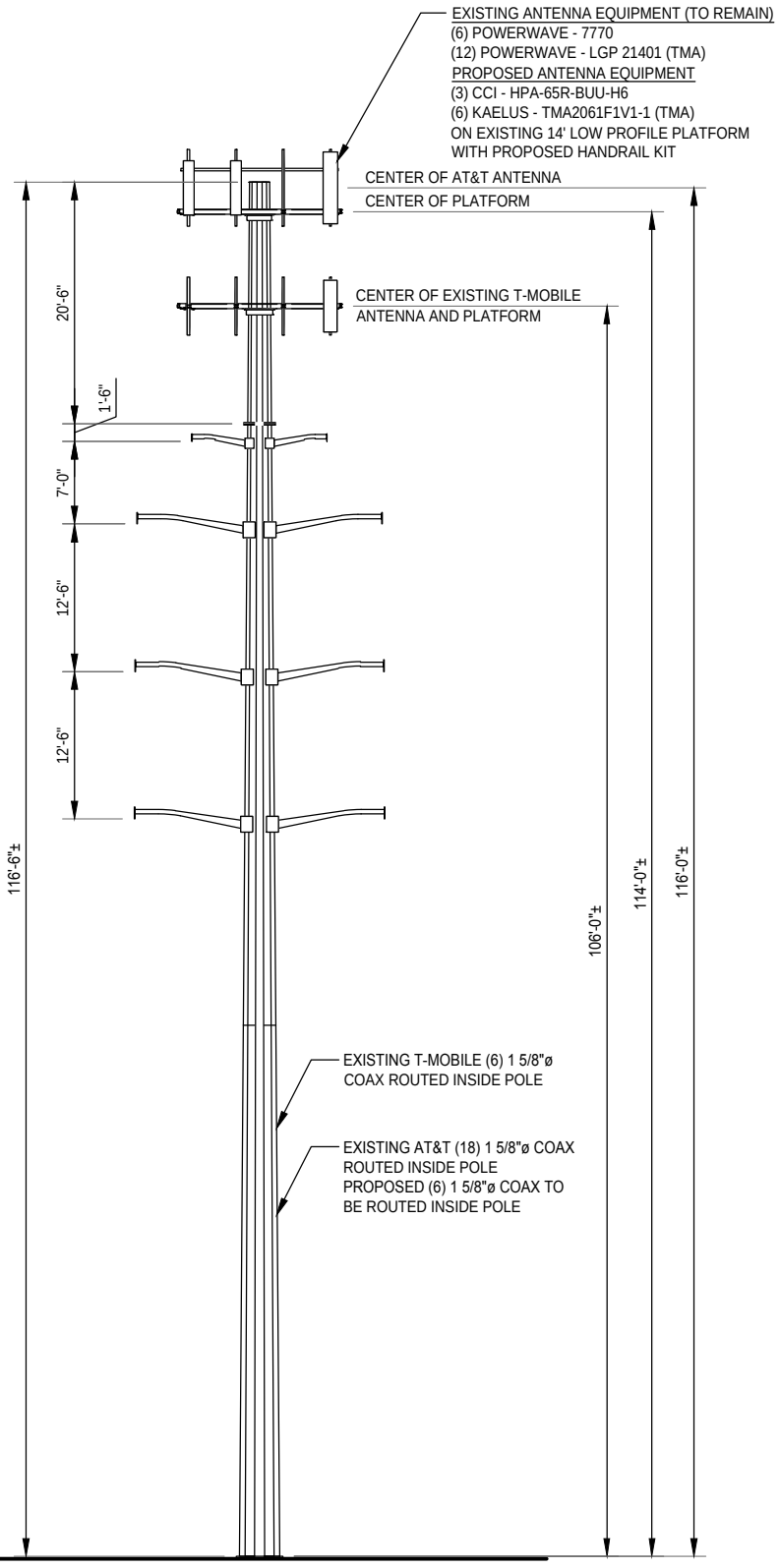
5) All Services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Paul J. Ford and Company is not responsible for the conclusions, opinions and/or recommendations made by others based on the information supplied herein.

****

APPENDIX A

STRUCTURE PHOTOS / PROFILE SHEET


© 2018 Google
© 2017 Google
Imagery Date: 8/2017



ELEVATION

TRANSVERSE FACE

LOOKING AHEAD

NOTE:
INFORMATION PROVIDED ON THIS DRAWING IS INTENDED SOLELY FOR THE PURPOSES OF THIS STRUCTURAL ANALYSIS REPORT. PJF WILL NOT BE RESPONSIBLE FOR ITEMS FABRICATED, PURCHASED OR INSTALLED BASED ON THIS DRAWING.

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

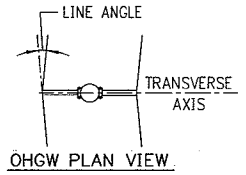
AT&T
550 COCHITUATE ROAD, SUITE 550 13&14 FARMINGTON, MA 01701

Description: TRANSMISSION POLE WITH ANTENNA MOUNT - ELEVATION	Job No. 80617-0015.001.6000
	Drawn by: FE
Utility: EVERSOURCE ENERGY	Designed by: JRA
	Checked by: JRA
Structure Info: POLE #4008	Date 1-9-2018
Site Info: 4286 WHITNEY AVENUE, HAMDEN, NEW HAVEN COUNTY, CONNECTICUT AT&T - TOWN OF HAMDEN SITE #CTL02255 / FA #10035414	SK-1

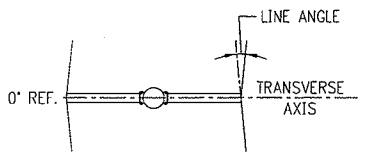
80617-0015.001.6000.dwg

APPENDIX B

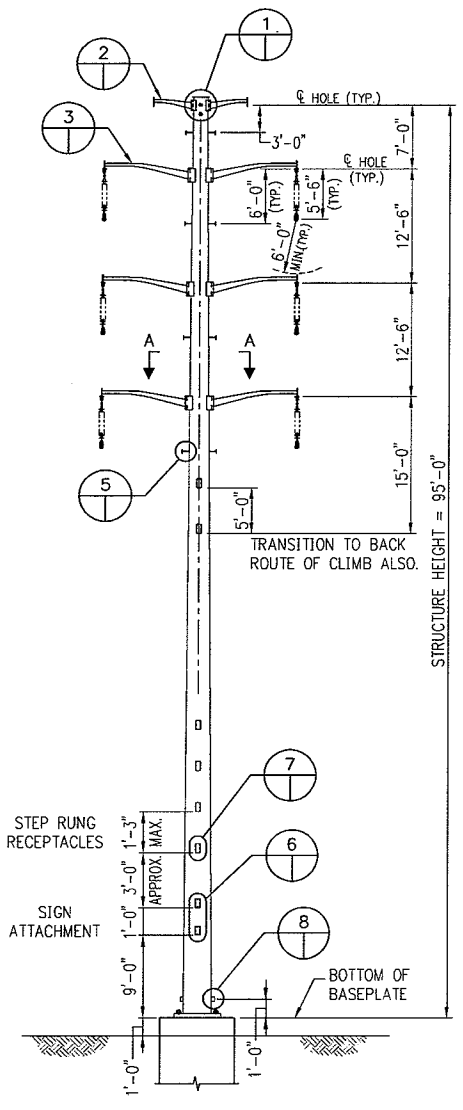
LOAD CALCULATIONS



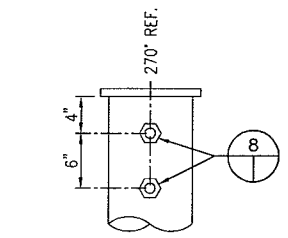
OHGW PLAN VIEW



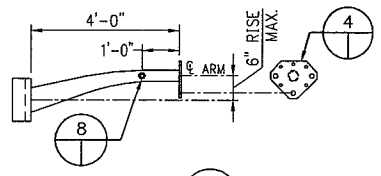
TRANSMISSION PLAN VIEW



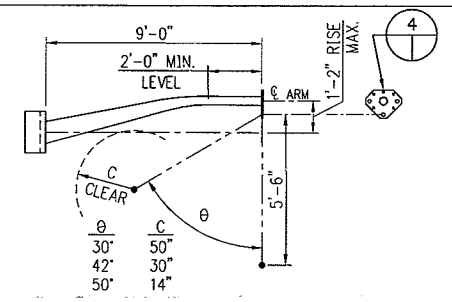
ELEVATION



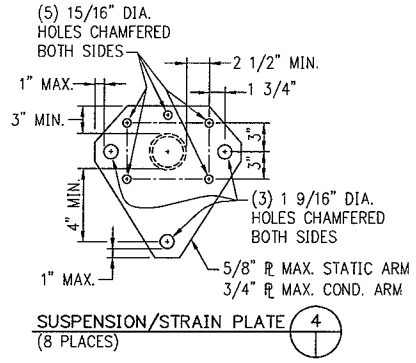
AERIAL MARKER ATTACHMENT (1)
(1 PLACE)



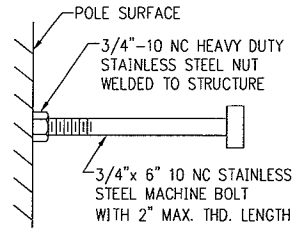
OHGW ARM ASSY (2)
(2 PLACES)



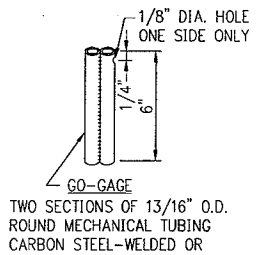
115kV ARM ASSEMBLY (3)
(6 PLACES)



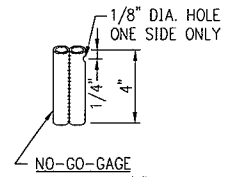
SUSPENSION/STRAIN PLATE (4)
(8 PLACES)



REMOVABLE GROUNDING BOLT (5)
(8 PLACES) SEE NOTE 9.

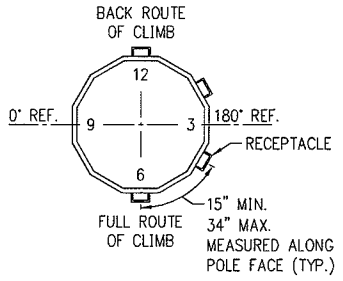


TWO SECTIONS OF 13/16" O.D. ROUND MECHANICAL TUBING CARBON STEEL-WELDED OR BRAZED TOGETHER. THICKNESS OF TUBING SUFFICIENT FOR WELDING OR BRAZING.

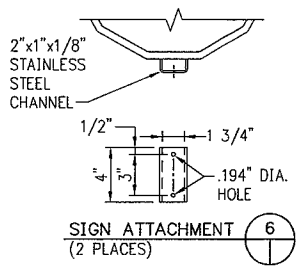


TWO SECTIONS OF 7/8" O.D. ROUND MECHANICAL TUBING CARBON STEEL-WELDED OR BRAZED TOGETHER. THICKNESS OF TUBING SUFFICIENT FOR WELDING OR BRAZING.

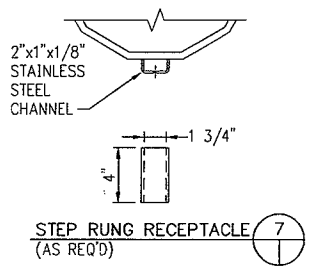
RECEPTACLE GAGES



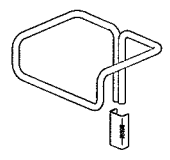
RECEPTACLE LOCATIONS



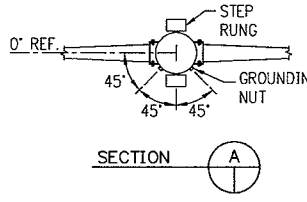
SIGN ATTACHMENT (6)
(2 PLACES)



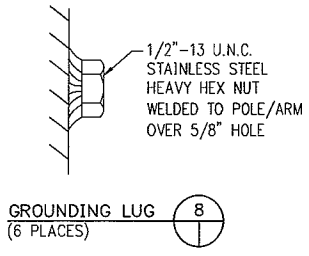
STEP RUNG RECEPTACLE (7)
(AS REQ'D)



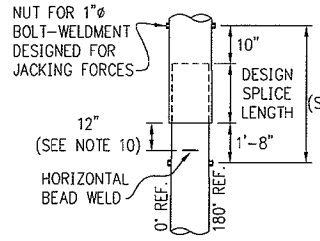
RECEPTACLE & STEP RUNG



SECTION (A)



GROUNDING LUG (8)
(6 PLACES)



SPLICE DETAILS JACKING NUT LOCATIONS

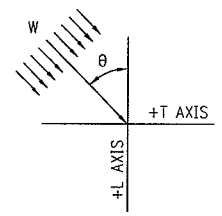
NOTES:

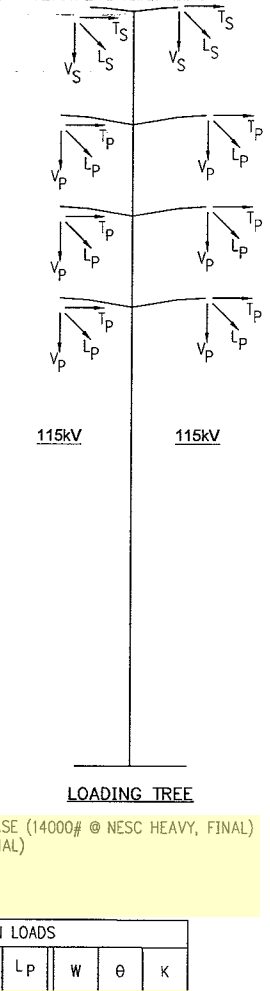
1. ALL INDICATED LOADS ARE ULTIMATE AND INCLUDE ALL OVERLOAD FACTORS.
2. V, T & L ARE IN KIPS AND ARE THE STRUCTURES VERTICAL, TRANSVERSE AND LONGITUDINAL AXIS RESPECTIVELY.
3. W IS THE WIND LOAD APPLIED TO THE STRUCTURE IN PSF. A SHAPE FACTOR OF 1.3 SHALL BE APPLIED TO "W".
4. THETA IS THE ANGLE IN DEGREES BETWEEN THE L-AXIS AND THE WIND DIRECTION AS SHOWN ON THE LOADING TREE DIAGRAM.
5. THE DEAD LOAD OF THE STRUCTURE SHALL BE MULTIPLIED BY K.
6. PROVIDE STEP RUNG RECEPTACLES FOR CLIMBING, STARTING APPROXIMATELY 13'-0" ABOVE GROUND TO THE TOP OF THE STRUCTURE IN CENTER OF FLAT 6 (SEE RECEPTACLE LOCATIONS) AND AS NOTED FOR BACK ROUTE OF CLIMB TO TOP. PROVIDE ADDITIONAL RECEPTACLES ON FLATS WHERE NECESSARY, SO THAT ALL PARTS OF THE STRUCTURE, INSULATORS, AND HARDWARE ASSEMBLIES CAN BE REACHED FOR MAINTENANCE.

   CAUTION: "CLIMBING SPACE" HAS BEEN PROVIDED FOR CLIMBING CLEARANCE TO ENERGIZED CONDUCTORS. ADDITIONAL STEP RUNG LOCATIONS MAY NOT PROVIDE ELECTRICAL CLEARANCES TO ENERGIZED CONDUCTORS.
7. STRUCTURE SHALL BE DESIGNED FOR THE FOLLOWING OPTIONS:
   A. ALL CONDUCTORS AND GROUNDWIRES INSTALLED.
   B. ONE GROUNDWIRE AND THREE PHASES ON ONE SIDE INSTALLED.
   C. OPTIONS A. & B. ABOVE AND THE BROKEN CONDUCTOR LOADING CASE APPLIED SINGULARLY AT EACH LOAD POINT.
   D. OPTIONS A. & B. ABOVE AND THE BROKEN SHIELD WIRE LOADING CASE APPLIED SINGULARLY AT EACH LOAD POINT.
8. TTT IN STRUCTURE TYPE DESIGNATION REFERS TO THE HEIGHT OF THE STRUCTURE ABOVE ITS FOUNDATION.
9. QUANTITIES OF BOLTS AS REQUIRED BY SPECIFICATIONS.

NOTES:

10. PERMISSIBLE VARIATION FROM THIS 12" DESIGN DIMENSION SHALL BE INDICATED IN FINAL DESIGN AND ERECTION DRAWING.
11. THE 10" AND 1'-8" DIMENSIONS MAY BE INCREASED TO ACHIEVE THIS 60" MIN.





LOADING TREE

CKT. #1640	
STR. NO.	HEIGHT
–	–
–	–
–	–
–	–
–	–
–	–
–	–
–	–

TYPE 11-DCSP-02-UGC.TTT
115kV CONDUCTOR: 1 - 1590 KCMIL 45/7 ACSR "LAPWING" CONDUCTOR PER PHASE (14000# @ NESC HEAVY, FINAL)
OPGW: S1-81 144 FIBERS 0.668 DIA. 0.477 lbs./FT. (5500# @ NESC HEAVY, FINAL)
WIND SPAN: 800 FT.
WEIGHT SPAN: 1200 FT.
LINE ANGLE: 0-2 DEGREES

LOADING CASE					DESIGN LOADS								
NO.	DESCRIPTION	TEMP. F	ICE R-IN.	WIND MPH	V_S	T_S	L_S	V_P	T_P	L_P	W	θ	K
1	NESC HEAVY (250 B)	0	0.50	39.5	2.20	1.43	0	5.84	2.44	0	10.0	90	1.50
2	NU HEAVY ICE	0	1.00	0.0	3.40	0.28	0	6.86	0.67	0	0.0	90	1.10
3	ASCE ICE/WIND (NESC PROPOSED 250 D)	32	0.75	50.0	2.40	1.26	0	5.41	1.96	0	7.0	90	1.10
4	NESC EXT. WIND (250 C)	60	0.00	112.0	0.66	1.78	0	2.53	4.07	0	40.7	90	1.10
5	BROKEN SHIELD WIRE	0	0.50	39.5	2.20	1.25	5.55	5.84	2.39	0	4.4	90	1.10
6	BROKEN CONDUCTOR	0	0.50	39.5	2.20	1.39	0	5.84	2.03	14.49	4.4	90	1.10
7	UNBALANCED ICE	0	0.50	39.5	2.20	1.32	2.75	5.84	2.27	4.72	4.4	90	1.10
8	DEFLECTION	60	0.00	0.0	0.60	0.07	0	2.30	0.23	0	0.0	90	1.00
9	CONSTRUCTION	30	0.00	30.0	2.54	0.29	0.23	8.62	0.84	0.86	3.5	90	1.50

DRAWING NOT TO SCALE

Burns & McDonnell SINCE 1898

38565

date JUNE 2, 2005 | detailed D.D. LAURSEN

designed J.J. WELLER | checked MEC

CAD GENERATED DWG
MAKE NO MANUAL CHANGES

NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER CO.

TITLE 115-kV DOUBLE CIRCUIT MONOPOLE

0-2 DEGREE TANGENT

11-DCSP-02-UGC.TTT

BY BMcD	CHKD .	APP .	APP .
DATE 6/01/2005	DATE .	DATE .	DATE .
SCALE NONE		DWG. NO. D	CINGULAR

N:\NUSCO\38565\Cadd\OHSTRS\CINGULAR_0-2.dwg (Model) 07-18-2006 17:20 DDL B&McD

Equipment Loads - NESC Calculations

NEU Required Factors

NEU Gust Response Factor Multiplier:	$m_{grf} := 1.25$	NEU specified multiplier for NESC 250C (OTRM 059.1, Attachment A)
NEU Shape Factor For Round:	$Cd_R := 1.3$	OTRM 059.4.E.2.c.1.ii
NEU Shape Factor For Flat:	$Cd_F := 1.6$	OTRM 059.4.E.2.c.1.ii
NEU Shape Factor For Coax (1) layer exterior of pole):	$Cd_{coax} := 1.45$	OTRM 059.4.E.2.c.1.iii

Basic Load Conditions

	Wind Speed		Radial Ice Thickness	
NESC 250B	$V_{250B} := 39.5$	mph	$r_{ice250B} := 0.5 \cdot in$	NESC Section 250B
NESC 250C	$V_{250C} := 110$	mph	$r_{ice250C} := 0\ in$	User Input - NESC Section 250C
NESC 250D	$V_{250D} := 40$	mph	$r_{ice250D} := 1 \cdot in$	User Input - NESC Section 250D & as per OTMR 060
			$I_d := 57 \cdot pcf$	User Input - Ice Density

NESC 250C - Extreme Wind Calculation

Top Elevation of Mast:	$h_{mast} := 116.5 \cdot ft$	User Input
NESC Importance Factor:	$I := 1.0$	NESC Importance Factor - Section 250C
NESC Factor kv:	$k_v := 1.43$	NESC Constant, Table 250-3
Velocity Pressure Coefficient:	$k_z := 2.01 \cdot \left(\frac{h_{mast}}{900 \cdot ft}\right)^{\left(\frac{2}{9.5}\right)} = 1.307$	Calculated kz per NESC Table 250-2
Exposure Factor:	$E_s := 0.346 \cdot \left(\frac{33}{\left(0.67 \cdot \frac{h_{mast}}{ft}\right)}\right)^{\frac{1}{7}} = 0.306$	NESC Table 250-3
Response Term:	$B_s := \frac{1}{\left(1 + \frac{0.56 \cdot \left(0.67 \cdot \frac{h_{mast}}{ft}\right)}{220}\right)} = 0.834$	NESC Table 250-3
Gust Response Factor:	$G_{RF} := \frac{\left(1 + \left(2.7 \cdot E_s \cdot B_s^{0.5}\right)\right)}{k_v^2} = 0.858$	Calculated GRF, Table 250-3

Wind Pressure Calculations

NESC 250B Wind Pressure: $qz_{250B} := 0.00256 \cdot V_{250B}^{2} \cdot I \cdot psf = 4.0\ psf$

NESC 250C Wind Pressure: $qz_{250C} := 0.00256 \cdot k_z \cdot V_{250C}^{2} \cdot G_{RF} \cdot I \cdot psf = 34.7\ psf$

NESC 250 D Wind Pressure: $qz_{250D} := 0.00256 \cdot V_{250D}^{2} \cdot I \cdot psf = 4.1\ psf$

Overload Factors

NESC 250B (Vertical):	$OLF250B_V := 1.5$	NESC Table 253-1 (Grade B)
NESC 250B (Wind):	$OLF250B_T := 2.5$	NESC Table 253-1 (Grade B)
NESC 250C (Vertical):	$OLF250C_V := 1.0$	NESC Table 253-1 (Grade B)
NESC 250C (Wind):	$OLF250C_T := 1.0$	NESC Table 253-1 (Grade B)
NESC 250D (Vertical):	$OLF250D_V := 1.0$	NESC Table 253-1 (Grade B)
NESC 250D (Wind):	$OLF250D_T := 1.0$	NESC Table 253-1 (Grade B)

Standard Equipment Calculations - Equipment 1

Standard Equipment Calculations - Equipment 1

Equipment Properties

Existing Antenna Carrier:	AT&T	User Defined
Equipment Model:	Existing - Powerwave - 7770.0 Antenna	User Defined
Equipment Height:	$L_{eq\_1} := 55 \cdot in$	User Defined
Equipment Width:	$W_{eq\_1} := 11 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_1} := 5 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_1} := 35 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_1} := L_{eq\_1} \cdot W_{eq\_1} \cdot D_{eq\_1} = 1.8\ ft^3$	
Equipment Quantity:	$N_{eq\_1} := 6$	User Defined

NESC 250B Vertical Load

Volume of Equipment w/ Ice:	$V_{eq\_1\_250B\_w\_ice} := \left(L_{eq\_1} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{eq\_1} + 2 \cdot r_{ice250B}\right) \cdot \left(D_{eq\_1} + 2 \cdot r_{ice250B}\right) = 2.3\ ft^3$
Volume of Ice:	$V_{eq\_1\_250B\_ice} := V_{eq\_1\_250B\_w\_ice} - V_{eq\_1} = 0.6\ ft^3$
Weight of Ice:	$WT_{eq\_1\_250B\_ice} := V_{eq\_1\_250B\_ice} \cdot I_d = 33.2\ lbf$
Factored Vertical Load of All Equipment w/ 250B Ice:	$WTall_{eq\_1\_250B} := \left(WT_{eq\_1} + WT_{eq\_1\_250B\_ice}\right) \cdot N_{eq\_1} \cdot OLF250B_V = 614\ lbf$

NESC 250C Vertical Load

Factored Vertical Load of All Equipment:	$WTall_{eq\_1\_250C} := WT_{eq\_1} \cdot N_{eq\_1} \cdot OLF250C_V = 210\ lbf$

NESC 250D Vertical Load

Volume of Equipment w/ Ice:	$V_{eq\_1\_250D\_w\_ice} := \left(L_{eq\_1} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{eq\_1} + 2 \cdot r_{ice250D}\right) \cdot \left(D_{eq\_1} + 2 \cdot r_{ice250D}\right) = 3\ ft^3$
Volume of Ice:	$V_{eq\_1\_250D\_ice} := V_{eq\_1\_250D\_w\_ice} - V_{eq\_1} = 1.3\ ft^3$
Weight of Ice:	$WT_{eq\_1\_250D\_ice} := V_{eq\_1\_250D\_ice} \cdot I_d = 71.3\ lbf$
Factored Vertical Load of All Equipment w/ 250D Ice:	$WTall_{eq\_1\_250D} := \left(WT_{eq\_1} + WT_{eq\_1\_250D\_ice}\right) \cdot N_{eq\_1} \cdot OLF250D_V = 638\ lbf$

NESC 250B Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_1\_250B\_w\_ice} := \left(L_{eq\_1} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{eq\_1} + 2 \cdot r_{ice250B}\right) = 4.7\ ft^2$$

Factored Wind Load on All Equipment w/ 250B Ice:

$$WLall_{eq\_1\_250B} := qz_{250B} \cdot Cd_F \cdot SA_{eq\_1\_250B\_w\_ice} \cdot N_{eq\_1} \cdot OLF250B_T = 447\ lbf$$

NESC 250C Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_1\_250C} := \left(L_{eq\_1}\right) \cdot \left(W_{eq\_1}\right) = 4.2\ ft^2$$

Factored Wind Load on All Equipment:

$$WLall_{eq\_1\_250C} := qz_{250C} \cdot Cd_F \cdot SA_{eq\_1\_250C} \cdot N_{eq\_1} \cdot OLF250C_T \cdot m_{grf} = 1751\ lbf$$

NESC 250D Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_1\_250D\_w\_ice} := \left(L_{eq\_1} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{eq\_1} + 2 \cdot r_{ice250D}\right) = 5.1\ ft^2$$

Factored Wind Load on All Equipment w/ 250D Ice:

$$WLall_{eq\_1\_250D} := qz_{250D} \cdot Cd_F \cdot SA_{eq\_1\_250D\_w\_ice} \cdot N_{eq\_1} \cdot OLF250D_T \cdot m_{grf} = 253\ lbf$$

Standard Equipment Calculations - Equipment 2

Equipment Properties

Existing Antenna Carrier:	AT&T	User Defined
Equipment Model:	Existing - Powerwave - LGP 21401 (TMA)	User Defined
Equipment Height:	$L_{eq\_2} := 14.4 \cdot in$	User Defined
Equipment Width:	$W_{eq\_2} := 9.2 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_2} := 2.6 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_2} := 14.1 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_2} := L_{eq\_2} \cdot W_{eq\_2} \cdot D_{eq\_2} = 0.2\ ft^3$	
Equipment Quantity:	$N_{eq\_2} := 12$	User Defined

NESC 250B Vertical Load

Volume of Equipment w/ Ice:	$V_{eq\_2\_250B\_w\_ice} := \left(L_{eq\_2} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{eq\_2} + 2 \cdot r_{ice250B}\right) \cdot \left(D_{eq\_2} + 2 \cdot r_{ice250B}\right) = 0.3\ ft^3$
Volume of Ice:	$V_{eq\_2\_250B\_ice} := V_{eq\_2\_250B\_w\_ice} - V_{eq\_2} = 0.1\ ft^3$
Weight of Ice:	$WT_{eq\_2\_250B\_ice} := V_{eq\_2\_250B\_ice} \cdot I_d = 7.3\ lbf$
Factored Vertical Load of All Equipment w/ 250B Ice:	$WTall_{eq\_2\_250B} := \left(WT_{eq\_2} + WT_{eq\_2\_250B\_ice}\right) \cdot N_{eq\_2} \cdot OLF250B_V = 385\ lbf$

NESC 250C Vertical Load

Factored Vertical Load of All Equipment:	$WTall_{eq\_2\_250C} := WT_{eq\_2} \cdot N_{eq\_2} \cdot OLF250C_V = 169\ lbf$

NESC 250D Vertical Load

Volume of Equipment w/ Ice:	$V_{eq\_2\_250D\_w\_ice} := \left(L_{eq\_2} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{eq\_2} + 2 \cdot r_{ice250D}\right) \cdot \left(D_{eq\_2} + 2 \cdot r_{ice250D}\right) = 0.5\ ft^3$
Volume of Ice:	$V_{eq\_2\_250D\_ice} := V_{eq\_2\_250D\_w\_ice} - V_{eq\_2} = 0.3\ ft^3$
Weight of Ice:	$WT_{eq\_2\_250D\_ice} := V_{eq\_2\_250D\_ice} \cdot I_d = 16.5\ lbf$
Factored Vertical Load of All Equipment w/ 250D Ice:	$WTall_{eq\_2\_250D} := \left(WT_{eq\_2} + WT_{eq\_2\_250D\_ice}\right) \cdot N_{eq\_2} \cdot OLF250D_V = 367\ lbf$

NESC 250B Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_2\_250B\_w\_ice} := \left(L_{eq\_2} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{eq\_2} + 2 \cdot r_{ice250B}\right) = 1.1\ ft^2$$

Factored Wind Load on All Equipment w/ 250B Ice:

$$WLall_{eq\_2\_250B} := qz_{250B} \cdot Cd_F \cdot SA_{eq\_2\_250B\_w\_ice} \cdot N_{eq\_2} \cdot OLF250B_T = 209\ lbf$$

NESC 250C Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_2\_250C} := \left(L_{eq\_2}\right) \cdot \left(W_{eq\_2}\right) = 0.9\ ft^2$$

Factored Wind Load on All Equipment:

$$WLall_{eq\_2\_250C} := qz_{250C} \cdot Cd_F \cdot SA_{eq\_2\_250C} \cdot N_{eq\_2} \cdot OLF250C_T \cdot m_{grf} = 767\ lbf$$

NESC 250D Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_2\_250D\_w\_ice} := \left(L_{eq\_2} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{eq\_2} + 2 \cdot r_{ice250D}\right) = 1.3\ ft^2$$

Factored Wind Load on All Equipment w/ 250D Ice:

$$WLall_{eq\_2\_250D} := qz_{250D} \cdot Cd_F \cdot SA_{eq\_2\_250D\_w\_ice} \cdot N_{eq\_2} \cdot OLF250D_T \cdot m_{grf} = 125\ lbf$$

Standard Equipment Calculations - Equipment 3

Equipment Properties

Existing Antenna Carrier:	AT&T	User Defined
Equipment Model:	Proposed - CCI - HPA-65R-BUU-H6 (Antenna)	User Defined
Equipment Height:	$L_{eq\_3} := 72.3\ in$	User Defined
Equipment Width:	$W_{eq\_3} := 14.4 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_3} := 7.3 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_3} := 42.9 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_3} := L_{eq\_3} \cdot W_{eq\_3} \cdot D_{eq\_3} = 4.4\ ft^3$	
Equipment Quantity:	$N_{eq\_3} := 3$	User Defined

NESC 250B Vertical Load

Volume of Equipment w/ Ice:	$V_{eq\_3\_250B\_w\_ice} := \left(L_{eq\_3} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{eq\_3} + 2 \cdot r_{ice250B}\right) \cdot \left(D_{eq\_3} + 2 \cdot r_{ice250B}\right) = 5.4\ ft^3$
Volume of Ice:	$V_{eq\_3\_250B\_ice} := V_{eq\_3\_250B\_w\_ice} - V_{eq\_3} = 1\ ft^3$
Weight of Ice:	$WT_{eq\_3\_250B\_ice} := V_{eq\_3\_250B\_ice} \cdot I_d = 58.4\ lbf$
Factored Vertical Load of All Equipment w/ 250B Ice:	$WTall_{eq\_3\_250B} := \left(WT_{eq\_3} + WT_{eq\_3\_250B\_ice}\right) \cdot N_{eq\_3} \cdot OLF250B_V = 456\ lbf$

NESC 250C Vertical Load

Factored Vertical Load of All Equipment:	$WTall_{eq\_3\_250C} := WT_{eq\_3} \cdot N_{eq\_3} \cdot OLF250C_V = 129\ lbf$

NESC 250D Vertical Load

Volume of Equipment w/ Ice:	$V_{eq\_3\_250D\_w\_ice} := \left(L_{eq\_3} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{eq\_3} + 2 \cdot r_{ice250D}\right) \cdot \left(D_{eq\_3} + 2 \cdot r_{ice250D}\right) = 6.6\ ft^3$
Volume of Ice:	$V_{eq\_3\_250D\_ice} := V_{eq\_3\_250D\_w\_ice} - V_{eq\_3} = 2.2\ ft^3$
Weight of Ice:	$WT_{eq\_3\_250D\_ice} := V_{eq\_3\_250D\_ice} \cdot I_d = 123.1\ lbf$
Factored Vertical Load of All Equipment w/ 250D Ice:	$WTall_{eq\_3\_250D} := \left(WT_{eq\_3} + WT_{eq\_3\_250D\_ice}\right) \cdot N_{eq\_3} \cdot OLF250D_V = 498\ lbf$

NESC 250B Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_3\_250B\_w\_ice} := \left(L_{eq\_3} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{eq\_3} + 2 \cdot r_{ice250B}\right) = 7.8\ ft^2$$

Factored Wind Load on All Equipment w/ 250B Ice:

$$WLall_{eq\_3\_250B} := qz_{250B} \cdot Cd_F \cdot SA_{eq\_3\_250B\_w\_ice} \cdot N_{eq\_3} \cdot OLF250B_T = 376\ lbf$$

NESC 250C Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_3\_250C} := \left(L_{eq\_3}\right) \cdot \left(W_{eq\_3}\right) = 7.2\ ft^2$$

Factored Wind Load on All Equipment:

$$WLall_{eq\_3\_250C} := qz_{250C} \cdot Cd_F \cdot SA_{eq\_3\_250C} \cdot N_{eq\_3} \cdot OLF250C_T \cdot m_{grf} = 1507\ lbf$$

NESC 250D Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_3\_250D\_w\_ice} := \left(L_{eq\_3} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{eq\_3} + 2 \cdot r_{ice250D}\right) = 8.5\ ft^2$$

Factored Wind Load on All Equipment w/ 250D Ice:

$$WLall_{eq\_3\_250D} := qz_{250D} \cdot Cd_F \cdot SA_{eq\_3\_250D\_w\_ice} \cdot N_{eq\_3} \cdot OLF250D_T \cdot m_{grf} = 208\ lbf$$

Standard Equipment Calculations - Equipment 4

Equipment Properties

Existing Antenna Carrier:	AT&T	User Defined
Equipment Model:	Proposed - Kaelus - TMA2061F1V1-1 (TMA)	User Defined
Equipment Height:	$L_{eq\_4} := 10.62 \cdot in$	User Defined
Equipment Width:	$W_{eq\_4} := 7.87 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_4} := 4.64 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_4} := 19.8 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_4} := L_{eq\_4} \cdot W_{eq\_4} \cdot D_{eq\_4} = 0.2\ ft^3$	
Equipment Quantity:	$N_{eq\_4} := 6$	User Defined

NESC 250B Vertical Load

Volume of Equipment w/ Ice:	$V_{eq\_4\_250B\_w\_ice} := \left(L_{eq\_4} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{eq\_4} + 2 \cdot r_{ice250B}\right) \cdot \left(D_{eq\_4} + 2 \cdot r_{ice250B}\right) = 0.3\ ft^3$
Volume of Ice:	$V_{eq\_4\_250B\_ice} := V_{eq\_4\_250B\_w\_ice} - V_{eq\_4} = 0.1\ ft^3$
Weight of Ice:	$WT_{eq\_4\_250B\_ice} := V_{eq\_4\_250B\_ice} \cdot I_d = 6.4\ lbf$
Factored Vertical Load of All Equipment w/ 250B Ice:	$WTall_{eq\_4\_250B} := \left(WT_{eq\_4} + WT_{eq\_4\_250B\_ice}\right) \cdot N_{eq\_4} \cdot OLF250B_V = 236\ lbf$

NESC 250C Vertical Load

Factored Vertical Load of All Equipment:	$WTall_{eq\_4\_250C} := WT_{eq\_4} \cdot N_{eq\_4} \cdot OLF250C_V = 119\ lbf$

NESC 250D Vertical Load

Volume of Equipment w/ Ice:	$V_{eq\_4\_250D\_w\_ice} := \left(L_{eq\_4} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{eq\_4} + 2 \cdot r_{ice250D}\right) \cdot \left(D_{eq\_4} + 2 \cdot r_{ice250D}\right) = 0.5\ ft^3$
Volume of Ice:	$V_{eq\_4\_250D\_ice} := V_{eq\_4\_250D\_w\_ice} - V_{eq\_4} = 0.3\ ft^3$
Weight of Ice:	$WT_{eq\_4\_250D\_ice} := V_{eq\_4\_250D\_ice} \cdot I_d = 14.5\ lbf$
Factored Vertical Load of All Equipment w/ 250D Ice:	$WTall_{eq\_4\_250D} := \left(WT_{eq\_4} + WT_{eq\_4\_250D\_ice}\right) \cdot N_{eq\_4} \cdot OLF250D_V = 206\ lbf$

NESC 250B Wind Load

Area of Equipment w/ Ice: $SA_{eq\_4\_250B\_w\_ice} := \left(L_{eq\_4} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{eq\_4} + 2 \cdot r_{ice250B}\right) = 0.7\ ft^2$

Factored Wind Load on All Equipment w/ 250B Ice: $WLall_{eq\_4\_250B} := qz_{250B} \cdot Cd_F \cdot SA_{eq\_4\_250B\_w\_ice} \cdot N_{eq\_4} \cdot OLF250B_T = 69\ lbf$

NESC 250C Wind Load

Area of Equipment w/ Ice: $SA_{eq\_4\_250C} := \left(L_{eq\_4}\right) \cdot \left(W_{eq\_4}\right) = 0.6\ ft^2$

Factored Wind Load on All Equipment: $WLall_{eq\_4\_250C} := qz_{250C} \cdot Cd_F \cdot SA_{eq\_4\_250C} \cdot N_{eq\_4} \cdot OLF250C_T \cdot m_{grf} = 242\ lbf$

NESC 250D Wind Load

Area of Equipment w/ Ice: $SA_{eq\_4\_250D\_w\_ice} := \left(L_{eq\_4} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{eq\_4} + 2 \cdot r_{ice250D}\right) = 0.9\ ft^2$

Factored Wind Load on All Equipment w/ 250D Ice: $WLall_{eq\_4\_250D} := qz_{250D} \cdot Cd_F \cdot SA_{eq\_4\_250D\_w\_ice} \cdot N_{eq\_4} \cdot OLF250D_T \cdot m_{grf} = 43\ lbf$

Standard Equipment Calculations - Equipment 5

Equipment Properties

Existing Antenna Carrier:	T-Mobile	User Defined
Equipment Model:	Existing - RFS - APX16PV-16PVL-E (Antenna)	User Defined
Equipment Height:	$L_{eq\_5} := 53 \cdot in$	User Defined
Equipment Width:	$W_{eq\_5} := 12.9 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_5} := 3.1 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_5} := 39.6 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_5} := L_{eq\_5} \cdot W_{eq\_5} \cdot D_{eq\_5} = 1.2\ ft^3$	
Equipment Quantity:	$N_{eq\_5} := 3$	User Defined

NESC 250B Vertical Load

Volume of Equipment w/ Ice:	$V_{eq\_5\_250B\_w\_ice} := \left(L_{eq\_5} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{eq\_5} + 2 \cdot r_{ice250B}\right) \cdot \left(D_{eq\_5} + 2 \cdot r_{ice250B}\right) = 1.8\ ft^3$
Volume of Ice:	$V_{eq\_5\_250B\_ice} := V_{eq\_5\_250B\_w\_ice} - V_{eq\_5} = 0.6\ ft^3$
Weight of Ice:	$WT_{eq\_5\_250B\_ice} := V_{eq\_5\_250B\_ice} \cdot I_d = 31.6\ lbf$
Factored Vertical Load of All Equipment w/ 250B Ice:	$WTall_{eq\_5\_250B} := \left(WT_{eq\_5} + WT_{eq\_5\_250B\_ice}\right) \cdot N_{eq\_5} \cdot OLF250B_V = 320\ lbf$

NESC 250C Vertical Load

Factored Vertical Load of All Equipment:	$WTall_{eq\_5\_250C} := WT_{eq\_5} \cdot N_{eq\_5} \cdot OLF250C_V = 119\ lbf$

NESC 250D Vertical Load

Volume of Equipment w/ Ice:	$V_{eq\_5\_250D\_w\_ice} := \left(L_{eq\_5} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{eq\_5} + 2 \cdot r_{ice250D}\right) \cdot \left(D_{eq\_5} + 2 \cdot r_{ice250D}\right) = 2.4\ ft^3$
Volume of Ice:	$V_{eq\_5\_250D\_ice} := V_{eq\_5\_250D\_w\_ice} - V_{eq\_5} = 1.2\ ft^3$
Weight of Ice:	$WT_{eq\_5\_250D\_ice} := V_{eq\_5\_250D\_ice} \cdot I_d = 68\ lbf$
Factored Vertical Load of All Equipment w/ 250D Ice:	$WTall_{eq\_5\_250D} := \left(WT_{eq\_5} + WT_{eq\_5\_250D\_ice}\right) \cdot N_{eq\_5} \cdot OLF250D_V = 323\ lbf$

NESC 250B Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_5\_250B\_w\_ice} := \left(L_{eq\_5} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{eq\_5} + 2 \cdot r_{ice250B}\right) = 5.2\ ft^2$$

Factored Wind Load on All Equipment w/ 250B Ice:

$$WLall_{eq\_5\_250B} := qz_{250B} \cdot Cd_F \cdot SA_{eq\_5\_250B\_w\_ice} \cdot N_{eq\_5} \cdot OLF250B_T = 250\ lbf$$

NESC 250C Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_5\_250C} := \left(L_{eq\_5}\right) \cdot \left(W_{eq\_5}\right) = 4.7\ ft^2$$

Factored Wind Load on All Equipment:

$$WLall_{eq\_5\_250C} := qz_{250C} \cdot Cd_F \cdot SA_{eq\_5\_250C} \cdot N_{eq\_5} \cdot OLF250C_T \cdot m_{grf} = 990\ lbf$$

NESC 250D Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_5\_250D\_w\_ice} := \left(L_{eq\_5} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{eq\_5} + 2 \cdot r_{ice250D}\right) = 5.7\ ft^2$$

Factored Wind Load on All Equipment w/ 250D Ice:

$$WLall_{eq\_5\_250D} := qz_{250D} \cdot Cd_F \cdot SA_{eq\_5\_250D\_w\_ice} \cdot N_{eq\_5} \cdot OLF250D_T \cdot m_{grf} = 140\ lbf$$

Standard Equipment Calculations - Equipment 6

Equipment Properties

Existing Antenna Carrier:	T-Mobile	User Defined
Equipment Model:	Existing - Remec - G20057A1 (TMA)	User Defined
Equipment Height:	$L_{eq\_6} := 13.2 \cdot in$	User Defined
Equipment Width:	$W_{eq\_6} := 6.4 \cdot in$	User Defined
Equipment Depth:	$D_{eq\_6} := 3 \cdot in$	User Defined
Equipment Weight:	$WT_{eq\_6} := 11 \cdot lbf$	User Defined
Equipment Volume:	$V_{eq\_6} := L_{eq\_6} \cdot W_{eq\_6} \cdot D_{eq\_6} = 0.1\ ft^3$	
Equipment Quantity:	$N_{eq\_6} := 6$	User Defined

NESC 250B Vertical Load

Volume of Equipment w/ Ice:	$V_{eq\_6\_250B\_w\_ice} := \left(L_{eq\_6} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{eq\_6} + 2 \cdot r_{ice250B}\right) \cdot \left(D_{eq\_6} + 2 \cdot r_{ice250B}\right) = 0.2\ ft^3$
Volume of Ice:	$V_{eq\_6\_250B\_ice} := V_{eq\_6\_250B\_w\_ice} - V_{eq\_6} = 0.1\ ft^3$
Weight of Ice:	$WT_{eq\_6\_250B\_ice} := V_{eq\_6\_250B\_ice} \cdot I_d = 5.5\ lbf$
Factored Vertical Load of All Equipment w/ 250B Ice:	$WTall_{eq\_6\_250B} := \left(WT_{eq\_6} + WT_{eq\_6\_250B\_ice}\right) \cdot N_{eq\_6} \cdot OLF250B_V = 149\ lbf$

NESC 250C Vertical Load

Factored Vertical Load of All Equipment:	$WTall_{eq\_6\_250C} := WT_{eq\_6} \cdot N_{eq\_6} \cdot OLF250C_V = 66\ lbf$

NESC 250D Vertical Load

Volume of Equipment w/ Ice:	$V_{eq\_6\_250D\_w\_ice} := \left(L_{eq\_6} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{eq\_6} + 2 \cdot r_{ice250D}\right) \cdot \left(D_{eq\_6} + 2 \cdot r_{ice250D}\right) = 0.4\ ft^3$
Volume of Ice:	$V_{eq\_6\_250D\_ice} := V_{eq\_6\_250D\_w\_ice} - V_{eq\_6} = 0.2\ ft^3$
Weight of Ice:	$WT_{eq\_6\_250D\_ice} := V_{eq\_6\_250D\_ice} \cdot I_d = 12.7\ lbf$
Factored Vertical Load of All Equipment w/ 250D Ice:	$WTall_{eq\_6\_250D} := \left(WT_{eq\_6} + WT_{eq\_6\_250D\_ice}\right) \cdot N_{eq\_6} \cdot OLF250D_V = 142\ lbf$

NESC 250B Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_6\_250B\_w\_ice} := \left(L_{eq\_6} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{eq\_6} + 2 \cdot r_{ice250B}\right) = 0.7\ ft^2$$

Factored Wind Load on All Equipment w/ 250B Ice:

$$WLall_{eq\_6\_250B} := qz_{250B} \cdot Cd_F \cdot SA_{eq\_6\_250B\_w\_ice} \cdot N_{eq\_6} \cdot OLF250B_T = 70\ lbf$$

NESC 250C Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_6\_250C} := \left(L_{eq\_6}\right) \cdot \left(W_{eq\_6}\right) = 0.6\ ft^2$$

Factored Wind Load on All Equipment:

$$WLall_{eq\_6\_250C} := qz_{250C} \cdot Cd_F \cdot SA_{eq\_6\_250C} \cdot N_{eq\_6} \cdot OLF250C_T \cdot m_{grf} = 245\ lbf$$

NESC 250D Wind Load

Area of Equipment w/ Ice:

$$SA_{eq\_6\_250D\_w\_ice} := \left(L_{eq\_6} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{eq\_6} + 2 \cdot r_{ice250D}\right) = 0.9\ ft^2$$

Factored Wind Load on All Equipment w/ 250D Ice:

$$WLall_{eq\_6\_250D} := qz_{250D} \cdot Cd_F \cdot SA_{eq\_6\_250D\_w\_ice} \cdot N_{eq\_6} \cdot OLF250D_T \cdot m_{grf} = 44\ lbf$$

Standard Equipment Calculations - Mount Pipes 1

Equipment Properties

Existing Antenna Carrier:	AT&T / T-Mobile Platforms	User Defined
Equipment Model:	Mounting Pipes	User Defined
Pipe Height:	$L_{pipe\_1} := 72 \cdot in$	User Defined
Pipe Diameter:	$W_{pipe\_1} := 2.375 \cdot in$	User Defined
Pipe Weight:	$WT_{pipe\_1} := 21.9 \cdot lbf$	User Defined
Pipe Volume:	$V_{pipe\_1} := L_{pipe\_1} \cdot \frac{\left(\left(W_{pipe\_1}\right)^2 \cdot \pi\right)}{4} = 0.2\ ft^3$	
Pipe Quantity:	$N_{pipe\_1} := 12$	User Defined

NESC 250B Vertical Load

Volume of Pipe w/ Ice:	$V_{pipe\_1\_250B\_w\_ice} := \left(L_{pipe\_1} + 2 \cdot r_{ice250B}\right) \cdot \frac{\left(\left(W_{pipe\_1} + 2 \cdot r_{ice250B}\right)^2 \cdot \pi\right)}{4} = 0.4\ ft^3$
Volume of Ice:	$V_{pipe\_1\_250B\_ice} := V_{pipe\_1\_250B\_w\_ice} - V_{pipe\_1} = 0.2\ ft^3$
Weight of Ice:	$WT_{pipe\_1\_250B\_ice} := V_{pipe\_1\_250B\_ice} \cdot I_d = 11\ lbf$
Factored Vertical Load of All Equipment w/ 250B Ice:	$WTall_{pipe\_1\_250B} := \left(WT_{pipe\_1} + WT_{pipe\_1\_250B\_ice}\right) \cdot N_{pipe\_1} \cdot OLF250B_V = 593\ lbf$

NESC 250C Vertical Load

Factored Vertical Load of All Equipment:	$WTall_{pipe\_1\_250C} := WT_{pipe\_1} \cdot N_{pipe\_1} \cdot OLF250C_V = 263\ lbf$

NESC 250D Vertical Load

Volume of Pipe w/ Ice:	$V_{pipe\_1\_250D\_w\_ice} := \left(L_{pipe\_1} + 2 \cdot r_{ice250D}\right) \cdot \frac{\left(\left(W_{pipe\_1} + 2 \cdot r_{ice250D}\right)^2 \cdot \pi\right)}{4} = 0.6\ ft^3$
Volume of Ice:	$V_{pipe\_1\_250D\_ice} := V_{pipe\_1\_250D\_w\_ice} - V_{pipe\_1} = 0.5\ ft^3$
Weight of Ice:	$WT_{pipe\_1\_250D\_ice} := V_{pipe\_1\_250D\_ice} \cdot I_d = 26.2\ lbf$
Factored Vertical Load of All Equipment w/ 250B Ice:	$WTall_{pipe\_1\_250D} := \left(WT_{pipe\_1} + WT_{pipe\_1\_250D\_ice}\right) \cdot N_{pipe\_1} \cdot OLF250D_V = 577\ lbf$

NESC 250B Wind Load

Area of PIpe w/ Ice:

$$SA_{pipe\_1\_250B\_w\_ice} := \left(L_{pipe\_1} + 2 \cdot r_{ice250B}\right) \cdot \left(W_{pipe\_1} + 2 \cdot r_{ice250B}\right) = 1.7\ ft^2$$

Factored Wind Load on Pipe w/ 250B Ice:

$$WLall_{pipe\_1\_250B} := qz_{250B} \cdot Cd_R \cdot SA_{pipe\_1\_250B\_w\_ice} \cdot N_{pipe\_1} \cdot OLF250B_T = 267\ lbf$$

NESC 250C Wind Load

Area of Pipe w/ Ice:

$$SA_{pipe\_1\_250C} := \left(L_{pipe\_1}\right) \cdot \left(W_{pipe\_1}\right) = 1.2\ ft^2$$

Factored Wind Load on All Pipe:

$$WLall_{pipe\_1\_250C} := qz_{250C} \cdot Cd_R \cdot SA_{pipe\_1\_250C} \cdot N_{pipe\_1} \cdot OLF250C_T \cdot m_{grf} = 804\ lbf$$

NESC 250D Wind Load

Area of Pipe w/ Ice:

$$SA_{pipe\_1\_250D\_w\_ice} := \left(L_{pipe\_1} + 2 \cdot r_{ice250D}\right) \cdot \left(W_{pipe\_1} + 2 \cdot r_{ice250D}\right) = 2.2\ ft^2$$

Factored Wind Load on Pipe w/ 250D Ice:

$$WLall_{pipe\_1\_250D} := qz_{250D} \cdot Cd_R \cdot SA_{pipe\_1\_250D\_w\_ice} \cdot N_{pipe\_1} \cdot OLF250D_T \cdot m_{grf} = 180\ lbf$$

Standard Platform Calculations - Platform 1

Mount Properties

Existing Antenna Carrier:	AT&T	User Defined
Platform Model:	Penn Summit 14' Low Profile Platform w/ Handrail Kit	User Defined
Platform Area w/o Ice:	$CAA_{A\_plt\_1} := 23.1\ ft^2 + 6\ ft^2 = 29.1\ ft^2$	User Defined (Includes TIA shape factor)
Platform Area w/ 1/2" Ice:	$CAA_{A\_plt\_1\_250B} := 26.8\ ft^2 + 8.5\ ft^2 = 35.3\ ft^2$	User Defined (Includes TIA shape factor)
Platform Area w/ 1" Ice:	$CAA_{A\_plt\_1\_250D} := 30.5\ ft^2 + 11\ ft^2 = 41.5\ ft^2$	User Defined (Includes TIA shape factor)
Platform Weight w/o Ice:	$WT_{plt\_1} := 2100\ lbf + 260\ lbf = 2360\ lbf$	User Defined
Platform Weight w/ 1/2" Ice:	$WT_{plt\_1\_250B} := 2500\ lbf + 340\ lbf = 2840\ lbf$	User Defined
Platform Weight w/ 1" Ice:	$WT_{plt\_1\_250D} := 2900\ lbf + 420\ lbf = 3320\ lbf$	User Defined

NESC 250B Vertical Load

Factored Vertical Load of Platform w/ 250B Ice: $WTall_{plt\_1\_250B} := WT_{plt\_1\_250B} \cdot OLF250B_V = 4260\ lbf$

NESC 250C Vertical Load

Factored Vertical Load of Platform: $WTall_{plt\_1\_250C} := WT_{plt\_1} \cdot OLF250C_V = 2360\ lbf$

NESC 250D Vertical Load

Factored Vertical Load of Platform w/ 250D Ice: $WTall_{plt\_1\_250D} := WT_{plt\_1\_250D} \cdot OLF250D_V = 3320\ lbf$

NESC 250B Wind Load

Factored Wind Load on Platform w/ 250B Ice: $WLall_{plt\_1\_250B} := qz_{250B} \cdot Cd_F \cdot CAA_{A\_plt\_1\_250B} \cdot OLF250B_T = 564\ lbf$

NESC 250C Wind Load

Factored Wind Load on Platform: $WLall_{plt\_1\_250C} := qz_{250C} \cdot CAA_{A\_plt\_1} \cdot OLF250C_T \cdot m_{grf} = 1264\ lbf$

NESC 250D Wind Load

Factored Wind Load on Platform w/ 250D Ice: $WLall_{plt\_1\_250D} := qz_{250D} \cdot CAA_{A\_plt\_1\_250D} \cdot OLF250D_T \cdot m_{grf} = 212\ lbf$

Standard Platform Calculations - Platform 2

Mount Properties

Existing Antenna Carrier:	T-Mobile	User Defined
Platform Model:	Penn Summit 14' Low Profile Platform	User Defined
Platform Area w/o Ice:	$C_AA_{A\_plt\_2} := 23.1 \cdot ft^2$	User Defined (Includes TIA shape factor)
Platform Area w/ 1/2" Ice:	$C_AA_{A\_plt\_2\_250B} := 26.8\ ft^2$	User Defined (Includes TIA shape factor)
Platform Area w/ 1" Ice:	$C_AA_{A\_plt\_2\_250D} := 30.5\ ft^2$	User Defined (Includes TIA shape factor)
Platform Weight w/o Ice:	$WT_{plt\_2} := 2100 \cdot lbf$	User Defined
Platform Weight w/ 1/2" Ice:	$WT_{plt\_2\_250B} := 2500 \cdot lbf$	User Defined
Platform Weight w/ 1" Ice:	$WT_{plt\_2\_250D} := 2900 \cdot lbf$	User Defined

NESC 250B Vertical Load

Factored Vertical Load of Platform w/ 250B Ice: $WTall_{plt\_2\_250B} := WT_{plt\_2\_250B} \cdot OLF250B_V = 3750\ lbf$

NESC 250C Vertical Load

Factored Vertical Load of Platform: $WTall_{plt\_2\_250C} := WT_{plt\_2} \cdot OLF250C_V = 2100\ lbf$

NESC 250D Vertical Load

Factored Vertical Load of Platform w/ 250D Ice: $WTall_{plt\_2\_250D} := WT_{plt\_2\_250D} \cdot OLF250D_V = 2900\ lbf$

NESC 250B Wind Load

Factored Wind Load on Platform w/ 250B Ice: $WLall_{plt\_2\_250B} := qz_{250B} \cdot Cd_F \cdot C_AA_{A\_plt\_2\_250B} \cdot OLF250B_T = 428\ lbf$

NESC 250C Wind Load

Factored Wind Load on Platform: $WLall_{plt\_2\_250C} := qz_{250C} \cdot C_AA_{A\_plt\_2} \cdot OLF250C_T \cdot m_{grf} = 1003\ lbf$

NESC 250D Wind Load

Factored Wind Load on Platform w/ 250D Ice: $WLall_{plt\_2\_250D} := qz_{250D} \cdot C_AA_{A\_plt\_2\_250D} \cdot OLF250D_T \cdot m_{grf} = 156\ lbf$

Standard Coax Calculations - Coax 1

Mount Properties

Existing Antenna Carrier:	AT&T	User Defined
Coax Outer Diameter:	$D_{coax\_1} := 1.98\ in$	User Defined
Coax Weight / Ft:	$WT_{coax\_1} := 1.04\ lbf$	User Defined
Coax Volume / Ft:	$V_{coax\_1} := 1\ ft \cdot \frac{\left(\left(D_{coax\_1}\right)^2 \cdot \pi\right)}{4} = 0.02\ ft^3$	
Coax Quantity:	$N_{coax\_1} := 24$	User Defined
Coax Projected Quantity:	$NP_{coax\_1} := 0$	User Defined
Coax Length:	$L_{coax\_1} := 116.5$ (Feet)	User Defined

NESC 250B Vertical Load

Volume of Coax w/ Ice / Ft:	$V_{coax\_1\_250B\_w\_ice} := 1\ ft \cdot \frac{\left(\left(D_{coax\_1} + 2 \cdot r_{ice250B}\right)^2 \cdot \pi\right)}{4} = 0.05\ ft^3$
Volume of Ice / Ft:	$V_{coax\_1\_250B\_ice} := V_{coax\_1\_250B\_w\_ice} - V_{coax\_1} = 0.03\ ft^3$
Weight of Ice / Ft:	$WT_{coax\_1\_250B\_ice} := V_{coax\_1\_250B\_ice} \cdot I_d = 1.5\ lbf$
Factored Vertical Load of All Coax w/ 250B Ice:	$WTall_{coax\_1\_250B} := \left(WT_{coax\_1} + WT_{coax\_1\_250B\_ice}\right) \cdot N_{coax\_1} \cdot L_{coax\_1} \cdot OLF250B_V = 10829\ lbf$

NESC 250C Vertical Load

Factored Vertical Load of All Coax:	$WTall_{coax\_1\_250C} := WT_{coax\_1} \cdot N_{coax\_1} \cdot L_{coax\_1} \cdot OLF250C_V = 2908\ lbf$

NESC 250D Vertical Load

Volume of Coax w/ Ice / Ft:	$V_{coax\_1\_250D\_w\_ice} := 1\ ft \cdot \frac{\left(\left(D_{coax\_1} + 2 \cdot r_{ice250D}\right)^2 \cdot \pi\right)}{4} = 0.09\ ft^3$
Volume of Ice / Ft:	$V_{coax\_1\_250D\_ice} := V_{coax\_1\_250D\_w\_ice} - V_{coax\_1} = 0.07\ ft^3$
Weight of Ice / Ft:	$WT_{coax\_1\_250D\_ice} := V_{coax\_1\_250D\_ice} \cdot I_d = 3.7\ lbf$
Factored Vertical Load of All Coax w/ 250D Ice:	$WTall_{coax\_1\_250D} := \left(WT_{coax\_1} + WT_{coax\_1\_250D\_ice}\right) \cdot N_{coax\_1} \cdot L_{coax\_1} \cdot OLF250D_V = 13269\ lbf$

NESC 250B Wind Load

Area of Coax w/ Ice / Ft:

$$SA_{coax\_1\_250B\_w\_ice} := 1\ ft \cdot \left(D_{coax\_1} + 2 \cdot r_{ice250B}\right) = 0.25\ ft^2$$

Factored Wind Load on Coax w/ 250B Ice:

$$WLall_{coax\_1\_250B} := qz_{250B} \cdot Cd_{coax} \cdot SA_{coax\_1\_250B\_w\_ice} \cdot NP_{coax\_1} \cdot L_{coax\_1} \cdot OLF250B_T = 0\ lbf$$

NESC 250C Wind Load

Area of Coax w/ Ice / Ft:

$$SA_{coax\_1\_250C} := 1\ ft \cdot \left(D_{coax\_1}\right) = 0.17\ ft^2$$

Factored Wind Load on All Pipe:

$$WLall_{coax\_1\_250C} := qz_{250C} \cdot Cd_{coax} \cdot SA_{coax\_1\_250C} \cdot NP_{coax\_1} \cdot L_{coax\_1} \cdot OLF250C_T \cdot m_{grf} = 0\ lbf$$

NESC 250D Wind Load

Area of Coax w/ Ice / Ft:

$$SA_{coax\_1\_250D\_w\_ice} := 1\ ft \cdot \left(D_{coax\_1} + 2 \cdot r_{ice250D}\right) = 0.3\ ft^2$$

Factored Wind Load on Pipe w/ 250D Ice:

$$WLall_{coax\_1\_250D} := qz_{250D} \cdot Cd_{coax} \cdot SA_{coax\_1\_250D\_w\_ice} \cdot NP_{coax\_1} \cdot L_{coax\_1} \cdot OLF250D_T \cdot m_{grf} = 0\ lbf$$

Standard Coax Calculations - Coax 2

Mount Properties

Existing Antenna Carrier:	T-Mobile		User Defined
Coax Outer Diameter:	$D_{coax\_2} := 1.98\ in$		User Defined
Coax Weight / Ft:	$WT_{coax\_2} := 1.04\ lbf$		User Defined
Coax Volume / Ft:	$V_{coax\_2} := 1\ ft \cdot \frac{\left(\left(D_{coax\_2}\right)^2 \cdot \pi\right)}{4} = 0.02\ ft^3$		
Coax Quantity:	$N_{coax\_2} := 6$		User Defined
Coax Projected Quantity:	$NP_{coax\_2} := 0$		User Defined
Coax Length:	$L_{coax\_2} := 106$	(Feet)	User Defined

NESC 250B Vertical Load

Volume of Coax w/ Ice / Ft:	$V_{coax\_2\_250B\_w\_ice} := 1\ ft \cdot \frac{\left(\left(D_{coax\_2} + 2 \cdot r_{ice250B}\right)^2 \cdot \pi\right)}{4} = 0.05\ ft^3$
Volume of Ice / Ft:	$V_{coax\_2\_250B\_ice} := V_{coax\_2\_250B\_w\_ice} - V_{coax\_1} = 0.03\ ft^3$
Weight of Ice / Ft:	$WT_{coax\_2\_250B\_ice} := V_{coax\_2\_250B\_ice} \cdot I_d = 1.5\ lbf$
Factored Vertical Load of All Coax w/ 250B Ice:	$WTall_{coax\_2\_250B} := \left(WT_{coax\_2} + WT_{coax\_2\_250B\_ice}\right) \cdot N_{coax\_2} \cdot L_{coax\_2} \cdot OLF250B_V = 2463\ lbf$

NESC 250C Vertical Load

Factored Vertical Load of All Coax:	$WTall_{coax\_2\_250C} := WT_{coax\_2} \cdot N_{coax\_2} \cdot L_{coax\_2} \cdot OLF250C_V = 661\ lbf$

NESC 250D Vertical Load

Volume of Coax w/ Ice / Ft:	$V_{coax\_2\_250D\_w\_ice} := 1\ ft \cdot \frac{\left(\left(D_{coax\_2} + 2 \cdot r_{ice250D}\right)^2 \cdot \pi\right)}{4} = 0.09\ ft^3$
Volume of Ice / Ft:	$V_{coax\_2\_250D\_ice} := V_{coax\_2\_250D\_w\_ice} - V_{coax\_2} = 0.07\ ft^3$
Weight of Ice / Ft:	$WT_{coax\_2\_250D\_ice} := V_{coax\_2\_250D\_ice} \cdot I_d = 3.7\ lbf$
Factored Vertical Load of All Coax w/ 250D Ice:	$WTall_{coax\_2\_250D} := \left(WT_{coax\_2} + WT_{coax\_2\_250D\_ice}\right) \cdot N_{coax\_2} \cdot L_{coax\_2} \cdot OLF250D_V = 3018\ lbf$

NESC 250B Wind Load

Area of Coax w/ Ice / Ft:

$$SA_{coax\_2\_250B\_w\_ice} := 1\ ft \cdot \left(D_{coax\_2} + 2 \cdot r_{ice250B}\right) = 0.25\ ft^2$$

Factored Wind Load on Coax w/ 250B Ice:

$$WLall_{coax\_2\_250B} := qz_{250B} \cdot Cd_{coax} \cdot SA_{coax\_2\_250B\_w\_ice} \cdot NP_{coax\_2} \cdot L_{coax\_2} \cdot OLF250B_T = 0\ lbf$$

NESC 250C Wind Load

Area of Coax w/ Ice / Ft:

$$SA_{coax\_2\_250C} := 1\ ft \cdot \left(D_{coax\_2}\right) = 0.17\ ft^2$$

Factored Wind Load on All Pipe:

$$WLall_{coax\_2\_250C} := qz_{250C} \cdot Cd_{coax} \cdot SA_{coax\_2\_250C} \cdot NP_{coax\_2} \cdot L_{coax\_2} \cdot OLF250C_T \cdot m_{grf} = 0\ lbf$$

NESC 250D Wind Load

Area of Coax w/ Ice / Ft:

$$SA_{coax\_2\_250D\_w\_ice} := 1\ ft \cdot \left(D_{coax\_2} + 2 \cdot r_{ice250D}\right) = 0.3\ ft^2$$

Factored Wind Load on Pipe w/ 250D Ice:

$$WLall_{coax\_2\_250D} := qz_{250D} \cdot Cd_{coax} \cdot SA_{coax\_2\_250D\_w\_ice} \cdot NP_{coax\_2} \cdot L_{coax\_2} \cdot OLF250D_T \cdot m_{grf} = 0\ lbf$$

AT&T Loads @ 116'

NESC 250B Loads Applied In PLS-Pole

$$NESC\_250B_V := WTall_{eq\_1\_250B} + WTall_{eq\_2\_250B} + WTall_{eq\_3\_250B} + WTall_{eq\_4\_250B} + WTall_{pipe\_1\_250B} + WTall_{plt\_1\_250B} = 6543\ lbf$$

$$NESC\_250B_T := WLall_{eq\_1\_250B} + WLall_{eq\_2\_250B} + WLall_{eq\_3\_250B} + WLall_{eq\_4\_250B} + WLall_{pipe\_1\_250B} + WLall_{plt\_1\_250B} = 1931\ lbf$$

$$Coax\_NESC\_250B_V := WTall_{coax\_1\_250B} = 10829\ lbf$$

$$Coax\_NESC\_250B_T := WLall_{coax\_1\_250B} = 0\ lbf$$

NESC 250C Loads Applied In PLS-Pole

$$NESC\_250C_V := WTall_{eq\_1\_250C} + WTall_{eq\_2\_250C} + WTall_{eq\_3\_250C} + WTall_{eq\_4\_250C} + WTall_{pipe\_1\_250C} + WTall_{plt\_1\_250C} = 3250\ lbf$$

$$NESC\_250C_T := WLall_{eq\_1\_250C} + WLall_{eq\_2\_250C} + WLall_{eq\_3\_250C} + WLall_{eq\_4\_250C} + WLall_{pipe\_1\_250C} + WLall_{plt\_1\_250C} = 6335\ lbf$$

$$Coax\_NESC\_250C_V := WTall_{coax\_1\_250C} = 2908\ lbf$$

$$Coax\_NESC\_250C_T := WLall_{coax\_1\_250C} = 0\ lbf$$

NESC 250D Loads Applied In PLS-Pole

$$NESC\_250D_V := WTall_{eq\_1\_250D} + WTall_{eq\_2\_250D} + WTall_{eq\_3\_250D} + WTall_{eq\_4\_250D} + WTall_{pipe\_1\_250D} + WTall_{plt\_1\_250D} = 5606\ lbf$$

$$NESC\_250D_T := WLall_{eq\_1\_250D} + WLall_{eq\_2\_250D} + WLall_{eq\_3\_250D} + WLall_{eq\_4\_250D} + WLall_{pipe\_1\_250D} + WLall_{plt\_1\_250D} = 1021\ lbf$$

$$Coax\_NESC\_250D_V := WTall_{coax\_1\_250D} = 13269\ lbf$$

$$Coax\_NESC\_250D_T := WLall_{coax\_1\_250D} = 0\ lbf$$

T-Mobile Loads @ 106'

NESC 250B Loads Applied In PLS-Pole

$$NESC\_250B_V := WTall_{eq\_5\_250B} + WTall_{eq\_6\_250B} + WTall_{pipe\_1\_250B} + WTall_{plt\_2\_250B} = 4812\ lbf$$

$$NESC\_250B_T := WLall_{eq\_5\_250B} + WLall_{eq\_6\_250B} + WLall_{pipe\_1\_250B} + WLall_{plt\_2\_250B} = 1014\ lbf$$

$$Coax\_NESC\_250B_V := WTall_{coax\_2\_250B} = 2463\ lbf$$

$$Coax\_NESC\_250B_T := WLall_{coax\_2\_250B} = 0\ lbf$$

NESC 250C Loads Applied In PLS-Pole

$$NESC\_250C_V := WTall_{eq\_5\_250C} + WTall_{eq\_6\_250C} + WTall_{pipe\_1\_250C} + WTall_{plt\_2\_250C} = 2548\ lbf$$

$$NESC\_250C_T := WLall_{eq\_5\_250C} + WLall_{eq\_6\_250C} + WLall_{pipe\_1\_250C} + WLall_{plt\_2\_250C} = 3041\ lbf$$

$$Coax\_NESC\_250C_V := WTall_{coax\_2\_250C} = 661\ lbf$$

$$Coax\_NESC\_250C_T := WLall_{coax\_2\_250C} = 0\ lbf$$

NESC 250D Loads Applied In PLS-Pole

$$NESC\_250D_V := WTall_{eq\_5\_250D} + WTall_{eq\_6\_250D} + WTall_{pipe\_1\_250D} + WTall_{plt\_2\_250D} = 3942\ lbf$$

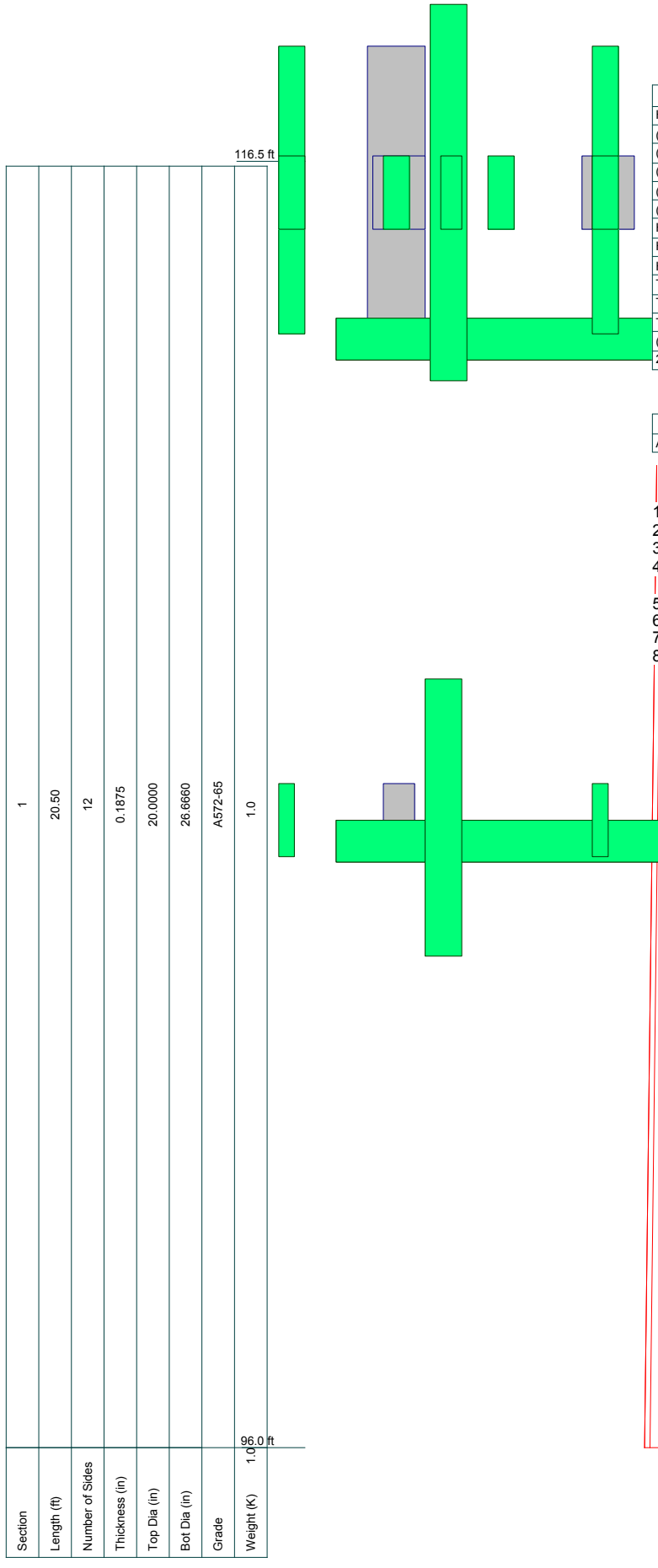
$$NESC\_250D_T := WLall_{eq\_5\_250D} + WLall_{eq\_6\_250D} + WLall_{pipe\_1\_250D} + WLall_{plt\_2\_250D} = 519\ lbf$$

$$Coax\_NESC\_250D_V := WTall_{coax\_2\_250D} = 3018\ lbf$$

$$Coax\_NESC\_250D_T := WLall_{coax\_2\_250D} = 0\ lbf$$

APPENDIX C

COMPUTER OUTPUT



Section	Length (ft)	Number of Sides	Thickness (in)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	20.50	12	0.1875	20.0000	26.6660	A572-65	1.0

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Handrail Kit	118	2.375" OD x 6' Mount Pipe	116
(2) 7770.00 w/ Mount Pipe	116	2.375" OD x 6' Mount Pipe	116
(2) 7770.00 w/ Mount Pipe	116	Penn Summit 14' Low Profile Platform	114
(4) LGP21401	116	APX16PV-16PVL-E w/ Mount Pipe	106
(4) LGP21401	116	APX16PV-16PVL-E w/ Mount Pipe	106
(4) LGP21401	116	APX16PV-16PVL-E w/ Mount Pipe	106
HPA-65R-BUU-H6 w/ Mount Pipe	116	(2) Remec G20057A1	106
HPA-65R-BUU-H6 w/ Mount Pipe	116	(2) Remec G20057A1	106
HPA-65R-BUU-H6 w/ Mount Pipe	116	(2) Remec G20057A1	106
TMA2061F1V1-1	116	Penn Summit 14' Low Profile Platform	106
TMA2061F1V1-1	116	(2) 2.375" OD x 6' Mount Pipe	106
TMA2061F1V1-1	116	(2) 2.375" OD x 6' Mount Pipe	106
(2) 7770.00 w/ Mount Pipe	116	(2) 2.375" OD x 6' Mount Pipe	106
2.375" OD x 6' Mount Pipe	116		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 30.5%

ALL REACTIONS ARE FACTORED

AXIAL 16 K

SHEAR 2 K *MOMENT 38 kip-ft*

TORQUE 0 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 9 K

SHEAR 10 K *MOMENT 152 kip-ft*

TORQUE 0 kip-ft
REACTIONS - 97 mph WIND

Paul J Ford and Company
250 E. Broad Street Suite 1500
Columbus, OH 43215
Phone: 614.22.16679
FAX: 614.448.4105

Job:	***80617-0015.001.6000 / CL&P Pole #4008***		
Project:	***Town of Hamden Site #CTL02255 / FA #10035414***		
Client: AT&T / Smartlink	Drawn by: James Antoszewski	App'd:	
Code: TIA-222-G	Date: 01/11/18	Scale: NTS	
Path:		Dwg No. E-1	

Tower Input Data

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

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

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	116.50-96.00	20.50		12	20.0000	26.6660	0.1875	0.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	20.7055	11.9618	599.3230	7.0929	10.3600	57.8497	1214.3908	5.8872	4.8575	25.907
	27.6067	15.9864	1430.6165	9.4793	13.8130	103.5704	2898.8169	7.8680	6.6440	35.435

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 116.50-96.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	C	No	Inside Pole	116.50 - 96.00	24	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
****								
LDF7-50A(1-5/8")	C	No	Inside Pole	106.00 - 96.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	116.50-96.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.45

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	116.50-96.00	A	1.685	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.45

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	116.50-96.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(4) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.35 0.44 0.54	0.01 0.02 0.03
(4) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.35 0.44 0.54	0.01 0.02 0.03
(4) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.35 0.44 0.54	0.01 0.02 0.03
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
TMA2061F1V1-1	A	From Leg	4.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	0.94 1.07 1.20	0.62 0.73 0.85	0.02 0.03 0.04
TMA2061F1V1-1	B	From Leg	4.00 0.00 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	0.94 1.07 1.20	0.62 0.73 0.85	0.02 0.03 0.04
TMA2061F1V1-1	C	From Leg	4.00 0.00	0.0000	116.00	No Ice 1/2" Ice	0.94 1.07	0.62 0.73	0.02 0.03

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral ft* / *Vert ft* / *ft*	*Azimuth Adjustment* °	*Placement* *ft*		*C_AA_A Front* *ft²*	*C_AA_A Side* *ft²*	*Weight* *K*
			0.00			1" Ice	1.20	0.85	0.04
Penn Summit 14' Low Profile Platform	C	None		0.0000	114.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50
						1" Ice	30.50	30.50	2.90
Handrail Kit	C	From Leg	0.00	0.0000	118.00	No Ice	6.00	6.00	0.26
			0.00			1/2" Ice	8.50	8.50	0.34
			0.00			1" Ice	11.00	11.00	0.42
2.375" OD x 6' Mount Pipe	A	From Leg	4.00	0.0000	116.00	No Ice	1.43	1.43	0.03
			0.00			1/2" Ice	1.92	1.92	0.04
			0.00			1" Ice	2.29	2.29	0.05
2.375" OD x 6' Mount Pipe	B	From Leg	4.00	0.0000	116.00	No Ice	1.43	1.43	0.03
			0.00			1/2" Ice	1.92	1.92	0.04
			0.00			1" Ice	2.29	2.29	0.05
2.375" OD x 6' Mount Pipe	C	From Leg	4.00	0.0000	116.00	No Ice	1.43	1.43	0.03
			0.00			1/2" Ice	1.92	1.92	0.04
			0.00			1" Ice	2.29	2.29	0.05
******									
APX16PV-16PVL-E w/ Mount Pipe	A	From Leg	4.00	0.0000	106.00	No Ice	6.31	3.29	0.06
			0.00			1/2" Ice	6.74	4.00	0.11
			0.00			1" Ice	7.17	4.66	0.16
APX16PV-16PVL-E w/ Mount Pipe	B	From Leg	4.00	0.0000	106.00	No Ice	6.31	3.29	0.06
			0.00			1/2" Ice	6.74	4.00	0.11
			0.00			1" Ice	7.17	4.66	0.16
APX16PV-16PVL-E w/ Mount Pipe	C	From Leg	4.00	0.0000	106.00	No Ice	6.31	3.29	0.06
			0.00			1/2" Ice	6.74	4.00	0.11
			0.00			1" Ice	7.17	4.66	0.16
(2) Remec G20057A1	A	From Leg	4.00	0.0000	106.00	No Ice	0.70	0.35	0.01
			0.00			1/2" Ice	0.82	0.44	0.02
			0.00			1" Ice	0.94	0.54	0.02
(2) Remec G20057A1	B	From Leg	4.00	0.0000	106.00	No Ice	0.70	0.35	0.01
			0.00			1/2" Ice	0.82	0.44	0.02
			0.00			1" Ice	0.94	0.54	0.02
(2) Remec G20057A1	C	From Leg	4.00	0.0000	106.00	No Ice	0.70	0.35	0.01
			0.00			1/2" Ice	0.82	0.44	0.02
			0.00			1" Ice	0.94	0.54	0.02
Penn Summit 14' Low Profile Platform	C	None		0.0000	106.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50
						1" Ice	30.50	30.50	2.90
(2) 2.375" OD x 6' Mount Pipe	A	From Leg	4.00	0.0000	106.00	No Ice	1.43	1.43	0.03
			0.00			1/2" Ice	1.92	1.92	0.04
			0.00			1" Ice	2.29	2.29	0.05
(2) 2.375" OD x 6' Mount Pipe	B	From Leg	4.00	0.0000	106.00	No Ice	1.43	1.43	0.03
			0.00			1/2" Ice	1.92	1.92	0.04
			0.00			1" Ice	2.29	2.29	0.05
(2) 2.375" OD x 6' Mount Pipe	C	From Leg	4.00	0.0000	106.00	No Ice	1.43	1.43	0.03
			0.00			1/2" Ice	1.92	1.92	0.04
			0.00			1" Ice	2.29	2.29	0.05

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 116.50-96.00	105.76	1.281	29	41.267	A	0.000	41.267	41.267	100.00	0.000	0.000
					B	0.000	41.267		100.00	0.000	0.000
					C	0.000	41.267		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 116.50-96.00	105.76	1.281	8	1.6853	47.025	A	0.000	47.025	47.025	100.00	0.000	0.000
						B	0.000	47.025		100.00	0.000	0.000
						C	0.000	47.025		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 116.50-96.00	105.76	1.281	10	41.267	A	0.000	41.267	41.267	100.00	0.000	0.000
					B	0.000	41.267		100.00	0.000	0.000
					C	0.000	41.267		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1 116.50-96.00	0.45	0.97	A	1	1	29	1	1	41.267	1.33	64.89	C
			B	1	1		1	1	41.267			
			C	1	1		1	1	41.267			
Sum Weight:	0.45	0.97						OTM	12.99 kip-ft	1.33		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.45	0.97	A	1	1	29	1	1	41.267	1.33	64.89	C
116.50-96.00			B	1	1		1	1	41.267			
			C	1	1		1	1	41.267			
Sum Weight:	0.45	0.97						OTM	12.99 kip-ft	1.33		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.45	0.97	A	1	1	29	1	1	41.267	1.33	64.89	C
116.50-96.00			B	1	1		1	1	41.267			
			C	1	1		1	1	41.267			
Sum Weight:	0.45	0.97						OTM	12.99 kip-ft	1.33		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.45	2.06	A	1	1.2	8	1	1	47.025	0.48	23.58	C
116.50-96.00			B	1	1.2		1	1	47.025			
			C	1	1.2		1	1	47.025			
Sum Weight:	0.45	2.06						OTM	4.72 kip-ft	0.48		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.45	2.06	A	1	1.2	8	1	1	47.025	0.48	23.58	C
116.50-96.00			B	1	1.2		1	1	47.025			
			C	1	1.2		1	1	47.025			
Sum Weight:	0.45	2.06						OTM	4.72 kip-ft	0.48		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.45	2.06	A	1	1.2	8	1	1	47.025	0.48	23.58	C
116.50-96.00			B	1	1.2		1	1	47.025			
			C	1	1.2		1	1	47.025			
Sum Weight:	0.45	2.06						OTM	4.72 kip-ft	0.48		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.45	0.97	A	1	1	10	1	1	41.267	0.46	22.21	C
116.50-96.00			B	1	1		1	1	41.267			
			C	1	1		1	1	41.267			
Sum Weight:	0.45	0.97						OTM	4.45 kip-ft	0.46		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.45	0.97	A	1	1	10	1	1	41.267	0.46	22.21	C
116.50-96.00			B	1	1		1	1	41.267			
			C	1	1		1	1	41.267			
Sum Weight:	0.45	0.97						OTM	4.45 kip-ft	0.46		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.45	0.97	A	1	1	10	1	1	41.267	0.46	22.21	C
116.50-96.00			B	1	1		1	1	41.267			
			C	1	1		1	1	41.267			
Sum Weight:	0.45	0.97						OTM	4.45 kip-ft	0.46		

Force Totals

Load Case	*Vertical Forces* K	*Sum of Forces X* K	*Sum of Forces Z* K	*Sum of Overturning Moments, M_x* kip-ft	*Sum of Overturning Moments, M_z* kip-ft	*Sum of Torques* kip-ft
Leg Weight	0.97					
Bracing Weight	0.00					
Total Member Self-Weight	0.97			0.11	0.18	
Total Weight	7.17			0.11	0.18	
Wind 0 deg - No Ice		0.00	-6.25	-94.28	0.18	-0.14
Wind 30 deg - No Ice		3.12	-5.41	-81.63	-47.01	-0.08
Wind 60 deg - No Ice		5.41	-3.12	-47.09	-81.56	0.00
Wind 90 deg - No Ice		6.25	0.00	0.11	-94.20	0.08
Wind 120 deg - No Ice		5.41	3.12	47.30	-81.56	0.14
Wind 150 deg - No Ice		3.12	5.41	81.85	-47.01	0.16
Wind 180 deg - No Ice		0.00	6.25	94.49	0.18	0.14
Wind 210 deg - No Ice		-3.12	5.41	81.85	47.38	0.08
Wind 240 deg - No Ice		-5.41	3.12	47.30	81.92	0.00
Wind 270 deg - No Ice		-6.25	0.00	0.11	94.57	-0.08
Wind 300 deg - No Ice		-5.41	-3.12	-47.09	81.92	-0.14
Wind 330 deg - No Ice		-3.12	-5.41	-81.63	47.38	-0.16
Member Ice	1.08					
Total Weight Ice	15.04			0.23	0.39	
Wind 0 deg - Ice		0.00	-2.49	-37.49	0.39	-0.09
Wind 30 deg - Ice		1.24	-2.15	-32.44	-18.47	-0.05
Wind 60 deg - Ice		2.15	-1.24	-18.63	-32.27	0.00
Wind 90 deg - Ice		2.49	0.00	0.23	-37.33	0.05
Wind 120 deg - Ice		2.15	1.24	19.08	-32.27	0.09
Wind 150 deg - Ice		1.24	2.15	32.89	-18.47	0.11
Wind 180 deg - Ice		0.00	2.49	37.94	0.39	0.09
Wind 210 deg - Ice		-1.24	2.15	32.89	19.25	0.05
Wind 240 deg - Ice		-2.15	1.24	19.08	33.05	0.00
Wind 270 deg - Ice		-2.49	0.00	0.23	38.11	-0.05
Wind 300 deg - Ice		-2.15	-1.24	-18.63	33.05	-0.09
Wind 330 deg - Ice		-1.24	-2.15	-32.44	19.25	-0.11
Total Weight	7.17			0.11	0.18	
Wind 0 deg - Service		0.00	-2.14	-32.20	0.18	-0.05
Wind 30 deg - Service		1.07	-1.85	-27.88	-15.97	-0.03
Wind 60 deg - Service		1.85	-1.07	-16.05	-27.80	0.00
Wind 90 deg - Service		2.14	0.00	0.11	-32.13	0.03
Wind 120 deg - Service		1.85	1.07	16.26	-27.80	0.05
Wind 150 deg - Service		1.07	1.85	28.09	-15.97	0.06
Wind 180 deg - Service		0.00	2.14	32.42	0.18	0.05
Wind 210 deg - Service		-1.07	1.85	28.09	16.34	0.03
Wind 240 deg - Service		-1.85	1.07	16.26	28.17	0.00
Wind 270 deg - Service		-2.14	0.00	0.11	32.50	-0.03
Wind 300 deg - Service		-1.85	-1.07	-16.05	28.17	-0.05
Wind 330 deg - Service		-1.07	-1.85	-27.88	16.34	-0.06

Load Combinations

Comb. No.	*Description*
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice

Comb. No.	Description
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	116.5 - 96	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-16.48	0.43	-0.25
			Max. Mx	20	-8.61	151.62	-0.13
			Max. My	14	-8.61	0.22	-151.53
			Max. Vy	20	-10.00	151.62	-0.13

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	14	10.00	0.22	-151.53
			Max. Torque	24			0.27

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	16.48	0.00	0.00
	Max. H_x	21	6.46	10.00	0.00
	Max. H_z	3	6.46	0.00	10.00
	Max. M_x	2	151.27	0.00	10.00
	Max. M_z	8	151.18	-10.00	0.00
	Max. Torsion	24	0.27	5.00	8.66
	Min. Vert	7	6.46	-8.66	5.00
	Min. H_x	9	6.46	-10.00	0.00
	Min. H_z	15	6.46	0.00	-10.00
	Min. M_x	14	-151.53	0.00	-10.00
	Min. M_z	20	-151.62	10.00	0.00
	Min. Torsion	12	-0.27	-5.00	-8.66

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	7.17	0.00	0.00	0.11	0.18	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	8.61	0.00	-10.00	-151.27	0.22	-0.23
0.9 Dead+1.6 Wind 0 deg - No Ice	6.46	0.00	-10.00	-151.21	0.17	-0.23
1.2 Dead+1.6 Wind 30 deg - No Ice	8.61	5.00	-8.66	-130.99	-75.48	-0.13
0.9 Dead+1.6 Wind 30 deg - No Ice	6.46	5.00	-8.66	-130.94	-75.48	-0.13
1.2 Dead+1.6 Wind 60 deg - No Ice	8.61	8.66	-5.00	-75.57	-130.89	0.00
0.9 Dead+1.6 Wind 60 deg - No Ice	6.46	8.66	-5.00	-75.56	-130.87	0.00
1.2 Dead+1.6 Wind 90 deg - No Ice	8.61	10.00	0.00	0.13	-151.18	0.13
0.9 Dead+1.6 Wind 90 deg - No Ice	6.46	10.00	0.00	0.10	-151.14	0.13
1.2 Dead+1.6 Wind 120 deg - No Ice	8.61	8.66	5.00	75.83	-130.89	0.23
0.9 Dead+1.6 Wind 120 deg - No Ice	6.46	8.66	5.00	75.75	-130.87	0.23
1.2 Dead+1.6 Wind 150 deg - No Ice	8.61	5.00	8.66	131.24	-75.48	0.27
0.9 Dead+1.6 Wind 150 deg - No Ice	6.46	5.00	8.66	131.13	-75.48	0.26
1.2 Dead+1.6 Wind 180 deg - No Ice	8.61	0.00	10.00	151.53	0.22	0.23

Load Combination	*Vertical*	*Shear$_x$*	*Shear$_z$*	*Overturning Moment, M$_x$*	*Overturning Moment, M$_z$*	*Torque*
	K	*K*	*K*	*kip-ft*	*kip-ft*	*kip-ft*
0.9 Dead+1.6 Wind 180 deg - No Ice	6.46	0.00	10.00	151.40	0.17	0.23
1.2 Dead+1.6 Wind 210 deg - No Ice	8.61	-5.00	8.66	131.24	75.92	0.13
0.9 Dead+1.6 Wind 210 deg - No Ice	6.46	-5.00	8.66	131.13	75.82	0.13
1.2 Dead+1.6 Wind 240 deg - No Ice	8.61	-8.66	5.00	75.83	131.34	0.00
0.9 Dead+1.6 Wind 240 deg - No Ice	6.46	-8.66	5.00	75.75	131.20	0.00
1.2 Dead+1.6 Wind 270 deg - No Ice	8.61	-10.00	0.00	0.13	151.62	-0.13
0.9 Dead+1.6 Wind 270 deg - No Ice	6.46	-10.00	0.00	0.10	151.47	-0.13
1.2 Dead+1.6 Wind 300 deg - No Ice	8.61	-8.66	-5.00	-75.57	131.34	-0.23
0.9 Dead+1.6 Wind 300 deg - No Ice	6.46	-8.66	-5.00	-75.56	131.20	-0.23
1.2 Dead+1.6 Wind 330 deg - No Ice	8.61	-5.00	-8.66	-130.99	75.92	-0.27
0.9 Dead+1.6 Wind 330 deg - No Ice	6.46	-5.00	-8.66	-130.94	75.82	-0.26
1.2 Dead+1.0 Ice+1.0 Temp	16.48	0.00	0.00	0.25	0.43	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	16.48	0.00	-2.49	-37.67	0.43	-0.09
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	16.48	1.24	-2.15	-32.59	-18.53	-0.05
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	16.48	2.15	-1.24	-18.71	-32.40	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	16.48	2.49	0.00	0.25	-37.48	0.05
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	16.48	2.15	1.24	19.21	-32.40	0.09
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	16.48	1.24	2.15	33.08	-18.53	0.11
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	16.48	0.00	2.49	38.16	0.43	0.09
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	16.48	-1.24	2.15	33.08	19.39	0.05
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	16.48	-2.15	1.24	19.21	33.27	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	16.48	-2.49	0.00	0.25	38.35	-0.05
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	16.48	-2.15	-1.24	-18.71	33.27	-0.09
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	16.48	-1.24	-2.15	-32.59	19.39	-0.11
Dead+Wind 0 deg - Service	7.17	0.00	-2.14	-32.27	0.19	-0.05
Dead+Wind 30 deg - Service	7.17	1.07	-1.85	-27.93	-16.00	-0.03
Dead+Wind 60 deg - Service	7.17	1.85	-1.07	-16.08	-27.86	0.00
Dead+Wind 90 deg - Service	7.17	2.14	0.00	0.11	-32.19	0.03
Dead+Wind 120 deg - Service	7.17	1.85	1.07	16.30	-27.86	0.05
Dead+Wind 150 deg - Service	7.17	1.07	1.85	28.15	-16.00	0.06
Dead+Wind 180 deg - Service	7.17	0.00	2.14	32.49	0.19	0.05
Dead+Wind 210 deg - Service	7.17	-1.07	1.85	28.15	16.37	0.03
Dead+Wind 240 deg - Service	7.17	-1.85	1.07	16.30	28.23	0.00
Dead+Wind 270 deg - Service	7.17	-2.14	0.00	0.11	32.56	-0.03
Dead+Wind 300 deg - Service	7.17	-1.85	-1.07	-16.08	28.23	-0.05
Dead+Wind 330 deg - Service	7.17	-1.07	-1.85	-27.93	16.37	-0.06

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-7.17	0.00	0.00	7.17	0.00	0.000%
2	0.00	-8.61	-10.00	0.00	8.61	10.00	0.000%
3	0.00	-6.46	-10.00	0.00	6.46	10.00	0.000%
4	5.00	-8.61	-8.66	-5.00	8.61	8.66	0.000%
5	5.00	-6.46	-8.66	-5.00	6.46	8.66	0.000%
6	8.66	-8.61	-5.00	-8.66	8.61	5.00	0.000%
7	8.66	-6.46	-5.00	-8.66	6.46	5.00	0.000%
8	10.00	-8.61	0.00	-10.00	8.61	0.00	0.000%
9	10.00	-6.46	0.00	-10.00	6.46	0.00	0.000%
10	8.66	-8.61	5.00	-8.66	8.61	-5.00	0.000%
11	8.66	-6.46	5.00	-8.66	6.46	-5.00	0.000%
12	5.00	-8.61	8.66	-5.00	8.61	-8.66	0.000%
13	5.00	-6.46	8.66	-5.00	6.46	-8.66	0.000%
14	0.00	-8.61	10.00	0.00	8.61	-10.00	0.000%
15	0.00	-6.46	10.00	0.00	6.46	-10.00	0.000%
16	-5.00	-8.61	8.66	5.00	8.61	-8.66	0.000%
17	-5.00	-6.46	8.66	5.00	6.46	-8.66	0.000%
18	-8.66	-8.61	5.00	8.66	8.61	-5.00	0.000%
19	-8.66	-6.46	5.00	8.66	6.46	-5.00	0.000%
20	-10.00	-8.61	0.00	10.00	8.61	0.00	0.000%
21	-10.00	-6.46	0.00	10.00	6.46	0.00	0.000%
22	-8.66	-8.61	-5.00	8.66	8.61	5.00	0.000%
23	-8.66	-6.46	-5.00	8.66	6.46	5.00	0.000%
24	-5.00	-8.61	-8.66	5.00	8.61	8.66	0.000%
25	-5.00	-6.46	-8.66	5.00	6.46	8.66	0.000%
26	0.00	-16.48	0.00	0.00	16.48	0.00	0.000%
27	0.00	-16.48	-2.49	0.00	16.48	2.49	0.000%
28	1.24	-16.48	-2.15	-1.24	16.48	2.15	0.000%
29	2.15	-16.48	-1.24	-2.15	16.48	1.24	0.000%
30	2.49	-16.48	0.00	-2.49	16.48	0.00	0.000%
31	2.15	-16.48	1.24	-2.15	16.48	-1.24	0.000%
32	1.24	-16.48	2.15	-1.24	16.48	-2.15	0.000%
33	0.00	-16.48	2.49	0.00	16.48	-2.49	0.000%
34	-1.24	-16.48	2.15	1.24	16.48	-2.15	0.000%
35	-2.15	-16.48	1.24	2.15	16.48	-1.24	0.000%
36	-2.49	-16.48	0.00	2.49	16.48	0.00	0.000%
37	-2.15	-16.48	-1.24	2.15	16.48	1.24	0.000%
38	-1.24	-16.48	-2.15	1.24	16.48	2.15	0.000%
39	0.00	-7.17	-2.14	0.00	7.17	2.14	0.000%
40	1.07	-7.17	-1.85	-1.07	7.17	1.85	0.000%
41	1.85	-7.17	-1.07	-1.85	7.17	1.07	0.000%
42	2.14	-7.17	0.00	-2.14	7.17	0.00	0.000%
43	1.85	-7.17	1.07	-1.85	7.17	-1.07	0.000%
44	1.07	-7.17	1.85	-1.07	7.17	-1.85	0.000%
45	0.00	-7.17	2.14	0.00	7.17	-2.14	0.000%
46	-1.07	-7.17	1.85	1.07	7.17	-1.85	0.000%
47	-1.85	-7.17	1.07	1.85	7.17	-1.07	0.000%
48	-2.14	-7.17	0.00	2.14	7.17	0.00	0.000%
49	-1.85	-7.17	-1.07	1.85	7.17	1.07	0.000%
50	-1.07	-7.17	-1.85	1.07	7.17	1.85	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	6	0.00000001	0.00000001
3	Yes	6	0.00000001	0.00000001
4	Yes	6	0.00000001	0.00000001
5	Yes	6	0.00000001	0.00000001
6	Yes	6	0.00000001	0.00000001
7	Yes	6	0.00000001	0.00000001
8	Yes	6	0.00000001	0.00000001
9	Yes	6	0.00000001	0.00000001
10	Yes	6	0.00000001	0.00000001
11	Yes	6	0.00000001	0.00000001
12	Yes	6	0.00000001	0.00000001
13	Yes	6	0.00000001	0.00000001
14	Yes	6	0.00000001	0.00000001
15	Yes	6	0.00000001	0.00000001
16	Yes	6	0.00000001	0.00000001
17	Yes	6	0.00000001	0.00000001
18	Yes	6	0.00000001	0.00000001
19	Yes	6	0.00000001	0.00000001
20	Yes	6	0.00000001	0.00000001
21	Yes	6	0.00000001	0.00000001
22	Yes	6	0.00000001	0.00000001
23	Yes	6	0.00000001	0.00000001
24	Yes	6	0.00000001	0.00000001
25	Yes	6	0.00000001	0.00000001
26	Yes	6	0.00000001	0.00000001
27	Yes	6	0.00000001	0.00000001
28	Yes	6	0.00000001	0.00000001
29	Yes	6	0.00000001	0.00000001
30	Yes	6	0.00000001	0.00000001
31	Yes	6	0.00000001	0.00000001
32	Yes	6	0.00000001	0.00000001
33	Yes	6	0.00000001	0.00000001
34	Yes	6	0.00000001	0.00000001
35	Yes	6	0.00000001	0.00000001
36	Yes	6	0.00000001	0.00000001
37	Yes	6	0.00000001	0.00000001
38	Yes	6	0.00000001	0.00000001
39	Yes	6	0.00000001	0.00000001
40	Yes	6	0.00000001	0.00000001
41	Yes	6	0.00000001	0.00000001
42	Yes	6	0.00000001	0.00000001
43	Yes	6	0.00000001	0.00000001
44	Yes	6	0.00000001	0.00000001
45	Yes	6	0.00000001	0.00000001
46	Yes	6	0.00000001	0.00000001
47	Yes	6	0.00000001	0.00000001
48	Yes	6	0.00000001	0.00000001
49	Yes	6	0.00000001	0.00000001
50	Yes	6	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

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

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	116.5 - 96	0.205	47	0.0730	0.0005

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	Handrail Kit	47	0.205	0.0730	0.0005	Inf
116.00	(2) 7770.00 w/ Mount Pipe	47	0.200	0.0713	0.0004	Inf
114.00	Penn Summit 14' Low Profile Platform	47	0.180	0.0641	0.0004	Inf
106.00	APX16PV-16PVL-E w/ Mount Pipe	47	0.100	0.0356	0.0002	Inf

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	116.5 - 96	0.951	18	0.3368	0.0022

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	Handrail Kit	18	0.951	0.3368	0.0022	Inf
116.00	(2) 7770.00 w/ Mount Pipe	18	0.927	0.3286	0.0021	Inf
114.00	Penn Summit 14' Low Profile Platform	18	0.835	0.2958	0.0019	Inf
106.00	APX16PV-16PVL-E w/ Mount Pipe	18	0.464	0.1643	0.0011	Inf

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	116.5 - 96 (1)	TP26.666x20x0.1875	20.50	0.00	0.0	15.9864	-8.61	950.57	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	116.5 - 96 (1)	TP26.666x20x0.1875	151.66	513.20	0.296	0.00	513.20	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	116.5 - 96 (1)	TP26.666x20x0.1875	10.00	475.28	0.021	0.00	1040.61	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	116.5 - 96 (1)	0.009	0.296	0.000	0.021	0.000	0.305 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	116.5 - 96	Pole	TP26.666x20x0.1875	1	-8.61	950.57	30.5	Pass
							Summary	
						Pole (L1)	30.5	Pass
						RATING =	**30.5**	**Pass**

Paul J. Ford and Company, Project: "80617-0015.001.6000"
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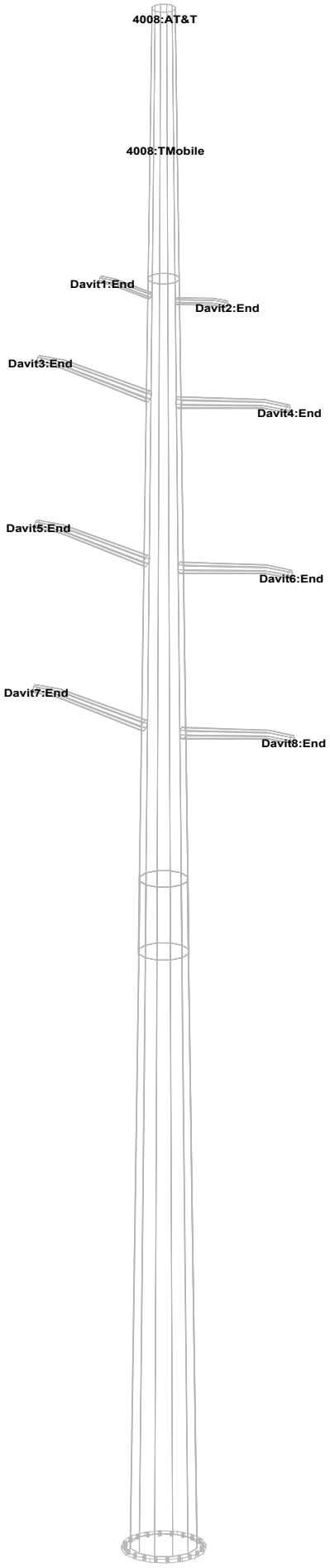

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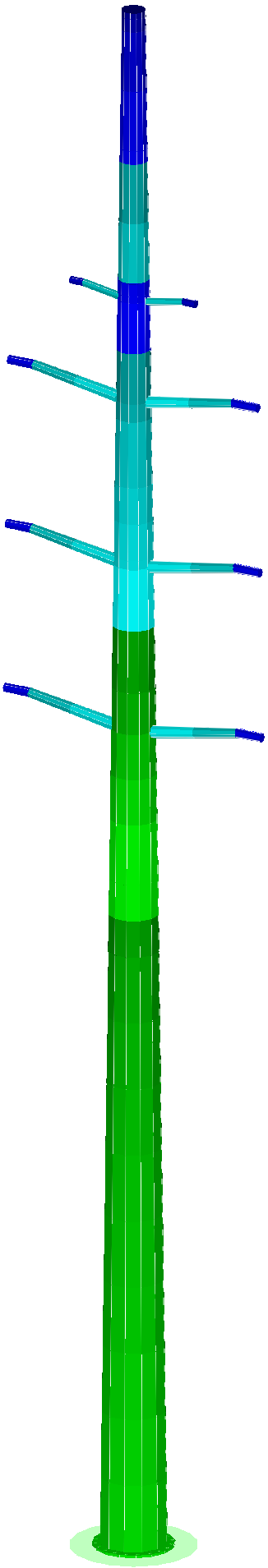

% Usage Legend
0 <= % < 25
25 <= % < 50
50 <= % < 75
75 <= % < 100
100 <= %

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*                              PLS-POLE                                  *
*                    POLE AND FRAME ANALYSIS AND DESIGN                  *
*               Copyright Power Line Systems, Inc. 1999-2016             *
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Project Name : PennSummit Tubular, LLC - Hybrid Pole - 116.50'
Project Notes: CL&P Structure # 4008 / AT&T CTL02255
Project File : G:\Transmission\Eversource\2017\806_Smartlink\80617-0015_Pole 4008_AT&T CTL02255\001.6000 - SA\Engineering Docs\PLS-Pole\80617-0015.001.6000.pol
Date run   : 3:40:08 PM Wednesday, January 10, 2018
by   : PLS-POLE Version 15.00
Licensed to : Paul J. Ford and Company

Successfully performed nonlinear analysis

The model has 0 warnings.

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

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

Steel Pole Properties:

Steel Pole Property Label	Stock Number	Length (ft)	Default Embedded Length (ft)	Base Plate	Shape	Tip Diameter (in)	Base Diameter (in)	Taper (in/ft)	Default Drag Coef.	Tubes	Modulus of Elasticity Override (ksi)	Weight Density Override (lbs/ft^3)	Shape At Base	Strength Check Type	Distance From Tip (ft)	Ultimate Trans. Load (kips)	Ultimate Long. Load (kips)	Texture
CL&P4008	4008	116.50	0	Yes	12F	20	57.49	0	1.3	3 tubes	0	0		Calculated	0.000	0.0000	0.0000	Galvanized Steel

Steel Tubes Properties:

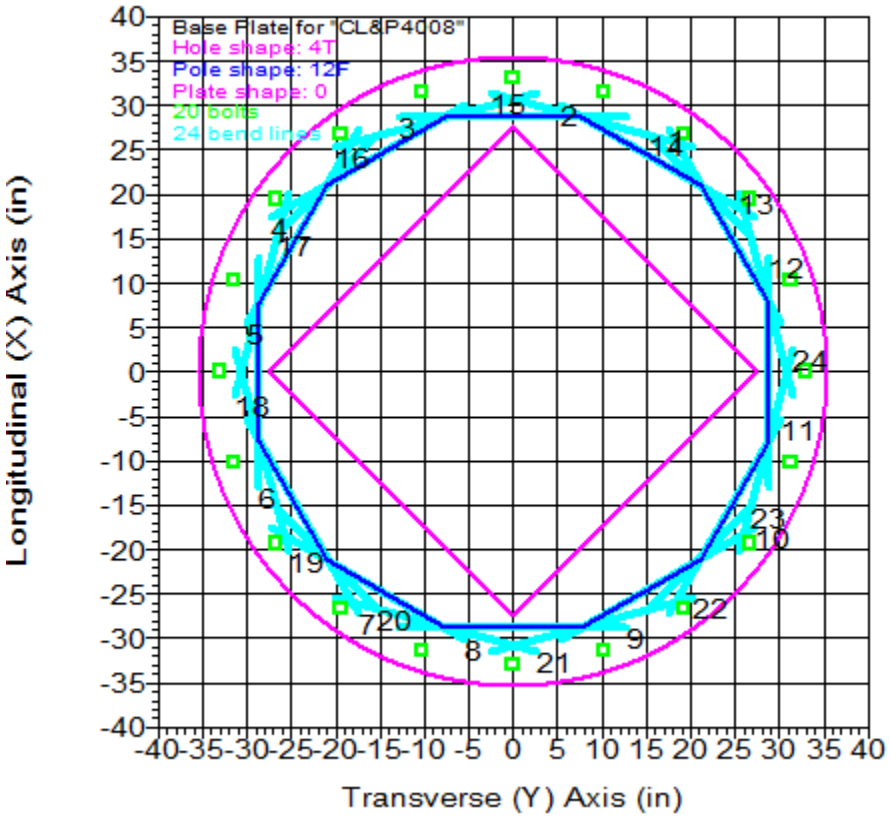
Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Gap or Butt Offset (in)	Yield Stress (ksi)	Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. Diameter (in)	1.5x Diam. Lap Length (ft)	Actual Overlap (ft)
CL&P4008	1	20.5	0.1875	0.000	0.000	0.000	65.000	0.000	973	10.74	0.32502	20.00	26.66	3.286	0.000
CL&P4008	2	51	0.3125	5.500	0.000	0.000	65.000	0.000	6084	27.52	0.32502	26.91	43.49	5.358	5.500
CL&P4008	3	50.5	0.4375	0.000	0.000	0.000	65.000	0.000	11808	26.66	0.32502	41.08	57.49	0.000	0.000

Base Plate Properties:

Pole Property	Plate Diam. (in)	Plate Shape	Plate Thick. (in)	Plate Weight (lbs)	Bend Line Length Override (in)	Hole Diam. (in)	Hole Shape	Steel Density (lbs/ft^3)	Steel Yield Stress (ksi)	Bolt Diam. (in)	Bolt Pattern Diam. (in)	Num. Of Bolts	Bolt Cage X Inertia (in^4)	Bolt Cage Y Inertia (in^4)
CL&P4008	71.000	0	3.000	2015	0.000	38.875	4T	490.00	50.000	2.250	66.000	20	43338.49	43338.49

Base Plate Bolt Coordinates for Property "CL&P4008":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0	1	0
0.3106	0.9508	0
0.5871	0.8106	0
0.8106	0.5871	0
0.9508	0.3106	0
1	0	0



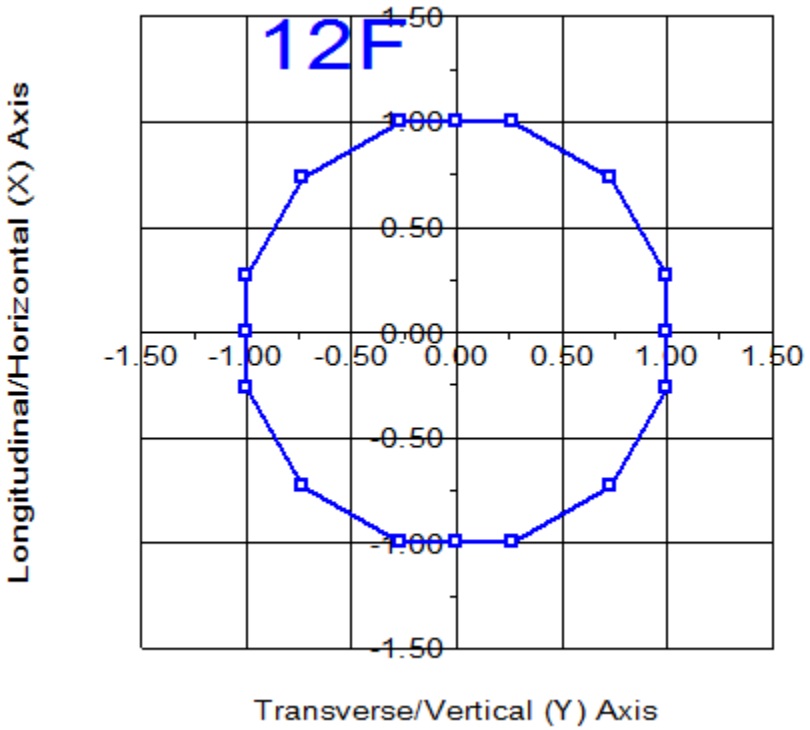
Steel Pole Connectivity:

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

	(ft)	(ft)	(ft)	(deg)	(deg)			(ft)
4008	0	0	0	0	0	CL&P4008 18 labels	0.00	0

Relative Attachment Labels for Steel Pole "4008":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
4008:Arm1	0.00	94.50
4008:Arm2	0.00	86.84
4008:Arm3	0.00	74.34
4008:Arm4	0.00	61.84
4008:WVGD1	0.00	5.00
4008:WVGD2	0.00	15.00
4008:WVGD3	0.00	25.00
4008:WVGD4	0.00	35.00
4008:WVGD5	0.00	45.00
4008:WVGD6	0.00	55.00
4008:WVGD7	0.00	65.00
4008:WVGD8	0.00	75.00
4008:WVGD9	0.00	85.50
4008:WVGD10	0.00	95.00
4008:WVGD11	0.00	105.00
4008:TMobile	0.00	106.00
4008:AT&T	0.00	116.00
4008:WVGD12	0.00	115.00



Pole Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist.	Outer Diam.	Area	T-Moment Inertia	L-Moment Inertia	D/t	W/t Max.	Fy	Fa Min.	T-Moment Capacity	L-Moment Capacity

				(ft)	(in)	(in^2)	(in^4)	(in^4)		(ksi)	(ksi)	(ft-k)	(ft-k)
4008	4008:t	4008:t	Ori	0.00	20.00	11.94	600.17	600.17	0.00	25.9	65.00	65.00	325.09	325.09
4008	4008:AT&T	4008:AT&T	End	0.50	20.16	12.04	615.06	615.06	0.00	26.1	65.00	65.00	330.47	330.47
4008	4008:AT&T	4008:AT&T	Ori	0.50	20.16	12.04	615.06	615.06	0.00	26.1	65.00	65.00	330.47	330.47
4008	4008:WVGD12	4008:WVGD12	End	1.50	20.49	12.24	645.57	645.57	0.00	26.6	65.00	65.00	341.36	341.36
4008	4008:WVGD12	4008:WVGD12	Ori	1.50	20.49	12.24	645.57	645.57	0.00	26.6	65.00	65.00	341.36	341.36
4008	#4008:0	Tube 1	End	6.00	21.95	13.12	795.39	795.39	0.00	28.7	65.00	65.00	392.56	392.56
4008	#4008:0	Tube 1	Ori	6.00	21.95	13.12	795.39	795.39	0.00	28.7	65.00	65.00	392.56	392.56
4008	4008:TMobile	4008:TMobile	End	10.50	23.41	14.00	966.77	966.77	0.00	30.8	65.00	64.08	441.00	441.00
4008	4008:TMobile	4008:TMobile	Ori	10.50	23.41	14.00	966.77	966.77	0.00	30.8	65.00	64.08	441.00	441.00
4008	4008:WVGD11	4008:WVGD11	End	11.50	23.74	14.20	1007.93	1007.93	0.00	31.2	65.00	63.62	450.26	450.26
4008	4008:WVGD11	4008:WVGD11	Ori	11.50	23.74	14.20	1007.93	1007.93	0.00	31.2	65.00	63.62	450.26	450.26
4008	#4008:1	Tube 1	End	16.00	25.20	15.08	1207.62	1207.62	0.00	33.3	65.00	61.58	491.79	491.79
4008	#4008:1	Tube 1	Ori	16.00	25.20	15.08	1207.62	1207.62	0.00	33.3	65.00	61.58	491.79	491.79
4008	#4008:2	SpliceT	End	20.50	26.66	15.96	1432.08	1432.08	0.00	35.4	65.00	59.53	532.87	532.87
4008	#4008:2	SpliceT	Ori	20.50	26.91	26.73	2420.97	2420.97	0.00	20.4	65.00	65.00	974.52	974.52
4008	4008:WVGD10	4008:WVGD10	End	21.50	27.24	27.05	2510.80	2510.80	0.00	20.7	65.00	65.00	998.62	998.62
4008	4008:WVGD10	4008:WVGD10	Ori	21.50	27.24	27.05	2510.80	2510.80	0.00	20.7	65.00	65.00	998.62	998.62
4008	4008:Arm1	4008:Arm1	End	22.00	27.40	27.22	2556.53	2556.53	0.00	20.8	65.00	65.00	1010.77	1010.77
4008	4008:Arm1	4008:Arm1	Ori	22.00	27.40	27.22	2556.53	2556.53	0.00	20.8	65.00	65.00	1010.77	1010.77
4008	#4008:3	Tube 2	End	25.83	28.65	28.47	2925.45	2925.45	0.00	21.9	65.00	65.00	1106.36	1106.36
4008	#4008:3	Tube 2	Ori	25.83	28.65	28.47	2925.45	2925.45	0.00	21.9	65.00	65.00	1106.36	1106.36
4008	4008:Arm2	4008:Arm2	End	29.66	29.89	29.72	3328.26	3328.26	0.00	22.9	65.00	65.00	1206.27	1206.27
4008	4008:Arm2	4008:Arm2	Ori	29.66	29.89	29.72	3328.26	3328.26	0.00	22.9	65.00	65.00	1206.27	1206.27
4008	4008:WVGD9	4008:WVGD9	End	31.00	30.33	30.16	3477.33	3477.33	0.00	23.3	65.00	65.00	1242.22	1242.22
4008	4008:WVGD9	4008:WVGD9	Ori	31.00	30.33	30.16	3477.33	3477.33	0.00	23.3	65.00	65.00	1242.22	1242.22
4008	#4008:4	Tube 2	End	36.00	31.95	31.79	4073.28	4073.28	0.00	24.7	65.00	65.00	1381.10	1381.10
4008	#4008:4	Tube 2	Ori	36.00	31.95	31.79	4073.28	4073.28	0.00	24.7	65.00	65.00	1381.10	1381.10
4008	#4008:5	Tube 2	End	38.75	32.84	32.69	4428.33	4428.33	0.00	25.5	65.00	65.00	1460.62	1460.62
4008	#4008:5	Tube 2	Ori	38.75	32.84	32.69	4428.33	4428.33	0.00	25.5	65.00	65.00	1460.62	1460.62
4008	4008:WVGD8	4008:WVGD8	End	41.50	33.74	33.59	4803.42	4803.42	0.00	26.2	65.00	65.00	1542.37	1542.37
4008	4008:WVGD8	4008:WVGD8	Ori	41.50	33.74	33.59	4803.43	4803.43	0.00	26.2	65.00	65.00	1542.37	1542.37
4008	4008:Arm3	4008:Arm3	End	42.16	33.95	33.80	4896.64	4896.64	0.00	26.4	65.00	65.00	1562.35	1562.35
4008	4008:Arm3	4008:Arm3	Ori	42.16	33.95	33.80	4896.64	4896.64	0.00	26.4	65.00	65.00	1562.35	1562.35
4008	#4008:6	Tube 2	End	46.83	35.47	35.33	5589.67	5589.67	0.00	27.7	65.00	65.00	1707.16	1707.16
4008	#4008:6	Tube 2	Ori	46.83	35.47	35.33	5589.67	5589.67	0.00	27.7	65.00	65.00	1707.16	1707.16
4008	4008:WVGD7	4008:WVGD7	End	51.50	36.99	36.85	6345.20	6345.20	0.00	29.0	65.00	65.00	1858.40	1858.40
4008	4008:WVGD7	4008:WVGD7	Ori	51.50	36.99	36.85	6345.20	6345.20	0.00	29.0	65.00	65.00	1858.40	1858.40
4008	4008:Arm4	4008:Arm4	End	54.66	38.02	37.88	6893.49	6893.49	0.00	29.9	65.00	64.92	1962.14	1962.14
4008	4008:Arm4	4008:Arm4	Ori	54.66	38.02	37.88	6893.49	6893.49	0.00	29.9	65.00	64.92	1962.14	1962.14
4008	#4008:7	Tube 2	End	58.08	39.13	39.00	7521.22	7521.22	0.00	30.9	65.00	63.99	2050.08	2050.08
4008	#4008:7	Tube 2	Ori	58.08	39.13	39.00	7521.22	7521.22	0.00	30.9	65.00	63.99	2050.08	2050.08
4008	4008:WVGD6	4008:WVGD6	End	61.50	40.24	40.12	8185.94	8185.94	0.00	31.8	65.00	63.06	2137.96	2137.96
4008	4008:WVGD6	4008:WVGD6	Ori	61.50	40.24	40.12	8185.94	8185.94	0.00	31.8	65.00	63.06	2137.96	2137.96
4008	#4008:8	SpliceT	End	66.00	41.70	41.59	9118.87	9118.87	0.00	33.1	65.00	61.83	2253.29	2253.29
4008	#4008:8	SpliceT	Ori	66.00	41.70	41.59	9118.88	9118.88	0.00	33.1	65.00	61.83	2253.29	2253.29
4008	#4008:9	Splice	End	68.75	41.97	58.43	12900.64	12900.64	0.00	23.0	65.00	65.00	3329.90	3329.90
4008	#4008:9	Splice	Ori	68.75	41.97	58.43	12900.64	12900.64	0.00	23.0	65.00	65.00	3329.90	3329.90
4008	4008:WVGD5	4008:WVGD5	End	71.50	42.86	59.68	13751.52	13751.52	0.00	23.6	65.00	65.00	3475.51	3475.51
4008	4008:WVGD5	4008:WVGD5	Ori	71.50	42.86	59.68	13751.52	13751.52	0.00	23.6	65.00	65.00	3475.52	3475.52
4008	#4008:10	Tube 3	End	76.50	44.49	61.97	15392.92	15392.92	0.00	24.6	65.00	65.00	3748.25	3748.25
4008	#4008:10	Tube 3	Ori	76.50	44.49	61.97	15392.93	15392.93	0.00	24.6	65.00	65.00	3748.25	3748.25
4008	4008:WVGD4	4008:WVGD4	End	81.50	46.11	64.25	17160.01	17160.01	0.00	25.6	65.00	65.00	4031.29	4031.29
4008	4008:WVGD4	4008:WVGD4	Ori	81.50	46.11	64.25	17160.01	17160.01	0.00	25.6	65.00	65.00	4031.29	4031.29
4008	#4008:11	Tube 3	End	86.50	47.74	66.54	19057.41	19057.41	0.00	26.6	65.00	65.00	4324.63	4324.63
4008	#4008:11	Tube 3	Ori	86.50	47.74	66.54	19057.41	19057.41	0.00	26.6	65.00	65.00	4324.63	4324.63
4008	4008:WVGD3	4008:WVGD3	End	91.50	49.36	68.83	21089.76	21089.76	0.00	27.6	65.00	65.00	4628.27	4628.27
4008	4008:WVGD3	4008:WVGD3	Ori	91.50	49.36	68.83	21089.76	21089.76	0.00	27.6	65.00	65.00	4628.27	4628.27
4008	#4008:12	Tube 3	End	96.50	50.99	71.11	23261.71	23261.71	0.00	28.5	65.00	65.00	4942.22	4942.22
4008	#4008:12	Tube 3	Ori	96.50	50.99	71.11	23261.71	23261.71	0.00	28.5	65.00	65.00	4942.22	4942.22
4008	4008:WVGD2	4008:WVGD2	End	101.50	52.61	73.40	25577.88	25577.88	0.00	29.5	65.00	65.00	5266.46	5266.46
4008	4008:WVGD2	4008:WVGD2	Ori	101.50	52.61	73.40	25577.88	25577.88	0.00	29.5	65.00	65.00	5266.46	5266.46
4008	#4008:13	Tube 3	End	106.50	54.24	75.69	28042.92	28042.92	0.00	30.5	65.00	64.31	5541.88	5541.88
4008	#4008:13	Tube 3	Ori	106.50	54.24	75.69	28042.92	28042.92	0.00	30.5	65.00	64.31	5541.88	5541.88
4008	4008:WVGD1	4008:WVGD1	End	111.50	55.86	77.97	30661.45	30661.45	0.00	31.5	65.00	63.34	5793.85	5793.85
4008	4008:WVGD1	4008:WVGD1	Ori	111.50	55.86	77.97	30661.46	30661.46	0.00	31.5	65.00	63.34	5793.85	5793.85
4008	4008:g	4008:g	End	116.50	57.49	80.26	33438.13	33438.13	0.00	32.5	65.00	62.36	6045.35	6045.35

Tubular Davit Properties:

Davit Property Label	Stock Number	Steel Shape	Thickness (in)	Base Diameter or Depth (in)	Tip Diameter or Depth (in)	Taper (in/ft)	Drag Coef.	Modulus of Elasticity (ksi)	Geometry	Strength Check Type	Vertical Capacity (lbs)	Tension Capacity (lbs)	Compres. Capacity (lbs)	Long. Capacity (lbs)	Yield Stress (ksi)	Weight Density Override (lbs/ft^3)	Steel Texture Shape At End
ARMA	5-25050-009	8T	0.19	6	6	0	1.3	29000	2 points	Calculated	0	0	0	0	65	0	
ARMB	5-25050-010	8T	0.31	10	7	0	1.3	29000	2 points	Calculated	0	0	0	0	65	0	

Intermediate Joints for Davit Property "ARMA":

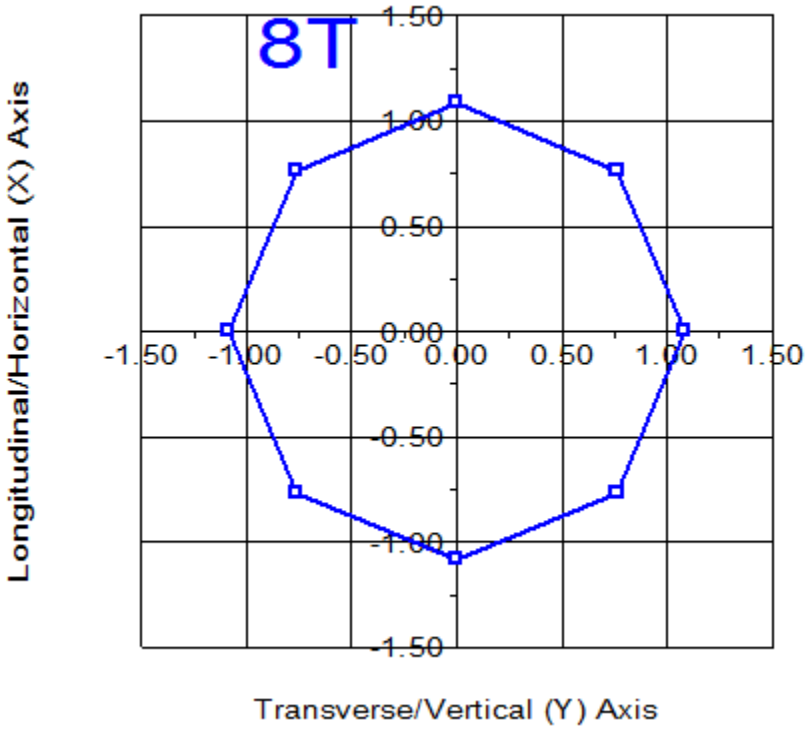
Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
V	3	-0.5
End	4	-0.5

Intermediate Joints for Davit Property "ARMB":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
V	7	-1.17
End	9	-1.17

Tubular Davit Arm Connectivity:

Davit Label	Attach Label	Davit Property Set	Azimuth (deg)
Davit1	4008:Arm1	ARMA	180
Davit2	4008:Arm1	ARMA	0
Davit3	4008:Arm2	ARMB	180
Davit4	4008:Arm2	ARMB	0
Davit5	4008:Arm3	ARMB	180
Davit6	4008:Arm3	ARMB	0
Davit7	4008:Arm4	ARMB	180
Davit8	4008:Arm4	ARMB	0



Tubular Davit Arm Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	V-Moment Inertia (in^4)	H-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	V-Moment Capacity (ft-k)	H-Moment Capacity (ft-k)
Davit1	Davit1:O	Origin	0.00	6.00	3.66	16.33	16.33	0.00	8.9	65.00	65.00	27.25	27.25
Davit1	Davit1:V	End	3.04	6.00	3.66	16.33	16.33	0.00	8.9	65.00	65.00	27.25	27.25
Davit1	Davit1:V	Origin	3.04	6.00	3.66	16.33	16.33	0.00	8.9	65.00	65.00	27.25	27.25
Davit1	Davit1:End	End	4.04	6.00	3.66	16.33	16.33	0.00	8.9	65.00	65.00	27.25	27.25
Davit2	Davit2:O	Origin	0.00	6.00	3.66	16.33	16.33	0.00	8.9	65.00	65.00	27.25	27.25
Davit2	Davit2:V	End	3.04	6.00	3.66	16.33	16.33	0.00	8.9	65.00	65.00	27.25	27.25
Davit2	Davit2:V	Origin	3.04	6.00	3.66	16.33	16.33	0.00	8.9	65.00	65.00	27.25	27.25
Davit2	Davit2:End	End	4.04	6.00	3.66	16.33	16.33	0.00	8.9	65.00	65.00	27.25	27.25
Davit3	Davit3:O	Origin	0.00	10.00	9.95	123.64	123.64	0.00	9.2	65.00	65.00	123.74	123.74
Davit3	#Davit3:0	End	3.55	8.83	8.75	84.06	84.06	0.00	7.7	65.00	65.00	95.28	95.28
Davit3	#Davit3:0	Origin	3.55	8.83	8.75	84.06	84.06	0.00	7.7	65.00	65.00	95.28	95.28
Davit3	Davit3:V	End	7.10	7.66	7.55	53.98	53.98	0.00	6.1	65.00	65.00	70.54	70.54
Davit3	Davit3:V	Origin	7.10	7.66	7.55	53.98	53.98	0.00	6.1	65.00	65.00	70.54	70.54
Davit3	Davit3:End	End	9.10	7.00	6.87	40.73	40.73	0.00	5.2	65.00	65.00	58.24	58.24
Davit4	Davit4:O	Origin	0.00	10.00	9.95	123.64	123.64	0.00	9.2	65.00	65.00	123.74	123.74
Davit4	#Davit4:0	End	3.55	8.83	8.75	84.06	84.06	0.00	7.7	65.00	65.00	95.28	95.28
Davit4	#Davit4:0	Origin	3.55	8.83	8.75	84.06	84.06	0.00	7.7	65.00	65.00	95.28	95.28
Davit4	Davit4:V	End	7.10	7.66	7.55	53.98	53.98	0.00	6.1	65.00	65.00	70.54	70.54
Davit4	Davit4:V	Origin	7.10	7.66	7.55	53.98	53.98	0.00	6.1	65.00	65.00	70.54	70.54
Davit4	Davit4:End	End	9.10	7.00	6.87	40.73	40.73	0.00	5.2	65.00	65.00	58.24	58.24
Davit5	Davit5:O	Origin	0.00	10.00	9.95	123.64	123.64	0.00	9.2	65.00	65.00	123.74	123.74
Davit5	#Davit5:0	End	3.55	8.83	8.75	84.06	84.06	0.00	7.7	65.00	65.00	95.28	95.28
Davit5	#Davit5:0	Origin	3.55	8.83	8.75	84.06	84.06	0.00	7.7	65.00	65.00	95.28	95.28
Davit5	Davit5:V	End	7.10	7.66	7.55	53.98	53.98	0.00	6.1	65.00	65.00	70.54	70.54
Davit5	Davit5:V	Origin	7.10	7.66	7.55	53.98	53.98	0.00	6.1	65.00	65.00	70.54	70.54
Davit5	Davit5:End	End	9.10	7.00	6.87	40.73	40.73	0.00	5.2	65.00	65.00	58.24	58.24
Davit6	Davit6:O	Origin	0.00	10.00	9.95	123.64	123.64	0.00	9.2	65.00	65.00	123.74	123.74
Davit6	#Davit6:0	End	3.55	8.83	8.75	84.06	84.06	0.00	7.7	65.00	65.00	95.28	95.28
Davit6	#Davit6:0	Origin	3.55	8.83	8.75	84.06	84.06	0.00	7.7	65.00	65.00	95.28	95.28
Davit6	Davit6:V	End	7.10	7.66	7.55	53.98	53.98	0.00	6.1	65.00	65.00	70.54	70.54
Davit6	Davit6:V	Origin	7.10	7.66	7.55	53.98	53.98	0.00	6.1	65.00	65.00	70.54	70.54
Davit6	Davit6:End	End	9.10	7.00	6.87	40.73	40.73	0.00	5.2	65.00	65.00	58.24	58.24
Davit7	Davit7:O	Origin	0.00	10.00	9.95	123.64	123.64	0.00	9.2	65.00	65.00	123.74	123.74
Davit7	#Davit7:0	End	3.55	8.83	8.75	84.06	84.06	0.00	7.7	65.00	65.00	95.28	95.28
Davit7	#Davit7:0	Origin	3.55	8.83	8.75	84.06	84.06	0.00	7.7	65.00	65.00	95.28	95.28
Davit7	Davit7:V	End	7.10	7.66	7.55	53.98	53.98	0.00	6.1	65.00	65.00	70.54	70.54
Davit7	Davit7:V	Origin	7.10	7.66	7.55	53.98	53.98	0.00	6.1	65.00	65.00	70.54	70.54
Davit7	Davit7:End	End	9.10	7.00	6.87	40.73	40.73	0.00	5.2	65.00	65.00	58.24	58.24
Davit8	Davit8:O	Origin	0.00	10.00	9.95	123.64	123.64	0.00	9.2	65.00	65.00	123.74	123.74
Davit8	#Davit8:0	End	3.55	8.83	8.75	84.06	84.06	0.00	7.7	65.00	65.00	95.28	95.28
Davit8	#Davit8:0	Origin	3.55	8.83	8.75	84.06	84.06	0.00	7.7	65.00	65.00	95.28	95.28
Davit8	Davit8:V	End	7.10	7.66	7.55	53.98	53.98	0.00	6.1	65.00	65.00	70.54	70.54
Davit8	Davit8:V	Origin	7.10	7.66	7.55	53.98	53.98	0.00	6.1	65.00	65.00	70.54	70.54
Davit8	Davit8:End	End	9.10	7.00	6.87	40.73	40.73	0.00	5.2	65.00	65.00	58.24	58.24

*** Insulator Data

Clamp Properties:

Label	Stock Number	Holding Capacity (lbs)	Hardware Capacity (lbs)	Notes
clamp	clamp1	8e+04	0	

Clamp Insulator Connectivity:

Clamp Label	Structure And Tip Attach	Property Set	Min. Required Vertical Load (uplift) (lbs)
Clamp1	Davit1:End	clamp	No Limit
Clamp2	Davit2:End	clamp	No Limit
Clamp3	Davit3:End	clamp	No Limit
Clamp4	Davit4:End	clamp	No Limit
Clamp5	Davit5:End	clamp	No Limit
Clamp6	Davit6:End	clamp	No Limit

Clamp7	Davit7:End	clamp	No Limit
Clamp8	Davit8:End	clamp	No Limit
Clamp9	4008:AT&T	clamp	No Limit
Clamp10	4008:TMobile	clamp	No Limit

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

Material List

Stock Number	Item Description	Quantity	Unit of Measure
5-25050-009	Tubular Davit property: ARMA	2.00	Each
5-25050-010	Tubular Davit property: ARMB	6.00	Each
clamp1	Clamp property: clamp	10.00	Each
4008	Steel Pole property: CL&P4008	1.00	Each

*** Loads Data

Loads from file: g:\transmission\eversource\2017\806_smartlink\80617-0015_pole 4008_at&t ctl02255\001.6000 - sa\engineering docs\pls-pole\80617-0015.001.6000.lca

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

Loading Method Parameters:

Structure Height Summary (used for calculating wind/ice adjust with height):
  Z of ground for wind height adjust   0.00 (ft) and structure Z coordinate that will be put on the centerline ground profile in PLS-CADD.
  Ground elevation shift   0.00 (ft)
  Z of ground with shift   0.00 (ft)
  Z of structure top (highest joint)   116.50 (ft)
  Structure height   116.50 (ft)
  Structure height above ground   116.50 (ft)

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Poles and Towers	SF for Wood Poles	SF for Conc. Ult.	SF for Conc. First Crack	SF for Conc. Zero Tens.	SF for Guys and Cables	SF for Non Tubular Arms	SF for Braces	SF for Insuls.	SF for Hardware	SF For Found.	Point Loads	Wind/Ice Model	Trans. Wind Pressure (psf)	Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature Deflection Check (deg F)	Pole Deflection Limit % or (ft)
NESC 250B (Heavy)	1.5000	2.5000	1.00000	0.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	12 loads	Wind on All	4	0	0.000	0.000	0.0	No Limit 0
NESC 250C (Extreme Wind)	1.0000	1.0000	1.00000	0.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	12 loads	NESC 2012	30.98	0	0.000	0.000	0.0	No Limit 0
NESC 250D (Extreme Ice w/ Wind)	1.0000	1.0000	1.00000	0.0000	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	12 loads	Wind on All	4.1	0	0.000	0.000	0.0	No Limit 0

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

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	2200	1430	0	Shield Wire
Davit2:End	2200	1430	0	Shield Wire
Davit3:End	5840	2440	0	Conductor
Davit4:End	5840	2440	0	Conductor
Davit5:End	5840	2440	0	Conductor
Davit6:End	5840	2440	0	Conductor
Davit7:End	5840	2440	0	Conductor
Davit8:End	5840	2440	0	Conductor
4008:AT&T	6543	1931	0	AT&T Equipment
4008:AT&T	10829	0	0	AT&T Coax (Internal)
4008:TMobile	4812	1014	0	T-Mobile Equipment
4008:TMobile	2463	0	0	T-Mobile Coax (Internal)

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

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	660	1780	0	Shield Wire
Davit2:End	660	1780	0	Shield Wire
Davit3:End	2530	4070	0	Conductor
Davit4:End	2530	4070	0	Conductor
Davit5:End	2530	4070	0	Conductor
Davit6:End	2530	4070	0	Conductor
Davit7:End	2530	4070	0	Conductor
Davit8:End	2530	4070	0	Conductor
4008:AT&T	3250	6335	0	AT&T Equipment
4008:AT&T	2908	0	0	AT&T Coax (Internal)
4008:TMobile	2548	3041	0	T-Mobile Equipment
4008:TMobile	661	0	0	T-Mobile Coax (Internal)

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

Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.

Wind load is calculated for the undeformed shape of a pole.

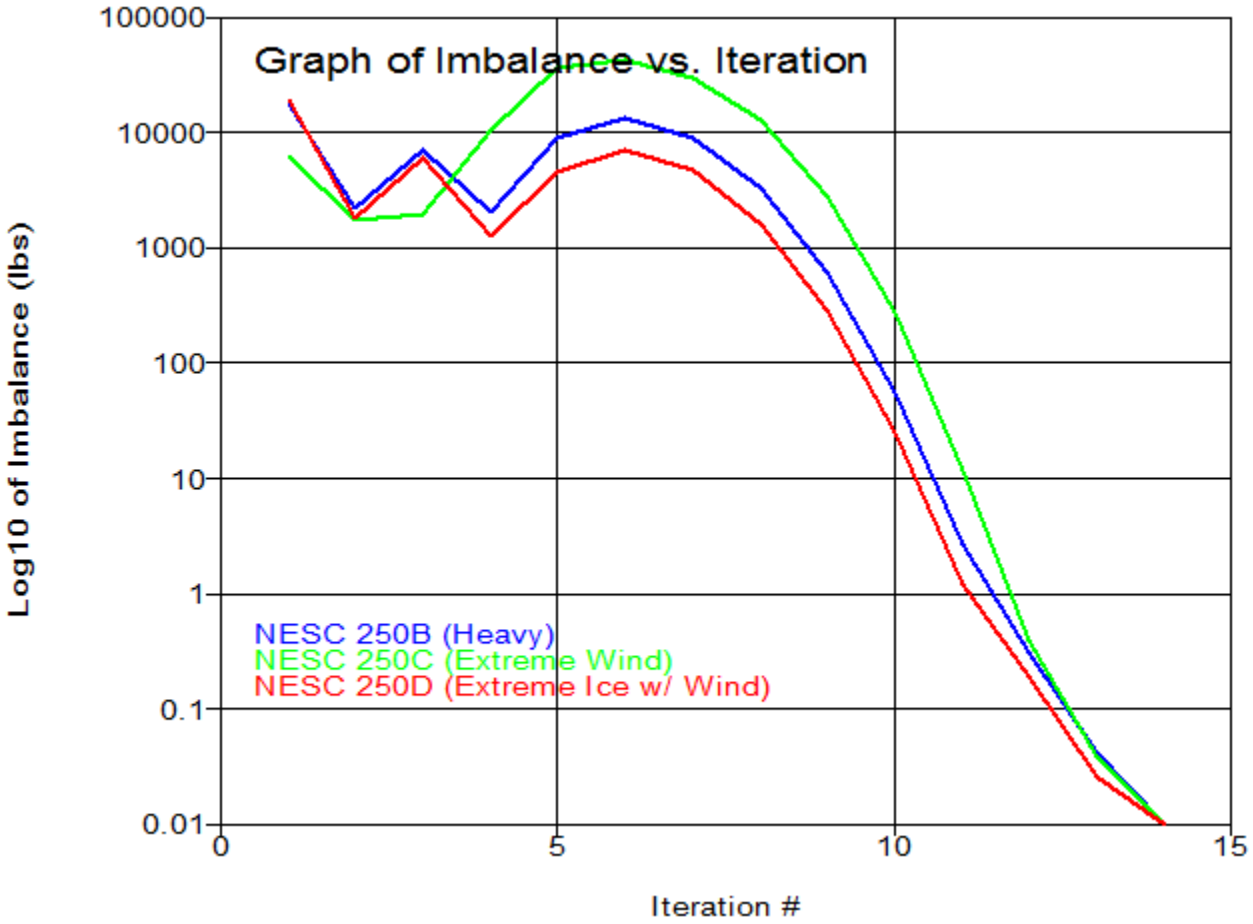
Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Ice Vertical Load (lbs)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
4008	4008:t	4008:AT&T	116.50	116.00	116.25	20.081	1.7e+06	1.000	31.90	0.00	20.41	26.69	0.00	0.00	26.69	0.00
4008	4008:AT&T	4008:WVGD12	116.00	115.00	115.50	20.325	1.72e+06	1.000	31.90	0.00	41.31	54.04	0.00	0.00	54.04	0.00
4008	4008:WVGD12		115.00	110.50	112.75	21.219	1.79e+06	1.000	31.90	0.00	194.15	253.86	0.00	0.00	253.86	0.00
4008		4008:TMobile	110.50	106.00	108.25	22.681	1.92e+06	1.000	31.90	0.00	207.66	271.35	0.00	0.00	271.35	0.00
4008	4008:TMobile	4008:WVGD11	106.00	105.00	105.50	23.575	1.99e+06	1.000	31.90	0.00	47.98	62.68	0.00	0.00	62.68	0.00
4008	4008:WVGD11		105.00	100.50	102.75	24.469	2.07e+06	1.000	31.90	0.00	224.16	292.74	0.00	0.00	292.74	0.00
4008			100.50	96.00	98.25	25.932	2.19e+06	1.000	31.90	0.00	237.68	310.24	0.00	0.00	310.24	0.00
4008		4008:WVGD10	96.00	95.00	95.50	27.075	2.29e+06	1.000	31.90	0.00	91.48	71.98	0.00	0.00	71.98	0.00
4008	4008:WVGD10	4008:Arm1	95.00	94.50	94.75	27.319	2.31e+06	1.000	31.90	0.00	46.17	36.32	0.00	0.00	36.32	0.00
4008	4008:Arm1		94.50	90.67	92.58	28.023	2.37e+06	1.000	31.90	0.00	362.92	285.38	0.00	0.00	285.38	0.00
4008		4008:Arm2	90.67	86.84	88.75	29.268	2.48e+06	1.000	31.90	0.00	379.23	298.06	0.00	0.00	298.06	0.00
4008	4008:Arm2	4008:WVGD9	86.84	85.50	86.17	30.108	2.55e+06	1.000	31.90	0.00	136.41	107.18	0.00	0.00	107.18	0.00
4008	4008:WVGD9		85.50	80.50	83.00	31.138	2.63e+06	1.000	31.90	0.00	526.99	413.92	0.00	0.00	413.92	0.00
4008			80.50	77.75	79.13	32.398	2.74e+06	1.000	31.90	0.00	301.69	236.87	0.00	0.00	236.87	0.00
4008		4008:WVGD8	77.75	75.00	76.38	33.291	2.82e+06	1.000	31.90	0.00	310.09	243.40	0.00	0.00	243.40	0.00
4008	4008:WVGD8	4008:Arm3	75.00	74.34	74.67	33.846	2.86e+06	1.000	31.90	0.00	75.79	59.48	0.00	0.00	59.48	0.00
4008	4008:Arm3		74.34	69.67	72.00	34.712	2.94e+06	1.000	31.90	0.00	549.21	430.93	0.00	0.00	430.93	0.00
4008		4008:WVGD7	69.67	65.00	67.33	36.230	3.06e+06	1.000	31.90	0.00	573.44	449.77	0.00	0.00	449.77	0.00
4008	4008:WVGD7	4008:Arm4	65.00	61.84	63.42	37.502	3.17e+06	1.000	31.90	0.00	401.94	315.16	0.00	0.00	315.16	0.00
4008	4008:Arm4		61.84	58.42	60.13	38.572	3.26e+06	1.000	31.90	0.00	447.32	350.66	0.00	0.00	350.66	0.00
4008		4008:WVGD6	58.42	55.00	56.71	39.683	3.36e+06	1.000	31.90	0.00	460.31	360.76	0.00	0.00	360.76	0.00
4008	4008:WVGD6		55.00	50.50	52.75	40.970	3.46e+06	1.000	31.90	0.00	625.56	490.16	0.00	0.00	490.16	0.00
4008			50.50	47.75	49.12	41.836	3.54e+06	1.000	31.90	0.00	934.21	305.87	0.00	0.00	305.87	0.00
4008		4008:WVGD5	47.75	45.00	46.38	42.417	3.59e+06	1.000	31.90	0.00	954.21	310.12	0.00	0.00	310.12	0.00
4008	4008:WVGD5		45.00	40.00	42.50	43.677	3.69e+06	1.000	31.90	0.00	1034.98	580.60	0.00	0.00	580.60	0.00
4008		4008:WVGD4	40.00	35.00	37.50	45.302	3.83e+06	1.000	31.90	0.00	1073.78	602.20	0.00	0.00	602.20	0.00
4008	4008:WVGD4		35.00	30.00	32.50	46.927	3.97e+06	1.000	31.90	0.00	1112.67	623.80	0.00	0.00	623.80	0.00
4008		4008:WVGD3	30.00	25.00	27.50	48.552	4.11e+06	1.000	31.90	0.00	1151.57	645.40	0.00	0.00	645.40	0.00
4008	4008:WVGD3		25.00	20.00	22.50	50.177	4.24e+06	1.000	31.90	0.00	1190.47	667.01	0.00	0.00	667.01	0.00
4008		4008:WVGD2	20.00	15.00	17.50	51.802	4.38e+06	1.000	31.90	0.00	1229.36	688.61	0.00	0.00	688.61	0.00
4008	4008:WVGD2		15.00	10.00	12.50	53.427	4.52e+06	1.000	31.90	0.00	1268.26	710.21	0.00	0.00	710.21	0.00
4008		4008:WVGD1	10.00	5.00	7.50	55.052	4.66e+06	1.000	31.90	0.00	1307.15	731.81	0.00	0.00	731.81	0.00
4008	4008:WVGD1	4008:g	5.00	0.00	2.50	56.677	4.79e+06	1.000	31.90	0.00	1346.05	753.42	0.00	0.00	753.42	0.00

Point Loads for Load Case "NESC 250D (Extreme Ice w/ Wind)":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	2400	1260	0	Shield Wire
Davit2:End	2400	1260	0	Shield Wire
Davit3:End	5410	1960	0	Conductor
Davit4:End	5410	1960	0	Conductor
Davit5:End	5410	1960	0	Conductor
Davit6:End	5410	1960	0	Conductor
Davit7:End	5410	1960	0	Conductor
Davit8:End	5410	1960	0	Conductor
4008:AT&T	5606	1021	0	AT&T Equipment
4008:AT&T	13269	0	0	AT&T Coax (Internal)
4008:TMobile	3942	519	0	T-Mobile Equipment
4008:TMobile	3018	0	0	T-Mobile Coax (Internal)

*** Analysis Results:

Maximum element usage is 70.90% for Steel Pole "4008" in load case "NESC 250C (Extreme Wind)"
Maximum insulator usage is 23.63% for Clamp "Clamp9" in load case "NESC 250D (Extreme Ice w/ Wind)"



*** Analysis Results for Load Case No. 1 "NESC 250B (Heavy)" - Number of iterations in SAPS 14

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

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
4008:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
4008:t	0.005942	2.234	-0.03376	-1.9287	0.0049	0.0000	0.005942	2.234	116.5
4008:AT&T	0.005899	2.217	-0.03348	-1.9287	0.0049	0.0000	0.005899	2.217	116
4008:WVGD12	0.005813	2.183	-0.03286	-1.9281	0.0049	0.0000	0.005813	2.183	115
4008:TMobile	0.005047	1.883	-0.02743	-1.8835	0.0048	0.0000	0.005047	1.883	106
4008:WVGD11	0.004963	1.85	-0.02683	-1.8753	0.0048	0.0000	0.004963	1.85	105
4008:WVGD10	0.004142	1.532	-0.0212	-1.7646	0.0046	0.0000	0.004142	1.532	94.98
4008:Arm1	0.004102	1.516	-0.02095	-1.7605	0.0046	0.0000	0.004102	1.516	94.48
4008:Arm2	0.003504	1.286	-0.01719	-1.6834	0.0044	0.0000	0.003504	1.286	86.82
4008:WVGD9	0.003403	1.247	-0.01654	-1.6670	0.0043	0.0000	0.003403	1.247	85.48

4008:WVGD8	0.002644	0.9547	-0.01197	-1.5060	0.0039	0.0000	0.002644	0.9547	74.99	
4008:Arm3	0.002599	0.9373	-0.01171	-1.4945	0.0039	0.0000	0.002599	0.9373	74.33	
4008:WVGD7	0.001996	0.7078	-0.008345	-1.3092	0.0035	0.0000	0.001996	0.7078	64.99	
4008:Arm4	0.001809	0.6373	-0.007382	-1.2402	0.0033	0.0000	0.001809	0.6373	61.83	
4008:WVGD6	0.001436	0.4983	-0.005521	-1.0791	0.0029	0.0000	0.001436	0.4983	54.99	
4008:WVGD5	0.0009734	0.3302	-0.003547	-0.8531	0.0024	0.0000	0.0009734	0.3302	45	
4008:WVGD4	0.0005974	0.198	-0.002223	-0.6565	0.0019	0.0000	0.0005974	0.198	35	
4008:WVGD3	0.0003093	0.1	-0.001306	-0.4613	0.0014	0.0000	0.0003093	0.1	25	
4008:WVGD2	0.0001135	0.03574	-0.000674	-0.2713	0.0008	0.0000	0.0001135	0.03574	15	
4008:WVGD1	1.332e-05	0.004043	-0.0002063	-0.0884	0.0003	0.0000	1.332e-05	0.004043	5	
Davit1:O	0.004105	1.517	0.01412	-1.7605	0.0046	0.0000	0.004105	0.3753	94.51	
Davit1:V	0.004152	1.532	0.0975	-1.4899	0.0046	0.0000	0.004152	-2.61	95.1	
Davit1:End	0.004154	1.532	0.1232	-1.4710	0.0046	0.0000	0.004154	-3.609	95.12	
Davit2:O	0.004099	1.516	-0.05602	-1.7605	0.0046	0.0000	0.004099	2.658	94.44	
Davit2:V	0.00413	1.531	-0.1584	-2.0692	0.0046	0.0000	0.00413	5.673	94.84	
Davit2:End	0.004127	1.531	-0.1948	-2.0880	0.0046	0.0000	0.004127	6.672	94.81	
Davit3:O	0.003507	1.286	0.0194	-1.6834	0.0044	0.0000	0.003507	0.04086	86.86	
Davit3:V	0.003611	1.314	0.176	-0.9745	0.0044	0.0000	0.003611	-6.931	88.19	
Davit3:End	0.003614	1.315	0.2083	-0.9044	0.0044	0.0000	0.003614	-8.931	88.22	
Davit4:O	0.003501	1.285	-0.05377	-1.6834	0.0044	0.0000	0.003501	2.531	86.79	
Davit4:V	0.00357	1.324	-0.3137	-2.4523	0.0044	0.0000	0.00357	9.569	87.7	
Davit4:End	0.003563	1.322	-0.401	-2.5216	0.0044	0.0000	0.003563	11.57	87.61	
Davit5:O	0.002602	0.9378	0.02519	-1.4945	0.0039	0.0000	0.002602	-0.4769	74.36	
Davit5:V	0.002693	0.9616	0.1587	-0.7843	0.0039	0.0000	0.002693	-7.453	75.67	
Davit5:End	0.002695	0.9618	0.1843	-0.7140	0.0039	0.0000	0.002695	-9.453	75.69	
Davit6:O	0.002596	0.9369	-0.04861	-1.4945	0.0039	0.0000	0.002596	2.352	74.29	
Davit6:V	0.00266	0.9723	-0.2854	-2.2643	0.0039	0.0000	0.00266	9.387	75.22	
Davit6:End	0.002654	0.9707	-0.3661	-2.3336	0.0039	0.0000	0.002654	11.39	75.14	
Davit7:O	0.001811	0.6377	0.0269	-1.2402	0.0033	0.0000	0.001811	-0.9463	61.87	
Davit7:V	0.001887	0.6557	0.1293	-0.5282	0.0033	0.0000	0.001887	-7.928	63.14	
Davit7:End	0.001888	0.6558	0.146	-0.4579	0.0033	0.0000	0.001888	-9.928	63.15	
Davit8:O	0.001807	0.637	-0.04167	-1.2402	0.0033	0.0000	0.001807	2.221	61.8	
Davit8:V	0.001863	0.6682	-0.2473	-2.0111	0.0033	-0.0000	0.001863	9.252	62.76	
Davit8:End	0.001859	0.667	-0.3192	-2.0806	0.0033	-0.0000	0.001859	11.25	62.69	

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

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
4008:g	-0.13	0.0	-25.35	0.0	0.0	-96.97	0.0	0.0	100.23	0.0	2055.83	0.0	-6.7	0.0	0.0	-0.00	0.0	0.0

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

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
4008	4008:t	Origin	0.00	26.80	0.07	-0.41	-0.00	-0.00	0.0	-0.02	0.01	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5
4008	4008:AT&T	End	0.50	26.60	0.07	-0.40	0.00	-0.00	0.0	-0.02	0.01	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	4
4008	4008:AT&T	Origin	0.50	26.60	0.07	-0.40	0.00	-0.00	0.0	-17.36	2.54	-0.00	-1.44	0.00	0.43	0.00	1.62	2.5	5
4008	4008:WVGD12	End	1.50	26.20	0.07	-0.39	2.54	-0.00	0.0	-17.36	2.54	-0.00	-1.42	0.48	0.11	0.00	1.91	2.9	2
4008	4008:WVGD12	Origin	1.50	26.20	0.07	-0.39	2.54	-0.00	0.0	-17.54	2.61	-0.00	-1.43	0.48	0.11	0.00	1.93	3.0	2
4008	Tube 1	End	6.00	24.39	0.07	-0.36	14.27	-0.02	0.0	-17.54	2.61	-0.00	-1.34	2.36	0.10	0.00	3.70	5.7	2
4008	Tube 1	Origin	6.00	24.39	0.07	-0.36	14.27	-0.02	0.0	-17.84	2.72	-0.01	-1.36	2.36	0.11	0.00	3.73	5.7	2
4008	4008:TMobile	End	10.50	22.59	0.06	-0.33	26.48	-0.05	0.0	-17.84	2.72	-0.01	-1.27	3.85	0.10	0.00	5.13	8.0	2
4008	4008:TMobile	Origin	10.50	22.59	0.06	-0.33	26.48	-0.05	-0.0	-25.27	4.04	-0.01	-1.80	3.85	0.15	0.00	5.66	8.8	2
4008	4008:WVGD11	End	11.50	22.20	0.06	-0.32	30.52	-0.06	-0.0	-25.27	4.04	-0.01	-1.78	4.31	0.15	0.00	6.10	9.6	2
4008	4008:WVGD11	Origin	11.50	22.20	0.06	-0.32	30.52	-0.06	0.0	-25.47	4.10	-0.01	-1.79	4.31	0.15	0.00	6.11	9.6	2
4008	Tube 1	End	16.00	20.45	0.06	-0.29	48.99	-0.11	0.0	-25.47	4.10	-0.01	-1.69	6.14	0.14	0.00	7.83	12.7	2
4008	Tube 1	Origin	16.00	20.45	0.06	-0.29	48.99	-0.11	0.0	-25.82	4.21	-0.01	-1.71	6.14	0.15	0.00	7.85	12.8	2
4008	SpliceT	End	20.50	18.75	0.05	-0.26	67.95	-0.17	0.0	-25.82	4.21	-0.01	-1.62	7.60	0.14	0.00	9.22	15.5	2
4008	SpliceT	Origin	20.50	18.75	0.05	-0.26	67.95	-0.17	-0.0	-26.07	4.28	-0.02	-0.98	4.54	0.08	0.00	5.51	8.5	2
4008	4008:WVGD10	End	21.50	18.38	0.05	-0.25	72.23	-0.18	-0.0	-26.07	4.28	-0.02	-0.96	4.70	0.08	0.00	5.67	8.7	2
4008	4008:WVGD10	Origin	21.50	18.38	0.05	-0.25	72.23	-0.18	-0.0	-26.18	4.31	-0.02	-0.97	4.70	0.08	0.00	5.67	8.7	2
4008	4008:Arm1	End	22.00	18.20	0.05	-0.25	74.39	-0.19	-0.0	-26.18	4.31	-0.02	-0.96	4.79	0.08	0.00	5.75	8.8	2
4008	4008:Arm1	Origin	22.00	18.20	0.05	-0.25	75.84	-0.19	0.0	-30.95	7.37	-0.02	-1.14	4.88	0.14	0.00	6.02	9.3	2
4008	Tube 2	End	25.83	16.80	0.05	-0.23	104.07	-0.27	0.0	-30.95	7.37	-0.02	-1.09	6.12	0.14	0.00	7.21	11.1	2
4008	Tube 2	Origin	25.83	16.80	0.05	-0.23	104.07	-0.27	0.0	-31.51	7.48	-0.02	-1.11	6.12	0.14	0.00	7.23	11.1	2
4008	4008:Arm2	End	29.66	15.43	0.04	-0.21	132.74	-0.35	0.0	-31.51	7.48	-0.02	-1.06	7.16	0.13	0.00	8.22	12.6	2
4008	4008:Arm2	Origin	29.66	15.43	0.04	-0.21	138.48	-0.35	0.0	-44.21	12.81	-0.03	-1.49	7.47	0.23	0.00	8.96	13.8	2
4008	4008:WVGD9	End	31.00	14.96	0.04	-0.20	155.62	-0.38	0.0	-44.21	12.81	-0.03	-1.47	8.15	0.22	0.00	9.62	14.8	2
4008	4008:WVGD9	Origin	31.00	14.96	0.04	-0.20	155.62	-0.38	0.0	-44.72	12.89	-0.03	-1.48	8.15	0.23	0.00	9.64	14.8	2
4008	Tube 2	End	36.00	13.25	0.04	-0.17	220.09	-0.53	0.0	-44.72	12.89	-0.03	-1.41	10.37	0.21	0.00	11.78	18.1	2
4008	Tube 2	Origin	36.00	13.25	0.04	-0.17	220.09	-0.53	0.0	-45.35	13.00	-0.03	-1.43	10.37	0.22	0.00	11.80	18.2	2
4008	Tube 2	End	38.75	12.34	0.03	-0.16	255.83	-0.61	0.0	-45.35	13.00	-0.03	-1.39	11.39	0.21	0.00	12.78	19.7	2
4008	Tube 2	Origin	38.75	12.34	0.03	-0.16	255.83	-0.61	0.0	-45.82	13.07	-0.03	-1.40	11.39	0.21	0.00	12.80	19.7	2
4008	4008:WVGD8	End	41.50	11.46	0.03	-0.14	291.78	-0.71	0.0	-45.82	13.07	-0.03	-1.36	12.30	0.21	0.00	13.67	21.0	2
4008	4008:WVGD8	Origin	41.50	11.46	0.03	-0.14	291.78	-0.71	0.0	-46.12	13.12	-0.04	-1.37	12.30	0.21	0.00	13.68	21.0	2

4008	4008:Arm3	End	42.16	11.25	0.03	-0.14	300.45	-0.73	0.0	-46.12	13.12	-0.04	-1.36	12.51	0.20	0.00	13.88	21.3	2
4008	4008:Arm3	Origin	42.16	11.25	0.03	-0.14	306.14	-0.73	0.0	-58.93	18.39	-0.04	-1.74	12.74	0.29	0.00	14.50	22.3	2
4008	Tube 2	End	46.83	9.83	0.03	-0.12	391.99	-0.92	0.0	-58.93	18.39	-0.04	-1.67	14.93	0.27	0.00	16.61	25.6	2
4008	Tube 2	Origin	46.83	9.83	0.03	-0.12	391.99	-0.92	0.0	-59.80	18.49	-0.04	-1.69	14.93	0.28	0.00	16.63	25.6	2
4008	4008:WVGD7	End	51.50	8.49	0.02	-0.10	478.33	-1.13	0.0	-59.80	18.49	-0.04	-1.62	16.74	0.26	0.00	18.37	28.3	2
4008	4008:WVGD7	Origin	51.50	8.49	0.02	-0.10	478.33	-1.13	0.0	-60.56	18.57	-0.05	-1.64	16.74	0.27	0.00	18.39	28.3	2
4008	4008:Arm4	End	54.66	7.65	0.02	-0.09	537.04	-1.28	0.0	-60.56	18.57	-0.05	-1.60	17.78	0.26	0.00	19.38	29.9	2
4008	4008:Arm4	Origin	54.66	7.65	0.02	-0.09	542.67	-1.28	0.0	-73.57	23.79	-0.05	-1.94	17.97	0.33	0.00	19.92	30.7	2
4008	Tube 2	End	58.08	6.79	0.02	-0.08	624.01	-1.46	0.0	-73.57	23.79	-0.05	-1.89	19.49	0.32	0.00	21.38	33.4	2
4008	Tube 2	Origin	58.08	6.79	0.02	-0.08	624.01	-1.46	0.0	-74.29	23.84	-0.06	-1.90	19.49	0.32	0.00	21.40	33.4	2
4008	4008:WVGD6	End	61.50	5.98	0.02	-0.07	705.54	-1.65	0.0	-74.29	23.84	-0.06	-1.85	20.82	0.31	0.00	22.68	36.0	2
4008	4008:WVGD6	Origin	61.50	5.98	0.02	-0.07	705.54	-1.65	0.0	-75.14	23.90	-0.06	-1.87	20.82	0.31	0.00	22.70	36.0	2
4008	SpliceT	End	66.00	5.01	0.01	-0.05	813.10	-1.93	0.0	-75.14	23.90	-0.06	-1.81	22.32	0.30	0.00	24.14	39.0	2
4008	SpliceT	Origin	66.00	5.01	0.01	-0.05	813.10	-1.93	0.0	-76.35	23.97	-0.06	-1.84	22.32	0.30	0.00	24.17	39.1	2
4008	Splice	End	68.75	4.47	0.01	-0.05	879.02	-2.10	0.0	-76.35	23.97	-0.06	-1.31	17.17	0.22	0.00	18.48	28.4	2
4008	Splice	Origin	68.75	4.47	0.01	-0.05	879.02	-2.10	0.0	-77.79	24.04	-0.07	-1.33	17.17	0.22	0.00	18.50	28.5	2
4008	4008:WVGD5	End	71.50	3.96	0.01	-0.04	945.13	-2.29	0.0	-77.79	24.04	-0.07	-1.30	17.69	0.21	0.00	18.99	29.2	2
4008	4008:WVGD5	Origin	71.50	3.96	0.01	-0.04	945.13	-2.29	0.0	-79.31	24.14	-0.07	-1.33	17.69	0.21	0.00	19.02	29.3	2
4008	Tube 3	End	76.50	3.12	0.01	-0.03	1065.84	-2.65	0.0	-79.31	24.14	-0.07	-1.28	18.50	0.21	0.00	19.78	30.4	2
4008	Tube 3	Origin	76.50	3.12	0.01	-0.03	1065.84	-2.65	0.0	-80.93	24.27	-0.08	-1.31	18.50	0.21	0.00	19.80	30.5	2
4008	4008:WVGD4	End	81.50	2.38	0.01	-0.03	1187.17	-3.04	0.0	-80.93	24.27	-0.08	-1.26	19.15	0.20	0.00	20.42	31.4	2
4008	4008:WVGD4	Origin	81.50	2.38	0.01	-0.03	1187.17	-3.04	0.0	-82.62	24.39	-0.08	-1.29	19.15	0.20	0.00	20.44	31.5	2
4008	Tube 3	End	86.50	1.74	0.01	-0.02	1309.13	-3.47	0.0	-82.62	24.39	-0.08	-1.24	19.69	0.19	0.00	20.93	32.2	2
4008	Tube 3	Origin	86.50	1.74	0.01	-0.02	1309.13	-3.47	0.0	-84.36	24.53	-0.09	-1.27	19.69	0.19	0.00	20.96	32.2	2
4008	4008:WVGD3	End	91.50	1.20	0.00	-0.02	1431.77	-3.92	0.0	-84.36	24.53	-0.09	-1.23	20.12	0.19	0.00	21.35	32.8	2
4008	4008:WVGD3	Origin	91.50	1.20	0.00	-0.02	1431.77	-3.92	0.0	-86.15	24.67	-0.10	-1.25	20.12	0.19	0.00	21.38	32.9	2
4008	Tube 3	End	96.50	0.76	0.00	-0.01	1555.09	-4.41	0.0	-86.15	24.67	-0.10	-1.21	20.47	0.18	0.00	21.68	33.4	2
4008	Tube 3	Origin	96.50	0.76	0.00	-0.01	1555.09	-4.41	0.0	-88.01	24.81	-0.10	-1.24	20.47	0.18	0.00	21.71	33.4	2
4008	4008:WVGD2	End	101.50	0.43	0.00	-0.01	1679.13	-4.93	0.0	-88.01	24.81	-0.10	-1.20	20.74	0.18	0.00	21.94	33.8	2
4008	4008:WVGD2	Origin	101.50	0.43	0.00	-0.01	1679.13	-4.93	0.0	-89.92	24.96	-0.11	-1.23	20.74	0.18	0.00	21.97	33.8	2
4008	Tube 3	End	106.50	0.19	0.00	-0.01	1803.91	-5.49	0.0	-89.92	24.96	-0.11	-1.19	20.95	0.17	0.00	22.14	34.4	2
4008	Tube 3	Origin	106.50	0.19	0.00	-0.01	1803.91	-5.49	0.0	-91.90	25.11	-0.12	-1.21	20.95	0.18	0.00	22.17	34.5	2
4008	4008:WVGD1	End	111.50	0.05	0.00	-0.00	1929.47	-6.09	0.0	-91.90	25.11	-0.12	-1.18	21.11	0.17	0.00	22.29	35.2	2
4008	4008:WVGD1	Origin	111.50	0.05	0.00	-0.00	1929.47	-6.09	0.0	-93.92	25.27	-0.13	-1.20	21.11	0.17	0.00	22.32	35.2	2
4008	4008:g	End	116.50	0.00	0.00	0.00	2055.83	-6.72	0.0	-93.92	25.27	-0.13	-1.17	21.23	0.17	0.00	22.40	35.9	2

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

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Vert. Mom. (ft-k)	Horz. Mom. (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Vert. Shear (kips)	Horz. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
Davit1	Davit1:O	Origin	0.00	18.20	0.05	0.17	-8.04	0.00	0.0	-1.83	1.93	-0.00	-0.50	19.19	0.00	0.00	19.69	30.3	1
Davit1	Davit1:V	End	3.04	18.39	0.05	1.17	-2.17	0.00	0.0	-1.83	1.93	-0.00	-0.50	5.18	0.00	0.00	5.68	8.7	1
Davit1	Davit1:V	Origin	3.04	18.39	0.05	1.17	-2.17	0.00	0.0	-1.49	2.17	-0.00	-0.41	5.18	0.00	0.00	5.59	8.6	1
Davit1	Davit1:End	End	4.04	18.39	0.05	1.48	-0.00	0.00	0.0	-1.49	2.17	-0.00	-0.41	0.00	1.23	0.00	2.17	3.3	3
Davit2	Davit2:O	Origin	0.00	18.19	0.05	-0.67	-9.50	-0.00	-0.0	1.12	2.41	0.00	0.31	22.66	0.00	0.00	22.97	35.3	1
Davit2	Davit2:V	End	3.04	18.37	0.05	-1.90	-2.16	-0.00	-0.0	1.12	2.41	0.00	0.31	5.14	0.00	0.00	5.45	8.4	1
Davit2	Davit2:V	Origin	3.04	18.37	0.05	-1.90	-2.16	-0.00	-0.0	1.51	2.16	0.00	0.41	5.14	0.00	0.00	5.56	8.5	1
Davit2	Davit2:End	End	4.04	18.37	0.05	-2.34	0.00	0.00	-0.0	1.51	2.16	0.00	0.41	0.00	1.22	0.00	2.16	3.3	3
Davit3	Davit3:O	Origin	0.00	15.44	0.04	0.23	-50.72	0.01	0.0	-3.56	5.57	-0.00	-0.36	26.64	0.00	0.00	27.00	41.5	1
Davit3	#Davit3:0	End	3.55	15.63	0.04	1.30	-30.96	0.00	0.0	-3.56	5.57	-0.00	-0.41	21.12	0.00	0.00	21.53	33.1	1
Davit3	#Davit3:0	Origin	3.55	15.63	0.04	1.30	-30.96	0.00	0.0	-3.50	5.44	-0.00	-0.40	21.12	0.00	0.00	21.52	33.1	1
Davit3	Davit3:V	End	7.10	15.77	0.04	2.11	-11.67	0.00	0.0	-3.50	5.44	-0.00	-0.46	10.76	0.00	0.00	11.22	17.3	1
Davit3	Davit3:V	Origin	7.10	15.77	0.04	2.11	-11.67	0.00	0.0	-2.53	5.84	-0.00	-0.34	10.76	0.00	0.00	11.09	17.1	1
Davit3	Davit3:End	End	9.10	15.78	0.04	2.50	-0.00	0.00	0.0	-2.53	5.84	-0.00	-0.37	0.00	1.77	0.00	3.09	4.8	3
Davit4	Davit4:O	Origin	0.00	15.42	0.04	-0.65	-56.45	-0.00	-0.0	1.61	6.41	0.00	0.16	29.65	0.00	0.00	29.82	45.9	1
Davit4	#Davit4:0	End	3.55	15.63	0.04	-2.06	-33.69	-0.00	-0.0	1.61	6.41	0.00	0.18	22.98	0.00	0.00	23.17	35.6	1
Davit4	#Davit4:0	Origin	3.55	15.63	0.04	-2.06	-33.69	-0.00	-0.0	1.67	6.25	0.00	0.19	22.98	0.00	0.00	23.18	35.7	1
Davit4	Davit4:V	End	7.10	15.88	0.04	-3.76	-11.53	-0.00	-0.0	1.67	6.25	0.00	0.22	10.62	0.00	0.00	10.85	16.7	1
Davit4	Davit4:V	Origin	7.10	15.88	0.04	-3.76	-11.53	-0.00	0.0	2.69	5.76	0.00	0.36	10.62	0.00	0.00	10.98	16.9	1
Davit4	Davit4:End	End	9.10	15.86	0.04	-4.81	0.00	0.00	0.0	2.69	5.76	0.00	0.39	0.00	1.75	0.00	3.06	4.7	3
Davit5	Davit5:O	Origin	0.00	11.25	0.03	0.30	-50.82	0.00	0.0	-3.55	5.58	-0.00	-0.36	26.70	0.00	0.00	27.05	41.6	1
Davit5	#Davit5:0	End	3.55	11.42	0.03	1.24	-31.02	0.00	0.0	-3.55	5.58	-0.00	-0.41	21.16	0.00	0.00	21.57	33.2	1
Davit5	#Davit5:0	Origin	3.55	11.42	0.03	1.24	-31.02	0.00	0.0	-3.48	5.45	-0.00	-0.40	21.16	0.00	0.00	21.56	33.2	1
Davit5	Davit5:V	End	7.10	11.54	0.03	1.90	-11.69	0.00	0.0	-3.48	5.45	-0.00	-0.46	10.77	0.00	0.00	11.23	17.3	1
Davit5	Davit5:V	Origin	7.10	11.54	0.03	1.90	-11.69	0.00	0.0	-2.52	5.85	-0.00	-0.33	10.77	0.00	0.00	11.10	17.1	1
Davit5	Davit5:End	End	9.10	11.54	0.03	2.21	-0.00	0.00	0.0	-2.52	5.85	-0.00	-0.37	0.00	1.77	0.00	3.09	4.8	3
Davit6	Davit6:O	Origin	0.00	11.24	0.03	-0.58	-56.51	-0.00	-0.0	1.59	6.42	0.00	0.16	29.68	0.00	0.00	29.84	45.9	1
Davit6	#Davit6:0	End	3.55	11.44	0.03	-1.86	-33.73	-0.00	-0.0	1.59	6.42	0.00	0.18	23.01	0.00	0.00	23.19	35.7	1
Davit6	#Davit6:0	Origin	3.55	11.44	0.03	-1.86	-33.73	-0.00	-0.0	1.65	6.25	0.00	0.19	23.01	0.00	0.00	23.20	35.7	1
Davit6	Davit6:V	End	7.10	11.67	0.03	-3.42	-11.55	-0.00	-0.0	1.65	6.25	0.00	0.22	10.64	0.00	0.00	10.86	16.7	1
Davit6	Davit6:V	Origin	7.10	11.67	0.03	-3.42	-11.55	-0.00	0.0	2.68	5.77	0.00	0.35	10.64	0.00	0.00	10.99	16.9	1
Davit6	Davit6:End	End	9.10	11.65	0.03	-4.39	0.00	0.00	0.0	2.68	5.77	0.00	0.39	0.00	1.75	0.00	3.06	4.7	3

Davit7	Davit7:O	Origin	0.00	7.65	0.02	0.32	-50.96	0.00	0.0	-3.52	5.60	-0.00	-0.35	26.77	0.00	0.00	27.12	41.7	1
Davit7	#Davit7:0	End	3.55	7.78	0.02	1.07	-31.10	0.00	0.0	-3.52	5.60	-0.00	-0.40	21.22	0.00	0.00	21.62	33.3	1
Davit7	#Davit7:0	Origin	3.55	7.78	0.02	1.07	-31.10	0.00	0.0	-3.46	5.46	-0.00	-0.39	21.22	0.00	0.00	21.61	33.2	1
Davit7	Davit7:V	End	7.10	7.87	0.02	1.55	-11.71	0.00	0.0	-3.46	5.46	-0.00	-0.46	10.79	0.00	0.00	11.25	17.3	1
Davit7	Davit7:V	Origin	7.10	7.87	0.02	1.55	-11.71	0.00	0.0	-2.49	5.86	-0.00	-0.33	10.79	0.00	0.00	11.12	17.1	1
Davit7	Davit7:End	End	9.10	7.87	0.02	1.75	-0.00	0.00	0.0	-2.49	5.86	-0.00	-0.36	0.00	1.78	0.00	3.10	4.8	3
Davit8	Davit8:O	Origin	0.00	7.64	0.02	-0.50	-56.58	-0.00	-0.0	1.56	6.43	0.00	0.16	29.72	0.00	0.00	29.88	46.0	1
Davit8	#Davit8:0	End	3.55	7.81	0.02	-1.59	-33.78	-0.00	-0.0	1.56	6.43	0.00	0.18	23.04	0.00	0.00	23.22	35.7	1
Davit8	#Davit8:0	Origin	3.55	7.81	0.02	-1.59	-33.78	-0.00	-0.0	1.63	6.26	0.00	0.19	23.04	0.00	0.00	23.23	35.7	1
Davit8	Davit8:V	End	7.10	8.02	0.02	-2.97	-11.57	-0.00	-0.0	1.63	6.26	0.00	0.22	10.66	0.00	0.00	10.88	16.7	1
Davit8	Davit8:V	Origin	7.10	8.02	0.02	-2.97	-11.57	-0.00	0.0	2.65	5.79	0.00	0.35	10.66	0.00	0.00	11.01	16.9	1
Davit8	Davit8:End	End	9.10	8.00	0.02	-3.83	0.00	0.00	0.0	2.65	5.79	0.00	0.39	0.00	1.76	0.00	3.07	4.7	3

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
Clamp1	2.624	80.00	80.00	3.28	0.00	0.00	0.00	3.28
Clamp2	2.624	80.00	80.00	3.28	0.00	0.00	0.00	3.28
Clamp3	6.329	80.00	80.00	7.91	0.00	0.00	0.00	7.91
Clamp4	6.329	80.00	80.00	7.91	0.00	0.00	0.00	7.91
Clamp5	6.329	80.00	80.00	7.91	0.00	0.00	0.00	7.91
Clamp6	6.329	80.00	80.00	7.91	0.00	0.00	0.00	7.91
Clamp7	6.329	80.00	80.00	7.91	0.00	0.00	0.00	7.91
Clamp8	6.329	80.00	80.00	7.91	0.00	0.00	0.00	7.91
Clamp9	17.479	80.00	80.00	21.85	0.00	0.00	0.00	21.85
Clamp10	7.345	80.00	80.00	9.18	0.00	0.00	0.00	9.18

*** Analysis Results for Load Case No. 2 "NESC 250C (Extreme Wind)" - Number of iterations in SAPS 14

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

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
4008:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
4008:t	0.001798	4.375	-0.1118	-3.9415	0.0015	0.0000	0.001798	4.375	116.4
4008:AT&T	0.001785	4.34	-0.1107	-3.9415	0.0015	0.0000	0.001785	4.34	115.9
4008:WVGD12	0.00176	4.272	-0.1083	-3.9399	0.0015	0.0000	0.00176	4.272	114.9
4008:TMobile	0.001532	3.66	-0.08732	-3.8210	0.0014	0.0000	0.001532	3.66	105.9
4008:WVGD11	0.001507	3.593	-0.08509	-3.7991	0.0014	0.0000	0.001507	3.593	104.9
4008:WVGD10	0.001261	2.955	-0.06445	-3.5052	0.0014	0.0000	0.001261	2.955	94.94
4008:Arm1	0.001249	2.924	-0.06351	-3.4943	0.0014	0.0000	0.001249	2.924	94.44
4008:Arm2	0.001069	2.469	-0.04987	-3.3039	0.0013	0.0000	0.001069	2.469	86.79
4008:WVGD9	0.001039	2.392	-0.04764	-3.2657	0.0013	0.0000	0.001039	2.392	85.45
4008:WVGD8	0.0008094	1.824	-0.03204	-2.9147	0.0012	0.0000	0.0008094	1.824	74.97
4008:Arm3	0.0007957	1.79	-0.03118	-2.8905	0.0012	0.0000	0.0007957	1.79	74.31
4008:WVGD7	0.0006127	1.348	-0.02048	-2.5123	0.0011	0.0000	0.0006127	1.348	64.98
4008:Arm4	0.0005557	1.213	-0.01752	-2.3747	0.0010	0.0000	0.0005557	1.213	61.82
4008:WVGD6	0.0004419	0.9478	-0.01216	-2.0587	0.0009	0.0000	0.0004419	0.9478	54.99
4008:WVGD5	0.0003002	0.6277	-0.006775	-1.6228	0.0007	0.0000	0.0003002	0.6277	44.99
4008:WVGD4	0.0001846	0.3763	-0.003401	-1.2475	0.0006	0.0000	0.0001846	0.3763	35
4008:WVGD3	9.577e-05	0.1902	-0.001457	-0.8766	0.0004	0.0000	9.577e-05	0.1902	25
4008:WVGD2	3.52e-05	0.068	-0.0004991	-0.5159	0.0003	0.0000	3.52e-05	0.068	15
4008:WVGD1	4.141e-06	0.007702	-0.0001062	-0.1683	0.0001	0.0000	4.141e-06	0.007702	5
Davit1:O	0.001251	2.926	0.006075	-3.4943	0.0014	0.0000	0.001251	1.785	94.51
Davit1:V	0.001268	2.962	0.1864	-3.4427	0.0014	0.0000	0.001268	-1.18	95.19
Davit1:End	0.001269	2.964	0.2464	-3.4378	0.0014	0.0000	0.001269	-2.178	95.25
Davit2:O	0.001247	2.922	-0.1331	-3.4943	0.0014	0.0000	0.001247	4.064	94.37
Davit2:V	0.001254	2.947	-0.3202	-3.5938	0.0014	0.0000	0.001254	7.089	94.68
Davit2:End	0.001252	2.945	-0.3829	-3.5986	0.0014	0.0000	0.001252	8.087	94.62
Davit3:O	0.001071	2.471	0.02191	-3.3039	0.0013	0.0000	0.001071	1.226	86.86
Davit3:V	0.001108	2.546	0.407	-3.0586	0.0013	0.0000	0.001108	-5.699	88.42
Davit3:End	0.001111	2.549	0.513	-3.0305	0.0013	0.0000	0.001111	-7.696	88.52
Davit4:O	0.001067	2.467	-0.1216	-3.3039	0.0013	0.0000	0.001067	3.712	86.72
Davit4:V	0.001083	2.525	-0.5519	-3.6530	0.0013	0.0000	0.001083	10.77	87.46
Davit4:End	0.00108	2.521	-0.68	-3.6805	0.0013	0.0000	0.00108	12.77	87.33
Davit5:O	0.0007973	1.792	0.04016	-2.8905	0.0012	0.0000	0.0007973	0.3775	74.38
Davit5:V	0.0008298	1.857	0.375	-2.6411	0.0012	0.0000	0.0008298	-6.558	75.88
Davit5:End	0.0008322	1.859	0.4664	-2.6126	0.0012	0.0000	0.0008322	-8.556	75.98
Davit6:O	0.000794	1.789	-0.1025	-2.8905	0.0012	0.0000	0.000794	3.203	74.24
Davit6:V	0.0008097	1.842	-0.4821	-3.2432	0.0012	0.0000	0.0008097	10.26	75.03
Davit6:End	0.0008072	1.839	-0.5959	-3.2711	0.0012	0.0000	0.0008072	12.25	74.91
Davit7:O	0.000557	1.215	0.04812	-2.3747	0.0010	0.0000	0.000557	-0.3693	61.89
Davit7:V	0.0005834	1.266	0.3201	-2.1202	0.0010	0.0000	0.0005834	-7.318	63.33
Davit7:End	0.0005851	1.267	0.3933	-2.0913	0.0010	0.0000	0.0005851	-9.317	63.4
Davit8:O	0.0005544	1.212	-0.08315	-2.3747	0.0010	0.0000	0.0005544	2.796	61.76
Davit8:V	0.0005691	1.258	-0.3996	-2.7318	0.0010	0.0000	0.0005691	9.842	62.61
Davit8:End	0.0005674	1.255	-0.4956	-2.7601	0.0010	0.0000	0.0005674	11.84	62.51

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

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
4008:g	-0.04	0.0	-49.38	0.0	0.0	-48.77	0.0	0.0	69.40	0.0	3915.51	0.0	-2.1	0.0	0.0	-0.00	0.0	0.0

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

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
4008	4008:t	Origin	0.00	52.50	0.02	-1.34	-0.00	-0.00	-0.0	-0.01	0.01	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5
4008	4008:AT&T	End	0.50	52.08	0.02	-1.33	0.01	-0.00	-0.0	-0.01	0.01	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5
4008	4008:AT&T	Origin	0.50	52.08	0.02	-1.33	0.01	-0.00	0.0	-5.75	6.80	-0.00	-0.48	0.00	1.15	0.00	2.04	3.1	5
4008	4008:WVGD12	End	1.50	51.26	0.02	-1.30	6.81	-0.00	0.0	-5.75	6.80	-0.00	-0.47	0.35	1.09	0.00	2.06	3.2	4
4008	4008:WVGD12	Origin	1.50	51.26	0.02	-1.30	6.81	-0.00	0.0	-5.87	6.96	-0.00	-0.48	0.35	1.12	0.00	2.10	3.2	4
4008	Tube 1	End	6.00	47.56	0.02	-1.17	38.12	-0.00	0.0	-5.87	6.96	-0.00	-0.45	6.31	0.28	0.00	6.78	10.4	2
4008	Tube 1	Origin	6.00	47.56	0.02	-1.17	38.12	-0.00	0.0	-6.08	7.23	-0.00	-0.46	6.31	0.29	0.00	6.79	10.5	2
4008	4008:TMobile	End	10.50	43.92	0.02	-1.05	70.65	-0.01	0.0	-6.08	7.23	-0.00	-0.43	10.27	0.27	0.00	10.71	16.7	2
4008	4008:TMobile	Origin	10.50	43.92	0.02	-1.05	70.65	-0.01	-0.0	-9.21	10.65	-0.00	-0.66	10.27	0.40	0.00	10.95	17.1	2
4008	4008:WVGD11	End	11.50	43.12	0.02	-1.02	81.30	-0.01	-0.0	-9.21	10.65	-0.00	-0.65	11.49	0.40	0.00	12.16	19.1	2
4008	4008:WVGD11	Origin	11.50	43.12	0.02	-1.02	81.30	-0.01	0.0	-9.36	10.82	-0.00	-0.66	11.49	0.40	0.00	12.17	19.1	2

4008	Tube 1	End	16.00	39.59	0.02	-0.90	129.98	-0.03	0.0	-9.36	10.82	-0.00	-0.62	16.28	0.38	0.00	16.91	27.5	2
4008	Tube 1	Origin	16.00	39.59	0.02	-0.90	129.98	-0.03	0.0	-9.61	11.11	-0.00	-0.64	16.28	0.39	0.00	16.93	27.5	2
4008	SpliceT	End	20.50	36.19	0.02	-0.80	179.99	-0.05	0.0	-9.61	11.11	-0.00	-0.60	20.11	0.37	0.00	20.72	34.8	2
4008	SpliceT	Origin	20.50	36.19	0.02	-0.80	179.99	-0.05	-0.0	-9.80	11.30	-0.00	-0.37	12.01	0.22	0.00	12.38	19.0	2
4008	4008:WVGD10	End	21.50	35.46	0.02	-0.77	191.29	-0.05	-0.0	-9.80	11.30	-0.00	-0.36	12.45	0.22	0.00	12.82	19.7	2
4008	4008:WVGD10	Origin	21.50	35.46	0.02	-0.77	191.29	-0.05	-0.0	-9.87	11.35	-0.00	-0.36	12.45	0.22	0.00	12.82	19.7	2
4008	4008:Arm1	End	22.00	35.09	0.01	-0.76	196.96	-0.05	-0.0	-9.87	11.35	-0.00	-0.36	12.67	0.22	0.00	13.04	20.1	2
4008	4008:Arm1	Origin	22.00	35.09	0.01	-0.76	198.78	-0.05	0.0	-11.28	15.16	-0.01	-0.41	12.78	0.29	0.00	13.21	20.3	2
4008	Tube 2	End	25.83	32.32	0.01	-0.68	256.84	-0.07	0.0	-11.28	15.16	-0.01	-0.40	15.09	0.28	0.00	15.49	23.8	2
4008	Tube 2	Origin	25.83	32.32	0.01	-0.68	256.84	-0.07	0.0	-11.68	15.45	-0.01	-0.41	15.09	0.29	0.00	15.51	23.9	2
4008	4008:Arm2	End	29.66	29.63	0.01	-0.60	316.02	-0.10	0.0	-11.68	15.45	-0.01	-0.39	17.03	0.27	0.00	17.43	26.8	2
4008	4008:Arm2	Origin	29.66	29.63	0.01	-0.60	325.68	-0.10	0.0	-17.05	24.10	-0.01	-0.57	17.55	0.43	0.00	18.14	27.9	2
4008	4008:WVGD9	End	31.00	28.71	0.01	-0.57	357.96	-0.11	0.0	-17.05	24.10	-0.01	-0.57	18.73	0.42	0.00	19.31	29.7	2
4008	4008:WVGD9	Origin	31.00	28.71	0.01	-0.57	357.96	-0.11	0.0	-17.42	24.35	-0.01	-0.58	18.73	0.43	0.00	19.32	29.7	2
4008	Tube 2	End	36.00	25.36	0.01	-0.48	479.71	-0.15	0.0	-17.42	24.35	-0.01	-0.55	22.58	0.40	0.00	23.14	35.6	2
4008	Tube 2	Origin	36.00	25.36	0.01	-0.48	479.71	-0.15	0.0	-17.89	24.66	-0.01	-0.56	22.58	0.41	0.00	23.15	35.6	2
4008	Tube 2	End	38.75	23.60	0.01	-0.43	547.53	-0.18	0.0	-17.89	24.66	-0.01	-0.55	24.37	0.40	0.00	24.92	38.3	2
4008	Tube 2	Origin	38.75	23.60	0.01	-0.43	547.53	-0.18	0.0	-18.24	24.88	-0.01	-0.56	24.37	0.40	0.00	24.94	38.4	2
4008	4008:WVGD8	End	41.50	21.89	0.01	-0.38	615.96	-0.21	0.0	-18.24	24.88	-0.01	-0.54	25.96	0.39	0.00	26.51	40.8	2
4008	4008:WVGD8	Origin	41.50	21.89	0.01	-0.38	615.96	-0.21	0.0	-18.46	25.03	-0.01	-0.55	25.96	0.39	0.00	26.52	40.8	2
4008	4008:Arm3	End	42.16	21.49	0.01	-0.37	632.50	-0.21	0.0	-18.46	25.03	-0.01	-0.55	26.32	0.39	0.00	26.87	41.3	2
4008	4008:Arm3	Origin	42.16	21.49	0.01	-0.37	642.12	-0.21	0.0	-23.98	33.66	-0.01	-0.71	26.72	0.53	0.00	27.44	42.2	2
4008	Tube 2	End	46.83	18.74	0.01	-0.31	799.29	-0.27	0.0	-23.98	33.66	-0.01	-0.68	30.44	0.50	0.00	31.13	47.9	2
4008	Tube 2	Origin	46.83	18.74	0.01	-0.31	799.29	-0.27	0.0	-24.66	34.04	-0.01	-0.70	30.44	0.51	0.00	31.15	47.9	2
4008	4008:WVGD7	End	51.50	16.18	0.01	-0.25	958.25	-0.33	0.0	-24.66	34.04	-0.01	-0.67	33.52	0.49	0.00	34.20	52.6	2
4008	4008:WVGD7	Origin	51.50	16.18	0.01	-0.25	958.25	-0.33	0.0	-25.24	34.37	-0.01	-0.68	33.52	0.49	0.00	34.21	52.6	2
4008	4008:Arm4	End	54.66	14.56	0.01	-0.21	1066.91	-0.38	0.0	-25.24	34.37	-0.01	-0.67	35.31	0.48	0.00	35.98	55.4	2
4008	4008:Arm4	Origin	54.66	14.56	0.01	-0.21	1076.47	-0.38	0.0	-31.00	43.02	-0.02	-0.82	35.62	0.60	0.00	36.46	56.2	2
4008	Tube 2	End	58.08	12.91	0.01	-0.18	1223.57	-0.43	0.0	-31.00	43.02	-0.02	-0.79	38.20	0.58	0.00	39.00	61.0	2
4008	Tube 2	Origin	58.08	12.91	0.01	-0.18	1223.57	-0.43	0.0	-31.57	43.31	-0.02	-0.81	38.20	0.59	0.00	39.02	61.0	2
4008	4008:WVGD6	End	61.50	11.37	0.01	-0.15	1371.66	-0.49	0.0	-31.57	43.31	-0.02	-0.79	40.46	0.57	0.00	41.26	65.4	2
4008	4008:WVGD6	Origin	61.50	11.37	0.01	-0.15	1371.66	-0.49	0.0	-32.26	43.65	-0.02	-0.80	40.46	0.57	0.00	41.28	65.5	2
4008	SpliceT	End	66.00	9.53	0.00	-0.11	1568.05	-0.58	0.0	-32.26	43.65	-0.02	-0.78	43.03	0.55	0.00	43.82	70.9	2
4008	SpliceT	Origin	66.00	9.53	0.00	-0.11	1568.05	-0.58	0.0	-33.17	43.97	-0.02	-0.80	43.03	0.56	0.00	43.84	70.9	2
4008	Splice	End	68.75	8.50	0.00	-0.10	1688.97	-0.63	0.0	-33.17	43.97	-0.02	-0.57	32.97	0.40	0.00	33.55	51.6	2
4008	Splice	Origin	68.75	8.50	0.00	-0.10	1688.97	-0.63	0.0	-34.19	44.24	-0.02	-0.59	32.97	0.40	0.00	33.56	51.6	2
4008	4008:WVGD5	End	71.50	7.53	0.00	-0.08	1810.64	-0.69	0.0	-34.19	44.24	-0.02	-0.57	33.87	0.39	0.00	34.45	53.0	2
4008	4008:WVGD5	Origin	71.50	7.53	0.00	-0.08	1810.64	-0.69	0.0	-35.30	44.63	-0.02	-0.59	33.87	0.40	0.00	34.46	53.0	2
4008	Tube 3	End	76.50	5.93	0.00	-0.06	2033.78	-0.80	0.0	-35.30	44.63	-0.02	-0.57	35.27	0.38	0.00	35.85	55.2	2
4008	Tube 3	Origin	76.50	5.93	0.00	-0.06	2033.78	-0.80	0.0	-36.50	45.13	-0.02	-0.59	35.27	0.38	0.00	35.87	55.2	2
4008	4008:WVGD4	End	81.50	4.52	0.00	-0.04	2259.42	-0.93	0.0	-36.50	45.13	-0.02	-0.57	36.43	0.37	0.00	37.01	56.9	2
4008	4008:WVGD4	Origin	81.50	4.52	0.00	-0.04	2259.42	-0.93	0.0	-37.74	45.64	-0.03	-0.59	36.43	0.38	0.00	37.03	57.0	2
4008	Tube 3	End	86.50	3.30	0.00	-0.03	2487.64	-1.06	0.0	-37.74	45.64	-0.03	-0.57	37.39	0.36	0.00	37.97	58.4	2
4008	Tube 3	Origin	86.50	3.30	0.00	-0.03	2487.64	-1.06	0.0	-39.02	46.18	-0.03	-0.59	37.39	0.37	0.00	37.99	58.4	2
4008	4008:WVGD3	End	91.50	2.28	0.00	-0.02	2718.51	-1.20	0.0	-39.02	46.18	-0.03	-0.57	38.18	0.35	0.00	38.76	59.6	2
4008	4008:WVGD3	Origin	91.50	2.28	0.00	-0.02	2718.51	-1.20	0.0	-40.34	46.72	-0.03	-0.59	38.18	0.36	0.00	38.77	59.7	2
4008	Tube 3	End	96.50	1.45	0.00	-0.01	2952.11	-1.36	0.0	-40.34	46.72	-0.03	-0.57	38.83	0.35	0.00	39.40	60.6	2
4008	Tube 3	Origin	96.50	1.45	0.00	-0.01	2952.11	-1.36	0.0	-41.70	47.29	-0.03	-0.59	38.83	0.35	0.00	39.42	60.6	2
4008	4008:WVGD2	End	101.50	0.82	0.00	-0.01	3188.53	-1.52	0.0	-41.70	47.29	-0.03	-0.57	39.36	0.34	0.00	39.93	61.4	2
4008	4008:WVGD2	Origin	101.50	0.82	0.00	-0.01	3188.53	-1.52	0.0	-43.10	47.86	-0.04	-0.59	39.36	0.34	0.00	39.95	61.5	2
4008	Tube 3	End	106.50	0.36	0.00	-0.00	3427.85	-1.70	0.0	-43.10	47.86	-0.04	-0.57	39.79	0.33	0.00	40.36	62.8	2
4008	Tube 3	Origin	106.50	0.36	0.00	-0.00	3427.85	-1.70	0.0	-44.53	48.46	-0.04	-0.59	39.79	0.34	0.00	40.38	62.8	2
4008	4008:WVGD1	End	111.50	0.09	0.00	-0.00	3670.15	-1.89	0.0	-44.53	48.46	-0.04	-0.57	40.13	0.33	0.00	40.70	64.3	2
4008	4008:WVGD1	Origin	111.50	0.09	0.00	-0.00	3670.15	-1.89	0.0	-46.00	49.07	-0.04	-0.59	40.13	0.33	0.00	40.72	64.3	2
4008	4008:g	End	116.50	0.00	0.00	0.00	3915.51	-2.09	0.0	-46.00	49.07	-0.04	-0.57	40.40	0.32	0.00	40.97	65.7	2

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

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Vert. Mom. (ft-k)	Horz. Mom. (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Vert. Shear (kips)	Horz. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
Davit1	Davit1:O	Origin	0.00	35.11	0.02	0.07	-1.39	0.00	0.0	-1.89	0.27	-0.00	-0.52	3.32	0.00	0.00	3.84	5.9	1
Davit1	Davit1:V	End	3.04	35.54	0.02	2.24	-0.56	0.00	0.0	-1.89	0.27	-0.00	-0.52	1.33	0.00	0.00	1.85	2.8	1
Davit1	Davit1:V	Origin	3.04	35.54	0.02	2.24	-0.56	0.00	0.0	-1.82	0.56	-0.00	-0.50	1.33	0.00	0.00	1.83	2.8	1
Davit1	Davit1:End	End	4.04	35.57	0.02	2.96	-0.00	0.00	0.0	-1.82	0.56	-0.00	-0.50	0.00	0.32	0.00	0.74	1.1	3
Davit2	Davit2:O	Origin	0.00	35.06	0.01	-1.60	-3.20	-0.00	-0.0	1.70	0.87	0.00	0.46	7.64	0.00	0.00	8.10	12.5	1
Davit2	Davit2:V	End	3.04	35.37	0.02	-3.84	-0.55	-0.00	-0.0	1.70	0.87	0.00	0.46	1.32	0.00	0.00	1.78	2.7	1
Davit2	Davit2:V	Origin	3.04	35.37	0.02	-3.84	-0.55	-0.00	-0.0	1.82	0.55	0.00	0.50	1.32	0.00	0.00	1.82	2.8	1
Davit2	Davit2:End	End	4.04	35.34	0.02	-4.60	0.00	0.00	-0.0	1.82	0.55	0.00	0.50	0.00	0.31	0.00	0.74	1.1	3
Davit3	Davit3:O	Origin	0.00	29.65	0.01	0.26	-16.87	0.00	0.0	-4.57	1.76	-0.00	-0.46	8.86	0.00	0.00	9.32	14.3	1
Davit3	#Davit3:0	End	3.55	30.12	0.01	2.62	-10.61	0.00	0.0	-4.57	1.76	-0.00	-0.52	7.24	0.00	0.00	7.76	11.9	1
Davit3	#Davit3:0	Origin	3.55	30.12	0.01	2.62	-10.61	0.00	0.0	-4.55	1.67	-0.00	-0.52	7.24	0.00	0.00	7.76	11.9	1
Davit3	Davit3:V	End	7.10	30.56	0.01	4.88	-4.67	0.00	0.0	-4.55	1.67	-0.00	-0.60	4.30	0.00	0.00	4.91	7.5	1
Davit3	Davit3:V	Origin	7.10	30.56	0.01	4.88	-4.67	0.00	0.0	-4.20	2.34	-0.00	-0.56	4.30	0.00	0.00	4.86	7.5	1
Davit3	Davit3:End	End	9.10	30.59	0.01	6.16	-0.00	0.00	0.0	-4.20	2.34	-0.00	-0.61	0.00	0.71	0.00	1.37	2.1	3
Davit4	Davit4:O	Origin	0.00	29.60	0.01	-1.46	-26.52	-0.00	-0.0	3.76	3.15	0.00	0.38	13.93	0.00	0.00	14.31	22.0	1

Davit4	#Davit4:0	End	3.55	29.95	0.01	-3.98	-15.34	-0.00	-0.0	3.76	3.15	0.00	0.43	10.46	0.00	0.00	10.89	16.8	1
Davit4	#Davit4:0	Origin	3.55	29.95	0.01	-3.98	-15.34	-0.00	-0.0	3.78	3.03	0.00	0.43	10.46	0.00	0.00	10.90	16.8	1
Davit4	Davit4:V	End	7.10	30.30	0.01	-6.62	-4.58	-0.00	-0.0	3.78	3.03	0.00	0.50	4.22	0.00	0.00	4.72	7.3	1
Davit4	Davit4:V	Origin	7.10	30.30	0.01	-6.62	-4.58	-0.00	0.0	4.23	2.29	0.00	0.56	4.22	0.00	0.00	4.78	7.3	1
Davit4	Davit4:End	End	9.10	30.26	0.01	-8.16	-0.00	0.00	0.0	4.23	2.29	0.00	0.61	0.00	0.69	0.00	1.35	2.1	3
Davit5	Davit5:O	Origin	0.00	21.51	0.01	0.48	-17.17	0.00	0.0	-4.56	1.80	-0.00	-0.46	9.02	0.00	0.00	9.48	14.6	1
Davit5	#Davit5:0	End	3.55	21.90	0.01	2.54	-10.79	0.00	0.0	-4.56	1.80	-0.00	-0.52	7.36	0.00	0.00	7.88	12.1	1
Davit5	#Davit5:0	Origin	3.55	21.90	0.01	2.54	-10.79	0.00	0.0	-4.53	1.71	-0.00	-0.52	7.36	0.00	0.00	7.88	12.1	1
Davit5	Davit5:V	End	7.10	22.28	0.01	4.50	-4.73	0.00	0.0	-4.53	1.71	-0.00	-0.60	4.36	0.00	0.00	4.96	7.6	1
Davit5	Davit5:V	Origin	7.10	22.28	0.01	4.50	-4.73	0.00	0.0	-4.18	2.37	-0.00	-0.55	4.36	0.00	0.00	4.91	7.6	1
Davit5	Davit5:End	End	9.10	22.31	0.01	5.60	-0.00	0.00	0.0	-4.18	2.37	-0.00	-0.61	0.00	0.72	0.00	1.38	2.1	3
Davit6	Davit6:O	Origin	0.00	21.46	0.01	-1.23	-26.77	-0.00	-0.0	3.74	3.18	0.00	0.38	14.06	0.00	0.00	14.44	22.2	1
Davit6	#Davit6:0	End	3.55	21.77	0.01	-3.44	-15.50	-0.00	-0.0	3.74	3.18	0.00	0.43	10.57	0.00	0.00	11.00	16.9	1
Davit6	#Davit6:0	Origin	3.55	21.77	0.01	-3.44	-15.50	-0.00	-0.0	3.76	3.06	0.00	0.43	10.57	0.00	0.00	11.00	16.9	1
Davit6	Davit6:V	End	7.10	22.10	0.01	-5.79	-4.64	-0.00	-0.0	3.76	3.06	0.00	0.50	4.27	0.00	0.00	4.77	7.3	1
Davit6	Davit6:V	Origin	7.10	22.10	0.01	-5.79	-4.64	-0.00	0.0	4.21	2.32	0.00	0.56	4.27	0.00	0.00	4.83	7.4	1
Davit6	Davit6:End	End	9.10	22.06	0.01	-7.15	-0.00	0.00	0.0	4.21	2.32	0.00	0.61	0.00	0.70	0.00	1.36	2.1	3
Davit7	Davit7:O	Origin	0.00	14.58	0.01	0.58	-17.54	0.00	0.0	-4.54	1.84	-0.00	-0.46	9.21	0.00	0.00	9.67	14.9	1
Davit7	#Davit7:0	End	3.55	14.89	0.01	2.26	-11.02	0.00	0.0	-4.54	1.84	-0.00	-0.52	7.51	0.00	0.00	8.03	12.4	1
Davit7	#Davit7:0	Origin	3.55	14.89	0.01	2.26	-11.02	0.00	0.0	-4.52	1.75	-0.00	-0.52	7.51	0.00	0.00	8.03	12.4	1
Davit7	Davit7:V	End	7.10	15.19	0.01	3.84	-4.81	0.00	0.0	-4.52	1.75	-0.00	-0.60	4.43	0.00	0.00	5.03	7.7	1
Davit7	Davit7:V	Origin	7.10	15.19	0.01	3.84	-4.81	0.00	0.0	-4.16	2.40	-0.00	-0.55	4.43	0.00	0.00	4.98	7.7	1
Davit7	Davit7:End	End	9.10	15.21	0.01	4.72	-0.00	0.00	0.0	-4.16	2.40	-0.00	-0.61	0.00	0.73	0.00	1.40	2.2	3
Davit8	Davit8:O	Origin	0.00	14.54	0.01	-1.00	-27.09	-0.00	-0.0	3.71	3.21	0.00	0.37	14.23	0.00	0.00	14.60	22.5	1
Davit8	#Davit8:0	End	3.55	14.81	0.01	-2.83	-15.69	-0.00	-0.0	3.71	3.21	0.00	0.42	10.70	0.00	0.00	11.13	17.1	1
Davit8	#Davit8:0	Origin	3.55	14.81	0.01	-2.83	-15.69	-0.00	-0.0	3.73	3.09	0.00	0.43	10.70	0.00	0.00	11.13	17.1	1
Davit8	Davit8:V	End	7.10	15.09	0.01	-4.79	-4.71	-0.00	-0.0	3.73	3.09	0.00	0.49	4.34	0.00	0.00	4.84	7.4	1
Davit8	Davit8:V	Origin	7.10	15.09	0.01	-4.79	-4.71	-0.00	0.0	4.19	2.36	0.00	0.55	4.34	0.00	0.00	4.90	7.5	1
Davit8	Davit8:End	End	9.10	15.07	0.01	-5.95	-0.00	0.00	0.0	4.19	2.36	0.00	0.61	0.00	0.72	0.00	1.38	2.1	3

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
Clamp1	1.898	80.00	80.00	2.37	0.00	0.00	0.00	2.37
Clamp2	1.898	80.00	80.00	2.37	0.00	0.00	0.00	2.37
Clamp3	4.792	80.00	80.00	5.99	0.00	0.00	0.00	5.99
Clamp4	4.792	80.00	80.00	5.99	0.00	0.00	0.00	5.99
Clamp5	4.792	80.00	80.00	5.99	0.00	0.00	0.00	5.99
Clamp6	4.792	80.00	80.00	5.99	0.00	0.00	0.00	5.99
Clamp7	4.792	80.00	80.00	5.99	0.00	0.00	0.00	5.99
Clamp8	4.792	80.00	80.00	5.99	0.00	0.00	0.00	5.99
Clamp9	8.835	80.00	80.00	11.04	0.00	0.00	0.00	11.04
Clamp10	4.421	80.00	80.00	5.53	0.00	0.00	0.00	5.53

*** Analysis Results for Load Case No. 3 "NESC 250D (Extreme Ice w/ Wind)" - Number of iterations in SAPS 14

Equilibrium Joint Positions and Rotations for Load Case "NESC 250D (Extreme Ice w/ Wind)":

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
4008:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
4008:t	0.002374	1.575	-0.01929	-1.3258	0.0020	0.0000	0.002374	1.575	116.5
4008:AT&T	0.002357	1.563	-0.01915	-1.3258	0.0020	0.0000	0.002357	1.563	116
4008:WVGD12	0.002323	1.54	-0.01883	-1.3254	0.0020	0.0000	0.002323	1.54	115
4008:TMobile	0.002016	1.333	-0.01601	-1.2999	0.0019	0.0000	0.002016	1.333	106
4008:WVGD11	0.001983	1.311	-0.01568	-1.2952	0.0019	0.0000	0.001983	1.311	105
4008:WVGD10	0.001654	1.09	-0.01266	-1.2330	0.0018	0.0000	0.001654	1.09	94.99
4008:Arm1	0.001638	1.079	-0.01253	-1.2307	0.0018	0.0000	0.001638	1.079	94.49
4008:Arm2	0.001399	0.9171	-0.01052	-1.1849	0.0017	0.0000	0.001399	0.9171	86.83
4008:WVGD9	0.001359	0.8895	-0.01017	-1.1747	0.0017	0.0000	0.001359	0.8895	85.49
4008:WVGD8	0.001056	0.683	-0.007632	-1.0691	0.0016	0.0000	0.001056	0.683	74.99
4008:Arm3	0.001038	0.6707	-0.007487	-1.0614	0.0016	0.0000	0.001038	0.6707	74.33
4008:WVGD7	0.0007969	0.5073	-0.005536	-0.9343	0.0014	0.0000	0.0007969	0.5073	64.99
4008:Arm4	0.0007222	0.4569	-0.004966	-0.8863	0.0013	0.0000	0.0007222	0.4569	61.83
4008:WVGD6	0.0005733	0.3575	-0.003821	-0.7728	0.0012	0.0000	0.0005733	0.3575	55
4008:WVGD5	0.0003885	0.2369	-0.002573	-0.6120	0.0010	0.0000	0.0003885	0.2369	45
4008:WVGD4	0.0002385	0.142	-0.00171	-0.4712	0.0008	0.0000	0.0002385	0.142	35
4008:WVGD3	0.0001235	0.07173	-0.001066	-0.3310	0.0006	0.0000	0.0001235	0.07173	25
4008:WVGD2	4.531e-05	0.02562	-0.000578	-0.1946	0.0003	0.0000	4.531e-05	0.02562	15
4008:WVGD1	5.317e-06	0.002895	-0.0001816	-0.0634	0.0001	0.0000	5.317e-06	0.002895	5
Davit1:O	0.001639	1.079	0.01199	-1.2307	0.0018	0.0000	0.001639	-0.06254	94.51
Davit1:V	0.001657	1.089	0.06679	-0.9303	0.0018	0.0000	0.001657	-3.053	95.07
Davit1:End	0.001657	1.089	0.08273	-0.9095	0.0018	0.0000	0.001657	-4.053	95.08
Davit2:O	0.001637	1.079	-0.03705	-1.2307	0.0018	0.0000	0.001637	2.22	94.46
Davit2:V	0.001651	1.09	-0.1124	-1.5644	0.0018	0.0000	0.001651	5.232	94.89
Davit2:End	0.00165	1.09	-0.14	-1.5850	0.0018	0.0000	0.00165	6.232	94.86
Davit3:O	0.0014	0.9173	0.01523	-1.1849	0.0017	0.0000	0.0014	-0.3281	86.85
Davit3:V	0.001439	0.9348	0.1145	-0.5251	0.0017	0.0000	0.001439	-7.311	88.12
Davit3:End	0.00144	0.9349	0.1312	-0.4600	0.0017	0.0000	0.00144	-9.311	88.14
Davit4:O	0.001398	0.9168	-0.03628	-1.1849	0.0017	0.0000	0.001398	2.162	86.8
Davit4:V	0.001428	0.9465	-0.2306	-1.8927	0.0017	-0.0000	0.001428	9.192	87.78
Davit4:End	0.001426	0.9454	-0.2983	-1.9572	0.0017	-0.0000	0.001426	11.19	87.71
Davit5:O	0.001038	0.6709	0.01872	-1.0614	0.0016	0.0000	0.001038	-0.7438	74.36
Davit5:V	0.001073	0.6856	0.1029	-0.4009	0.0016	0.0000	0.001073	-7.729	75.61
Davit5:End	0.001074	0.6857	0.1152	-0.3357	0.0016	0.0000	0.001074	-9.729	75.62
Davit6:O	0.001037	0.6704	-0.03369	-1.0614	0.0016	0.0000	0.001037	2.085	74.31
Davit6:V	0.001064	0.698	-0.2129	-1.7696	0.0016	-0.0000	0.001064	9.113	75.3
Davit6:End	0.001062	0.6971	-0.2763	-1.8341	0.0016	-0.0000	0.001062	11.11	75.23
Davit7:O	0.0007228	0.4571	0.01953	-0.8863	0.0013	0.0000	0.0007228	-1.127	61.86
Davit7:V	0.0007518	0.468	0.08228	-0.2247	0.0013	0.0000	0.0007518	-8.116	63.09
Davit7:End	0.0007521	0.468	0.08847	-0.1595	0.0013	0.0000	0.0007521	-10.12	63.1
Davit8:O	0.0007216	0.4567	-0.02947	-0.8863	0.0013	0.0000	0.0007216	2.041	61.81
Davit8:V	0.0007449	0.4813	-0.1872	-1.5951	0.0013	-0.0000	0.0007449	9.065	62.82
Davit8:End	0.0007437	0.4805	-0.2445	-1.6597	0.0013	-0.0000	0.0007437	11.06	62.76

Joint Support Reactions for Load Case "NESC 250D (Extreme Ice w/ Wind)":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
4008:g	-0.05	0.0	-17.83	0.0	0.0	-85.66	0.0	87.50	0.0	1472.31	0.0	-2.7	0.0	0.0	-0.00	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC 250D (Extreme Ice w/ Wind)":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
4008	4008:t	Origin	0.00	18.90	0.03	-0.23	-0.00	-0.00	0.0	-0.01	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5
4008	4008:AT&T	End	0.50	18.76	0.03	-0.23	0.00	-0.00	0.0	-0.01	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	4
4008	4008:AT&T	Origin	0.50	18.76	0.03	-0.23	0.00	-0.00	0.0	-18.89	1.47	-0.00	-1.57	0.00	0.25	0.00	1.63	2.5	5
4008	4008:WVGD12	End	1.50	18.48	0.03	-0.23	1.47	-0.00	0.0	-18.89	1.47	-0.00	-1.54	0.28	0.06	0.00	1.83	2.8	2
4008	4008:WVGD12	Origin	1.50	18.48	0.03	-0.23	1.47	-0.00	0.0	-19.01	1.49	-0.00	-1.55	0.28	0.06	0.00	1.84	2.8	2
4008	Tube 1	End	6.00	17.23	0.03	-0.21	8.19	-0.01	0.0	-19.01	1.49	-0.00	-1.45	1.36	0.06	0.00	2.81	4.3	2
4008	Tube 1	Origin	6.00	17.23	0.03	-0.21	8.19	-0.01	0.0	-19.21	1.54	-0.00	-1.46	1.36	0.06	0.00	2.82	4.3	2
4008	4008:TMobile	End	10.50	16.00	0.02	-0.19	15.12	-0.02	0.0	-19.21	1.54	-0.00	-1.37	2.20	0.06	0.00	3.57	5.6	2
4008	4008:TMobile	Origin	10.50	16.00	0.02	-0.19	15.12	-0.02	-0.0	-26.28	2.24	-0.00	-1.88	2.20	0.08	0.00	4.08	6.4	2
4008	4008:WVGD11	End	11.50	15.73	0.02	-0.19	17.36	-0.02	-0.0	-26.28	2.24	-0.00	-1.85	2.45	0.08	0.00	4.31	6.8	2
4008	4008:WVGD11	Origin	11.50	15.73	0.02	-0.19	17.36	-0.02	0.0	-26.42	2.27	-0.00	-1.86	2.45	0.08	0.00	4.32	6.8	2

4008	Tube 1	End	16.00	14.52	0.02	-0.17	27.57	-0.04	0.0	-26.42	2.27	-0.00	-1.75	3.45	0.08	0.00	5.21	8.5	2
4008	Tube 1	Origin	16.00	14.52	0.02	-0.17	27.57	-0.04	0.0	-26.65	2.31	-0.01	-1.77	3.45	0.08	0.00	5.22	8.5	2
4008	SpliceT	End	20.50	13.33	0.02	-0.16	37.97	-0.07	0.0	-26.65	2.31	-0.01	-1.67	4.24	0.08	0.00	5.91	9.9	2
4008	SpliceT	Origin	20.50	13.33	0.02	-0.16	37.97	-0.07	-0.0	-26.81	2.34	-0.01	-1.00	2.53	0.05	0.00	3.54	5.4	2
4008	4008:WVGD10	End	21.50	13.08	0.02	-0.15	40.30	-0.07	-0.0	-26.81	2.34	-0.01	-0.99	2.62	0.05	0.00	3.62	5.6	2
4008	4008:WVGD10	Origin	21.50	13.08	0.02	-0.15	40.30	-0.07	-0.0	-26.88	2.35	-0.01	-0.99	2.62	0.05	0.00	3.62	5.6	2
4008	4008:Arm1	End	22.00	12.95	0.02	-0.15	41.48	-0.08	-0.0	-26.88	2.35	-0.01	-0.99	2.67	0.05	0.00	3.66	5.6	2
4008	4008:Arm1	Origin	22.00	12.95	0.02	-0.15	42.75	-0.08	0.0	-31.93	5.00	-0.01	-1.17	2.75	0.10	0.00	3.93	6.0	2
4008	Tube 2	End	25.83	11.97	0.02	-0.14	61.89	-0.11	0.0	-31.93	5.00	-0.01	-1.12	3.64	0.09	0.00	4.76	7.3	2
4008	Tube 2	Origin	25.83	11.97	0.02	-0.14	61.89	-0.11	0.0	-32.31	5.04	-0.01	-1.13	3.64	0.09	0.00	4.78	7.3	2
4008	4008:Arm2	End	29.66	11.00	0.02	-0.13	81.19	-0.14	0.0	-32.31	5.04	-0.01	-1.09	4.38	0.09	0.00	5.47	8.4	2
4008	4008:Arm2	Origin	29.66	11.00	0.02	-0.13	85.76	-0.14	0.0	-43.82	9.22	-0.01	-1.47	4.62	0.16	0.00	6.10	9.4	2
4008	4008:WVGD9	End	31.00	10.67	0.02	-0.12	98.10	-0.15	0.0	-43.82	9.22	-0.01	-1.45	5.14	0.16	0.00	6.59	10.1	2
4008	4008:WVGD9	Origin	31.00	10.67	0.02	-0.12	98.10	-0.15	0.0	-44.16	9.25	-0.01	-1.46	5.14	0.16	0.00	6.61	10.2	2
4008	Tube 2	End	36.00	9.46	0.01	-0.11	144.36	-0.21	0.0	-44.16	9.25	-0.01	-1.39	6.80	0.15	0.00	8.19	12.6	2
4008	Tube 2	Origin	36.00	9.46	0.01	-0.11	144.36	-0.21	0.0	-44.58	9.29	-0.01	-1.40	6.80	0.15	0.00	8.20	12.6	2
4008	Tube 2	End	38.75	8.82	0.01	-0.10	169.90	-0.25	0.0	-44.58	9.29	-0.01	-1.36	7.56	0.15	0.00	8.93	13.7	2
4008	Tube 2	Origin	38.75	8.82	0.01	-0.10	169.90	-0.25	0.0	-44.89	9.31	-0.01	-1.37	7.56	0.15	0.00	8.94	13.8	2
4008	4008:WVGD8	End	41.50	8.20	0.01	-0.09	195.49	-0.28	0.0	-44.89	9.31	-0.01	-1.34	8.24	0.15	0.00	9.58	14.7	2
4008	4008:WVGD8	Origin	41.50	8.20	0.01	-0.09	195.49	-0.28	0.0	-45.09	9.32	-0.01	-1.34	8.24	0.15	0.00	9.59	14.8	2
4008	4008:Arm3	End	42.16	8.05	0.01	-0.09	201.65	-0.29	0.0	-45.09	9.32	-0.01	-1.33	8.39	0.15	0.00	9.73	15.0	2
4008	4008:Arm3	Origin	42.16	8.05	0.01	-0.09	206.19	-0.29	0.0	-56.67	13.47	-0.02	-1.68	8.58	0.21	0.00	10.26	15.8	2
4008	Tube 2	End	46.83	7.04	0.01	-0.08	269.07	-0.37	0.0	-56.67	13.47	-0.02	-1.60	10.25	0.20	0.00	11.86	18.2	2
4008	Tube 2	Origin	46.83	7.04	0.01	-0.08	269.07	-0.37	0.0	-57.25	13.49	-0.02	-1.62	10.25	0.20	0.00	11.87	18.3	2
4008	4008:WVGD7	End	51.50	6.09	0.01	-0.07	332.04	-0.45	0.0	-57.25	13.49	-0.02	-1.55	11.62	0.19	0.00	13.18	20.3	2
4008	4008:WVGD7	Origin	51.50	6.09	0.01	-0.07	332.04	-0.45	0.0	-57.75	13.50	-0.02	-1.57	11.62	0.19	0.00	13.19	20.3	2
4008	4008:Arm4	End	54.66	5.48	0.01	-0.06	374.72	-0.51	0.0	-57.75	13.50	-0.02	-1.52	12.40	0.19	0.00	13.93	21.5	2
4008	4008:Arm4	Origin	54.66	5.48	0.01	-0.06	379.22	-0.51	0.0	-69.47	17.60	-0.02	-1.83	12.55	0.25	0.00	14.39	22.2	2
4008	Tube 2	End	58.08	4.87	0.01	-0.05	439.40	-0.58	0.0	-69.47	17.60	-0.02	-1.78	13.72	0.24	0.00	15.51	24.2	2
4008	Tube 2	Origin	58.08	4.87	0.01	-0.05	439.40	-0.58	0.0	-69.94	17.60	-0.02	-1.79	13.72	0.24	0.00	15.52	24.3	2
4008	4008:WVGD6	End	61.50	4.29	0.01	-0.05	499.57	-0.66	0.0	-69.94	17.60	-0.02	-1.74	14.74	0.23	0.00	16.49	26.1	2
4008	4008:WVGD6	Origin	61.50	4.29	0.01	-0.05	499.57	-0.66	0.0	-70.50	17.59	-0.02	-1.76	14.74	0.23	0.00	16.50	26.2	2
4008	SpliceT	End	66.00	3.60	0.01	-0.04	578.73	-0.77	0.0	-70.50	17.59	-0.02	-1.70	15.89	0.22	0.00	17.58	28.4	2
4008	SpliceT	Origin	66.00	3.60	0.01	-0.04	578.73	-0.77	0.0	-71.30	17.59	-0.03	-1.71	15.89	0.22	0.00	17.60	28.5	2
4008	Splice	End	68.75	3.21	0.01	-0.03	627.11	-0.84	0.0	-71.30	17.59	-0.03	-1.22	12.25	0.16	0.00	13.47	20.7	2
4008	Splice	Origin	68.75	3.21	0.01	-0.03	627.11	-0.84	0.0	-72.26	17.60	-0.03	-1.24	12.25	0.16	0.00	13.49	20.7	2
4008	4008:WVGD5	End	71.50	2.84	0.00	-0.03	675.51	-0.91	0.0	-72.26	17.60	-0.03	-1.21	12.64	0.16	0.00	13.85	21.3	2
4008	4008:WVGD5	Origin	71.50	2.84	0.00	-0.03	675.51	-0.91	0.0	-73.27	17.62	-0.03	-1.23	12.64	0.16	0.00	13.87	21.3	2
4008	Tube 3	End	76.50	2.24	0.00	-0.03	763.60	-1.06	0.0	-73.27	17.62	-0.03	-1.18	13.25	0.15	0.00	14.43	22.2	2
4008	Tube 3	Origin	76.50	2.24	0.00	-0.03	763.60	-1.06	0.0	-74.35	17.64	-0.03	-1.20	13.25	0.15	0.00	14.45	22.2	2
4008	4008:WVGD4	End	81.50	1.70	0.00	-0.02	851.78	-1.21	0.0	-74.35	17.64	-0.03	-1.16	13.74	0.15	0.00	14.90	22.9	2
4008	4008:WVGD4	Origin	81.50	1.70	0.00	-0.02	851.78	-1.21	0.0	-75.46	17.66	-0.03	-1.17	13.74	0.15	0.00	14.92	22.9	2
4008	Tube 3	End	86.50	1.25	0.00	-0.02	940.06	-1.38	0.0	-75.46	17.66	-0.03	-1.13	14.13	0.14	0.00	15.27	23.5	2
4008	Tube 3	Origin	86.50	1.25	0.00	-0.02	940.06	-1.38	0.0	-76.61	17.68	-0.04	-1.15	14.13	0.14	0.00	15.29	23.5	2
4008	4008:WVGD3	End	91.50	0.86	0.00	-0.01	1028.44	-1.57	0.0	-76.61	17.68	-0.04	-1.11	14.45	0.14	0.00	15.56	23.9	2
4008	4008:WVGD3	Origin	91.50	0.86	0.00	-0.01	1028.44	-1.57	0.0	-77.81	17.70	-0.04	-1.13	14.45	0.14	0.00	15.58	24.0	2
4008	Tube 3	End	96.50	0.55	0.00	-0.01	1116.93	-1.76	0.0	-77.81	17.70	-0.04	-1.09	14.70	0.13	0.00	15.79	24.3	2
4008	Tube 3	Origin	96.50	0.55	0.00	-0.01	1116.93	-1.76	0.0	-79.04	17.73	-0.04	-1.11	14.70	0.13	0.00	15.81	24.3	2
4008	4008:WVGD2	End	101.50	0.31	0.00	-0.01	1205.55	-1.97	0.0	-79.04	17.73	-0.04	-1.08	14.89	0.13	0.00	15.96	24.6	2
4008	4008:WVGD2	Origin	101.50	0.31	0.00	-0.01	1205.55	-1.97	0.0	-80.31	17.75	-0.04	-1.09	14.89	0.13	0.00	15.98	24.6	2
4008	Tube 3	End	106.50	0.14	0.00	-0.00	1294.32	-2.19	0.0	-80.31	17.75	-0.04	-1.06	15.03	0.12	0.00	16.09	25.0	2
4008	Tube 3	Origin	106.50	0.14	0.00	-0.00	1294.32	-2.19	0.0	-81.61	17.78	-0.05	-1.08	15.03	0.12	0.00	16.11	25.0	2
4008	4008:WVGD1	End	111.50	0.03	0.00	-0.00	1383.23	-2.43	0.0	-81.61	17.78	-0.05	-1.05	15.13	0.12	0.00	16.18	25.5	2
4008	4008:WVGD1	Origin	111.50	0.03	0.00	-0.00	1383.23	-2.43	0.0	-82.96	17.82	-0.05	-1.06	15.13	0.12	0.00	16.19	25.6	2
4008	4008:g	End	116.50	0.00	0.00	0.00	1472.31	-2.68	0.0	-82.96	17.82	-0.05	-1.03	15.20	0.12	0.00	16.23	26.0	2

Detailed Tubular Davit Arm Usages for Load Case "NESC 250D (Extreme Ice w/ Wind)":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Vert. Mom. (ft-k)	Horz. Mom. (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Vert. Shear (kips)	Horz. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
Davit1	Davit1:O	Origin	0.00	12.95	0.02	0.14	-8.96	0.00	0.0	-1.68	2.16	-0.00	-0.46	21.37	0.00	0.00	21.83	33.6	1
Davit1	Davit1:V	End	3.04	13.07	0.02	0.80	-2.39	0.00	0.0	-1.68	2.16	-0.00	-0.46	5.69	0.00	0.00	6.15	9.5	1
Davit1	Davit1:V	Origin	3.04	13.07	0.02	0.80	-2.39	0.00	0.0	-1.30	2.39	-0.00	-0.35	5.69	0.00	0.00	6.05	9.3	1
Davit1	Davit1:End	End	4.04	13.07	0.02	0.99	-0.00	0.00	0.0	-1.30	2.39	-0.00	-0.35	0.00	1.35	0.00	2.37	3.6	3
Davit2	Davit2:O	Origin	0.00	12.94	0.02	-0.44	-10.23	-0.00	-0.0	0.91	2.58	0.00	0.25	24.40	0.00	0.00	24.65	37.9	1
Davit2	Davit2:V	End	3.04	13.08	0.02	-1.35	-2.37	-0.00	-0.0	0.91	2.58	0.00	0.25	5.65	0.00	0.00	5.90	9.1	1
Davit2	Davit2:V	Origin	3.04	13.08	0.02	-1.35	-2.37	-0.00	-0.0	1.33	2.37	0.00	0.36	5.65	0.00	0.00	6.02	9.3	1
Davit2	Davit2:End	End	4.04	13.08	0.02	-1.68	0.00	0.00	-0.0	1.33	2.37	0.00	0.36	0.00	1.35	0.00	2.36	3.6	3
Davit3	Davit3:O	Origin	0.00	11.01	0.02	0.18	-47.18	0.00	0.0	-2.95	5.16	-0.00	-0.30	24.78	0.00	0.00	25.08	38.6	1
Davit3	#Davit3:0	End	3.55	11.14	0.02	0.90	-28.85	0.00	0.0	-2.95	5.16	-0.00	-0.34	19.68	0.00	0.00	20.02	30.8	1
Davit3	#Davit3:0	Origin	3.55	11.14	0.02	0.90	-28.85	0.00	0.0	-2.90	5.08	-0.00	-0.33	19.68	0.00	0.00	20.01	30.8	1
Davit3	Davit3:V	End	7.10	11.22	0.02	1.37	-10.84	0.00	0.0	-2.90	5.08	-0.00	-0.38	9.98	0.00	0.00	10.37	16.0	1
Davit3	Davit3:V	Origin	7.10	11.22	0.02	1.37	-10.84	0.00	0.0	-2.01	5.42	-0.00	-0.27	9.98	0.00	0.00	10.25	15.8	1
Davit3	Davit3:End	End	9.10	11.22	0.02	1.57	-0.00	0.00	0.0	-2.01	5.42	-0.00	-0.29	0.00	1.64	0.00	2.86	4.4	3
Davit4	Davit4:O	Origin	0.00	11.00	0.02	-0.44	-51.74	-0.00	-0.0	1.15	5.83	0.00	0.12	27.18	0.00	0.00	27.29	42.0	1

Davit4	#Davit4:0	End	3.55	11.16	0.02	-1.47	-31.03	-0.00	-0.0	1.15	5.83	0.00	0.13	21.17	0.00	0.00	21.30	32.8	1
Davit4	#Davit4:0	Origin	3.55	11.16	0.02	-1.47	-31.03	-0.00	-0.0	1.20	5.72	0.00	0.14	21.17	0.00	0.00	21.31	32.8	1
Davit4	Davit4:V	End	7.10	11.36	0.02	-2.77	-10.73	-0.00	-0.0	1.20	5.72	0.00	0.16	9.89	0.00	0.00	10.05	15.5	1
Davit4	Davit4:V	Origin	7.10	11.36	0.02	-2.77	-10.73	-0.00	0.0	2.14	5.37	0.00	0.28	9.89	0.00	0.00	10.17	15.6	1
Davit4	Davit4:End	End	9.10	11.34	0.02	-3.58	0.00	0.00	0.0	2.14	5.37	0.00	0.31	0.00	1.63	0.00	2.84	4.4	3
Davit5	Davit5:O	Origin	0.00	8.05	0.01	0.22	-47.23	0.00	0.0	-2.94	5.17	-0.00	-0.30	24.81	0.00	0.00	25.10	38.6	1
Davit5	#Davit5:0	End	3.55	8.16	0.01	0.85	-28.88	0.00	0.0	-2.94	5.17	-0.00	-0.34	19.70	0.00	0.00	20.04	30.8	1
Davit5	#Davit5:0	Origin	3.55	8.16	0.01	0.85	-28.88	0.00	0.0	-2.89	5.08	-0.00	-0.33	19.70	0.00	0.00	20.03	30.8	1
Davit5	Davit5:V	End	7.10	8.23	0.01	1.23	-10.84	0.00	0.0	-2.89	5.08	-0.00	-0.38	9.99	0.00	0.00	10.38	16.0	1
Davit5	Davit5:V	Origin	7.10	8.23	0.01	1.23	-10.84	0.00	0.0	-1.99	5.42	-0.00	-0.26	9.99	0.00	0.00	10.26	15.8	1
Davit5	Davit5:End	End	9.10	8.23	0.01	1.38	-0.00	0.00	0.0	-1.99	5.42	-0.00	-0.29	0.00	1.65	0.00	2.86	4.4	3
Davit6	Davit6:O	Origin	0.00	8.05	0.01	-0.40	-51.76	-0.00	-0.0	1.14	5.84	0.00	0.11	27.19	0.00	0.00	27.31	42.0	1
Davit6	#Davit6:0	End	3.55	8.19	0.01	-1.35	-31.05	-0.00	-0.0	1.14	5.84	0.00	0.13	21.18	0.00	0.00	21.31	32.8	1
Davit6	#Davit6:0	Origin	3.55	8.19	0.01	-1.35	-31.05	-0.00	-0.0	1.19	5.72	0.00	0.14	21.18	0.00	0.00	21.32	32.8	1
Davit6	Davit6:V	End	7.10	8.38	0.01	-2.55	-10.74	-0.00	-0.0	1.19	5.72	0.00	0.16	9.90	0.00	0.00	10.05	15.5	1
Davit6	Davit6:V	Origin	7.10	8.38	0.01	-2.55	-10.74	-0.00	0.0	2.13	5.37	0.00	0.28	9.90	0.00	0.00	10.18	15.7	1
Davit6	Davit6:End	End	9.10	8.36	0.01	-3.32	0.00	0.00	0.0	2.13	5.37	0.00	0.31	0.00	1.63	0.00	2.84	4.4	3
Davit7	Davit7:O	Origin	0.00	5.49	0.01	0.23	-47.30	0.00	0.0	-2.92	5.18	-0.00	-0.29	24.85	0.00	0.00	25.14	38.7	1
Davit7	#Davit7:0	End	3.55	5.57	0.01	0.73	-28.93	0.00	0.0	-2.92	5.18	-0.00	-0.33	19.73	0.00	0.00	20.07	30.9	1
Davit7	#Davit7:0	Origin	3.55	5.57	0.01	0.73	-28.93	0.00	0.0	-2.87	5.09	-0.00	-0.33	19.73	0.00	0.00	20.06	30.9	1
Davit7	Davit7:V	End	7.10	5.62	0.01	0.99	-10.86	0.00	0.0	-2.87	5.09	-0.00	-0.38	10.00	0.00	0.00	10.38	16.0	1
Davit7	Davit7:V	Origin	7.10	5.62	0.01	0.99	-10.86	0.00	0.0	-1.98	5.43	-0.00	-0.26	10.00	0.00	0.00	10.27	15.8	1
Davit7	Davit7:End	End	9.10	5.62	0.01	1.06	-0.00	0.00	0.0	-1.98	5.43	-0.00	-0.29	0.00	1.65	0.00	2.87	4.4	3
Davit8	Davit8:O	Origin	0.00	5.48	0.01	-0.35	-51.80	-0.00	-0.0	1.12	5.84	0.00	0.11	27.21	0.00	0.00	27.32	42.0	1
Davit8	#Davit8:0	End	3.55	5.61	0.01	-1.17	-31.08	-0.00	-0.0	1.12	5.84	0.00	0.13	21.20	0.00	0.00	21.33	32.8	1
Davit8	#Davit8:0	Origin	3.55	5.61	0.01	-1.17	-31.08	-0.00	-0.0	1.17	5.73	0.00	0.13	21.20	0.00	0.00	21.34	32.8	1
Davit8	Davit8:V	End	7.10	5.78	0.01	-2.25	-10.75	-0.00	-0.0	1.17	5.73	0.00	0.16	9.91	0.00	0.00	10.06	15.5	1
Davit8	Davit8:V	Origin	7.10	5.78	0.01	-2.25	-10.75	-0.00	0.0	2.11	5.38	0.00	0.28	9.91	0.00	0.00	10.19	15.7	1
Davit8	Davit8:End	End	9.10	5.77	0.01	-2.93	0.00	0.00	0.0	2.11	5.38	0.00	0.31	0.00	1.63	0.00	2.84	4.4	3

Summary of Clamp Capacities and Usages for Load Case "NESC 250D (Extreme Ice w/ Wind)":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
Clamp1	2.711	80.00	80.00	3.39	0.00	0.00	0.00	3.39
Clamp2	2.711	80.00	80.00	3.39	0.00	0.00	0.00	3.39
Clamp3	5.754	80.00	80.00	7.19	0.00	0.00	0.00	7.19
Clamp4	5.754	80.00	80.00	7.19	0.00	0.00	0.00	7.19
Clamp5	5.754	80.00	80.00	7.19	0.00	0.00	0.00	7.19
Clamp6	5.754	80.00	80.00	7.19	0.00	0.00	0.00	7.19
Clamp7	5.754	80.00	80.00	7.19	0.00	0.00	0.00	7.19
Clamp8	5.754	80.00	80.00	7.19	0.00	0.00	0.00	7.19
Clamp9	18.903	80.00	80.00	23.63	0.00	0.00	0.00	23.63
Clamp10	6.979	80.00	80.00	8.72	0.00	0.00	0.00	8.72

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

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
4008	70.90	NESC 250C (Extreme Wind)	23	20879.9

Base Plate Results by Bend Line:

Pole Label	Load Case	Bend Line #	Start X (ft)	Start Y (ft)	End X (ft)	End Y (ft)	Length (in)	Bending Stress (ksi)	Bolt Mom. Sum (ft-k)	# Bolts Acting	Bolt Max Load (kips)	Min Plate Thickness (in)	Actual Thickness (in)	Usage %
4008	NESC 250B (Heavy)	1	2.272	1.454	0.450	2.506	25.252	15.965	50.392	3	75.687	1.695	3.000	31.93
4008	NESC 250B (Heavy)	2	2.506	0.450	1.454	2.272	25.252	10.272	32.422	3	65.148	1.360	3.000	20.54
4008	NESC 250B (Heavy)	3	2.395	-1.073	2.395	1.073	25.762	3.655	11.771	3	27.714	0.811	3.000	7.31
4008	NESC 250B (Heavy)	4	1.454	-2.272	2.506	-0.450	25.252	8.095	25.552	3	-55.939	1.207	3.000	16.19
4008	NESC 250B (Heavy)	5	0.450	-2.506	2.272	-1.454	25.252	13.751	43.405	3	-66.343	1.573	3.000	27.50
4008	NESC 250B (Heavy)	6	-1.073	-2.395	1.073	-2.395	25.762	16.726	53.863	3	-69.942	1.735	3.000	33.45
4008	NESC 250B (Heavy)	7	-2.272	-1.454	-0.450	-2.506	25.252	13.691	43.216	3	-66.192	1.570	3.000	27.38
4008	NESC 250B (Heavy)	8	-2.506	-0.450	-1.454	-2.272	25.252	7.998	25.245	3	-55.653	1.200	3.000	16.00
4008	NESC 250B (Heavy)	9	-2.395	1.073	-2.395	-1.073	25.762	3.709	11.944	3	28.178	0.817	3.000	7.42
4008	NESC 250B (Heavy)	10	-1.454	2.272	-2.506	0.450	25.252	10.369	32.728	3	65.435	1.366	3.000	20.74
4008	NESC 250B (Heavy)	11	-0.450	2.506	-2.272	1.454	25.252	16.025	50.582	3	75.839	1.698	3.000	32.05
4008	NESC 250B (Heavy)	12	1.073	2.395	-1.073	2.395	25.762	19.065	61.394	3	79.438	1.852	3.000	38.13
4008	NESC 250B (Heavy)	13	1.679	2.118	-0.216	2.625	23.542	13.640	40.139	3	79.438	1.567	3.000	27.28
4008	NESC 250B (Heavy)	14	2.229	1.278	1.278	2.229	16.142	13.392	27.022	2	65.148	1.553	3.000	26.78
4008	NESC 250B (Heavy)	15	2.625	-0.216	2.118	1.679	23.542	4.281	12.599	3	48.400	0.878	3.000	8.56
4008	NESC 250B (Heavy)	16	2.118	-1.679	2.625	0.216	23.542	3.181	9.360	3	-39.301	0.757	3.000	6.36
4008	NESC 250B (Heavy)	17	1.278	-2.229	2.229	-1.278	16.142	11.233	22.665	2	-55.939	1.422	3.000	22.47
4008	NESC 250B (Heavy)	18	-0.216	-2.625	1.679	-2.118	23.542	11.939	35.133	3	-69.942	1.466	3.000	23.88
4008	NESC 250B (Heavy)	19	-1.679	-2.118	0.216	-2.625	23.542	11.916	35.066	3	-69.942	1.465	3.000	23.83
4008	NESC 250B (Heavy)	20	-2.229	-1.278	-1.278	-2.229	16.142	11.152	22.502	2	-55.653	1.417	3.000	22.30
4008	NESC 250B (Heavy)	21	-2.625	0.216	-2.118	-1.679	23.542	3.156	9.287	3	-38.905	0.754	3.000	6.31
4008	NESC 250B (Heavy)	22	-2.118	1.679	-2.625	-0.216	23.542	4.365	12.845	3	48.796	0.886	3.000	8.73
4008	NESC 250B (Heavy)	23	-1.278	2.229	-2.229	1.278	16.142	13.472	27.184	2	65.435	1.557	3.000	26.94
4008	NESC 250B (Heavy)	24	0.216	2.625	-1.679	2.118	23.542	13.663	40.206	3	79.438	1.568	3.000	27.33
4008	NESC 250C (Extreme Wind)	1	2.272	1.454	0.450	2.506	25.252	28.849	91.060	3	137.569	2.279	3.000	57.70
4008	NESC 250C (Extreme Wind)	2	2.506	0.450	1.454	2.272	25.252	18.035	56.927	3	117.604	1.802	3.000	36.07
4008	NESC 250C (Extreme Wind)	3	2.395	-1.073	2.395	1.073	25.762	6.266	20.180	3	46.450	1.062	3.000	12.53
4008	NESC 250C (Extreme Wind)	4	1.454	-2.272	2.506	-0.450	25.252	16.946	53.489	3	-113.018	1.747	3.000	33.89
4008	NESC 250C (Extreme Wind)	5	0.450	-2.506	2.272	-1.454	25.252	27.748	87.586	3	-132.941	2.235	3.000	55.50
4008	NESC 250C (Extreme Wind)	6	-1.073	-2.395	1.073	-2.395	25.762	33.508	107.905	3	-139.917	2.456	3.000	67.02
4008	NESC 250C (Extreme Wind)	7	-2.272	-1.454	-0.450	-2.506	25.252	27.729	87.527	3	-132.894	2.234	3.000	55.46
4008	NESC 250C (Extreme Wind)	8	-2.506	-0.450	-1.454	-2.272	25.252	16.916	53.394	3	-112.929	1.745	3.000	33.83
4008	NESC 250C (Extreme Wind)	9	-2.395	1.073	-2.395	-1.073	25.762	6.283	20.233	3	46.594	1.063	3.000	12.57
4008	NESC 250C (Extreme Wind)	10	-1.454	2.272	-2.506	0.450	25.252	18.065	57.023	3	117.693	1.803	3.000	36.13
4008	NESC 250C (Extreme Wind)	11	-0.450	2.506	-2.272	1.454	25.252	28.867	91.119	3	137.616	2.280	3.000	57.73
4008	NESC 250C (Extreme Wind)	12	1.073	2.395	-1.073	2.395	25.762	34.659	111.613	3	144.592	2.498	3.000	69.32
4008	NESC 250C (Extreme Wind)	13	1.679	2.118	-0.216	2.625	23.542	24.779	72.920	3	144.592	2.112	3.000	49.56
4008	NESC 250C (Extreme Wind)	14	2.229	1.278	1.278	2.229	16.142	23.989	48.403	2	117.604	2.078	3.000	47.98
4008	NESC 250C (Extreme Wind)	15	2.625	-0.216	2.118	1.679	23.542	7.003	20.609	3	85.793	1.123	3.000	14.01
4008	NESC 250C (Extreme Wind)	16	2.118	-1.679	2.625	0.216	23.542	6.452	18.986	3	-81.241	1.078	3.000	12.90
4008	NESC 250C (Extreme Wind)	17	1.278	-2.229	2.229	-1.278	16.142	22.911	46.229	2	-113.018	2.031	3.000	45.82
4008	NESC 250C (Extreme Wind)	18	-0.216	-2.625	1.679	-2.118	23.542	23.938	70.442	3	-139.917	2.076	3.000	47.88
4008	NESC 250C (Extreme Wind)	19	-1.679	-2.118	0.216	-2.625	23.542	23.931	70.422	3	-139.917	2.075	3.000	47.86
4008	NESC 250C (Extreme Wind)	20	-2.229	-1.278	-1.278	-2.229	16.142	22.886	46.178	2	-112.929	2.030	3.000	45.77
4008	NESC 250C (Extreme Wind)	21	-2.625	0.216	-2.118	-1.679	23.542	6.444	18.963	3	-81.118	1.077	3.000	12.89
4008	NESC 250C (Extreme Wind)	22	-2.118	1.679	-2.625	-0.216	23.542	7.029	20.686	3	85.916	1.125	3.000	14.06
4008	NESC 250C (Extreme Wind)	23	-1.278	2.229	-2.229	1.278	16.142	24.014	48.454	2	117.693	2.079	3.000	48.03
4008	NESC 250C (Extreme Wind)	24	0.216	2.625	-1.679	2.118	23.542	24.786	72.940	3	144.592	2.112	3.000	49.57
4008	NESC 250D (Extreme Ice w/ Wind)	1	2.272	1.454	0.450	2.506	25.252	11.630	36.710	3	55.011	1.447	3.000	23.26
4008	NESC 250D (Extreme Ice w/ Wind)	2	2.506	0.450	1.454	2.272	25.252	7.559	23.859	3	47.484	1.166	3.000	15.12
4008	NESC 250D (Extreme Ice w/ Wind)	3	2.395	-1.073	2.395	1.073	25.762	2.712	8.735	3	20.704	0.699	3.000	5.42
4008	NESC 250D (Extreme Ice w/ Wind)	4	1.454	-2.272	2.506	-0.450	25.252	5.595	17.660	3	-39.234	1.004	3.000	11.19
4008	NESC 250D (Extreme Ice w/ Wind)	5	0.450	-2.506	2.272	-1.454	25.252	9.651	30.464	3	-46.707	1.318	3.000	19.30
4008	NESC 250D (Extreme Ice w/ Wind)	6	-1.073	-2.395	1.073	-2.395	25.762	11.786	37.955	3	-49.308	1.457	3.000	23.57
4008	NESC 250D (Extreme Ice w/ Wind)	7	-2.272	-1.454	-0.450	-2.506	25.252	9.627	30.389	3	-46.646	1.316	3.000	19.25
4008	NESC 250D (Extreme Ice w/ Wind)	8	-2.506	-0.450	-1.454	-2.272	25.252	5.556	17.537	3	-39.120	1.000	3.000	11.11
4008	NESC 250D (Extreme Ice w/ Wind)	9	-2.395	1.073	-2.395	-1.073	25.762	2.734	8.804	3	20.889	0.701	3.000	5.47
4008	NESC 250D (Extreme Ice w/ Wind)	10	-1.454	2.272	-2.506	0.450	25.252	7.598	23.982	3	47.599	1.169	3.000	15.20
4008	NESC 250D (Extreme Ice w/ Wind)	11	-0.450	2.506	-2.272	1.454	25.252	11.654	36.786	3	55.071	1.448	3.000	23.31
4008	NESC 250D (Extreme Ice w/ Wind)	12	1.073	2.395	-1.073	2.395	25.762	13.846	44.589	3	57.673	1.579	3.000	27.69
4008	NESC 250D (Extreme Ice w/ Wind)	13	1.679	2.118	-0.216	2.625	23.542	9.914	29.175	3	57.673	1.336	3.000	19.83
4008	NESC 250D (Extreme Ice w/ Wind)	14	2.229	1.278	1.278	2.229	16.142	9.788	19.750	2	47.484	1.327	3.000	19.58

4008	NESC 250D (Extreme Ice w/ Wind)	15	2.625	-0.216	2.118	1.679	23.542	3.221	9.480	3	35.507	0.761	3.000	6.44
4008	NESC 250D (Extreme Ice w/ Wind)	16	2.118	-1.679	2.625	0.216	23.542	2.226	6.550	3	-27.301	0.633	3.000	4.45
4008	NESC 250D (Extreme Ice w/ Wind)	17	1.278	-2.229	2.229	-1.278	16.142	7.847	15.834	2	-39.234	1.188	3.000	15.69
4008	NESC 250D (Extreme Ice w/ Wind)	18	-0.216	-2.625	1.679	-2.118	23.542	8.404	24.732	3	-49.308	1.230	3.000	16.81
4008	NESC 250D (Extreme Ice w/ Wind)	19	-1.679	-2.118	0.216	-2.625	23.542	8.395	24.706	3	-49.308	1.229	3.000	16.79
4008	NESC 250D (Extreme Ice w/ Wind)	20	-2.229	-1.278	-1.278	-2.229	16.142	7.815	15.769	2	-39.120	1.186	3.000	15.63
4008	NESC 250D (Extreme Ice w/ Wind)	21	-2.625	0.216	-2.118	-1.679	23.542	2.216	6.520	3	-27.143	0.632	3.000	4.43
4008	NESC 250D (Extreme Ice w/ Wind)	22	-2.118	1.679	-2.625	-0.216	23.542	3.255	9.578	3	35.665	0.765	3.000	6.51
4008	NESC 250D (Extreme Ice w/ Wind)	23	-1.278	2.229	-2.229	1.278	16.142	9.820	19.815	2	47.599	1.330	3.000	19.64
4008	NESC 250D (Extreme Ice w/ Wind)	24	0.216	2.625	-1.679	2.118	23.542	9.923	29.201	3	57.673	1.336	3.000	19.85

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %		Load Case Segment Number	Weight (lbs)
Davit1	33.58	NESC 250D (Extreme Ice w/ Wind)	1	50.3
Davit2	37.92	NESC 250D (Extreme Ice w/ Wind)	1	50.3
Davit3	41.54	NESC 250B (Heavy)	1	260.4
Davit4	45.87	NESC 250B (Heavy)	1	260.4
Davit5	41.62	NESC 250B (Heavy)	1	260.4
Davit6	45.91	NESC 250B (Heavy)	1	260.4
Davit7	41.72	NESC 250B (Heavy)	1	260.4
Davit8	45.97	NESC 250B (Heavy)	1	260.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC 250B (Heavy)	45.97	Davit8	Tubular Davit
NESC 250C (Extreme Wind)	70.90	4008	Steel Pole
NESC 250D (Extreme Ice w/ Wind)	42.04	Davit8	Tubular Davit

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC 250B (Heavy)	39.09	4008	23
NESC 250C (Extreme Wind)	70.90	4008	23
NESC 250D (Extreme Ice w/ Wind)	28.47	4008	23

Summary of Base Plate Usages by Load Case:

Load Case	Pole Label	Bend Line #	Length (in)	Vertical Load (kips)	X Moment (ft-k)	Y Moment (ft-k)	Bending Stress (ksi)	Bolt Moment Sum (ft-k)	# Bolts Acting On Bend Line	Max Bolt Load For Bend Line (kips)	Minimum Plate Thickness (in)	Usage %
NESC 250B (Heavy)	4008	12	25.762	94.955	2055.826	-6.717	19.065	61.394	3	79.438	1.852	38.13
NESC 250C (Extreme Wind)	4008	12	25.762	46.751	3915.510	-2.088	34.659	111.613	3	144.592	2.498	69.32
NESC 250D (Extreme Ice w/ Wind)	4008	12	25.762	83.645	1472.312	-2.682	13.846	44.589	3	57.673	1.579	27.69

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Segment Number
NESC 250B (Heavy)	45.97	Davit8	1
NESC 250C (Extreme Wind)	22.46	Davit8	1
NESC 250D (Extreme Ice w/ Wind)	42.04	Davit8	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %		Load Case Weight (lbs)
Clamp1	Clamp	3.39	NESC 250D (Extreme Ice w/ Wind)	0.0
Clamp2	Clamp	3.39	NESC 250D (Extreme Ice w/ Wind)	0.0
Clamp3	Clamp	7.91	NESC 250B (Heavy)	0.0
Clamp4	Clamp	7.91	NESC 250B (Heavy)	0.0
Clamp5	Clamp	7.91	NESC 250B (Heavy)	0.0
Clamp6	Clamp	7.91	NESC 250B (Heavy)	0.0
Clamp7	Clamp	7.91	NESC 250B (Heavy)	0.0

Clamp8	Clamp	7.91	NESC 250B (Heavy)	0.0
Clamp9	Clamp	23.63	NESC 250D (Extreme Ice w/ Wind)	0.0
Clamp10	Clamp	9.18	NESC 250B (Heavy)	0.0

Loads At Insulator Attachments For All Load Cases:

Load Case	Insulator Label	Insulator Type	Structure Attach Label	Structure Attach Load X (kips)	Structure Attach Load Y (kips)	Structure Attach Load Z (kips)	Structure Attach Load Res. (kips)
NESC 250B (Heavy)	Clamp1	Clamp	Davit1:End	0.000	1.430	2.200	2.624
NESC 250B (Heavy)	Clamp2	Clamp	Davit2:End	0.000	1.430	2.200	2.624
NESC 250B (Heavy)	Clamp3	Clamp	Davit3:End	0.000	2.440	5.840	6.329
NESC 250B (Heavy)	Clamp4	Clamp	Davit4:End	0.000	2.440	5.840	6.329
NESC 250B (Heavy)	Clamp5	Clamp	Davit5:End	0.000	2.440	5.840	6.329
NESC 250B (Heavy)	Clamp6	Clamp	Davit6:End	0.000	2.440	5.840	6.329
NESC 250B (Heavy)	Clamp7	Clamp	Davit7:End	0.000	2.440	5.840	6.329
NESC 250B (Heavy)	Clamp8	Clamp	Davit8:End	0.000	2.440	5.840	6.329
NESC 250B (Heavy)	Clamp9	Clamp	4008:AT&T	0.000	1.931	17.372	17.479
NESC 250B (Heavy)	Clamp10	Clamp	4008:TMobile	0.000	1.014	7.275	7.345
NESC 250C (Extreme Wind)	Clamp1	Clamp	Davit1:End	0.000	1.780	0.660	1.898
NESC 250C (Extreme Wind)	Clamp2	Clamp	Davit2:End	0.000	1.780	0.660	1.898
NESC 250C (Extreme Wind)	Clamp3	Clamp	Davit3:End	0.000	4.070	2.530	4.792
NESC 250C (Extreme Wind)	Clamp4	Clamp	Davit4:End	0.000	4.070	2.530	4.792
NESC 250C (Extreme Wind)	Clamp5	Clamp	Davit5:End	0.000	4.070	2.530	4.792
NESC 250C (Extreme Wind)	Clamp6	Clamp	Davit6:End	0.000	4.070	2.530	4.792
NESC 250C (Extreme Wind)	Clamp7	Clamp	Davit7:End	0.000	4.070	2.530	4.792
NESC 250C (Extreme Wind)	Clamp8	Clamp	Davit8:End	0.000	4.070	2.530	4.792
NESC 250C (Extreme Wind)	Clamp9	Clamp	4008:AT&T	0.000	6.335	6.158	8.835
NESC 250C (Extreme Wind)	Clamp10	Clamp	4008:TMobile	0.000	3.041	3.209	4.421
NESC 250D (Extreme Ice w/ Wind)	Clamp1	Clamp	Davit1:End	0.000	1.260	2.400	2.711
NESC 250D (Extreme Ice w/ Wind)	Clamp2	Clamp	Davit2:End	0.000	1.260	2.400	2.711
NESC 250D (Extreme Ice w/ Wind)	Clamp3	Clamp	Davit3:End	0.000	1.960	5.410	5.754
NESC 250D (Extreme Ice w/ Wind)	Clamp4	Clamp	Davit4:End	0.000	1.960	5.410	5.754
NESC 250D (Extreme Ice w/ Wind)	Clamp5	Clamp	Davit5:End	0.000	1.960	5.410	5.754
NESC 250D (Extreme Ice w/ Wind)	Clamp6	Clamp	Davit6:End	0.000	1.960	5.410	5.754
NESC 250D (Extreme Ice w/ Wind)	Clamp7	Clamp	Davit7:End	0.000	1.960	5.410	5.754
NESC 250D (Extreme Ice w/ Wind)	Clamp8	Clamp	Davit8:End	0.000	1.960	5.410	5.754
NESC 250D (Extreme Ice w/ Wind)	Clamp9	Clamp	4008:AT&T	0.000	1.021	18.875	18.903
NESC 250D (Extreme Ice w/ Wind)	Clamp10	Clamp	4008:TMobile	0.000	0.519	6.960	6.979

Overturning Moments For User Input Concentrated Loads:

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

Load Case	Total Tran. Load (kips)	Total Long. Load (kips)	Total Vert. Load (kips)	Transverse Overturning Moment (ft-k)	Longitudinal Overturning Moment (ft-k)	Torsional Moment (ft-k)
NESC 250B (Heavy)	20.445	0.000	64.087	1708.632	0.000	0.000
NESC 250C (Extreme Wind)	37.356	0.000	25.867	3239.336	0.000	0.000
NESC 250D (Extreme Ice w/ Wind)	15.820	0.000	63.095	1300.836	0.000	0.000

*** Weight of structure (lbs):
Weight of Tubular Davit Arms: 1663.2
Weight of Steel Poles: 20879.9
Total: 22543.1

*** End of Report

Project Name : PennSummit Tubular, LLC - Hybrid Pole - 116.50'
Project Notes: CL&P Structure # 4008 / AT&T CTL02255
Project File : G:\Transmission\Eversource\2017\806_Smartlink\80617-0015_Pole 4008_AT&T CTL02255\001.6000 - SA\Engineering Docs\PLS-Pole\80617-0015.001.6000.pol
Date run : 3:40:09 PM Wednesday, January 10, 2018
by : PLS-POLE Version 15.00
Licensed to : Paul J. Ford and Company

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: g:\transmission\eversource\2017\806_smartlink\80617-0015_pole 4008_at&t ctl02255\001.6000 - sa\engineering docs\pls-pole\80617-0015.001.6000.lca

*** Analysis Results:

Maximum element usage is 70.90% for Steel Pole "4008" in load case "NESC 250C (Extreme Wind)"
Maximum insulator usage is 23.63% for Clamp "Clamp9" in load case "NESC 250D (Extreme Ice w/ Wind)"

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
NESC 250B (Heavy)	4008:g	-0.13	-25.35	-96.97	25.35	2055.83	-6.72	2055.84	-0.00	0.00
NESC 250C (Extreme Wind)	4008:g	-0.04	-49.38	-48.77	49.38	3915.51	-2.09	3915.51	-0.00	0.00
NESC 250D (Extreme Ice w/ Wind)	4008:g	-0.05	-17.83	-85.66	17.83	1472.31	-2.68	1472.31	-0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
NESC 250B (Heavy)	4008:t	0.07	26.80	-0.41	26.81	0.00	-1.93	0.00
NESC 250C (Extreme Wind)	4008:t	0.02	52.50	-1.34	52.51	0.00	-3.94	0.00
NESC 250D (Extreme Ice w/ Wind)	4008:t	0.03	18.90	-0.23	18.90	0.00	-1.33	0.00

Tubes Summary:

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)
4008	1	973	NESC 250C (Extreme Wind)	34.81	179.99
4008	2	6084	NESC 250C (Extreme Wind)	70.90	1568.05
4008	3	11808	NESC 250C (Extreme Wind)	65.70	3915.51

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

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
4008	70.90	NESC 250C (Extreme Wind)	23	20879.9

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
Davit1	33.58	NESC 250D (Extreme Ice w/ Wind)	1	50.3
Davit2	37.92	NESC 250D (Extreme Ice w/ Wind)	1	50.3
Davit3	41.54	NESC 250B (Heavy)	1	260.4
Davit4	45.87	NESC 250B (Heavy)	1	260.4
Davit5	41.62	NESC 250B (Heavy)	1	260.4
Davit6	45.91	NESC 250B (Heavy)	1	260.4
Davit7	41.72	NESC 250B (Heavy)	1	260.4
Davit8	45.97	NESC 250B (Heavy)	1	260.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type

NESC 250B (Heavy)	45.97	Davit8	Tubular Davit
NESC 250C (Extreme Wind)	70.90	4008	Steel Pole
NESC 250D (Extreme Ice w/ Wind)	42.04	Davit8	Tubular Davit

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC 250B (Heavy)	39.09	4008	23
NESC 250C (Extreme Wind)	70.90	4008	23
NESC 250D (Extreme Ice w/ Wind)	28.47	4008	23

Summary of Base Plate Usages by Load Case:

Load Case	Pole Label	Bend Line #	Length (in)	Vertical Load (kips)	X Moment (ft-k)	Y Moment (ft-k)	Bending Stress (ksi)	Bolt Moment Sum (ft-k)	# Bolts Acting On Bend Line	Max Bolt Load For Bend Line (kips)	Minimum Plate Thickness (in)	Usage %
NESC 250B (Heavy)	4008	12	25.762	94.955	2055.826	-6.717	19.065	61.394	3	79.438	1.852	38.13
NESC 250C (Extreme Wind)	4008	12	25.762	46.751	3915.510	-2.088	34.659	111.613	3	144.592	2.498	69.32
NESC 250D (Extreme Ice w/ Wind)	4008	12	25.762	83.645	1472.312	-2.682	13.846	44.589	3	57.673	1.579	27.69

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Segment Number
NESC 250B (Heavy)	45.97	Davit8	1
NESC 250C (Extreme Wind)	22.46	Davit8	1
NESC 250D (Extreme Ice w/ Wind)	42.04	Davit8	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	3.39	NESC 250D (Extreme Ice w/ Wind)	0.0
Clamp2	Clamp	3.39	NESC 250D (Extreme Ice w/ Wind)	0.0
Clamp3	Clamp	7.91	NESC 250B (Heavy)	0.0
Clamp4	Clamp	7.91	NESC 250B (Heavy)	0.0
Clamp5	Clamp	7.91	NESC 250B (Heavy)	0.0
Clamp6	Clamp	7.91	NESC 250B (Heavy)	0.0
Clamp7	Clamp	7.91	NESC 250B (Heavy)	0.0
Clamp8	Clamp	7.91	NESC 250B (Heavy)	0.0
Clamp9	Clamp	23.63	NESC 250D (Extreme Ice w/ Wind)	0.0
Clamp10	Clamp	9.18	NESC 250B (Heavy)	0.0

*** Weight of structure (lbs):
    Weight of Tubular Davit Arms: 1663.2
    Weight of Steel Poles: 20879.9
    Total: 22543.1

*** End of Report

APPENDIX D

SUPPLEMENTAL CALCULATIONS

Mast Flange Bolt and Flange Plate Analysis - TIA/222-G

Max Flange Loads

Overturning Moment (Max):	$OM := 152 \cdot ft \cdot kip$	User Input - from tnxTower
Shear (Max):	$V := 10 \cdot kip$	User Input - from tnxTower
Axial Load (Max):	$A := 16 \cdot kip$	User Input - from tnxTower

Flange Bolt Input:

Bolt Type:	ASTM A325 bolts	User Input
Bolt Quantity:	$N := 12$	User Input
Bolt Circle:	$BC := 32 \cdot in$	User Input
Bolt Ultimate Strength:	$Fu_{bolt} := 120 \cdot ksi$	User Input
Bolt Yield Strength:	$Fy_{bolt} := 92\ ksi$	User Input
Bolt Nominal Diameter:	$D_{bolt} := 1 \cdot in$	User Input
Bolt Threads per Inch:	$n := 8$	User Input

Flange Plate Input:

Flange Steel Grade:	ASTM A572-50	User Input
Flange Yield Strength:	$Fy_{plate} := 50 \cdot ksi$	User Input
Flange Thickness:	$t_{Plate} := 1.5 \cdot in$	User Input
Flange Diameter:	$D_{Plate} := 35 \cdot in$	User Input
Pole Diameter:	$D_{Pole} := 26.96 \cdot in$	User Input

Distance from Bolts to Centroid of Pole:

$$R_{BC} := \frac{BC}{2} = 16\ in$$

$$i := 1 .. N$$

$$d_i := \left\| \begin{array}{l} \Theta \leftarrow 2 \cdot \pi \cdot \frac{i}{N} \\ d \leftarrow R_{BC} \cdot \sin(\Theta) \end{array} \right.$$

$$d = \begin{bmatrix} 8 \\ 13.86 \\ 16 \\ 13.86 \\ 8 \\ 0 \\ -8 \\ -13.86 \\ -16 \\ -13.86 \\ -8 \\ 0 \end{bmatrix} in$$

Determine Distances For Bending in Plate:

$$R_{Pole} := \frac{D_{Pole}}{2} = 13.48\ in$$

$$MA_i := \begin{cases} \text{if } d_i \geq R_{Pole} \\ \quad d_i - R_{Pole} \\ \text{else} \\ \quad 0 \cdot in \end{cases}$$

$$MA_i = \begin{bmatrix} 0 \\ 0.38 \\ 2.52 \\ 0.38 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix} in$$

$$B_{eff} := 0.8 \cdot 2 \cdot \sqrt{\left(\frac{D_{Plate}}{2}\right)^2 - \left(\frac{D_{Pole}}{2}\right)^2} = 17.86\ in$$

Flange Bolt Properties and Check:

$$I_p := \sum_i d_i^2 = 1536\ in^2$$

$$A_g := \frac{\pi \cdot D_{bolt}^{\ 2}}{4} = 0.785\ in^2$$

$$A_n := \frac{\pi}{4} \cdot \left(D_{bolt} - \frac{0.9743\ in}{n}\right)^2 = 0.606\ in^2$$

$$D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 0.878\ in$$

$$r_{bolt} := \frac{D_n}{4} = 0.22\ in$$

$$S_{bolt} := \pi \cdot \frac{D_n^{\ 3}}{32} = 0.066\ in^3$$

$$T_{max} := OM \cdot \frac{R_{BC}}{I_p} - \frac{A}{N} = 17.667\ kip$$

$$T_{allow} := 0.75 \cdot A_n \cdot Fu_{bolt} = 54.517\ kip$$

$$Bolt_{usage} := \frac{T_{max}}{T_{allow}} = 32.4\%$$

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

Flange Plate Check:

$$C_i := \frac{OM \cdot d_i}{I_p} + \frac{A}{N}$$

$$C = \begin{bmatrix} 10.833 \\ 17.788 \\ 20.333 \\ 17.788 \\ 10.833 \\ 1.333 \\ -8.167 \\ -15.121 \\ -17.667 \\ -15.121 \\ -8.167 \\ 1.333 \end{bmatrix} \textit{kip}$$

Bolt Forces

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{B_{eff} \cdot t_{Plate}^2} = 9.652 \textit{ ksi}$$

$$F_{bp} := 0.9 \cdot Fy_{plate} = 45 \textit{ ksi}$$

$$Plate_{usage} := \frac{f_{bp}}{F_{bp}} = 21.4\%$$

$$Status_{plate} := \left\| \begin{array}{l} \text{if } Plate_{usage} \le 1 \\ \quad \left\| \text{“OK”} \right. \\ \text{else} \\ \quad \left\| \text{“NG”} \right. \end{array} \right. = \text{“OK”}$$

Anchor Bolt Analysis - NESC

Anchor Bolt - Data

Anchor Bolt Type:	ASTM A615 Grade 75	User Input
Anchor Bolt Load (Max Tension):	$T_{max} := 144.592\ kip$	User Input - from PLS-Pole
Anchor Bolt Nominal Diameter:	$D_{ab} := 2.25\ in$	User Input
Anchor Bolt Threads per Inch:	$n_{ab} := 4.5$	User Input
Anchor Bolt Ultimate Strength:	$Fu := 100\ ksi$	User Input
Anchor Bolt Yield Strength:	$Fy := 75\ ksi$	User Input

Anchor Bolt - Allowable Capacity

Anchor Bolt Net Area:

$$An := \frac{\pi}{4} \cdot \left(D_{ab} - \frac{0.9743}{n_{ab}}\ in \right)^2 = 3.25\ in^2$$

Allowable Bolt Load (Tension):

$$T_{allowable} := An \cdot Fy = 243.6\ kip$$

Anchor Bolt - Check

Actual vs. Allowable Bolt Load (Tension):

$$AB_{usage} := \frac{T_{max}}{T_{allowable}} = 59.4\%$$

Anchor Bolt Usage Check:

$$AB_{check1} := \text{if}\left(\frac{T_{max}}{T_{allowable}} \le 1.00\ , \text{“OK”}\ , \text{“NG”} \right)$$

$$AB_{check1} = \text{“OK”}$$

Foundation Analysis - Pole Caisson (OTRM 059.1 / OTRM 051)

Analysis Data Input

Overturning Moment (Max):	$OM := 3915.51 \cdot ft \cdot kip$	User Input - from PLS-Pole
	$OM_{Lpile} := OM \cdot 1.1 = 51684732 \ in \cdot lbf$	Includes NEU 1.1 Factor - to be used in LPile
Shear (Max):	$V := 49.38 \cdot kip$	User Input - from PLS-Pole
	$V_{Lpile} := V \cdot 1.1 = 54318 \ lbf$	Includes NEU 1.1 Factor - to be used in LPile
Axial Load (Max):	$A := 48.77 \cdot kip$	User Input - from PLS-Pole
	$A_{Lpile} := A \cdot 1.1 = 53647 \ lbf$	Includes NEU 1.1 Factor - to be used in LPile
Bending Moment Capacity:	$Mn := 115651.349 \ in \cdot kip$	User Input - from LPILE
Bending Moment:	$Mu := 54708475 \ in \cdot lbf$	User Input - from LPILE
Caisson Diameter:	$C_{dia} := 8 \ ft$	User Input
Caisson Overall Length:	$C_L := 27.5 \ ft$	User Input
Caisson Reveal:	$C_R := 0.5 \ ft$	User Input
Rebar Quantity:	$n := 30$	User Input
Rebar Area:	$A_{reb} := 1.56 \ in^2$	User Input
Rebar Yield Strength:	$fy := 60 \ ksi$	User Input
Concrete Weight:	$WT_{conc} := 150 \ pcf$	User Input
Concrete Compressive Strength:	$f'c := 3.5 \ ksi$	User Input

Caisson Moment Capacity:

Factor of Safety Required: $FS_{moment\_req} := 1.1$ OTMR 051 Section 6 - Foundation Design Criteria

Factor of Safety Provided: $FS_{moment} := \frac{Mn}{Mu} = 2.1$ $FS_{moment\_check} := \text{if}\left(FS_{moment} \geq FS_{moment\_req}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$

Moment Usage: $Usage_{moment} := \frac{FS_{moment\_req}}{FS_{moment}} = 52\%$

Caisson Axial Capacity:

Factor of Safety Required: $FS_{axial\_req} := 1.1$ OTMR 051 Section 6 - Foundation Design Criteria

Caisson Area: $C_{area} := \pi \cdot \frac{\left(C_{dia}\right)^2}{4} = 50.3\ ft^2$

Caisson Volume: $C_{volume} := C_{area} \cdot C_L = 1382.3\ ft^3$

Caisson Weight: $C_{weight} := C_{volume} \cdot WT_{conc} = 207.3\ kip$

Total Axial Load: $A_{total} := A + C_{weight} = 256.1\ kip$

Axial Capacity Provided: $A_{cap} := n \cdot A_{reb} \cdot fy + \left(C_{area} - n \cdot A_{reb}\right) \cdot 0.85 \cdot f'c = 24202.5\ kip$

Factor of Safety Provided: $FS_{axial} := \frac{A_{cap}}{A_{total}} = 94.5$ $FS_{axial\_check} := \text{if}\left(FS_{axial} \geq FS_{axial\_req}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$

Moment Usage: $Usage_{axial} := \frac{FS_{axial\_req}}{FS_{axial}} = 1.2\%$

LPile Plus for Windows, Version 6 (6.0.22)

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

This program is licensed to:

Paul J. Ford and Company
Columbus, Ohio

Files Used for Analysis

Path to file locations: G:\Transmission\Eversource\2017\806_Smartlink\80617-0015_Pole 4008_AT&T CTL02255\001.6000 - SA\Engineering Docs\LPILE\
Name of input data file: 80617-0015.001.6000.lp6d
Name of output report file: 80617-0015.001.6000.lp6o
Name of plot output file: 80617-0015.001.6000.lp6p
Name of runtime messeage file: 80617-0015.001.6000.lp6r

Date and Time of Analysis

Date: January 10, 2018 Time: 18:45:47

Problem Title

CL&P Structure #4008 / AT&T CTL02255

Job Number: 80617-0015.001.6000

Client: AT&T / Smartlink

Engineer: JRA

Description: 8'x27.5' Caisson (Pole)

Program Options

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

Basic Program Options:

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

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

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 100
- Deflection tolerance for convergence = 1.0000E-04 in
- Maximum allowable deflection = 100.0000 in

Pile Response Output Options:
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (nodal spacing of output points) = 0

Pile Structural Properties and Geometry

Total Number of Sections = 1

Total Pile Length = 27.50 ft

Depth of ground surface below top of pile = 0.50 ft

Slope angle of ground surface = 0.00 deg.

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

Point No.	Depth X ft	Pile Diameter in
1	0.00000	96.0000000
2	27.500000	96.0000000

Input Structural Properties:

Pile Section No. 1:

Section Type = Drilled Shaft (Bored Pile)
Section Length = 27.500 ft
Section Diameter = 96.000 in

Ground Slope and Pile Batter Angles

Ground Slope Angle = 0.000 degrees
= 0.000 radians

Pile Batter Angle = 0.000 degrees
= 0.000 radians

Soil and Rock Layering Information

The soil profile is modelled using 5 layers

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

Distance from top of pile to top of layer = 0.500 ft
Distance from top of pile to bottom of layer = 4.000 ft
p-y subgrade modulus k for top of soil layer = 12.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 12.000 lbs/in**3

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

Distance from top of pile to top of layer = 4.000 ft
Distance from top of pile to bottom of layer = 19.000 ft
p-y subgrade modulus k for top of soil layer = 90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 90.000 lbs/in**3

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

Distance from top of pile to top of layer = 19.000 ft
Distance from top of pile to bottom of layer = 20.500 ft
p-y subgrade modulus k for top of soil layer = 20.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 20.000 lbs/in**3

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

Distance from top of pile to top of layer = 20.500 ft
Distance from top of pile to bottom of layer = 24.500 ft
p-y subgrade modulus k for top of soil layer = 20.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 20.000 lbs/in**3

Layer 5 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer = 24.500 ft
Distance from top of pile to bottom of layer = 34.500 ft
p-y subgrade modulus k for top of soil layer = 20.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 20.000 lbs/in**3

(Depth of lowest layer extends 7.00 ft below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 10 points

Point No.	Depth X ft	Eff. Unit Weight pcf

1	0.50	100.22400
2	4.00	100.22400
3	4.00	124.41600
4	19.00	124.41600
5	19.00	62.20800
6	20.50	62.20800
7	20.50	62.20800
8	24.50	62.20800
9	24.50	62.20800
10	34.50	62.20800

Summary of Soil Properties

Layer Num.	Soil Type (p-y Curve Criteria)	kpy pci	Rock Emass psi	Depth krm ft	Eff. Unit Wt., pcf	Cohesion Test Type	Friction Test Prop. psf	Friction Elas. Subgr. Ang., deg.	qu Subgr. pci	RQD percent	Epsilon 50
1	Sand (Reese, et al.)			0.500	100.224	--		20.000	--	--	--
--	--	12.000	--	4.000	100.224	--	--	20.000	--	--	--
2	Sand (Reese, et al.)			4.000	124.416	--		32.000	--	--	--
--	--	90.000	--	19.000	124.416	--	--	32.000	--	--	--
3	Sand (Reese, et al.)			19.000	62.208	--		32.000	--	--	--
--	--	20.000	--	20.500	62.208	--	--	32.000	--	--	--
4	Sand (Reese, et al.)			20.500	62.208	--		32.000	--	--	--
--	--	20.000	--	24.500	62.208	--	--	32.000	--	--	--
5	Sand (Reese, et al.)			24.500	62.208	--		32.000	--	--	--
--	--	20.000	--	34.500	62.208	--	--	32.000	--	--	--
--	--	20.000	--	--	--	--	--	--	--	--	--

Loading Type

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

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs
1	1	V = 54318.000 lbs	M = 51684732.000 in-lbs	53647.000

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

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:

Length of Section	=	27.50000000 ft
Shaft Diameter	=	96.00000000 in
Concrete Cover Thickness	=	3.29532744 in
Number of Reinforcing Bars	=	30 bars
Yield Stress of Reinforcing Bars	=	60.00000000 ksi
Modulus of Elasticity of Reinforcing Bars	=	29000. ksi
Gross Area of Shaft	=	7238.22947387 sq. in.
Total Area of Reinforcing Steel	=	46.80000000 sq. in.
Area Ratio of Steel Reinforcement	=	0.65 percent

Edge-to-Edge Bar Spacing = 7.78843631 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = 0.85 Fc Ac + Fy As = 24202.503 kips
Tensile Load for Cracking of Concrete = -2961.065 kips
Nominal Axial Tensile Capacity = -2808.000 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	43.99967	0.00000
2	1.41000	1.56000	43.03817	9.14805
3	1.41000	1.56000	40.19570	17.89628
4	1.41000	1.56000	35.59648	25.86236
5	1.41000	1.56000	29.44153	32.69813
6	1.41000	1.56000	21.99984	38.10483
7	1.41000	1.56000	13.59665	41.84618
8	1.41000	1.56000	4.59922	43.75864
9	1.41000	1.56000	-4.59922	43.75864
10	1.41000	1.56000	-13.59665	41.84618
11	1.41000	1.56000	-21.99984	38.10483
12	1.41000	1.56000	-29.44153	32.69813
13	1.41000	1.56000	-35.59648	25.86236
14	1.41000	1.56000	-40.19570	17.89628
15	1.41000	1.56000	-43.03817	9.14805
16	1.41000	1.56000	-43.99967	0.00000
17	1.41000	1.56000	-43.03817	-9.14805
18	1.41000	1.56000	-40.19570	-17.89628
19	1.41000	1.56000	-35.59648	-25.86236
20	1.41000	1.56000	-29.44153	-32.69813
21	1.41000	1.56000	-21.99984	-38.10483
22	1.41000	1.56000	-13.59665	-41.84618
23	1.41000	1.56000	-4.59922	-43.75864
24	1.41000	1.56000	4.59922	-43.75864
25	1.41000	1.56000	13.59665	-41.84618
26	1.41000	1.56000	21.99984	-38.10483
27	1.41000	1.56000	29.44153	-32.69813
28	1.41000	1.56000	35.59648	-25.86236
29	1.41000	1.56000	40.19570	-17.89628
30	1.41000	1.56000	43.03817	-9.14805

Concrete Properties:

Compressive Strength of Concrete = 3.5000000 ksi
Modulus of Elasticity of Concrete = 3372.1654764 ksi
Modulus of Rupture of Concrete = -0.4437060 ksi
Compression Strain at Peak Stress = 0.0017644
Tensile Strain at Fracture of Concrete = -0.0001156
Maximum Coarse Aggregate Size = 0.7500000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 1

Number	Axial Thrust Force kips
1	53.647

Definitions of Run Messages and Notes:

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

Axial Thrust Force = 53.647 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	5509.0497035	17628959051.	53.7638346	0.0000168	-0.0000132	0.0657478	0.4828848	
0.000000625	10989.	17582641986.	50.8918454	0.0000318	-0.0000282	0.1238818	0.9137147	
0.000000938	16440.	17535765836.	49.9345775	0.0000468	-0.0000432	0.1815198	1.3445463	

0.000001250	21861.	17488749114.	49.4559815	0.0000618	-0.0000582	0.2386617
1.7753793						
0.000001563	27253.	17441676101.	49.1688533	0.0000768	-0.0000732	0.2953075
2.2062136						
0.000001875	32615.	17394574906.	48.9774584	0.0000918	-0.0000882	0.3514573
2.6370493						
0.000002188	37948.	17347457608.	48.8407685	0.0001068	-0.0001032	0.4071109
3.0678862						
0.000002500	37948.	15179025407.	24.0098422	0.0000600	-0.0001800	0.2294819
-5.1844865 C						
0.000002813	37948.	13492467029.	23.6702574	0.0000666	-0.0002034	0.2539722
-5.8602446 C						
0.000003125	37948.	12143220326.	23.3940130	0.0000731	-0.0002269	0.2783159
-6.5364176 C						
0.000003438	37948.	11039291205.	23.1632094	0.0000796	-0.0002504	0.3025056
-7.2130676 C						
0.000003750	37948.	10119350271.	22.9719323	0.0000861	-0.0002739	0.3266192
-7.8896023 C						
0.000004063	37948.	9340938712.	22.8110633	0.0000927	-0.0002973	0.3506565
-8.5660216 C						
0.000004375	37948.	8673728804.	22.6740892	0.0000992	-0.0003208	0.3746175
-9.2423249 C						
0.000004688	37948.	8095480217.	22.5560484	0.0001057	-0.0003443	0.3984986
-9.9185372 C						
0.000005000	37948.	7589512704.	22.4486923	0.0001122	-0.0003678	0.4222125
-10.5953396 C						
0.000005313	37948.	7143070780.	22.3547512	0.0001188	-0.0003912	0.4458508
-11.2720211 C						
0.000005625	37948.	6746233514.	22.2719919	0.0001253	-0.0004147	0.4694134
-11.9485813 C						
0.000005938	37948.	6391168592.	22.1986511	0.0001318	-0.0004382	0.4929002
-12.6250197 C						
0.000006250	37948.	6071610163.	22.1333183	0.0001383	-0.0004617	0.5163110
-13.3013360 C						
0.000006563	37948.	5782485869.	22.0748516	0.0001449	-0.0004851	0.5396458
-13.9775298 C						
0.000006875	37948.	5519645603.	22.0223169	0.0001514	-0.0005086	0.5629045
-14.6536005 C						
0.000007188	37948.	5279661011.	21.9749423	0.0001579	-0.0005321	0.5860867
-15.3295479 C						
0.000007500	37948.	5059675136.	21.9320848	0.0001645	-0.0005555	0.6091926
-16.0053715 C						
0.000007813	37948.	4857288130.	21.8932042	0.0001710	-0.0005790	0.6322218
-16.6810709 C						
0.000008125	37948.	4670469356.	21.8578433	0.0001776	-0.0006024	0.6551743
-17.3566457 C						
0.000008438	37948.	4497489010.	21.8256128	0.0001842	-0.0006258	0.6780499
-18.0320953 C						
0.000008750	37948.	4336864402.	21.7961791	0.0001907	-0.0006493	0.7008486
-18.7074195 C						
0.000009063	37948.	4187317354.	21.7692544	0.0001973	-0.0006727	0.7235701
-19.3826178 C						
0.000009375	37948.	4047740109.	21.7445894	0.0002039	-0.0006961	0.7462144
-20.0576897 C						
0.000009688	37948.	3917167847.	21.7219670	0.0002104	-0.0007196	0.7687812
-20.7326349 C						
0.0000100	37948.	3794756352.	21.7011972	0.0002170	-0.0007430	0.7912705
-21.4074531 C						
0.0000103	37948.	3679763735.	21.6821131	0.0002236	-0.0007664	0.8136822
-22.0821433 C						
0.0000106	37948.	3571535390.	21.6645673	0.0002302	-0.0007898	0.8360160
-22.7567054 C						
0.0000109	37948.	3469491522.	21.6484294	0.0002368	-0.0008132	0.8582719
-23.4311390 C						
0.0000113	37948.	3373116757.	21.6335835	0.0002434	-0.0008366	0.8804497
-24.1054435 C						
0.0000116	37948.	3281951439.	21.6199262	0.0002500	-0.0008600	0.9025493
-24.7796186 C						
0.0000119	37948.	3195584296.	21.6073648	0.0002566	-0.0008834	0.9245705
-25.4536639 C						
0.0000122	37948.	3113646237.	21.5955966	0.0002632	-0.0009068	0.9465042
-26.1276563 C						
0.0000128	37948.	2961761055.	21.5741742	0.0002764	-0.0009536	0.9901068
-27.4754959 C						
0.0000134	38465.	2862525956.	21.5561632	0.0002897	-0.0010003	1.0333975
-28.8227826 C						
0.0000141	40169.	2856470126.	21.5411190	0.0003029	-0.0010471	1.0763750
-30.1695127 C						
0.0000147	41871.	2850823525.	21.5286727	0.0003162	-0.0010938	1.1190381
-31.5156812 C						
0.0000153	43572.	2845535240.	21.5185159	0.0003295	-0.0011405	1.1613856
-32.8612841 C						
0.0000159	45271.	2840562467.	21.5103887	0.0003428	-0.0011872	1.2034163
-34.2063173 C						
0.0000166	46969.	2835868853.	21.5040703	0.0003562	-0.0012338	1.2451289
-35.5507762 C						
0.0000172	48665.	2831423328.	21.4993726	0.0003695	-0.0012805	1.2865222
-36.8946565 C						
0.0000178	50359.	2827199171.	21.4961336	0.0003829	-0.0013271	1.3275949
-38.2379535 C						
0.0000184	52052.	2823173278.	21.4942135	0.0003963	-0.0013737	1.3683457
-39.5806627 C						
0.0000191	53743.	2819325568.	21.4934911	0.0004097	-0.0014203	1.4087733
-40.9227794 C						
0.0000197	55433.	2815638502.	21.4938607	0.0004232	-0.0014668	1.4488764
-42.2642989 C						

0.0000203	57121.	2812096693.	21.4952294	0.0004366	-0.0015134	1.4886536
-43.6052164 C						
0.0000209	58807.	2808686582.	21.4975159	0.0004501	-0.0015599	1.5281038
-44.9455270 C						
0.0000216	60491.	2805396177.	21.5006482	0.0004636	-0.0016064	1.5672253
-46.2852259 C						
0.0000222	62174.	2802214828.	21.5045626	0.0004771	-0.0016529	1.6060170
-47.6243080 C						
0.0000228	63855.	2799133048.	21.5092026	0.0004907	-0.0016993	1.6444774
-48.9627682 C						
0.0000234	65535.	2796142350.	21.5145177	0.0005042	-0.0017458	1.6826050
-50.3006013 C						
0.0000241	67212.	2793235127.	21.5204627	0.0005178	-0.0017922	1.7203986
-51.6378022 C						
0.0000247	68888.	2790404533.	21.5269972	0.0005314	-0.0018386	1.7578566
-52.9743656 C						
0.0000253	70562.	2787644390.	21.5340849	0.0005451	-0.0018849	1.7949775
-54.3102859 C						
0.0000259	72235.	2784949110.	21.5416931	0.0005587	-0.0019313	1.8317599
-55.6455579 C						
0.0000266	73905.	2782313625.	21.5497923	0.0005724	-0.0019776	1.8682024
-56.9801759 C						
0.0000272	75574.	2779733323.	21.5583557	0.0005861	-0.0020239	1.9043033
-58.3141342 C						
0.0000278	77241.	2777204003.	21.5673592	0.0005998	-0.0020702	1.9400612
-59.6474272 C						
0.0000284	78906.	2774721825.	21.5767808	0.0006136	-0.0021164	1.9754744
-60.0000000 CY						
0.0000291	80569.	2772283272.	21.5866005	0.0006274	-0.0021626	2.0105415
-60.0000000 CY						
0.0000297	82131.	2766527539.	21.5877207	0.0006409	-0.0022091	2.0445714
-60.0000000 CY						
0.0000303	83490.	2754293116.	21.5713247	0.0006539	-0.0022561	2.0768686
-60.0000000 CY						
0.0000309	84615.	2735023494.	21.5352142	0.0006662	-0.0023038	2.1072263
-60.0000000 CY						
0.0000316	85719.	2715852857.	21.4992870	0.0006786	-0.0023514	2.1371592
-60.0000000 CY						
0.0000322	86742.	2694892289.	21.4578745	0.0006907	-0.0023993	2.1662246
-60.0000000 CY						
0.0000328	87592.	2669456427.	21.4028221	0.0007023	-0.0024477	2.1937668
-60.0000000 CY						
0.0000334	88439.	2644909423.	21.3501352	0.0007139	-0.0024961	2.2210464
-60.0000000 CY						
0.0000341	89286.	2621237908.	21.2997943	0.0007255	-0.0025445	2.2480714
-60.0000000 CY						
0.0000347	90107.	2597692873.	21.2493954	0.0007371	-0.0025929	2.2746554
-60.0000000 CY						
0.0000353	90796.	2571201445.	21.1888942	0.0007482	-0.0026418	2.2999793
-60.0000000 CY						
0.0000359	91418.	2543810769.	21.1248783	0.0007592	-0.0026908	2.3245745
-60.0000000 CY						
0.0000366	92040.	2517338528.	21.0633760	0.0007701	-0.0027399	2.3489421
-60.0000000 CY						
0.0000372	92662.	2491738326.	21.0042623	0.0007811	-0.0027889	2.3730814
-60.0000000 CY						
0.0000397	94944.	2392289915.	20.7711161	0.0008244	-0.0029856	2.4657704
-60.0000000 CY						
0.0000422	96678.	2291620442.	20.5144658	0.0008655	-0.0031845	2.5500286
-60.0000000 CY						
0.0000447	98391.	2201761772.	20.2816926	0.0009063	-0.0033837	2.6302798
-60.0000000 CY						
0.0000472	99675.	2112320543.	20.0352139	0.0009454	-0.0035846	2.7035671
-60.0000000 CY						
0.0000497	100815.	2028977402.	19.8034034	0.0009840	-0.0037860	2.7727189
-60.0000000 CY						
0.0000522	101943.	1953395390.	19.5902740	0.0010224	-0.0039876	2.8384130
-60.0000000 CY						
0.0000547	103035.	1884068090.	19.3883977	0.0010603	-0.0041897	2.9002590
-60.0000000 CY						
0.0000572	103773.	1814616486.	19.1688124	0.0010962	-0.0043938	2.9559123
-60.0000000 CY						
0.0000597	104472.	1750316297.	18.9660449	0.0011320	-0.0045980	3.0087162
-60.0000000 CY						
0.0000622	105166.	1691118452.	18.7816933	0.0011680	-0.0048020	3.0590105
-60.0000000 CY						
0.0000647	105847.	1636287419.	18.6045815	0.0012035	-0.0050065	3.1059862
-60.0000000 CY						
0.0000672	106519.	1585401072.	18.4377756	0.0012388	-0.0052112	3.1500748
-60.0000000 CY						
0.0000697	107132.	1537313548.	18.2779705	0.0012737	-0.0054163	3.1911404
-60.0000000 CY						
0.0000722	107579.	1490266315.	18.1112812	0.0013074	-0.0056226	3.2282129
-60.0000000 CY						
0.0000747	107974.	1445682220.	17.9515807	0.0013408	-0.0058292	3.2625942
-60.0000000 CY						
0.0000772	108367.	1403947137.	17.8037815	0.0013742	-0.0060358	3.2947669
-60.0000000 CY						
0.0000797	108747.	1364667127.	17.6577633	0.0014071	-0.0062429	3.3240673
-60.0000000 CY						
0.0000822	109119.	1327687730.	17.5181217	0.0014398	-0.0064502	3.3509434
-60.0000000 CY						
0.0000847	109489.	1292858536.	17.3881420	0.0014726	-0.0066574	3.3756829
-60.0000000 CY						
0.0000872	109856.	1259993993.	17.2670131	0.0015055	-0.0068645	3.3982613
-60.0000000 CY						

0.0000897	110220.	1228929225.	17.1540150	0.0015385	-0.0070715	3.4186537
-60.0000000 CY						
0.0000922	110574.	1199446327.	17.0475762	0.0015716	-0.0072784	3.4367889
-60.0000000 CY						
0.0000947	110904.	1171259902.	16.9449935	0.0016045	-0.0074855	3.4525627
-60.0000000 CY						
0.0000972	111125.	1143405180.	16.8339674	0.0016361	-0.0076939	3.4655535
-60.0000000 CY						
0.0000997	111322.	1116708231.	16.7197866	0.0016668	-0.0079032	3.4761865
-60.0000000 CY						
0.0001022	111507.	1091201062.	16.6078015	0.0016971	-0.0081129	3.4847718
-60.0000000 CY						
0.0001047	111690.	1066893014.	16.5022412	0.0017276	-0.0083224	3.4914680
-60.0000000 CY						
0.0001072	111872.	1043699830.	16.4026708	0.0017582	-0.0085318	3.4962528
-60.0000000 CY						
0.0001097	112051.	1021544926.	16.3086957	0.0017889	-0.0087411	3.4991038
-60.0000000 CY						
0.0001122	112228.	1000358080.	16.2199728	0.0018197	-0.0089503	3.4996432
-60.0000000 CY						
0.0001147	112402.	980068138.	16.1364364	0.0018506	-0.0091594	3.4929931
-60.0000000 CY						
0.0001172	112574.	960627524.	16.0574140	0.0018817	-0.0093683	3.4970221
-60.0000000 CY						
0.0001197	112744.	941982715.	15.9826363	0.0019129	-0.0095771	3.4993593
-60.0000000 CY						
0.0001222	112911.	924082587.	15.9119321	0.0019442	-0.0097858	3.4990085
-60.0000000 CY						
0.0001247	113076.	906873789.	15.8453862	0.0019757	-0.0099943	3.4918172
-60.0000000 CY						
0.0001272	113232.	890273183.	15.7748069	0.0020064	-0.0102036	3.4954902
-60.0000000 CY						
0.0001297	113385.	874296525.	15.7070630	0.0020370	-0.0104130	3.4983176
-60.0000000 CY						
0.0001322	113538.	858913134.	15.6426564	0.0020678	-0.0106222	3.4997818
-60.0000000 CY						
0.0001347	113686.	844072667.	15.5813972	0.0020986	-0.0108314	3.4971824
-60.0000000 CY						
0.0001372	113832.	829752944.	15.5232901	0.0021296	-0.0110404	3.4907392
-60.0000000 CY						
0.0001522	114379.	751567589.	15.1706436	0.0023088	-0.0123012	3.4914920
60.0000000 CY						
0.0001672	114773.	686490710.	14.8767072	0.0024872	-0.0135628	3.4998699
60.0000000 CY						
0.0001822	115105.	631793542.	14.6072083	0.0026613	-0.0148287	3.4952291
60.0000000 CY						
0.0001972	115410.	585280217.	14.3940381	0.0028383	-0.0160917	3.4915586
60.0000000 CY						
0.0002122	115680.	545178547.	14.2291013	0.0030192	-0.0173508	3.4946076
60.0000000 CY						
0.0002272	115890.	510108055.	14.1130954	0.0032063	-0.0186037	3.4937523
60.0000000 CY						
0.0002422	116079.	479295555.	14.0231912	0.0033962	-0.0198538	3.4859095
60.0000000 CY						
0.0002572	116178.	451724969.	13.9303630	0.0035827	-0.0211073	3.4987399
60.0000000 CY						
0.0002722	116241.	427061977.	13.8284556	0.0037639	-0.0223661	3.4897510
60.0000000 CY						
0.0002872	116241.	404756237.	13.9112011	0.0039951	-0.0235749	3.4857027
60.0000000 CY						

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

Moment values interpolated at maximum compressive strain = 0.003
or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
1	53.647	115651.349	0.00300000

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

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

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

Computed Values of Pile Loading and Deflection
for Lateral Loading for Load Case Number 1

Pile-head conditions are Shear and Moment (Loading Type 1)

Horizontal shear force at pile head = 54318.000 lbs
Applied moment at pile head = 51684732.000 in-lbs

Axial thrust load on pile head = 53647.000 lbs

Depth X inches	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	1.5823	51684732.	54318.	-0.009836	0.000	2.824E+12	0.000	0.000	0.000

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

Output Summary for Load Case No. 1:

Pile-head deflection = 1.5823096 inches
Computed slope at pile head = -0.0098357 radians
Maximum bending moment = 54708475. inch-lbs
Maximum shear force = -362940. lbs
Depth of maximum bending moment = 72.6000000 inches below pile head
Depth of maximum shear force = 198.0000000 inches below pile head
Number of iterations = 37
Number of zero deflection points = 1

Summary of Pile Response(s)

Definitions of Pile-head Loading Conditions:

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

Load Case No.	Load Type No.	Pile-head Condition 1 V(lbs) or y(inches)	Pile-head Condition 2 in-lb, rad., or in-lb/rad.	Axial Loading lbs	Pile-head Deflection inches	Maximum Moment in-lbs	Maximum Shear lbs	Pile-head Rotation radians
1	1	V = 54318.	M = 51684732.	53647.	1.58230960	54708475.	-362940.	-0.00983575

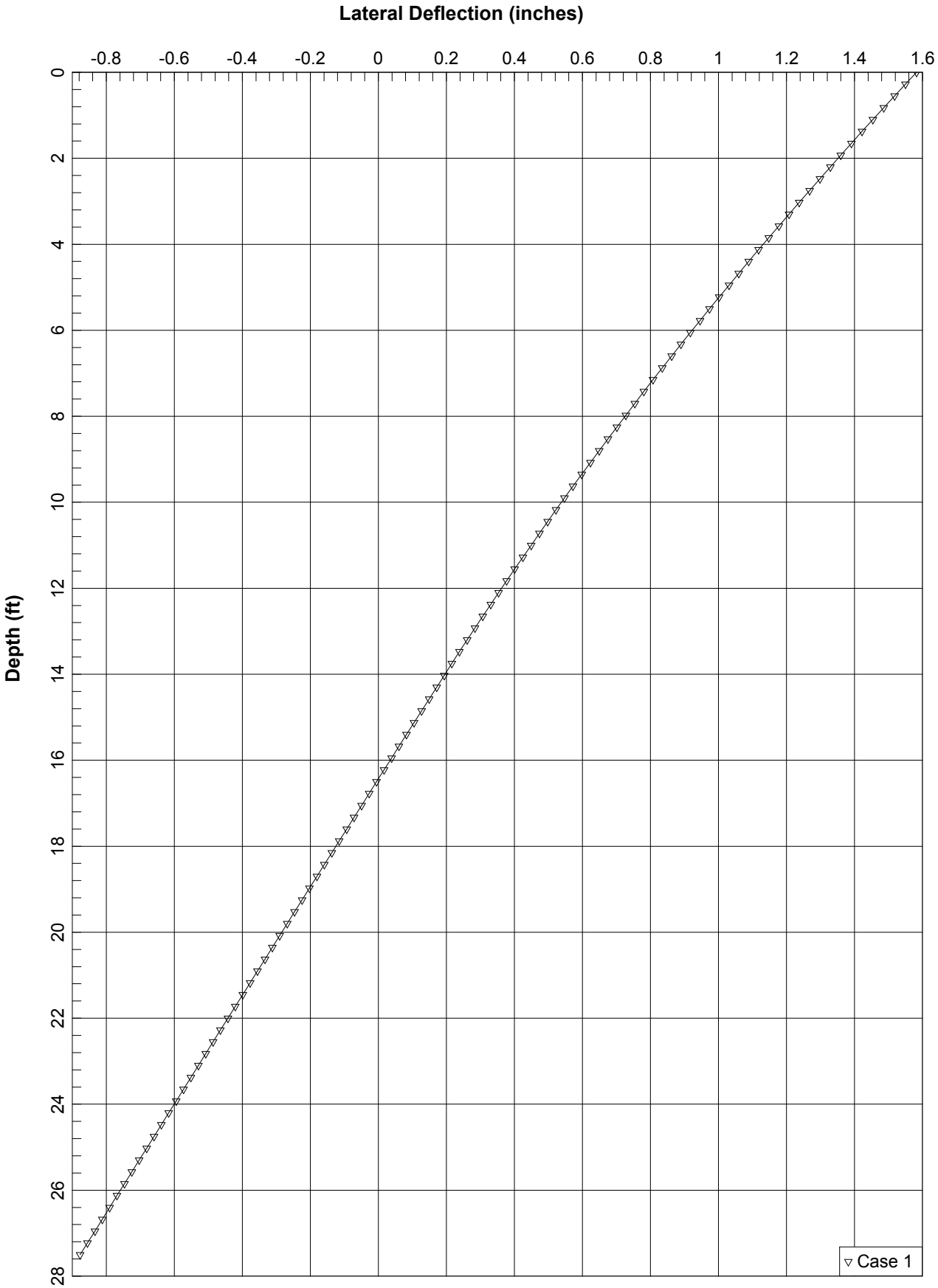
Computed Pile-head Stiffness Matrix Values
K22, K23, K32, K33 for Pile Head

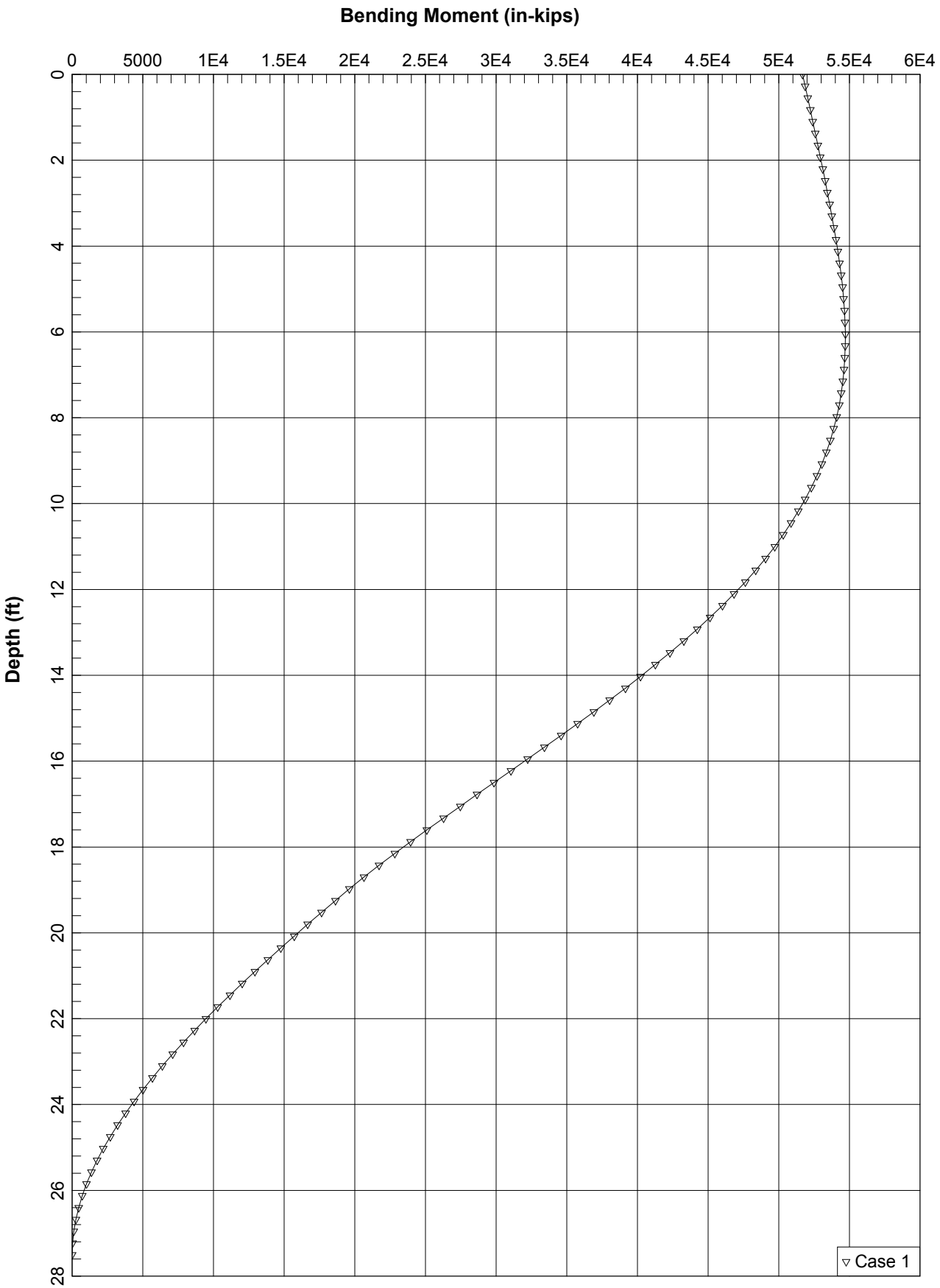
Pile-Top Deflection inches	Pile-Top Shear Reaction lbs	Pile-Top Moment React. in-lbs	K22 lb/in.	K32 in-lb/in.
0.0028119	5431.800080861	957886.	1931692.	340649567.
0.0084648	16351.	2883524.	1931692.	340649567.
0.0134164	25916.	4570277.	1931692.	340649567.
0.0169296	32703.	5767044.	1931684.	340648061.
0.0196555	37967.	6695278.	1931600.	340630477.
0.0218833	42268.	7453664.	1931500.	340609513.
0.0237671	45904.	8094852.	1931411.	340590664.
0.0253990	49054.	8650263.	1931335.	340574485.
0.0268386	51833.	9140164.	1931270.	340560666.
0.0281263	54318.	9578391.	1931215.	340548786.

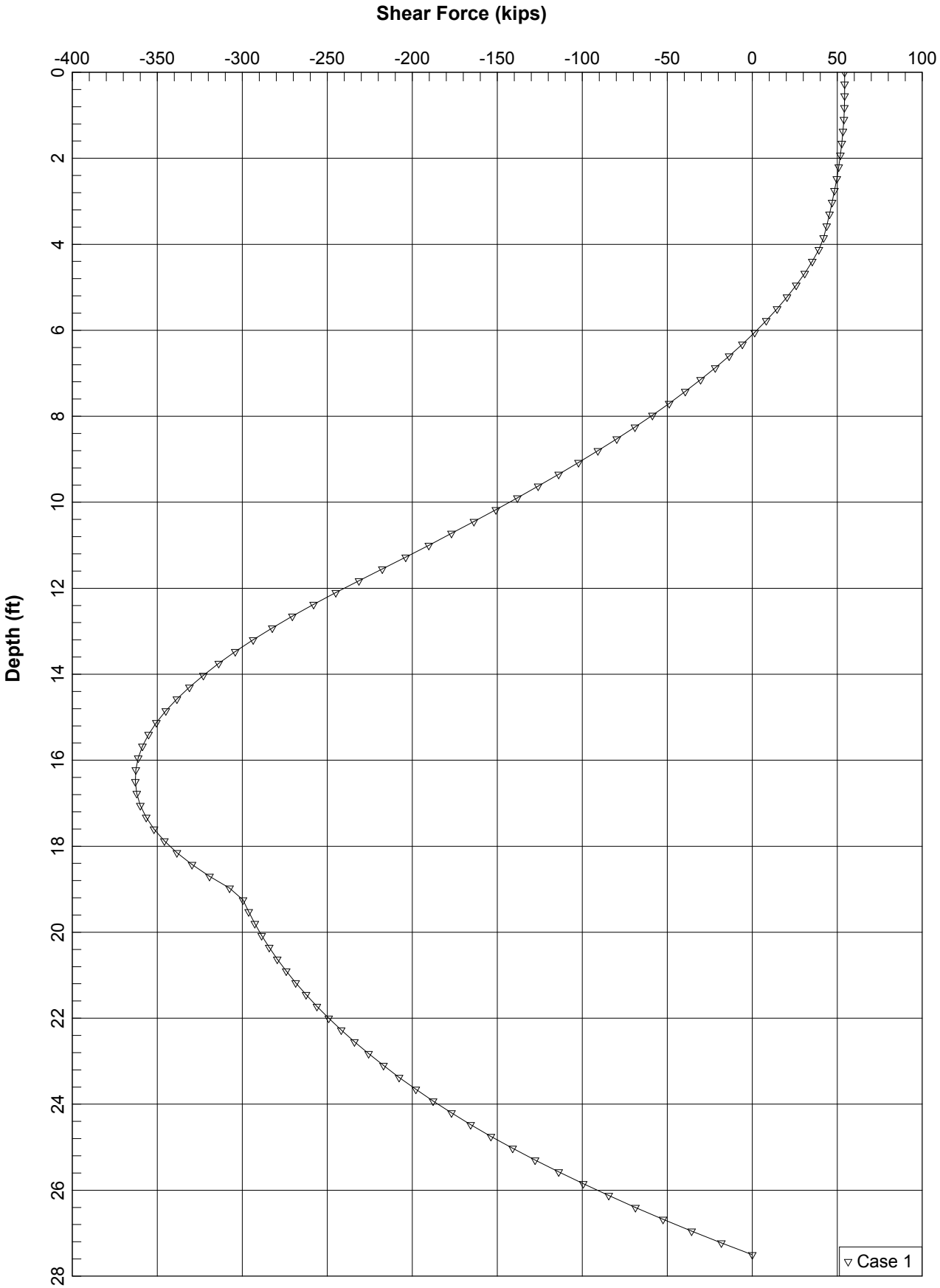
Pile-Top Rotation radians	Pile-Top Shear React. lbs	Pile-Top Moment React. in-lbs	K23 lb/rad	K33 in-lb/rad
0.0000735	25049.	5168473.	340649567.	70287447090.
0.0002216	75408.	15558655.	340357852.	70224807359.
0.0003515	119524.	24659884.	340063796.	70161028977.
0.0004438	150828.	31117309.	339848310.	70114258437.
0.0005155	175110.	36126077.	339679289.	70077560646.
0.0005783	194956.	40218539.	337124597.	69547199431.
0.0006515	211793.	43678666.	325091356.	67044442838.
0.0010113	227751.	46675964.	225205396.	46154305329.
0.0011832	241965.	49319768.	204506767.	41684616181.
0.0013048	254566.	51684732.	195103084.	39611882911.

K22 = abs(Shear Reaction/Top y)
K23 = abs(Shear Reaction/Top Rotation)
K32 = abs(Moment Reaction/Top y)
K33 = abs(Moment Reaction/Top Rotation)

The analysis ended normally.


Lateral Deflection (inches)
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
Case 1


Bending Moment (in-kips)
0
5000
1E4
1.5E4
2E4
2.5E4
3E4
3.5E4
4E4
4.5E4
5E4
5.5E4
6E4
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
Case 1


Shear Force (kips)
-400
-350
-300
-250
-200
-150
-100
-50
0
50
100
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
Case 1

APPENDIX E

SUPPLEMENTAL INFORMATION

Dual Broadband Antenna

90° 1.4 m MET Antenna

806-960/1710-2170 MHz

Part Number: 7770.00

Horizontal Beamwidth: 90°
Gain: 13.5/16 dBi

Electrical Downtilt: Adjustable
Connector Type: 7/16 female

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

Key Benefits

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

Preliminary

ANTENNA SYSTEMS

BASE STATION SYSTEMS

COVERAGE SYSTEMS

806-960/1710-2170 MHz

Dual Broadband Antenna

Electrical Specifications (Preliminary)

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

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

Mechanical Specifications

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

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D031-08208 Rev A

Tower Mounted Amplifier

Dual Band 1900 MHz with 850 MHz Bypass

1900/850 MHz

Part Number:
LGP 214nn

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

Gain: 12 dB
Noise Figure: < 1.7 dB

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

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

Key Benefits:

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

ANTENNA SYSTEMS

BASE STATION SYSTEMS

COVERAGE SYSTEMS

Powerwave technologies

Tower Mounted Amplifier

1900/850 MHz

Technical Specifications

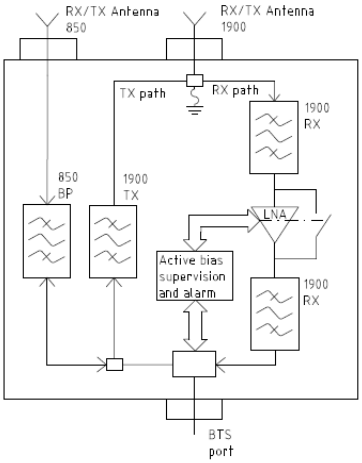
Product Number	LGP214nn	
850 MHz	Bypass (MHz)	824-894
	Return loss* (dB)	> 20
	Insertion loss* (dB)	< 0.3
1900 MHz		
Up-link	Frequency range, full band (60 MHz)	1850-1910
	Nominal gain (dB)	12
	Return loss* (dB)	> 20
	Noise figure* (dB)	< 1.7
	Output 3rd order Intercept Point* (dBm)	> +23
Down-link	Frequency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

* Typical

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

Mechanical Specifications

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



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FILTER BY SELECTION

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- Antennas
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- DAS Products
- Filters & Combiners
- PIM Analyzers

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- Bi-Sector
- iDAS
- Multi-Sector/Special Events
- Single Sector Multiport
- Small Cell/oDAS
- Specialty

Antennas

DATASHEET

HexPort Multi-Band Ar

OVERVIEW SPECIFICATIONS ACCESSORIES

RESOURCES ORDERING

STANDARDS & CERTIFICATIONS PATTERN VIEWER

Electrical

Ports	2 x Low Band Ports for 698-894 MHz		4 x High Band Ports for 1710-23		
Frequency Range	698-806 MHz	824-894 MHz	1850-1990 MHz	1710-1780 MHz	2110-218 MHz
Gain	14.1 dBi	14.8 dBi	16.9 dBi	16.3 dBi	17.2 dBi
Azimuth Beamwidth (-3dB)	66°	65°	61°	66°	62°
Elevation Beamwidth (-3dB)	12.5°	10.5°	5.7°	6.3°	5.1°

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South Hackensack, NJ 07606
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+1 (201) 342-3339 fax
sales@ccipro.com

FREQUENCY BAND

- [ ] 698-787 MHz
- [ ] 698-894 MHz
- [ ] 698-960 MHz
- [ ] 790-960 MHz
- [ ] 824-894 MHz
- [ ] 1710-1880 MHz
- [ ] 1710-2170 MHz
- [ ] 1710-2360 MHz
- [ ] 1710-2690 MHz
- [ ] 1850-1990 MHz
- [ ] 2300-2400 MHz
- [ ] 2300-2690 MHz
- [ ] 2500-2690 MHz

HEIGHT

- [ ] 2 ft. (458 - 761 mm)
- [ ] 4 ft. (1067 - 1371 mm)
- [ ] 5 ft. (1372 - 1676 mm)
- [ ] 6 ft. (1677 - 1981 mm)
- [ ] 7 ft. (1982 - 2286 mm)
- [ ] 8 ft. (2287 - 2590 mm)

HORIZONTAL BEAMWIDTH

- [ ] 30° to 40°
- [ ] 40° to 50°
- [ ] 50° to 70°
- [ ] 80° to 100°

NUMBER OF PORTS

Electrical Downtilt	0° to 10°	0° to 10°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	< -17 dB	< -19 dB	< -19 dB	< -18 dB	< -18 dB
Front-to-Back Ratio @180°	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Front-to-Back Ratio over ± 20°	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross-Polar Discrimination (at Peak)	> 25 dB	> 20 dB	> 25 dB	> 25 dB	> 25 dB
Cross-polar Discrimination at ± 60°	> 17 dB	> 14 dB	> 17 dB	> 17 dB	> 17 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB	> 26 dB	> 25 dB	> 26 dB
Voltage Standing Wave Ratio (VSWR)	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2×20W)	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dB
Input Power Continuous Wave (CW)	500 watts	500 watts	300 watts	300 watts	300 wat
Polarization (Pol)	Dual Pol ±45°	Dual Pol ±45°	Dual Pol ±45°	Dual Pol ±45°	Dual Po ±45°
Input Impedance	50 ohms	50 ohms	50 ohms	50 ohms	50 ohm
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground

Mechanical

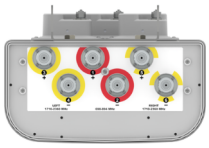
Dimensions (LxWxD)	72.3×14.4×7.3 in (1836×366×185 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	243 lbs (1081 N) @ 100 mph (161 kph)
Side Wind Load	140 lbs (622 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	9.5 ft^2 (0.9 m^2)
Weight *	42.9 lbs (19.5 kg)
RET System Weight	5.0 lbs (2.3 kg)
Connector	6 x 7-16 DIN female long neck
Mounting Pole	2 to 5 in (5 to 12 cm)

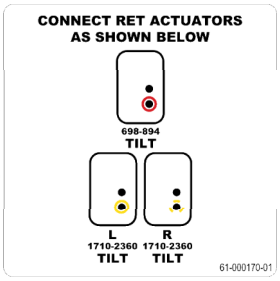
** Weight excludes mounting and RET*

Bottom View

RET Connection Diagram

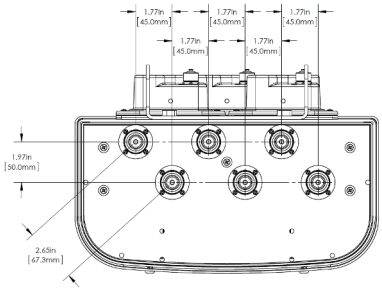
- [ ] 4
- [ ] 6
- [ ] 8
- [ ] 10
- [ ] 12





Connector

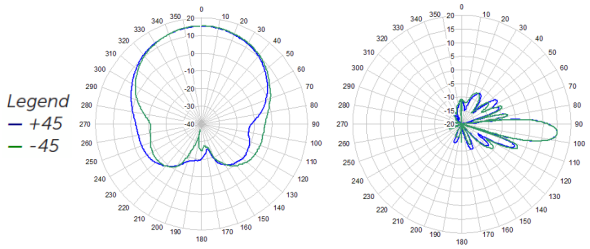
Spacing



Typical Antenna Patterns

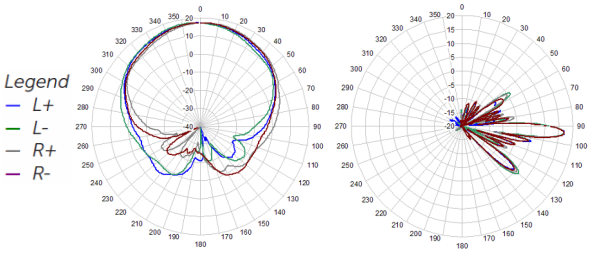
For detailed information on additional antenna patterns, contact customer support at support@cciproducts.com

Interactive Pattern Viewer



894 MHz Azimuth

894 MHz Elevation 5°



1920 MHz Azimuth

1920 MHz Elevation 4°

Tweet

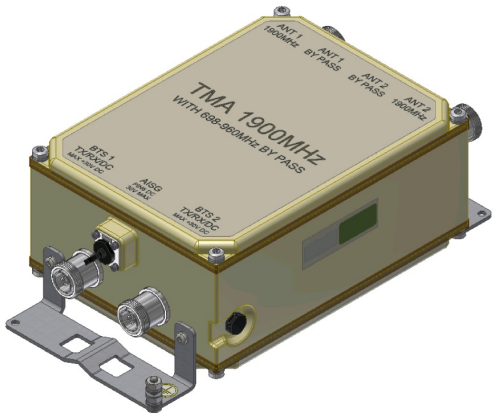
Email Link

back to top

TMA2061F1V1-1

TWIN TMA 1900

Designed to be used at co-located 700MHz/850MHz and 1900MHz sites, the Kaelus TMA2061 provides gain on the 1900 uplink path while diplexing the 700MHz band to avoid costly external diplexers. Separate feeders are no longer required, resulting in decreased hardware costs, environmental impact and tower licensing fees.



FEATURES

- Full band 1900 TMA with 698-960MHz bypass path
- Provides improved base station sensitivity through low noise figure and good linearity
- High reliability with full lightning protection and a fail-safe bypass mode
- Small twin unit, ideal for X-Pol dual band systems
- AISG 2.0 compatible with current window alarm backup mode
- High power handling

TECHNICAL SPECIFICATIONS

DOWNLINK (TX) PATH	
Passband	1930 - 1990MHz
Return loss	18dB minimum (VSWR <1.3:1)
Insertion loss	0.6dB typical
Maximum input power with no damage	300W (average) / 3kW (PEP)

UPLINK AWS (RX) PATH	
Passband	1850 - 1910MHz
Nominal gain	12dB
Gain variation over frequency, temperature	± 1dB maximum
Noise figure	1.3dB typical
Return loss	18dB minimum operating, 14dB minimum in bypass mode
Bypass loss	2.5dB typical
Output IP3	+25dBm minimum
Maximum input power with no damage	12dBm maximum

698 - 960MHZ BYPASS PATH	
Passband	698 - 960MHz
Return loss	18dB minimum (VSWR <1.3:1)
Insertion loss	0.2dB typical
Maximum input power with no damage	500W (average) / 5kW (PEP)
Rejection to 1900MHz TMA bands	80dB typical

ELECTRICAL	
Impedance	50ohms
Intermodulation products	-153dBc maximum in RX band with 2 x 20W carriers

POWER SUPPLY AND ALARM (CURRENT WINDOW ALARM MODE, DEFAULT)	
Current Window Alarm Mode (CWA) is the default TMA operating mode and can be configured to specific customer requirements. The TMA2061F1V1-1 is configured so that both channels are independently powered and monitored via the respective BTS port. The BTS port sinks additional current to indicate an alarm state in its uplink path. Normal operating and alarm current values are configured independently and are alterable via a field-loadable personality file, contact Kaelus for more information.	
DC supply voltage via BTS-RF cable	+8V to +30V DC, case is DC ground Each BTS port powered individually (programmable)
DC supply current, normal mode	100mA typical, 120mA maximum
DC supply current, alarm mode	200mA typical per LNA

AISG MODE OF OPERATION (AUTO SELECTED ON VALID AISG 2.0 FRAMES)	
AISG signals can be applied to either BTS port. The TMA unit switches to AISG mode when valid frames are detected on one of the ports. The TMA unit is DC powered only from the port supplying AISG frames.	
DC supply voltage	+8V to +30V DC, negative ground
AISG version	2.0 (1.1 optional)
Supply current, AISG mode	55mA at 30V, 135mA at 12V
AISG connector, current rating	IEC60130-9, 8-pin female, < 4A peak, 2A continuous, pin 6
Field firmware upgradable	Yes

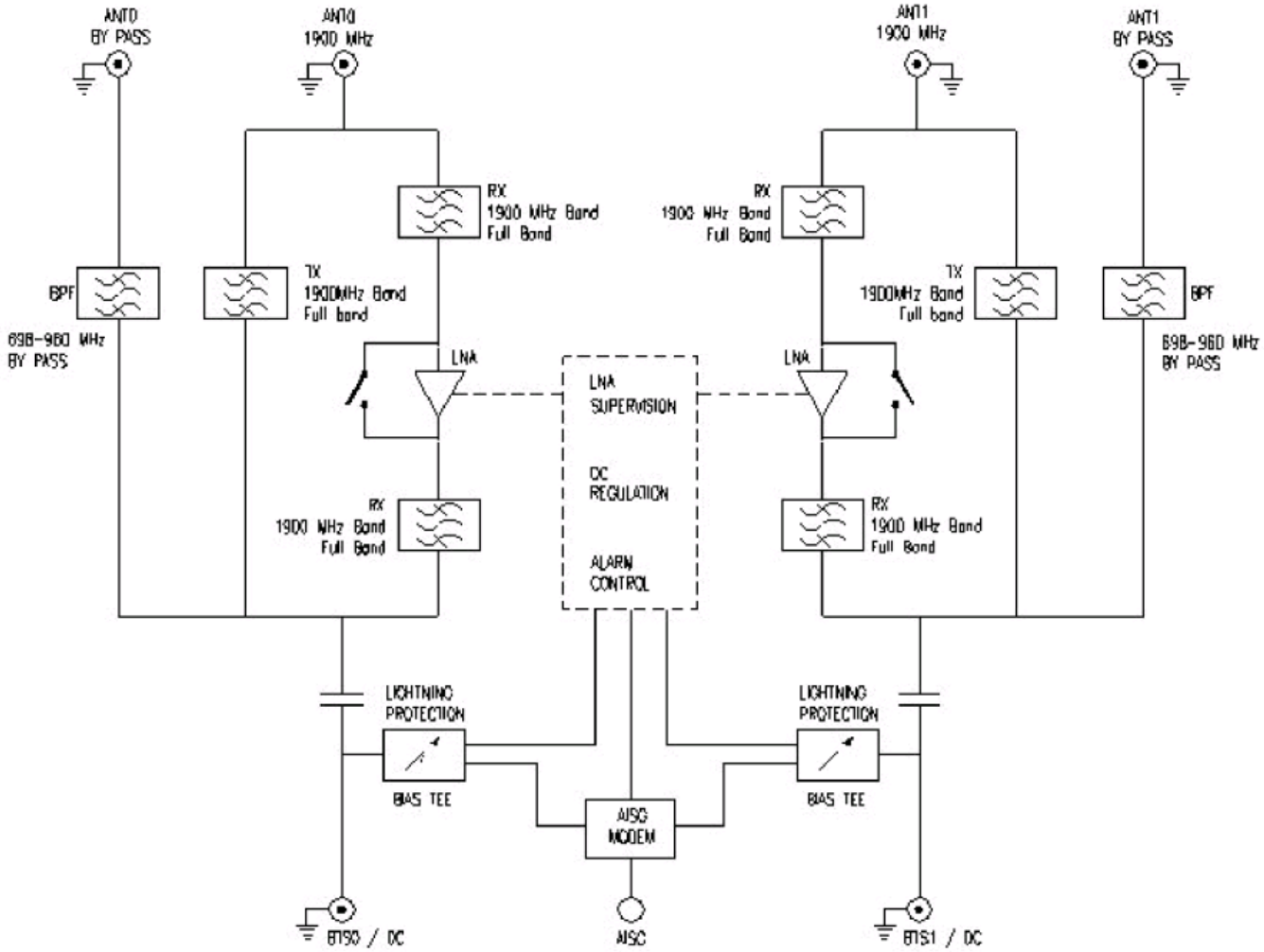
ENVIRONMENTAL	
For further details of environmental compliance, please contact Kaelus.	
Temperature range	-40º to +65ºC | -40º to +149ºF
Ingress protection	IP67
Lightning protection	IEC61312-1, RF: ±5kA maximum (8/20us), AISG: ±2kA maximum (8/20us)
MTBF	>1,000,000 (hours)
Compliance	FCC part 15, ETSI EN 300 019 class 4.1, RoHS

MECHANICAL	
Dimensions H x D x W	270 x 200 x 118mm | 10.62 x 7.87 x 4.64in (excluding brackets and connectors)
Weight	9kg | 19.8lbs
Finish	Painted, light grey (RAL7035)
Connectors	DIN 7-16 (F) x 6 long shank, AISG (F) x 1
Mounting	Pole/wall bracket supplied with two metal clamps 45-178mm diameter poles

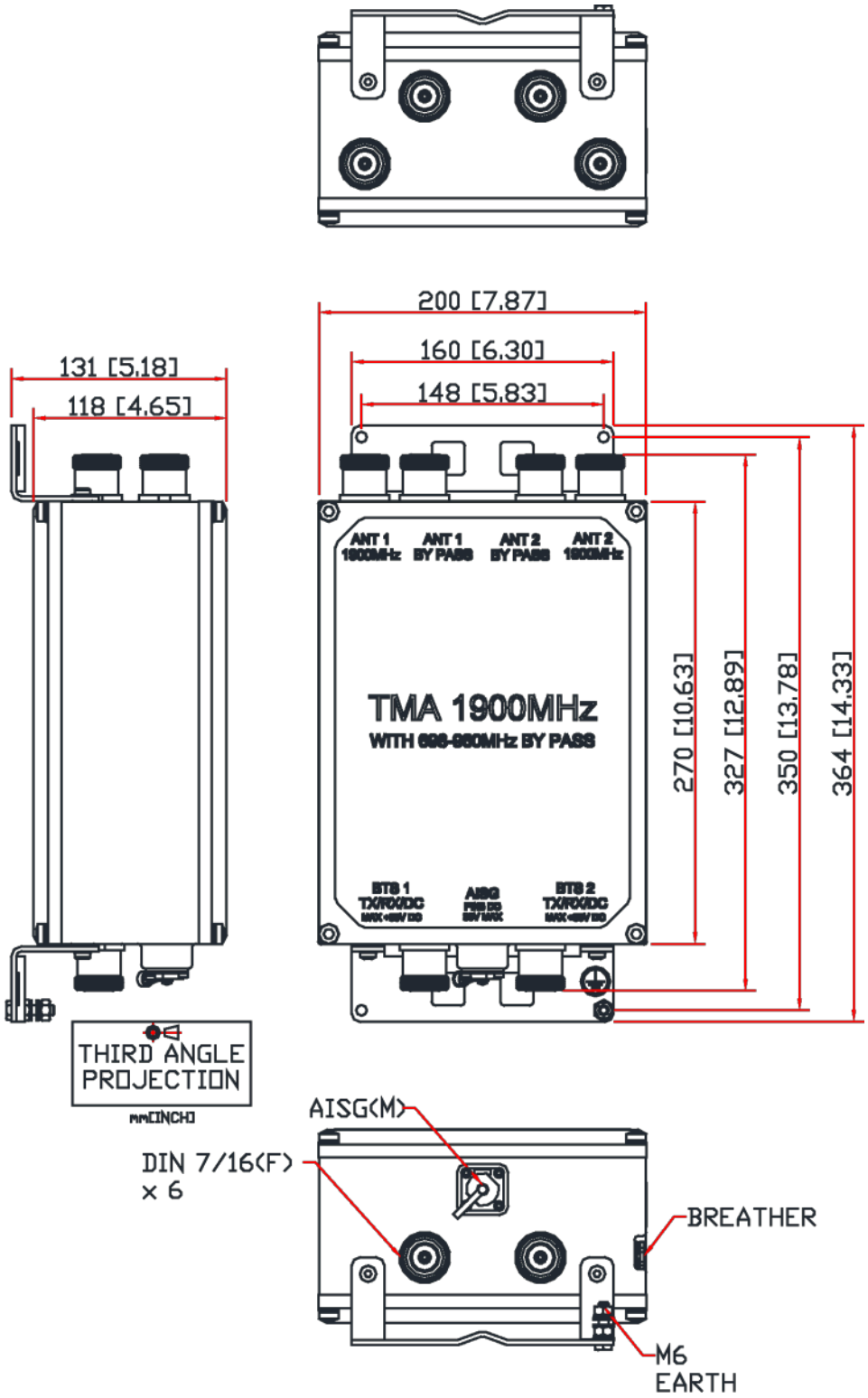
ORDERING INFORMATION

PART NUMBER	DESCRIPTION
TMA2061F1V1-1	Twin TMA, 1900 full band, 700-900 bypass

ELECTRICAL BLOCK DIAGRAM



MECHANICAL BLOCK DIAGRAM



Optimizer® Panel Dual Polarized Antenna

Connector Type	(4) 7-16 DIN Female
Connector Location	Bottom
Mount Type	Downtilt Kit w/Scissor Kit
Electrical Downtilt, deg	0-10 , 0-10
Horizontal Beamwidth, deg	66 , 66
Mounting Hardware	APM40-2 + APM40-E2
Rated Wind Speed, km/h (mph)-	160 (100)
VSWR	< 1.5:1
Vertical Beamwidth, deg	6.6
1st Upper Sidelobe Suppression, dB	> 17 (typically > 20)
Upper Sidelobe Suppression, dB	> 18 all (typically > 20)
Polarization	Dual pol +/-45°
Front-To-Back Ratio, dB	> 25
Maximum Power Input, W	300
Isolation between Ports, dB	> 30
Lightning protection	Direct Ground
3rd Order IMP @ 2 x 38 dBm, dBc	> 160
Overall Length, m (ft)	1.35 (4.42)
Dimensions - HxWxD, mm (in)	1349 x 330 x 80 (53 x 12.9 x 3.1)
Weight w/o Mtg. Hardware, kg (lb)	18.0 (39.6)
Radiating Element Material	Brass
Radome Material	Fiberglass
Reflector Material	Aluminum
Max Wind Loading Area, m² (ft²)	0.64 (6.6)
Maximum Thrust @ Rated Wind, N (lbf)	787 (177)
Shipping Weight, kg (lb)	24.1 (52.7)
Packing Dimensions, HxWxD, mm (in)	1550 x 420 x 210 (61 x 16.5 x 8.3)
Survival Wind Speed, km/h (mph)	200 (125)

PCS Full Band Tower Mounted Amplifier
G20057A1

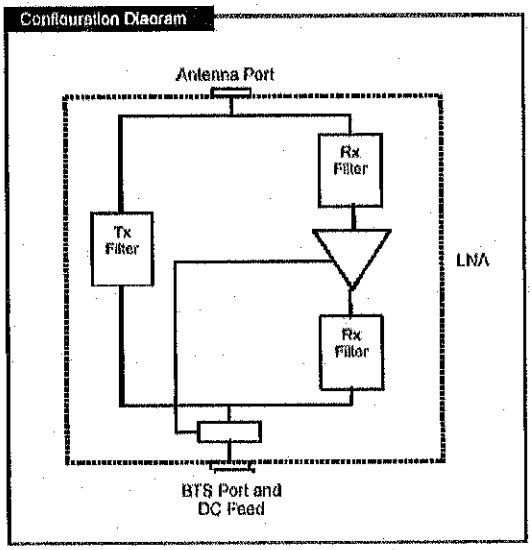
Tx Characteristics	Specification
Frequency Range	1930 to 1990 MHz
Operating Bandwidth	60 MHz
Insertion Loss	≤0.9 dB
Ripple	± 0.3 dB
Max Power Handling - CW	+52 dBm (160 W)
Max Power Handling - Peak	+61.6 dBm (1400 W)
Return Loss (VSWR)	>18 dB (<1.28:1)

Rx Characteristics	Specification
Frequency Range	1850 to 1910 MHz
Operating Bandwidth	60 MHz
Noise Figure (Ambient)	1.7 dB
Gain Variation Over Frequency &Temperature	12.0 ± 1.3 dB
Gain Variation with Frequency	± 0.7 dB
Output 1dB Compression	≥+11.5 dBm
Output IP3	≥+22 dBm
Return Loss (VSWR)	>18 dB (<1.28:1)

System Characteristics	Specification
Rx to Tx Rejection	>80 dB
Intermodulation (2 Tx Carriers at +43 dBm, products in Rx operating Band)	<-110 dBm
DC Supply Voltage	+10V to +17V DC
Current (nominal)	<110 mA normal >170 mA alarm

Environmental Characteristics	Specification
Operating Temperature Range	-40°C to +65°C (-40°F to +149°F)
Storage Temperature	-40°C to +85°C (-40°F to +185°F)
Relative Humidity	5% to full Immersion
Enclosure Protection	IP68
Lightning Protection BTS Port ANT Port	 8/20 µ S 10 kA pulse DC Grounded
EMC	ETS 300 342-3 Compliant
MTBF	>800,000 hrs

Configuration Diagram



Mechanical Characteristics	Specification
Dimensions	335 x 162 x 77 mm (13.2 x 6.4 x 3.0 in.)
Weight	<5 kg (<11.0 lb).
Volume	4.2 Ltr (256 cu.in.)
RF Connectors BTS ANT	 7/16 Female 7/16 Female

This document gives only a general description of the product(s) and shall not form part of any contract.

ISSUE : TMA S20057A1 Preliminary

REMEC Inc. • 14020 Stowe Drive • Poway • CA • 92064 • USA
Tel: (+1) 858.560.3720 • Fax: (+1) 858.605.3666 • Email: sales@remec.com • www.remec.com

REMEC
Building solutions through teamwork.

SITESAFE
RF COMPLIANCE EXPERTS

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

Smartlink on behalf of AT&T Mobility, LLC
Site FA – 10035414
Site ID – CT2255 (MRCTB025391)
USID – 88366
Site Name – Hamden 4286 Whitney Avenue Nu
Site Compliance Report

4286 Whitney Avenue
Hamden, CT 06518

Latitude: N41-26-53.69
Longitude: W72-54-36.50
Structure Type: Utility Pole

Report generated date: February 16, 2018
Report by: Jessica Johnson
Customer Contact: David Barbagallo

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

Table of Contents

1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Yes
RF Sign(s) @ access point(s)	(1) Information 1 and (1) Caution at Utility Pole Base (1) Information 2 @ Equipment Gate
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated RFE level on the Ground	<1% General Public Limit
FCC & AT&T Compliant?	Will Be Compliant

Note: All existing signage was documented during a previous site visit DATE.

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

RFDS: NEW-ENGLAND_CONNECTICUT_CTV2255_2018-LTE-Next-Carrier_LTE-2C_sp656b_2051A0D6T5_10035414_88366_06-21-2017_Final-Approved_v2.00

CD's: 10035414_AE201_180108_CTL02255_REV2

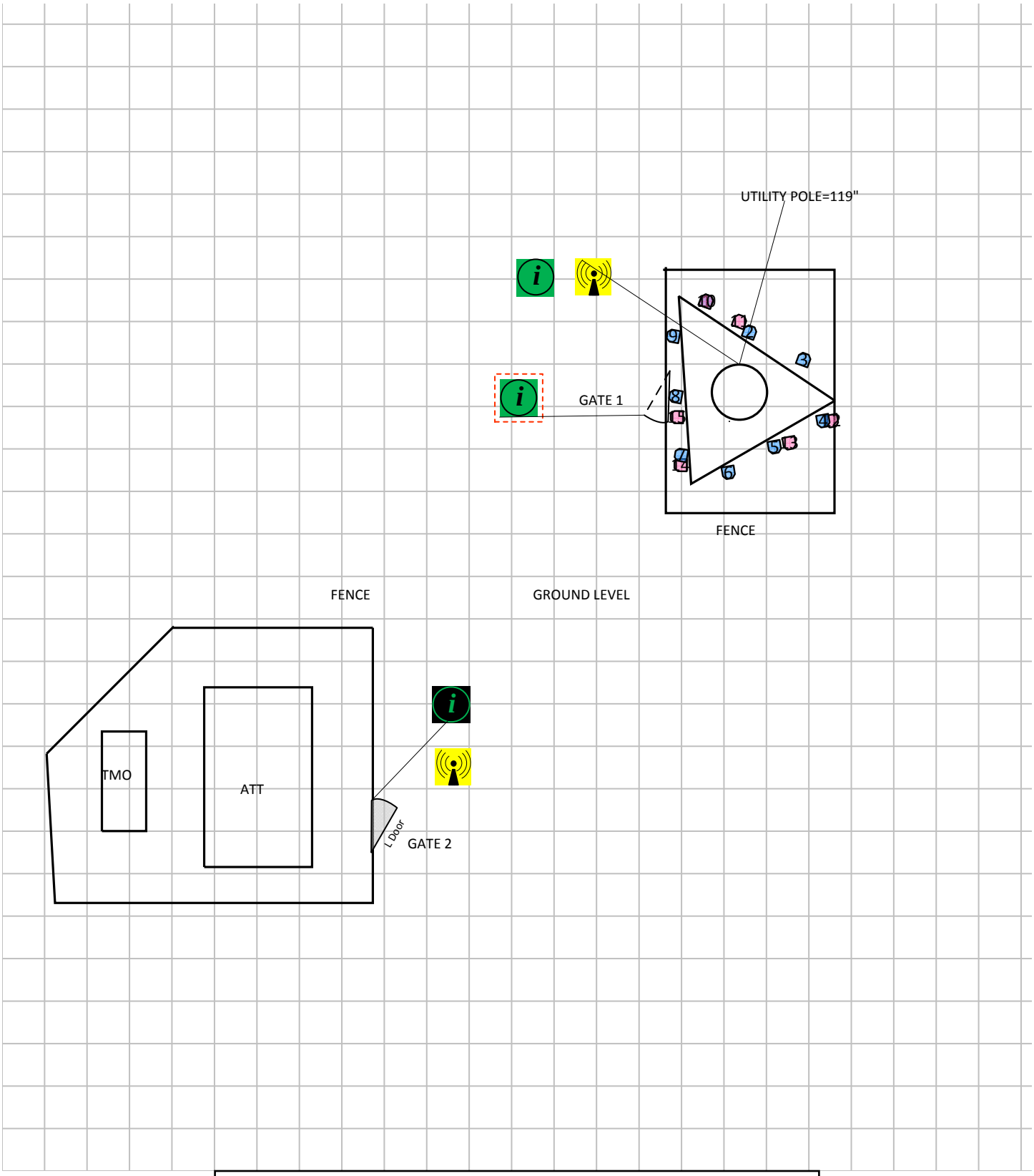
RF Powers Used: AT&T Mobility, LLC Approved Powers - 10-9-17

2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- AT&T Mobility, LLC Contribution
- Elevation View

Site Scale Map For: Hamden 4286 Whitney Avenue Nu



(Feet)

0 8.1 16.2

www.sitesafe.com
Site Name:Hamden 4286 Whitney Avenue Nu
2/16/2018 3:09:26 PM

Carrier Identification

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

Sign Legend

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

Barrier ——————

Proposed Barriers/ Signs — — — — —

3 Antenna Inventory

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

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z
1	AT&T MOBILITY LLC (proposed)	CCI Antennas HPA-65R-BUU-H6	Panel	700	20	66.2	6	11.68	0	0	1	883.4	103.7'	123.6'	113'
1	AT&T MOBILITY LLC (proposed)	CCI Antennas HPA-65R-BUU-H6	Panel	1900	20	61.1	6	14.53	0	0	1	1702.8	103.7'	123.6'	113'
2	AT&T MOBILITY LLC (decommissioned)	Powerwave 7770	Panel	850	20	82	4.6	11.51	0	0	0	0	108.8'	119.9'	113.7'
3	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	20	82	4.6	11.51	0	1	0	1132.6	115.2'	116.7'	113.7'
4	AT&T MOBILITY LLC (proposed)	CCI Antennas HPA-65R-BUU-H4	Panel	1900	170	62	4	13.33	0	0	1	1291.7	117.5'	109.5'	114'
4	AT&T MOBILITY LLC (proposed)	CCI Antennas HPA-65R-BUU-H4	Panel	700	170	65.2	4	11.27	0	0	1	803.8	117.5'	109.5'	114'
5	AT&T MOBILITY LLC (decommissioned)	Powerwave 7770	Panel	850	170	82	4.6	11.51	0	0	0	0	111.8'	106.4'	113.7'
6	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	170	82	4.6	11.51	0	1	0	1132.6	106.3'	103.4'	113.7'
7	AT&T MOBILITY LLC (proposed)	CCI Antennas HPA-65R-BUU-H4	Panel	1900	280	62	4	13.33	0	0	1	1291.7	100.8'	105.5'	114'
7	AT&T MOBILITY LLC (proposed)	CCI Antennas HPA-65R-BUU-H4	Panel	700	280	65.2	4	11.27	0	0	1	803.8	100.8'	105.5'	114'
8	AT&T MOBILITY LLC (decommissioned)	Powerwave 7770	Panel	850	280	82	4.6	11.51	0	0	0	0	100.1'	112.4'	113.7'
9	AT&T MOBILITY LLC	Powerwave 7770	Panel	850	280	82	4.6	11.51	0	1	0	14157.9	99.8'	119.5'	113.7'
10	T-MOBILE	Generic 6 Ft./65 Deg.	Panel	1900	20	65	6.3	16.26	-	-	-	2536	103.7'	123.6'	95.9'
11	T-MOBILE	Generic 6 Ft./65 Deg.	Panel	2100	20	65	6.3	15.53	-	-	-	2143.6	107.6'	121.2'	95.9'
12	T-MOBILE	Generic 6 Ft./65 Deg.	Panel	1900	170	65	6.3	16.26	-	-	-	2536	118.5'	109.5'	95.9'
13	T-MOBILE	Generic 6 Ft./65 Deg.	Panel	2100	170	65	6.3	15.53	-	-	-	2143.6	113.5'	106.9'	95.9'
14	T-MOBILE	Generic 6 Ft./65 Deg.	Panel	1900	270	65	6.3	16.26	-	-	-	2536	100.7'	104.3'	95.9'
15	T-MOBILE	Generic 6 Ft./65 Deg.	Panel	2100	270	65	6.3	15.53	-	-	-	2143.6	100.3'	109.9'	95.9'

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

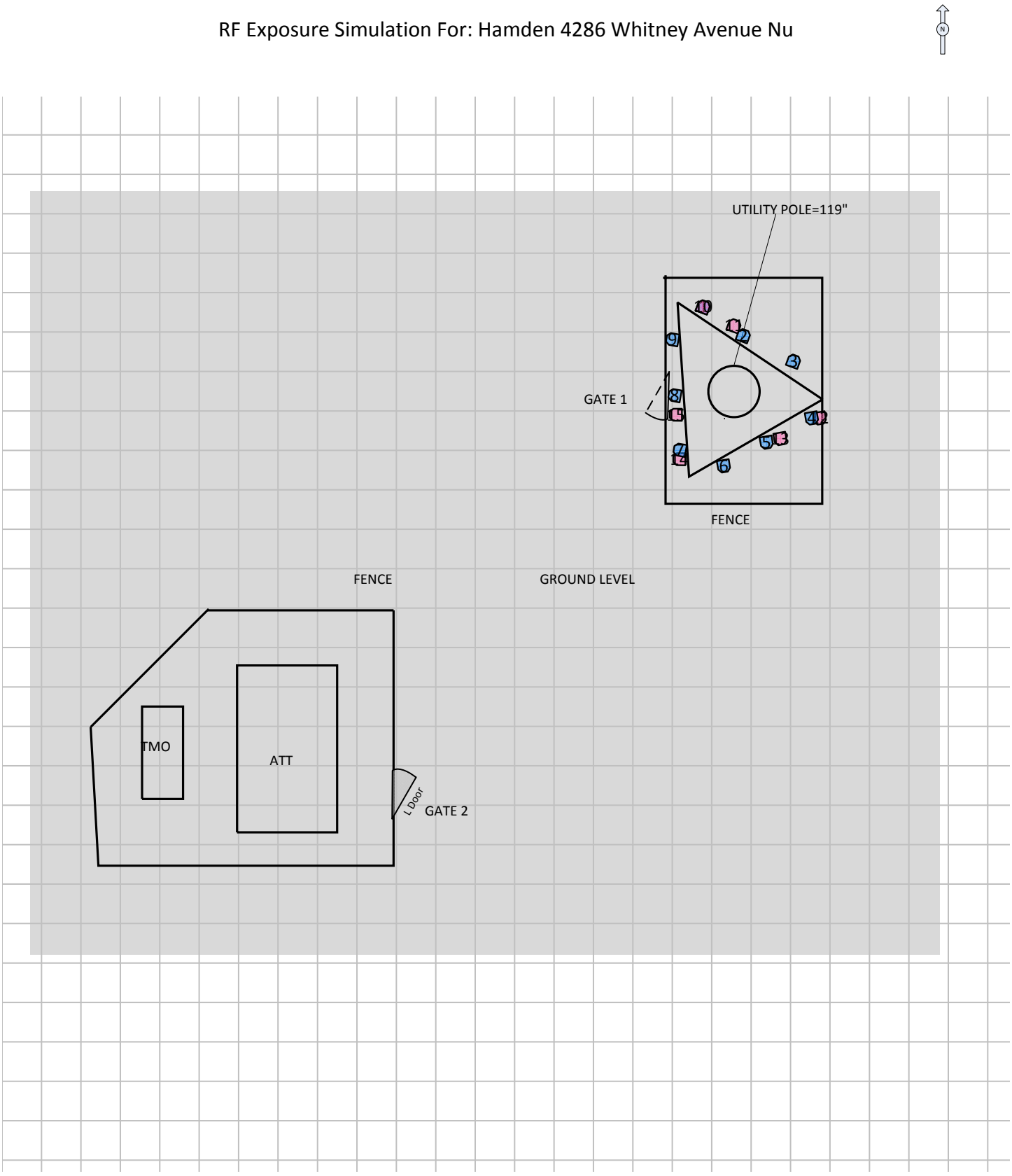
Note: The _MHz LTE technology is being added to an existing antenna.

4 Emission Predictions

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

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: Hamden 4286 Whitney Avenue Nu



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

% of FCC Public Exposure Limit

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

Carrier Identification

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

Barrier

Proposed Barriers/ Signs

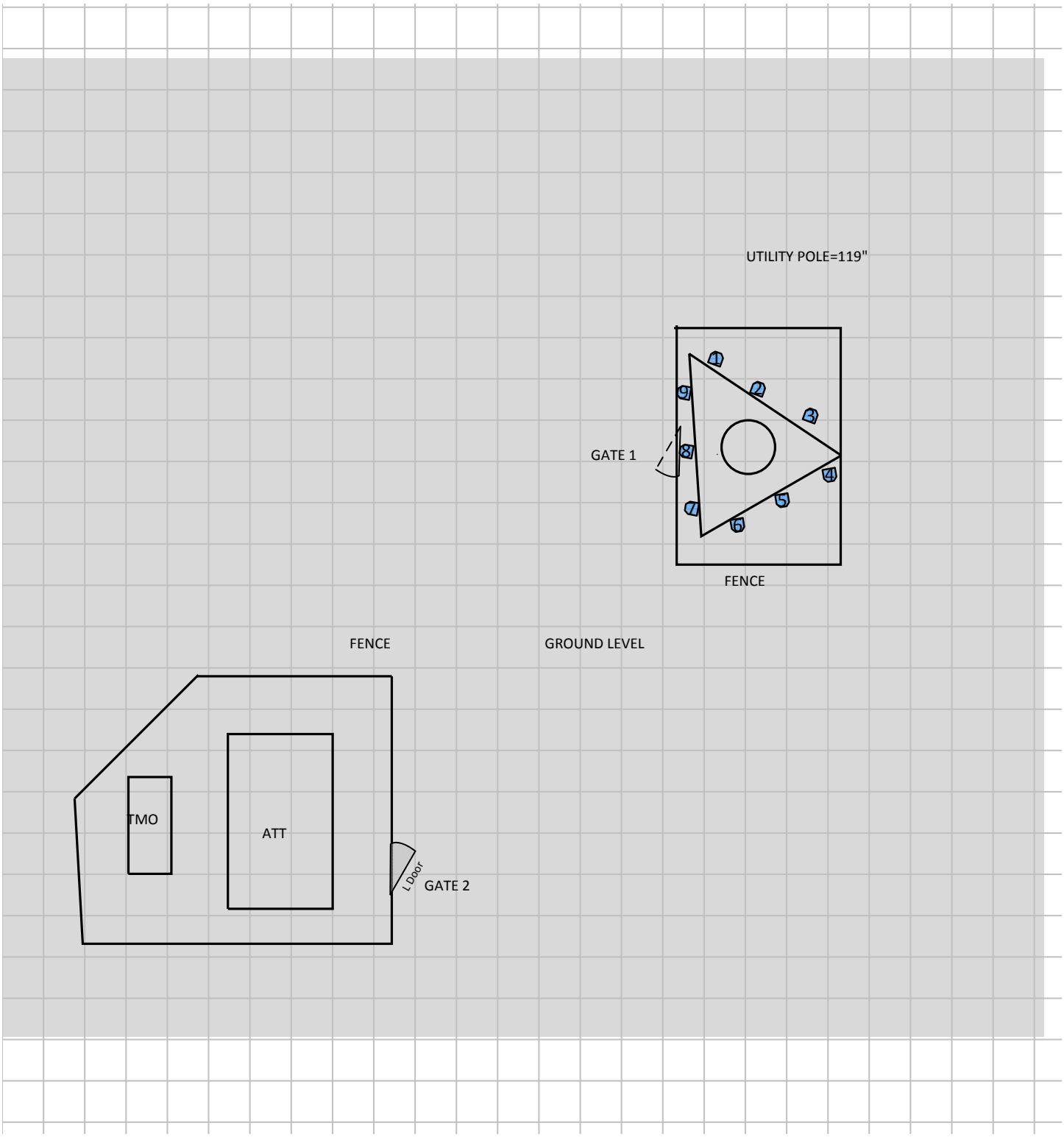
(Feet)

0 9.1 18.1

www.sitesafe.com
Site Name:Hamden 4286 Whitney Avenue Nu
2/16/2018 3:06:39 PM

SitesafeTC Version:1.0.0.0 - 0.0.0.268
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Hamden 4286 Whitney Avenue Nu
ATT Mobility, LLC Contribution



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

% of FCC Public Exposure Limit

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

Carrier Identification

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

Barrier

Proposed Barriers/ Signs

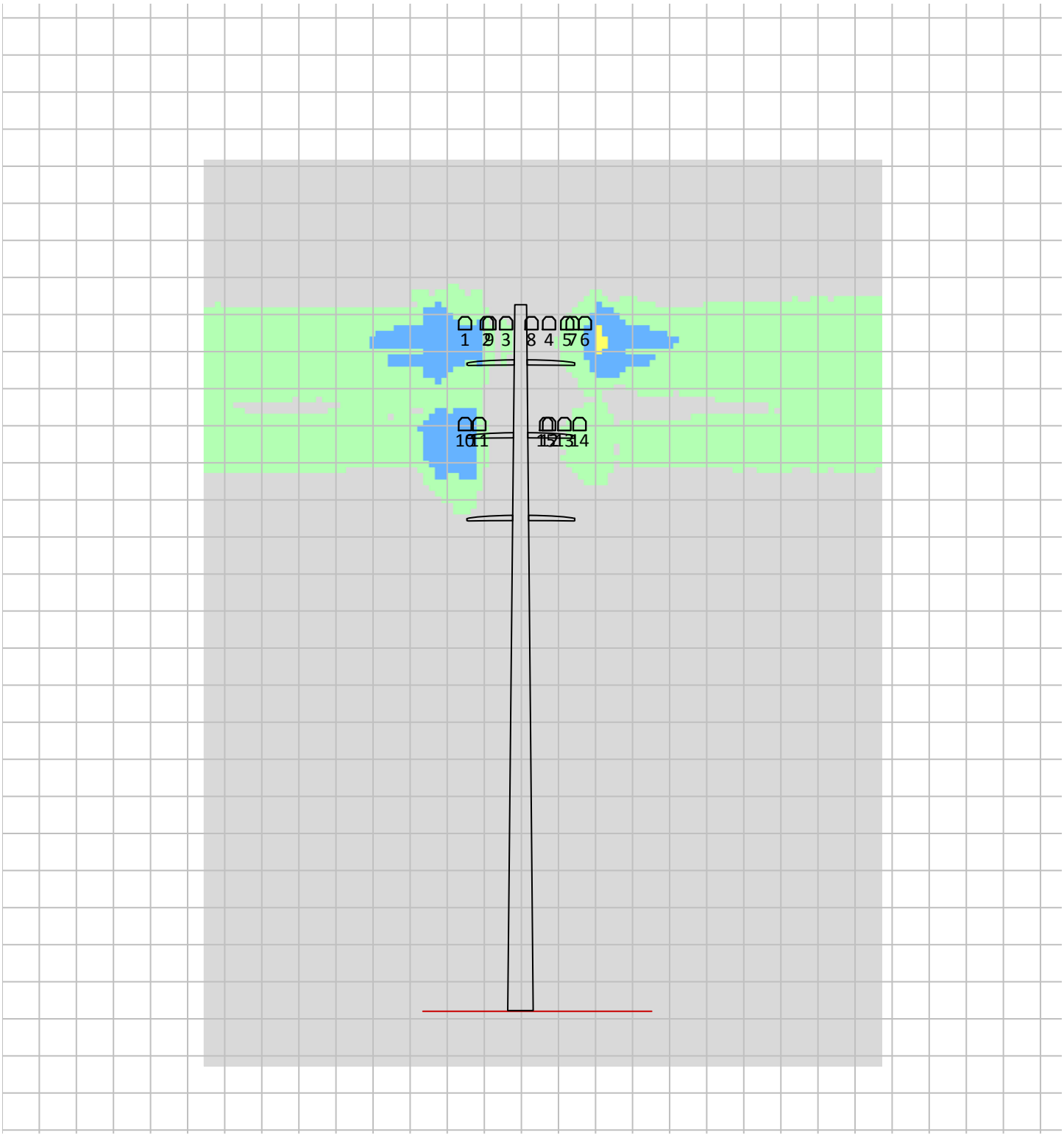
(Feet)

0 9.1 18.2

www.sitesafe.com
Site Name:Hamden 4286 Whitney Avenue Nu
2/16/2018 3:00:59 PM

SitesafeTC Version:1.0.0.0 - 0.0.0.268
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: Hamden 4286 Whitney Avenue Nu
Elevation View



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

% of FCC Public Exposure Limit

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

Carrier Identification

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

Barrier

Proposed Barriers/ Signs

(Feet)

0 12.7 25.3

www.sitesafe.com
Site Name:Hamden 4286 Whitney Avenue Nu
2/16/2018 3:08:36 PM

SitesafeTC Version:1.0.0.0 - 0.0.0.268
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

5 Site Compliance

5.1 Site Compliance Statement

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

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

Based on measurement or predictions, other wireless operators on this site may be out of RF exposure compliance with FCC regulations on this site. We recommend that those operators review this site with respect to RF exposure compliance.

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

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

5.2 Actions for Site Compliance

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

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

Site Access Location

Information 1 sign required at Gate

Notes:

- Ensure all existing signage documented in this report still exist at the site, unless otherwise indicated.

6 Reviewer Certification

The reviewer whose signature appears below hereby certifies and affirms:

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

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

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

February 16, 2018

Appendix A – Statement of Limiting Conditions

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

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

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

Appendix B – Regulatory Background Information

FCC Rules and Regulations

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

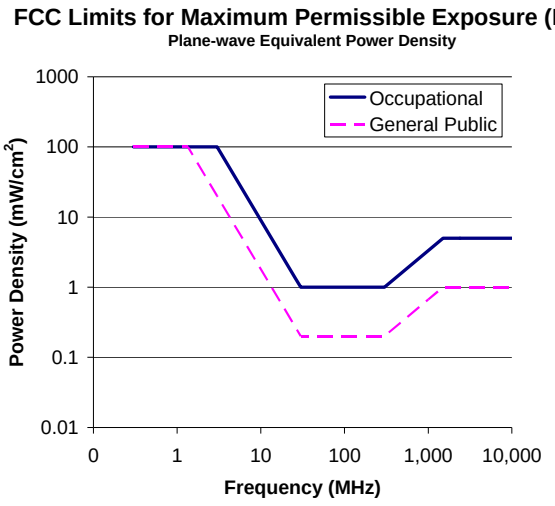
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible*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

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

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

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

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



Limits for Occupational/Controlled Exposure (MPE)

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

Limits for General Population/Uncontrolled Exposure (MPE)

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

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

OSHA Statement

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

(a) Each employer –

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

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

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

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

Appendix C – Safety Plan and Procedures

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

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

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

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

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

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

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

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

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

Appendix D – RF Emissions

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

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

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

Appendix E – Assumptions and Definitions

General Model Assumptions

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

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

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

Use of Generic Antennas

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

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

Definitions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix F – References

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

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