NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
4 Angela's Way Burlington CT 06013
860-209-4690
denise@northeastsitesolutions.com

November 26, 2018

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
437 Hobart Street, Southington CT 06489
Latitude: 41.6083000
Longitude: -72.8628000
T-Mobile Site#: CT11734B_L700 4x2

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 100-foot level of the existing 105-foot lattice tower at 437 Hobart Street, Southington CT. The 105-foot lattice tower is owned by CL&P – Eversource structure #1814. The property is owned by Frederick & Bonnie Lasky. T-Mobile now intends to replace six (6) of its existing antennas with three (3) new 600/700/1900/2100 MHz antenna. The new antennas would be installed at the 100-foot level of the tower.

Planned Modifications:

Tower:
Remove: (3)APX16 DWV Antenna 1900/2100 MHz

Remove and Replace:
(3) LNX 6515-A1M Antenna (REMOVE) - (3) RFS-APXVAARR24_43U-NA20 Antenna 600/700/1900/2100 MHz **(REPLACE)**
Install New:
(6) 7/8" Coax
Existing to Remain:
(18) 7/8" Coax
Ground:
(3) RRU
(3) Diplexer
(3) TMA to remain - (3) TMA to be removed

This facility was approved by the CT Siting Council Petition No.764A–on September 16, 2016 Approval to replace electric transmission tower #1814. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16-SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Town Manager -Mark J. Sciota, Elected Official and Matthew A. Reimondo, Zoning Official for the City of Southington, as well as the property owner and the tower owner.

The planned modifications to the 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 structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Denise Sabo
Mobile: 860-209-4690
Fax: 413-521-0558
Office: 4 Angela's Way, Burlington CT 06013
Email: denise@northeastsitesolutions.com

cc: Mark J. Sciota- Southington Town Manager
Matthew A. Reimondo– Southington Zoning Enforcement Officer
Eversource - tower owner
Frederick & Bonnie Lasky - property owner

Exhibit A

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

September 16, 2016

Eric Dahl
Vertical Development
20 Commercial Street
Branford, CT 06405

RE: **PETITION NO. 764A –** T-Mobile Northeast LLC (T-Mobile) request to amend its declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required to relocate an existing T-Mobile facility attached to an Eversource transmission line structure (#1814) onto an approved replacement electric transmission line structure (#1814) within the existing Eversource right-of-way located at 437 Hobart Street, Southington, Connecticut.

Dear Mr. Dahl:

At a public meeting held on September 15, 2016, the Connecticut Siting Council (Council) considered and ruled that the above-referenced proposal to amend its declaratory ruling would not have a substantial adverse environmental effect, and pursuant to Connecticut General Statutes § 16-50k, would not require a Certificate of Environmental Compatibility and Public Need with the following conditions:

1. Use of off-road construction equipment that meets the latest EPA or California Air Resources Board standards, or in the alternative, equipment with the best available controls on diesel emissions, including, but not limited to, retrofitting with diesel oxidation catalysts, particulate filters and use of ultra-low sulfur fuel;

2. Compliance with the provisions of Section 22a-174-18(b)(3)(C) of the Regulations of Connecticut State Agencies that limit the idling of mobile sources to 3 minutes;

3. Approval of any minor project changes be delegated to Council staff;

4. Deployment and operation of a temporary facility subject to the submission of final design details to the Executive Director for review and final authorization;

5. A final copy of the structural evaluation letter dated July 22, 2016, stamped by a Professional Engineer, duly licensed in the State of Connecticut, shall be submitted to the Council prior to construction;

6. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed within three years from the date of the mailing of the Council's decision, this decision shall be void, and the facility owner/operator shall dismantle the facility and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The facility owner/operator shall provide written notice to the Executive Director of any schedule changes as soon as is practicable;

7. Any request for extension of the time period to fully construct the facility shall be filed with the Council not later than 60 days prior to the expiration date of this decision and shall be served on all parties and intervenors, if applicable, and the Town of Southington;

8. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;

9. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by the Petitioner shall be removed within 60 days of the date the antenna ceased to function;

10. The facility owner/operator shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v;

11. This Declaratory Ruling may be transferred, provided the facility owner/operator/transferor is current with payments to the Council for annual assessments and invoices under Conn. Gen. Stat. §16-50v and the transferee provides written confirmation that the transferee agrees to comply with the terms, limitations and conditions contained in the Declaratory Ruling, including timely payments to the Council for annual assessments and invoices under Conn. Gen. Stat. §16-50v; and

12. If the facility owner/operator is a wholly owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the facility within 30 days of the sale and/or transfer.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the petition dated August 16, 2016.

Enclosed for your information is a copy of the staff report on this project.

Very truly yours,

Robert Stein MAB

Robert Stein
Chairman

RS/MP/lm

Enclosure: Staff Report dated September 15, 2016

c: The Honorable Michael Riccio, Chairman, Town of Southington
Garry Brumback, Town Manager, Town of Southington
Robert Phillips, Director of Planning and Community Development, Town of Southington

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

Petition No. 764A
T-Mobile
Southington, Connecticut
Staff Report
September 15, 2016

On August 18, 2016, the Connecticut Siting Council (Council) received a petition from T-Mobile Northeast LLC (T-Mobile) to amend its declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the proposed relocation of an existing telecommunications facility attached to an existing Eversource electric transmission structure. On or about August 11, 2016, T-Mobile notified the Town, the property owner of record, and abutting property owners of the proposed project. To date, the Council has not received any comments regarding the petition filing.

On May 17, 2006, T-Mobile (formerly Omnipoint) received approval from the Council in Petition No. 764 to install a telecommunications facility on an existing 90-foot tall electric transmission line structure (#1814) located at 437 Hobart Street in Southington. T-Mobile's existing facility consists of three panel antennas installed on a pipe mast extending about ten feet above the existing lattice structure and associated ground equipment installed within a fenced compound at the base of the lattice structure.

On January 21, 2016, the Council approved Petition No. 1201, filed by Eversource, which includes rebuilding and reconductoring of approximately 1.85 miles of the existing double-circuit lattice towers that support the existing #1800 and #1810 lines from Southington Substation to structure #1815 in Southington. The petition included the replacement of existing transmission structure #1814. Eversource designed the replacement transmission structure as a 105-foot above ground level (agl) double-circuit monopole to accommodate both T-Mobile and Eversource's necessary transmission line clearance requirements. The new replacement structure would be installed adjacent to Eversource's existing lattice transmission structure that would be removed as part of Petition No. 1201. T-Mobile's existing compound would remain in the same location.

T-Mobile's proposed replacement facility would consist of new amplifiers attached to Unistrut framing within the existing compound and six new panel antennas installed on T-arms at a centerline height of 100 feet agl on the replacement transmission structure. The top of T-Mobile's antennas would extend to 104 feet agl, which is slightly below the 105-foot agl height of the new Eversource transmission structure. Coax would be installed along one side of the monopole, connecting the new antennas to the radio equipment within the compound. T-Mobile would utilize the existing access road from Hobart Street.

All work would be within Eversource's existing right-of-way. T-Mobile's proposed project would not require site clearing and would not impact wetlands. The site is not located within a shaded area of the Natural Diversity Database. The maximum worst-case power density from T-Mobile's antennas would be 3.7 percent of the applicable Federal Communications Commission limit for radio frequency power density.

The areas surrounding the transmission structure and the transmission right-of-way are residential in nature. However, the incremental visual impact is not expected to be significant because the approved replacement transmission structure that T-Mobile would co-locate on will be comparable in height to the existing structure and will have a more narrow visual profile as a monopole versus the existing lattice tower. Furthermore, T-Mobile's antennas would not extend above the top of the replacement structure. T-Mobile would maintain the same equipment compound.

Due to potential for complications associated with reconstruction of Eversource's 115-kV transmission line, T-Mobile may need to deploy a temporary telecommunications facility in order to maintain wireless service to the surrounding area.

If the Petition is approved, staff suggests including the following conditions:

1. Use of off-road construction equipment that meets the latest EPA or California Air Resources Board standards, or in the alternative, equipment with the best available controls on diesel emissions, including, but not limited to, retrofitting with diesel oxidation catalysts, particulate filters and use of ultra-low sulfur fuel;
2. Compliance with the provisions of Section 22a-174-18(b)(3)(C) of the Regulations of Connecticut State Agencies that limit the idling of mobile sources to 3 minutes;
3. Approval of any minor project changes be delegated to Council staff;
4. Deployment and operation of a temporary facility subject to the submission of final design details to the Executive Director for review and final authorization; and
5. A final copy of the structural evaluation letter dated July 22, 2016, stamped by a Professional Engineer, duly licensed in the State of Connecticut, shall be submitted to the Council prior to construction.

Site location at 437 Hobart Street, Southington.

Exhibit B

437 HOBART ST

Location	437 HOBART ST	**Mblu**	123/ / 084/ /
Acct#	8556	**Owner**	LASKY FREDERICK W & BONNIE G
Assessment	$137,140	**Appraisal**	$195,910
PID	12734	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$126,200	$69,710	$195,910
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$88,340	$48,800	$137,140

Owner of Record

Owner	LASKY FREDERICK W & BONNIE G	**Sale Price**	$145,900
Co-Owner		**Certificate**	
Address	437 HOBART ST SOUTHINGTON, CT 06489-3354	**Book & Page**	515/ 244
		Sale Date	07/11/1991
		Instrument	00

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
LASKY FREDERICK W & BONNIE G	$145,900		515/ 244	00	07/11/1991

Building Information

Building 1 : Section 1

Year Built:	1991
Living Area:	1,134
Building Percent Good:	83

Building Attributes	
Field	**Description**
Style	Raised Ranch

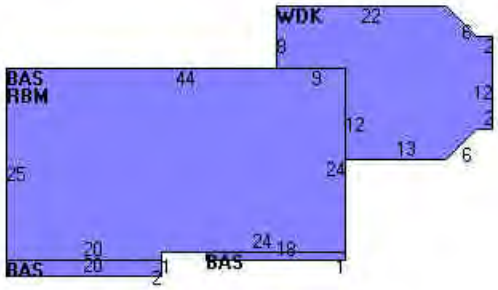
Model	Residential
Grade:	C+
Stories	1
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Average
Interior Wall 2	
Interior Flr 1	Average
Interior Flr 2	
Heat Fuel	Electric
Heat Type:	Elec Baseboard
AC Type:	Central
Total Bedrooms:	3
Full Bthrms:	1
Half Baths:	0
Extra Fixtures	0
Total Rooms:	5
Bath Style:	Average
Kitchen Style:	Average
Total Kitchens	1
Fireplaces	0
Whirlpool Tubs	
Fin Bsmt Area	
Fin Bsmt Quality	
Bsmt Garages	2
.	
Attic Type	None
Cath Ceiling	No

Building Photo

123 084 05/20/2015

(http://images.vgsi.com/photos2/SouthingtonCTPhotos//\00\04\

Building Layout



(http://images.vgsi.com/photos2/SouthingtonCTPhotos//Sketche

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,134	1,134
RBM	Raised Basement	1,076	0
WDK	Deck	420	0
		2,630	1,134

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Land Line Valuation

Use Code	101	**Size (Acres)**	0.54
Description	Single Family	**Depth**	
Zone	R-20/25		
Alt Land Appr	No		
Category			

Outbuildings

Outbuildings					Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Bldg #**
SPL4	Above Ground Pool			452 Units	1
SHD1	Shed	FR	Frame	120 S.F.	1
SHD3	Metal Shed			80 S.F.	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$126,200	$69,710	$195,910
2016	$126,200	$69,710	$195,910
2015	$126,200	$69,710	$195,910
2014	$119,400	$66,390	$185,790
2013	$119,400	$66,390	$185,790

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$88,340	$48,800	$137,140
2016	$88,340	$48,800	$137,140
2015	$88,340	$48,800	$137,140
2014	$83,580	$46,470	$130,050
2013	$83,580	$46,470	$130,050

Property Boundaries

- Historic Parcel Boundary
- Easement
- Town Boundary
- Parcels

Structures and Buildings

- Stone Wall
- Fence or Gate
- Wall or Barrier
- Pools
- Building or Structure
- Decks, Wharf or Pier

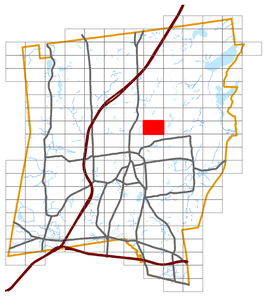
Natural Features

- Path or Trail
- Streams
- Lake or Pond
- River
- Swamp
- Recreational / Sportfield

Roads and Transportation

- Bridges
- Paved
- DriveWays and Parking Lots

133	134	135
122	123	124
111	112	113



Disclaimer:
This map is for informational purposes only. All information is subject to verification by any user. The Town of Southington and its mapping contractors assume no legal responsibility for the information contained herein.

Map: 123

NEGEO
New England Geosystems
www.negeosystems.com
282 Main Street Extension - C2
Middletown, CT 06457 • (203) 404 - 7129

1 inch equals 100 feet

100 0 100 200 300 400 500 600 Feet

Town of Southington, Connecticut 2018
Assessment Parcel Map

Map Coordinates based on NAD 83 Connecticut State Plane Feet.
Original planimetric features based on aerial photography dated April 1997. Planimetric features updated using aerial photography dated June 2016.

Map Produced October 2018

Map: 123

Exhibit C

ANTENNA UPGRADES BY

T-Mobile

T-MOBILE NORTHEAST LLC

PROJECT: L700 4X2

SITE NUMBER: CT11734B

SITE NAME: CT734 / CL&P STANCHION

EVERSOURCE STRUCTURE # 1814

SITE ADDRESS: 437 HOBART STREET
SOUTHINGTON, CT 06489
(RF CONFIGURATION 67D94B OUTDOOR)

PROJECT SCOPE:

UPGRADE OF EXISTING WIRELESS FACILITY AS FOLLOWS:
UPGRADE EXISTING 6102 CABINET INTERNALLY.
REPLACE (6) EXISTING ANTENNAS WITH (3) NEW ANTENNAS.
REMOVE (3) OF (6) EXISTING TMA'S AT GROUND LEVEL.
ADD (3) REMOTE RADIO UNITS (RRU) AT GROUND LEVEL.
ADD (3) DIPLEXER AT GROUND LEVEL.
ADD (6) 7/8" COAXIAL CABLE TO EXISTING (18).

PROJECT NOTES:

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION.
   HANDICAPPED ACCESS IS NOT REQUIRED.
   POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
   NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACES THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. DEVELOPMENT AND USE OF THE SITE WILL CONFORM TO ALL APPLICABLE CODES, ORDINANCES AND SPECIFICATIONS.
4. REFER TO "STRUCTURAL ANALYSIS OF POLE" REV 1, DATED AUGUST 29, 2018, PREPARED BY CENTEK ENGINEERING AND "ANTENNA MOUNT ANALYSIS" DATED AUGUST 6, 2018 ALSO BY CENTEK ENGINEERING.

APPLICABLE STATE ADOPTION CODES:

2018 CONNECTICUT STATE BUILDING CODE (CSBC).

ANSI/TIA-222-G-2005 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

2017 NATIONAL ELECTRICAL CODE (NFPA 70) FOR POWER AND GROUNDING REQUIREMENTS.

APPROVALS:

FSA CM	DATE
RF ENGINEER	DATE
FOPS	DATE
T-MOBILE ENGINEERING AND DEVELOPMENT	DATE
	DATE
	DATE

SITE IMAGE:

VICINITY MAP:

PROJECT INFORMATION:

SITE NAME:	CT734 / CL&P STANCHION
SITE NUMBER:	CT11734B
ADDRESS:	437 HOBART STREET SOUTHINGTON, CT 06489
STRUCTURE TYPE:	ELECTRIC TRANSMISSION TOWER EVERSOURCE STRUCTURE NO. 1814
COORDINATES:	41°-36'-30.60" N 72°-51'-47.43" W

PROJECT TEAM:

APPLICANT:	T-MOBILE NORTHEAST, LLC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 860-692-7100
LANDLORD:	EVERSOURCE 56 PROSPECT STREET HARTFORD, CT 06103
PROJECT MANAGER:	NORTHEAST SITE SOLUTIONS 420 MAIN STREET, BLDG 4 STURBRIDGE, MA 01566 SHELDON FREINCLE SHELDON@NORTHEASTSITESOLUTIONS.COM 201-776-8521
CONSULTANTS:	FORESITE LLC 462 WALNUT ST NEWTON, MA 02460 SAEED MOSSAVAT SMOSSAVAT@FORESITELLC.COM 617-212-3123

SHEET INDEX:

APPLICANT:

T-Mobile

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:

FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL

REV	DESCRIPTION	DATE
A	PRELIMINARY	10/23/18
B	ANTENNA MOUNT BRACE ADD.	10/29/18
0	SIGNED AND SEALED	11/07/18
1	UPDATED STRUCTURAL REF.	11/23/18

SITE NUMBER: CT11734B
SITE NAME: CT734 / CL&P STANCHION
EVERSOURCE STRUCTURE# 1814
SITE ADDRESS: 437 HOBART STREET
SOUTHINGTON, CT 06489

SHEET TITLE:

T-1: TITLE SHEET

GENERAL NOTES:

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.

2. THE ARCHITECT/ENGINEER HAS MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.

3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE CLIENT'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.

5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.

6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

7. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS DURING CONSTRUCTION.

8. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE BASIC STATE BUILDING CODE, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJEC

9. THE CONTRACTOR SHALL NOTIFY THE CLIENT'S REPRESENTATIVE IN WRITING WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE CLIENT'S REPRESENTATIVE.

10. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:

A. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS, AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS BUILDING CODES" OR LATEST EDITION.

B. AWS: AMERICAN WELDING SOCIETY INC. AS PUBLISHED IN "STANDARD D1.1–08, STRUCTURAL WELDING CODE" OR LATEST EDITION.

C. AISC: AMERICAN INSTITUTE FOR STEEL CONSTRUCTION AS PUBLISHED IN "CODE FOR STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"; "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" (LATEST EDITION).

11. BOLTING:

A. BOLTS SHALL BE CONFORMING TO ASTM A325 HIGH STRENGTH, HOT DIP GALVANIZED WITH ASTM A153 HEAVY HEX TYPE NUTS.

B. BOLTS SHALL BE 3/4"ø MINIMUM (UNLESS OTHERWISE NOTED)

C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.

12. FABRICATION:

A. FABRICATION OF STEEL SHALL CONFORM TO THE AISC AND AWS STANDARDS AND CODES (LATEST EDITION).

B. ALL STRUCTURAL STEEL SHALL BE HOT–DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 (LATEST EDITION), UNLESS OTHERWISE NOTED.

13. ERECTION OF STEEL:

A. PROVIDE ALL ERECTION EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF THE COMPLETED CONSTRUCTION BUT ARE NECESSARY FOR ITS PROPER ERECTION.

B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISHED LINES AND ELEVATIONS AND RIGIDLY FASTENED IN PLACE WITH SUITABLE ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING.

C. TEMPORARY BRACING, GUYING AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SAFE AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.

14. ANTENNA INSTALLATION:

A. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND CLIENT'S REPRESENTATIVE SPECIFICATIONS.

B. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

C. INSTALL COAXIAL / FIBER CABLES AND TERMINATIONS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS.

15. ANTENNA AND COAXIAL / FIBER CABLE GROUNDING:

A. ALL EXTERIOR #6 GREEN GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH ANDREWS CONNECTOR/SPLICE WEATHERPROOFING KIT TYPE #221213 OR EQUAL.

B. ALL COAXIAL / FIBER CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL / FIBER CABLE (NOT WITHIN BENDS).

16. RELATED WORK, FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO BID:

A. FLASHING OF OPENING INTO OUTSIDE WALLS

B. SEALING AND CAULKING ALL OPENINGS

C. PAINTING

D. CUTTING AND PATCHING

17. REQUIREMENTS OF REGULATORY AGENCIES:

A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE. INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

B. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, AND SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

C. TIA–EIA – 222 (LATEST EDITION). STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

D. FAA – FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460–IH, OBSTRUCTION MARKING AND LIGHTING.

E. FCC – FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES AND FORM 715A, HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES.

F. AISC – AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 BOLTS (LATEST EDITION).

G. NEC – NATIONAL ELECTRICAL CODE – ON TOWER LIGHTING KITS.

H. UL – UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.

I. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.

J. 2009 LIFE SAFETY CODE NFPA – 101.

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

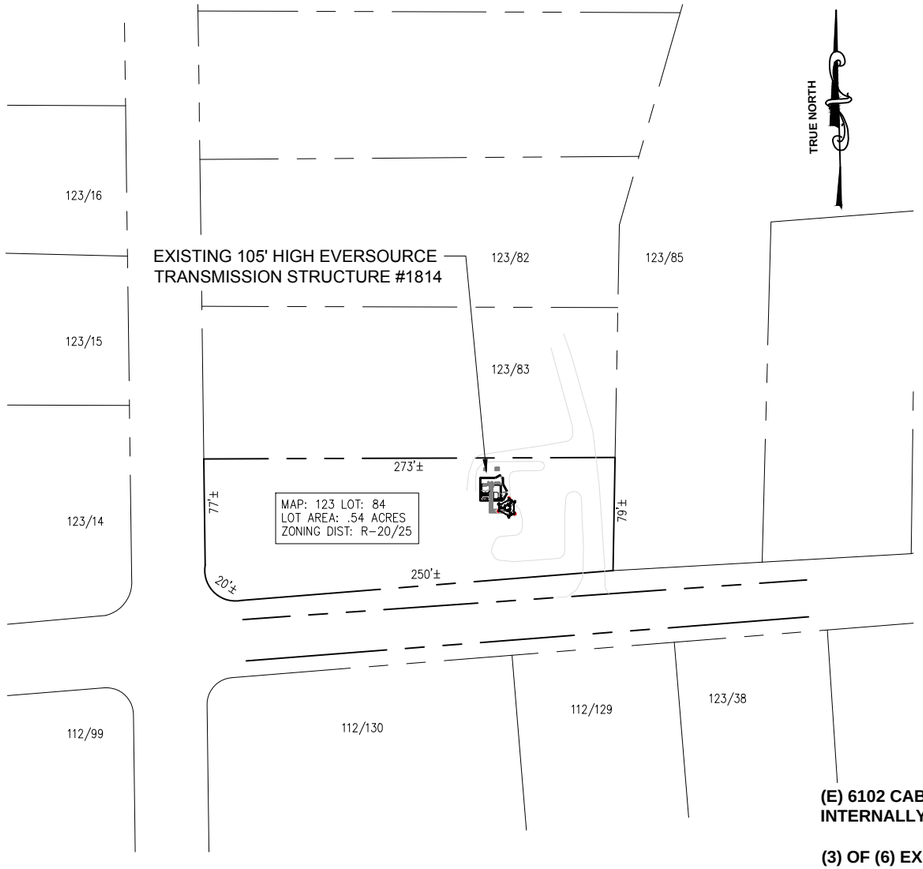
CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL

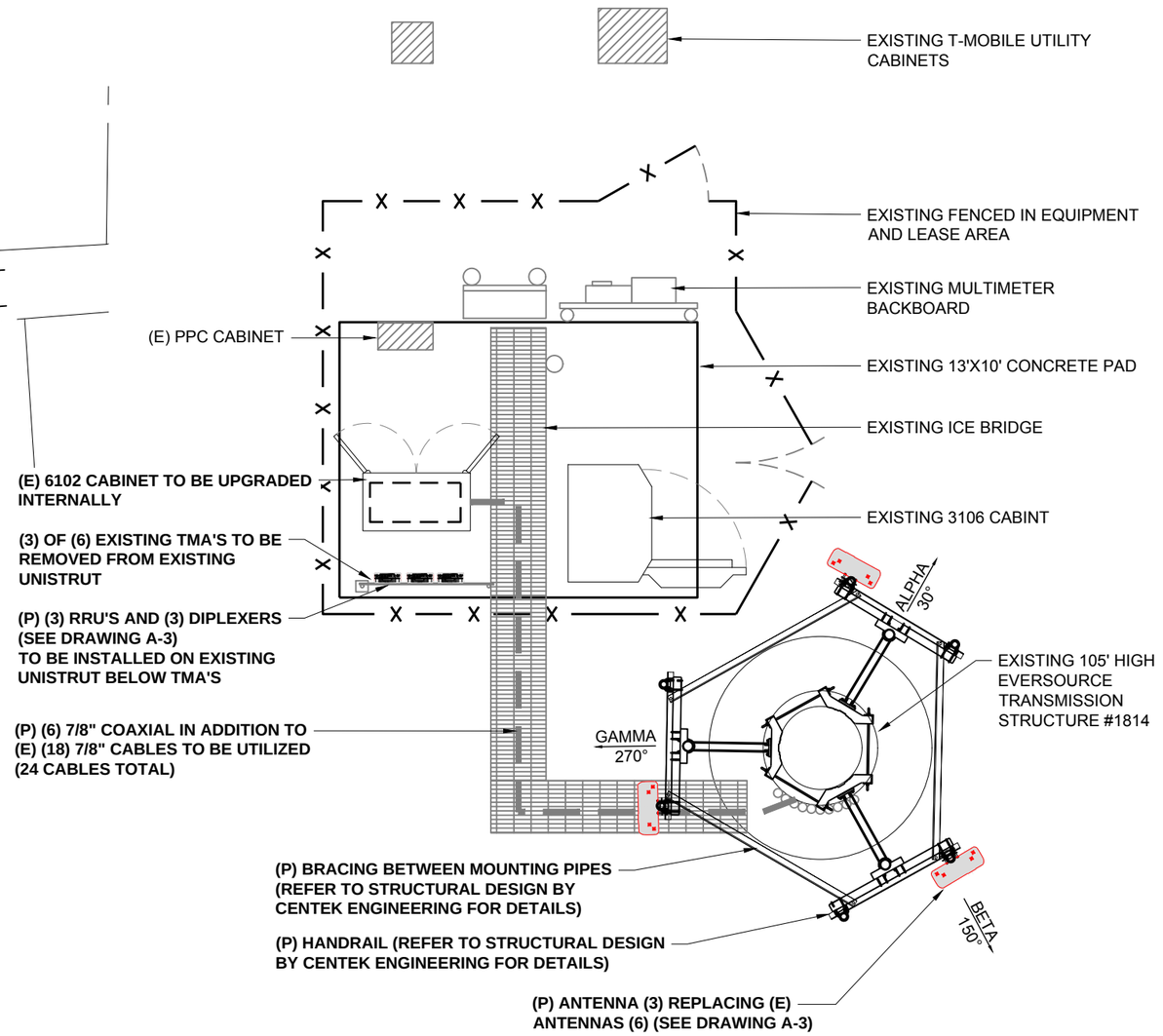
REV	DESCRIPTION	DATE
A	PRELIMINARY	10/23/18
B	ANTENNA MOUNT BRACE ADD.	10/29/18
0	SIGNED AND SEALED	11/07/18
1	UPDATED STRUCTURAL REF.	11/23/18

SITE NUMBER: CT11734B
SITE NAME: CT734 / CL&P STANCHION
EVERSOURCE STRUCTURE# 1814
SITE ADDRESS: 437 HOBART STREET
SOUTHINGTON, CT 06489

SHEET TITLE:
N-1: GENERAL NOTES



SITE PLAN (1 / A-1)
SCALE: 1" = 100'



COMPOUND PLAN (2 / A-1)
SCALE: 3/16" = 1'-0"

APPLICANT:
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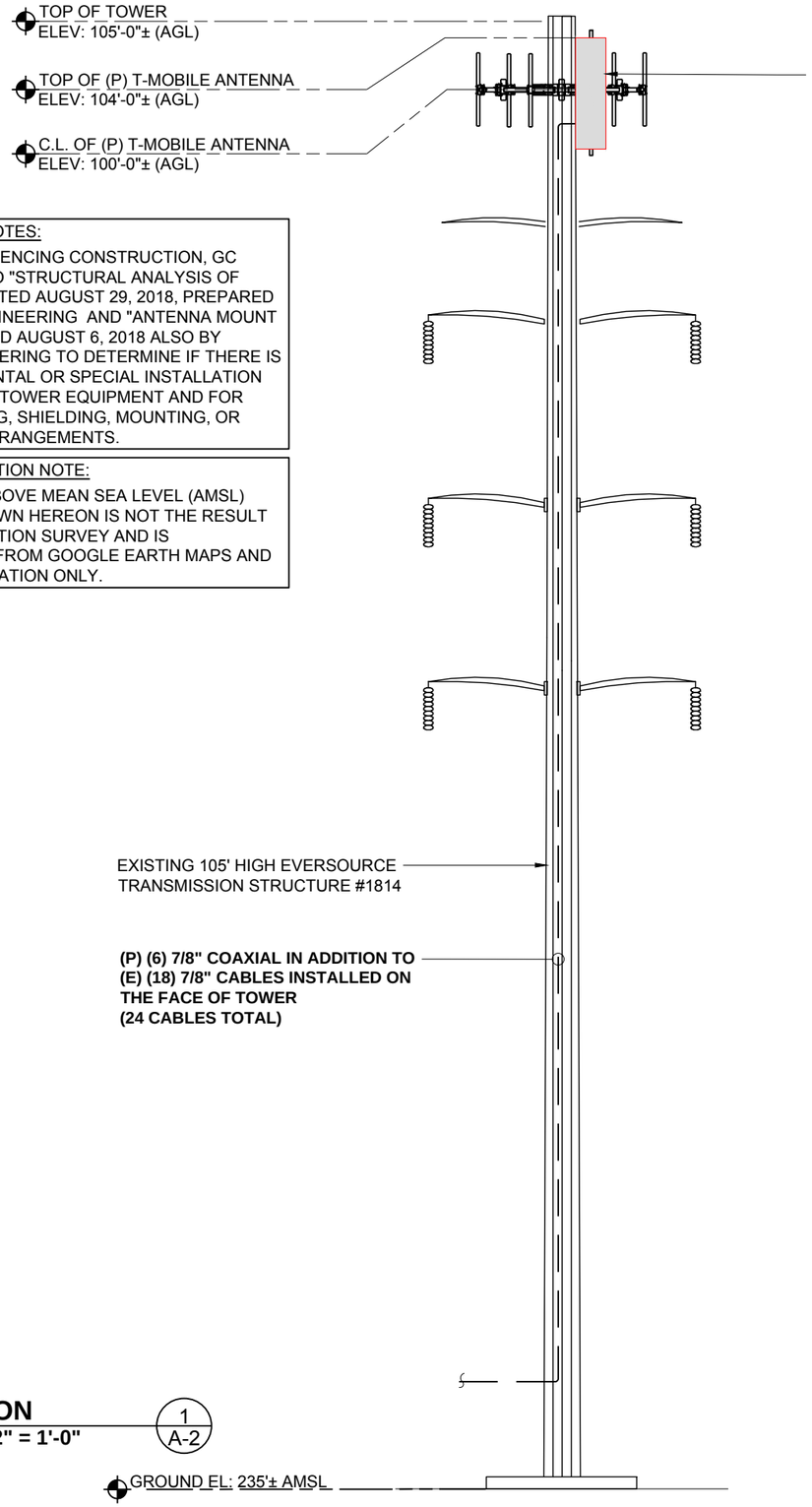
SOUTHINGTON, CT 06489

SHEET TITLE:
A-1: PLAN



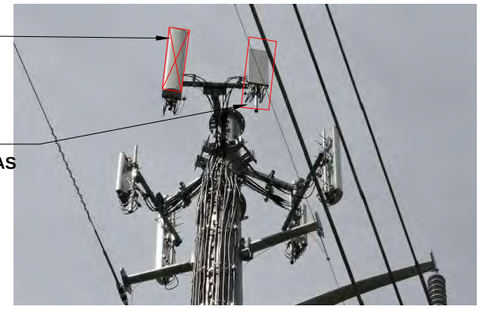
STRUCTURAL NOTES:

PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO "STRUCTURAL ANALYSIS OF POLE" REV 1, DATED AUGUST 29, 2018, PREPARED BY CENTEK ENGINEERING AND "ANTENNA MOUNT ANALYSIS" DATED AUGUST 6, 2018 ALSO BY CENTEK ENGINEERING TO DETERMINE IF THERE IS ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIRED FOR TOWER EQUIPMENT AND FOR CABLE BUNDLING, SHIELDING, MOUNTING, OR RELOCATION ARRANGEMENTS.

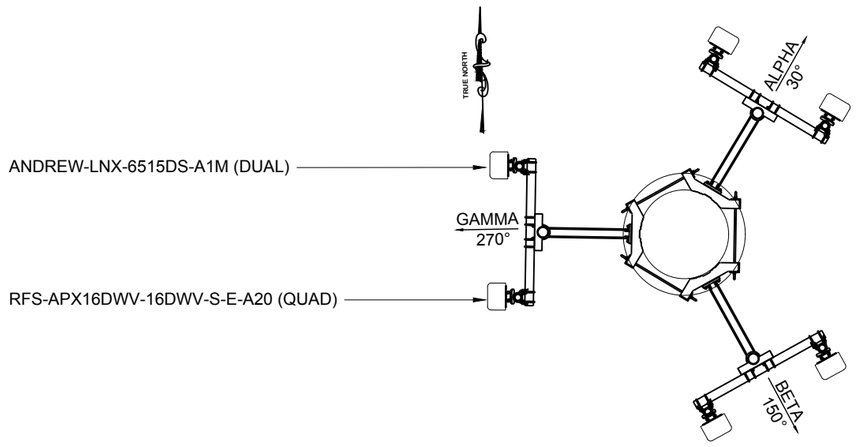
GROUND ELEVATION NOTE:

THE GROUND ABOVE MEAN SEA LEVEL (AMSL) ELEVATION SHOWN HEREON IS NOT THE RESULT OF A FAA ELEVATION SURVEY AND IS INTERPOLATED FROM GOOGLE EARTH MAPS AND IS AN APPROXIMATION ONLY.

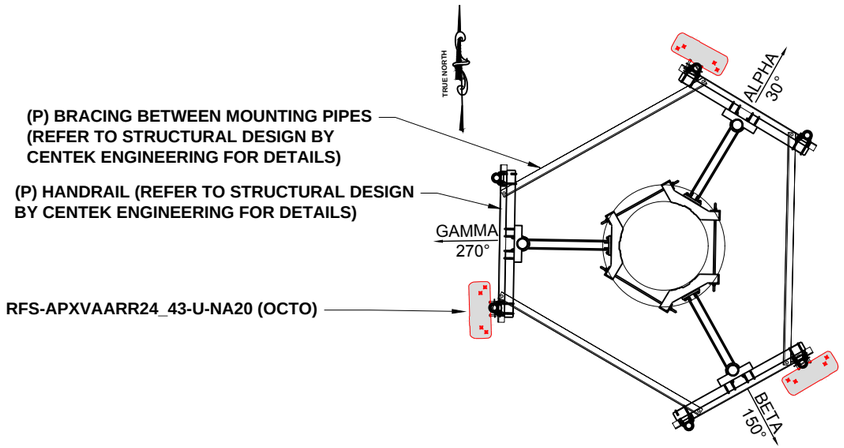
ELEVATION
SCALE: 3/32" = 1'-0"
1 / A-2



ANTENNA PHOTO DETAIL
SCALE: N.T.S.
2 / A-2



EXISTING ANTENNA PLAN
SCALE: N.T.S.
3 / A-2



FINAL ANTENNA PLAN
SCALE: N.T.S.
4 / A-2

APPLICANT:
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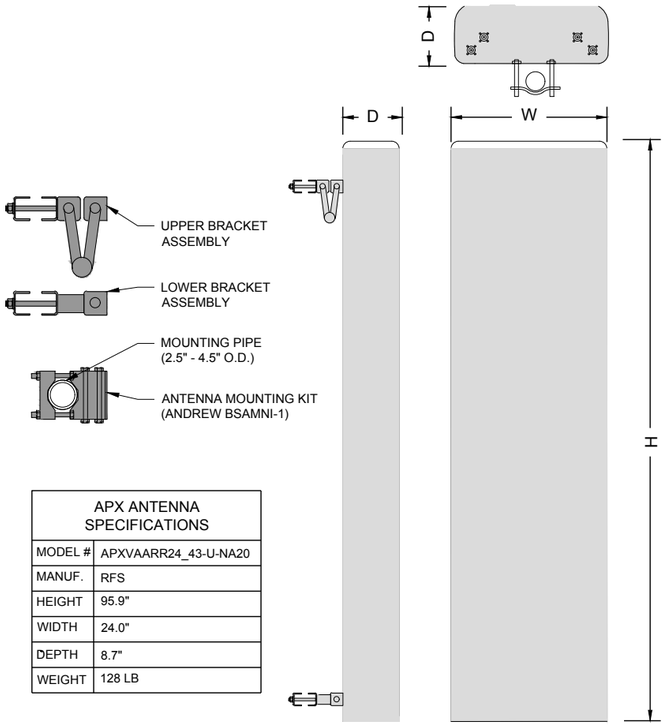
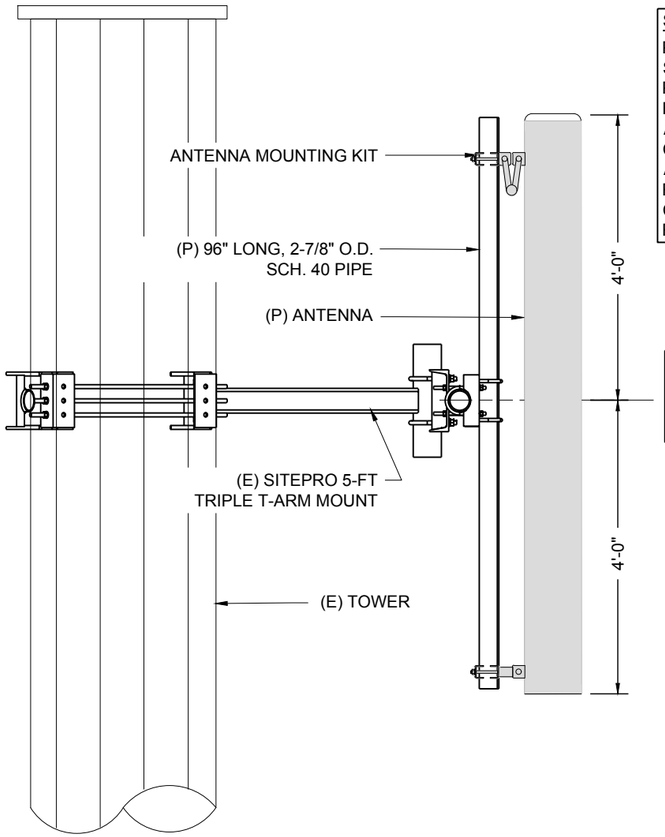
SHEET TITLE:
A-2: ELEVATION AND ANTENNA PLANS



APX ANTENNA SPECIFICATIONS	
MODEL #	APXVAARR24_43-U-NA20
MANUF.	RFS
HEIGHT	95.9"
WIDTH	24.0"
DEPTH	8.7"
WEIGHT	128 LB

RFS ANTENNA
N.T.S
1 A-3



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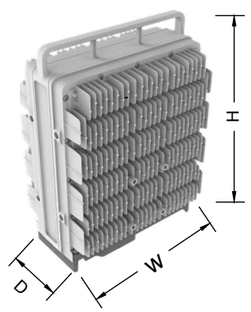
SPECIAL WORK NOTE:

VERTICALLY CENTER THE PIPE MAST AND THE PROPOSED ANTENNAS ON THE EXISTING MOUNTING RAIL

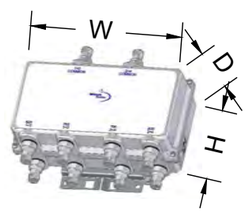
ANTENNA MOUNTING DETAIL
N.T.S
2 A-3

REMOTE RADIO UNIT SPECIFICATIONS	
MODEL #	RADIO 4449 B71+B12
MANUF.	ERICSSON
HEIGHT	14.9"
WIDTH	13.2"
DEPTH	10.4"
WEIGHT	74 LB



REMOTE RADIO UNIT
N.T.S
3 A-3

REMOTE RADIO UNIT SPECIFICATIONS	
MODEL #	GENERIC AWS/PCS
MANUF.	AWS
HEIGHT	6.3"
WIDTH	11.9"
DEPTH	5.7"



DIPLEXER
N.T.S
4 A-3

APPLICANT:
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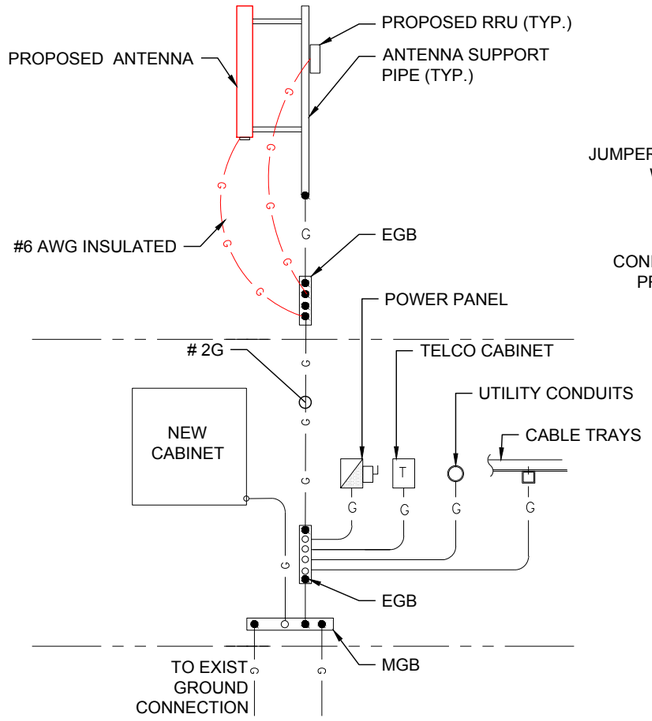
SITE NAME: CT734 / CL&P STANCHION
EVERSOURCE STRUCTURE# 1814
SITE ADDRESS: 437 HOBART STREET
SOUTHINGTON, CT 06489

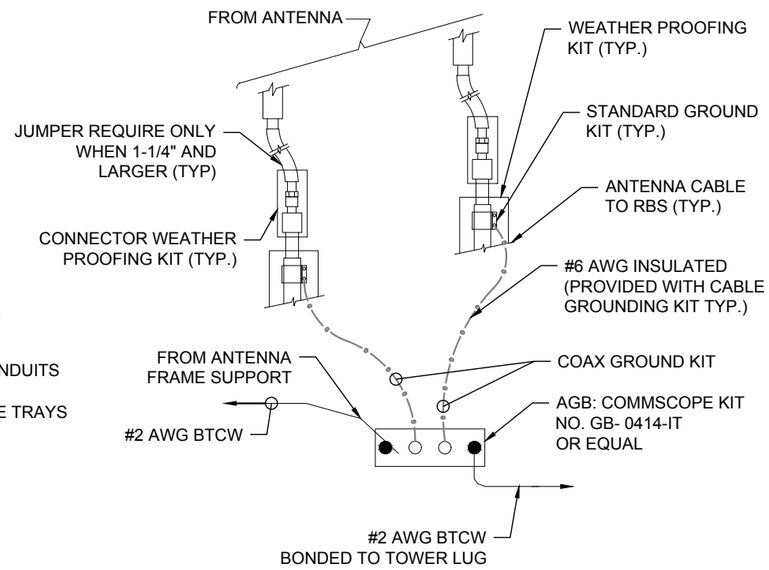
SHEET TITLE:
A-4: DETAILS

ELECTRICAL & GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PRODUCED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) ND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLING BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE ARE PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELECOM CABINET AND RBS CABINET AS INDICATED ON DRAWING A -1. PROVIDE FULL LENGTH PULL ROPE INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NAME 3R ENCLOSURE.
11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
12. GROUNDING COAX CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURES COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
13. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSTALLATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE GROUND.
14. ALL GROUND CONNECTION TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
15. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AS RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY BOND ANY METER OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
16. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PROCEDURES (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN RBS UNIT).
17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTION.
19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
20 BOND ANTENNA EGB'S AND MGB TO WATER MAIN.
21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
22. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
23. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

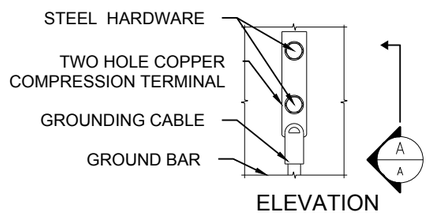


GROUNDING RISER DIAGRAM (1 / E-1)
SCALE: N.T.S

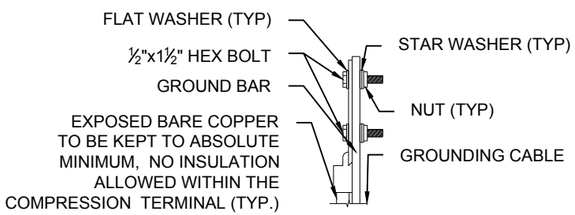


NOTES:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB

TOWER TOP CABLE GROUNDING DETAIL (2 / E-1)
SCALE: N.T.S



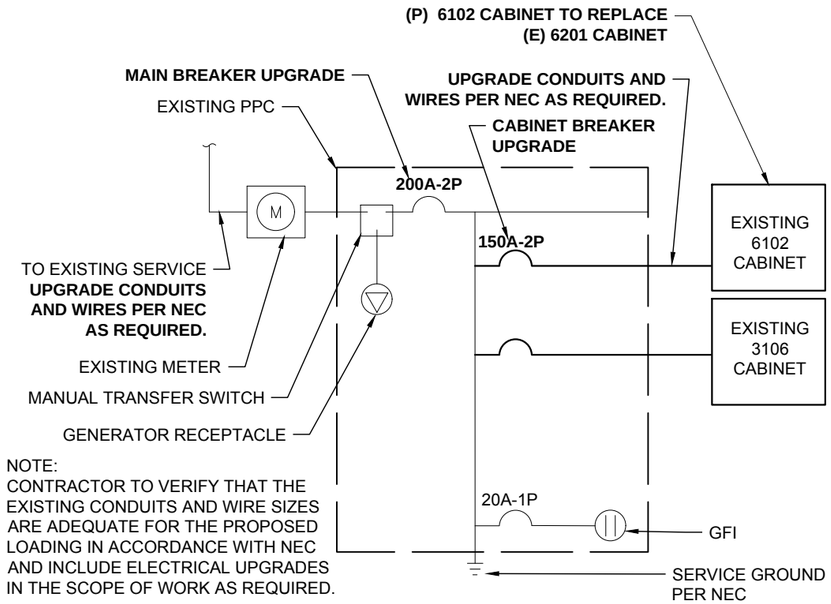
ELEVATION



SECTION A-A

NOTES:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR CONNECTIONS DETAIL (3 / E-1)
SCALE: N.T.S



NOTE:
CONTRACTOR TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

ONE LINE DIAGRAM (4 / E-1)
SCALE: N.T.S

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SHEET TITLE:
E-1: GROUNDING AND ELECTRICAL DETAILS

Exhibit D

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Pole

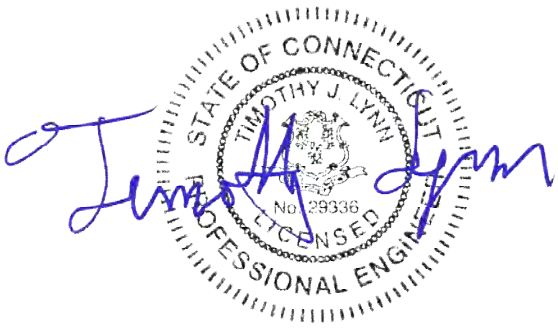
T-Mobile Site Ref: CT11734B

Eversource Structure No. 1814
105' Electric Transmission Pole

437 Hobart Street
Southington, CT

CENTEK Project No. 18098.02

~~Date: August 2, 2018~~
Rev 1: October 29, 2018



Prepared for:
T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

Introduction

The purpose of this report is to analyze the 105' pole located at 437 Hobart Street Southington, CT for the proposed equipment installation by T-Mobile.

The pole was analyzed for the following antenna configuration:

- T-MOBILE (Existing to Remain):
  Coax Cables: Eighteen (18) 7/8" ∅ coax cables mounted to the outside of the pole as indicated in Section 4 of this report.
- **T-MOBILE (Existing to Remove):**
  Antennas: Three (3) RFS APX16DWV-16DWVS panel antennas and three (3) Andrew LNX-6515DS panel antennas mounted on a SitePro 5-ft triple T-Arm to the existing utility pole with a RAD center elevation of 100-ft above grade.
- **T-MOBILE (Proposed):**
  Antennas: Three (3) RFS APXVAARR24_43 panel antennas mounted on a SitePro 5-ft triple T-Arm to the existing utility pole with a RAD center elevation of 100-ft above grade. (Handrail to be installed on existing T-Arms. Refer to section 4 for details)
  Coax Cables: Six (6) 7/8" ∅ coax cables mounted to the outside of the pole as indicated in Section 4 of this report.

Primary assumptions used in the analysis

- ASCE Manual No. 48-11, "Design of Steel Transmission Pole Structures", defines allowable steel stresses for evaluation of the utility pole.
- All utility pole members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- No residual stresses exist due to incorrect pole erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- All utility pole members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.

Analysis

Structural analysis of the utility pole was completed using the current version of PLS-Pole computer program licensed to CENTEK Engineering. Loading was developed per the requirements of the NESC standard and Northeast Utilities Design Criteria. These loads are developed in Section 5 of this report.

Design Basis

Our analysis was performed in accordance with ASCE Manual No. 48-11 – "Design of Steel Transmission Pole Structures", NESC C2-2012 and Northeast Utilities Design Criteria.

The utility pole structure, considering existing and future conductor and shield wire loading, with the proposed Sprint equipment was analyzed as follows:

- UTILITY POLE ANALYSIS

  The purpose of this analysis is to determine the adequacy of the existing utility pole to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the NU Design Criteria Table, NESC C2-2012 ~ Construction Grade B, and ASCE Manual No. 48-11.

  Load cases considered:

  Load Case 1: NESC Heavy Wind
  Wind Pressure..... 4.0 psf
  Radial Ice Thickness..... 0.5"
  Vertical Overload Capacity Factor..... 1.50
  Wind Overload Capacity Factor..... 2.50
  Wire Tension Overload Capacity Factor..... 1.65

  Load Case 2: NESC Extreme Wind
  Wind Speed..... 110 mph (1)
  Radial Ice Thickness..... 0"

  Load Case 3: NESC Extreme Ice w/ Wind
  Wind Pressure..... 4.0 psf
  Radial Ice Thickness..... 1.0"
  Vertical Overload Capacity Factor..... 1.0
  Wind Overload Capacity Factor..... 1.0

  Note 1: NESC C2-2007, Section25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)

R e s u l t s

- UTILITY POLE

This analysis finds that the subject utility pole is adequate to support the proposed antenna mast and related appurtenances. The pole stresses meet the requirements set forth by the ASCE Manual No. 48-11, "Design of Steel Transmission Pole Structures", for the applied NESC Heavy and Hi-Wind load cases. The detailed analysis results are provided in Section 6 of this report. The analysis results are summarized as follows:

A maximum usage of **74.83%** occurs in the utility pole base plate under the **NESC Extreme Wind** loading condition.

POLE SECTION:

The utility pole was found to be within allowable limits.

Tower Section	Elevation	Stress Ratio (% of capacity)	Result
Tube Number 3	0.00' -43.00' (AGL)	50.49%	**PASS**

BASE PLATE:

The base plate was found to be within allowable limits from the PLS output based on 16 bend lines.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Base Plate	Bending	74.83%	**PASS**

- FOUNDATION AND ANCHORS

The base of the tower is connected to the foundation by means of (16) 2.25"∅, ASTM A615-75 anchor bolts embedded into the concrete foundation structure.

BASE REACTIONS:

From PLS-Pole analysis of pole based on NESC/NU prescribed loads.

Load Case	Shear	Axial	Moment
NESC Heavy Wind	22.26 kips	73.68 kips	1578.60 ft-kips
NESC Extreme Wind	41.65 kips	36.97 kips	2841.19 ft-kips
NESC Extreme Ice w/ Wind	14.28 kips	69.91 kips	1064.11 ft-kips

Note 1 – 10% increase will be applied to above tower base reactions per OTRM 051 for foundation analysis.

ANCHOR BOLTS:

The anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (% of capacity)	Result
Anchor Bolts	Tension	50.09%	**PASS**

FOUNDATION:

- The foundation was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading	Result
Reinforced Concrete Caisson	Moment Capacity	31.0%	**PASS**

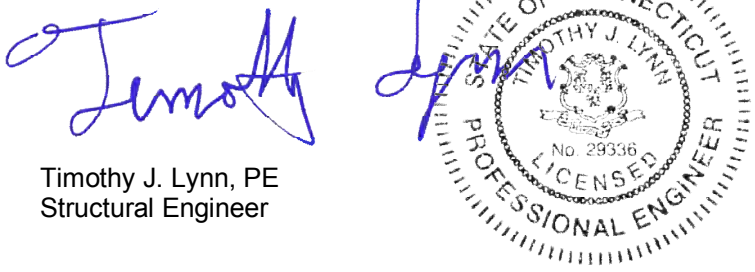
Conclusion

This analysis shows that the subject utility tower **is adequate** to support the proposed T-Mobile equipment installation.

The analysis is based, in part on the information provided to this office by Eversource and T-Mobile. If the existing conditions are different than the information in this report, CENTEK engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.

- Information from the field and/or drawings in the possession of CENTEK engineering, Inc. or generated by field inspections or measurements of the structure.

- It is the responsibility of the client to ensure that the information provided to CENTEK engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.

- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222.

- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. CENTEK engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-POLE

PLS-POLE provides all of the capabilities a structural engineer requires to design transmission, substation or communications structures. It does so using a simple easy to use graphical interface that rests upon our time tested finite element engine. Regardless of whether you want to model a simple wood pole or a guyed steel X-Frame; PLS-POLE can handle the job simply, reliably and efficiently.

Modeling Features:

- Structures are made of standard reusable components that are available in libraries. You can easily create your own libraries or get them from a manufacturer
- Structure models are built interactively using interactive menus and graphical commands
- Automatic generation of underlying finite element model of structure
- Steel poles can have circular, 4, 6, 8, 12, 16, or 18-sided, regular, elliptical or user input cross sections (flat-to-flat or tip-to-tip orientations)
- Steel and concrete poles can be selected from standard sizes available from manufacturers
- Automatic pole class selection
- Cross brace position optimizer
- Capability to specify pole ground line rotations
- Capability to model foundation displacements
- Can optionally model foundation stiffness
- Guys are easily handled (modeled as exact cable elements in nonlinear analysis)
- Powerful graphics module (members color-coded by stress usage)
- Graphical selection of joints and components allows graphical editing and checking
- Poles can be shown as lines, wire frames or can be rendered as 3-d polygon surfaces

Analysis Features:

- Automatic distribution of loads in 2-part suspension insulators (v-strings, horizontal vees, etc.)
- Design checks for ASCE, ANSI/TIA/EIA 222 (Revisions F and G) or other requirements
- Automatic calculation of dead and wind loads
- Automated loading on structure (wind, ice and drag coefficients) according to:
    - ASCE 74-1991
    - NESC 2002
    - NESC 2007
    - IEC 60826:2003
    - EN50341-1:2001 (CENELEC)
    - EN50341-3-9:2001 (UK NNA)
    - EN50341-3-17:2001 (Portugal NNA)
    - ESAA C(b)1-2003 (Australia)
    - TPNZ (New Zealand)
    - REE (Spain)
    - EIA/TIA 222-F
    - ANSI/TIA 222-G
    - CSA S37-01
- Automated microwave antenna loading as per EIA/TIA 222-F and ANSI/TIA 222-G
- Detects buckling by nonlinear analysis

Results Features:

- Detects buckling by nonlinear analysis
- Easy to interpret text, spreadsheet and graphics design summaries
- Automatic determination of allowable wind and weight spans
- Automatic determination of interaction diagrams between allowable wind and weight spans
- Automatic tracking of part numbers and costs

Criteria for Design of PCS Facilities On or Extending Above Metal Electric Transmission Towers & Analysis of Transmission Towers Supporting PCS Masts (1)

Introduction

This criteria is the result from an evaluation of the methods and loadings specified by the separate standards, which are used in designing telecommunications towers and electric transmission towers. That evaluation is detailed elsewhere, but in summary; the methods and loadings are significantly different. This criteria specifies the manner in which the appropriate standard is used to design PCS facilities including masts and brackets (hereafter referred to as "masts"), and to evaluate the electric transmission towers to support PCS masts. The intent is to achieve an equivalent level of safety and security under the extreme design conditions expected in Connecticut and Massachusetts.

ANSI Standard TIA-222 covering the design of telecommunications structures specifies a working strength/allowable stress design approach. This approach applies the loads from extreme weather loading conditions, and designs the structure so that it does not exceed some defined percentage of failure strength (allowable stress).

ANSI Standard C2-2012 (National Electrical Safety Code) covering the design of electric transmission metal structures is based upon an ultimate strength/yield stress design approach. This approach applies a multiplier (overload capacity factor) to the loads possible from extreme weather loading conditions, and designs the structure so that it does not exceed its ultimate strength (yield stress).

Each standard defines the details of how loads are to be calculated differently. Most of the NU effort in "unifying" both codes was to establish what level of strength each approach would provide, and then increasing the appropriate elements of each to achieve a similar level of security under extreme weather loadings.

Two extreme weather conditions are considered. The first is an extreme wind condition (hurricane) based upon a 50-year recurrence (2% annual probability). The second is a winter condition combining wind and ice loadings.

The following sections describe the design criteria for any PCS mast extending above the top of an electric transmission tower, and the analysis criteria for evaluating the loads on the transmission tower from such a mast from the lower portions of such a mast, and loads on the pre-existing electric lower portions of such a mast, and loads on the pre-existing electric transmission tower and the conductors it supports.

Note 1: Prepared from documentation provide from Northeast Utilities.

E L E C T R I C T R A N S M I S S I O N T O W E R

The electric transmission tower shall be analyzed using yield stress theory in accordance with the attached table titled “NU Design Criteria”. This specifies uniform loadings (different from the TIA loadings) on the each of the following components of the installed facility:

- PCS mast for its total height above ground level, including the initial and planned future support platforms, antennas, etc. above the top of an electric transmission structure.
- Conductors are related devices and hardware.
- Electric transmission structure. The loads from the PCS facility and from the electric conductors shall be applied to the structure at conductor and PCS mast attachment points, where those load transfer to the tower.

The uniform loadings and factors specified for the above components in the table are based upon the National Electrical Safety Code 2007 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to TIA and its loads and factors with the exceptions noted above. (Note that the NESC does not require the projected wind surfaces of structures and equipment to be increased by the ice covering.)

In the event that the electric transmission tower is not sufficient to support the additional loadings of the PCS mast, reinforcement will be necessary to upgrade the strength of the overstressed members.

Attachment A
Eversource Design Criteria

		Attachment A NU Design Criteria	Basic Wind Speed	Pressure	Height factor	Gust Factor	Load or Stress Factor	Force Coef. - Shape Factor
			V (MPH)	Q (PSF)	Kz	Gh		
Ice Condition	TIA/EIA	Antenna Mount	TIA	TIA (0.75Wi)	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Heavy	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	——	4	1	1	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole (on two faces)	——	4	1	1	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by NU					
High Wind Condition	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Apply a 1.25 X Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by NU					
NESC Extreme Ice with Wind Condition *		Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load 1.25 X Gust Response Factor Apply a 1.25 X Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by NU					
		* Only for structures installed after 2007						

mount as specified below, and shall include the wireless communication mast and antenna loads per NESC criteria)

The strength reduction factor obtained from the field investigation shall be applied to the members or connections that are showing signs of deterioration from their original condition

With the written approval of Eversource Transmission Line Engineering on a case by case the existing structures may be analyzed initially using the current NESC code, then it is permitted to use the original design code with the original conductor load should the existing tower fail the current NESC code.

The structure shall be analyzed using yield stress theory in accordance with Attachment A, "Eversource Design Criteria." This specifies uniform loadings (different from the TIA loadings) on each of the following components of the installed facility:

a) Wireless communication mast for its total height above ground level, including the initial and any planned future equipment (Support Platforms, Antennas, TMA's etc.) above the top of an electric transmission structure.

b) Conductors and related devices and hardware (wire loads will be provided by Eversource).

c) Electric Transmission Structure

   i) The loads from the wireless communication equipment components based on NESC and Eversource Criteria in Attachment A, and from the electric conductors shall be applied to the structure at conductor and wireless communication mast attachment points, where those loads transfer to the tower.

   ii) Shape Factor Multiplier:

NESC Structure Shape	Cd
Polyround (for polygonal steel poles)	1.3
Flat	1.6
Open Lattice	3.2
Pole with Coaxial Cable	1.6

   iii) When Coaxial Cables are mounted alongside the pole structure, the shape multiplier shall be:

Mount Type	Cable Cd	Pole Cd
Coaxial Cables on outside periphery (One layer)	1.45	1.45
Coaxial Cables mounted on stand offs	1.6	1.6

d) The uniform loadings and factors specified for the above components in Attachment A, "Eversource Design Criteria" are based upon the National Electric Safety Code 2007 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to the TIA and its loads and factors with the exceptions noted above.

   Note: The NESC does not require ice load be included in the supporting structure. (Ice on conductors and shield wire only, and Eversource will provide these loads).

e) Mast reaction loads shall be evaluated for local effects on the transmission structure members at the attachment points.

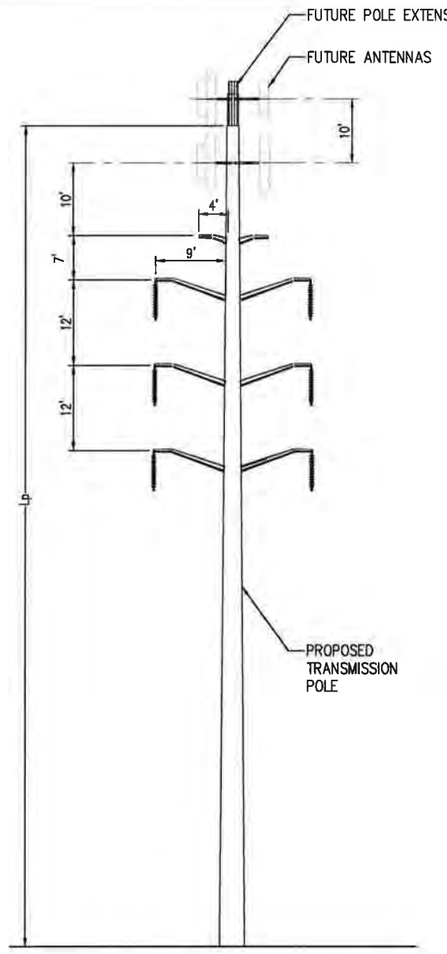
TYPE 10-SCSP-095-091-FULL DE-FDN STR. 1814
115-kV CONDUCTOR: 1 - 1272 KCMIL 54/19 ACSS "PHEASANT" CONDUCTOR PER PHASE (10000# @ NESC HEAVY, FINAL)
OHGW : 1 - 19#10 ALUMOWELD 0.509" DIA. (5500# @ NESC HEAVY, FINAL)
WIND SPAN: 700 FT
WEIGHT SPAN: 1100 FT
LINE ANGLE: 91 DEGREES
RULING SPAN: 710 FT.

STR. 1814

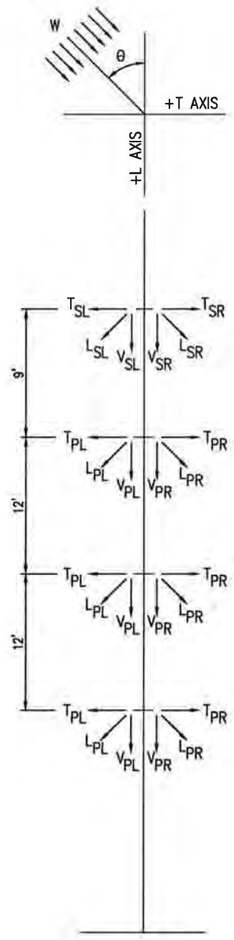
LOADING CASE					TRANSMISSION LINE DESIGN LOADS														
NO.	DESCRIPTION	TEMP F	ICE R-IN.	WIND MPH	V_{SL}	T_{SL}	L_{SL}	V_{SR}	T_{SR}	L_{SR}	V_{PL}	T_{PL}	L_{PL}	V_{PR}	T_{PR}	L_{PR}	W psf	Θ	K
1	NESC HEAVY (250 B)	0	0.50	39.50	1938	1343	0	1938	1343	0	5497	2271	0	5497	2271	0	4.00	0.00	1.50
2	NESC EXT. WIND (250 C)	60	0.00	110	539	1327	0	539	1327	0	2260	3815	0	2260	3815	0	35.00	0.00	1.10
3	NESC EXT. WIND (250 C) LONGITUDINAL ON POLE ONLY	60	0.00	117	539	73	0	539	73	0	2260	176	0	2260	176	0	40.00	0.00	1.10
4	NESC EXT. ICE (250D)	15	1.00	39.50	2792	1018	0	2792	1018	0	5816	1522	0	5816	1522	0	4.00	0.00	1.10
5	NESC HEAVY (250B) NO OLR	0	0.50	39.50	1292	645	0	1292	645	0	3665	1104	0	3665	1104	0	4.00	0.00	1.10
6	DEFLECTION	60	0.00	0.00	539	73	0	539	73	0	2260	176	0	2260	176	0	0.00	0.00	1.10
7A	BROKEN SW AND PHASE (250B/261C)	0	0.50	39.50	1292	672	-6050	1292	672	0	3590	1136	-11000	3590	1136	0	4.00	0.00	1.10
7B	BROKEN SW OR PHASE (250B/261)	0	0.50	39.50	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	1.10

TELECOMMUNICATION EQUIPMENT PROPERTIES								
Equipment Property Label	Weight (lbs)	Wind Area (ft^2)	Ice Area (ft^2)	Shape or EIA	Drag Coef.	Diameter (ft)	Height (ft)	Vertical Offset (ft)
APX16DWV-16DWVS-C	60	10	12	Square	14	1.3	5	0
LNX-651DS-VTM	60	16	18	Square	1	1.3	8	0
Coax Cable	15	0.363	0.8	Circle	1	0.3	5	0

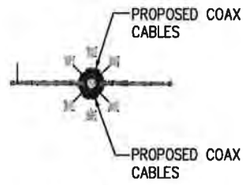
TELECOMMUNICATION EQUIPMENT CONNECTIVITY TABLE						
Equipment Label	Attach Label	Equipment Property Set	Azimuth (deg)	Offset (ft)	Measured Relative To	Mount Location
Antenna 1	P:A1	APX16DWV-16DWVS-C	45	3	Face	Bottom
Antenna 2	P:A1	APX16DWV-16DWVS-C	90	3	Face	Bottom
Antenna 3	P:A1	APX16DWV-16DWVS-C	225	3	Face	Bottom
Antenna 4	P:A1	APX16DWV-16DWVS-C	270	3	Face	Bottom
Antenna 5	P:A1	APX16DWV-16DWVS-C	315	3	Face	Bottom
Antenna 6	P:A1	LNX-651DS-VTM	135	3	Face	Bottom
Antenna 7	P:A1	LNX-651DS-VTM	225	3	Face	Bottom
Antenna 8	P:A2	APX16DWV-16DWVS-C	90	3	Face	Top
Antenna 9	P:A2	APX16DWV-16DWVS-C	225	3	Face	Top
Antenna 10	P:A2	APX16DWV-16DWVS-C	270	3	Face	Top
Antenna 11	P:A2	LNX-651DS-VTM	315	3	Face	Top
Antenna 12	P:A2	LNX-651DS-VTM	135	3	Face	Top
Antenna 13	P:A2	LNX-651DS-VTM	225	3	Face	Top
Antenna 14	P:A2	LNX-651DS-VTM	45	3	Face	Top



POLE CONFIGURATION



LOADING TREE



TRANSMISSION PLAN VIEW

NOTES:
1. ALL INDICATED LOADS ARE ULTIMATE AND INCLUDE ALL OVERLOAD FACTORS.
2. V, T & L ARE IN LBS 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.

REV 1

REVISIONS DURING CONSTRUCTION				
1	12/2015	PER W.O. # 40372810	RRH	EQ

NO.	DATE	AS BUILT REVISIONS	BY	CHK	APP	APP

EVERSOURCE ENERGY

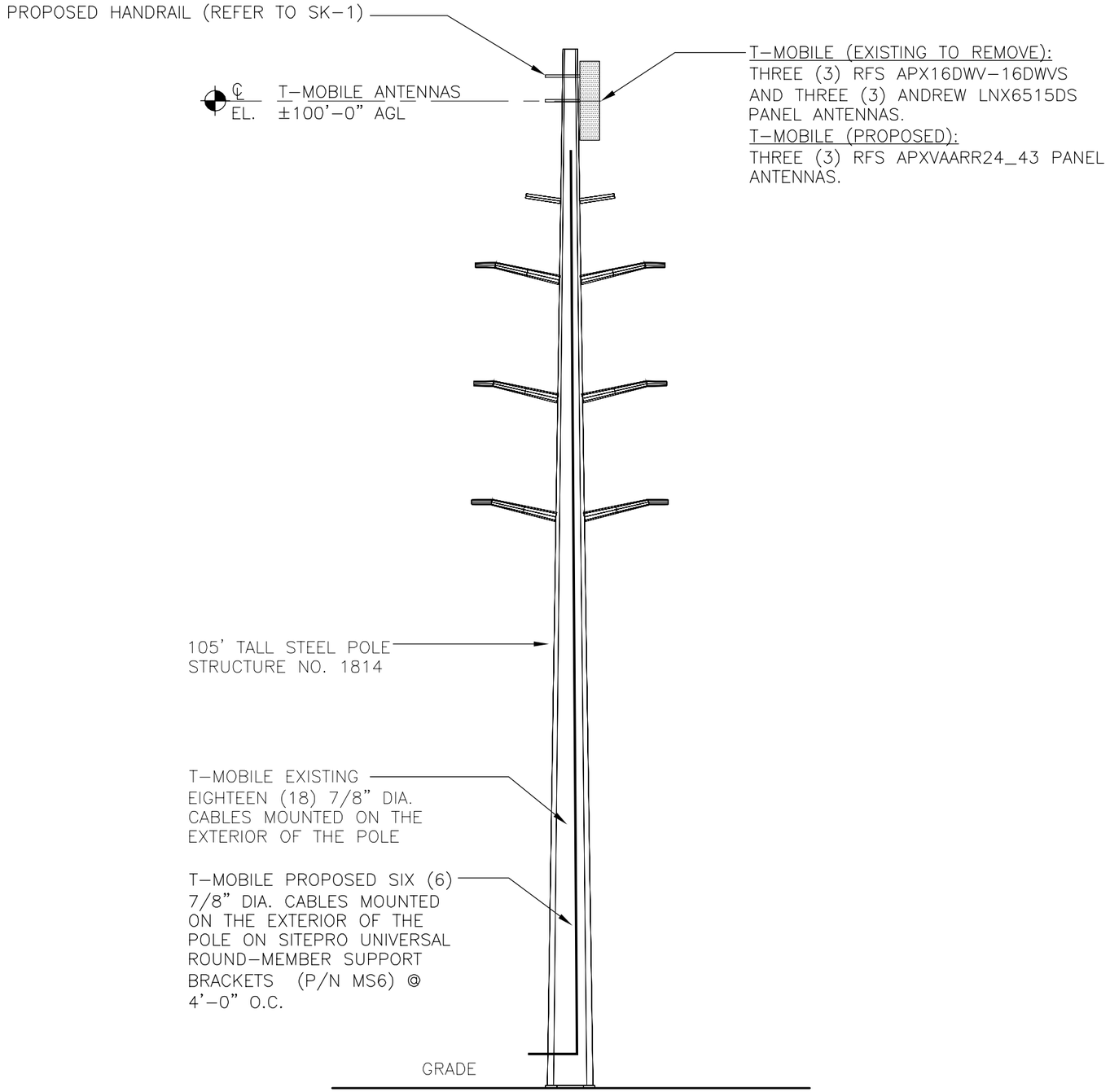
1810 TRANSMISSION LINE - UPGARED PROJECT
115 KV DCVSP ON FOUNDATION
DETAILS

BY	RRH	CHKD	EQ	APP	APP
DATE	11/30/15	DATE	11/30/15	DATE	DATE
D-SIZE	N.T.S.	SIZE	D	FIELD BOOK & PAGE	
D-WING	N.T.S.	DWG		DES. DWG	
DES. PROJ. NUMBER				DWG NO.	

SKETCH 5

ES VER: 05/2015

12/10/2015 7:45 AM - hamfer - K:\Engineering\Transmission Engineering\UPDCV\Line 1810-1 Reconductoring\Design\Steel Pole Spec\Loading Tree\Loading tree\SKETCH 5.dwg - Construction-All



1 / EL-1 **TOWER & MAST ELEVATION**

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	10/29/18	TJL	CAG	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

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T-MOBILE

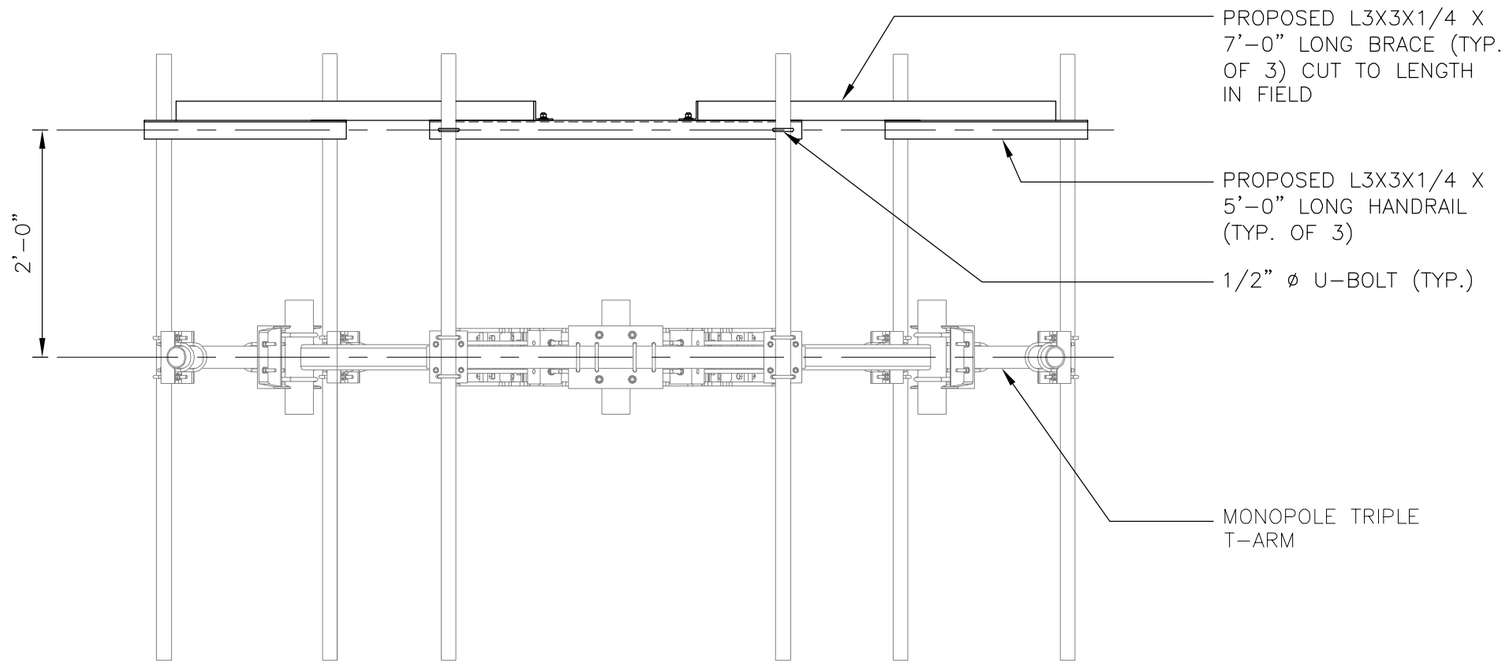
CT11734B

497 HOBART STREET
SOUTHINGTON, CT 06489

DATE:	10/29/18
SCALE:	AS SHOWN
JOB NO.	18098.02

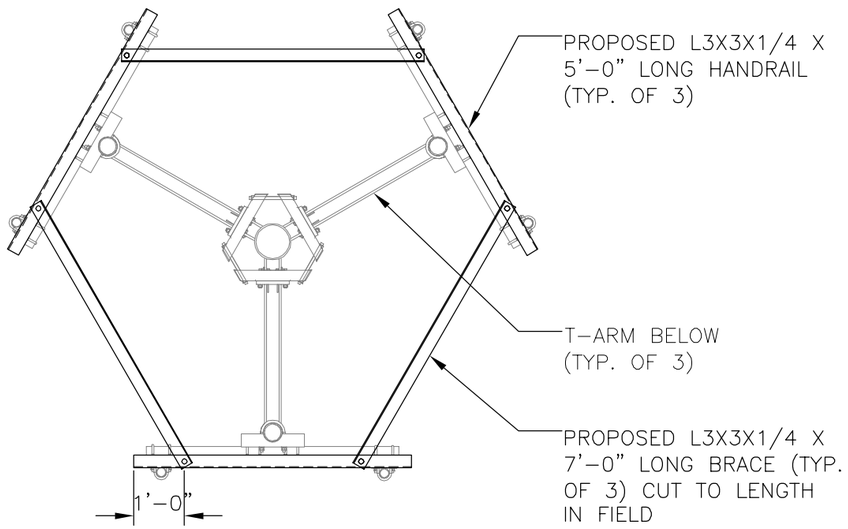
TOWER ELEVATION

SHEET NO.
EL-1
Sheet No. 1 of 2



1 / SK-1 **MOUNT MOD ELEVATION**

SCALE: NOT TO SCALE



2 / SK-1 **MOUNT MOD PLAN**

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	10/29/18	TJL	CAG	ISSUED FOR CONSTRUCTION

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CT11734B

457 HOBART STREET
SOUTHINGTON, CT 06489

DATE: 10/29/18
SCALE: AS SHOWN
JOB NO. 18098.02

MOUNT MODIFICATION

SHEET NO.
SK-1
Sheet No. 2 of 2

CENTEK engineering
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Subject:	Load Analysis of T-Mobile Equipment on Structure #1814
Location:	Southington, CT
Rev. 1: 10/29/18	Prepared by: T.J.L Checked by: C.F.C. Job No. 18098.02

Basic Components

Heavy Wind Pressure =	p := 4.00	psf	(User Input NESC 2007 Figure 250-1 & Table 250-1)
Basic Windspeed =	V := 110	mph	(User Input NESC 2007 Figure 250-2(e))
Radial Ice Thickness =	Ir := 0.50	in	(User Input)
Radial Ice Density =	Id := 56.0	pcf	(User Input)

Factors for Extreme Wind Calculation

Elevation of Top of Tower Above Grade =	TME := 105	ft	(User Input)
Multiplier Gust Response Factor =	m := 1.25		(User Input - Only for NESC Extreme wind case)
NESC Factor =	kv := 1.43		(User Input from NESC 2007 Table 250-3 equation)
Importance Factor =	I := 1.0		(User Input from NESC 2007 Section 250.C.2)
Velocity Pressure Coefficient =	$Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.279$		(NESC 2007 Table 250-2)
Exposure Factor =	$Es := 0.346 \left[\frac{33}{(0.67 \cdot TME)}\right]^{\frac{1}{7}} = 0.311$		(NESC 2007 Table 250-3)
Response Term =	$Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TME}{220}\right)} = 0.848$		(NESC 2007 Table 250-3)
Gust Response Factor =	$Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.867$		(NESC 2007 Table 250-3)
Wind Pressure =	$qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 34.3$	psf	(NESC 2007 Section 250.C.2)

NESC Extreme Ice w/ Wind Components

Heavy Wind Pressure =	$p_{ex} := 4$	psf	(User Input NESC 2007 Figure 250-3 & Table 250-4)
Radial Ice Thickness =	$Ir_{ex} := 1$	in	(User Input NESC 2007 Figure 250-3)

Shape Factors — NUS Design Criteria Issued April 12, 2007

Shape Factor for Round Members =	$Cd_R := 1.3$	(User Input)
Shape Factor for Flat Members =	$Cd_F := 1.6$	(User Input)
Shape Factor for Coax Cables Attached to Outside of Pole =	$Cd_{coax} := 1.6$	(User Input)

Overload Factors — NU Design Criteria Table

Overload Factors for Wind Loads:

NESC Heavy Wind Loading =	**2.5**	(User Input)
NESC Extreme Wind Loading =	**1.0**	(User Input)
NESC Extreme Ice w/ Wind Loading =	**1.0**	(User Input)

Overload Factors for Vertical Loads:

NESC Heavy Wind Loading =	**1.5**	(User Input)
NESC Extreme Wind Loading =	**1.0**	(User Input)
NESC Extreme Ice w/ Wind Loading =	**1.0**	(User Input)

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F: (203) 488-8587

Subject:	Load Analysis of T-Mobile Equipment on Structure #1814
Location:	Southington, CT
Rev. 1: 10/29/18	Prepared by: T.J.L Checked by: C.F.C. Job No. 18098.02

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPXVAARR24_43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 128$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant1} := WT_{ant} \cdot N_{ant} = 384$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^{4}$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot Ir\right)\left(W_{ant} + 2 \cdot Ir\right)\left(T_{ant} + 2 \cdot Ir\right) - V_{ant} = 3474$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 113$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 338$ lbs

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := \left(L_{ant} + 2 \cdot Ir_{ex}\right)\left(W_{ant} + 2 \cdot Ir_{ex}\right)\left(T_{ant} + 2 \cdot Ir_{ex}\right) - V_{ant} = 7212$ cu in

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := \frac{V_{ice.ex}}{1728} \cdot Id = 234$ lbs

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant1} := W_{ICE.exant} \cdot N_{ant} = 701$ lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{\left(L_{ant} + 2 \cdot Ir\right) \cdot \left(W_{ant} + 2 \cdot Ir\right)}{144} = 16.8$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 50.5$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 323$ lbs

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 48$ sf

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 3292$ lbs

Wind Load (NESC Extreme Ice w/ Wind)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := \frac{(L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex})}{144} = 17.7$ sf

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 53$ sf

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant1} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 424$ lbs

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63-2 North Branford Road
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P: (203) 488-0580
F: (203) 488-8587

Subject:	Load Analysis of T-Mobile Equipment on Structure #1814
Location:	Southington, CT
Rev. 1: 10/29/18	Prepared by: T.J.L Checked by: C.F.C. Job No. 18098.02

Development of Wind & Ice Load on Platform

Platform Data:

Platform Model =	SitePro RMV5-296		
Mount Shape =	Flat		
Mount Projected Surface Area =	$CdAa := 16$	sf	(User Input)
Mount Projected Surface Area w/ Ice =	$CdAa_{ice} := 25$	sf	(User Input)
Mount Projected Surface Area w/ Extreme Ice =	$CdAa_{ice.ex} := 28$	sf	(User Input)
Mount Weight =	$WT_{mnt} := 1100$	lbs	(User Input)
Mount Weight w/ Ice =	$WT_{mnt.ice} := 1300$	lbs	(User Input)
Mount Weight w/ Extreme Ice =	$WT_{mnt.ice.ex} := 1500$	lbs	(User Input)

Gravity Loads (without ice)

Weight of All Mounts = $Wt_{mnt1} := WT_{mnt} = 1100$ lbs

Gravity Load (ice only)

Weight of Ice on All Mounts = $Wt_{ice.mnt1} := \left(WT_{mnt.ice} - WT_{mnt}\right) = 200$ lbs

Gravity Load (ice only)

Weight of Ice on All Mounts = $Wt_{ice.ex.mnt1} := \left(WT_{mnt.ice.ex} - WT_{mnt}\right) = 400$ lbs

Wind Load (NESC Heavy)

Total Mount Wind Force w/ Ice = $Fi_{mnt1} := p \cdot CdAa_{ice} = 100$ lbs

Wind Load (NESC Extreme)

Total Mount Wind Force = $F_{mnt1} := qz \cdot CdAa \cdot m = 687$ lbs

Wind Load (NESC Extreme Ice w/ Wind)

Total Mount Wind Force = $Fi_{ex.mnt1} := qz \cdot CdAa \cdot m = 687$ lbs

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Subject:	Load Analysis of T-Mobile Equipment on Structure #1814
Location:	Southington, CT
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Total Equipment Loads:

NESC Heavy Wind Vertical =	$\left(Wt_{ant1} + Wt_{ice.ant1} + Wt_{mnt1} + Wt_{ice.mnt1}\right) \cdot 1.5 = 3033$	lbs
NESC Heavy Wind Trasnsverse =	$\left(Fi_{ant1} + Fi_{mnt1}\right) \cdot 2.5 = 1058$	lbs
NESC Extreme Wind Vertical =	$\left(Wt_{ant1} + Wt_{mnt1}\right) = 1484$	lbs
NESC Extreme Wind Trasnsverse =	$\left(F_{ant1} + F_{mnt1}\right) = 3978$	lbs
NESC Extreme Ice w/ Wind Vertical =	$NESC_{ice.ex} := Wt_{ant1} + Wt_{ice.ex.ant1} + Wt_{mnt1} + Wt_{ice.ex.mnt1} = 2585$	lbs
NESC Extreme Ice w/ Wind Trasnsverse =	$\left(Fi_{ex.ant1} + Fi_{ex.mnt1}\right) = 1111$	lbs

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Subject:	Coax Cable on Pole #1814
Location:	Southington, CT
Rev. 0: 8/2/18	Prepared by: T.J.L Checked by: C.F.C. Job No. 18098.02

Coax Cable on Pole

Distance Between Coax Cable Attach Points =

Coaxial Cable Span = $Coax_{Span} := \begin{pmatrix} 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \end{pmatrix} \cdot ft$ *(User Input)*

Diameter of Coax Cable = $D_{coax} := 1.11 \cdot in$ *(User Input)*

Weight of Coax Cable = $W_{coax} := 0.54 \cdot plf$ *(User Input)*

Number of Coax Cables = $N_{coax} := 24$ *(User Input)*

Number of Projected Coax Cables = $NP_{coax} := 4$ *(User Input)*

Extreme Wind Pressure = $qz := 34.3 \cdot psf$ *(User Input)*

Heavy Wind Pressure = $p := 4 \cdot psf$ *(User Input)*

Radial Ice Thickness = $Ir := 0.5 \cdot in$ *(User Input)*

Radial Ice Density = $Id := 56 \cdot pcf$ *(User Input)*

Extreme Ice w/ Wind Pressure = $p_{ex} := 4 \cdot psf$ *(User Input)*

Extreme Radial Ice Thickness = $Ir_{ex} := 1 \cdot in$ *(User Input)*

Shape Factor = $Cd_{coax} := 1.6$ *(User Input)*

Overload Factor for NESC Heavy Wind Transverse Load = $OF_{HWT} := 2.5$ *(User Input)*

Overload Factor for NESC Heavy Wind Vertical Load = $OF_{HWV} := 1.5$ *(User Input)*

Overload Factor for NESC Extreme Wind Transverse Load = $OF_{EWT} := 1.0$ *(User Input)*

Overload Factor for NESC Extreme Wind Vertical Load = $OF_{EWV} := 1.0$ *(User Input)*

Overload Factor for NESC Extreme Ice w/ Wind Transverse Load = $OF_{EIT} := 1.0$ *(User Input)*

Overload Factor for NESC Extreme Ice w/ Wind Vertical Load = $OF_{EIV} := 1.0$ *(User Input)*

Wind Area without Ice = $A := \left(NP_{coax} \cdot D_{coax}\right) = 4.44 \cdot in$

Wind Area with Ice = $A_{ice} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right) = 5.44 \cdot in$

Wind Area with Extreme Ice = $A_{ice.ex} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir_{ex}\right) = 6.44 \cdot in$

Ice Area per Liner Ft =

$$Ai_{coax} := \frac{\pi}{4}\cdot\left[\left(D_{coax} + 2\cdot Ir\right)^2 - D_{coax}^2\right] = 0.018\,ft^2$$

Weight of Ice on All Coax Cables =

$$W_{ice} := Ai_{coax}\cdot Id\cdot N_{coax} = 23.604\cdot plf$$

Extreme Ice Area per Liner Ft =

$$Ai_{coax.ex} := \frac{\pi}{4}\cdot\left[\left(D_{coax} + 2\cdot Ir_{ex}\right)^2 - D_{coax}^2\right] = 0.046\,ft^2$$

Weight of Extreme Ice on All Coax Cables =

$$W_{ice.ex} := Ai_{coax.ex}\cdot Id\cdot N_{coax} = 61.868\cdot plf$$

Heavy Vertical Load =

$$Heavy_{Vert} := \overrightarrow{\left[\left(N_{coax}\cdot W_{coax} + W_{ice}\right)\cdot Coax_{Span}\cdot OF_{HWV}\right]}$$

Heavy Transverse Load =

$$Heavy_{Trans} := \overrightarrow{\left(p\cdot A_{ice}\cdot Cd_{coax}\cdot Coax_{Span}\cdot OF_{HWT}\right)}$$

$$Heavy_{Vert} = \begin{pmatrix}548\\548\\548\\548\\548\\548\\548\\548\\548\\548\end{pmatrix} lb \qquad Heavy_{Trans} = \begin{pmatrix}73\\73\\73\\73\\73\\73\\73\\73\\73\\73\end{pmatrix} lb$$

Extreme Wind Vertical Load =

$$Extreme\_Wind_{Vert} := \overrightarrow{\left(N_{coax}\cdot W_{coax}\cdot Coax_{Span}\cdot OF_{EWV}\right)}$$

Extreme Wind Transverse Load =

$$Extreme\_Wind_{Trans} := \overrightarrow{\left[\left(qz\cdot A\cdot Cd_{coax}\right)\cdot Coax_{Span}\cdot OF_{EWT}\right]}$$

$$Extreme\_Wind_{Vert} = \begin{pmatrix}130\\130\\130\\130\\130\\130\\130\\130\\130\\130\end{pmatrix} lb \qquad Extreme\_Wind_{Trans} = \begin{pmatrix}203\\203\\203\\203\\203\\203\\203\\203\\203\\203\end{pmatrix} lb$$

Extreme Ice w/ Wind Vertical Load =

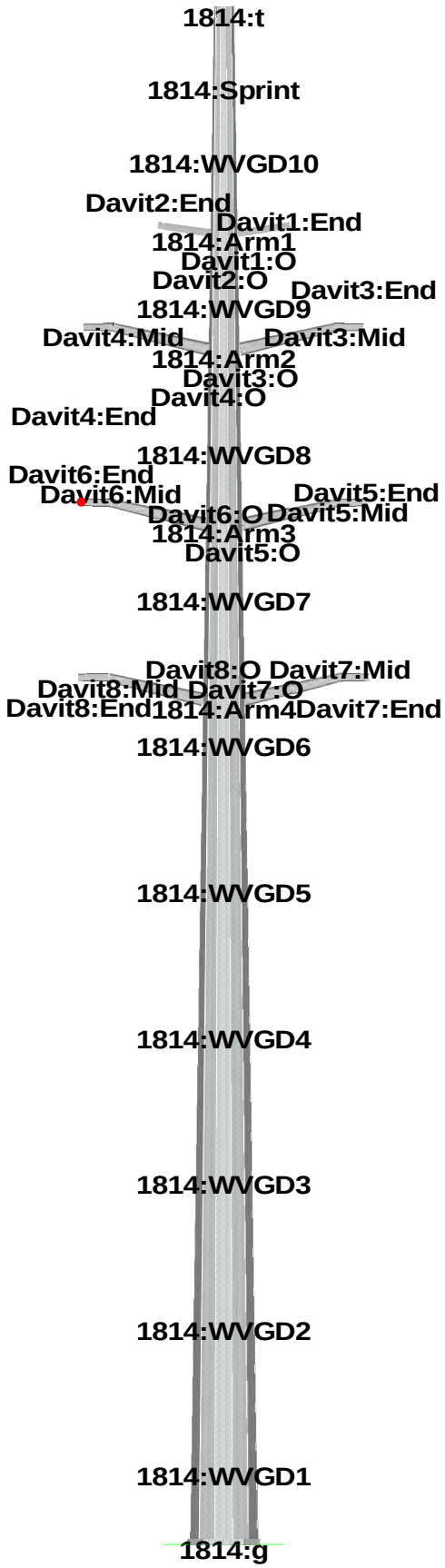
$$Extreme\_Ice_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax} + W_{ice.ex}\right) \cdot Coax_{Span} \cdot OF_{EIV}\right]}$$

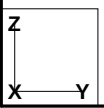
Extreme Ice w/ Wind Transverse Load =

$$Extreme\_Ice_{Trans} := \overrightarrow{\left(p_{ex} \cdot A_{ice.ex} \cdot Cd_{coax} \cdot Coax_{Span} \cdot OF_{EIT}\right)}$$

$$Extreme\_Ice_{Vert} = \begin{pmatrix} 748 \\ 748 \\ 748 \\ 748 \\ 748 \\ 748 \\ 748 \\ 748 \\ 748 \\ 748 \end{pmatrix} lb \qquad Extreme\_Ice_{Trans} = \begin{pmatrix} 34 \\ 34 \\ 34 \\ 34 \\ 34 \\ 34 \\ 34 \\ 34 \\ 34 \\ 34 \end{pmatrix} lb$$

Centek Engineering Inc, Project: "Structure # 1814"
PLS-POLE Version 12.50, 2:06:49 PM Thursday, August 02, 2018
Undeformed geometry displayed





Project Name : 18098.02 - Southington
Project Notes: Str # 1814/T-Mobile - CT11734B
Project File : J:\Jobs\1809800.WI\02_CT11734B\Structural\Tower\Backup Documentation\Rev (1)\Calcs\PLS Pole\Structure # 1814.pol
Date run : 11:15:44 AM Monday, October 29, 2018
by : PLS-POLE Version 12.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: j:\jobs\1809800.wi\02_ct11734b\structural\tower\backup documentation\rev (1)\calcs\pls pole\structure #1814.lca

*** Analysis Results:

Maximum element usage is 74.83% for Base Plate "1814" in load case "NESC Extreme Wind"
Maximum insulator usage is 7.51% for Clamp "Clamp3" in load case "NESC 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. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
NESC Heavy Wind	1814:g	-0.11	-22.26	-73.68	22.26	1578.59	-5.01	1578.60	-0.00	0.00
NESC Extreme Wind	1814:g	-0.03	-41.65	-36.97	41.65	2841.19	-1.56	2841.19	-0.00	0.00
NESC Extreme Ice w/ Wind	1814:g	-0.04	-14.28	-69.91	14.28	1064.10	-2.01	1064.11	-0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: postive 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 Heavy Wind	1814:t	0.05	17.89	-0.20	17.89	0.00	-1.32	0.00
NESC Extreme Wind	1814:t	0.01	32.27	-0.55	32.27	0.00	-2.44	0.00
NESC Extreme Ice w/ Wind	1814:t	0.02	12.45	-0.11	12.45	0.00	-0.93	0.00

Tubes Summary:

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)
1814	1	393	NESC Extreme Wind	6.49	22.75
1814	2	6472	NESC Extreme Wind	46.24	1177.71
1814	3	9725	NESC Extreme Wind	50.49	2841.19

*** 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)
1814	50.49	NESC Extreme Wind	26	18119.1

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
Davit1	23.18	NESC Extreme Ice w/ Wind	1	58.6
Davit2	21.09	NESC Extreme Ice w/ Wind	1	58.6
Davit3	48.94	NESC Extreme Ice w/ Wind	1	186.4
Davit4	45.16	NESC Extreme Ice w/ Wind	1	186.4
Davit5	48.94	NESC Extreme Ice w/ Wind	1	186.4
Davit6	45.19	NESC Extreme Ice w/ Wind	1	186.4
Davit7	48.95	NESC Extreme Ice w/ Wind	1	186.4
Davit8	45.23	NESC Extreme Ice w/ Wind	1	186.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy Wind	47.76	Davit7	Tubular Davit
NESC Extreme Wind	74.83	1814	Base Plate
NESC Extreme Ice w/ Wind	48.95	Davit7	Tubular Davit

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC Heavy Wind	29.13	1814	26
NESC Extreme Wind	50.49	1814	26
NESC Extreme Ice w/ Wind	20.03	1814	26

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 Heavy Wind	1814	11	17.551	72.155	1578.588	-5.013	21.950	48.156	3	70.895	1.988	43.90
NESC Extreme Wind	1814	11	17.551	35.446	2841.186	-1.565	37.415	82.084	3	121.528	2.595	74.83
NESC Extreme Ice w/ Wind	1814	11	17.551	68.383	1064.104	-2.006	15.205	33.358	3	48.992	1.654	30.41

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Segment Number
NESC Heavy Wind	47.76	Davit7	1
NESC Extreme Wind	23.64	Davit7	1
NESC Extreme Ice w/ Wind	48.95	Davit7	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	3.71	NESC Extreme Ice w/ Wind	0.0
Clamp2	Clamp	3.71	NESC Extreme Ice w/ Wind	0.0
Clamp3	Clamp	7.51	NESC Extreme Ice w/ Wind	0.0
Clamp4	Clamp	7.51	NESC Extreme Ice w/ Wind	0.0
Clamp5	Clamp	7.51	NESC Extreme Ice w/ Wind	0.0
Clamp6	Clamp	7.51	NESC Extreme Ice w/ Wind	0.0
Clamp7	Clamp	7.51	NESC Extreme Ice w/ Wind	0.0
Clamp8	Clamp	7.51	NESC Extreme Ice w/ Wind	0.0
Clamp9	Clamp	5.31	NESC Extreme Wind	0.0
Clamp10	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp11	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp12	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp13	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp14	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp15	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp16	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp17	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp18	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp19	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0

*** Weight of structure (lbs):
Weight of Tubular Davit Arms: 1235.5
Weight of Steel Poles: 18119.1
Total: 19354.5

*** End of Report

```
**************************************************************************
*                                                                        *
*                              PLS-POLE                                  *
*                   POLE AND FRAME ANALYSIS AND DESIGN                   *
*               Copyright Power Line Systems, Inc. 1999-2011             *
*                                                                        *
**************************************************************************

Project Name : 18098.02 - Southington
Project Notes: Str # 1814/T-Mobile - CT11734B
Project File : J:\Jobs\1809800.WI\02_CT11734B\Structural\Tower\Backup Documentation\Rev (1)\Calcs\PLS Pole\Structure # 1814.pol
Date run     : 11:15:44 AM Monday, October 29, 2018
by           : PLS-POLE Version 12.50
Licensed to  : Centek Engineering Inc

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	Stock Length Number	Default Embedded	Base Plate	Shape	Tip Diameter	Base Diameter	Taper	Default Drag	Tubes Modulus of Elasticity	Weight Density	Shape At	Strength Check	Distance From	Ultimate Ultimate

Label	Length (ft)	Length (ft)		(in)	(in)	Coef. (in/ft)		Override (ksi)	Override (lbs/ft^3)	Base	Type	Tip (ft)	Trans. Load (kips)	Long. Load (kips)
1814	1814	105.00	0	Yes	12F	17.56	55.31	0	1.3	3 tubes	0	0	Calculated	0.000	0.0000	0.0000

Steel Tubes Properties:

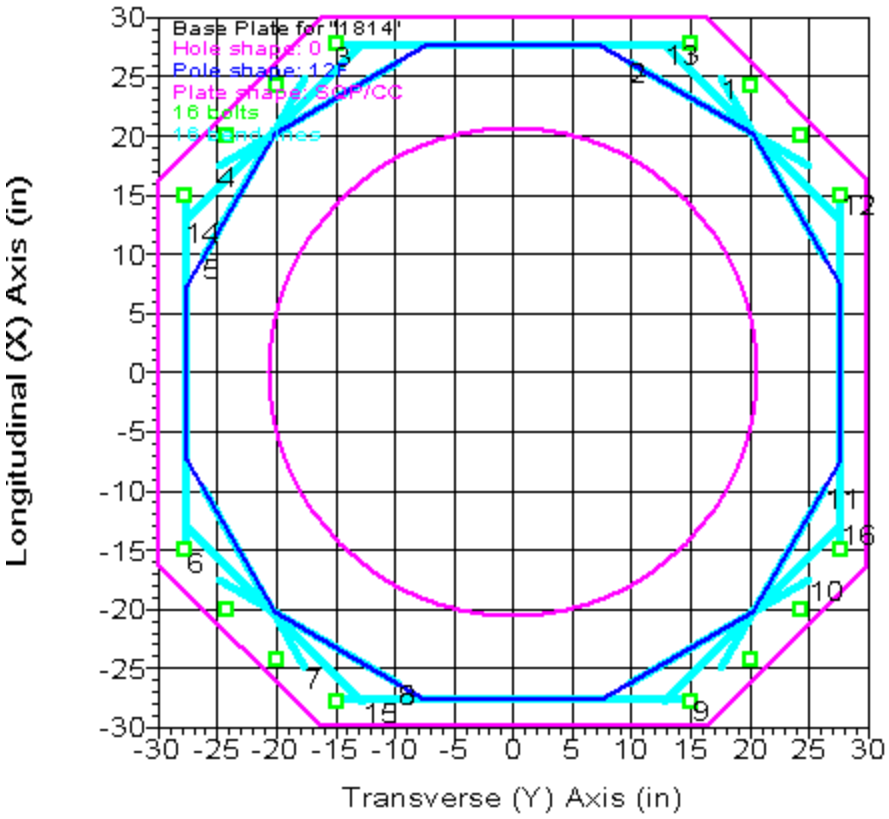
Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Gap (in)	Yield Stress (ksi)	Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. Diameter (in)	1.5x Diam. Lap Length (ft)	Actual Overlap (ft)
1814	1	10	0.1875	0.000	0.000	0.000	65.000	0.000	393	5.15	0.35476	17.56	21.11	2.592	0.000
1814	2	52	0.375	0.000	0.000	0.000	65.000	0.000	6472	28.64	0.35476	21.49	39.93	4.898	0.000
1814	3	43	0.4375	0.000	0.000	0.000	65.000	0.000	9725	22.66	0.35476	40.06	55.31	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)
1814	59.875	SQP/CC	3.000	1529	0.000	41.500	0	490.00	50.000	2.250	63.000	16	31540.29	31540.29

Base Plate Bolt Coordinates for Property "1814":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0.4762	0.881	0
0.6349	0.7698	0
0.7698	0.6349	0
0.881	0.4762	0



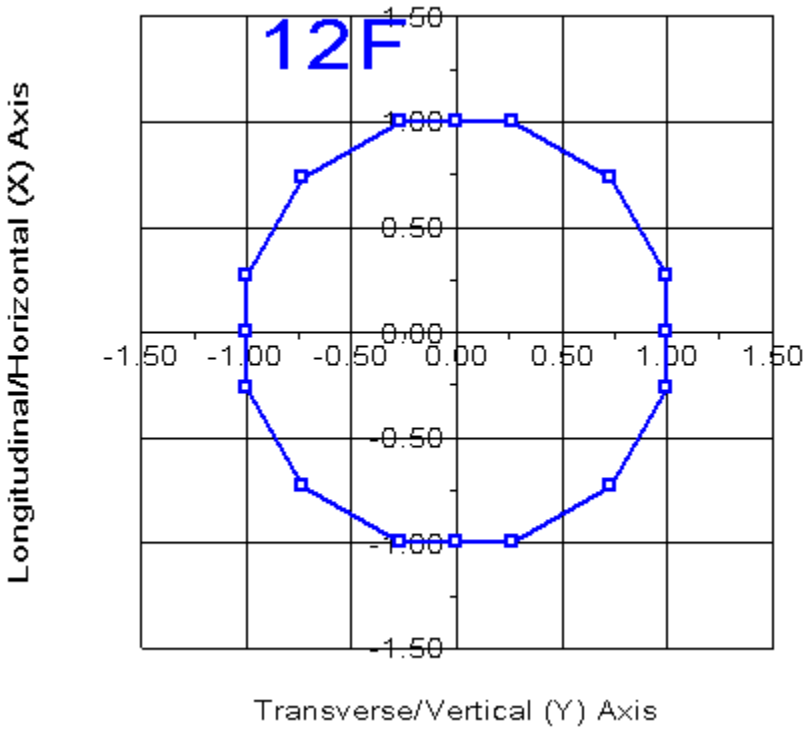
Steel Pole Connectivity:

Pole Label	Tip Joint	Base Joint	X of Base (ft)	Y of Base (ft)	Z of Base (ft)	Inclin. About X (deg)	Inclin. About Y (deg)	Property Set	Attach. Labels	Base Connect	Embed % Override	Embed C. Override (ft)
1814			0	0	0	0	0	1814	15 labels	Fixed	0.00	0

Relative Attachment Labels for Steel Pole "1814":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
1814:Arm1	0.00	89.60
1814:Arm2	0.00	81.60
1814:Arm3	0.00	69.60
1814:Arm4	0.00	57.60
1814:Sprint	0.00	100.00

1814:WVGD1	0.00	5.00
1814:WVGD2	0.00	15.00
1814:WVGD3	0.00	25.00
1814:WVGD4	0.00	35.00
1814:WVGD5	0.00	45.00
1814:WVGD6	0.00	55.00
1814:WVGD7	0.00	65.00
1814:WVGD8	0.00	75.00
1814:WVGD9	0.00	85.00
1814:WVGD10	0.00	95.00



Pole Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	T-Moment Inertia (in^4)	L-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	T-Moment Capacity (ft-k)	L-Moment Capacity (ft-k)
1814	1814:t	1814:t Ori	0.00	17.56	10.48	404.80	404.80	0.00	22.4	65.00	65.00	249.70	249.70
1814	1814:Sprint	1814:Sprint End	5.00	19.34	11.54	541.85	541.85	0.00	25.0	65.00	65.00	303.58	303.58
1814	1814:Sprint	1814:Sprint Ori	5.00	19.34	11.54	541.85	541.85	0.00	25.0	65.00	65.00	303.58	303.58
1814	1814:WVGD10	1814:WVGD10 End	10.00	21.11	12.61	706.80	706.80	0.00	27.5	65.00	65.00	362.72	362.72
1814	1814:WVGD10	1814:WVGD10 Ori	10.00	21.49	25.45	1452.28	1452.28	0.00	12.7	65.00	65.00	732.28	732.28
1814	#1814:0	Tube 2 End	12.70	22.44	26.61	1659.03	1659.03	0.00	13.4	65.00	65.00	800.82	800.82
1814	#1814:0	Tube 2 Ori	12.70	22.44	26.61	1659.03	1659.03	0.00	13.4	65.00	65.00	800.82	800.82

1814	1814:Arm1	1814:Arm1 End	15.40	23.40	27.76	1884.53	1884.53	0.00	14.0	65.00	65.00	872.44	872.44		
1814	1814:Arm1	1814:Arm1 Ori	15.40	23.40	27.76	1884.53	1884.53	0.00	14.0	65.00	65.00	872.44	872.44		
1814	1814:WVGD9	1814:WVGD9 End	20.00	25.03	29.73	2314.21	2314.21	0.00	15.2	65.00	65.00	1001.51	1001.51		
1814	1814:WVGD9	1814:WVGD9 Ori	20.00	25.03	29.73	2314.21	2314.21	0.00	15.2	65.00	65.00	1001.51	1001.51		
1814	1814:Arm2	1814:Arm2 End	23.40	26.24	31.19	2670.66	2670.66	0.00	16.1	65.00	65.00	1102.64	1102.64		
1814	1814:Arm2	1814:Arm2 Ori	23.40	26.24	31.19	2670.66	2670.66	0.00	16.1	65.00	65.00	1102.64	1102.64		
1814	#1814:1	Tube 2 End	26.70	27.41	32.60	3049.93	3049.93	0.00	16.9	65.00	65.00	1205.45	1205.45		
1814	#1814:1	Tube 2 Ori	26.70	27.41	32.60	3049.93	3049.93	0.00	16.9	65.00	65.00	1205.45	1205.45		
1814	1814:WVGD8	1814:WVGD8 End	30.00	28.58	34.01	3463.50	3463.50	0.00	17.7	65.00	65.00	1312.83	1312.83		
1814	1814:WVGD8	1814:WVGD8 Ori	30.00	28.58	34.01	3463.51	3463.51	0.00	17.7	65.00	65.00	1312.83	1312.83		
1814	#1814:2	Tube 2 End	32.70	29.54	35.16	3828.44	3828.44	0.00	18.4	65.00	65.00	1404.10	1404.10		
1814	#1814:2	Tube 2 Ori	32.70	29.54	35.16	3828.45	3828.45	0.00	18.4	65.00	65.00	1404.11	1404.11		
1814	1814:Arm3	1814:Arm3 End	35.40	30.50	36.32	4218.16	4218.16	0.00	19.1	65.00	65.00	1498.44	1498.44		
1814	1814:Arm3	1814:Arm3 Ori	35.40	30.50	36.32	4218.16	4218.16	0.00	19.1	65.00	65.00	1498.44	1498.44		
1814	1814:WVGD7	1814:WVGD7 End	40.00	32.13	38.29	4941.50	4941.50	0.00	20.3	65.00	65.00	1666.24	1666.24		
1814	1814:WVGD7	1814:WVGD7 Ori	40.00	32.13	38.29	4941.50	4941.50	0.00	20.3	65.00	65.00	1666.24	1666.24		
1814	#1814:3	Tube 2 End	43.70	33.44	39.87	5579.94	5579.94	0.00	21.2	65.00	65.00	1807.66	1807.66		
1814	#1814:3	Tube 2 Ori	43.70	33.44	39.87	5579.94	5579.94	0.00	21.2	65.00	65.00	1807.66	1807.66		
1814	1814:Arm4	1814:Arm4 End	47.40	34.75	41.45	6271.14	6271.14	0.00	22.2	65.00	65.00	1954.85	1954.85		
1814	1814:Arm4	1814:Arm4 Ori	47.40	34.75	41.45	6271.14	6271.14	0.00	22.2	65.00	65.00	1954.85	1954.85		
1814	1814:WVGD6	1814:WVGD6 End	50.00	35.68	42.56	6789.54	6789.54	0.00	22.8	65.00	65.00	2061.72	2061.72		
1814	1814:WVGD6	1814:WVGD6 Ori	50.00	35.68	42.56	6789.54	6789.54	0.00	22.8	65.00	65.00	2061.72	2061.72		
1814	#1814:4	Tube 2 End	55.00	37.45	44.70	7865.24	7865.24	0.00	24.1	65.00	65.00	2275.25	2275.25		
1814	#1814:4	Tube 2 Ori	55.00	37.45	44.70	7865.24	7865.24	0.00	24.1	65.00	65.00	2275.25	2275.25		
1814	1814:WVGD5	1814:WVGD5 End	60.00	39.22	46.84	9048.96	9048.96	0.00	25.3	65.00	65.00	2499.29	2499.29		
1814	1814:WVGD5	1814:WVGD5 Ori	60.00	39.22	46.84	9048.97	9048.97	0.00	25.3	65.00	65.00	2499.29	2499.29		
1814	#1814:5	SpliceT End	62.00	39.93	47.70	9553.85	9553.85	0.00	25.9	65.00	65.00	2591.86	2591.86		
1814	#1814:5	SpliceT Ori	62.00	40.06	55.74	11199.43	11199.43	0.00	21.9	65.00	65.00	3028.80	3028.80		
1814	#1814:6	Tube 3 End	66.00	41.48	57.73	12446.31	12446.31	0.00	22.7	65.00	65.00	3250.85	3250.85		
1814	#1814:6	Tube 3 Ori	66.00	41.48	57.73	12446.31	12446.31	0.00	22.7	65.00	65.00	3250.85	3250.85		
1814	1814:WVGD4	1814:WVGD4 End	70.00	42.90	59.73	13782.46	13782.46	0.00	23.6	65.00	65.00	3480.75	3480.75		
1814	1814:WVGD4	1814:WVGD4 Ori	70.00	42.90	59.73	13782.46	13782.46	0.00	23.6	65.00	65.00	3480.75	3480.75		
1814	#1814:7	Tube 3 End	75.00	44.67	62.22	15582.90	15582.90	0.00	24.7	65.00	65.00	3779.18	3779.18		
1814	#1814:7	Tube 3 Ori	75.00	44.67	62.22	15582.91	15582.91	0.00	24.7	65.00	65.00	3779.18	3779.18		
1814	1814:WVGD3	1814:WVGD3 End	80.00	46.44	64.72	17533.69	17533.69	0.00	25.8	65.00	65.00	4089.88	4089.88		
1814	1814:WVGD3	1814:WVGD3 Ori	80.00	46.44	64.72	17533.70	17533.70	0.00	25.8	65.00	65.00	4089.88	4089.88		
1814	#1814:8	Tube 3 End	85.00	48.22	67.21	19640.86	19640.86	0.00	26.9	65.00	65.00	4412.85	4412.85		
1814	#1814:8	Tube 3 Ori	85.00	48.22	67.21	19640.86	19640.86	0.00	26.9	65.00	65.00	4412.85	4412.85		
1814	1814:WVGD2	1814:WVGD2 End	90.00	49.99	69.71	21910.43	21910.43	0.00	27.9	65.00	65.00	4748.10	4748.10		
1814	1814:WVGD2	1814:WVGD2 Ori	90.00	49.99	69.71	21910.43	21910.43	0.00	27.9	65.00	65.00	4748.10	4748.10		
1814	#1814:9	Tube 3 End	95.00	51.76	72.20	24348.44	24348.44	0.00	29.0	65.00	65.00	5095.62	5095.62		
1814	#1814:9	Tube 3 Ori	95.00	51.76	72.20	24348.44	24348.44	0.00	29.0	65.00	65.00	5095.62	5095.62		
1814	1814:WVGD1	1814:WVGD1 End	100.00	53.54	74.70	26960.91	26960.91	0.00	30.1	65.00	64.73	5433.15	5433.15		
1814	1814:WVGD1	1814:WVGD1 Ori	100.00	53.54	74.70	26960.91	26960.91	0.00	30.1	65.00	64.73	5433.15	5433.15		
1814	1814:g	1814:g End	105.00	55.31	77.19	29753.87	29753.87	0.00	31.2	65.00	63.67	5708.23	5708.23		

Tubular Davit Properties:

Davit Label	Stock Steel Property Number	Steel Shape	Thickness Diameter or Depth (in)	Base Diameter or Depth (in)	Tip Diameter (in)	Taper (in/ft)	Drag Coef.	Modulus of Elasticity (ksi)	Geometry Check Type	Strength Vertical Capacity (lbs)	Tension Capacity (lbs)	Compres. Capacity (lbs)	Long. Capacity (lbs)	Yield Stress (ksi)	Weight Steel Density Override (lbs/ft^3)
ARM G	ARM G	6F	0.25	6.25	5.5	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0

ARM L	ARM L	8T	0.25	10.25	5.5	0	1.3	29000	2 points	Calculated	0	0	0	0	65	0

Intermediate Joints for Davit Property "ARM G":

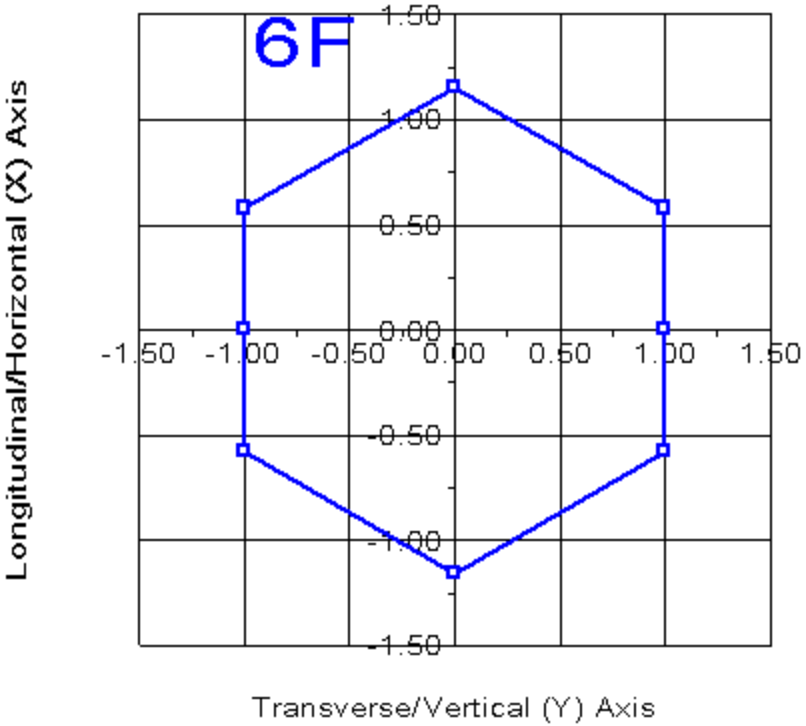
Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
End	3.5	-0.5

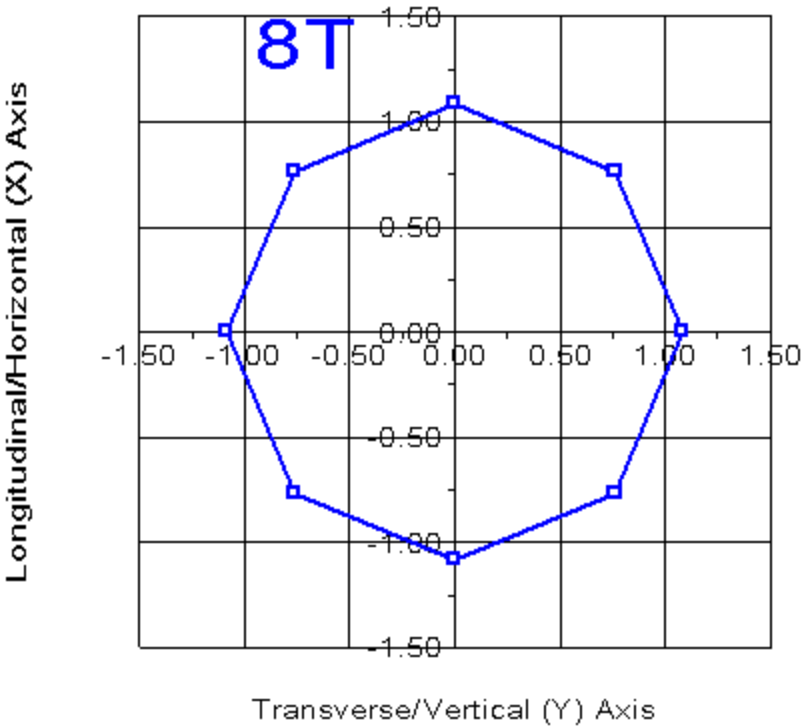
Intermediate Joints for Davit Property "ARM L":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
Mid	6.5	-1.5
End	8.5	-1.5

Tubular Davit Arm Connectivity:

Davit Label	Attach Label	Davit Property Set	Azimuth (deg)
Davit1	1814:Arm1	ARM G	0
Davit2	1814:Arm1	ARM G	180
Davit3	1814:Arm2	ARM L	0
Davit4	1814:Arm2	ARM L	180
Davit5	1814:Arm3	ARM L	0
Davit6	1814:Arm3	ARM L	180
Davit7	1814:Arm4	ARM L	0
Davit8	1814:Arm4	ARM L	180


6F
Longitudinal/Horizontal (X) Axis
1.50
1.00
0.50
0.00
-0.50
-1.00
-1.50
-1.50
-1.00
-0.50
0.00
0.50
1.00
1.50
Transverse/Vertical (Y) Axis



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	6.25	5.20	26.02	26.02	0.00	8.7	65.00	65.00	45.11	39.07
Davit1	Davit1:End	End	3.54	5.50	4.55	17.44	17.44	0.00	6.9	65.00	65.00	34.36	29.76
Davit2	Davit2:O	Origin	0.00	6.25	5.20	26.02	26.02	0.00	8.7	65.00	65.00	45.11	39.07
Davit2	Davit2:End	End	3.54	5.50	4.55	17.44	17.44	0.00	6.9	65.00	65.00	34.36	29.76
Davit3	Davit3:O	Origin	0.00	10.25	8.28	109.54	109.54	0.00	12.8	65.00	65.00	106.96	106.96
Davit3	#Davit3:0	End	3.34	8.42	6.77	59.82	59.82	0.00	9.8	65.00	65.00	71.08	71.08
Davit3	#Davit3:0	Origin	3.34	8.42	6.77	59.82	59.82	0.00	9.8	65.00	65.00	71.08	71.08
Davit3	Davit3:Mid	End	6.67	6.60	5.26	28.02	28.02	0.00	6.8	65.00	65.00	42.51	42.51
Davit3	Davit3:Mid	Origin	6.67	6.60	5.26	28.02	28.02	0.00	6.8	65.00	65.00	42.51	42.51
Davit3	Davit3:End	End	8.67	5.50	4.35	15.88	15.88	0.00	5.0	65.00	65.00	28.89	28.89
Davit4	Davit4:O	Origin	0.00	10.25	8.28	109.54	109.54	0.00	12.8	65.00	65.00	106.96	106.96
Davit4	#Davit4:0	End	3.34	8.42	6.77	59.82	59.82	0.00	9.8	65.00	65.00	71.08	71.08
Davit4	#Davit4:0	Origin	3.34	8.42	6.77	59.82	59.82	0.00	9.8	65.00	65.00	71.08	71.08
Davit4	Davit4:Mid	End	6.67	6.60	5.26	28.02	28.02	0.00	6.8	65.00	65.00	42.51	42.51

Davit4	Davit4:Mid	Origin	6.67	6.60	5.26	28.02	28.02	0.00	6.8	65.00	65.00	42.51	42.51
Davit4	Davit4:End	End	8.67	5.50	4.35	15.88	15.88	0.00	5.0	65.00	65.00	28.89	28.89
Davit5	Davit5:O	Origin	0.00	10.25	8.28	109.54	109.54	0.00	12.8	65.00	65.00	106.96	106.96
Davit5	#Davit5:0	End	3.34	8.42	6.77	59.82	59.82	0.00	9.8	65.00	65.00	71.08	71.08
Davit5	#Davit5:0	Origin	3.34	8.42	6.77	59.82	59.82	0.00	9.8	65.00	65.00	71.08	71.08
Davit5	Davit5:Mid	End	6.67	6.60	5.26	28.02	28.02	0.00	6.8	65.00	65.00	42.51	42.51
Davit5	Davit5:Mid	Origin	6.67	6.60	5.26	28.02	28.02	0.00	6.8	65.00	65.00	42.51	42.51
Davit5	Davit5:End	End	8.67	5.50	4.35	15.88	15.88	0.00	5.0	65.00	65.00	28.89	28.89
Davit6	Davit6:O	Origin	0.00	10.25	8.28	109.54	109.54	0.00	12.8	65.00	65.00	106.96	106.96
Davit6	#Davit6:0	End	3.34	8.42	6.77	59.82	59.82	0.00	9.8	65.00	65.00	71.08	71.08
Davit6	#Davit6:0	Origin	3.34	8.42	6.77	59.82	59.82	0.00	9.8	65.00	65.00	71.08	71.08
Davit6	Davit6:Mid	End	6.67	6.60	5.26	28.02	28.02	0.00	6.8	65.00	65.00	42.51	42.51
Davit6	Davit6:Mid	Origin	6.67	6.60	5.26	28.02	28.02	0.00	6.8	65.00	65.00	42.51	42.51
Davit6	Davit6:End	End	8.67	5.50	4.35	15.88	15.88	0.00	5.0	65.00	65.00	28.89	28.89
Davit7	Davit7:O	Origin	0.00	10.25	8.28	109.54	109.54	0.00	12.8	65.00	65.00	106.96	106.96
Davit7	#Davit7:0	End	3.34	8.42	6.77	59.82	59.82	0.00	9.8	65.00	65.00	71.08	71.08
Davit7	#Davit7:0	Origin	3.34	8.42	6.77	59.82	59.82	0.00	9.8	65.00	65.00	71.08	71.08
Davit7	Davit7:Mid	End	6.67	6.60	5.26	28.02	28.02	0.00	6.8	65.00	65.00	42.51	42.51
Davit7	Davit7:Mid	Origin	6.67	6.60	5.26	28.02	28.02	0.00	6.8	65.00	65.00	42.51	42.51
Davit7	Davit7:End	End	8.67	5.50	4.35	15.88	15.88	0.00	5.0	65.00	65.00	28.89	28.89
Davit8	Davit8:O	Origin	0.00	10.25	8.28	109.54	109.54	0.00	12.8	65.00	65.00	106.96	106.96
Davit8	#Davit8:0	End	3.34	8.42	6.77	59.82	59.82	0.00	9.8	65.00	65.00	71.08	71.08
Davit8	#Davit8:0	Origin	3.34	8.42	6.77	59.82	59.82	0.00	9.8	65.00	65.00	71.08	71.08
Davit8	Davit8:Mid	End	6.67	6.60	5.26	28.02	28.02	0.00	6.8	65.00	65.00	42.51	42.51
Davit8	Davit8:Mid	Origin	6.67	6.60	5.26	28.02	28.02	0.00	6.8	65.00	65.00	42.51	42.51
Davit8	Davit8:End	End	8.67	5.50	4.35	15.88	15.88	0.00	5.0	65.00	65.00	28.89	28.89

*** Insulator Data

Clamp Properties:

Label	Stock Number	Holding Capacity (lbs)
clamp	clamp1	8e+004

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	1814:Sprint	clamp	No Limit
Clamp10	1814:WVGD1	clamp	No Limit
Clamp11	1814:WVGD2	clamp	No Limit

Clamp12	1814:WVGD3	clamp	No Limit
Clamp13	1814:WVGD4	clamp	No Limit
Clamp14	1814:WVGD5	clamp	No Limit
Clamp15	1814:WVGD6	clamp	No Limit
Clamp16	1814:WVGD7	clamp	No Limit
Clamp17	1814:WVGD8	clamp	No Limit
Clamp18	1814:WVGD9	clamp	No Limit
Clamp19	1814:WVGD10	clamp	No Limit

*** Loads Data

Loads from file: j:\jobs\1809800.wi\02_ct11734b\structural\tower\backup documentation\rev (1)\calcs\pls pole\structure #1814.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)	105.00	(ft)
Structure height	105.00	(ft)
Structure height above ground	105.00	(ft)

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Tubular Poles and Towers	SF for Wood Poles Deflection Check	SF for Conc. Poles Deflection Limit	SF for Conc. Ult. Limit	SF for First Crack	SF for Guys Zero Tens.	SF for Cables and Tubular Arms	SF for Non Braces	SF For Insuls.	SF for Found.	Point Loads	Wind/Ice Model	Trans. Wind Pressure
Longit. Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature (deg F)													
															(psf)
						% or (ft)									(psf)
NESC Heavy Wind	1.5000	2.5000	1.00000	0.6500	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	19 loads	Wind on All	4
0 0.000	0.000	0.0	No Limit		0										
NESC Extreme Wind	1.0000	1.0000	1.00000	0.6500	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	19 loads	NESC 2012	31
0 0.000	0.000	0.0	No Limit		0										
NESC Extreme Ice w/ Wind	1.0000	1.0000	1.00000	0.6500	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	19 loads	Wind on All	4
0 0.000	0.000	0.0	No Limit		0										

Point Loads for Load Case "NESC Heavy Wind":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	1938	1343	0	Shield Wire
Davit2:End	1938	1343	0	Shield Wire
Davit3:End	5497	2271	0	Conductor
Davit4:End	5497	2271	0	Conductor
Davit5:End	5497	2271	0	Conductor
Davit6:End	5497	2271	0	Conductor
Davit7:End	5497	2271	0	Conductor
Davit8:End	5497	2271	0	Conductor
1814:Sprint	3033	1058	0	T-Mobile Equipment
1814:WVGD1	548	73	0	Coax Cables
1814:WVGD2	548	73	0	Coax Cables
1814:WVGD3	548	73	0	Coax Cables
1814:WVGD4	548	73	0	Coax Cables
1814:WVGD5	548	73	0	Coax Cables

1814:WVGD6	548	73	0	Coax Cables
1814:WVGD7	548	73	0	Coax Cables
1814:WVGD8	548	73	0	Coax Cables
1814:WVGD9	548	73	0	Coax Cables
1814:WVGD10	548	73	0	Coax Cables

Point Loads for Load Case "NESC Extreme Wind":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	539	1327	0	Shield Wire
Davit2:End	539	1327	0	Shield Wire
Davit3:End	2260	3815	0	Conductor
Davit4:End	2260	3815	0	Conductor
Davit5:End	2260	3815	0	Conductor
Davit6:End	2260	3815	0	Conductor
Davit7:End	2260	3815	0	Conductor
Davit8:End	2260	3815	0	Conductor
1814:Sprint	1484	3978	0	T-Mobile Equipment
1814:WVGD1	130	203	0	Coax Cables
1814:WVGD2	130	203	0	Coax Cables
1814:WVGD3	130	203	0	Coax Cables
1814:WVGD4	130	203	0	Coax Cables
1814:WVGD5	130	203	0	Coax Cables
1814:WVGD6	130	203	0	Coax Cables
1814:WVGD7	130	203	0	Coax Cables
1814:WVGD8	130	203	0	Coax Cables
1814:WVGD9	130	203	0	Coax Cables
1814:WVGD10	130	203	0	Coax Cables

Detailed Pole Loading Data for Load Case "NESC 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)
1814	1814:t	1814:Sprint	105.00	100.00	102.50	18.449	1.55e+006	1.000	31.55	0.00	187.32	242.51	0.00	0.00	242.51	0.00
1814	1814:Sprint	1814:WVGD10	100.00	95.00	97.50	20.223	1.7e+006	1.000	31.55	0.00	205.51	265.82	0.00	0.00	265.82	0.00
1814	1814:WVGD10		95.00	92.30	93.65	21.964	1.85e+006	1.000	31.55	0.00	239.16	155.90	0.00	0.00	155.90	0.00
1814		1814:Arm1	92.30	89.60	90.95	22.922	1.93e+006	1.000	31.55	0.00	249.78	162.70	0.00	0.00	162.70	0.00
1814	1814:Arm1	1814:WVGD9	89.60	85.00	87.30	24.217	2.04e+006	1.000	31.55	0.00	449.98	292.85	0.00	0.00	292.85	0.00
1814	1814:WVGD9	1814:Arm2	85.00	81.60	83.30	25.636	2.16e+006	1.000	31.55	0.00	352.39	229.14	0.00	0.00	229.14	0.00
1814	1814:Arm2		81.60	78.30	79.95	26.824	2.26e+006	1.000	31.55	0.00	358.12	232.71	0.00	0.00	232.71	0.00
1814		1814:WVGD8	78.30	75.00	76.65	27.995	2.35e+006	1.000	31.55	0.00	373.97	242.87	0.00	0.00	242.87	0.00
1814	1814:WVGD8		75.00	72.30	73.65	29.059	2.44e+006	1.000	31.55	0.00	317.77	206.26	0.00	0.00	206.26	0.00
1814		1814:Arm3	72.30	69.60	70.95	30.017	2.52e+006	1.000	31.55	0.00	328.38	213.06	0.00	0.00	213.06	0.00
1814	1814:Arm3	1814:WVGD7	69.60	65.00	67.30	31.312	2.63e+006	1.000	31.55	0.00	583.90	378.65	0.00	0.00	378.65	0.00
1814	1814:WVGD7		65.00	61.30	63.15	32.784	2.76e+006	1.000	31.55	0.00	492.01	318.89	0.00	0.00	318.89	0.00
1814		1814:Arm4	61.30	57.60	59.45	34.097	2.87e+006	1.000	31.55	0.00	511.93	331.66	0.00	0.00	331.66	0.00
1814	1814:Arm4	1814:WVGD6	57.60	55.00	56.30	35.214	2.96e+006	1.000	31.55	0.00	371.66	240.69	0.00	0.00	240.69	0.00
1814	1814:WVGD6		55.00	50.00	52.50	36.563	3.07e+006	1.000	31.55	0.00	742.38	480.59	0.00	0.00	480.59	0.00
1814		1814:WVGD5	50.00	45.00	47.50	38.336	3.22e+006	1.000	31.55	0.00	778.77	503.91	0.00	0.00	503.91	0.00
1814	1814:WVGD5		45.00	43.00	44.00	39.578	3.33e+006	1.000	31.55	0.00	321.71	208.09	0.00	0.00	208.09	0.00

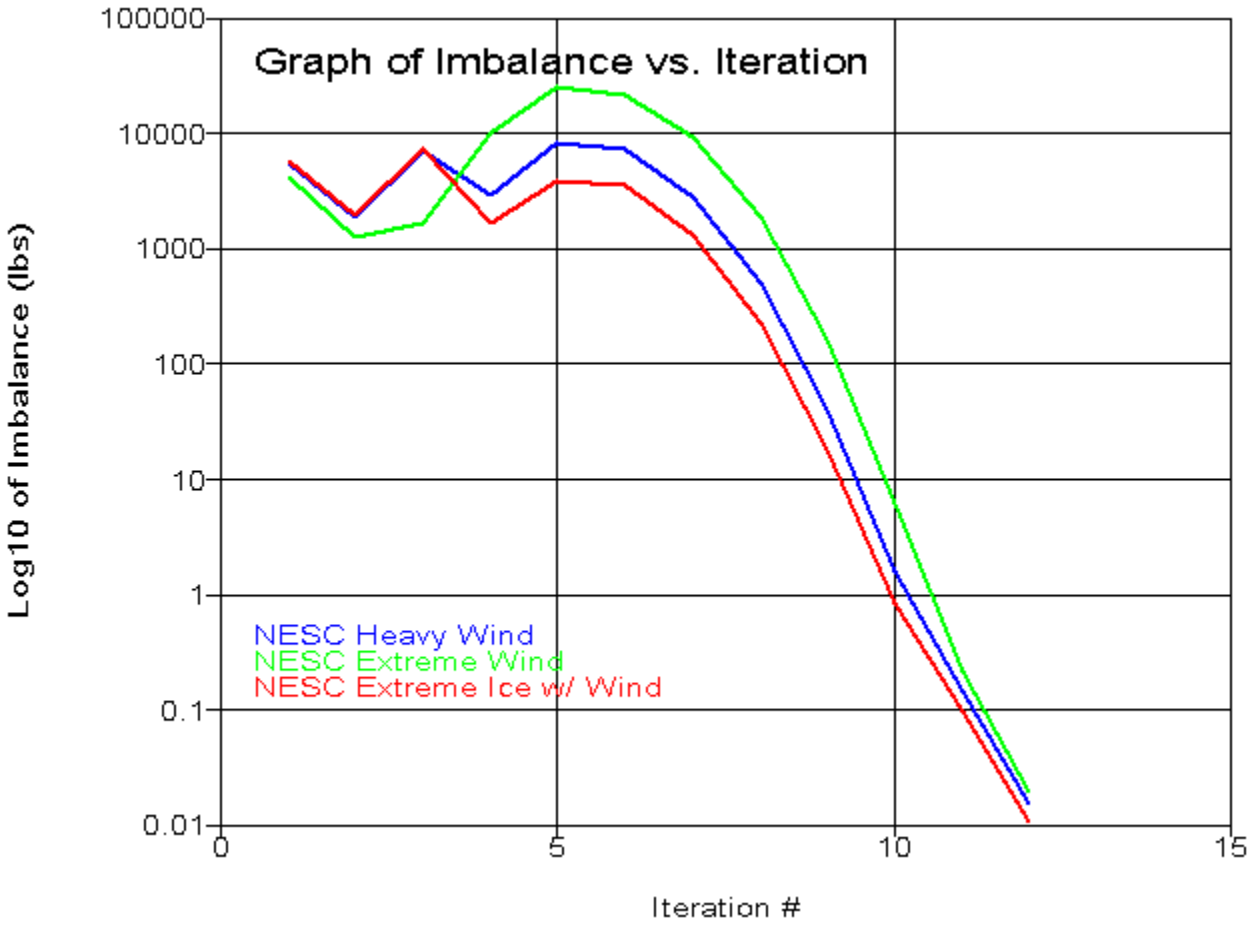
1814			43.00	39.00	41.00	40.767	3.43e+006	1.000	31.55	0.00	772.18	428.69	0.00	0.00	428.69	0.00
1814		1814:WVGD4	39.00	35.00	37.00	42.186	3.55e+006	1.000	31.55	0.00	799.37	443.61	0.00	0.00	443.61	0.00
1814	1814:WVGD4		35.00	30.00	32.50	43.783	3.68e+006	1.000	31.55	0.00	1037.42	575.50	0.00	0.00	575.50	0.00
1814		1814:WVGD3	30.00	25.00	27.50	45.557	3.83e+006	1.000	31.55	0.00	1079.88	598.82	0.00	0.00	598.82	0.00
1814	1814:WVGD3		25.00	20.00	22.50	47.330	3.98e+006	1.000	31.55	0.00	1122.33	622.13	0.00	0.00	622.13	0.00
1814		1814:WVGD2	20.00	15.00	17.50	49.104	4.13e+006	1.000	31.55	0.00	1164.79	645.45	0.00	0.00	645.45	0.00
1814	1814:WVGD2		15.00	10.00	12.50	50.878	4.28e+006	1.000	31.55	0.00	1207.24	668.76	0.00	0.00	668.76	0.00
1814		1814:WVGD1	10.00	5.00	7.50	52.652	4.43e+006	1.000	31.55	0.00	1249.70	692.08	0.00	0.00	692.08	0.00
1814	1814:WVGD1	1814:g	5.00	0.00	2.50	54.426	4.58e+006	1.000	31.55	0.00	1292.15	715.40	0.00	0.00	715.40	0.00

Point Loads for Load Case "NESC Extreme Ice w/ Wind":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	2792	1018	0	Shield Wire
Davit2:End	2792	1018	0	Shield Wire
Davit3:End	5816	1522	0	Conductor
Davit4:End	5816	1522	0	Conductor
Davit5:End	5816	1522	0	Conductor
Davit6:End	5816	1522	0	Conductor
Davit7:End	5816	1522	0	Conductor
Davit8:End	5816	1522	0	Conductor
1814:Sprint	2585	1111	0	T-Mobile Equipment
1814:WVGD1	748	34	0	Coax Cables
1814:WVGD2	748	34	0	Coax Cables
1814:WVGD3	748	34	0	Coax Cables
1814:WVGD4	748	34	0	Coax Cables
1814:WVGD5	748	34	0	Coax Cables
1814:WVGD6	748	34	0	Coax Cables
1814:WVGD7	748	34	0	Coax Cables
1814:WVGD8	748	34	0	Coax Cables
1814:WVGD9	748	34	0	Coax Cables
1814:WVGD10	748	34	0	Coax Cables

*** Analysis Results:

Maximum element usage is 74.83% for Base Plate "1814" in load case "NESC Extreme Wind"
Maximum insulator usage is 7.51% for Clamp "Clamp3" in load case "NESC Extreme Ice w/ Wind"



*** Analysis Results for Load Case No. 1 "NESC Heavy Wind" - Number of iterations in SAPS 12

Equilibrium Joint Positions and Rotations for Load Case "NESC Heavy 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)
1814:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
1814:t	0.003865	1.49	-0.01645	-1.3206	0.0034	0.0000	0.003865	1.49	105
1814:Sprint	0.00357	1.375	-0.01512	-1.3202	0.0034	0.0000	0.00357	1.375	99.98

1814:WVGD10	0.003276	1.26	-0.01375	-1.3122	0.0033	0.0000	0.003276	1.26	94.99
1814:Arm1	0.002964	1.137	-0.01231	-1.3024	0.0033	0.0000	0.002964	1.137	89.59
1814:WVGD9	0.002701	1.033	-0.01108	-1.2859	0.0032	0.0000	0.002701	1.033	84.99
1814:Arm2	0.002511	0.957	-0.01019	-1.2686	0.0032	0.0000	0.002511	0.957	81.59
1814:WVGD8	0.002152	0.8136	-0.008477	-1.2134	0.0030	0.0000	0.002152	0.8136	74.99
1814:Arm3	0.001871	0.7019	-0.007192	-1.1538	0.0029	0.0000	0.001871	0.7019	69.59
1814:WVGD7	0.001644	0.6114	-0.006147	-1.0920	0.0028	0.0000	0.001644	0.6114	64.99
1814:Arm4	0.001304	0.4773	-0.004685	-0.9771	0.0025	0.0000	0.001304	0.4773	57.6
1814:WVGD6	0.001192	0.4339	-0.004214	-0.9325	0.0024	0.0000	0.001192	0.4339	55
1814:WVGD5	0.0008085	0.2866	-0.002718	-0.7451	0.0020	0.0000	0.0008085	0.2866	45
1814:WVGD4	0.0004977	0.1718	-0.001706	-0.5699	0.0016	0.0000	0.0004977	0.1718	35
1814:WVGD3	0.0002585	0.08672	-0.001011	-0.4002	0.0011	0.0000	0.0002585	0.08672	25
1814:WVGD2	9.509e-005	0.03096	-0.0005265	-0.2350	0.0007	0.0000	9.509e-005	0.03096	15
1814:WVGD1	1.121e-005	0.003505	-0.0001628	-0.0764	0.0002	0.0000	1.121e-005	0.003505	5
Davit1:O	0.002962	1.137	-0.03447	-1.3024	0.0033	0.0000	0.002962	2.112	89.57
Davit1:End	0.002986	1.148	-0.1214	-1.4763	0.0033	0.0000	0.002986	5.623	89.98
Davit2:O	0.002965	1.137	0.009855	-1.3024	0.0033	0.0000	0.002965	0.1621	89.61
Davit2:End	0.002998	1.149	0.08339	-1.1602	0.0033	0.0000	0.002998	-3.327	90.18
Davit3:O	0.002509	0.9567	-0.0344	-1.2686	0.0032	0.0000	0.002509	2.05	81.57
Davit3:Mid	0.002581	0.9996	-0.2341	-2.1731	0.0032	-0.0000	0.002581	8.593	82.87
Davit3:End	0.002577	0.9981	-0.3135	-2.3138	0.0032	-0.0000	0.002577	10.59	82.79
Davit4:O	0.002512	0.9573	0.01401	-1.2686	0.0032	0.0000	0.002512	-0.136	81.61
Davit4:Mid	0.002602	0.9801	0.109	-0.4540	0.0032	0.0000	0.002602	-6.613	83.21
Davit4:End	0.002604	0.9802	0.1213	-0.3112	0.0032	0.0000	0.002604	-8.613	83.22
Davit5:O	0.00187	0.7016	-0.03278	-1.1538	0.0029	0.0000	0.00187	1.972	69.57
Davit5:Mid	0.001937	0.7419	-0.2194	-2.0588	0.0029	-0.0000	0.001937	8.513	70.88
Davit5:End	0.001933	0.7405	-0.2948	-2.1997	0.0029	-0.0000	0.001933	10.51	70.81
Davit6:O	0.001873	0.7021	0.0184	-1.1538	0.0029	0.0000	0.001873	-0.5686	69.62
Davit6:Mid	0.001955	0.7217	0.1003	-0.3382	0.0029	0.0000	0.001955	-7.049	71.2
Davit6:End	0.001956	0.7218	0.1086	-0.1953	0.0029	0.0000	0.001956	-9.049	71.21
Davit7:O	0.001303	0.4771	-0.02938	-0.9771	0.0025	0.0000	0.001303	1.925	57.57
Davit7:Mid	0.001361	0.5133	-0.1959	-1.8830	0.0025	-0.0000	0.001361	8.461	58.9
Davit7:End	0.001358	0.5121	-0.2651	-2.0240	0.0025	-0.0000	0.001358	10.46	58.83
Davit8:O	0.001305	0.4775	0.02001	-0.9771	0.0025	0.0000	0.001305	-0.9705	57.62
Davit8:Mid	0.001375	0.4923	0.08182	-0.1600	0.0025	0.0000	0.001375	-7.456	59.18
Davit8:End	0.001375	0.4923	0.08387	-0.0169	0.0025	0.0000	0.001375	-9.456	59.18

Joint Support Reactions for Load Case "NESC Heavy 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 %
1814:g	-0.11	0.0	-22.26	0.0	0.0	-73.68	0.0	0.0	76.97	0.0	1578.59	0.0	-5.0	0.0	0.0	-0.00	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC Heavy 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)	Mom. (ft-k)	Tors. (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.
1814	1814:t	Origin	0.00	17.89	0.05	-0.20	-0.00	-0.00	0.0	-0.14	0.05	-0.00	-0.01	0.00	0.01	0.00	0.02	0.0	5	
1814	1814:Sprint	End	5.00	16.50	0.04	-0.18	0.27	-0.01	0.0	-0.14	0.05	-0.00	-0.01	0.06	0.00	0.00	0.07	0.1	2	
1814	1814:Sprint	Origin	5.00	16.50	0.04	-0.18	0.27	-0.01	-0.0	-3.44	1.29	-0.00	-0.30	0.00	0.23	0.00	0.49	0.8	5	
1814	1814:WVGD10	End	10.00	15.12	0.04	-0.16	6.73	-0.03	-0.0	-3.44	1.29	-0.00	-0.27	1.21	0.05	0.00	1.48	2.3	2	
1814	1814:WVGD10	Origin	10.00	15.12	0.04	-0.16	6.73	-0.03	0.0	-4.32	1.47	-0.01	-0.17	0.60	0.03	0.00	0.77	1.2	2	
1814	Tube 2	End	12.70	14.38	0.04	-0.16	10.70	-0.05	0.0	-4.32	1.47	-0.01	-0.16	0.87	0.03	0.00	1.03	1.6	2	
1814	Tube 2	Origin	12.70	14.38	0.04	-0.16	10.70	-0.05	0.0	-4.69	1.55	-0.01	-0.18	0.87	0.03	0.00	1.05	1.6	2	

1814	1814:Arm1	End	15.40	13.64	0.04	-0.15	14.87	-0.07	0.0	-4.69	1.55	-0.01	-0.17	1.11	0.03	0.00	1.28	2.0	2
1814	1814:Arm1	Origin	15.40	13.64	0.04	-0.15	16.24	-0.07	0.0	-9.20	4.43	-0.01	-0.33	1.21	0.08	0.00	1.55	2.4	2
1814	1814:WVGD9	End	20.00	12.39	0.03	-0.13	36.61	-0.12	0.0	-9.20	4.43	-0.01	-0.31	2.38	0.08	0.00	2.69	4.1	2
1814	1814:WVGD9	Origin	20.00	12.39	0.03	-0.13	36.61	-0.12	0.0	-10.35	4.63	-0.01	-0.35	2.38	0.08	0.00	2.73	4.2	2
1814	1814:Arm2	End	23.40	11.48	0.03	-0.12	52.35	-0.17	0.0	-10.35	4.63	-0.01	-0.33	3.09	0.08	0.00	3.42	5.3	2
1814	1814:Arm2	Origin	23.40	11.48	0.03	-0.12	59.16	-0.17	0.0	-22.34	9.53	-0.02	-0.72	3.49	0.16	0.00	4.22	6.5	2
1814	Tube 2	End	26.70	10.61	0.03	-0.11	90.61	-0.23	0.0	-22.34	9.53	-0.02	-0.69	4.89	0.16	0.00	5.58	8.6	2
1814	Tube 2	Origin	26.70	10.61	0.03	-0.11	90.61	-0.23	0.0	-22.89	9.63	-0.02	-0.70	4.89	0.16	0.00	5.60	8.6	2
1814	1814:WVGD8	End	30.00	9.76	0.03	-0.10	122.38	-0.29	0.0	-22.89	9.63	-0.02	-0.67	6.06	0.15	0.00	6.74	10.4	2
1814	1814:WVGD8	Origin	30.00	9.76	0.03	-0.10	122.38	-0.29	0.0	-23.96	9.80	-0.02	-0.70	6.06	0.15	0.00	6.77	10.4	2
1814	Tube 2	End	32.70	9.08	0.02	-0.09	148.86	-0.36	0.0	-23.96	9.80	-0.02	-0.68	6.90	0.15	0.00	7.58	11.7	2
1814	Tube 2	Origin	32.70	9.08	0.02	-0.09	148.86	-0.36	0.0	-24.45	9.89	-0.03	-0.70	6.90	0.15	0.00	7.60	11.7	2
1814	1814:Arm3	End	35.40	8.42	0.02	-0.09	175.55	-0.42	0.0	-24.45	9.89	-0.03	-0.67	7.62	0.14	0.00	8.30	12.8	2
1814	1814:Arm3	Origin	35.40	8.42	0.02	-0.09	182.33	-0.43	0.0	-36.60	14.77	-0.03	-1.01	7.91	0.22	0.00	8.93	13.7	2
1814	1814:WVGD7	End	40.00	7.34	0.02	-0.07	250.29	-0.56	0.0	-36.60	14.77	-0.03	-0.96	9.77	0.20	0.00	10.73	16.5	2
1814	1814:WVGD7	Origin	40.00	7.34	0.02	-0.07	250.29	-0.56	0.0	-37.97	14.98	-0.03	-0.99	9.77	0.21	0.00	10.77	16.6	2
1814	Tube 2	End	43.70	6.51	0.02	-0.06	305.71	-0.69	0.0	-37.97	14.98	-0.03	-0.95	11.00	0.20	0.00	11.96	18.4	2
1814	Tube 2	Origin	43.70	6.51	0.02	-0.06	305.71	-0.69	0.0	-38.74	15.09	-0.04	-0.97	11.00	0.20	0.00	11.98	18.4	2
1814	1814:Arm4	End	47.40	5.73	0.02	-0.06	361.53	-0.82	0.0	-38.74	15.09	-0.04	-0.93	12.03	0.19	0.00	12.97	19.9	2
1814	1814:Arm4	Origin	47.40	5.73	0.02	-0.06	368.26	-0.82	0.0	-50.89	19.92	-0.04	-1.23	12.25	0.25	0.00	13.49	20.7	2
1814	1814:WVGD6	End	50.00	5.21	0.01	-0.05	420.04	-0.93	0.0	-50.89	19.92	-0.04	-1.20	13.25	0.25	0.00	14.45	22.2	2
1814	1814:WVGD6	Origin	50.00	5.21	0.01	-0.05	420.04	-0.93	0.0	-52.30	20.10	-0.04	-1.23	13.25	0.25	0.00	14.49	22.3	2
1814	Tube 2	End	55.00	4.27	0.01	-0.04	520.54	-1.15	0.0	-52.30	20.10	-0.04	-1.17	14.88	0.24	0.00	16.05	24.7	2
1814	Tube 2	Origin	55.00	4.27	0.01	-0.04	520.54	-1.15	0.0	-53.47	20.23	-0.05	-1.20	14.88	0.24	0.00	16.08	24.7	2
1814	1814:WVGD5	End	60.00	3.44	0.01	-0.03	621.70	-1.40	0.0	-53.47	20.23	-0.05	-1.14	16.18	0.23	0.00	17.32	26.7	2
1814	1814:WVGD5	Origin	60.00	3.44	0.01	-0.03	621.70	-1.40	0.0	-54.87	20.41	-0.05	-1.17	16.18	0.23	0.00	17.35	26.7	2
1814	SpliceT	End	62.00	3.13	0.01	-0.03	662.51	-1.51	0.0	-54.87	20.41	-0.05	-1.15	16.62	0.23	0.00	17.78	27.4	2
1814	SpliceT	Origin	62.00	3.13	0.01	-0.03	662.51	-1.51	0.0	-55.71	20.50	-0.06	-1.00	14.23	0.19	0.00	15.23	23.4	2
1814	Tube 3	End	66.00	2.57	0.01	-0.02	744.49	-1.74	0.0	-55.71	20.50	-0.06	-0.96	14.90	0.19	0.00	15.86	24.4	2
1814	Tube 3	Origin	66.00	2.57	0.01	-0.02	744.49	-1.74	0.0	-56.91	20.62	-0.06	-0.99	14.90	0.19	0.00	15.88	24.4	2
1814	1814:WVGD4	End	70.00	2.06	0.01	-0.02	826.97	-1.99	0.0	-56.91	20.62	-0.06	-0.95	15.45	0.18	0.00	16.41	25.2	2
1814	1814:WVGD4	Origin	70.00	2.06	0.01	-0.02	826.97	-1.99	0.0	-58.86	20.85	-0.07	-0.99	15.45	0.18	0.00	16.44	25.3	2
1814	Tube 3	End	75.00	1.51	0.00	-0.02	931.20	-2.32	0.0	-58.86	20.85	-0.07	-0.95	16.03	0.18	0.00	16.98	26.1	2
1814	Tube 3	Origin	75.00	1.51	0.00	-0.02	931.20	-2.32	0.0	-60.48	21.01	-0.07	-0.97	16.03	0.18	0.00	17.00	26.2	2
1814	1814:WVGD3	End	80.00	1.04	0.00	-0.01	1036.27	-2.69	0.0	-60.48	21.01	-0.07	-0.93	16.48	0.17	0.00	17.42	26.8	2
1814	1814:WVGD3	Origin	80.00	1.04	0.00	-0.01	1036.27	-2.69	0.0	-62.71	21.26	-0.08	-0.97	16.48	0.17	0.00	17.45	26.8	2
1814	Tube 3	End	85.00	0.66	0.00	-0.01	1142.58	-3.08	0.0	-62.71	21.26	-0.08	-0.93	16.84	0.17	0.00	17.78	27.3	2
1814	Tube 3	Origin	85.00	0.66	0.00	-0.01	1142.58	-3.08	0.0	-64.46	21.44	-0.09	-0.96	16.84	0.17	0.00	17.80	27.4	2
1814	1814:WVGD2	End	90.00	0.37	0.00	-0.01	1249.79	-3.51	0.0	-64.46	21.44	-0.09	-0.92	17.12	0.16	0.00	18.05	27.8	2
1814	1814:WVGD2	Origin	90.00	0.37	0.00	-0.01	1249.79	-3.51	0.0	-66.81	21.70	-0.09	-0.96	17.12	0.16	0.00	18.08	27.8	2
1814	Tube 3	End	95.00	0.17	0.00	-0.00	1358.29	-3.98	0.0	-66.81	21.70	-0.09	-0.93	17.34	0.16	0.00	18.27	28.1	2
1814	Tube 3	Origin	95.00	0.17	0.00	-0.00	1358.29	-3.98	0.0	-68.69	21.89	-0.10	-0.95	17.34	0.16	0.00	18.29	28.1	2
1814	1814:WVGD1	End	100.00	0.04	0.00	-0.00	1467.76	-4.48	0.0	-68.69	21.89	-0.10	-0.92	17.50	0.15	0.00	18.42	28.5	2
1814	1814:WVGD1	Origin	100.00	0.04	0.00	-0.00	1467.76	-4.48	0.0	-71.17	22.17	-0.11	-0.95	17.50	0.16	0.00	18.46	28.5	2
1814	1814:g	End	105.00	0.00	0.00	0.00	1578.59	-5.01	0.0	-71.17	22.17	-0.11	-0.92	17.62	0.15	0.00	18.55	29.1	2

Detailed Tubular Davit Arm Usages for Load Case "NESC Heavy 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	13.64	0.04	-0.41	-7.51	-0.00	-0.0	1.10	2.13	0.00	0.21	10.83	0.44	0.00	11.07	17.0	2
Davit1	Davit1:End	End	3.54	13.78	0.04	-1.46	0.00	0.00	-0.0	1.10	2.13	0.00	0.24	0.00	0.99	0.00	1.73	2.7	3
Davit2	Davit2:O	Origin	0.00	13.65	0.04	0.12	-6.14	0.00	0.0	-1.65	1.74	-0.00	-0.32	8.85	0.36	0.00	9.19	14.1	2
Davit2	Davit2:End	End	3.54	13.78	0.04	1.00	-0.00	0.00	0.0	-1.65	1.74	-0.00	-0.36	0.00	0.81	0.00	1.45	2.2	3

Davit3	Davit3:O	Origin	0.00	11.48	0.03	-0.41	-50.81	-0.00	-0.0	1.09	6.05	0.00	0.13	30.88	0.00	0.00	31.01	47.7	1
Davit3	#Davit3:0	End	3.34	11.71	0.03	-1.45	-30.63	-0.00	-0.0	1.09	6.05	0.00	0.16	28.01	0.00	0.00	28.17	43.3	1
Davit3	#Davit3:0	Origin	3.34	11.71	0.03	-1.45	-30.63	-0.00	-0.0	1.16	5.93	0.00	0.17	28.01	0.00	0.00	28.18	43.4	1
Davit3	Davit3:Mid	End	6.67	12.00	0.03	-2.81	-10.85	-0.00	-0.0	1.16	5.93	0.00	0.22	16.60	0.00	0.00	16.82	25.9	1
Davit3	Davit3:Mid	Origin	6.67	12.00	0.03	-2.81	-10.85	-0.00	0.0	2.49	5.43	0.00	0.47	16.60	0.00	0.00	17.07	26.3	1
Davit3	Davit3:End	End	8.67	11.98	0.03	-3.76	0.00	0.00	0.0	2.49	5.43	0.00	0.57	0.00	2.60	0.00	4.55	7.0	3
Davit4	Davit4:O	Origin	0.00	11.49	0.03	0.17	-44.01	0.00	0.0	-3.59	4.99	-0.00	-0.43	26.74	0.00	0.00	27.18	41.8	1
Davit4	#Davit4:0	End	3.34	11.66	0.03	0.88	-27.37	0.00	0.0	-3.59	4.99	-0.00	-0.53	25.03	0.00	0.00	25.56	39.3	1
Davit4	#Davit4:0	Origin	3.34	11.66	0.03	0.88	-27.37	0.00	0.0	-3.53	4.90	-0.00	-0.52	25.03	0.00	0.00	25.55	39.3	1
Davit4	Davit4:Mid	End	6.67	11.76	0.03	1.31	-11.01	0.00	0.0	-3.53	4.90	-0.00	-0.67	16.84	0.00	0.00	17.51	26.9	1
Davit4	Davit4:Mid	Origin	6.67	11.76	0.03	1.31	-11.01	0.00	0.0	-2.30	5.51	-0.00	-0.44	16.84	0.00	0.00	17.28	26.6	1
Davit4	Davit4:End	End	8.67	11.76	0.03	1.46	-0.00	0.00	0.0	-2.30	5.51	-0.00	-0.53	0.00	2.64	0.00	4.61	7.1	3
Davit5	Davit5:O	Origin	0.00	8.42	0.02	-0.39	-50.84	-0.00	-0.0	1.08	6.05	0.00	0.13	30.89	0.00	0.00	31.02	47.7	1
Davit5	#Davit5:0	End	3.34	8.63	0.02	-1.35	-30.65	-0.00	-0.0	1.08	6.05	0.00	0.16	28.02	0.00	0.00	28.18	43.4	1
Davit5	#Davit5:0	Origin	3.34	8.63	0.02	-1.35	-30.65	-0.00	-0.0	1.15	5.93	0.00	0.17	28.02	0.00	0.00	28.19	43.4	1
Davit5	Davit5:Mid	End	6.67	8.90	0.02	-2.63	-10.86	-0.00	-0.0	1.15	5.93	0.00	0.22	16.61	0.00	0.00	16.83	25.9	1
Davit5	Davit5:Mid	Origin	6.67	8.90	0.02	-2.63	-10.86	-0.00	0.0	2.48	5.43	0.00	0.47	16.61	0.00	0.00	17.08	26.3	1
Davit5	Davit5:End	End	8.67	8.89	0.02	-3.54	0.00	0.00	0.0	2.48	5.43	0.00	0.57	0.00	2.61	0.00	4.55	7.0	3
Davit6	Davit6:O	Origin	0.00	8.43	0.02	0.22	-44.07	0.00	0.0	-3.58	5.00	-0.00	-0.43	26.78	0.00	0.00	27.21	41.9	1
Davit6	#Davit6:0	End	3.34	8.58	0.02	0.86	-27.40	0.00	0.0	-3.58	5.00	-0.00	-0.53	25.06	0.00	0.00	25.59	39.4	1
Davit6	#Davit6:0	Origin	3.34	8.58	0.02	0.86	-27.40	0.00	0.0	-3.52	4.91	-0.00	-0.52	25.06	0.00	0.00	25.58	39.4	1
Davit6	Davit6:Mid	End	6.67	8.66	0.02	1.20	-11.02	0.00	0.0	-3.52	4.91	-0.00	-0.67	16.86	0.00	0.00	17.52	27.0	1
Davit6	Davit6:Mid	Origin	6.67	8.66	0.02	1.20	-11.02	0.00	0.0	-2.29	5.51	-0.00	-0.44	16.86	0.00	0.00	17.29	26.6	1
Davit6	Davit6:End	End	8.67	8.66	0.02	1.30	-0.00	0.00	0.0	-2.29	5.51	-0.00	-0.53	0.00	2.64	0.00	4.61	7.1	3
Davit7	Davit7:O	Origin	0.00	5.73	0.02	-0.35	-50.88	-0.00	-0.0	1.06	6.06	0.00	0.13	30.92	0.00	0.00	31.04	47.8	1
Davit7	#Davit7:0	End	3.34	5.91	0.02	-1.19	-30.67	-0.00	-0.0	1.06	6.06	0.00	0.16	28.05	0.00	0.00	28.20	43.4	1
Davit7	#Davit7:0	Origin	3.34	5.91	0.02	-1.19	-30.67	-0.00	-0.0	1.13	5.93	0.00	0.17	28.05	0.00	0.00	28.22	43.4	1
Davit7	Davit7:Mid	End	6.67	6.16	0.02	-2.35	-10.88	-0.00	-0.0	1.13	5.93	0.00	0.22	16.63	0.00	0.00	16.85	25.9	1
Davit7	Davit7:Mid	Origin	6.67	6.16	0.02	-2.35	-10.88	-0.00	0.0	2.46	5.44	0.00	0.47	16.63	0.00	0.00	17.10	26.3	1
Davit7	Davit7:End	End	8.67	6.15	0.02	-3.18	0.00	0.00	0.0	2.46	5.44	0.00	0.57	0.00	2.61	0.00	4.56	7.0	3
Davit8	Davit8:O	Origin	0.00	5.73	0.02	0.24	-44.15	0.00	0.0	-3.56	5.01	-0.00	-0.43	26.83	0.00	0.00	27.26	41.9	1
Davit8	#Davit8:0	End	3.34	5.85	0.02	0.75	-27.46	0.00	0.0	-3.56	5.01	-0.00	-0.53	25.11	0.00	0.00	25.63	39.4	1
Davit8	#Davit8:0	Origin	3.34	5.85	0.02	0.75	-27.46	0.00	0.0	-3.50	4.92	-0.00	-0.52	25.11	0.00	0.00	25.62	39.4	1
Davit8	Davit8:Mid	End	6.67	5.91	0.02	0.98	-11.04	0.00	0.0	-3.50	4.92	-0.00	-0.67	16.88	0.00	0.00	17.54	27.0	1
Davit8	Davit8:Mid	Origin	6.67	5.91	0.02	0.98	-11.04	0.00	0.0	-2.28	5.52	-0.00	-0.43	16.88	0.00	0.00	17.31	26.6	1
Davit8	Davit8:End	End	8.67	5.91	0.02	1.01	-0.00	0.00	0.0	-2.28	5.52	-0.00	-0.52	0.00	2.65	0.00	4.62	7.1	3

Summary of Clamp Capacities and Usages for Load Case "NESC Heavy Wind":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
Clamp1	2.358	80.00	80.00	2.95
Clamp2	2.358	80.00	80.00	2.95
Clamp3	5.948	80.00	80.00	7.43
Clamp4	5.948	80.00	80.00	7.43
Clamp5	5.948	80.00	80.00	7.43
Clamp6	5.948	80.00	80.00	7.43
Clamp7	5.948	80.00	80.00	7.43
Clamp8	5.948	80.00	80.00	7.43
Clamp9	3.212	80.00	80.00	4.02

Clamp10	0.553	80.00	80.00	0.69
Clamp11	0.553	80.00	80.00	0.69
Clamp12	0.553	80.00	80.00	0.69
Clamp13	0.553	80.00	80.00	0.69
Clamp14	0.553	80.00	80.00	0.69
Clamp15	0.553	80.00	80.00	0.69
Clamp16	0.553	80.00	80.00	0.69
Clamp17	0.553	80.00	80.00	0.69
Clamp18	0.553	80.00	80.00	0.69
Clamp19	0.553	80.00	80.00	0.69

*** Analysis Results for Load Case No. 2 "NESC Extreme Wind" - Number of iterations in SAPS 12

Equilibrium Joint Positions and Rotations for Load Case "NESC 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)
1814:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
1814:t	0.001197	2.689	-0.0457	-2.4353	0.0010	0.0000	0.001197	2.689	105
1814:Sprint	0.001105	2.476	-0.04118	-2.4343	0.0010	0.0000	0.001105	2.476	99.96
1814:WVGD10	0.001015	2.265	-0.03667	-2.4077	0.0010	0.0000	0.001015	2.265	94.96
1814:Arm1	0.0009182	2.039	-0.03195	-2.3748	0.0010	0.0000	0.0009182	2.039	89.57
1814:WVGD9	0.0008372	1.85	-0.02804	-2.3317	0.0010	0.0000	0.0008372	1.85	84.97
1814:Arm2	0.0007783	1.713	-0.02525	-2.2922	0.0010	0.0000	0.0007783	1.713	81.57
1814:WVGD8	0.0006674	1.454	-0.02012	-2.1809	0.0009	0.0000	0.0006674	1.454	74.98
1814:Arm3	0.0005807	1.254	-0.01635	-2.0673	0.0009	0.0000	0.0005807	1.254	69.58
1814:WVGD7	0.0005104	1.092	-0.01343	-1.9528	0.0009	0.0000	0.0005104	1.092	64.99
1814:Arm4	0.000405	0.8524	-0.009447	-1.7438	0.0008	0.0000	0.000405	0.8524	57.59
1814:WVGD6	0.0003705	0.7749	-0.008245	-1.6634	0.0007	0.0000	0.0003705	0.7749	54.99
1814:WVGD5	0.0002514	0.5123	-0.004608	-1.3288	0.0006	0.0000	0.0002514	0.5123	45
1814:WVGD4	0.0001549	0.3075	-0.002343	-1.0176	0.0005	0.0000	0.0001549	0.3075	35
1814:WVGD3	8.052e-005	0.1554	-0.001028	-0.7159	0.0004	0.0000	8.052e-005	0.1554	25
1814:WVGD2	2.965e-005	0.0556	-0.0003676	-0.4212	0.0002	0.0000	2.965e-005	0.0556	15
1814:WVGD1	3.501e-006	0.006312	-8.287e-005	-0.1373	0.0001	0.0000	3.501e-006	0.006312	5
Davit1:O	0.0009174	2.038	-0.07235	-2.3748	0.0010	0.0000	0.0009174	3.013	89.53
Davit1:End	0.0009235	2.056	-0.2202	-2.4319	0.0010	0.0000	0.0009235	6.531	89.88
Davit2:O	0.000919	2.04	0.008454	-2.3748	0.0010	0.0000	0.000919	1.065	89.61
Davit2:End	0.0009308	2.063	0.152	-2.3489	0.0010	0.0000	0.0009308	-2.412	90.25
Davit3:O	0.0007775	1.712	-0.06897	-2.2922	0.0010	0.0000	0.0007775	2.805	81.53
Davit3:Mid	0.0007981	1.772	-0.3561	-2.7053	0.0010	0.0000	0.0007981	9.365	82.74
Davit3:End	0.0007964	1.769	-0.4519	-2.7595	0.0010	0.0000	0.0007964	11.36	82.65
Davit4:O	0.0007791	1.714	0.01848	-2.2922	0.0010	0.0000	0.0007791	0.6202	81.62
Davit4:Mid	0.0008101	1.775	0.2625	-2.0354	0.0010	0.0000	0.0008101	-5.818	83.36
Davit4:End	0.0008117	1.776	0.3322	-1.9799	0.0010	0.0000	0.0008117	-7.817	83.43
Davit5:O	0.0005799	1.253	-0.06218	-2.0673	0.0009	0.0000	0.0005799	2.524	69.54
Davit5:Mid	0.0005992	1.308	-0.3237	-2.4826	0.0009	0.0000	0.0005992	9.079	70.78
Davit5:End	0.0005978	1.306	-0.4117	-2.5373	0.0009	-0.0000	0.0005978	11.08	70.69
Davit6:O	0.0005815	1.255	0.02949	-2.0673	0.0009	0.0000	0.0005815	-0.01607	69.63
Davit6:Mid	0.0006094	1.309	0.2481	-1.8079	0.0009	0.0000	0.0006094	-6.462	71.35
Davit6:End	0.0006107	1.31	0.3098	-1.7520	0.0009	0.0000	0.0006107	-8.461	71.41
Davit7:O	0.0004044	0.8518	-0.05351	-1.7438	0.0008	0.0000	0.0004044	2.3	57.55
Davit7:Mid	0.0004216	0.8997	-0.2782	-2.1622	0.0008	-0.0000	0.0004216	8.848	58.82
Davit7:End	0.0004206	0.8982	-0.3551	-2.2174	0.0008	-0.0000	0.0004206	10.85	58.74
Davit8:O	0.0004057	0.8531	0.03462	-1.7438	0.0008	0.0000	0.0004057	-0.5949	57.63
Davit8:Mid	0.0004292	0.898	0.2166	-1.4806	0.0008	0.0000	0.0004292	-7.05	59.32
Davit8:End	0.0004302	0.8986	0.2669	-1.4241	0.0008	0.0000	0.0004302	-9.049	59.37

Joint Support Reactions for Load Case "NESC 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 %
1814:g	-0.03	0.0	-41.65	0.0	0.0	-36.97	0.0	0.0	55.70	0.0	2841.19	0.0	-1.6	0.0	0.0	-0.00	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC 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.
1814	1814:t	Origin	0.00	32.27	0.01	-0.55	-0.00	-0.00	0.0	-0.09	0.13	-0.00	-0.01	0.00	0.02	0.00	0.04	0.1	5
1814	1814:Sprint	End	5.00	29.72	0.01	-0.49	0.63	-0.00	0.0	-0.09	0.13	-0.00	-0.01	0.13	0.01	0.00	0.14	0.2	2
1814	1814:Sprint	Origin	5.00	29.72	0.01	-0.49	0.63	-0.00	-0.0	-1.60	4.42	-0.00	-0.14	0.00	0.78	0.00	1.36	2.1	5
1814	1814:WVGD10	End	10.00	27.18	0.01	-0.44	22.75	-0.01	-0.0	-1.60	4.42	-0.00	-0.13	4.08	0.19	0.00	4.22	6.5	2
1814	1814:WVGD10	Origin	10.00	27.18	0.01	-0.44	22.75	-0.01	0.0	-1.95	4.85	-0.00	-0.08	2.02	0.10	0.00	2.10	3.2	2
1814	Tube 2	End	12.70	25.82	0.01	-0.41	35.85	-0.01	0.0	-1.95	4.85	-0.00	-0.07	2.91	0.10	0.00	2.99	4.6	2
1814	Tube 2	Origin	12.70	25.82	0.01	-0.41	35.85	-0.01	0.0	-2.20	5.02	-0.00	-0.08	2.91	0.10	0.00	3.00	4.6	2
1814	1814:Arm1	End	15.40	24.47	0.01	-0.38	49.40	-0.02	0.0	-2.20	5.02	-0.00	-0.08	3.68	0.10	0.00	3.76	5.8	2
1814	1814:Arm1	Origin	15.40	24.47	0.01	-0.38	50.75	-0.02	0.0	-3.63	7.96	-0.00	-0.13	3.78	0.15	0.00	3.92	6.0	2
1814	1814:WVGD9	End	20.00	22.20	0.01	-0.34	87.38	-0.04	0.0	-3.63	7.96	-0.00	-0.12	5.67	0.14	0.00	5.80	8.9	2
1814	1814:WVGD9	Origin	20.00	22.20	0.01	-0.34	87.38	-0.04	0.0	-4.16	8.44	-0.00	-0.14	5.67	0.15	0.00	5.82	9.0	2
1814	1814:Arm2	End	23.40	20.55	0.01	-0.30	116.09	-0.05	0.0	-4.16	8.44	-0.00	-0.13	6.84	0.14	0.00	6.98	10.7	2
1814	1814:Arm2	Origin	23.40	20.55	0.01	-0.30	127.64	-0.05	0.0	-9.10	16.51	-0.01	-0.29	7.52	0.28	0.00	7.83	12.0	2
1814	Tube 2	End	26.70	18.98	0.01	-0.27	182.11	-0.07	0.0	-9.10	16.51	-0.01	-0.28	9.82	0.27	0.00	10.11	15.6	2
1814	Tube 2	Origin	26.70	18.98	0.01	-0.27	182.11	-0.07	0.0	-9.48	16.75	-0.01	-0.29	9.82	0.27	0.00	10.12	15.6	2
1814	1814:WVGD8	End	30.00	17.45	0.01	-0.24	237.39	-0.09	0.0	-9.48	16.75	-0.01	-0.28	11.75	0.26	0.00	12.04	18.5	2
1814	1814:WVGD8	Origin	30.00	17.45	0.01	-0.24	237.39	-0.09	0.0	-9.97	17.19	-0.01	-0.29	11.75	0.27	0.00	12.06	18.5	2
1814	Tube 2	End	32.70	16.23	0.01	-0.22	283.79	-0.11	0.0	-9.97	17.19	-0.01	-0.28	13.14	0.26	0.00	13.43	20.7	2
1814	Tube 2	Origin	32.70	16.23	0.01	-0.22	283.79	-0.11	0.0	-10.31	17.40	-0.01	-0.29	13.14	0.26	0.00	13.44	20.7	2
1814	1814:Arm3	End	35.40	15.05	0.01	-0.20	330.77	-0.13	0.0	-10.31	17.40	-0.01	-0.28	14.35	0.25	0.00	14.64	22.5	2
1814	1814:Arm3	Origin	35.40	15.05	0.01	-0.20	342.29	-0.13	0.0	-15.40	25.50	-0.01	-0.42	14.85	0.37	0.00	15.29	23.5	2
1814	1814:WVGD7	End	40.00	13.10	0.01	-0.16	459.57	-0.17	0.0	-15.40	25.50	-0.01	-0.40	17.93	0.35	0.00	18.34	28.2	2
1814	1814:WVGD7	Origin	40.00	13.10	0.01	-0.16	459.57	-0.17	0.0	-16.11	26.04	-0.01	-0.42	17.93	0.36	0.00	18.36	28.2	2
1814	Tube 2	End	43.70	11.63	0.01	-0.14	555.91	-0.21	0.0	-16.11	26.04	-0.01	-0.40	19.99	0.35	0.00	20.40	31.4	2
1814	Tube 2	Origin	43.70	11.63	0.01	-0.14	555.91	-0.21	0.0	-16.66	26.35	-0.01	-0.42	19.99	0.35	0.00	20.42	31.4	2
1814	1814:Arm4	End	47.40	10.23	0.00	-0.11	653.41	-0.25	0.0	-16.66	26.35	-0.01	-0.40	21.73	0.34	0.00	22.14	34.1	2
1814	1814:Arm4	Origin	47.40	10.23	0.00	-0.11	664.89	-0.25	0.0	-21.81	34.40	-0.01	-0.53	22.11	0.44	0.00	22.65	34.8	2
1814	1814:WVGD6	End	50.00	9.30	0.00	-0.10	754.33	-0.29	0.0	-21.81	34.40	-0.01	-0.51	23.78	0.43	0.00	24.31	37.4	2
1814	1814:WVGD6	Origin	50.00	9.30	0.00	-0.10	754.33	-0.29	0.0	-22.56	34.94	-0.01	-0.53	23.78	0.43	0.00	24.33	37.4	2
1814	Tube 2	End	55.00	7.64	0.00	-0.07	929.01	-0.36	0.0	-22.56	34.94	-0.01	-0.50	26.54	0.41	0.00	27.06	41.6	2
1814	Tube 2	Origin	55.00	7.64	0.00	-0.07	929.01	-0.35	0.0	-23.42	35.38	-0.02	-0.52	26.54	0.42	0.00	27.08	41.7	2
1814	1814:WVGD5	End	60.00	6.15	0.00	-0.06	1105.91	-0.43	0.0	-23.42	35.38	-0.02	-0.50	28.76	0.40	0.00	29.27	45.0	2
1814	1814:WVGD5	Origin	60.00	6.15	0.00	-0.06	1105.91	-0.43	0.0	-24.17	35.90	-0.02	-0.52	28.76	0.41	0.00	29.29	45.1	2
1814	SpliceT	End	62.00	5.60	0.00	-0.05	1177.71	-0.47	0.0	-24.17	35.90	-0.02	-0.51	29.54	0.40	0.00	30.05	46.2	2
1814	SpliceT	Origin	62.00	5.60	0.00	-0.05	1177.71	-0.47	0.0	-24.78	36.19	-0.02	-0.44	25.28	0.34	0.00	25.73	39.6	2
1814	Tube 3	End	66.00	4.60	0.00	-0.04	1322.49	-0.54	0.0	-24.78	36.19	-0.02	-0.43	26.45	0.33	0.00	26.88	41.4	2
1814	Tube 3	Origin	66.00	4.60	0.00	-0.04	1322.49	-0.54	0.0	-25.64	36.59	-0.02	-0.44	26.45	0.34	0.00	26.90	41.4	2
1814	1814:WVGD4	End	70.00	3.69	0.00	-0.03	1468.86	-0.61	0.0	-25.64	36.59	-0.02	-0.43	27.43	0.32	0.00	27.87	42.9	2
1814	1814:WVGD4	Origin	70.00	3.69	0.00	-0.03	1468.86	-0.61	0.0	-26.78	37.26	-0.02	-0.45	27.43	0.33	0.00	27.89	42.9	2
1814	Tube 3	End	75.00	2.70	0.00	-0.02	1655.16	-0.72	0.0	-26.78	37.26	-0.02	-0.43	28.47	0.32	0.00	28.91	44.5	2
1814	Tube 3	Origin	75.00	2.70	0.00	-0.02	1655.16	-0.72	0.0	-27.93	37.79	-0.02	-0.45	28.47	0.32	0.00	28.93	44.5	2
1814	1814:WVGD3	End	80.00	1.87	0.00	-0.01	1844.12	-0.83	0.0	-27.93	37.79	-0.02	-0.43	29.31	0.31	0.00	29.75	45.8	2
1814	1814:WVGD3	Origin	80.00	1.87	0.00	-0.01	1844.12	-0.83	0.0	-29.26	38.55	-0.02	-0.45	29.31	0.31	0.00	29.77	45.8	2
1814	Tube 3	End	85.00	1.19	0.00	-0.01	2036.85	-0.96	0.0	-29.26	38.55	-0.02	-0.44	30.01	0.30	0.00	30.45	46.8	2
1814	Tube 3	Origin	85.00	1.19	0.00	-0.01	2036.85	-0.96	0.0	-30.50	39.11	-0.03	-0.45	30.01	0.31	0.00	30.46	46.9	2
1814	1814:WVGD2	End	90.00	0.67	0.00	-0.00	2232.42	-1.09	0.0	-30.50	39.11	-0.03	-0.44	30.57	0.30	0.00	31.01	47.7	2
1814	1814:WVGD2	Origin	90.00	0.67	0.00	-0.00	2232.42	-1.09	0.0	-31.92	39.91	-0.03	-0.46	30.57	0.30	0.00	31.03	47.7	2
1814	Tube 3	End	95.00	0.30	0.00	-0.00	2431.94	-1.24	0.0	-31.92	39.91	-0.03	-0.44	31.03	0.29	0.00	31.47	48.4	2
1814	Tube 3	Origin	95.00	0.30	0.00	-0.00	2431.94	-1.24	0.0	-33.25	40.51	-0.03	-0.46	31.03	0.30	0.00	31.49	48.4	2
1814	1814:WVGD1	End	100.00	0.08	0.00	-0.00	2634.50	-1.40	0.0	-33.25	40.51	-0.03	-0.45	31.39	0.29	0.00	31.84	49.2	2
1814	1814:WVGD1	Origin	100.00	0.08	0.00	-0.00	2634.50	-1.40	0.0	-34.75	41.34	-0.03	-0.47	31.39	0.29	0.00	31.86	49.2	2
1814	1814:g	End	105.00	0.00	0.00	0.00	2841.19	-1.56	0.0	-34.75	41.34	-0.03	-0.45	31.70	0.28	0.00	32.15	50.5	2

Detailed Tubular Davit Arm Usages for Load Case "NESC 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	24.46	0.01	-0.87	-2.47	-0.00	-0.0	1.26	0.70	0.00	0.24	3.56	0.15	0.00	3.81	5.9	2
Davit1	Davit1:End	End	3.54	24.67	0.01	-2.64	0.00	0.00	-0.0	1.26	0.70	0.00	0.28	0.00	0.33	0.00	0.63	1.0	3
Davit2	Davit2:O	Origin	0.00	24.48	0.01	0.10	-1.12	0.00	0.0	-1.41	0.32	-0.00	-0.27	1.61	0.07	0.00	1.88	2.9	2
Davit2	Davit2:End	End	3.54	24.76	0.01	1.82	-0.00	0.00	0.0	-1.41	0.32	-0.00	-0.31	0.00	0.15	0.00	0.40	0.6	3
Davit3	Davit3:O	Origin	0.00	20.54	0.01	-0.83	-24.34	-0.00	-0.0	3.31	3.07	0.00	0.40	14.79	0.00	0.00	15.19	23.4	1
Davit3	#Davit3:0	End	3.34	20.89	0.01	-2.48	-14.11	-0.00	-0.0	3.31	3.07	0.00	0.49	12.90	0.00	0.00	13.39	20.6	1
Davit3	#Davit3:0	Origin	3.34	20.89	0.01	-2.48	-14.11	-0.00	-0.0	3.33	2.98	0.00	0.49	12.90	0.00	0.00	13.40	20.6	1
Davit3	Davit3:Mid	End	6.67	21.26	0.01	-4.27	-4.18	-0.00	-0.0	3.33	2.98	0.00	0.63	6.39	0.00	0.00	7.03	10.8	1
Davit3	Davit3:Mid	Origin	6.67	21.26	0.01	-4.27	-4.18	-0.00	0.0	3.92	2.09	0.00	0.75	6.39	0.00	0.00	7.14	11.0	1
Davit3	Davit3:End	End	8.67	21.23	0.01	-5.42	0.00	0.00	0.0	3.92	2.09	0.00	0.90	0.00	1.00	0.00	1.96	3.0	3
Davit4	Davit4:O	Origin	0.00	20.56	0.01	0.22	-12.82	0.00	0.0	-4.31	1.31	-0.00	-0.52	7.79	0.00	0.00	8.31	12.8	1
Davit4	#Davit4:0	End	3.34	20.94	0.01	1.73	-8.45	0.00	0.0	-4.31	1.31	-0.00	-0.64	7.73	0.00	0.00	8.37	12.9	1
Davit4	#Davit4:0	Origin	3.34	20.94	0.01	1.73	-8.45	0.00	0.0	-4.29	1.25	-0.00	-0.63	7.73	0.00	0.00	8.36	12.9	1
Davit4	Davit4:Mid	End	6.67	21.30	0.01	3.15	-4.28	0.00	0.0	-4.29	1.25	-0.00	-0.82	6.55	0.00	0.00	7.37	11.3	1
Davit4	Davit4:Mid	Origin	6.67	21.30	0.01	3.15	-4.28	0.00	0.0	-3.89	2.14	-0.00	-0.74	6.55	0.00	0.00	7.29	11.2	1
Davit4	Davit4:End	End	8.67	21.31	0.01	3.99	-0.00	0.00	0.0	-3.89	2.14	-0.00	-0.89	0.00	1.03	0.00	1.99	3.1	3
Davit5	Davit5:O	Origin	0.00	15.04	0.01	-0.75	-24.46	-0.00	-0.0	3.30	3.08	0.00	0.40	14.86	0.00	0.00	15.26	23.5	1
Davit5	#Davit5:0	End	3.34	15.35	0.01	-2.24	-14.18	-0.00	-0.0	3.30	3.08	0.00	0.49	12.97	0.00	0.00	13.46	20.7	1
Davit5	#Davit5:0	Origin	3.34	15.35	0.01	-2.24	-14.18	-0.00	-0.0	3.32	2.99	0.00	0.49	12.97	0.00	0.00	13.46	20.7	1
Davit5	Davit5:Mid	End	6.67	15.69	0.01	-3.88	-4.21	-0.00	-0.0	3.32	2.99	0.00	0.63	6.44	0.00	0.00	7.07	10.9	1
Davit5	Davit5:Mid	Origin	6.67	15.69	0.01	-3.88	-4.21	-0.00	0.0	3.91	2.11	0.00	0.74	6.44	0.00	0.00	7.19	11.1	1
Davit5	Davit5:End	End	8.67	15.67	0.01	-4.94	0.00	0.00	0.0	3.91	2.11	0.00	0.90	0.00	1.01	0.00	1.97	3.0	3
Davit6	Davit6:O	Origin	0.00	15.06	0.01	0.35	-12.96	0.00	0.0	-4.31	1.33	-0.00	-0.52	7.88	0.00	0.00	8.40	12.9	1
Davit6	#Davit6:0	End	3.34	15.39	0.01	1.71	-8.54	0.00	0.0	-4.31	1.33	-0.00	-0.64	7.81	0.00	0.00	8.45	13.0	1
Davit6	#Davit6:0	Origin	3.34	15.39	0.01	1.71	-8.54	0.00	0.0	-4.28	1.27	-0.00	-0.63	7.81	0.00	0.00	8.44	13.0	1
Davit6	Davit6:Mid	End	6.67	15.71	0.01	2.98	-4.31	0.00	0.0	-4.28	1.27	-0.00	-0.81	6.60	0.00	0.00	7.41	11.4	1
Davit6	Davit6:Mid	Origin	6.67	15.71	0.01	2.98	-4.31	0.00	0.0	-3.88	2.16	-0.00	-0.74	6.60	0.00	0.00	7.34	11.3	1
Davit6	Davit6:End	End	8.67	15.72	0.01	3.72	-0.00	0.00	0.0	-3.88	2.16	-0.00	-0.89	0.00	1.04	0.00	2.00	3.1	3
Davit7	Davit7:O	Origin	0.00	10.22	0.00	-0.64	-24.63	-0.00	-0.0	3.28	3.10	0.00	0.40	14.97	0.00	0.00	15.36	23.6	1
Davit7	#Davit7:0	End	3.34	10.49	0.00	-1.92	-14.29	-0.00	-0.0	3.28	3.10	0.00	0.48	13.07	0.00	0.00	13.55	20.9	1
Davit7	#Davit7:0	Origin	3.34	10.49	0.00	-1.92	-14.29	-0.00	-0.0	3.31	3.01	0.00	0.49	13.07	0.00	0.00	13.56	20.9	1
Davit7	Davit7:Mid	End	6.67	10.80	0.01	-3.34	-4.26	-0.00	-0.0	3.31	3.01	0.00	0.63	6.51	0.00	0.00	7.14	11.0	1
Davit7	Davit7:Mid	Origin	6.67	10.80	0.01	-3.34	-4.26	-0.00	-0.0	3.90	2.13	0.00	0.74	6.51	0.00	0.00	7.25	11.2	1
Davit7	Davit7:End	End	8.67	10.78	0.01	-4.26	0.00	0.00	-0.0	3.90	2.13	0.00	0.90	0.00	1.02	0.00	1.98	3.1	3
Davit8	Davit8:O	Origin	0.00	10.24	0.00	0.42	-13.17	0.00	0.0	-4.30	1.35	-0.00	-0.52	8.00	0.00	0.00	8.52	13.1	1
Davit8	#Davit8:0	End	3.34	10.52	0.01	1.55	-8.67	0.00	0.0	-4.30	1.35	-0.00	-0.64	7.93	0.00	0.00	8.56	13.2	1
Davit8	#Davit8:0	Origin	3.34	10.52	0.01	1.55	-8.67	0.00	0.0	-4.28	1.29	-0.00	-0.63	7.93	0.00	0.00	8.56	13.2	1
Davit8	Davit8:Mid	End	6.67	10.78	0.01	2.60	-4.36	0.00	0.0	-4.28	1.29	-0.00	-0.81	6.67	0.00	0.00	7.48	11.5	1
Davit8	Davit8:Mid	Origin	6.67	10.78	0.01	2.60	-4.36	0.00	0.0	-3.87	2.18	-0.00	-0.74	6.67	0.00	0.00	7.40	11.4	1
Davit8	Davit8:End	End	8.67	10.78	0.01	3.20	-0.00	0.00	0.0	-3.87	2.18	-0.00	-0.89	0.00	1.05	0.00	2.02	3.1	3

Summary of Clamp Capacities and Usages for Load Case "NESC Extreme Wind":

Clamp Label	Force Input Holding	Factored Holding	Usage

	(kips)	Capacity (kips)	Capacity (kips)	%
Clamp1	1.432	80.00	80.00	1.79
Clamp2	1.432	80.00	80.00	1.79
Clamp3	4.434	80.00	80.00	5.54
Clamp4	4.434	80.00	80.00	5.54
Clamp5	4.434	80.00	80.00	5.54
Clamp6	4.434	80.00	80.00	5.54
Clamp7	4.434	80.00	80.00	5.54
Clamp8	4.434	80.00	80.00	5.54
Clamp9	4.246	80.00	80.00	5.31
Clamp10	0.241	80.00	80.00	0.30
Clamp11	0.241	80.00	80.00	0.30
Clamp12	0.241	80.00	80.00	0.30
Clamp13	0.241	80.00	80.00	0.30
Clamp14	0.241	80.00	80.00	0.30
Clamp15	0.241	80.00	80.00	0.30
Clamp16	0.241	80.00	80.00	0.30
Clamp17	0.241	80.00	80.00	0.30
Clamp18	0.241	80.00	80.00	0.30
Clamp19	0.241	80.00	80.00	0.30

*** Analysis Results for Load Case No. 3 "NESC Extreme Ice w/ Wind" - Number of iterations in SAPS 12

Equilibrium Joint Positions and Rotations for Load Case "NESC 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)
1814:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
1814:t	0.001547	1.037	-0.009495	-0.9349	0.0014	0.0000	0.001547	1.037	105
1814:Sprint	0.001429	0.9558	-0.008828	-0.9347	0.0014	0.0000	0.001429	0.9558	99.99
1814:WVGD10	0.001311	0.8744	-0.008125	-0.9275	0.0013	0.0000	0.001311	0.8744	94.99
1814:Arm1	0.001186	0.7873	-0.007396	-0.9186	0.0013	0.0000	0.001186	0.7873	89.59
1814:WVGD9	0.001081	0.714	-0.006756	-0.9046	0.0013	0.0000	0.001081	0.714	84.99
1814:Arm2	0.001005	0.6607	-0.006295	-0.8904	0.0013	0.0000	0.001005	0.6607	81.59
1814:WVGD8	0.0008612	0.5603	-0.005365	-0.8477	0.0012	0.0000	0.0008612	0.5603	74.99
1814:Arm3	0.000749	0.4823	-0.004669	-0.8031	0.0012	0.0000	0.000749	0.4823	69.6
1814:WVGD7	0.000658	0.4195	-0.004078	-0.7578	0.0011	0.0000	0.000658	0.4195	65
1814:Arm4	0.0005218	0.3266	-0.003244	-0.6750	0.0010	0.0000	0.0005218	0.3266	57.6
1814:WVGD6	0.0004772	0.2967	-0.00296	-0.6431	0.0010	0.0000	0.0004772	0.2967	55
1814:WVGD5	0.0003235	0.1954	-0.002031	-0.5111	0.0008	0.0000	0.0003235	0.1954	45
1814:WVGD4	0.0001992	0.1168	-0.00137	-0.3892	0.0006	0.0000	0.0001992	0.1168	35
1814:WVGD3	0.0001034	0.05879	-0.0008742	-0.2722	0.0005	0.0000	0.0001034	0.05879	25
1814:WVGD2	3.805e-005	0.02093	-0.0004835	-0.1592	0.0003	0.0000	3.805e-005	0.02093	15
1814:WVGD1	4.487e-006	0.002361	-0.0001543	-0.0516	0.0001	0.0000	4.487e-006	0.002361	5
Davit1:O	0.001186	0.7872	-0.02303	-0.9186	0.0013	0.0000	0.001186	1.762	89.58
Davit1:End	0.001196	0.796	-0.08916	-1.1579	0.0013	0.0000	0.001196	5.271	90.01
Davit2:O	0.001187	0.7875	0.008236	-0.9186	0.0013	0.0000	0.001187	-0.1876	89.61
Davit2:End	0.001199	0.7946	0.05537	-0.7034	0.0013	0.0000	0.001199	-3.68	90.16
Davit3:O	0.001005	0.6606	-0.02328	-0.8904	0.0013	0.0000	0.001005	1.754	81.58
Davit3:Mid	0.001034	0.6951	-0.1818	-1.8299	0.0013	-0.0000	0.001034	8.288	82.92
Davit3:End	0.001033	0.694	-0.2494	-1.9797	0.0013	-0.0000	0.001033	10.29	82.85
Davit4:O	0.001005	0.6609	0.0107	-0.8904	0.0013	0.0000	0.001005	-0.4324	81.61
Davit4:Mid	0.00104	0.6723	0.05885	-0.0110	0.0013	0.0000	0.00104	-6.921	83.16
Davit4:End	0.001041	0.6723	0.05549	0.1403	0.0013	0.0000	0.001041	-8.921	83.16
Davit5:O	0.0007486	0.4822	-0.02248	-0.8031	0.0012	0.0000	0.0007486	1.753	69.58
Davit5:Mid	0.0007761	0.5147	-0.171	-1.7428	0.0012	-0.0000	0.0007761	8.285	70.93
Davit5:End	0.0007749	0.5137	-0.2356	-1.8927	0.0012	-0.0000	0.0007749	10.28	70.86
Davit6:O	0.0007494	0.4825	0.01314	-0.8031	0.0012	0.0000	0.0007494	-0.7882	69.61
Davit6:Mid	0.0007812	0.4916	0.05137	0.0768	0.0012	0.0000	0.0007812	-7.279	71.15
Davit6:End	0.0007813	0.4916	0.04495	0.2282	0.0012	0.0000	0.0007813	-9.279	71.14
Davit7:O	0.0005214	0.3265	-0.0203	-0.6750	0.0010	0.0000	0.0005214	1.775	57.58
Davit7:Mid	0.0005455	0.356	-0.1543	-1.6150	0.0010	-0.0000	0.0005455	8.304	58.95
Davit7:End	0.0005445	0.3551	-0.2143	-1.7649	0.0010	-0.0000	0.0005445	10.3	58.89
Davit8:O	0.0005221	0.3267	0.01381	-0.6750	0.0010	0.0000	0.0005221	-1.121	57.61
Davit8:Mid	0.0005493	0.3324	0.03747	0.2058	0.0010	0.0000	0.0005493	-7.616	59.14
Davit8:End	0.0005493	0.3325	0.02655	0.3572	0.0010	0.0000	0.0005493	-9.616	59.13

Joint Support Reactions for Load Case "NESC 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. 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 %
1814:g	-0.04	0.0	-14.28	0.0	0.0	-69.91	0.0	0.0	71.36	0.0	1064.10	0.0	-2.0	0.0	0.0	-0.00	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC 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.
1814	1814:t	Origin	0.00	12.45	0.02	-0.11	-0.00	-0.00	0.0	-0.09	0.02	-0.00	-0.01	0.00	0.00	0.00	0.01	0.0	5
1814	1814:Sprint	End	5.00	11.47	0.02	-0.11	0.11	-0.00	0.0	-0.09	0.02	-0.00	-0.01	0.02	0.00	0.00	0.03	0.0	2
1814	1814:Sprint	Origin	5.00	11.47	0.02	-0.11	0.11	-0.00	-0.0	-2.86	1.22	-0.00	-0.25	0.00	0.21	0.00	0.45	0.7	5
1814	1814:WVGD10	End	10.00	10.49	0.02	-0.10	6.21	-0.01	-0.0	-2.86	1.22	-0.00	-0.23	1.11	0.05	0.00	1.34	2.1	2
1814	1814:WVGD10	Origin	10.00	10.49	0.02	-0.10	6.21	-0.01	0.0	-3.83	1.30	-0.00	-0.15	0.55	0.03	0.00	0.70	1.1	2
1814	Tube 2	End	12.70	9.97	0.01	-0.09	9.72	-0.02	0.0	-3.83	1.30	-0.00	-0.14	0.79	0.03	0.00	0.93	1.4	2
1814	Tube 2	Origin	12.70	9.97	0.01	-0.09	9.72	-0.02	0.0	-4.07	1.33	-0.00	-0.15	0.79	0.03	0.00	0.94	1.5	2
1814	1814:Arm1	End	15.40	9.45	0.01	-0.09	13.33	-0.03	0.0	-4.07	1.33	-0.00	-0.15	0.99	0.03	0.00	1.14	1.8	2
1814	1814:Arm1	Origin	15.40	9.45	0.01	-0.09	14.37	-0.03	0.0	-10.09	3.50	-0.00	-0.36	1.07	0.07	0.00	1.44	2.2	2
1814	1814:WVGD9	End	20.00	8.57	0.01	-0.08	30.48	-0.05	0.0	-10.09	3.50	-0.00	-0.34	1.98	0.06	0.00	2.32	3.6	2
1814	1814:WVGD9	Origin	20.00	8.57	0.01	-0.08	30.48	-0.05	0.0	-11.24	3.60	-0.01	-0.38	1.98	0.06	0.00	2.36	3.6	2
1814	1814:Arm2	End	23.40	7.93	0.01	-0.08	42.70	-0.07	0.0	-11.24	3.60	-0.01	-0.36	2.52	0.06	0.00	2.88	4.4	2
1814	1814:Arm2	Origin	23.40	7.93	0.01	-0.08	47.27	-0.07	0.0	-23.55	6.86	-0.01	-0.76	2.79	0.12	0.00	3.55	5.5	2
1814	Tube 2	End	26.70	7.32	0.01	-0.07	69.92	-0.09	0.0	-23.55	6.86	-0.01	-0.72	3.77	0.11	0.00	4.50	6.9	2
1814	Tube 2	Origin	26.70	7.32	0.01	-0.07	69.92	-0.09	0.0	-23.92	6.90	-0.01	-0.73	3.77	0.11	0.00	4.51	6.9	2
1814	1814:WVGD8	End	30.00	6.72	0.01	-0.06	92.69	-0.12	0.0	-23.92	6.90	-0.01	-0.70	4.59	0.11	0.00	5.30	8.2	2
1814	1814:WVGD8	Origin	30.00	6.72	0.01	-0.06	92.69	-0.12	0.0	-25.02	6.98	-0.01	-0.74	4.59	0.11	0.00	5.33	8.2	2
1814	Tube 2	End	32.70	6.25	0.01	-0.06	111.53	-0.14	0.0	-25.02	6.98	-0.01	-0.71	5.16	0.11	0.00	5.88	9.0	2
1814	Tube 2	Origin	32.70	6.25	0.01	-0.06	111.53	-0.14	0.0	-25.34	7.01	-0.01	-0.72	5.16	0.11	0.00	5.89	9.1	2
1814	1814:Arm3	End	35.40	5.79	0.01	-0.06	130.45	-0.17	0.0	-25.34	7.01	-0.01	-0.70	5.66	0.10	0.00	6.36	9.8	2
1814	1814:Arm3	Origin	35.40	5.79	0.01	-0.06	134.99	-0.17	0.0	-37.76	10.26	-0.01	-1.04	5.86	0.15	0.00	6.90	10.6	2
1814	1814:WVGD7	End	40.00	5.03	0.01	-0.05	182.17	-0.23	0.0	-37.76	10.26	-0.01	-0.99	7.11	0.14	0.00	8.10	12.5	2
1814	1814:WVGD7	Origin	40.00	5.03	0.01	-0.05	182.17	-0.23	0.0	-39.06	10.34	-0.01	-1.02	7.11	0.14	0.00	8.13	12.5	2
1814	Tube 2	End	43.70	4.46	0.01	-0.04	220.41	-0.27	0.0	-39.06	10.34	-0.01	-0.98	7.93	0.14	0.00	8.91	13.7	2
1814	Tube 2	Origin	43.70	4.46	0.01	-0.04	220.41	-0.27	0.0	-39.57	10.37	-0.01	-0.99	7.93	0.14	0.00	8.92	13.7	2
1814	1814:Arm4	End	47.40	3.92	0.01	-0.04	258.76	-0.33	0.0	-39.57	10.37	-0.01	-0.95	8.61	0.13	0.00	9.56	14.7	2
1814	1814:Arm4	Origin	47.40	3.92	0.01	-0.04	263.27	-0.33	0.0	-51.98	13.58	-0.02	-1.25	8.76	0.17	0.00	10.02	15.4	2
1814	1814:WVGD6	End	50.00	3.56	0.01	-0.04	298.56	-0.37	0.0	-51.98	13.58	-0.02	-1.22	9.42	0.17	0.00	10.64	16.4	2
1814	1814:WVGD6	Origin	50.00	3.56	0.01	-0.04	298.56	-0.37	0.0	-53.30	13.64	-0.02	-1.25	9.42	0.17	0.00	10.67	16.4	2
1814	Tube 2	End	55.00	2.92	0.00	-0.03	366.76	-0.46	0.0	-53.30	13.64	-0.02	-1.19	10.48	0.16	0.00	11.68	18.0	2
1814	Tube 2	Origin	55.00	2.92	0.00	-0.03	366.76	-0.46	0.0	-54.07	13.67	-0.02	-1.21	10.48	0.16	0.00	11.69	18.0	2
1814	1814:WVGD5	End	60.00	2.34	0.00	-0.02	435.10	-0.56	0.0	-54.07	13.67	-0.02	-1.15	11.32	0.15	0.00	12.48	19.2	2
1814	1814:WVGD5	Origin	60.00	2.34	0.00	-0.02	435.10	-0.56	0.0	-55.38	13.73	-0.02	-1.18	11.32	0.15	0.00	12.50	19.2	2
1814	SpliceT	End	62.00	2.14	0.00	-0.02	462.55	-0.60	0.0	-55.38	13.73	-0.02	-1.16	11.60	0.15	0.00	12.77	19.6	2
1814	SpliceT	Origin	62.00	2.14	0.00	-0.02	462.55	-0.60	0.0	-55.94	13.75	-0.02	-1.00	9.93	0.13	0.00	10.94	16.8	2
1814	Tube 3	End	66.00	1.75	0.00	-0.02	517.53	-0.70	0.0	-55.94	13.75	-0.02	-0.97	10.35	0.13	0.00	11.32	17.4	2
1814	Tube 3	Origin	66.00	1.75	0.00	-0.02	517.53	-0.70	0.0	-56.74	13.78	-0.02	-0.98	10.35	0.13	0.00	11.34	17.4	2
1814	1814:WVGD4	End	70.00	1.40	0.00	-0.02	572.64	-0.79	0.0	-56.74	13.78	-0.02	-0.95	10.70	0.12	0.00	11.65	17.9	2
1814	1814:WVGD4	Origin	70.00	1.40	0.00	-0.02	572.64	-0.79	0.0	-58.42	13.85	-0.03	-0.98	10.70	0.12	0.00	11.68	18.0	2
1814	Tube 3	End	75.00	1.02	0.00	-0.01	641.91	-0.93	0.0	-58.42	13.85	-0.03	-0.94	11.04	0.12	0.00	11.99	18.4	2
1814	Tube 3	Origin	75.00	1.02	0.00	-0.01	641.91	-0.93	0.0	-59.49	13.90	-0.03	-0.96	11.04	0.12	0.00	12.00	18.5	2
1814	1814:WVGD3	End	80.00	0.71	0.00	-0.01	711.39	-1.07	0.0	-59.49	13.90	-0.03	-0.92	11.31	0.11	0.00	12.23	18.8	2
1814	1814:WVGD3	Origin	80.00	0.71	0.00	-0.01	711.39	-1.07	0.0	-61.35	13.98	-0.03	-0.95	11.31	0.11	0.00	12.26	18.9	2
1814	Tube 3	End	85.00	0.45	0.00	-0.01	781.29	-1.23	0.0	-61.35	13.98	-0.03	-0.91	11.51	0.11	0.00	12.43	19.1	2
1814	Tube 3	Origin	85.00	0.45	0.00	-0.01	781.29	-1.23	0.0	-62.51	14.03	-0.03	-0.93	11.51	0.11	0.00	12.44	19.1	2
1814	1814:WVGD2	End	90.00	0.25	0.00	-0.01	851.42	-1.41	0.0	-62.51	14.03	-0.03	-0.90	11.66	0.11	0.00	12.56	19.3	2
1814	1814:WVGD2	Origin	90.00	0.25	0.00	-0.01	851.42	-1.41	0.0	-64.46	14.11	-0.04	-0.92	11.66	0.11	0.00	12.59	19.4	2
1814	Tube 3	End	95.00	0.11	0.00	-0.00	921.99	-1.59	0.0	-64.46	14.11	-0.04	-0.89	11.77	0.10	0.00	12.66	19.5	2
1814	Tube 3	Origin	95.00	0.11	0.00	-0.00	921.99	-1.59	0.0	-65.70	14.17	-0.04	-0.91	11.77	0.10	0.00	12.68	19.5	2
1814	1814:WVGD1	End	100.00	0.03	0.00	-0.00	992.82	-1.79	0.0	-65.70	14.17	-0.04	-0.88	11.83	0.10	0.00	12.72	19.6	2
1814	1814:WVGD1	Origin	100.00	0.03	0.00	-0.00	992.82	-1.79	0.0	-67.73	14.26	-0.04	-0.91	11.83	0.10	0.00	12.74	19.7	2
1814	1814:g	End	105.00	0.00	0.00	0.00	1064.10	-2.01	0.0	-67.73	14.26	-0.04	-0.88	11.88	0.10	0.00	12.75	20.0	2

Detailed Tubular Davit Arm Usages for Load Case "NESC 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	9.45	0.01	-0.28	-10.34	-0.00	-0.0	0.66	2.92	0.00	0.13	14.90	0.61	0.00	15.07	23.2	2
Davit1	Davit1:End	End	3.54	9.55	0.01	-1.07	0.00	0.00	-0.0	0.66	2.92	0.00	0.15	0.00	1.36	0.00	2.37	3.6	3
Davit2	Davit2:O	Origin	0.00	9.45	0.01	0.10	-9.30	0.00	0.0	-1.44	2.63	-0.00	-0.28	13.40	0.55	0.00	13.71	21.1	2
Davit2	Davit2:End	End	3.54	9.53	0.01	0.66	-0.00	0.00	0.0	-1.44	2.63	-0.00	-0.32	0.00	1.23	0.00	2.15	3.3	3
Davit3	Davit3:O	Origin	0.00	7.93	0.01	-0.28	-52.29	-0.00	-0.0	0.27	6.15	0.00	0.03	31.78	0.00	0.00	31.81	48.9	1
Davit3	#Davit3:0	End	3.34	8.10	0.01	-1.06	-31.79	-0.00	-0.0	0.27	6.15	0.00	0.04	29.07	0.00	0.00	29.11	44.8	1
Davit3	#Davit3:0	Origin	3.34	8.10	0.01	-1.06	-31.79	-0.00	-0.0	0.33	6.07	0.00	0.05	29.07	0.00	0.00	29.12	44.8	1
Davit3	Davit3:Mid	End	6.67	8.34	0.01	-2.18	-11.56	-0.00	-0.0	0.33	6.07	0.00	0.06	17.67	0.00	0.00	17.73	27.3	1
Davit3	Davit3:Mid	Origin	6.67	8.34	0.01	-2.18	-11.56	-0.00	-0.0	1.72	5.78	0.00	0.33	17.67	0.00	0.00	17.99	27.7	1
Davit3	Davit3:End	End	8.67	8.33	0.01	-2.99	0.00	0.00	-0.0	1.72	5.78	0.00	0.40	0.00	2.77	0.00	4.82	7.4	3
Davit4	Davit4:O	Origin	0.00	7.93	0.01	0.13	-47.73	0.00	0.0	-2.89	5.43	-0.00	-0.35	29.00	0.00	0.00	29.35	45.2	1
Davit4	#Davit4:0	End	3.34	8.04	0.01	0.57	-29.61	0.00	0.0	-2.89	5.43	-0.00	-0.43	27.08	0.00	0.00	27.51	42.3	1
Davit4	#Davit4:0	Origin	3.34	8.04	0.01	0.57	-29.61	0.00	0.0	-2.82	5.38	-0.00	-0.42	27.08	0.00	0.00	27.50	42.3	1
Davit4	Davit4:Mid	End	6.67	8.07	0.01	0.71	-11.67	0.00	0.0	-2.82	5.38	-0.00	-0.54	17.84	0.00	0.00	18.38	28.3	1
Davit4	Davit4:Mid	Origin	6.67	8.07	0.01	0.71	-11.67	0.00	0.0	-1.51	5.83	-0.00	-0.29	17.84	0.00	0.00	18.13	27.9	1
Davit4	Davit4:End	End	8.67	8.07	0.01	0.67	-0.00	0.00	0.0	-1.51	5.83	-0.00	-0.35	0.00	2.80	0.00	4.86	7.5	3
Davit5	Davit5:O	Origin	0.00	5.79	0.01	-0.27	-52.30	-0.00	-0.0	0.26	6.15	0.00	0.03	31.78	0.00	0.00	31.81	48.9	1
Davit5	#Davit5:0	End	3.34	5.95	0.01	-0.99	-31.80	-0.00	-0.0	0.26	6.15	0.00	0.04	29.08	0.00	0.00	29.12	44.8	1
Davit5	#Davit5:0	Origin	3.34	5.95	0.01	-0.99	-31.80	-0.00	-0.0	0.32	6.07	0.00	0.05	29.08	0.00	0.00	29.13	44.8	1
Davit5	Davit5:Mid	End	6.67	6.18	0.01	-2.05	-11.56	-0.00	-0.0	0.32	6.07	0.00	0.06	17.68	0.00	0.00	17.74	27.3	1
Davit5	Davit5:Mid	Origin	6.67	6.18	0.01	-2.05	-11.56	-0.00	-0.0	1.71	5.78	0.00	0.33	17.68	0.00	0.00	18.00	27.7	1
Davit5	Davit5:End	End	8.67	6.16	0.01	-2.83	0.00	0.00	-0.0	1.71	5.78	0.00	0.39	0.00	2.77	0.00	4.82	7.4	3
Davit6	Davit6:O	Origin	0.00	5.79	0.01	0.16	-47.76	0.00	0.0	-2.88	5.44	-0.00	-0.35	29.02	0.00	0.00	29.37	45.2	1
Davit6	#Davit6:0	End	3.34	5.88	0.01	0.54	-29.63	0.00	0.0	-2.88	5.44	-0.00	-0.42	27.10	0.00	0.00	27.52	42.3	1
Davit6	#Davit6:0	Origin	3.34	5.88	0.01	0.54	-29.63	0.00	0.0	-2.82	5.38	-0.00	-0.42	27.10	0.00	0.00	27.51	42.3	1
Davit6	Davit6:Mid	End	6.67	5.90	0.01	0.62	-11.67	0.00	0.0	-2.82	5.38	-0.00	-0.54	17.85	0.00	0.00	18.39	28.3	1
Davit6	Davit6:Mid	Origin	6.67	5.90	0.01	0.62	-11.67	0.00	0.0	-1.50	5.84	-0.00	-0.29	17.85	0.00	0.00	18.14	27.9	1
Davit6	Davit6:End	End	8.67	5.90	0.01	0.54	-0.00	0.00	0.0	-1.50	5.84	-0.00	-0.35	0.00	2.80	0.00	4.86	7.5	3
Davit7	Davit7:O	Origin	0.00	3.92	0.01	-0.24	-52.31	-0.00	-0.0	0.24	6.15	0.00	0.03	31.79	0.00	0.00	31.82	49.0	1
Davit7	#Davit7:0	End	3.34	4.06	0.01	-0.88	-31.81	-0.00	-0.0	0.24	6.15	0.00	0.04	29.09	0.00	0.00	29.12	44.8	1
Davit7	#Davit7:0	Origin	3.34	4.06	0.01	-0.88	-31.81	-0.00	-0.0	0.31	6.07	0.00	0.05	29.09	0.00	0.00	29.13	44.8	1
Davit7	Davit7:Mid	End	6.67	4.27	0.01	-1.85	-11.57	-0.00	-0.0	0.31	6.07	0.00	0.06	17.69	0.00	0.00	17.75	27.3	1
Davit7	Davit7:Mid	Origin	6.67	4.27	0.01	-1.85	-11.57	-0.00	-0.0	1.70	5.78	0.00	0.32	17.69	0.00	0.00	18.01	27.7	1
Davit7	Davit7:End	End	8.67	4.26	0.01	-2.57	0.00	0.00	-0.0	1.70	5.78	0.00	0.39	0.00	2.77	0.00	4.82	7.4	3
Davit8	Davit8:O	Origin	0.00	3.92	0.01	0.17	-47.81	0.00	0.0	-2.86	5.44	-0.00	-0.35	29.05	0.00	0.00	29.40	45.2	1
Davit8	#Davit8:0	End	3.34	3.99	0.01	0.46	-29.66	0.00	0.0	-2.86	5.44	-0.00	-0.42	27.12	0.00	0.00	27.55	42.4	1
Davit8	#Davit8:0	Origin	3.34	3.99	0.01	0.46	-29.66	0.00	0.0	-2.80	5.39	-0.00	-0.41	27.12	0.00	0.00	27.54	42.4	1
Davit8	Davit8:Mid	End	6.67	3.99	0.01	0.45	-11.68	0.00	0.0	-2.80	5.39	-0.00	-0.53	17.86	0.00	0.00	18.39	28.3	1
Davit8	Davit8:Mid	Origin	6.67	3.99	0.01	0.45	-11.68	0.00	0.0	-1.49	5.84	-0.00	-0.28	17.86	0.00	0.00	18.14	27.9	1
Davit8	Davit8:End	End	8.67	3.99	0.01	0.32	-0.00	0.00	0.0	-1.49	5.84	-0.00	-0.34	0.00	2.80	0.00	4.87	7.5	3

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

Clamp Label	Force Input Holding	Factored Holding	Usage

	(kips)	Capacity (kips)	Capacity (kips)	%
Clamp1	2.972	80.00	80.00	3.71
Clamp2	2.972	80.00	80.00	3.71
Clamp3	6.012	80.00	80.00	7.51
Clamp4	6.012	80.00	80.00	7.51
Clamp5	6.012	80.00	80.00	7.51
Clamp6	6.012	80.00	80.00	7.51
Clamp7	6.012	80.00	80.00	7.51
Clamp8	6.012	80.00	80.00	7.51
Clamp9	2.814	80.00	80.00	3.52
Clamp10	0.749	80.00	80.00	0.94
Clamp11	0.749	80.00	80.00	0.94
Clamp12	0.749	80.00	80.00	0.94
Clamp13	0.749	80.00	80.00	0.94
Clamp14	0.749	80.00	80.00	0.94
Clamp15	0.749	80.00	80.00	0.94
Clamp16	0.749	80.00	80.00	0.94
Clamp17	0.749	80.00	80.00	0.94
Clamp18	0.749	80.00	80.00	0.94
Clamp19	0.749	80.00	80.00	0.94

*** 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)
1814	50.49	NESC Extreme Wind	26	18119.1

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 %
1814	NESC Heavy Wind	1	2.075	1.463	0.809	2.194	17.551	21.853	47.943	3	70.667	1.983	3.000	43.71
1814	NESC Heavy Wind	2	2.194	0.809	1.463	2.075	17.551	16.753	36.753	3	62.265	1.737	3.000	33.51
1814	NESC Heavy Wind	3	2.305	-1.258	2.305	1.258	30.191	0.151	0.569	2	40.120	0.165	3.000	0.30
1814	NESC Heavy Wind	4	1.463	-2.075	2.194	-0.809	17.551	13.796	30.266	3	-53.548	1.576	3.000	27.59
1814	NESC Heavy Wind	5	0.809	-2.194	2.075	-1.463	17.551	18.864	41.385	3	-61.875	1.843	3.000	37.73
1814	NESC Heavy Wind	6	-1.258	-2.305	1.258	-2.305	30.191	0.260	0.980	2	-61.875	0.216	3.000	0.52
1814	NESC Heavy Wind	7	-2.075	-1.463	-0.809	-2.194	17.551	18.767	41.172	3	-61.648	1.838	3.000	37.53
1814	NESC Heavy Wind	8	-2.194	-0.809	-1.463	-2.075	17.551	13.666	29.982	3	-53.245	1.568	3.000	27.33
1814	NESC Heavy Wind	9	-2.305	1.258	-2.305	-1.258	30.191	0.151	0.569	2	40.541	0.165	3.000	0.30
1814	NESC Heavy Wind	10	-1.463	2.075	-2.194	0.809	17.551	16.882	37.037	3	62.568	1.743	3.000	33.76
1814	NESC Heavy Wind	11	-0.809	2.194	-2.075	1.463	17.551	21.950	48.156	3	70.895	1.988	3.000	43.90
1814	NESC Heavy Wind	12	1.258	2.305	-1.258	2.305	30.191	0.298	1.124	2	70.895	0.232	3.000	0.60
1814	NESC Heavy Wind	13	2.313	1.062	1.062	2.313	21.229	15.099	40.068	4	70.667	1.649	3.000	30.20
1814	NESC Heavy Wind	14	1.062	-2.313	2.313	-1.062	21.229	12.777	33.907	4	-61.875	1.517	3.000	25.55
1814	NESC Heavy Wind	15	-2.313	-1.062	-1.062	-2.313	21.229	12.689	33.672	4	-61.648	1.511	3.000	25.38
1814	NESC Heavy Wind	16	-1.062	2.313	-2.313	1.062	21.229	15.187	40.302	4	70.895	1.653	3.000	30.37
1814	NESC Extreme Wind	1	2.075	1.463	0.809	2.194	17.551	37.385	82.017	3	121.457	2.594	3.000	74.77
1814	NESC Extreme Wind	2	2.194	0.809	1.463	2.075	17.551	28.229	61.930	3	106.390	2.254	3.000	56.46
1814	NESC Extreme Wind	3	2.305	-1.258	2.305	1.258	30.191	0.271	1.023	2	66.622	0.221	3.000	0.54
1814	NESC Extreme Wind	4	1.463	-2.075	2.194	-0.809	17.551	26.753	58.692	3	-102.054	2.194	3.000	53.51
1814	NESC Extreme Wind	5	0.809	-2.194	2.075	-1.463	17.551	35.899	78.757	3	-117.097	2.542	3.000	71.80
1814	NESC Extreme Wind	6	-1.258	-2.305	1.258	-2.305	30.191	0.492	1.858	2	-117.097	0.298	3.000	0.98
1814	NESC Extreme Wind	7	-2.075	-1.463	-0.809	-2.194	17.551	35.869	78.691	3	-117.026	2.541	3.000	71.74
1814	NESC Extreme Wind	8	-2.194	-0.809	-1.463	-2.075	17.551	26.713	58.604	3	-101.959	2.193	3.000	53.43
1814	NESC Extreme Wind	9	-2.305	1.258	-2.305	-1.258	30.191	0.271	1.023	2	66.753	0.221	3.000	0.54
1814	NESC Extreme Wind	10	-1.463	2.075	-2.194	0.809	17.551	28.269	62.019	3	106.485	2.256	3.000	56.54
1814	NESC Extreme Wind	11	-0.809	2.194	-2.075	1.463	17.551	37.415	82.084	3	121.528	2.595	3.000	74.83
1814	NESC Extreme Wind	12	1.258	2.305	-1.258	2.305	30.191	0.511	1.929	2	121.528	0.303	3.000	1.02
1814	NESC Extreme Wind	13	2.313	1.062	1.062	2.313	21.229	25.664	68.105	4	121.457	2.149	3.000	51.33
1814	NESC Extreme Wind	14	1.062	-2.313	2.313	-1.062	21.229	24.508	65.036	4	-117.097	2.100	3.000	49.02
1814	NESC Extreme Wind	15	-2.313	-1.062	-1.062	-2.313	21.229	24.480	64.963	4	-117.026	2.099	3.000	48.96
1814	NESC Extreme Wind	16	-1.062	2.313	-2.313	1.062	21.229	25.692	68.178	4	121.528	2.150	3.000	51.38
1814	NESC Extreme Ice w/ Wind	1	2.075	1.463	0.809	2.194	17.551	15.167	33.273	3	48.901	1.652	3.000	30.33
1814	NESC Extreme Ice w/ Wind	2	2.194	0.809	1.463	2.075	17.551	11.733	25.740	3	43.247	1.453	3.000	23.47
1814	NESC Extreme Ice w/ Wind	3	2.305	-1.258	2.305	1.258	30.191	0.102	0.383	2	28.336	0.135	3.000	0.20
1814	NESC Extreme Ice w/ Wind	4	1.463	-2.075	2.194	-0.809	17.551	8.859	19.436	3	-34.821	1.263	3.000	17.72
1814	NESC Extreme Ice w/ Wind	5	0.809	-2.194	2.075	-1.463	17.551	12.280	26.941	3	-40.444	1.487	3.000	24.56
1814	NESC Extreme Ice w/ Wind	6	-1.258	-2.305	1.258	-2.305	30.191	0.170	0.641	2	-40.444	0.175	3.000	0.34
1814	NESC Extreme Ice w/ Wind	7	-2.075	-1.463	-0.809	-2.194	17.551	12.241	26.856	3	-40.353	1.484	3.000	24.48
1814	NESC Extreme Ice w/ Wind	8	-2.194	-0.809	-1.463	-2.075	17.551	8.808	19.323	3	-34.699	1.259	3.000	17.62

1814	NESC Extreme Ice w/ Wind	9	-2.305	1.258	-2.305	-1.258	30.191	0.102	0.383	2	28.505	0.135	3.000	0.20
1814	NESC Extreme Ice w/ Wind	10	-1.463	2.075	-2.194	0.809	17.551	11.785	25.854	3	43.369	1.456	3.000	23.57
1814	NESC Extreme Ice w/ Wind	11	-0.809	2.194	-2.075	1.463	17.551	15.205	33.358	3	48.992	1.654	3.000	30.41
1814	NESC Extreme Ice w/ Wind	12	1.258	2.305	-1.258	2.305	30.191	0.206	0.777	2	48.992	0.193	3.000	0.41
1814	NESC Extreme Ice w/ Wind	13	2.313	1.062	1.062	2.313	21.229	10.520	27.916	4	48.901	1.376	3.000	21.04
1814	NESC Extreme Ice w/ Wind	14	1.062	-2.313	2.313	-1.062	21.229	8.271	21.949	4	-40.444	1.220	3.000	16.54
1814	NESC Extreme Ice w/ Wind	15	-2.313	-1.062	-1.062	-2.313	21.229	8.236	21.855	4	-40.353	1.218	3.000	16.47
1814	NESC Extreme Ice w/ Wind	16	-1.062	2.313	-2.313	1.062	21.229	10.555	28.010	4	48.992	1.378	3.000	21.11

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
Davit1	23.18	NESC Extreme Ice w/ Wind	1	58.6
Davit2	21.09	NESC Extreme Ice w/ Wind	1	58.6
Davit3	48.94	NESC Extreme Ice w/ Wind	1	186.4
Davit4	45.16	NESC Extreme Ice w/ Wind	1	186.4
Davit5	48.94	NESC Extreme Ice w/ Wind	1	186.4
Davit6	45.19	NESC Extreme Ice w/ Wind	1	186.4
Davit7	48.95	NESC Extreme Ice w/ Wind	1	186.4
Davit8	45.23	NESC Extreme Ice w/ Wind	1	186.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy Wind	47.76	Davit7	Tubular Davit
NESC Extreme Wind	74.83	1814	Base Plate
NESC Extreme Ice w/ Wind	48.95	Davit7	Tubular Davit

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC Heavy Wind	29.13	1814	26
NESC Extreme Wind	50.49	1814	26
NESC Extreme Ice w/ Wind	20.03	1814	26

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 Heavy Wind	1814	11	17.551	72.155	1578.588	-5.013	21.950	48.156	3	70.895	1.988	43.90
NESC Extreme Wind	1814	11	17.551	35.446	2841.186	-1.565	37.415	82.084	3	121.528	2.595	74.83
NESC Extreme Ice w/ Wind	1814	11	17.551	68.383	1064.104	-2.006	15.205	33.358	3	48.992	1.654	30.41

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Tubular Davit Segment

	Usage %	Label	Number
NESC Heavy Wind	47.76	Davit7	1
NESC Extreme Wind	23.64	Davit7	1
NESC Extreme Ice w/ Wind	48.95	Davit7	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	3.71	NESC Extreme Ice w/ Wind	0.0
Clamp2	Clamp	3.71	NESC Extreme Ice w/ Wind	0.0
Clamp3	Clamp	7.51	NESC Extreme Ice w/ Wind	0.0
Clamp4	Clamp	7.51	NESC Extreme Ice w/ Wind	0.0
Clamp5	Clamp	7.51	NESC Extreme Ice w/ Wind	0.0
Clamp6	Clamp	7.51	NESC Extreme Ice w/ Wind	0.0
Clamp7	Clamp	7.51	NESC Extreme Ice w/ Wind	0.0
Clamp8	Clamp	7.51	NESC Extreme Ice w/ Wind	0.0
Clamp9	Clamp	5.31	NESC Extreme Wind	0.0
Clamp10	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp11	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp12	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp13	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp14	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp15	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp16	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp17	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp18	Clamp	0.94	NESC Extreme Ice w/ Wind	0.0
Clamp19	Clamp	0.94	NESC Extreme Ice w/ Wind	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 Heavy Wind	Clamp1	Clamp	Davit1:End	0.000	1.343	1.938	2.358
NESC Heavy Wind	Clamp2	Clamp	Davit2:End	0.000	1.343	1.938	2.358
NESC Heavy Wind	Clamp3	Clamp	Davit3:End	0.000	2.271	5.497	5.948
NESC Heavy Wind	Clamp4	Clamp	Davit4:End	0.000	2.271	5.497	5.948
NESC Heavy Wind	Clamp5	Clamp	Davit5:End	0.000	2.271	5.497	5.948
NESC Heavy Wind	Clamp6	Clamp	Davit6:End	0.000	2.271	5.497	5.948
NESC Heavy Wind	Clamp7	Clamp	Davit7:End	0.000	2.271	5.497	5.948
NESC Heavy Wind	Clamp8	Clamp	Davit8:End	0.000	2.271	5.497	5.948
NESC Heavy Wind	Clamp9	Clamp	1814:Sprint	0.000	1.058	3.033	3.212
NESC Heavy Wind	Clamp10	Clamp	1814:WVGD1	0.000	0.073	0.548	0.553
NESC Heavy Wind	Clamp11	Clamp	1814:WVGD2	0.000	0.073	0.548	0.553
NESC Heavy Wind	Clamp12	Clamp	1814:WVGD3	0.000	0.073	0.548	0.553
NESC Heavy Wind	Clamp13	Clamp	1814:WVGD4	0.000	0.073	0.548	0.553
NESC Heavy Wind	Clamp14	Clamp	1814:WVGD5	0.000	0.073	0.548	0.553
NESC Heavy Wind	Clamp15	Clamp	1814:WVGD6	0.000	0.073	0.548	0.553
NESC Heavy Wind	Clamp16	Clamp	1814:WVGD7	0.000	0.073	0.548	0.553
NESC Heavy Wind	Clamp17	Clamp	1814:WVGD8	0.000	0.073	0.548	0.553
NESC Heavy Wind	Clamp18	Clamp	1814:WVGD9	0.000	0.073	0.548	0.553
NESC Heavy Wind	Clamp19	Clamp	1814:WVGD10	0.000	0.073	0.548	0.553
NESC Extreme Wind	Clamp1	Clamp	Davit1:End	0.000	1.327	0.539	1.432

NESC Extreme Wind	Clamp2	Clamp	Davit2:End	0.000	1.327	0.539	1.432
NESC Extreme Wind	Clamp3	Clamp	Davit3:End	0.000	3.815	2.260	4.434
NESC Extreme Wind	Clamp4	Clamp	Davit4:End	0.000	3.815	2.260	4.434
NESC Extreme Wind	Clamp5	Clamp	Davit5:End	0.000	3.815	2.260	4.434
NESC Extreme Wind	Clamp6	Clamp	Davit6:End	0.000	3.815	2.260	4.434
NESC Extreme Wind	Clamp7	Clamp	Davit7:End	0.000	3.815	2.260	4.434
NESC Extreme Wind	Clamp8	Clamp	Davit8:End	0.000	3.815	2.260	4.434
NESC Extreme Wind	Clamp9	Clamp	1814:Sprint	0.000	3.978	1.484	4.246
NESC Extreme Wind	Clamp10	Clamp	1814:WVGD1	0.000	0.203	0.130	0.241
NESC Extreme Wind	Clamp11	Clamp	1814:WVGD2	0.000	0.203	0.130	0.241
NESC Extreme Wind	Clamp12	Clamp	1814:WVGD3	0.000	0.203	0.130	0.241
NESC Extreme Wind	Clamp13	Clamp	1814:WVGD4	0.000	0.203	0.130	0.241
NESC Extreme Wind	Clamp14	Clamp	1814:WVGD5	0.000	0.203	0.130	0.241
NESC Extreme Wind	Clamp15	Clamp	1814:WVGD6	0.000	0.203	0.130	0.241
NESC Extreme Wind	Clamp16	Clamp	1814:WVGD7	0.000	0.203	0.130	0.241
NESC Extreme Wind	Clamp17	Clamp	1814:WVGD8	0.000	0.203	0.130	0.241
NESC Extreme Wind	Clamp18	Clamp	1814:WVGD9	0.000	0.203	0.130	0.241
NESC Extreme Wind	Clamp19	Clamp	1814:WVGD10	0.000	0.203	0.130	0.241
NESC Extreme Ice w/ Wind	Clamp1	Clamp	Davit1:End	0.000	1.018	2.792	2.972
NESC Extreme Ice w/ Wind	Clamp2	Clamp	Davit2:End	0.000	1.018	2.792	2.972
NESC Extreme Ice w/ Wind	Clamp3	Clamp	Davit3:End	0.000	1.522	5.816	6.012
NESC Extreme Ice w/ Wind	Clamp4	Clamp	Davit4:End	0.000	1.522	5.816	6.012
NESC Extreme Ice w/ Wind	Clamp5	Clamp	Davit5:End	0.000	1.522	5.816	6.012
NESC Extreme Ice w/ Wind	Clamp6	Clamp	Davit6:End	0.000	1.522	5.816	6.012
NESC Extreme Ice w/ Wind	Clamp7	Clamp	Davit7:End	0.000	1.522	5.816	6.012
NESC Extreme Ice w/ Wind	Clamp8	Clamp	Davit8:End	0.000	1.522	5.816	6.012
NESC Extreme Ice w/ Wind	Clamp9	Clamp	1814:Sprint	0.000	1.111	2.585	2.814
NESC Extreme Ice w/ Wind	Clamp10	Clamp	1814:WVGD1	0.000	0.034	0.748	0.749
NESC Extreme Ice w/ Wind	Clamp11	Clamp	1814:WVGD2	0.000	0.034	0.748	0.749
NESC Extreme Ice w/ Wind	Clamp12	Clamp	1814:WVGD3	0.000	0.034	0.748	0.749
NESC Extreme Ice w/ Wind	Clamp13	Clamp	1814:WVGD4	0.000	0.034	0.748	0.749
NESC Extreme Ice w/ Wind	Clamp14	Clamp	1814:WVGD5	0.000	0.034	0.748	0.749
NESC Extreme Ice w/ Wind	Clamp15	Clamp	1814:WVGD6	0.000	0.034	0.748	0.749
NESC Extreme Ice w/ Wind	Clamp16	Clamp	1814:WVGD7	0.000	0.034	0.748	0.749
NESC Extreme Ice w/ Wind	Clamp17	Clamp	1814:WVGD8	0.000	0.034	0.748	0.749
NESC Extreme Ice w/ Wind	Clamp18	Clamp	1814:WVGD9	0.000	0.034	0.748	0.749
NESC Extreme Ice w/ Wind	Clamp19	Clamp	1814:WVGD10	0.000	0.034	0.748	0.749

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 Heavy Wind	18.100	0.000	45.371	1353.117	-0.000	-0.000
NESC Extreme Wind	31.552	0.000	17.422	2365.904	-0.000	-0.000
NESC Extreme Ice w/ Wind	12.619	0.000	50.545	960.829	-0.000	-0.000

*** Weight of structure (lbs):
    Weight of Tubular Davit Arms: 1235.5
    Weight of Steel Poles: 18119.1
    Total: 19354.5

*** End of Report

CENTEK engineering
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Subject:	Anchor Bolt Analysis Pole #1814
Location:	Southington, CT
Rev. 1: 10/29/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 18098.02

Anchor Bolt Analysis:

Input Data:

Bolt Force:

Maximum Tensile Force = $T_{Max} := 122 \cdot kips$ (User Input from PLS-Pole)

Anchor Bolt Data:

Use AST MA615 Grade 75

Number of Anchor Bolts = $N := 16$ (User Input)

Bolt "Column" Distance = $l := 3.0 \cdot in$ (User Input)

Bolt Ultimate Strength = $F_u := 100 \cdot ksi$ (User Input)

Bolt Yeild Strength= $F_y := 75 \cdot ksi$ (User Input)

Bolt Modulus = $E := 29000 \cdot ksi$ (User Input)

Diameter of Anchor Bolts = $D := 2.25 \cdot in$ (User Input)

Threads per Inch = $n := 4.5$ (User Input)

Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 = 3.248 \cdot in^2$

Bolt Tension Check:

Allowable Tensile Force (Net Area) = $T_{ALL.Net} := 1.0 \cdot \left(A_n \cdot F_y \right) = 243.576 \cdot kips$

Bolt Tension % of Capacity = $\frac{T_{Max}}{T_{ALL.Net}} = 50.09 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{T_{Max}}{T_{ALL.Net}} \le 1.00, "OK", "Overstressed" \right)$

Condition1 = "OK"

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Subject:	CAISSON FOUNDATION
Location:	Southington, CT
Rev. 1: 10/29/18	Prepared by: TJL Checked by: C.F.C. Job No. 18098.02

Caisson Foundation:

Input Data:

Shear Force =	$S := 41.7k \cdot 1.1 = 45.87 \cdot kips$	*USER INPUT-FROM tnxTower*
Overturning Moment =	$M := 2841.2ft \cdot k \cdot 1.1 = 3125 \cdot ft \cdot k$	*USER INPUT-FROM tnxTower*
Applied Axial Load =	$A1 := 37.0k \cdot 1.1 = 40.7 \cdot kips$	*USER INPUT-FROM tnxTower*
Bending Moment =	$Mu := 3302ft \cdot k$	*USER INPUT--FROM LPILE*
Moment Capacity =	$Mn := 11843ft \cdot k$	*USER INPUT--FROM LPILE*
Foundation Diameter =	$d := 8.0ft$	*USER INPUT*
Overall Length of Caisson =	$L_c := 30.0ft$	*USER INPUT*
Depth From Top of Caisson to Grade =	$L_{pag} := 1.0ft$	*USER INPUT*
Number of Rebar =	$n := 36$	*USER INPUT*
Area of Rebar =	$Ar := 1.56in^2$	*USER INPUT*
Rebar Yield Strength =	$fy := 60ksi$	*USER INPUT*
Concrete Comp Strength =	$f'c := 5ksi$	*USER INPUT*

Check Moment Capacity:

Factor of Safety = $FS := \frac{0.9 \cdot Mn}{Mu} = 3.23$

Factor of Safety Required = $FS_{reqd} := 1$

$FOSCheck := if(FS \geq FS_{reqd}, "OK", "NO GOOD")$

FOSCheck = "OK"

LPILE Plus for Windows, Version 5.0 (5.0.47)

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

This program is licensed to:

TJL
Centek Engineering

Files Used for Analysis

Path to file locations: J:\Jobs\1809800.WI\02_CT11734B\Structural\Tower\Backup Documentation\Rev (1)\Calcs\Foundation\
Name of input data file: Caisson Analysis.lpd
Name of output file: Caisson Analysis.lpo
Name of plot output file: Caisson Analysis.lpp
Name of runtime file: Caisson Analysis.lpr

Time and Date of Analysis

Date: October 29, 2018 Time: 11:21:11

Problem Title

18098.02 - CT11734B / Structure #1814

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending 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 additional p-y curves to be computed at 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 = 1.0000E+02 in

Printing Options:
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (spacing of output points) = 8

Pile Structural Properties and Geometry

Pile Length = 360.00 in

Depth of ground surface below top of pile = 12.00 in

Slope angle of ground surface = 0.00 deg.

Structural properties of pile defined using 2 points

Point No.	Point Depth in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	96.00000000	4169220.	7238.0000	4030508.
2	360.0000	96.00000000	4169220.	7238.0000	4030508.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness

that the above values of moment of inertia and modulus of are not used
for any computations other than total stress due to combined axial
loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 3 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   12.000 in
Distance from top of pile to bottom of layer =   132.000 in
p-y subgrade modulus k for top of soil layer =   60.000 lbs/in**3
p-y subgrade modulus k for bottom of layer   =   60.000 lbs/in**3

Layer 2 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   132.000 in
Distance from top of pile to bottom of layer =   156.000 in
p-y subgrade modulus k for top of soil layer =   40.000 lbs/in**3
p-y subgrade modulus k for bottom of layer   =   40.000 lbs/in**3

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   156.000 in
Distance from top of pile to bottom of layer =   360.000 in
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   0.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 6 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	12.00	0.06900
2	132.00	0.06900
3	132.00	0.03400
4	156.00	0.03400
5	156.00	0.03400
6	360.00	0.03400

Shear Strength of Soils

Shear strength parameters with depth defined using 6 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	12.000	0.00000	32.00	------	------
2	132.000	0.00000	32.00	------	------
3	132.000	0.00000	32.00	------	------
4	156.000	0.00000	32.00	------	------
5	156.000	0.00000	30.00	------	------
6	360.000	0.00000	30.00	------	------

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.
(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Loading Type

Static loading criteria was used for computation of p-y curves.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 45870.000 lbs
Bending moment at pile head = 37500000.000 in-lbs
Axial load at pile head = 40700.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment) condition.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Number of sections = 1

Pile Section No. 1

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter	=	96.0000 in

Material Properties:

Compressive Strength of Concrete	=	5.000 kip/in**2
Yield Stress of Reinforcement	=	60. kip/in**2
Modulus of Elasticity of Reinforcement	=	29000. kip/in**2
Number of Reinforcing Bars	=	36
Area of Single Bar	=	1.56000 in**2
Number of Rows of Reinforcing Bars	=	19
Area of Steel	=	56.160 in**2
Area of Shaft	=	7238.229 in**2
Percentage of Steel Reinforcement	=	0.776 percent
Cover Thickness (edge to bar center)	=	4.000 in

Unfactored Axial Squash Load Capacity = 33893.40 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	1.560	44.000
2	3.120	43.332
3	3.120	41.346
4	3.120	38.105
5	3.120	33.706
6	3.120	28.283
7	3.120	22.000
8	3.120	15.049

9	3.120	7.641
10	3.120	0.000
11	3.120	-7.641
12	3.120	-15.049
13	3.120	-22.000
14	3.120	-28.283
15	3.120	-33.706
16	3.120	-38.105
17	3.120	-41.346
18	3.120	-43.332
19	1.560	-44.000

Axial Thrust Force = 40700.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
11555484.	1.848877E+13	6.250000E-07	0.00003143	50.28576708	124.82130	838.92953
23008063.	1.840645E+13	0.00000125	0.00006156	49.24546766	242.64984	1640.14820
34356432.	1.832343E+13	0.00000188	0.00009166	48.88750219	358.68943	2440.75793
45601163.	1.824047E+13	0.00000250	0.00012177	48.70839643	473.02301	3241.35874
45601163.	1.459237E+13	0.00000313	0.00007445	23.82477808	287.51440	6178.37949
45601163.	1.216031E+13	0.00000375	0.00008818	23.51435709	339.27020	7447.81367
45601163.	1.042312E+13	0.00000438	0.00010192	23.29605532	390.74387	8716.81298
45601163.	9.120233E+12	0.00000500	0.00011568	23.13534594	441.93459	9985.37484
45601163.	8.106873E+12	0.00000563	0.00012945	23.01304579	492.84151	11253.49691
45601163.	7.296186E+12	0.00000625	0.00014324	22.91765070	543.46390	12521.17581
45601163.	6.632896E+12	0.00000688	0.00015704	22.84183073	593.80076	13788.41000
45601163.	6.080155E+12	0.00000750	0.00017086	22.78071070	643.85145	15055.19542
45601163.	5.612451E+12	0.00000813	0.00018469	22.73090315	693.61488	16321.53095

45601163.	5.211561E+12	0.00000875	0.00019854	22.68999910	743.09036
17587.41273					
45601163.	4.864124E+12	0.00000938	0.00021240	22.65622759	792.27700
18852.83812					
45601163.	4.560116E+12	0.00001000	0.00022628	22.62825823	841.17381
20117.80511					
45601163.	4.291874E+12	0.00001063	0.00024018	22.60508108	889.78011
21382.30939					
45601163.	4.053437E+12	0.00001125	0.00025409	22.58590078	938.09478
22646.34987					
45601163.	3.840098E+12	0.00001188	0.00026802	22.57009935	986.11713
23909.92204					
45601163.	3.648093E+12	0.00001250	0.00028196	22.55717325	1033.84603
25173.02470					
45601163.	3.474374E+12	0.00001313	0.00029593	22.54672480	1081.28082
26435.65287					
46369527.	3.372329E+12	0.00001375	0.00030990	22.53841925	1128.42037
27697.80533					
48405860.	3.367364E+12	0.00001438	0.00032390	22.53198767	1175.26390
28959.47764					
50440252.	3.362683E+12	0.00001500	0.00033791	22.52720118	1221.81039
30220.66749					
52472688.	3.358252E+12	0.00001563	0.00035194	22.52386808	1268.05884
31481.37227					
54503163.	3.354041E+12	0.00001625	0.00036598	22.52182817	1314.00833
32741.58847					
56531665.	3.350025E+12	0.00001688	0.00038004	22.52094412	1359.65789
34001.31297					
58558193.	3.346182E+12	0.00001750	0.00039412	22.52110147	1405.00673
35260.54100					
60582724.	3.342495E+12	0.00001813	0.00040821	22.52219439	1450.05361
36519.27158					
62605253.	3.338947E+12	0.00001875	0.00042233	22.52413702	1494.79763
37777.50050					
64625767.	3.335523E+12	0.00001938	0.00043646	22.52685213	1539.23775
39035.22496					
66644258.	3.332213E+12	0.00002000	0.00045061	22.53027391	1583.37299
40292.44113					
68660719.	3.329005E+12	0.00002063	0.00046477	22.53434515	1627.20243
41549.14481					
70675131.	3.325889E+12	0.00002125	0.00047895	22.53901148	1670.72486
42805.33418					
72687492.	3.322857E+12	0.00002188	0.00049316	22.54422998	1713.93941
44061.00410					
74697782.	3.319901E+12	0.00002250	0.00050737	22.54995775	1756.84487
45316.15257					
76705996.	3.317016E+12	0.00002313	0.00052161	22.55616045	1799.44031
46570.77490					
78712127.	3.314195E+12	0.00002375	0.00053587	22.56280661	1841.72469

47824.86695					
80716141.	3.311431E+12	0.00002438	0.00055014	22.56986189	1883.69655
49078.42888					
84717842.	3.306062E+12	0.00002563	0.00057874	22.58511686	1966.69960
51583.93503					
88710997.	3.300874E+12	0.00002688	0.00060742	22.60174513	2048.44041
54087.26489					
92695518.	3.295841E+12	0.00002813	0.00063618	22.61960363	2128.91008
56588.38579					
96671292.	3.290938E+12	0.00002938	0.00066501	22.63856936	2208.09911
59087.26873					
1.002454E+08	3.273318E+12	0.00003063	0.00069298	22.62788057	2283.40172
60000.00000					
1.030158E+08	3.231867E+12	0.00003188	0.00071908	22.55929327	2352.20621
60000.00000					
1.053856E+08	3.181452E+12	0.00003313	0.00074422	22.46705389	2417.23675
60000.00000					
1.076968E+08	3.132998E+12	0.00003438	0.00077000	22.40000010	2482.79925
60000.00000					
1.093506E+08	3.069489E+12	0.00003563	0.00079484	22.31143713	2544.76327
60000.00000					
1.109885E+08	3.009858E+12	0.00003688	0.00081781	22.17785025	2600.85921
60000.00000					
1.126229E+08	2.954043E+12	0.00003813	0.00084081	22.05412531	2656.12160
60000.00000					
1.138722E+08	2.891992E+12	0.00003938	0.00086256	21.90621614	2707.35347
60000.00000					
1.151105E+08	2.833490E+12	0.00004063	0.00088431	21.76760530	2757.76767
60000.00000					
1.163459E+08	2.778410E+12	0.00004188	0.00090610	21.63812399	2807.42909
60000.00000					
1.174713E+08	2.723972E+12	0.00004313	0.00092751	21.50739813	2855.37129
60000.00000					
1.183795E+08	2.667706E+12	0.00004438	0.00094812	21.36610651	2900.68110
60000.00000					
1.192853E+08	2.614472E+12	0.00004563	0.00096877	21.23323488	2945.31236
60000.00000					
1.201887E+08	2.564026E+12	0.00004688	0.00098944	21.10811663	2989.26225
60000.00000					
1.210898E+08	2.516151E+12	0.00004813	0.00101015	20.99014807	3032.52723
60000.00000					
1.219313E+08	2.469494E+12	0.00004938	0.00103063	20.87358999	3074.55517
60000.00000					
1.224216E+08	2.418204E+12	0.00005063	0.00105300	20.79999876	3119.79811
60000.00000					
1.233071E+08	2.377005E+12	0.00005188	0.00107390	20.70163107	3161.13155
60000.00000					
1.239330E+08	2.332856E+12	0.00005313	0.00109295	20.57323408	3197.97373
60000.00000					

1.245570E+08	2.290704E+12	0.00005438	0.00111204	20.45123720	3234.23555
60000.00000					
1.251793E+08	2.250414E+12	0.00005563	0.00113115	20.33520842	3269.91409
60000.00000					
1.257998E+08	2.211865E+12	0.00005688	0.00115028	20.22476149	3305.00731
60000.00000					
1.264185E+08	2.174942E+12	0.00005813	0.00116945	20.11953878	3339.51258
60000.00000					
1.268612E+08	2.136609E+12	0.00005938	0.00118759	20.00155020	3371.48970
60000.00000					
1.272861E+08	2.099565E+12	0.00006063	0.00120566	19.88720369	3402.76056
60000.00000					
1.277096E+08	2.063993E+12	0.00006188	0.00122376	19.77786398	3433.50739
60000.00000					
1.281316E+08	2.029807E+12	0.00006313	0.00124187	19.67323923	3463.72842
60000.00000					
1.285521E+08	1.996926E+12	0.00006438	0.00126002	19.57305193	3493.42090
60000.00000					
1.289712E+08	1.965275E+12	0.00006563	0.00127818	19.47705603	3522.58326
60000.00000					
1.293888E+08	1.934786E+12	0.00006688	0.00129637	19.38501406	3551.21277
60000.00000					
1.298048E+08	1.905392E+12	0.00006813	0.00131459	19.29670858	3579.30699
60000.00000					
1.302194E+08	1.877037E+12	0.00006938	0.00133283	19.21194506	3606.86429
60000.00000					
1.312819E+08	1.858858E+12	0.00007063	0.00135600	19.20000029	3641.45351
60000.00000					
1.312819E+08	1.826530E+12	0.00007188	0.00137592	19.14324045	3670.21494
60000.00000					
1.314019E+08	1.796949E+12	0.00007313	0.00139243	19.04183435	3693.27834
60000.00000					
1.316637E+08	1.770269E+12	0.00007438	0.00140897	18.94411325	3715.90328
60000.00000					
1.321843E+08	1.719471E+12	0.00007688	0.00144210	18.75901937	3759.83169
60000.00000					
1.327005E+08	1.671818E+12	0.00007938	0.00147531	18.58664274	3801.98608
60000.00000					
1.332124E+08	1.627021E+12	0.00008188	0.00150861	18.42582750	3842.35210
60000.00000					
1.337197E+08	1.584826E+12	0.00008438	0.00154200	18.27555513	3880.91522
60000.00000					
1.342226E+08	1.545008E+12	0.00008688	0.00157547	18.13492727	3917.66094
60000.00000					
1.347209E+08	1.507367E+12	0.00008938	0.00160903	18.00314569	3952.57444
60000.00000					
1.352147E+08	1.471725E+12	0.00009188	0.00164268	17.87949800	3985.64053
60000.00000					
1.355427E+08	1.436214E+12	0.00009438	0.00167458	17.74387693	4015.09055

60000.00000
1.358577E+08 1.402402E+12 0.00009688 0.00170645 17.61500502 4042.78012
60000.00000
1.361825E+08 1.370389E+12 0.00009938 0.00174900 17.59999895 4077.58345
60000.00000
1.366152E+08 1.341009E+12 0.00010188 0.00178092 17.48138094 4101.21218
60000.00000
1.368943E+08 1.311562E+12 0.00010438 0.00181133 17.35410261 4122.04642
60000.00000
1.371700E+08 1.283462E+12 0.00010688 0.00184183 17.23349333 4141.35959
60000.00000
1.374424E+08 1.256616E+12 0.00010938 0.00187240 17.11910105 4159.13934
60000.00000
1.377114E+08 1.230940E+12 0.00011188 0.00190305 17.01051378 4175.37313
60000.00000
1.379769E+08 1.206355E+12 0.00011438 0.00193378 16.90736246 4190.04864
60000.00000
1.382389E+08 1.182793E+12 0.00011688 0.00196459 16.80930090 4203.15282
60000.00000
1.384974E+08 1.160188E+12 0.00011938 0.00199547 16.71602011 4214.67282
60000.00000
1.387524E+08 1.138481E+12 0.00012188 0.00202644 16.62723112 4224.59531
60000.00000
1.390037E+08 1.117618E+12 0.00012438 0.00205750 16.54267359 4232.90692
60000.00000
1.392069E+08 1.097197E+12 0.00012688 0.00208777 16.45536661 4239.42118
60000.00000
1.393525E+08 1.077121E+12 0.00012938 0.00211709 16.36396265 4244.23626
60000.00000
1.394952E+08 1.057784E+12 0.00013188 0.00214648 16.27658987 4247.60767
60000.00000
1.396349E+08 1.039143E+12 0.00013438 0.00217594 16.19302797 4249.52352
60000.00000
1.397688E+08 1.021142E+12 0.00013688 0.00220548 16.11306810 4247.98657
60000.00000
1.398902E+08 1.003696E+12 0.00013938 0.00223509 16.03653002 4237.68797
60000.00000
1.404586E+08 9.900163E+11 0.00014188 0.00227000 16.00000048 4225.41523
60000.00000
1.414465E+08 9.797158E+11 0.00014438 0.00231000 16.00000048 4234.29694
60000.00000
1.414465E+08 9.630398E+11 0.00014688 0.00234561 15.97012854 4240.76282
60000.00000
1.414465E+08 9.469219E+11 0.00014938 0.00237381 15.89158487 4244.49060
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1.414465E+08 9.313347E+11 0.00015188 0.00240207 15.81612825 4247.26835
60000.00000
1.414465E+08 9.162524E+11 0.00015438 0.00243042 15.74361849 4249.08627
60000.00000

1.414465E+08	9.016508E+11	0.00015688	0.00245885	15.67391539	4249.93424
60000.00000					
1.414465E+08	8.875072E+11	0.00015938	0.00248748	15.60772562	4244.62828
60000.00000					
1.414465E+08	8.738005E+11	0.00016188	0.00251625	15.54442835	4236.13546
60000.00000					
1.414465E+08	8.605108E+11	0.00016438	0.00254508	15.48340559	4227.62123
60000.00000					
1.414465E+08	8.476193E+11	0.00016688	0.00257397	15.42455721	4219.08548
60000.00000					
1.414465E+08	8.351083E+11	0.00016938	0.00260292	15.36779451	4223.47559
60000.00000					
1.414465E+08	8.229612E+11	0.00017188	0.00263193	15.31302881	4229.22932
60000.00000					
1.414514E+08	8.111908E+11	0.00017438	0.00266099	15.26017427	4234.29516
60000.00000					
1.416309E+08	7.895801E+11	0.00017938	0.00271931	15.15990686	4242.33758
60000.00000					
1.418077E+08	7.691267E+11	0.00018438	0.00277787	15.06642008	4247.54904
60000.00000					
1.419546E+08	7.495953E+11	0.00018938	0.00283597	14.97544241	4249.85769
60000.00000					
1.420159E+08	7.306285E+11	0.00019438	0.00289252	14.88112593	4240.88494
60000.00000					
1.420740E+08	7.125970E+11	0.00019938	0.00294939	14.79318666	4227.13389
60000.00000					
1.421310E+08	6.954424E+11	0.00020438	0.00300642	14.71029997	4213.32569
60000.00000					
1.421753E+08	6.790463E+11	0.00020938	0.00306464	14.63706636	4211.70716
60000.00000					
1.422068E+08	6.633554E+11	0.00021438	0.00312404	14.57280207	4222.86966
60000.00000					
1.422368E+08	6.483729E+11	0.00021938	0.00318365	14.51236296	4232.16536
60000.00000					
1.422653E+08	6.340514E+11	0.00022438	0.00324346	14.45551443	4239.55896
60000.00000					
1.422922E+08	6.203474E+11	0.00022938	0.00330347	14.40203905	4245.01367
60000.00000					
1.422922E+08	6.071133E+11	0.00023438	0.00337500	14.39999914	4249.23355
60000.00000					
1.422922E+08	5.944321E+11	0.00023938	0.00344700	14.39999914	4244.06198
60000.00000					
1.422922E+08	5.822698E+11	0.00024438	0.00351900	14.39999914	4227.65293
60000.00000					
1.422922E+08	5.705952E+11	0.00024938	0.00359100	14.39999914	4211.24389
60000.00000					
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60000.00000					
1.424749E+08	5.493010E+11	0.00025938	0.00373283	14.39163637	4200.66335

60000.00000
1.424827E+08 5.389416E+11 0.00026438 0.00379248 14.34508753 4210.48053
60000.00000
1.424898E+08 5.289645E+11 0.00026938 0.00385229 14.30084467 4219.26359
60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 142124.61856 in-kip

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

Pile-head boundary conditions are Shear and Moment (Pile-head Condition Type 1)
Specified shear force at pile head = 45870.000 lbs
Specified moment at pile head = 37500000.000 in-lbs
Specified axial load at pile head = 40700.000 lbs

Depth X in	Deflect. y in	Moment M lbs-in	Shear V lbs	Slope S Rad.	Total Stress lbs/in**2	Flx. Rig. EI lbs-in**2	Soil Res. Es*h p lbs/in	F/L
0.000	0.763201	3.75E+07	45870.	-0.003678	437.359	1.83E+13	0.000	0.000
28.800	0.658133	3.88E+07	40866.	-0.003618	452.305	1.83E+13	-597.239	3266.911
57.600	0.554823	3.96E+07	9224.144	-0.003556	461.423	1.83E+13	-1517.996	9849.600
86.400	0.453305	3.91E+07	-42588.	-0.003494	456.354	1.83E+13	-2023.555	16070.
115.200	0.353557	3.71E+07	-1.04E+05	-0.003434	432.227	1.83E+13	-2189.228	22291.
144.000	0.255482	3.32E+07	-1.57E+05	-0.003378	388.079	1.83E+13	-1351.214	19040.
172.800	0.158906	2.83E+07	-1.83E+05	-0.003330	330.914	1.84E+13	-557.622	12633.
201.600	0.063605	2.28E+07	-1.95E+05	-0.003290	267.993	1.84E+13	-259.834	14706.
230.400	-0.030670	1.71E+07	-1.97E+05	-0.003259	202.673	1.84E+13	142.956	16780.
259.200	-0.124174	1.16E+07	-1.86E+05	-0.003236	138.799	1.85E+13	650.316	18854.

```
 288.000 -0.217157  6.57E+06 -1.59E+05 -0.003222    81.218  1.85E+13  1262.362
20927.
 316.800 -0.309842  2.62E+06 -1.12E+05 -0.003215    35.773  1.85E+13  1979.618
23001.
 345.600 -0.402403  3.21E+05   -43581. -0.003213     9.315  1.85E+13  2802.786
25074.
```

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of total stress due to combined axial stress and bending may not be representative of actual conditions.

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 1:

```
Pile-head deflection             =     0.76320053 in
Computed slope at pile head      =    -0.00367805
Maximum bending moment           =      39617288. lbs-in
Maximum shear force              =  -197752.80532 lbs
Depth of maximum bending moment  =    64.80000000 in
Depth of maximum shear force     =      219.60000 in
Number of iterations             =              5
Number of zero deflection points =              1
```

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

```
Type 1 = Shear and Moment,          y = pile-head displacment in
Type 2 = Shear and Slope,           M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness,  V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment,     S = Pile-head Slope, radians
Type 5 = Deflection and Slope,      R = Rot. Stiffness of Pile-head in-lbs/rad
```

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs

1 V= 45870. M= 3.75E+07 40700.0000 0.7632005 3.9617E+07 -197753.

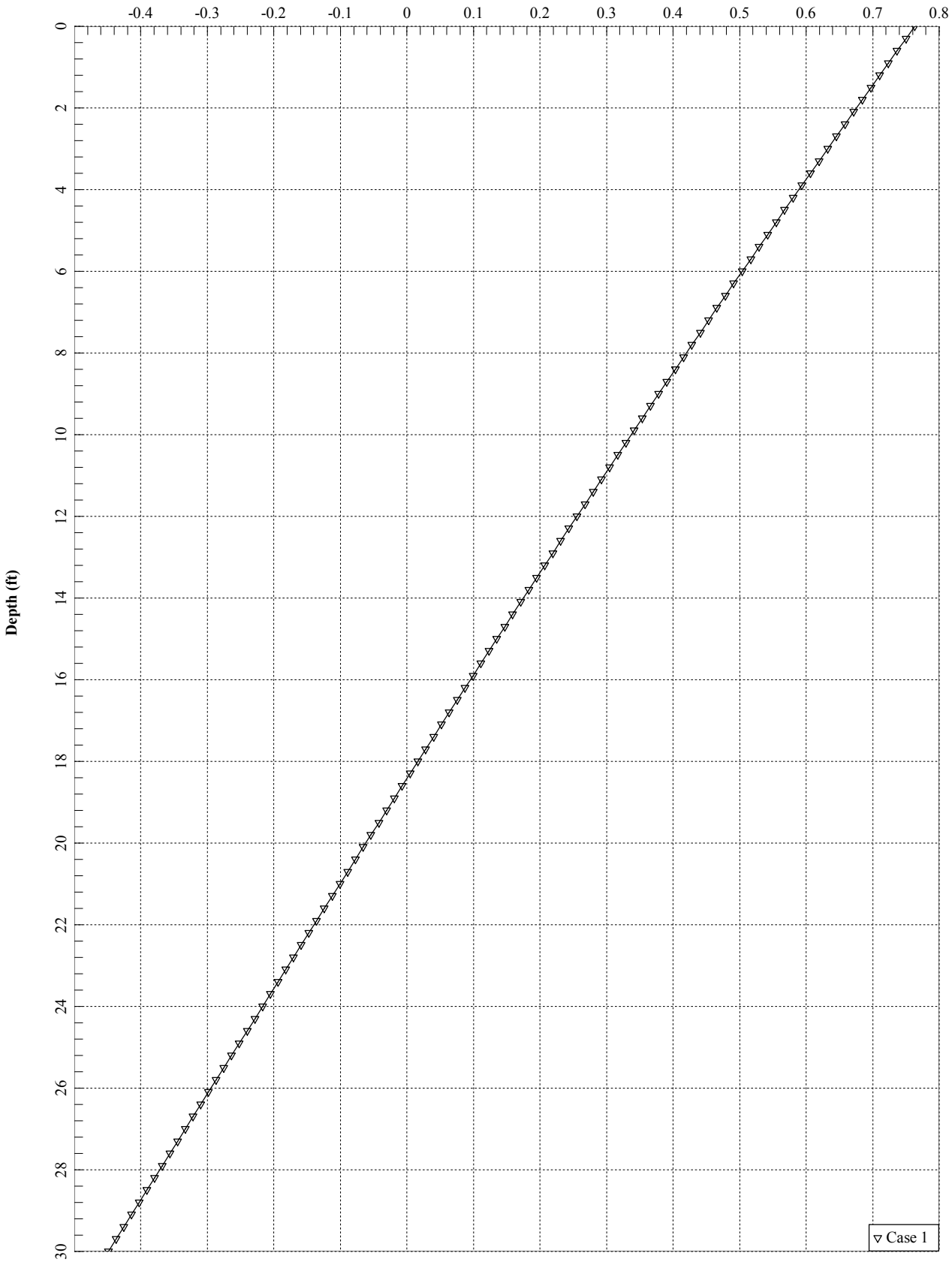
Computed Pile-head Stiffness Matrix Members
K22, K23, K32, K33 for Superstructure

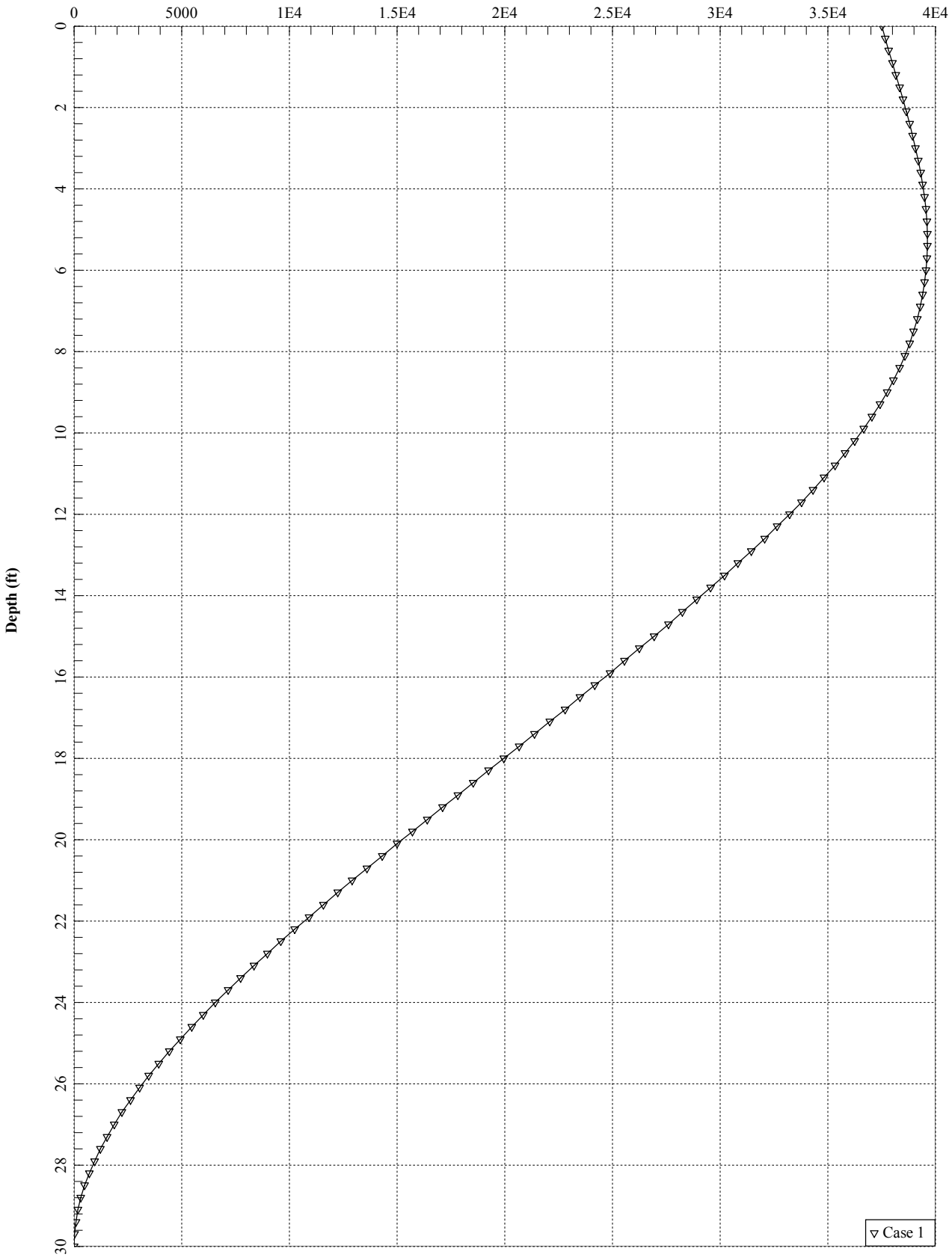
Top y in	Shear React. lbs	Mom. React. in-lbs	K22 lbs/in	K32 in-lbs/in
0.00361530	4587.00007	905931.35465	1268773.	2.505824E+08
0.01088315	13808.24590	2727125.	1268773.	2.505824E+08
0.01724938	21885.55195	4322391.	1268773.	2.505824E+08
0.02176629	27616.49180	5454250.	1268773.	2.505824E+08
0.02526989	32061.75410	6332188.	1268773.	2.505824E+08
0.02813253	35693.79785	7049516.	1268773.	2.505824E+08
0.03055286	38764.64710	7656008.	1268773.	2.505824E+08
0.03264944	41424.73770	8181375.	1268773.	2.505824E+08
0.03449876	43771.10391	8644782.	1268773.	2.505824E+08
0.03615303	45870.00000	9059313.	1268773.	2.505824E+08

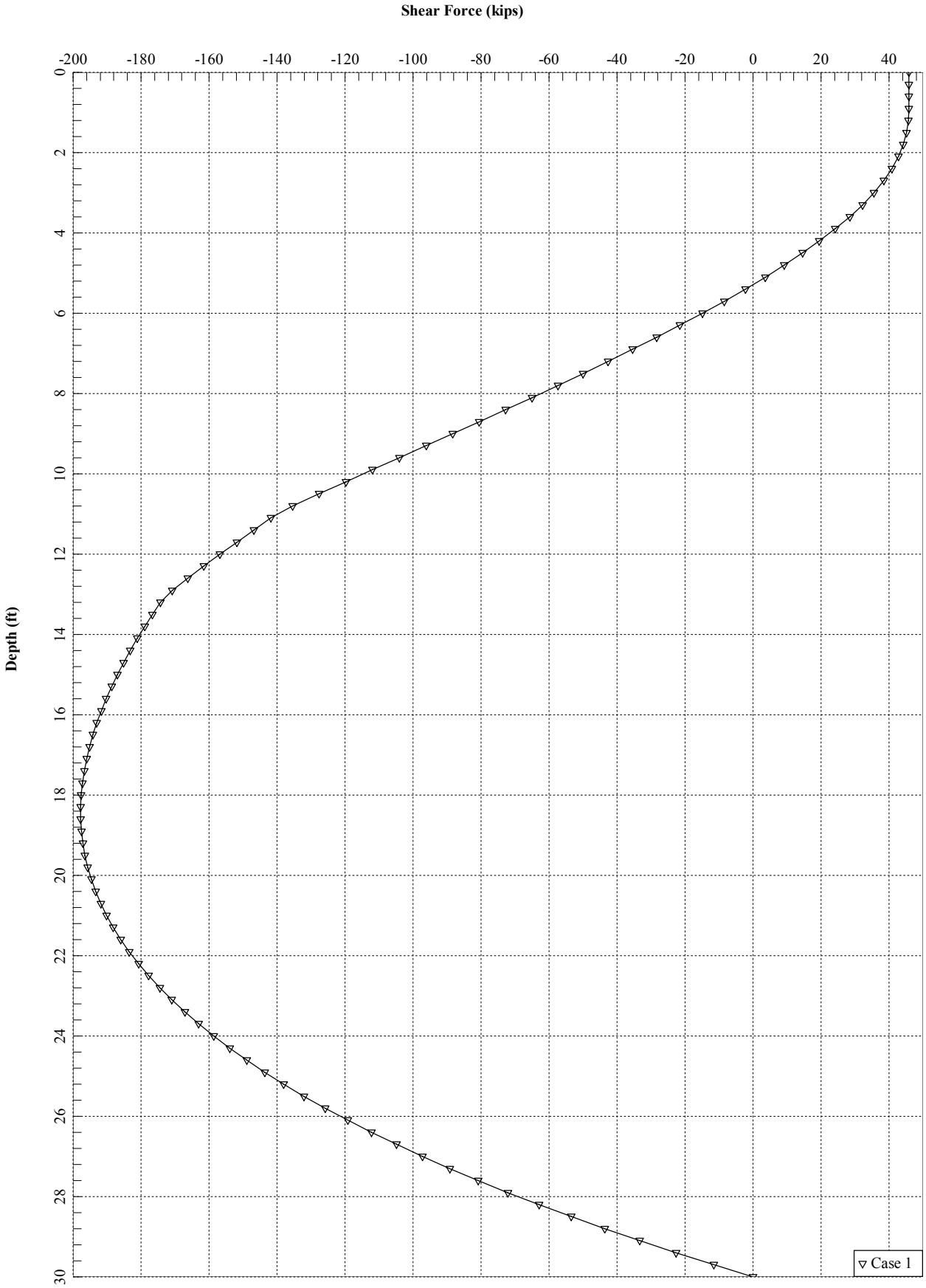
Top Rota. rad	Shear React. lbs	Mom. React. in-lbs	K23 lbs/rad	K33 in-lbs/rad
0.00006026	15101.19308	3750000.	2.505824E+08	6.222581E+10
0.00018141	45459.12019	11288625.	2.505824E+08	6.222581E+10
0.00028765	72052.00301	17892047.	2.504813E+08	6.219985E+10
0.00036310	90921.44279	22577250.	2.504019E+08	6.217880E+10
0.00042166	105558.33753	26211375.	2.503391E+08	6.216215E+10
0.00046955	117518.03668	29180672.	2.502804E+08	6.214664E+10
0.00051005	127630.17276	31691177.	2.502316E+08	6.213370E+10
0.00054514	136389.94658	33865875.	2.501914E+08	6.212299E+10
0.00057611	144116.78604	35784094.	2.501562E+08	6.211360E+10
0.00060382	151028.81862	37500000.	2.501228E+08	6.210474E+10

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 (in)
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
▽ Case 1


Bending Moment (in-kips)
0
5000
1E4
1.5E4
2E4
2.5E4
3E4
3.5E4
4E4
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
Case 1


Shear Force (kips)
-200
-180
-160
-140
-120
-100
-80
-60
-40
-20
0
20
40
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
Case 1

RAN Template:	A&L Template:	Power System Template:
67D94B Outdoor	67D94B_1DP+1OP	Custom

CT11734B_L600_5.1_draft

Section 1 - Site Information

Site ID: CT11734B
Status: Draft
Version: 5.1
Project Type: L600
Approved: Not Approved
Approved By: Not Approved
Last Modified: 5/15/2018 3:49:25 PM
Last Modified By: GSM1900\MLucey

Site Name: CT734/CL&P Stanchion
Site Class: Utility Lattice Tower
Site Type: Structure Non Building
Solution Type:
Plan Year:
Market: CONNECTICUT
Vendor: Ericsson
Landlord: CL&P

Latitude: 41.6083000000
Longitude: -72.8628000000
Address: 437 Hobart Street
City, State: Southington, CT
Region: NORTHEAST

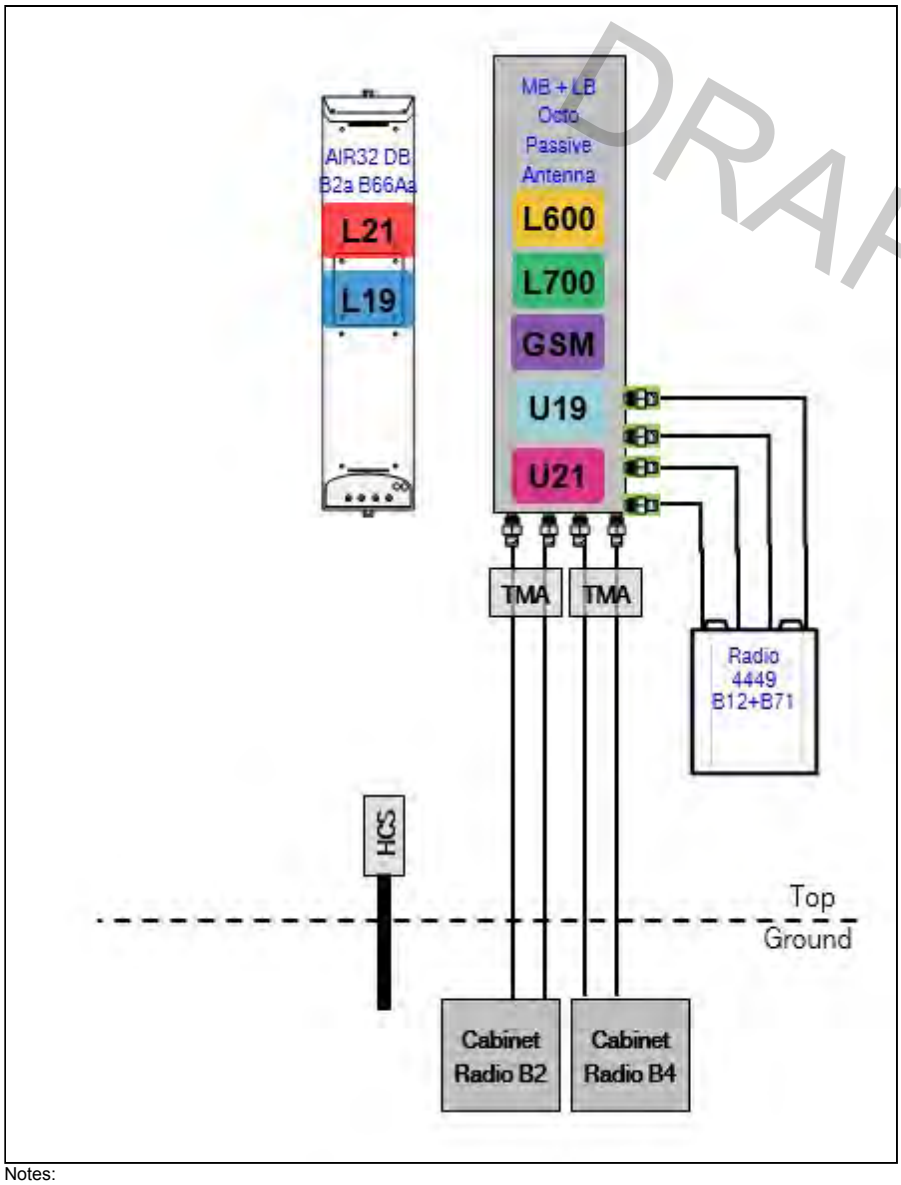
RAN Template: 67D94B Outdoor			AL Template: 67D94B_1DP+1OP	
Sector Count: 3	**Antenna Count:** 3	**Coax Line Count:** 24	**TMA Count:** 0	**RRU Count:** 0

Section 2 - Existing Template Images

----- This section is intentionally blank. -----

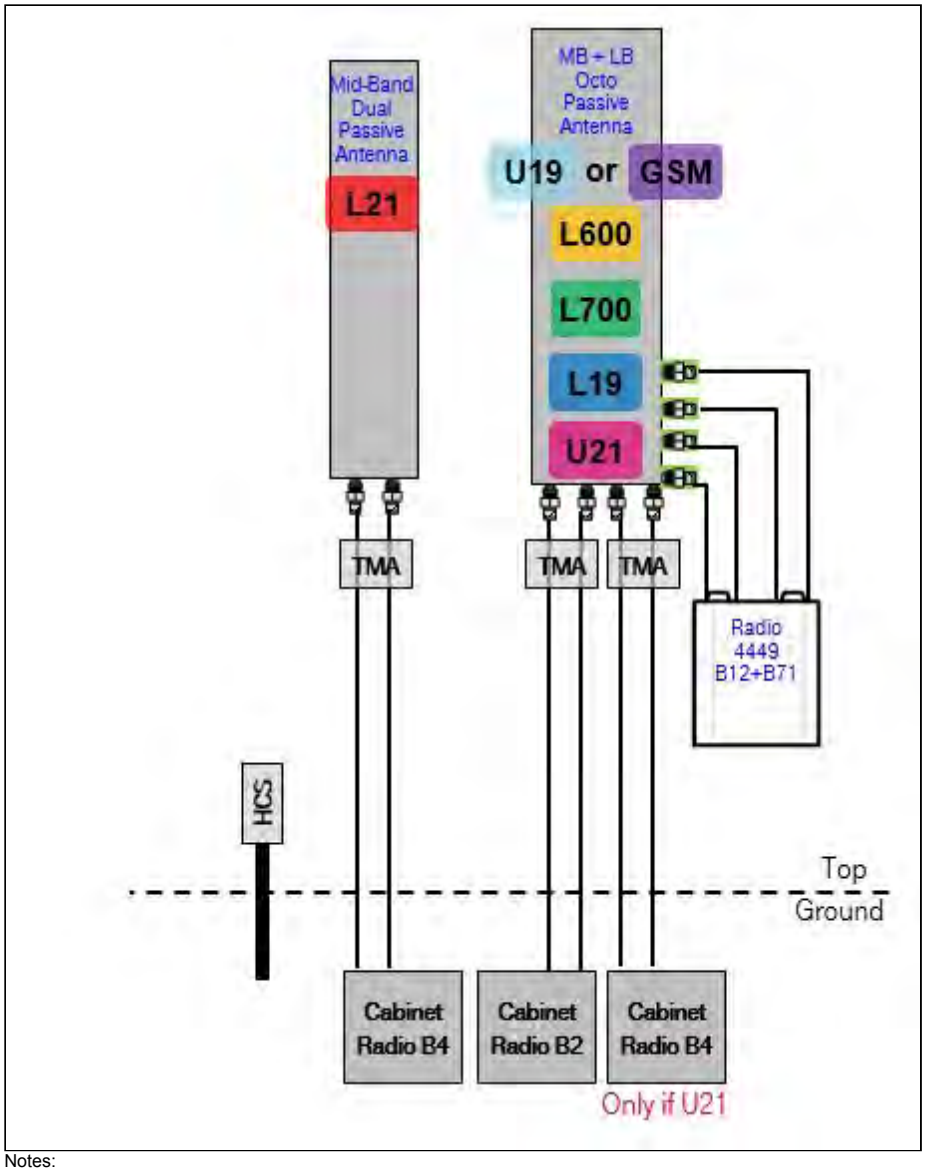
Section 3 - Proposed Template Images

67D94DB_1xAIR+1OP.JPG



Notes:

67D94B_1DP+1OP.JPG


Mid-Band
Dual
Passive
Antenna
L21
MB + LB
Octo
Passive
Antenna
U19 or GSM
L600
L700
L19
U21
TMA
TMA
TMA
Radio
4449
B12+B71
HCS
Top
Ground
Cabinet
Radio B4
Cabinet
Radio B2
Cabinet
Radio B4
Only if U21

Notes:

Section 4 - Siteplan Images

----- This section is intentionally blank. -----

RAN Template:	A&L Template:	Power System Template:
67D94B Outdoor	67D94B_1DP+1OP	Custom

CT11734B_L600_5.1_draft

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 794DB Outdoor (evolved from 4A)

Enclosure	1	2
Enclosure Type	RBS 6102	Ground Mount
Baseband	DUG20 (G1900); DUW30 (U2100); DUS41 (L2100, L1900, L700)	
Multiplexer	XMU (L2100, L1900, L700)	
Radio	RUS01 B2 (x3) (L1900, G1900); RUS01 B2 (x3) (L1900); RUS01 B4 (x3) (U2100); RUS01 B4 (x3) (L2100)	RRUS11 B12 (x3) (L700)

Proposed RAN Equipment

Template: 67D94B Outdoor

Enclosure	1
Enclosure Type	RBS 6102
Baseband	BB 5216 (L2100, L1900, L700, L600); DUW30 (U2100); DUG20 (G1900)
Multiplexer	XMU
Radio	RUS01 B2 (x3) (L1900, G1900); RUS01 B4 (x6) (L2100); RUS01 B4 (x3) (U2100)

RAN Scope of Work:

Swap 3 B2 radio's for 3 B4 radio's. L19 and G19 will share 1 radio per sector and fed from diplexed lines in SIMO mixed mode. L2100 will use 6 radio's on 6 lines in MIMO. U2100 will be on 3 radio's in SIMO.

RAN Template:	A&L Template:	Power System Template:
67D94B Outdoor	67D94B_1DP+1OP	Custom

CT11734B_L600_5.1_draft

Section 6 - A&L Equipment

Existing Template: 704A-V2_1HP
Proposed Template: 67D94B_1DP+1OP

Sector 1 (Existing) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	1		2
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		Andrew - LNX-6515DS-A1M (Dual)
Azimuth	30		30
M. Tilt	0		0
Height	100		100
Ports	P1	P2	P3
Active Tech.	L1900 G1900	U2100 L2100	L700
Dark Tech.			
Restricted Tech.			
Decomm. Tech.			
E. Tilt	4	4	2
Cables	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	Generic Twin Style 1B - AWS (AtAntenna)	
Diplexers / Combiners			
Radio			
Sector Equipment			

Unconnected Equipment:

Scope of Work:

Ground mounted TMAs

RAN Template:	A&L Template:	Power System Template:
67D94B Outdoor	67D94B_1DP+1OP	Custom

CT11734B_L600_5.1_draft

Sector 1 (Proposed) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1			
Antenna Model	RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	30			
M. Tilt				
Height	100			
Ports	P1	P2	P3	P4
Active Tech.	U2100 L1900 G1900	L2100	L700 L600	L700 L600
Dark Tech.				
Restricted Tech.				
Decomm. Tech.				
E. Tilt	2	2	2	2
Cables	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**
TMAs		Generic Twin Style 1B - AWS (AtCabinet)		
Diplexers / Combiners	Generic AWS/PCS Diplexer (AtCabinet) **(x2)**			
Radio			Radio 4449 B71+B12 (At Cabinet)	
Sector Equipment				

Unconnected Equipment:

Scope of Work:

Add 6 new coax for L6/L7. Swap PCS TMA for AWS/PCS diplexer. Swap L7 RRU for 4449 with 4 coax per RRU.

RAN Template:	A&L Template:	Power System Template:
67D94B Outdoor	67D94B_1DP+1OP	Custom

CT11734B_L600_5.1_draft

Sector 2 (Existing) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	**1**		**2**
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		Andrew - LNX-6515DS-A1M (Dual)
Azimuth	150		150
M. Tilt	0		0
Height	100		100
Ports	**P1**	**P2**	**P3**
Active Tech.	L1900 G1900	U2100 L2100	L700
Dark Tech.			
Restricted Tech.			
Decomm. Tech.			
E. Tilt	4	4	2
Cables	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	Generic Twin Style 1B - AWS (AtAntenna)	
Diplexers / Combiners			
Radio			
Sector Equipment			

Unconnected Equipment:

Scope of Work:

Ground mounted TMAs

RAN Template:	A&L Template:	Power System Template:
67D94B Outdoor	67D94B_1DP+1OP	Custom

CT11734B_L600_5.1_draft

Sector 2 (Proposed) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1			
Antenna Model	RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	150			
M. Tilt				
Height	100			
Ports	P1	P2	P3	P4
Active Tech.	U2100, L1900, G1900	L2100	L700, L600	L700, L600
Dark Tech.				
Restricted Tech.				
Decomm. Tech.				
E. Tilt	2	2	2	2
Cables	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**
TMAs		Generic Twin Style 1B - AWS (AtCabinet)		
Diplexers / Combiners	Generic AWS/PCS Diplexer (AtCabinet) **(x2)**			
Radio			Radio 4449 B71+B12 (At Cabinet)	
Sector Equipment				

Unconnected Equipment:

Scope of Work:

Add 6 new coax for L6/L7. Swap PCS TMA for AWS/PCS diplexer. Swap L7 RRU for 4449 with 4 coax per RRU.

RAN Template:	A&L Template:	Power System Template:
67D94B Outdoor	67D94B_1DP+1OP	Custom

CT11734B_L600_5.1_draft

Sector 3 (Existing) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	**1**		**2**
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		Andrew - LNX-6515DS-A1M (Dual)
Azimuth	270		270
M. Tilt	0		0
Height	100		100
Ports	**P1**	**P2**	**P3**
Active Tech.	L1900 G1900	U2100 L2100	L700
Dark Tech.			
Restricted Tech.			
Decomm. Tech.			
E. Tilt	4	4	2
Cables	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	Generic Twin Style 1B - AWS (AtAntenna)	
Diplexers / Combiners			
Radio			
Sector Equipment			

Unconnected Equipment:

Scope of Work:

Ground mounted TMAs

RAN Template:	A&L Template:	Power System Template:
67D94B Outdoor	67D94B_1DP+1OP	Custom

CT11734B_L600_5.1_draft

Sector 3 (Proposed) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1			
Antenna Model	RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	270			
M. Tilt				
Height	100			
Ports	P1	P2	P3	P4
Active Tech.	U2100 L1900 G1900	L2100	L700 L600	L700 L600
Dark Tech.				
Restricted Tech.				
Decomm. Tech.				
E. Tilt	2	2	2	2
Cables	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**	7/8" Coax - 130 ft. **(x2)**
TMAs		Generic Twin Style 1B - AWS (AtCabinet)		
Diplexers / Combiners	Generic AWS/PCS Diplexer (AtCabinet) **(x2)**			
Radio			Radio 4449 B71+B12 (At Cabinet)	
Sector Equipment				

Unconnected Equipment:

Scope of Work:

Add 6 new coax for L6/L7. Swap PCS TMA for AWS/PCS diplexer. Swap L7 RRU for 4449 with 4 coax per RRU.

RAN Template:	A&L Template:	Power System Template:
67D94B Outdoor	67D94B_1DP+1OP	Custom

CT11734B_L600_5.1_draft

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

----- This section is intentionally blank. -----

Proposed Power Systems Equipment

RADIO FREQUENCY SYSTEMS
The Clear Choice®

Dual Slant Polarized Quad Band (8 Port) Antenna, 617-746/617-746/1695-2200/1695-2200MHz, 65deg, 15/15/18/18dBi, 2.4m (8ft), VET, RET, 0-12°/0-12°/2-12°/2-12°

FEATURES / BENEFITS

This antenna provides a 8 Port multi-band flexible platform for advanced use for flexible use in deployment scenarios for encompassing 600MHz, 700MHz, AWS & PCS applications.

- **24 Inch Width For Easier Zoning**
- **Field Replaceable (Integrated) AISG RET platform for reduced environmental exposure and long lasting quality**
- **Superior elevation pattern performance across the entire electrical down tilt range**
- **Includes three AISG RET motors - Includes 0.5m AISG jumper for optional diasy chain of two high band RET motors for one single AISG point of high band tilt control.**
- **Low band arrays driven by a single RET motor**

Technical Features

LOW BAND LEFT ARRAY (617-746 MHZ) [R1]

Frequency Band	MHz	617-698	698-746
Gain	dBi	15.1	15.5
Horizontal Beamwidth @3dB	Deg	65	62
Vertical Beamwidth @3dB	Deg	11.4	10.4
Electrical Downtilt Range	Deg	0-12	0-12
Upper Side Lobe Suppression 0 to +20	dB	19	20
Front-to-Back, at +/-30°, Copolar	dB	25	24
Cross Polar Discrimination (XPD) @ Boresight	dB	19	19
Cross Polar Discrimination (XPD) @ +/-60	dB	5	3
3rd Order PIM 2 x 43dBm	dBc		-153
VSWR	-	1.5:1	1.5:1
Cross Polar Isolation	dB	25	25
Maximum Effective Power per Port	Watt	250	250

LOW BAND RIGHT ARRAY (617-746 MHZ) [R2]

Frequency Band	MHz	617-698	698-746
Gain	dBi	14.8	15.1
Horizontal Beamwidth @3dB	Deg	65	62
Vertical Beamwidth @3dB	Deg	11.4	10.3
Electrical Downtilt Range	Deg	0-12	0-12
Upper Side Lobe Suppression 0 to +20	dB	19	20
Front-to-Back, at +/-30°, Copolar	dB	25	23
Cross Polar Discrimination (XPD) @ Boresight	dB	19	19
Cross Polar Discrimination (XPD) @ +/-60	dB	5	3
3rd Order PIM 2 x 43dBm	dBc		-153
VSWR	-	1.5:1	1.5:1
Cross Polar Isolation	dB	25	25
Maximum Effective Power per Port	Watt	250	250

RADIO FREQUENCY SYSTEMS
The Clear Choice®

Dual Slant Polarized Quad Band (8 Port) Antenna, 617-746/617-746/1695-2200/1695-2200MHz, 65deg, 15/15/18/18dBi, 2.4m (8ft), VET, RET, 0-12°/0-12°/2-12°/2-12°

ELECTRICAL SPECIFICATIONS

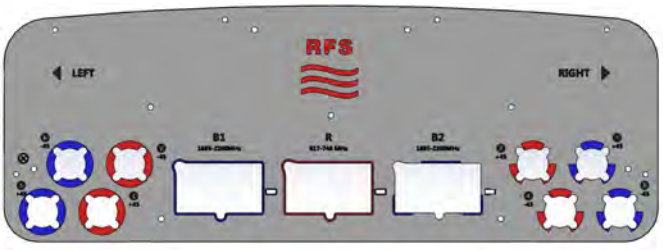
Impedance	Ohm	50.0
Polarization	Deg	±45°

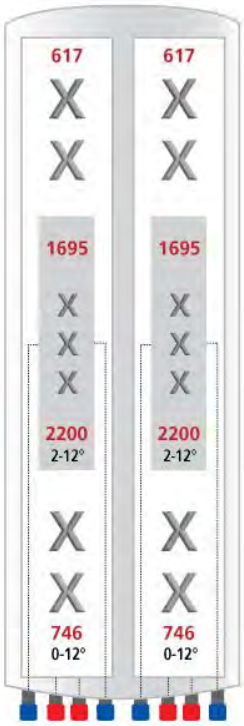
MECHANICAL SPECIFICATIONS

Dimensions - H x W x D	mm (in)	2436 x 609 x 222 (95.9 x 24 x 8.7)
Weight (Antenna Only)	kg (lb)	58 (128)
Weight (Mounting Hardware only)	kg (lb)	11.5 (25.3)
Shipping Weight	kg (lb)	80 (176)
Connector type		8 x 4.3-10 female at bottom + 6 AISG connectors (3 male, 3 female)
Adjustment mechanism		Integrated RET solution AISG compliant (Field Replaceable) + Manual Override + External Tilt Indicator
Mounting Hardware Material		Galvanized steel
Radome Material / Color		Fiber Glass / Light Grey RAL7035

TESTING AND ENVIRONMENTAL

Temperature Range	°C (°F)	-40 to 60 (-40 to 140)
Lightning protection		IEC 61000-4-5
Survival/Rated Wind Velocity	km/h	241 (150)
Environmental		ETSI 300-019-2-4 Class 4.1E





ORDERING INFORMATION

Order No.	Configuration	Mounting Hardware	Mounting pipe Diameter	Shipping Weight
APXVAARR24_43-U-NA20	Field Replace RET included (3)	APM40-5E Beam tilt kit (included)	60-120mm	80 Kg

Exhibit E

CENTEK engineering

Centered on Solutions℠

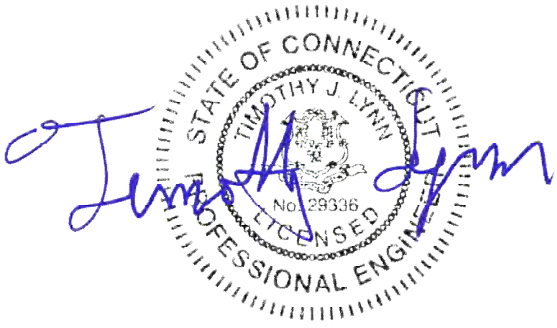
Structural Analysis Report

Antenna Mount Analysis

T-Mobile Site #: CT11734B

437 Hobart Street
Southington, CT

Centek Project No. 18098.02



Date: August 6, 2018

Max Stress Ratio = 97.3%

Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

August 6, 2018

Mr. Sheldon Freincle
Northeast Site Solutions
420 Main Street
Sturbridge, MA 01566

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11734B
437 Hobart Street
Southington, CT 06489

Centek Project No. 18098.02

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting of three (3) 5-ft T-Arms to support the equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2012 International Building Code as modified by the 2016 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  T-Arms: Three (3) RFS APXVAARR24-43-NA20 panel antennas mounted on three (3) T-Arms with a RAD center elevation of 100-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2012 International Building Code as modified by the 2016 Connecticut State Building Code considering a nominal design wind speed of 97 mph for Southington as required in Appendix N of the 2016 Connecticut State Building Code.

Based on our review of the installation, it is our opinion that the subject antenna mount has sufficient capacity to support the aforementioned antenna configuration. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Section 2 - Calculations

CENTEK engineering
Centered on Solutions
63-2 North Branford Road
Branford, CT 06405
www.centekeng.com
P: (203) 488-0580
F: (203) 488-8587

Subject: TIA-222-G Loads

Location: Southington, CT

Rev. 0: 8/6/18

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 18098.02

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-G

Wind Speeds

Basic Wind Speed: $V := 97$ mph (User Input - 2016 CSBC Appendix N)

Basic Wind Speed with Ice: $V_i := 50$ mph (User Input per Annex B of TIA-222-G)

Input

Structure Type = $Structure\_Type := Pole$ (User Input)

Structure Category = $SC := II$ (User Input)

Exposure Category = $Exp := C$ (User Input)

Structure Height = $h := 105$ ft (User Input)

Height to Center of Antennas = $z_{AT\&T} := 100$ ft (User Input)

Radial Ice Thickness = $t_i := 1.00$ in (User Input per Annex B of TIA-222-G)

Radial Ice Density = $Id := 56.00$ pcf (User Input)

Topograpic Factor = $K_{zt} := 1.0$ (User Input)

$K_a := 1.0$ (User Input)

Gust Response Factor = $G_H = 1.1$ (User Input)

Output

Wind Direction Probability Factor =

$$K_d := \begin{cases} 0.95 & \text{if } Structure\_Type = Pole \\ 0.85 & \text{if } Structure\_Type = Lattice \end{cases} = 0.95$$

(Per Table 2-2 of TIA-222-G)

Importance Factors =

$$I_{Wind} := \begin{cases} 0.87 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \end{cases} = 1$$

(Per Table 2-3 of TIA-222-G)

$$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.00 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \end{cases} = 1$$

$$K_{iz} := \left(\frac{z_{AT\&T}}{33}\right)^{0.1} = 1.117$$

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.234$$

Velocity Pressure Coefficient Antennas =

$$Kz_{AT\&T} := 2.01\left(\left(\frac{z_{AT\&T}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.266$$

Velocity Pressure w/o Ice Antennas =

$$qz_{AT\&T} := 0.00256 \cdot K_d \cdot Kz_{AT\&T} \cdot V^2 \cdot I_{Wind} = 28.961$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.AT\&T} := 0.00256 \cdot K_d \cdot Kz_{AT\&T} \cdot V_i^2 \cdot I_{Wind} = 7.695$$

CENTEK engineering
Centered on Solutions
63-2 North Branford Road
Branford, CT 06405
www.centekeng.com
P: (203) 488-0580
F: (203) 488-8587

Subject:	TIA-222-G Loads
Location:	Southington, CT
Rev. 0: 8/6/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 18098.02

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPXVAARR24-43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 153$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 645$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 234$	lbs

Wind Load (with ice)

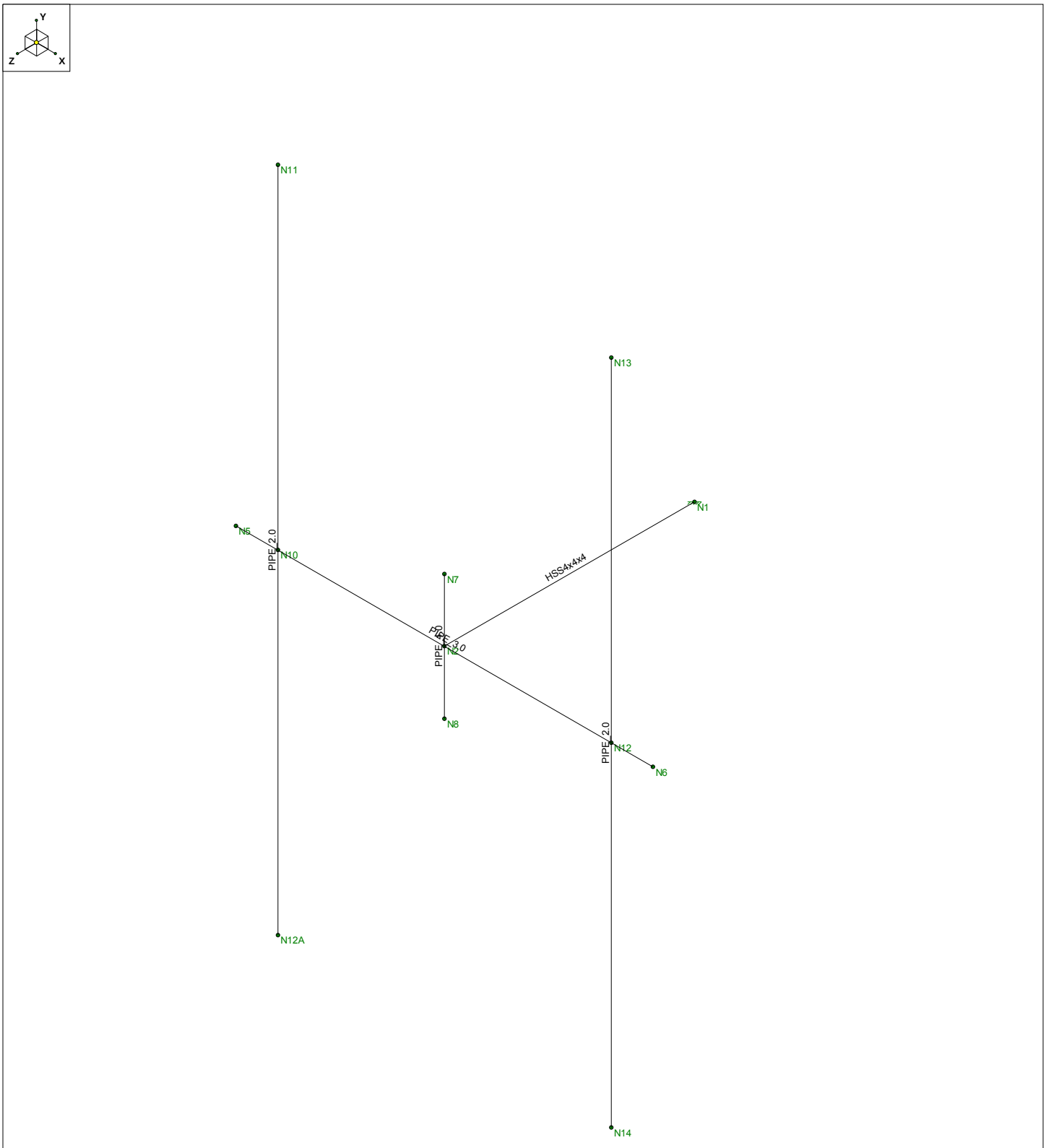
Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 19.8$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 213$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 9.2$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.AT\&T} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 98$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 153$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 2 \times 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 571$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 571$	lbs



Envelope Only Solution

Centek		
TJL	CT11734B - Mount	Aug 6, 2018 at 9:40 AM
18058.02	Member Framing	Mount.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
	AISC 14th(360-10): ASD

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Outrigger	HSS4x4x4	Beam	Tube	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
2	Horz	PIPE_3.0	Beam	Pipe	A53 Grade B	Typical	2.07	2.85	2.85	5.69
3	Antenna Mast	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Support	LL2.5x2.5x3x3	Beam	Tube	A36 Gr.36	Typical	1.8	2.46	1.07	.023
5	Vert	PIPE_4.0	Beam	Pipe	A53 Grade B	Typical	2.96	6.82	6.82	13.6

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Outrigger	3			Lbyy						Lateral
2	M2	Horz	5			Lbyy						Lateral
3	M3	Vert	1.5			Lbyy						Lateral
4	M6	Antenna Mast	8			Lbyy						Lateral
5	M5	Antenna Mast	8			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N2			Outrigger	Beam	Tube	A500 Gr...	Typical
2	M2	N5	N6			Horz	Beam	Pipe	A53 Gra...	Typical
3	M3	N7	N8			Vert	Beam	Pipe	A53 Gra...	Typical
4	M6	N14	N13			Antenna Mast	Beam	Pipe	A53 Gra...	Typical
5	M5	N12A	N11			Antenna Mast	Beam	Pipe	A53 Gra...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	0	0	
2	N2	0	0	3	0	
3	N5	-2.5	0	3	0	
4	N6	2.5	0	3	0	
5	N7	0	.75	3	0	
6	N8	0	-.75	3	0	
7	N12	2	0	3	0	
8	N13	2	4	3	0	
9	N14	2	-4	3	0	
10	N10	-2	0	3	0	
11	N11	-2	4	3	0	
12	N12A	-2	-4	3	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6	Y	-.077	.5
2	M6	Y	-.077	7.5

Member Point Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6	Y	-.286	.5
2	M6	Y	-.286	7.5

Member Point Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6	X	.049	.5
2	M6	X	.049	7.5

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6	X	.117	.5
2	M6	X	.117	7.5

Member Point Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6	Z	.107	.5
2	M6	Z	.107	7.5

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6	Z	.323	.5
2	M6	Z	.323	7.5

Member Distributed Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M5	X	.003	.003	0	0
2	M3	X	.003	.003	0	0
3	M1	X	.003	.003	0	0
4	M6	X	.003	.003	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M5	X	.01	.01	0	0
2	M3	X	.01	.01	0	0
3	M1	X	.01	.01	0	0
4	M6	X	.01	.01	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M5	Z	.003	.003	0	0
2	M3	Z	.003	.003	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
3	M2	Z	.003	.003	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M5	Z	.01	.01	0	0
2	M3	Z	.01	.01	0	0
3	M2	Z	.01	.01	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Self Weight	DL		-1						
2	Equipment Weight	None					2			
3	Ice Weight	None					2			
4	Wind w/ Ice X	None					2	4		
5	Wind X	None					2	4		
6	Wind w/ Ice Z	None					2	3		
7	Wind Z	None					2	3		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.2D + 1.6W (X-d..	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-d..	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1....	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6W (Z-d..	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-d..	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1....	Yes	Y		1	1.2	2	1.2	3	1	6	1												

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	0	4	.925	6	0	1	-.748	2	1.803	4	1.516	3
2		min	-.702	1	.265	2	-1.266	4	-2.719	6	-2.033	1	.277	5
3	Totals:	max	0	4	.925	6	0	1						
4		min	-.702	1	.265	2	-1.266	4						

Envelope Joint Displacements

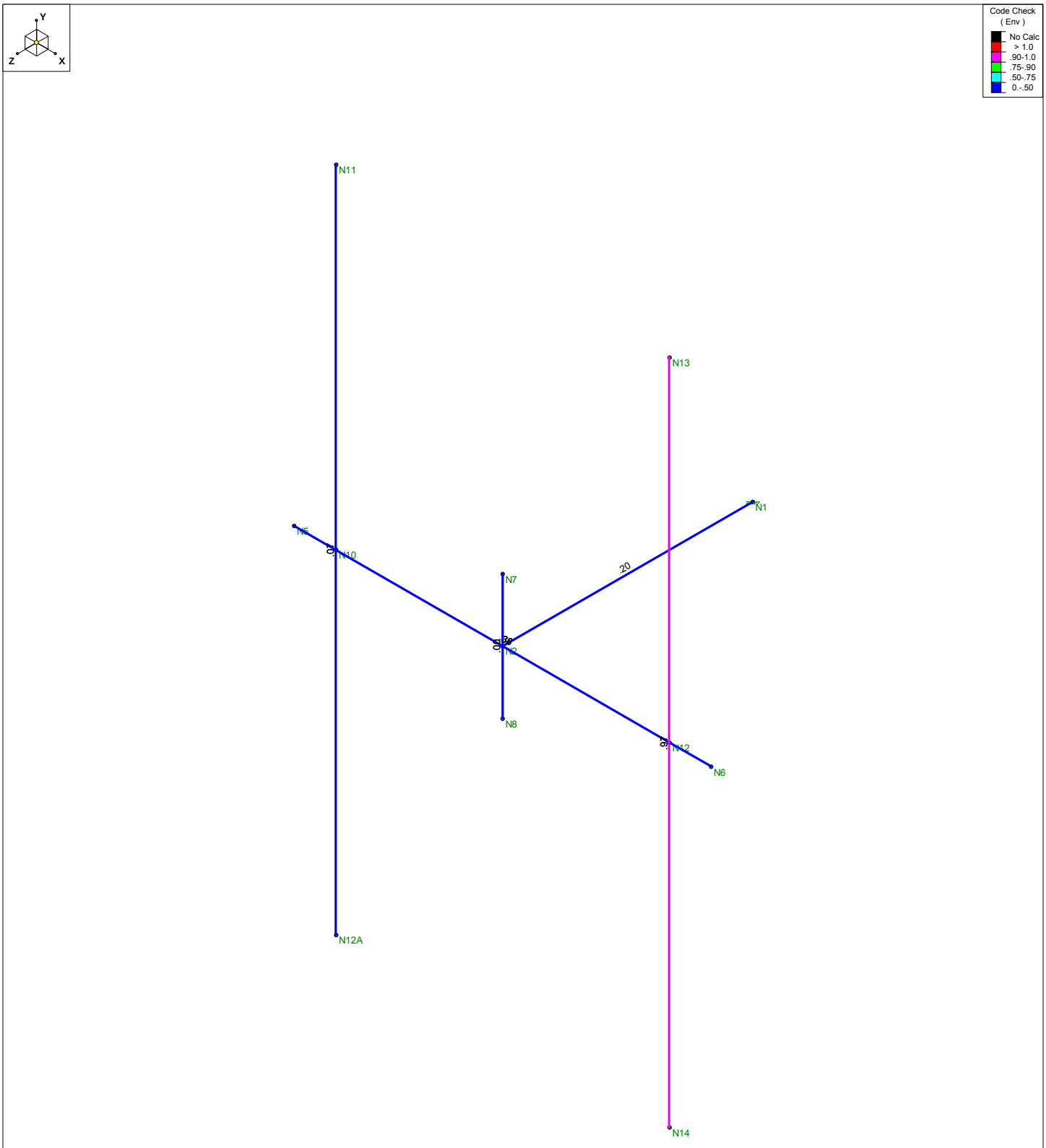
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	1	0	2	0	4	0	6	0	1	0	5
2		min	0	4	0	6	0	1	0	2	0	4	0	3
3	N2	max	.059	1	-.022	2	0	4	3.23e-03	6	2.396e-03	1	-8.388e-04	5
4		min	-.078	4	-.079	6	0	1	8.744e-04	2	-4.314e-03	4	-4.587e-03	3
5	N5	max	.059	1	.054	3	.072	1	3.23e-03	6	2.398e-03	1	-6.94e-04	5
6		min	-.078	4	0	5	-.114	4	8.744e-04	2	-3.666e-03	4	-4.395e-03	3
7	N6	max	.059	1	-.064	5	.233	4	3.263e-03	6	2.391e-03	1	-1.587e-03	5
8		min	-.078	4	-.295	3	-.072	1	8.744e-04	2	-8.907e-03	4	-8.09e-03	3
9	N7	max	.069	1	-.022	2	.029	6	3.23e-03	6	2.396e-03	1	-8.388e-04	5

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
10		min	-.07	5	-.079	6	.008	2	8.744e-04	2	-4.314e-03	4	-4.587e-03	3
11	N8	max	.051	2	-.022	2	-.007	5	3.23e-03	6	2.396e-03	1	-8.388e-04	5
12		min	-.088	4	-.079	6	-.029	6	8.744e-04	2	-4.314e-03	4	-4.587e-03	3
13	N12	max	.059	1	-.054	5	.18	4	3.263e-03	6	2.391e-03	1	-1.587e-03	5
14		min	-.078	4	-.247	3	-.057	1	8.744e-04	2	-8.906e-03	4	-8.089e-03	3
15	N13	max	.612	1	-.054	5	1.311	4	3.267e-02	4	2.391e-03	1	-1.592e-03	5
16		min	-.001	5	-.247	3	-.015	2	8.773e-04	2	-8.906e-03	4	-1.523e-02	1
17	N14	max	.43	2	-.054	5	1.203	5	3.165e-03	3	2.391e-03	1	1.141e-02	2
18		min	-.4	6	-.247	3	-.166	3	-3.034e-02	5	-8.906e-03	4	-7.945e-03	6
19	N10	max	.059	1	.028	3	.058	1	3.23e-03	6	2.398e-03	1	-6.942e-04	5
20		min	-.078	4	-.005	4	-.092	4	8.744e-04	2	-3.667e-03	4	-4.395e-03	3
21	N11	max	.236	3	.028	3	.168	3	3.549e-03	6	2.398e-03	1	-6.946e-04	5
22		min	-.044	5	-.006	4	.012	5	8.749e-04	2	-3.667e-03	4	-4.715e-03	3
23	N12A	max	.087	2	.028	3	.016	2	3.212e-03	3	2.398e-03	1	9.884e-04	2
24		min	-.227	6	-.006	4	-.163	6	-7.998e-04	5	-3.667e-03	4	-4.385e-03	6

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

	Member	Shape	Code Check	Loc...	LC	Shea...	Loc.....	L...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn
1	M1	HSS4x4x4	.196	0	3	.135	0	y 3	134.361	139.518	16.181	16.181	1...	H1-1b
2	M2	PIPE_3.0	.377	2.5	4	.058	2.5	4	57.037	65.205	5.749	5.749	1...	H1-1b
3	M3	PIPE_4.0	.000	.75	4	.000	.75	4	92.571	93.24	10.631	10.631	1	H1-1b
4	M6	PIPE_2.0	.973	4	4	.054	4	4	14.916	32.13	1.872	1.872	1...	H1-1b
5	M5	PIPE_2.0	.069	4	4	.007	4	4	14.916	32.13	1.872	1.872	1...	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CT11734B - Mount	Aug 6, 2018 at 9:39 AM
18058.02	Unity Check	Mount.r3d

Exhibit F

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11734B

CT734/CL&P Stanchion
437 Hobart Street
Southington, CT 06489

August 10, 2018

EBI Project Number: 6218005476

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	6.48 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

August 10, 2018

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11734B – CT734/CL&P Stanchion**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **437 Hobart Street, Southington, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **437 Hobart Street, Southington, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 1 GSM channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.

2) 1 UMTS channels (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

6) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

8) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antennas used in this modeling are the **RFS APXVAARR24_43-U-NA20** for 1900 MHz (PCS), 2100 MHz (AWS), 600 MHz and 700 MHz channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerline of the proposed antennas is **100 feet** above ground level (AGL).

11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

12) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	15.65 / 16.35 / 12.95 / 13.35 dBd	Gain:	15.65 / 16.35 / 12.95 / 13.35 dBd	Gain:	15.65 / 16.35 / 12.95 / 13.35 dBd
Height (AGL):	100 feet	Height (AGL):	100 feet	Height (AGL):	100 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS) / 600 MHz / 700 MHz
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	375	Total TX Power(W):	375	Total TX Power(W):	375
ERP (W):	12,579.57	ERP (W):	12,579.57	ERP (W):	12,579.57
Antenna A1 MPE%	**6.48**	Antenna B1 MPE%	**6.48**	Antenna C1 MPE%	**6.48**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**6.48 %**
No Additional Carriers on This Facility	**NA**
Site Total MPE %:	**6.48 %**

T-Mobile Sector A Total:	6.48 %
T-Mobile Sector B Total:	6.48 %
T-Mobile Sector C Total:	6.48 %
Site Total:	6.48 %

T-Mobile Max Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile PCS - 1900 MHz GSM	1	550.92	100	2.24	PCS - 1900 MHz	1000.00	0.22%
T-Mobile AWS - 2100 MHz UMTS	1	1,726.08	100	7.02	AWS - 2100 MHz	1000.00	0.70%
T-Mobile PCS - 1900 MHz LTE	2	1,726.08	100	14.05	PCS - 1900 MHz	1000.00	1.41%
T-Mobile AWS - 2100 MHz LTE	2	2,203.69	100	17.93	AWS - 2100 MHz	1000.00	1.79%
T-Mobile 600 MHz LTE	2	788.97	100	6.42	600 MHz	400.00	1.61%
T-Mobile 700 MHz LTE	2	432.54	100	3.52	700 MHz	467.00	0.75%
						Total:	**6.48%**

Summary

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

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	6.48 %
Sector B:	6.48 %
Sector C:	6.48 %
T-Mobile Maximum MPE % (Per Sector):	6.48 %
Site Total:	6.48 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **6.48%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Exhibit G

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

9405 5036 9930 0330 2735 31 0067 0000 0010 6037

usps.com
$6.70
US POSTAGE
Flat Rate Env

P

11/26/2018 Mailed from 06002 062S0000001310

PRIORITY MAIL 1-DAY™

DEBORAH CHASE
T-MOBILE USA- NSS
35 GRIFFIN RD S
BLOOMFIELD CT 06002-1351

Expected Delivery Date: 11/27/18
Ref#: 734B-L7ZAP

0024

Carrier -- Leave if No Response

C015

SHIP TO: CHRIS GELINAS
EVERSOURCE
107 SELDEN ST
BERLIN CT 06037-1616

USPS TRACKING #

9405 5036 9930 0330 2735 31

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

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2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0330 2735 31

Trans. #:	449497392
Print Date:	11/26/2018
Ship Date:	11/26/2018
Expected Delivery Date:	11/27/2018

Priority Mail® Postage:	**$6.70**
Total	**$6.70**

From: DEBORAH CHASE
T-MOBILE USA- NSS
35 GRIFFIN RD S
BLOOMFIELD CT 06002-1351

Ref#: 734B-L7ZAP

To: CHRIS GELINAS
EVERSOURCE
107 SELDEN ST
BERLIN CT 06037-1616

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

UNITED STATES POSTAL SERVICE®

Thank you for shipping with the United States Postal Service!
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UNITED STATES POSTAL SERVICE®

Click-N-Ship®

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usps.com
$6.70
US POSTAGE
Flat Rate Env

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11/26/2018 Mailed from 06002 062S0000001311

PRIORITY MAIL 1-DAY™

DEBORAH CHASE
T-MOBILE USA- NSS
35 GRIFFIN RD S
BLOOMFIELD CT 06002-1351

Expected Delivery Date: 11/27/18
Ref#: 734B-L7ZAP

0024

Carrier -- Leave if No Response

C019

SHIP TO: MARK J SCIOTA
SOUTHINGTON TOWN MANAGER
75 MAIN ST
SOUTHINGTON CT 06489-2504

USPS TRACKING #

9405 5036 9930 0330 2735 55

Electronic Rate Approved #038555749

Cut on dotted line.

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2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0330 2735 55

Trans. #:	449497392
Print Date:	11/26/2018
Ship Date:	11/26/2018
Expected Delivery Date:	11/27/2018

Priority Mail® Postage:	**$6.70**
Total	**$6.70**

From: DEBORAH CHASE
T-MOBILE USA- NSS
35 GRIFFIN RD S
BLOOMFIELD CT 06002-1351

Ref#: 734B-L7ZAP

To: MARK J SCIOTA
SOUTHINGTON TOWN MANAGER
75 MAIN ST
SOUTHINGTON CT 06489-2504

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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Check the status of your shipment on the USPS Tracking® page at usps.com

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Click-N-Ship®

9405 5036 9930 0330 2735 62 0067 0000 0010 6489

usps.com
$6.70
US POSTAGE
Flat Rate Env

P

11/26/2018 Mailed from 06002 062S0000001311

PRIORITY MAIL 1-DAY™

DEBORAH CHASE
T-MOBILE USA- NSS
35 GRIFFIN RD S
BLOOMFIELD CT 06002-1351

Expected Delivery Date: 11/27/18
Ref#: 734B-L7ZAP

0024

Carrier -- Leave if No Response

C020

SHIP TO: MATTHEW A REIMONDO
SOUTHINGTON ZONING ENFORCEMENT OFFICER
196 N MAIN ST
200
SOUTHINGTON CT 06489-2514

USPS TRACKING #

9405 5036 9930 0330 2735 62

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0330 2735 62

Trans. #:	449497392
Print Date:	11/26/2018
Ship Date:	11/26/2018
Expected Delivery Date:	11/27/2018

Priority Mail® Postage:	**$6.70**
Total	**$6.70**

From: DEBORAH CHASE
T-MOBILE USA- NSS
35 GRIFFIN RD S
BLOOMFIELD CT 06002-1351

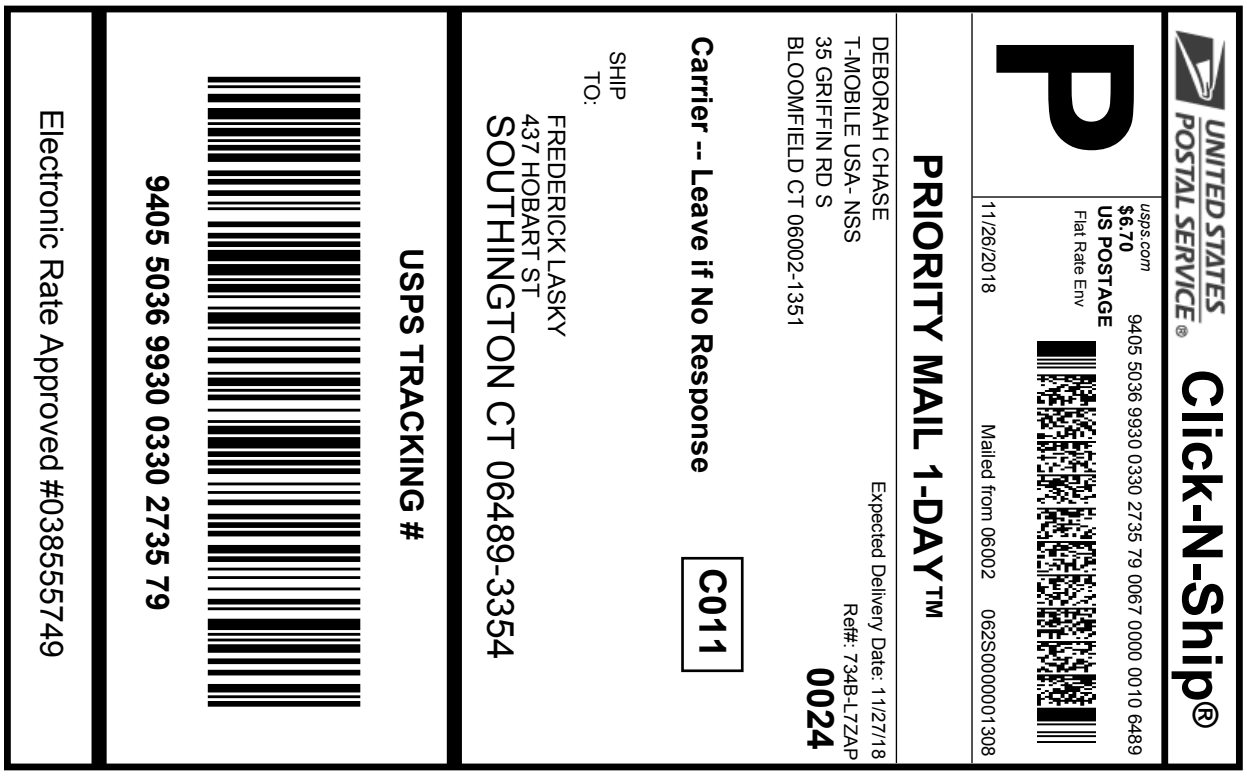
Ref#: 734B-L7ZAP

To: MATTHEW A REIMONDO
SOUTHINGTON ZONING ENFORCEMENT OFFICER
196 N MAIN ST
200
SOUTHINGTON CT 06489-2514

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

UNITED STATES POSTAL SERVICE®

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com



Cut on dotted line.

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From: DEBORAH CHASE
T-MOBILE USA- NSS
35 GRIFFIN RD S
BLOOMFIELD CT 06002-1351

Ref#: 734B-L7ZAP

To: FREDERICK LASKY
437 HOBART ST
SOUTHINGTON CT 06489-3354

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

Thank you for shipping with the United States Postal Service!
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