Transcend Wireless

10 Industrial Ave. Suite 3
Mahwah, NJ 07430
Phone: 201.684.0055
Fax: 201.684.0066

February 23, 2018

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

Notice of Exempt Modification
560B Hawley Lane Stratford, CT 06614
Latitude: 41' 13' 59.28"N
Longitude: 73' 08' 58.64"W

Dear Ms. Bachman,

Sprint currently maintains three existing antennas at the 99' level of the existing power mount located within an 81' Lattice transmission line structure at 560B Hawley Lane Stratford, CT 06614. The tower is owned by Eversource. Sprint now intends to swap the three existing antennas for three new antennas. These new antennas would be installed on Eversource's new replacement transmission pole #830 at the 120' level. Sprint also plans to install six diplexers and 18 coax lines.

The facility was approved by the Town of Stratford. Please see enclosed documentation, Petition NO. 1291, for your reference.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50j-73, for constructions that constitutes an exempt modifications pursuant to R.C.S.A 16-50j-72(b)(2). In accordance with R.C.S.A. 16-50j-73, a copy of this letter is being sent to The Honorable Mayor Laura R. Hoydick, Mayor, Town of Stratford, as well as the property owner/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 modification 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 modification 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, Sprint respectfully submits that the proposed modifications to the above referenced telecommunications facility constitutes an exempt modification under R.C.S.A 16-50j-72(b)(2).

Sincerely,

Jennifer Ardis

Jennifer Ardis
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, NJ 07430
Cell: 201-704-8157
jardis@TranscendWireless.com

Attachments:

Cc: The Honorable Mayor Laura R. Hoydick, Mayor, Town of Stratford
Eversource - as tower and property owner
Town of Statford, Zoning Department

Sprint

WIRELESS COMMUNICATIONS FACILITY

EVERSOURCE STRUCT. No.: 830

SITE ID: CT81XC008/CT1078

560B HAWLEY LANE

STRATFORD, CT 06614

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2016 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM: 5 WAYSIDE ROAD
BURLINGTON, MA 01803

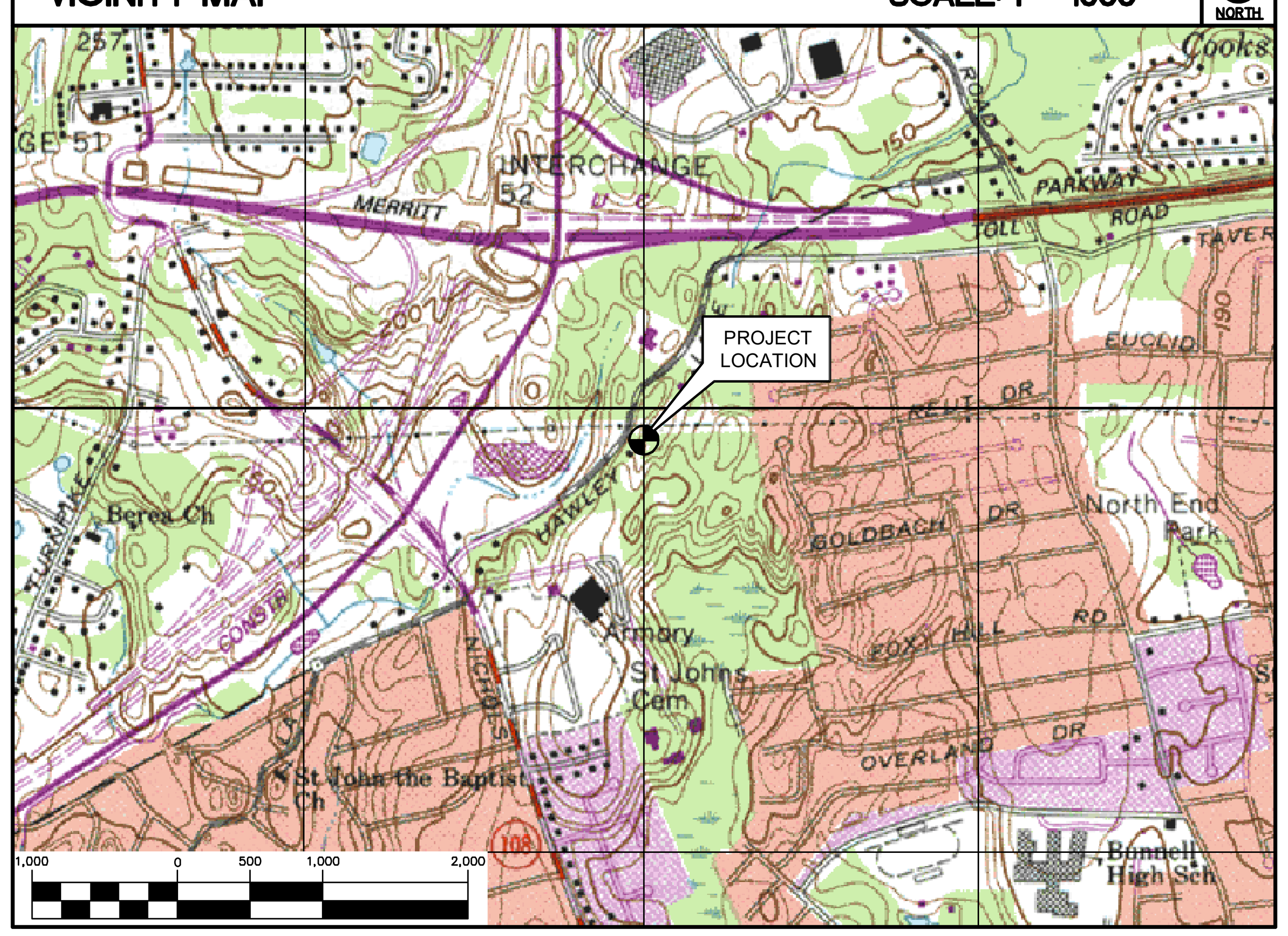
TO: 560B HAWLEY LANE
STRATFORD, CT 06614

1.	START OUT BY GOING TO WAYSIDE ROAD.	0.12 MI.
2.	TURN LEFT ONTO CAMBRIDGE ST/US-3 N/MA	0.12 MI.
3.	MERGE ONTO I-95 S/MA-128 S/YANKEE DIVISION HWY S TOWARD WALTHAM/LOWELL	0.27 MI.
4.	TAKE THE I-90/MASS PIKE EXIT, EXIT 25, TOWARD BOSTON/ALBANY NY.	12.32 MI.
5.	MERGE ONTO I-90 W/MASSACHUSETTS TPKE W TOWARD WORCESTER (PORTIONS TOLL).	0.32 MI.
6.	MERGE ONTO I-84 W/WILBUR CROSS HWY S VIA EXIT 9 TOWARD US-20(PORTIONS TOLL).	44.45 MI.
7.	KEEP LEFT TO TAKE CT-15 S VIA EXIT 57 TOWARD I-91 S/CHARTER OAK BR/NY CITY.	41.73 MI.
8.	MERGE ONTO I-91 S VIA EXIT 86 TOWARD NEW HAVEN/NY CITY.	1.99 MI.
9.	MERGE ONTO CT-15 S VIA EXIT 17 TOWARD E MAIN ST.	17.07 MI.
10.	TAKE THE CT-8 S EXIT, EXIT 52, TOWARD CT-108 S/BRIDGEPORT.	30.24 MI.
11.	KEEP RIGHT TO TAKE THE CT-108 RAMP TOWARD STRATFORD.	0.64 MI.
12.	TURN LEFT ONTO NICHOLS AVE/CT-108.	0.22 MI.
13.	TURN LEFT ONTO HAWLEY LN.	0.27 MI.
14.	560 HAWLEY LN, #B, STRATFORD, CT 06614, 560 HAWLEY LN, #B IS ON THE LEFT.	0.61 MI.

VICINITY MAP

SCALE: 1" = 1000'

NORTH



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
   - A. RELOCATE EXISTING OUTDOOR SPRINT EQUIPMENT TO ACCOMMODATE NEW PROPOSED EVERSOURCE POLE AS REQUIRED.
   - B. INSTALL PROPOSED LOW PROFILE PLATFORM MOUNT.
   - C. INSTALL (3) PROPOSED 10-PORT PANEL ANTENNAS, (1) PER SECTOR.
   - D. INSTALL (6) PROPOSED DIPLEXERS ON TOWER.
   - E. INSTALL (6) PROPOSED DIPLEXERS AT GRADE.
   - F. INSTALL (3) PROPOSED RRH'S AT GRADE ON PROPOSED SUPPORT FRAME.
   - G. RELOCATE (6) EXISTING RRH'S TO PROPOSED FRAME.

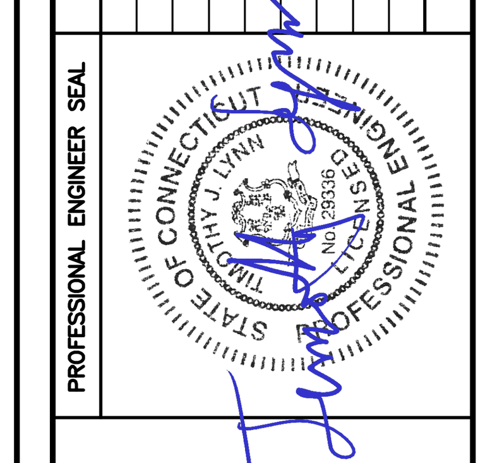
PROJECT INFORMATION

SITE NAME:	EVERSOURCE STRUCT. No.: 830
SITE ID:	CT81XC008/CT1078
SITE ADDRESS:	560B HAWLEY LANE STRATFORD, CT 06614
APPLICANT:	SPRINT 5 WAYSIDE ROAD BURLINGTON, MA 01803
CONTACT PERSON:	MIKE KITHCART (PROJECT MANAGER) (973)626-5792
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41° 13' 59.28"N LONGITUDE: 73° 08' 58.64"W GROUND ELEVATION: ±193' AMSL SITE COORDINATES REFERENCED FROM NV5. GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
3	2/15/18	TJL	CAG	ISSUED FOR CONSTRUCTION – REVISED LAYOUT
2	2/5/18	TJL	CAG	ISSUED FOR CONSTRUCTION
1	2/2/18	TJL	CAG	REVISED EVERSOURCE RRH FRAME LOCATION AND CABLE ROUTING
0	1/25/18	TJL	CAG	REVISED EVERSOURCE TOWER LOCATION AND CABLE ROUTING
A	12/15/17	FJP	CAG	PRELIMINARY DRAWINGS – ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL



Sprint

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

SPRINT

WIRELESS COMMUNICATIONS FACILITY

EVERSOURCE STRUCT No.: 830
SITE ID: CT81XC008/CT1078
560B HAWLEY LANE
STRATFORD, CT 06614

DATE:	12/13/17
SCALE:	AS NOTED
JOB NO.	17159.23

TITLE SHEET

T-1

Sheet No. 1 of 6

DESIGN BASIS:

GOVERNING CODE: 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CT STATE BUILDING CODE.

1. DESIGN CRITERIA:
   - WIND LOAD: PER EIA/TIA 222 G & NU CRITERIA (ANTENNA MOUNTS): 97 MPH (3 SECOND GUST), NORMAL DESIGNS WIND SPEED VASD
   - WIND LOAD: PER NESC C2–2012 SECTION 25 RULE 250C (TOWER AND FOUNDATION 110 MPH (3 SECOND GUSTS).
   - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7–02 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF–SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)–––ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)–––ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)–––ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)–––ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE–––ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS–––ASTM A325–N
   G. U–BOLTS–––ASTM A36
   H. ANCHOR RODS–––ASTM F 1554
   I. WELDING ELECTRODE–––ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON–GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT–DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
3	2/15/18	TJL	CAG	ISSUED FOR CONSTRUCTION – REVISED LAYOUT
2	2/5/18	TJL	CAG	ISSUED FOR CONSTRUCTION
1	2/2/18	TJL	CAG	REVISED EVERSOURCE RRH FRAME LOCATION AND CABLE ROUTING
0	1/25/18	TJL	CAG	REVISED EVERSOURCE TOWER LOCATION AND CABLE ROUTING
A	12/15/17	FJP	CAG	PRELIMINARY DRAWINGS – ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Sprint

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

SPRINT
WIRELESS COMMUNICATIONS FACILITY
EVERSOURCE STRUCT No: 830
SITE ID: CT81XC008/CT1078
560B HAWLEY LANE
STRATFORD, CT 06614

DATE: 12/13/17
SCALE: AS NOTED
JOB NO. 17159.23

DESIGN BASIS AND SITE NOTES

N–1

Sheet No. 2 of 6

1 / C-1 **ABUTTERS MAP**
SCALE: 1" = 150'

APPROX. NORTH

GRAPHIC SCALE
150 0 75 150 300 600
(IN FEET)
1 inch = 150 ft.

ABUTTERS MAP INFO:

A:
SECOND AVENUE DEVELOPMENT LLC C/O
JAMES FITZPATRICK
355 HAWLEY LN
M.A.: 170 MORNING DEW LN
STRATFORD, CT 06614

B:
SHD HAWLEY LLC C/O GERARD J KILEY
HAWLEY LN
M.A.: 1055 SUMMER ST 2ND FL
STAMFORD, CT 06905

C:
HAWLEY LANE MEDICAL CENTER LLC MARSEL HURIBAL
495 HAWLEY LN
M.A.: 495 HAWLEY LANE STE 2A
STRATFORD, CT 06614

D:
JACKSON KEVIN E & JACKSON EDVENA M (SV)
65 PLANE TREE RD
M.A.: 65 PLANE TREE RD
STRATFORD, CT 06614-1826

E:
HIGGINS LINDEN & WILLIAMS SONIA (SV)
45 PLANE TREE RD
M.A.: 45 PLANE TREE RD
STRATFORD, CT 06614-1826

F:
TOWN OF STRATFORD
PLANE TREE RD
M.A.: 2725 MAIN ST
STRATFORD, CT 06615

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
3	2/15/18	TJL	CAG	ISSUED FOR CONSTRUCTION - REVISED LAYOUT
2	2/5/18	TJL	CAG	ISSUED FOR CONSTRUCTION
1	2/2/18	TJL	CAG	REVISED EVERSOURCE RRH FRAME LOCATION AND CABLE ROUTING
0	1/25/18	TJL	CAG	REVISED EVERSOURCE TOWER LOCATION AND CABLE ROUTING
A	12/15/17	FJP	CAG	PRELIMINARY DRAWINGS - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT — TIMOTHY J. LYNN — LICENSED PROFESSIONAL ENGINEER

Sprint

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

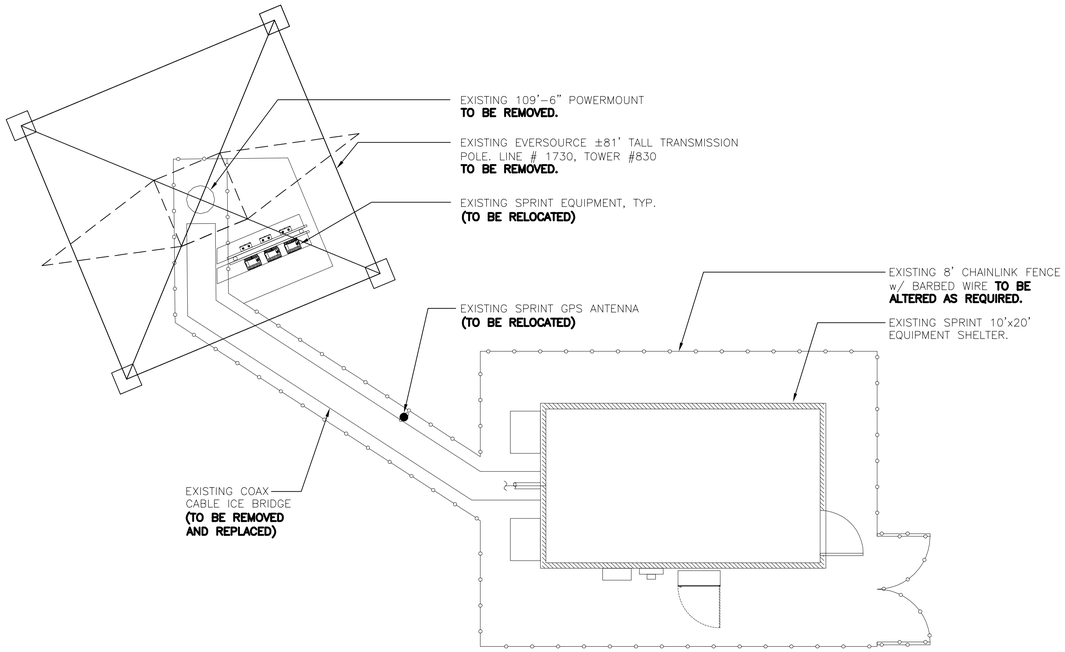
SPRINT
WIRELESS COMMUNICATIONS FACILITY
EVERSOURCE STRUCT No: 830
SITE ID: CT81XC008/CT1078
560B HAWLEY LANE
STRATFORD, CT 06614

DATE: 12/13/17
SCALE: AS NOTED
JOB NO. 17159.23

ABUTTERS MAP

C-1

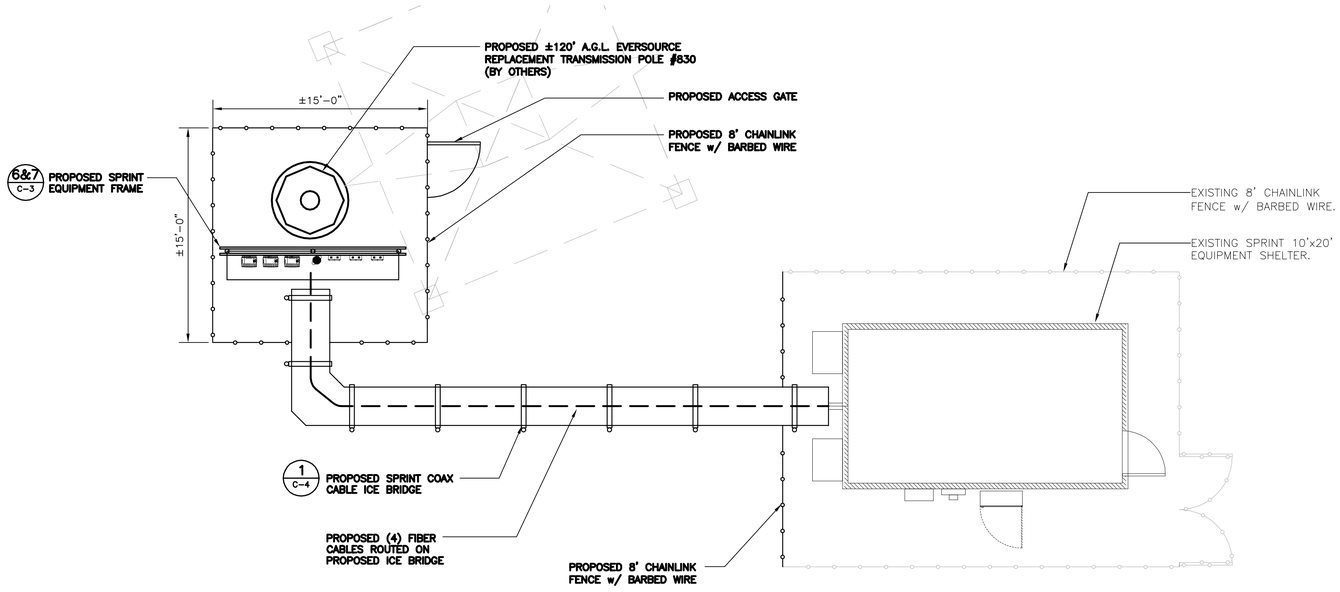
Sheet No. 3 of 6



1 C-2 **EXISTING SITE PLAN**
SCALE: 1" = 5'

TRUE NORTH

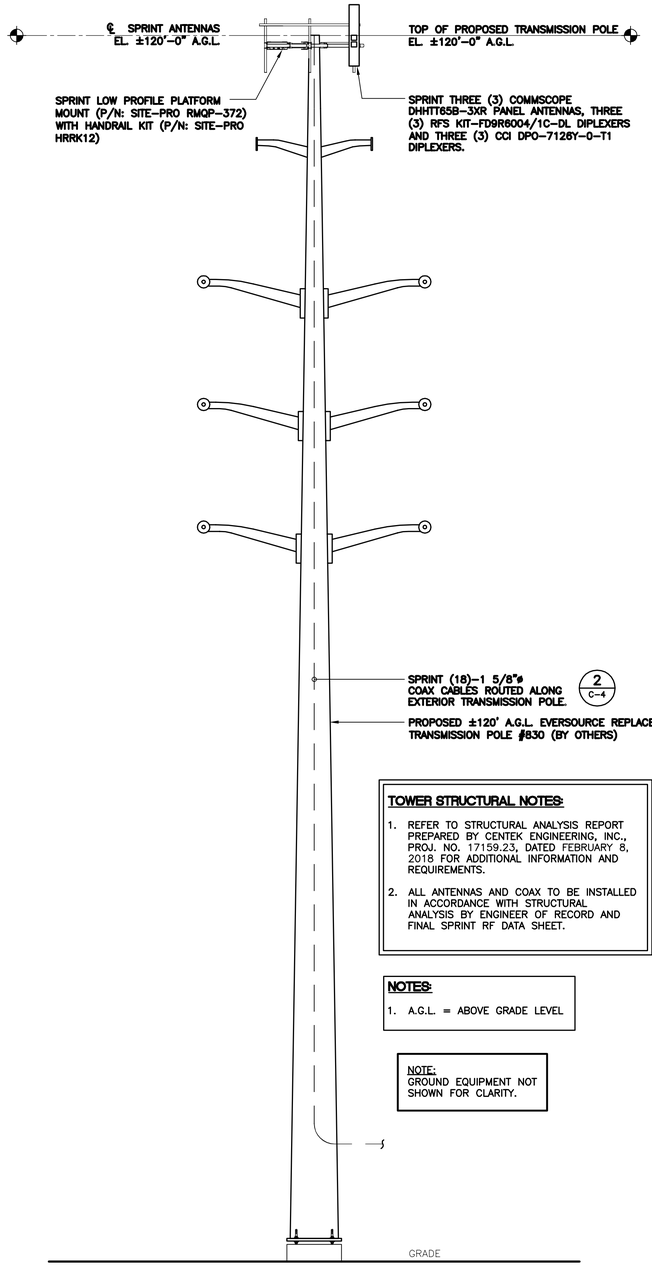
GRAPHIC SCALE
5 0 2.5 5 10 20
(IN FEET)
1 inch = 5 ft.



2 C-2 **PROPOSED SITE PLAN**
SCALE: 1" = 5'

TRUE NORTH

GRAPHIC SCALE
5 0 2.5 5 10 20
(IN FEET)
1 inch = 5 ft.



TOWER STRUCTURAL NOTES:

1. REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJ. NO. 17159.23, DATED FEBRUARY 8, 2018 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS BY ENGINEER OF RECORD AND FINAL SPRINT RF DATA SHEET.

NOTES:

1. A.G.L. = ABOVE GRADE LEVEL

NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

3 C-2 **PROPOSED TOWER ELEVATION**
SCALE: 1" = 7'-0"

GRAPHIC SCALE
7 0 3.5 7 14 28
(IN FEET)
1 inch = 7 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
3	2/15/18	TJL	CAG	ISSUED FOR CONSTRUCTION - REVISED LAYOUT
2	2/5/18	TJL	CAG	ISSUED FOR CONSTRUCTION
1	2/2/18	TJL	CAG	REVISED EVERSOURCE RRH FRAME LOCATION AND CABLE ROUTING
0	1/25/18	TJL	CAG	REVISED EVERSOURCE TOWER LOCATION AND CABLE ROUTING
A	12/15/17	FJP	CAG	PRELIMINARY DRAWINGS - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL
STATE OF CONNECTICUT TIMOTHY J. LAMMERT LICENSED PROFESSIONAL ENGINEER

Sprint

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax.
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

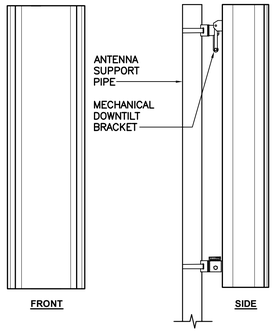
SPRINT
WIRELESS COMMUNICATIONS FACILITY
EVERSOURCE STRUCT No.: 830
SITE ID: CT81XC008/CT1078
560B HAWLEY LANE
STRATFORD, CT 06614

DATE: 12/13/17
SCALE: AS NOTED
JOB NO. 17159.23

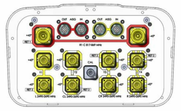
COMPOUND PLANS AND ELEVATION

C-2

Sheet No. 4 of 6



FRONT SIDE



BOTTOM

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: DHHTT65B-3XR	71.9"L x 13.8"W x 8.2"D	58 LBS.

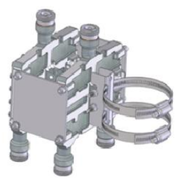
1 C-3 PROPOSED ANTENNA DETAIL
SCALE: 1/2" = 1'-0"

TD-RRH8x20-25

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ALCATEL-LUCENT MODEL: TD-RRH8x20-25	25.3"L x 17.5"W x 5.7"D	66 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH SPRINT CONSTRUCTION MANAGER PRIOR TO ORDERING.			

2 C-3 REMOTE RADIO HEAD DETAIL
SCALE: NOT TO SCALE

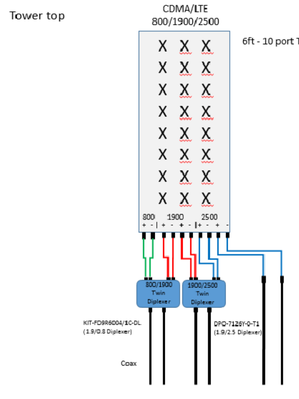
DOP-7126Y-0-T1

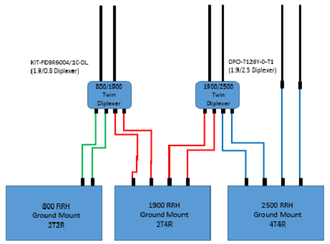


KIT-FD9R6004/1C-DL

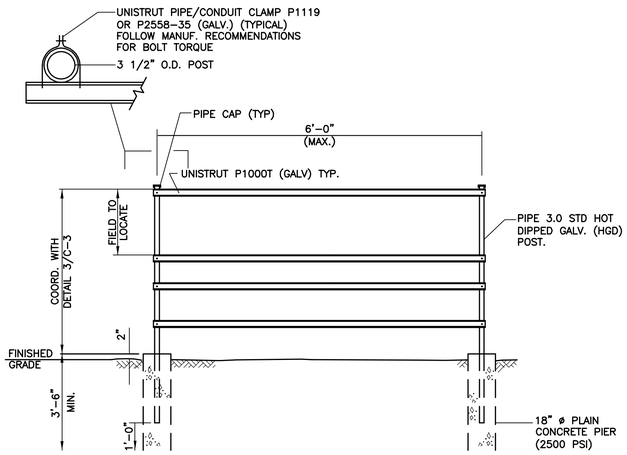
DIPLEXERS		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: KIT-FD9R6004/1C-DL	5.8"L x 6.5"W x 4.6"D	6.4 LBS.
MAKE: CCI MODEL: DPO-7126Y-0-T1	6.26"L x 7.42"W x 4.07"D	7.3 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH SPRINT CONSTRUCTION MANAGER PRIOR TO ORDERING.		

3 C-3 DIPLEXER DETAIL
SCALE: NOT TO SCALE

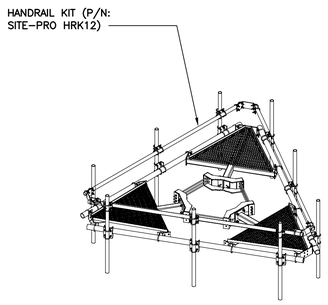




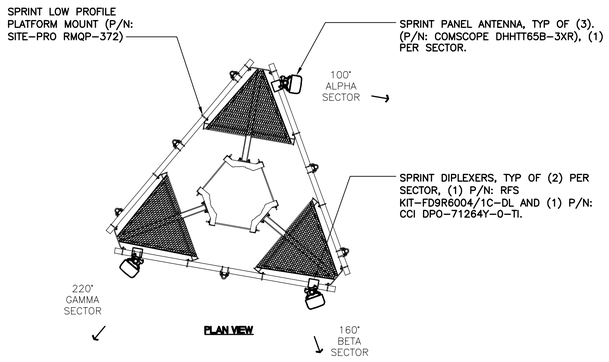
4 C-3 PLUMBING DIAGRAM
NOT TO SCALE



6 C-3 UTILITY SUPPORT FRAME (TYP.)
NOT TO SCALE

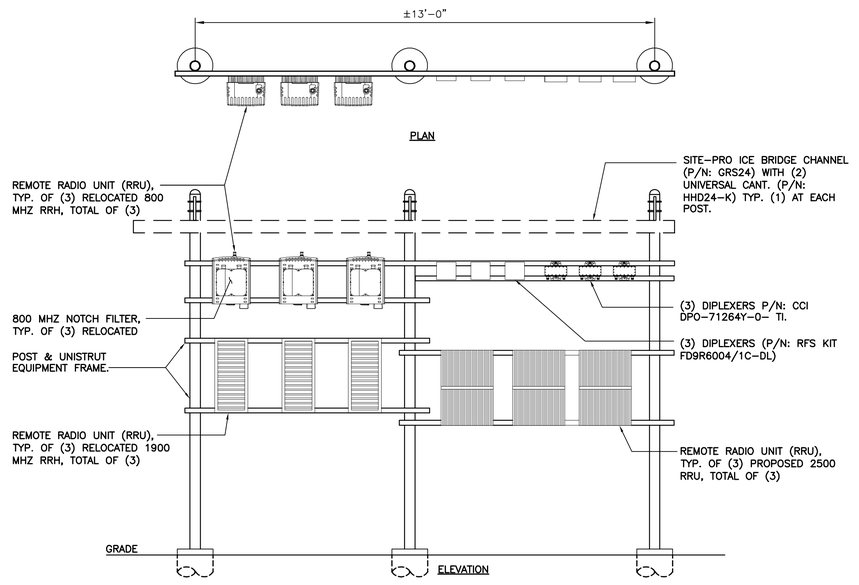


ISOMETRIC VIEW



PLAN VIEW

5 C-3 PROPOSED ANTENNA MOUNT DETAILS
SCALE: = 1/4" = 1'



7 C-3 RRU MOUNTING CONFIG.
SCALE: 1/2" = 1'- 0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
3	2/15/18	TJL	CAG	ISSUED FOR CONSTRUCTION - REVISED LAYOUT
2	2/5/18	TJL	CAG	ISSUED FOR CONSTRUCTION
1	2/2/18	TJL	CAG	REVISED EVERSOURCE RRH FRAME LOCATION AND CABLE ROUTING
0	1/25/18	TJL	CAG	REVISED EVERSOURCE TOWER LOCATION AND CABLE ROUTING
A	12/15/17	FJP	CAG	PRELIMINARY DRAWINGS - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT — TIMOTHY J. LUTT — LICENSED PROFESSIONAL ENGINEER

Sprint

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

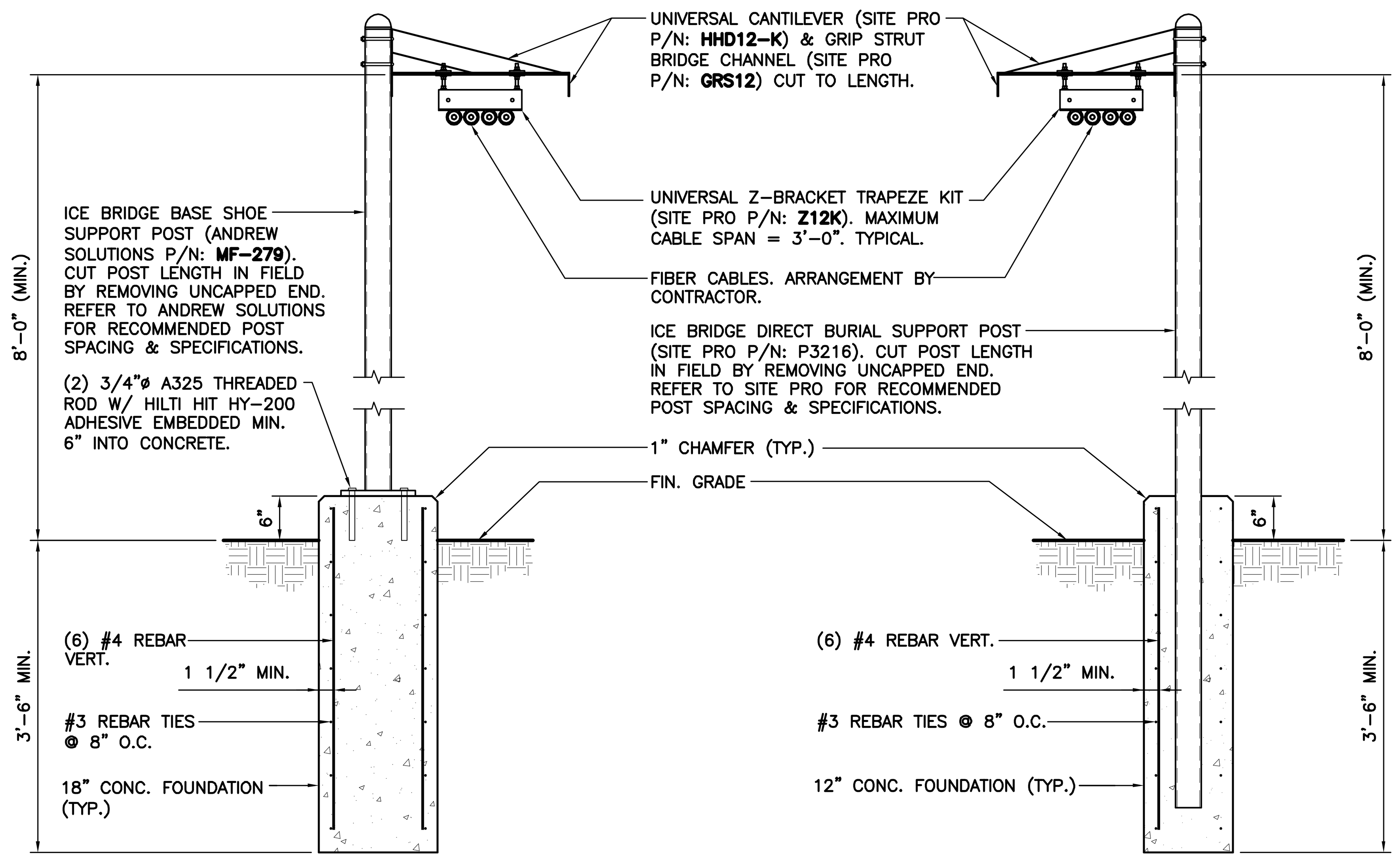
SPRINT
WIRELESS COMMUNICATIONS FACILITY
EVERSOURCE STRUCT No: 830
SITE ID: CT81XC008/CT1078
560B HAWLEY LANE
STRATFORD, CT 06614

DATE: 12/13/17
SCALE: AS NOTED
JOB NO. 17159.23

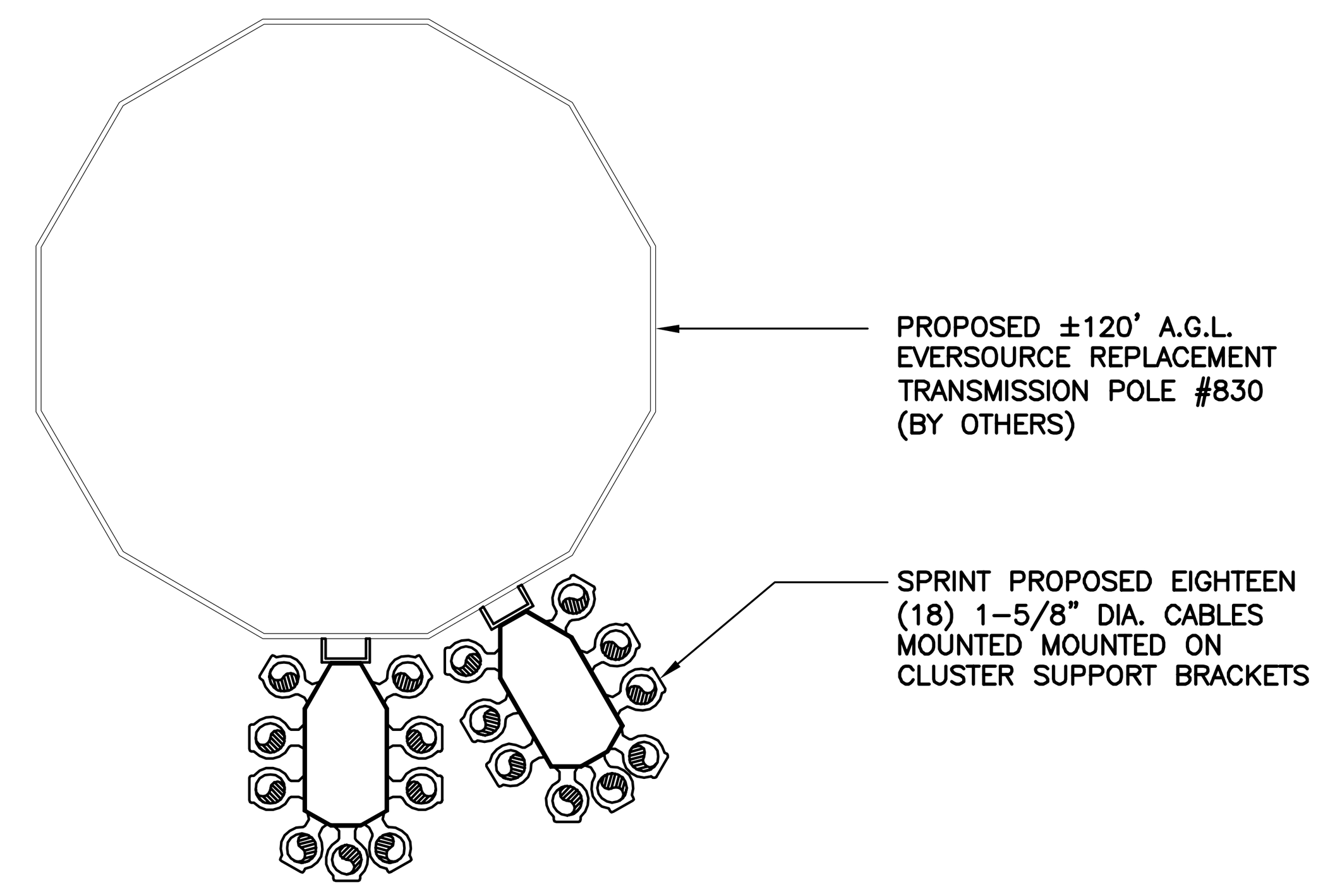
TYPICAL DETAILS

C-3

Sheet No. 5 of 6



1 / C-4 **ICE BRIDGE DETAIL**
SCALE: 3/4" = 1'- 0"



2 / C-4 **COAX CABLE BRACKET ON TOWER**
SCALE: 1" = 1'- 0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
3	2/15/18	TJL	CAG	ISSUED FOR CONSTRUCTION – REVISED LAYOUT
2	2/5/18	TJL	CAG	ISSUED FOR CONSTRUCTION
1	2/2/18	TJL	CAG	REVISED EVERSOURCE RRH FRAME LOCATION AND CABLE ROUTING
0	1/25/18	TJL	CAG	REVISED EVERSOURCE TOWER LOCATION AND CABLE ROUTING
A	12/15/17	FJP	CAG	PRELIMINARY DRAWINGS – ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Sprint

CENTEK engineering
Centered on Solutions™
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

SPRINT
WIRELESS COMMUNICATIONS FACILITY
EVERSOURCE STRUCT No: 830
SITE ID: CT81XC008/CT1078
560B HAWLEY LANE
STRATFORD, CT 06614

DATE: 12/13/17
SCALE: AS NOTED
JOB NO. 17159.23

COAX CABLE ROUTING DETAILS

C-4

Sheet No. 6 of 6

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Pole

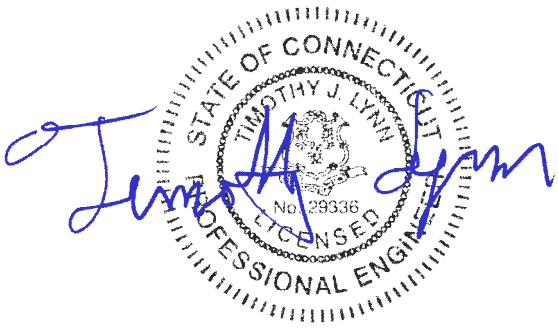
Sprint Site Ref: CT81XC008

Eversource Structure No. 830
120' Electric Transmission Pole

560B Hawley Lane
Stratford, CT

CENTEK Project No. 17159.23

~~Date: December 5, 2017~~
~~Rev 1: December 13, 2017~~
Rev 2: January 22, 2018



Prepared for:
Transcend Wireless
10 Industrial Ave, Suite 3
Mahwah, NJ 07430

Table of Contents

Introduction

The purpose of this report is to analyze the 120' pole located at 560B Hawley Lane in Stratford, CT for the proposed equipment installation by Sprint.

The pole was analyzed for the following antenna configuration:

- SPRINT (Proposed):
  Antennas: Three (3) Commscope DHHTT65B-3XR panel antennas, three (3) RFS KIT-FD9R6004/1C-DL Diplexers and three (3) CCI DPO-7126Y-0-T1 Diplexers mounted on a SitePro 12-ft Low Profile Platform p/n RMQP-372 to the existing utility pole with a RAD center elevation of 120-ft above grade.
  Coax Cables: Eighteen (18) 1-5/8" ∅ 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.

A n a l y s i s

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.

D e s i g n B a s i s

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 CL&P 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……..	6.4 psf
Radial Ice Thickness……	0.75"
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 **72.20%** occurs in the utility pole base plate under the **NESC Heavy 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 4	0.00' -33.00' (AGL)	70.12%	**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	72.20%	**PASS**

- FOUNDATION AND ANCHORS

The base of the tower is connected to the foundation by means of (20) 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	49.59 kips	71.72 kips	4368.31 ft-kips
NESC Extreme Wind	54.80 kips	39.52 kips	4370.80 ft-kips
NESC Extreme Ice w/ Wind	38.31 kips	60.72 kips	3421.46 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	59.94%	**PASS**

FOUNDATION:

- The foundation was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading	Result
Reinforced Concrete Caisson	Moment Capacity	34.5%	**PASS**

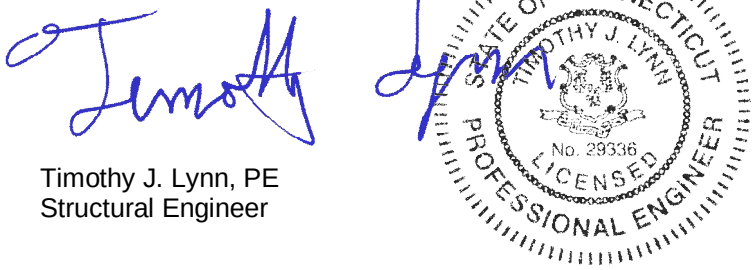
C o n c l u s i o n

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

The analysis is based, in part on the information provided to this office by Eversource and Sprint. 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

		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	Antenna Mount	TIA SUB 090	TIA SUB 090	TIA SUB 090	TIA SUB 090	TIA SUB 090	TIA SUB 090
	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	Antenna Mount	TIA SUB 090	TIA SUB 090	TIA SUB 090	TIA SUB 090	TIA SUB 090	TIA SUB 090
	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						

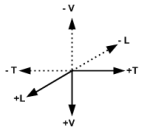
Sabre Industries™ Tubular Structures
8653 E. Hwy 67 · Alvarado, TX 76009 · 866.254.3707

NESC RULE 250B (-T WIND)

Trans. Wind	-10.0	psf		Dead Load Factor	1.50	**Strength Factors**	
Long. Wind	0.0	psf				Structure	1.00
Resultant Wind	10.0	psf @	180.0 deg			Guys	1.00
Ice Thickness	0.5	in					

Applied Loads

Label	Vertical (kip)	Transverse (kip)	Longitudinal (kip)
SW L:T	1.292	-4.252	0.000
SW R:T	1.292	-4.252	-0.142
C1 L:T	3.262	-5.721	0.000
C1 R:T	3.262	-5.721	0.000
C2 L:T	3.262	-5.721	0.000
C2 R:T	3.262	-5.721	0.000
C3 L:T	3.262	-5.721	0.000
C3 R:T	3.262	-5.721	0.000
P:t	2.027	-6.034	0.000
P:A1	2.027	-6.034	0.000
P:CC1	2.065	-0.162	0.000
P:CC2	2.065	-0.162	0.000
P:CC3	2.065	-0.162	0.000
P:CC4	2.065	-0.162	0.000
P:CC5	2.065	-0.162	0.000
P:CC6	2.065	-0.162	0.000
P:CC7	2.065	-0.162	0.000
P:CC8	2.065	-0.162	0.000
P:CC9	2.065	-0.162	0.000
P:CC10	2.065	-0.162	0.000
P:CC11	2.065	-0.162	0.000
P:CC12	2.065	-0.162	0.000
P:CC13	2.065	-0.162	0.000



Pole Label: P

Pole Shaft Results

Dist. (ft)	Deflection (in) Trans.	Long.	Resultant	Rotation (deg)	Force (kip) Axial	Trans.	Long.	Moments (ft-kip) Trans.	Long.	Torsion	Stress (ksi) Normal	Shear	Torsion	Combined	Allow. Stress	Max Usage	Label
0.00	-167.36	-0.29	167.36	11.17	-0.93	-6.36	0.00	0.00	0.00	0.00	0.16	2.19	0.00	3.80	65.00	5.8	P:t
5.00	-155.80	-0.28	155.80		-1.18	-6.46	0.00	-31.81	0.01	0.00	18.55	0.49	0.00	18.56	65.00	28.6	Tube 1
10.00	-144.61	-0.26	144.61	10.51	-3.48	-7.10	0.00	-64.13	0.01	0.00	27.87	0.46	0.00	27.88	65.00	42.9	P:CC1
15.00	-133.89	-0.24	133.89	10.02	-4.80	-13.50	0.00	-99.65	0.01	0.00	33.36	0.77	0.00	33.38	65.00	51.4	P:A1
20.00	-123.70	-0.22	123.70	9.47	-7.27	-14.09	0.00	-167.15	0.01	0.00	44.43	0.71	0.00	44.44	65.00	68.4	P:CC2
25.00	-114.12	-0.20	114.12		-7.58	-14.14	0.00	-237.60	0.01	0.00	51.17	0.64	0.00	51.18	65.00	78.7	SpliceT
25.83	-112.59	-0.19	112.59	8.81	-9.56	-23.08	0.14	-252.25	0.06	0.80	26.11	0.52	0.04	26.13	65.00	40.2	P:SW
30.00	-105.02	-0.18	105.02	8.55	-12.28	-23.68	0.14	-348.48	0.66	0.80	30.93	0.49	0.04	30.94	65.00	47.6	P:CC3
34.13	-97.78	-0.16	97.78		-13.03	-23.82	0.14	-446.16	1.24	0.80	34.31	0.46	0.03	34.32	65.00	52.8	Tube 3
38.25	-90.77	-0.15	90.77	7.98	-19.13	-36.24	0.14	-553.10	1.82	0.80	37.40	0.65	0.03	37.42	65.00	57.6	P:C1
40.00	-87.88	-0.14	87.88	7.86	-21.89	-36.77	0.14	-616.52	2.07	0.80	39.56	0.65	0.03	39.57	65.00	60.9	P:CC4
45.00	-79.85	-0.13	79.85		-23.04	-36.89	0.14	-800.37	2.77	0.80	44.28	0.60	0.02	44.29	65.00	68.1	Tube 3
50.00	-72.22	-0.11	72.22	7.11	-25.70	-37.37	0.14	-984.83	3.46	0.80	47.54	0.57	0.02	47.55	65.00	73.2	P:CC5
50.25	-71.85	-0.11	71.85	7.09	-32.10	-49.66	0.14	-1002.79	3.50	0.80	48.26	0.76	0.02	48.28	65.00	74.3	P:C2
55.13	-64.81	-0.09	64.81		-33.44	-49.72	0.14	-1244.86	4.18	0.80	52.83	0.71	0.02	52.84	65.00	81.3	Tube 3
60.00	-58.16	-0.08	58.16	6.32	-36.50	-50.15	0.14	-1487.25	4.84	0.80	56.14	0.68	0.01	56.15	65.00	86.4	P:CC6
62.25	-55.23	-0.08	55.23	6.14	-43.37	-62.32	0.14	-1608.63	5.15	0.80	57.79	0.82	0.01	57.81	65.00	88.9	P:C3
66.13	-50.37	-0.07	50.37		-44.62	-62.32	0.14	-1850.10	5.67	0.80	60.92	0.78	0.01	60.94	65.00	93.7	Tube 3
70.00	-45.76	-0.06	45.76	5.52	-47.68	-62.68	0.13	-2091.60	6.18	0.80	63.41	0.76	0.01	63.43	65.00	97.6	P:CC7
72.25	-43.20	-0.05	43.20		-48.88	-62.71	0.13	-2232.62	6.47	0.70	64.61	0.74	0.01	64.62	65.00	99.4	SpliceT
75.00	-40.19	-0.05	40.19		-50.55	-62.78	0.13	-2405.07	6.82	0.70	59.00	0.63	0.01	59.02	65.00	90.8	Splice
77.75	-37.29	-0.04	37.29		-51.82	-62.82	0.13	-2577.71	7.17	0.70	59.85	0.62	0.01	59.86	65.00	92.1	SpliceB
80.00	-35.00	-0.04	35.00	4.77	-55.27	-63.17	0.13	-2719.04	7.46	0.70	60.45	0.61	0.01	60.46	65.00	93.0	P:CC8
85.00	-30.18	-0.03	30.18		-57.25	-63.18	0.12	-3034.87	8.08	0.70	61.39	0.58	0.01	61.40	65.00	94.5	Tube 4
90.00	-25.73	-0.03	25.73	4.08	-61.35	-63.51	0.12	-3350.78	8.68	0.70	61.97	0.55	0.01	61.98	65.00	95.4	P:CC9
95.00	-21.61	-0.02	21.61		-63.45	-63.53	0.12	-3668.31	9.27	0.70	62.24	0.53	0.01	62.25	65.00	95.8	Tube 4
100.00	-17.84	-0.02	17.84	3.45	-67.01	-63.82	0.11	-3985.92	9.84	0.70	62.30	0.51	0.01	62.30	65.00	95.9	P:CC10
102.00	-16.42	-0.01	16.42		-68.82	-63.86	0.11	-4113.56	10.06	0.70	62.28	0.50	0.01	62.28	65.00	95.8	SpliceT
105.50	-14.06	-0.01	14.06		-71.60	-63.92	0.11	-4337.06	10.45	0.70	64.45	0.50	0.01	64.46	65.00	99.2	Splice

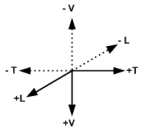
Sabre Industries™ Tubular Structures
8653 E. Hwy 67 · Alvarado, TX 76009 · 866.254.3707

NESC RULE 250C(EXTREME WIND) (-T WIND)

Trans. Wind	-37.0	psf		Dead Load Factor	1.00	**Strength Factors**	
Long. Wind	0.0	psf				Structure	1.00
Resultant Wind	37.0	psf @	180.0 deg			Guys	1.00
Ice Thickness	0.0	in		NOTE: per NESC, ice on structure is not required to be applied			

Applied Loads

Label	Vertical (kip)	Transverse (kip)	Longitudinal (kip)
SW L:T	0.359	-2.616	0.000
SW R:T	0.359	-2.616	-0.067
C1 L:T	1.374	-5.224	0.000
C1 R:T	1.374	-5.224	0.000
C2 L:T	1.374	-5.224	0.000
C2 R:T	1.374	-5.224	0.000
C3 L:T	1.374	-5.224	0.000
C3 R:T	1.374	-5.224	0.000
P:t	8.052	-2.920	0.000
P:A1	8.052	-2.920	0.000
P:CC1	0.475	-0.487	0.000
P:CC2	0.475	-0.487	0.000
P:CC3	0.475	-0.487	0.000
P:CC4	0.475	-0.487	0.000
P:CC5	0.475	-0.487	0.000
P:CC6	0.475	-0.487	0.000
P:CC7	0.475	-0.487	0.000
P:CC8	0.475	-0.487	0.000
P:CC9	0.475	-0.487	0.000
P:CC10	0.475	-0.487	0.000
P:CC11	0.475	-0.487	0.000
P:CC12	0.475	-0.487	0.000
P:CC13	0.475	-0.487	0.000



Pole Label: P

Pole Shaft Results

Dist. (ft)	Deflection (in) Trans.	Long.	Resultant	Rotation (deg)	Force (kip) Axial	Trans.	Long.	Moments (ft-kip) Trans.	Long.	Torsion	Stress (ksi) Normal	Shear	Torsion	Combined	Allow. Stress	Max Usage	Label
0.00	-145.82	-0.12	145.82	9.07	-7.55	-4.26	0.00	0.00	0.00	0.00	1.28	1.47	0.00	2.85	65.00	4.4	P:t
5.00	-136.41	-0.11	136.41		-7.68	-4.48	0.00	-21.31	0.01	0.00	13.40	0.34	0.00	13.42	65.00	20.6	Tube 1
10.00	-127.24	-0.10	127.24	8.63	-8.25	-5.28	0.00	-43.72	0.01	0.00	19.72	0.34	0.00	19.72	65.00	30.3	P:CC1
15.00	-118.40	-0.10	118.40	8.29	-16.00	-9.59	0.00	-70.13	0.01	0.00	24.83	0.54	0.00	24.85	65.00	38.2	P:A1
20.00	-109.94	-0.09	109.94	7.9	-16.65	-10.38	0.00	-118.06	0.01	0.00	32.47	0.53	0.00	32.49	65.00	50.0	P:CC2
25.00	-101.90	-0.08	101.90		-16.82	-10.54	0.00	-169.98	0.00	0.00	37.59	0.47	0.00	37.60	65.00	57.8	SpliceT
25.83	-100.61	-0.08	100.61	7.43	-17.30	-16.05	0.07	-180.51	0.02	0.40	19.13	0.36	0.02	19.14	65.00	29.4	P:SW
30.00	-94.21	-0.07	94.21	7.24	-18.13	-16.94	0.07	-247.44	0.30	0.40	22.33	0.35	0.02	22.33	65.00	34.4	P:CC3
34.13	-88.06	-0.07	88.06		-18.57	-17.30	0.06	-317.30	0.56	0.40	24.73	0.33	0.01	24.74	65.00	38.1	Tube 3
38.25	-82.07	-0.06	82.07	6.84	-20.83	-28.32	0.06	-396.61	0.82	0.40	27.05	0.51	0.01	27.07	65.00	41.6	P:C1
40.00	-79.58	-0.06	79.58	6.75	-21.68	-29.18	0.06	-446.16	0.93	0.40	28.81	0.51	0.01	28.82	65.00	44.3	P:CC4
45.00	-72.67	-0.05	72.67		-22.37	-29.68	0.06	-592.06	1.23	0.40	32.91	0.49	0.01	32.92	65.00	50.6	Tube 3
50.00	-66.04	-0.04	66.04	6.19	-23.17	-30.48	0.06	-740.43	1.53	0.40	35.84	0.47	0.01	35.85	65.00	55.2	P:CC5
50.25	-65.71	-0.04	65.71	6.18	-25.63	-41.48	0.06	-755.99	1.55	0.40	36.42	0.63	0.01	36.43	65.00	56.0	P:C2
55.13	-59.55	-0.04	59.55		-26.45	-42.01	0.06	-958.22	1.83	0.40	40.66	0.60	0.01	40.68	65.00	62.6	Tube 3
60.00	-53.70	-0.03	53.70	5.59	-27.51	-42.94	0.06	-1163.03	2.10	0.40	43.86	0.58	0.01	43.87	65.00	67.5	P:CC6
62.25	-51.10	-0.03	51.10	5.45	-30.27	-54.01	0.05	-1267.55	2.22	0.40	45.42	0.71	0.01	45.44	65.00	69.9	P:C3
66.13	-46.77	-0.03	46.77		-31.06	-54.47	0.05	-1476.83	2.43	0.40	48.50	0.69	0.01	48.52	65.00	74.6	Tube 3
70.00	-42.65	-0.02	42.65	4.95	-32.13	-55.37	0.05	-1687.88	2.62	0.40	51.01	0.67	0.01	51.02	65.00	78.5	P:CC7
72.25	-40.35	-0.02	40.35		-32.91	-55.70	0.05	-1812.45	2.74	0.40	52.27	0.66	0.01	52.29	65.00	80.4	SpliceT
75.00	-37.63	-0.02	37.63		-33.99	-56.09	0.05	-1965.63	2.87	0.40	48.07	0.56	0.00	48.08	65.00	74.0	Splice
77.75	-35.01	-0.02	35.01		-34.81	-56.44	0.05	-2119.88	3.00	0.40	49.05	0.55	0.00	49.07	65.00	75.5	SpliceB
80.00	-32.93	-0.02	32.93	4.34	-36.15	-57.47	0.05	-2246.88	3.10	0.40	49.76	0.55	0.00	49.78	65.00	76.6	P:CC8
85.00	-28.54	-0.01	28.54		-37.42	-58.18	0.04	-2534.22	3.33	0.40	51.07	0.53	0.00	51.08	65.00	78.6	Tube 4
90.00	-24.44	-0.01	24.44	3.77	-39.18	-59.45	0.04	-2825.13	3.53	0.40	52.03	0.52	0.00	52.04	65.00	80.1	P:CC9
95.00	-20.64	-0.01	20.64		-40.53	-60.23	0.04	-3122.37	3.73	0.40	52.75	0.50	0.00	52.76	65.00	81.2	Tube 4
100.00	-17.12	-0.01	17.12	3.22	-41.95	-61.30	0.04	-3423.51	3.91	0.40	53.25	0.49	0.00	53.26	65.00	81.9	P:CC10
102.00	-15.79	0.00	15.79		-43.13	-61.78	0.03	-3546.12	3.98	0.40	53.42	0.49	0.00	53.43	65.00	82.2	SpliceT
105.50	-13.57	0.00	13.57		-44.96	-62.40	0.03	-3762.34	4.09	0.40	55.64	0.49	0.00	55.64	65.00	85.6	Splice

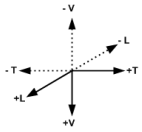
Sabre Industries™ Tubular Structures
8653 E. Hwy 67 · Alvarado, TX 76009 · 866.254.3707

NESC RULE 250D (-T WIND)

Trans. Wind	-4.0	psf		Dead Load Factor	1.00	**Strength Factors**	
Long. Wind	0.0	psf				Structure	1.00
Resultant Wind	4.0	psf @	180.0 deg			Guys	1.00
Ice Thickness	1.0	in					

Applied Loads

Label	Vertical (kip)	Transverse (kip)	Longitudinal (kip)
SW L:T	1.861	-3.366	0.000
SW R:T	1.861	-3.366	-0.118
C1 L:T	3.472	-4.426	0.000
C1 R:T	3.472	-4.426	0.000
C2 L:T	3.472	-4.426	0.000
C2 R:T	3.472	-4.426	0.000
C3 L:T	3.472	-4.426	0.000
C3 R:T	3.472	-4.426	0.000
P:t	2.247	-4.476	0.000
P:A1	2.247	-4.476	0.000
P:CC1	1.993	-0.107	0.000
P:CC2	1.993	-0.107	0.000
P:CC3	1.993	-0.107	0.000
P:CC4	1.993	-0.107	0.000
P:CC5	1.993	-0.107	0.000
P:CC6	1.993	-0.107	0.000
P:CC7	1.993	-0.107	0.000
P:CC8	1.993	-0.107	0.000
P:CC9	1.993	-0.107	0.000
P:CC10	1.993	-0.107	0.000
P:CC11	1.993	-0.107	0.000
P:CC12	1.993	-0.107	0.000
P:CC13	1.993	-0.107	0.000



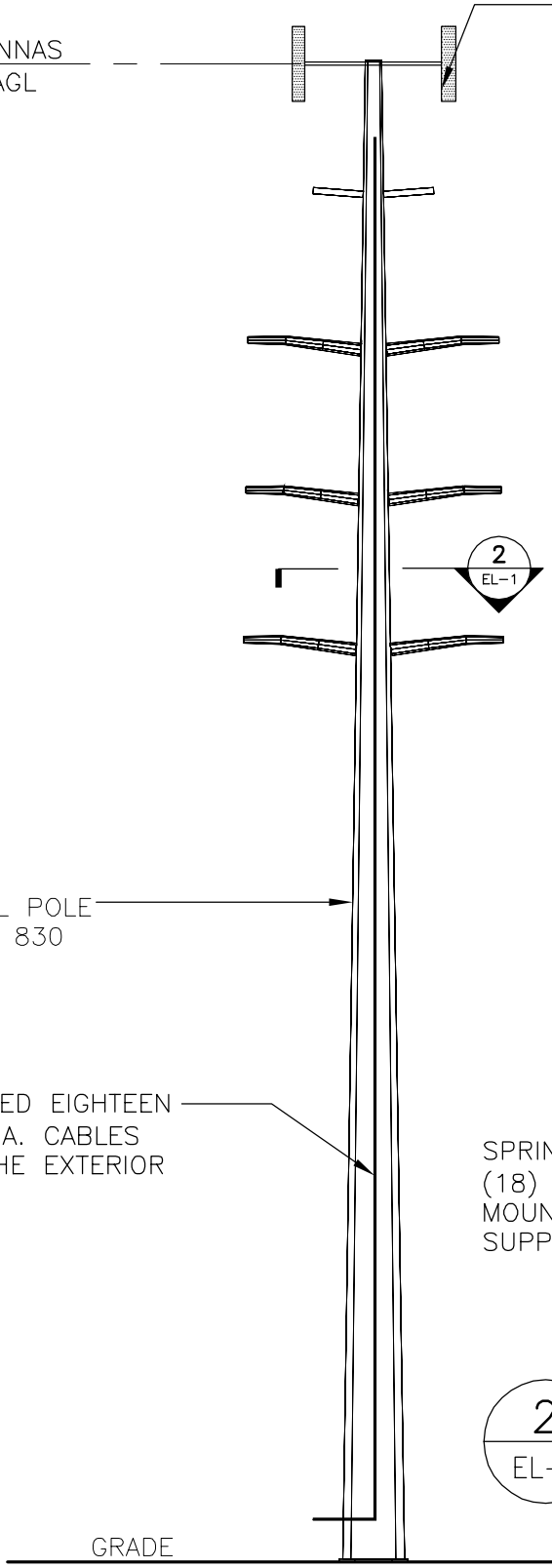
Pole Label: P

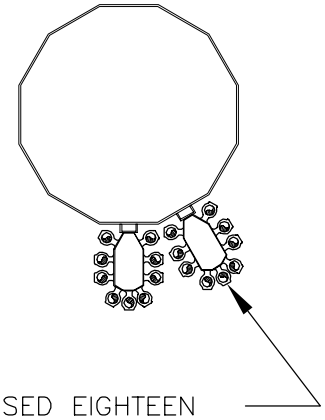
Pole Shaft Results

Dist. (ft)	Deflection (in) Trans.	Long.	Resultant	Rotation (deg)	Force (kip) Axial	Trans.	Long.	Moments (ft-kip) Trans.	Long.	Torsion	Stress (ksi) Normal	Shear	Torsion	Combined	Allow. Stress	Max Usage	Label
0.00	-92.53	-0.24	92.53	7.15	-1.77	-4.74	0.00	0.00	0.00	0.00	0.30	1.64	0.00	2.85	65.00	4.4	P:t
5.00	-85.12	-0.23	85.12		-1.98	-4.79	0.00	-23.72	0.00	0.00	13.98	0.36	0.00	14.00	65.00	21.5	Tube 1
10.00	-77.97	-0.21	77.97	6.66	-4.20	-5.17	0.00	-47.67	0.00	0.00	20.90	0.34	0.00	20.92	65.00	32.2	P:CC1
15.00	-71.19	-0.19	71.19	6.3	-6.25	-9.90	0.00	-73.51	0.00	0.00	24.89	0.56	0.00	24.91	65.00	38.3	P:A1
20.00	-64.79	-0.18	64.79	5.89	-8.59	-10.22	0.00	-122.98	0.00	0.00	32.99	0.52	0.00	33.01	65.00	50.8	P:CC2
25.00	-58.85	-0.16	58.85		-8.83	-10.23	0.00	-174.10	0.00	0.00	37.77	0.47	0.00	37.78	65.00	58.1	SpliceT
25.83	-57.91	-0.16	57.91	5.41	-12.42	-17.33	0.12	-184.89	0.04	0.60	19.37	0.39	0.03	19.38	65.00	29.8	P:SW
30.00	-53.27	-0.15	53.27	5.21	-14.93	-17.65	0.12	-257.16	0.52	0.60	23.05	0.37	0.03	23.07	65.00	35.5	P:CC3
34.13	-48.85	-0.13	48.85		-15.51	-17.69	0.12	-329.98	1.00	0.60	25.59	0.34	0.03	25.60	65.00	39.4	Tube 3
38.25	-44.62	-0.12	44.62	4.79	-22.56	-27.15	0.12	-409.51	1.48	0.60	27.98	0.49	0.02	27.99	65.00	43.1	P:C1
40.00	-42.88	-0.12	42.88	4.7	-25.09	-27.42	0.12	-457.01	1.68	0.60	29.61	0.48	0.02	29.63	65.00	45.6	P:CC4
45.00	-38.09	-0.10	38.09		-25.95	-27.42	0.12	-594.10	2.26	0.60	33.14	0.45	0.02	33.15	65.00	51.0	Tube 3
50.00	-33.60	-0.09	33.60	4.15	-28.40	-27.66	0.11	-731.17	2.82	0.60	35.57	0.42	0.02	35.57	65.00	54.7	P:CC5
50.25	-33.38	-0.09	33.38	4.13	-35.63	-37.00	0.11	-744.58	2.85	0.60	36.17	0.56	0.02	36.19	65.00	55.7	P:C2
55.13	-29.30	-0.08	29.30		-36.62	-37.00	0.11	-924.94	3.40	0.60	39.57	0.53	0.01	39.58	65.00	60.9	Tube 3
60.00	-25.51	-0.07	25.51	3.56	-39.36	-37.12	0.11	-1105.02	3.94	0.60	42.02	0.50	0.01	42.04	65.00	64.7	P:CC6
62.25	-23.87	-0.06	23.87	3.43	-46.89	-46.35	0.11	-1194.99	4.18	0.60	43.29	0.61	0.01	43.31	65.00	66.6	P:C3
66.13	-21.17	-0.05	21.17		-47.81	-46.35	0.11	-1374.58	4.60	0.60	45.62	0.58	0.01	45.63	65.00	70.2	Tube 3
70.00	-18.66	-0.05	18.66	2.97	-50.53	-46.39	0.11	-1553.82	5.01	0.60	47.45	0.56	0.01	47.47	65.00	73.0	P:CC7
72.25	-17.30	-0.04	17.30		-51.39	-46.39	0.10	-1658.20	5.25	0.60	48.33	0.55	0.01	48.33	65.00	74.4	SpliceT
75.00	-15.71	-0.04	15.71		-52.57	-46.34	0.10	-1785.64	5.53	0.60	44.10	0.47	0.01	44.10	65.00	67.9	Splice
77.75	-14.20	-0.04	14.20		-53.48	-46.30	0.10	-1912.97	5.81	0.60	44.70	0.45	0.01	44.70	65.00	68.8	SpliceB
80.00	-13.04	-0.03	13.04	2.41	-56.49	-46.37	0.10	-2017.05	6.03	0.60	45.13	0.44	0.01	45.14	65.00	69.4	P:CC8
85.00	-10.64	-0.03	10.64		-57.95	-46.37	0.10	-2248.89	6.52	0.60	45.76	0.42	0.01	45.77	65.00	70.4	Tube 4
90.00	-8.51	-0.02	8.51	1.9	-61.44	-46.32	0.09	-2480.17	6.99	0.60	46.15	0.40	0.01	46.15	65.00	71.0	P:CC9
95.00	-6.64	-0.02	6.64		-62.99	-46.32	0.09	-2711.75	7.45	0.60	46.28	0.39	0.01	46.28	65.00	71.2	Tube 4
100.00	-5.02	-0.01	5.02	1.43	-66.10	-46.28	0.09	-2942.75	7.89	0.60	46.24	0.37	0.01	46.25	65.00	71.2	P:CC10
102.00	-4.44	-0.01	4.44		-67.39	-46.28	0.09	-3035.30	8.06	0.60	46.21	0.37	0.00	46.21	65.00	71.1	SpliceT
105.50	-3.51	-0.01	3.51		-69.36	-46.22	0.08	-3197.06	8.35	0.60	47.76	0.36	0.00	47.76	65.00	73.5	Splice

℄ SPRINT ANTENNAS
EL. ±120'-0" AGL

SPRINT (PROPOSED):
THREE (3) COMMSCOPE DHHTT65B-3XR PANEL ANTENNAS, THREE (3) RFS KIT-FD9R6004/1C-DL DIPLEXERS AND THREE (3) CCI DPO-7126Y-0-T1 DIPLEXERS MOUNTED ON ONE (1) SITEPRO 12-FT LOW PROFILE PLATFORM (P/N RMQP-372)





2 / EL-1 **COAX CABLE PLAN**
SCALE: NOT TO SCALE

1 / EL-1 **TOWER & MAST ELEVATION**
SCALE: NOT TO SCALE

REVISIONS		
00	12/5/17	ISSUED FOR REVIEW
01	12/13/17	ISSUED FOR REVIEW
02	1/22/18	CONSTRUCTION

CENTEK engineering
Centered on Solutions℠
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

CT81XC008
EVERSOURCE 830

560B HAWLEY LANE
STRATFORD, CT 06614

PROJECT NO:	17159.23
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	12/5/17

TOWER ELEVATION

EL-1

DWG. 1 OF 1

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

Subject: Load Analysis of Sprint Equipment on Structure #830

Location: Stratford, CT

Rev. 2: 1/22/17

Prepared by: T.J.L Checked by: C.F.C.
Job No. 17159.23

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 := 120	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 = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.315$ (NESC 2007 Table 250-2)

Exposure Factor = $Es := 0.346 \left[\frac{33}{(0.67 \cdot TME)}\right]^{\frac{1}{7}} = 0.305$ (NESC 2007 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TME}{220}\right)} = 0.83$ (NESC 2007 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.856$ (NESC 2007 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 34.9$ psf (NESC 2007 Section 250.C.2)

NESC Extreme Ice w/ Wind Components

Heavy Wind Pressure =	$p_{ex} := 6.4$	psf	(User Input NESC 2007 Figure 250-3 & Table 250-4)
Radial Ice Thickness =	$Ir_{ex} := 0.75$	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)

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

Subject:	Load Analysis of Sprint Equipment on Structure #830
Location:	Stratford, CT
Rev. 2: 1/22/17	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.23

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Commscope DHHTT65B-3XR		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72.1$	in	(User Input)
Antenna Width =	$W_{ant} := 11.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.1$	in	(User Input)
Antenna Weight =	$WT_{ant} := 46$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant1} := WT_{ant} \cdot N_{ant} = 138$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6092$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot Ir\right)\left(W_{ant} + 2 \cdot Ir\right)\left(T_{ant} + 2 \cdot Ir\right) - V_{ant} = 1546$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 50$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 150$ lbs

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := \left(L_{ant} + 2 \cdot Ir_{ex}\right)\left(W_{ant} + 2 \cdot Ir_{ex}\right)\left(T_{ant} + 2 \cdot Ir_{ex}\right) - V_{ant} = 2390$ cu in

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := \frac{V_{ice.ex}}{1728} \cdot Id = 77$ lbs

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant1} := W_{ICE.exant} \cdot N_{ant} = 232$ lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{\left(L_{ant} + 2 \cdot Ir\right) \cdot \left(W_{ant} + 2 \cdot Ir\right)}{144} = 6.5$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 19.6$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 126$ lbs

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 6$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 17.9$ sf

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1246$ 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 = $SA_{ICE.exant} := \frac{\left(L_{ant} + 2 \cdot Ir_{ex}\right) \cdot \left(W_{ant} + 2 \cdot Ir_{ex}\right)}{144} = 6.8$ sf

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 20.5$ sf

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant1} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 263$ lbs

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

Subject: Load Analysis of Sprint Equipment on Structure #830

Location: Stratford, CT

Rev. 2: 1/22/17

Prepared by: T.J.L Checked by: C.F.C.
Job No. 17159.23

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS KIT-FD9R6004/1C-DL Diplexer		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 5.8$	in	(User Input)
Antenna Width =	$W_{ant} := 6.5$	in	(User Input)
Antenna Thickness =	$T_{ant} := 4.6$	in	(User Input)
Antenna Weight =	$WT_{ant} := 7$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant2} := WT_{ant} \cdot N_{ant} = 21$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 173$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot Ir\right)\left(W_{ant} + 2 \cdot Ir\right)\left(T_{ant} + 2 \cdot Ir\right) - V_{ant} = 112$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 4$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant2} := W_{ICEant} \cdot N_{ant} = 11$ lbs

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := \left(L_{ant} + 2 \cdot Ir_{ex}\right)\left(W_{ant} + 2 \cdot Ir_{ex}\right)\left(T_{ant} + 2 \cdot Ir_{ex}\right) - V_{ant} = 183$ cu in

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := \frac{V_{ice.ex}}{1728} \cdot Id = 6$ lbs

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant2} := W_{ICE.exant} \cdot N_{ant} = 18$ lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{\left(L_{ant} + 2 \cdot Ir\right) \cdot \left(W_{ant} + 2 \cdot Ir\right)}{144} = 0.4$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 1.1$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant2} := p \cdot Cd_F \cdot A_{ICEant} = 7$ lbs

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.3$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 0.8$ sf

Total Antenna Wind Force = $F_{ant2} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 55$ 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 = $SA_{ICE.exant} := \frac{\left(L_{ant} + 2 \cdot Ir_{ex}\right) \cdot \left(W_{ant} + 2 \cdot Ir_{ex}\right)}{144} = 0.4$ sf

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 1.2$ sf

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant2} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 16$ lbs

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

Subject: Load Analysis of Sprint Equipment on Structure #830

Location: Stratford, CT

Rev. 2: 1/22/17

Prepared by: T.J.L Checked by: C.F.C.
Job No. 17159.23

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	CCI DPO-7126Y-0-T1 Diplexer		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 4.07$	in	(User Input)
Antenna Width =	$W_{ant} := 7.42$	in	(User Input)
Antenna Thickness =	$T_{ant} := 6.26$	in	(User Input)
Antenna Weight =	$WT_{ant} := 8$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant3} := WT_{ant} \cdot N_{ant} = 24$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 189$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot Ir\right)\left(W_{ant} + 2 \cdot Ir\right)\left(T_{ant} + 2 \cdot Ir\right) - V_{ant} = 121$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 4$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant3} := W_{ICEant} \cdot N_{ant} = 12$ lbs

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := \left(L_{ant} + 2 \cdot Ir_{ex}\right)\left(W_{ant} + 2 \cdot Ir_{ex}\right)\left(T_{ant} + 2 \cdot Ir_{ex}\right) - V_{ant} = 197$ cu in

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := \frac{V_{ice.ex}}{1728} \cdot Id = 6$ lbs

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant3} := W_{ICE.exant} \cdot N_{ant} = 19$ lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{\left(L_{ant} + 2 \cdot Ir\right) \cdot \left(W_{ant} + 2 \cdot Ir\right)}{144} = 0.3$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 0.9$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant3} := p \cdot Cd_F \cdot A_{ICEant} = 6$ lbs

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.2$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 0.6$ sf

Total Antenna Wind Force = $F_{ant3} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 44$ 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 = $SA_{ICE.exant} := \frac{\left(L_{ant} + 2 \cdot Ir_{ex}\right) \cdot \left(W_{ant} + 2 \cdot Ir_{ex}\right)}{144} = 0.3$ sf

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 1$ sf

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant3} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 13$ lbs

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

Subject:	Load Analysis of Sprint Equipment on Structure #830
Location:	Stratford, CT
Rev. 2: 1/22/17	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.23

Development of Wind & Ice Load on Platform

Platform Data:

Platform Model =	SitePro 12-ft Low Profile Platform RMQP-372		
Mount Shape =	Flat		
Mount Projected Surface Area =	$CdAa := 16$	sf	(User Input)
Mount Projected Surface Area w/ Ice =	$CdAa_{ice} := 19$	sf	(User Input)
Mount Projected Surface Area w/ Extreme Ice =	$CdAa_{ice.ex} := 23$	sf	(User Input)
Mount Weight =	$WT_{mnt} := 1720$	lbs	(User Input)
Mount Weight w/ Ice =	$WT_{mnt.ice} := 2000$	lbs	(User Input)
Mount Weight w/ Extreme Ice =	$WT_{mnt.ice.ex} := 2400$	lbs	(User Input)

Gravity Loads (without ice)

Weight of All Mounts = $Wt_{mnt1} := WT_{mnt} = 1720$ lbs

Gravity Load (ice only)

Weight of Ice on All Mounts = $Wt_{ice.mnt1} := \left(WT_{mnt.ice} - WT_{mnt}\right) = 280$ lbs

Gravity Load (ice only)

Weight of Ice on All Mounts = $Wt_{ice.ex.mnt1} := \left(WT_{mnt.ice.ex} - WT_{mnt}\right) = 680$ lbs

Wind Load (NESC Heavy)

Total Mount Wind Force w/ Ice = $Fi_{mnt1} := p \cdot CdAa_{ice} = 76$ lbs

Wind Load (NESC Extreme)

Total Mount Wind Force = $F_{mnt1} := qz \cdot CdAa \cdot m = 697$ lbs

Wind Load (NESC Extreme Ice w/ Wind)

Total Mount Wind Force = $Fi_{ex.mnt1} := qz \cdot CdAa \cdot m = 697$ lbs

Total Equipment Loads:

NESC Heavy Wind Vertical =

$$\left(Wt_{ant1} + Wt_{ice.ant1} + Wt_{ant2} + Wt_{ice.ant2} + Wt_{ant3} + Wt_{ice.ant3} + Wt_{mnt1} + Wt_{ice.mnt1}\right)\cdot 1.5 = 3534 \text{ lbs}$$

NESC Heavy Wind Trasnsverse = $\left(Fi_{ant1} + Fi_{ant2} + Fi_{ant3} + Fi_{mnt1}\right)\cdot 2.5 = 536$ lbs

NESC Extreme Wind Vertical = $\left(Wt_{ant1} + Wt_{ant2} + Wt_{ant3} + Wt_{mnt1}\right) = 1903$ lbs

NESC Extreme Wind Trasnsverse = $\left(F_{ant1} + F_{ant2} + F_{ant3} + F_{mnt1}\right) = 2042$ lbs

NESC Extreme Ice w/ Wind Vertical =

$$NESC_{ice.ex} := Wt_{ant1} + Wt_{ice.ex.ant1} + Wt_{ant2} + Wt_{ice.ex.ant2} + Wt_{ant3} + Wt_{ice.ex.ant3} + Wt_{mnt1} + Wt_{ice.ex.mnt1} = 2852 \text{ lbs}$$

NESC Extreme Ice w/ Wind Trasnsverse = $\left(Fi_{ex.ant1} + Fi_{ex.ant2} + Fi_{ex.ant3} + Fi_{ex.mnt1}\right) = 989$ lbs

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

Subject:	Coax Cable on Pole #830
Location:	Stratford, CT
Rev. 2: 1/22/18	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.23

Coax Cable on Pole

Distance Between Coax Cable Attach Points =

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

Diameter of Coax Cable = $D_{coax} := 1.98 \cdot in$ *(User Input)*

Weight of Coax Cable = $W_{coax} := 1.04 \cdot plf$ *(User Input)*

Number of Coax Cables = $N_{coax} := 18$ *(User Input)*

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

Extreme Wind Pressure = $qz := 34.9 \cdot psf$ *(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 = $p_{ex} := 6.4 \cdot psf$ *(User Input)*

Extreme Radial Ice Thickness = $Ir_{ex} := 0.75 \cdot in$ *(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 = $A := \left(NP_{coax} \cdot D_{coax}\right) = 7.92 \cdot in$

Wind Area with Ice = $A_{ice} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right) = 8.92 \cdot in$

Wind Area with Extreme Ice = $A_{ice.ex} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir_{ex}\right) = 9.42 \cdot in$

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

Subject:	Coax Cable on Pole #830
Location:	Stratford, CT
Rev. 2: 1/22/18	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.23

Ice Area per Liner Ft =

$$Ai_{coax} := \frac{\pi}{4}\cdot\left[\left(D_{coax} + 2\cdot Ir\right)^2 - D_{coax}^2\right] = 0.027\,ft^2$$

Weight of Ice on All Coax Cables =

$$W_{ice} := Ai_{coax}\cdot Id\cdot N_{coax} = 27.269\cdot plf$$

Extreme Ice Area per Liner Ft =

$$Ai_{coax.ex} := \frac{\pi}{4}\cdot\left[\left(D_{coax} + 2\cdot Ir_{ex}\right)^2 - D_{coax}^2\right] = 0.045\,ft^2$$

Weight of Extreme Ice on All Coax Cables =

$$W_{ice.ex} := Ai_{coax.ex}\cdot Id\cdot N_{coax} = 45.027\cdot plf$$

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 =

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

$$Heavy_{Vert} = \begin{pmatrix}690\\690\\690\\690\\690\\690\\690\\690\\690\\690\\690\\690\end{pmatrix} lb \qquad Heavy_{Trans} = \begin{pmatrix}119\\119\\119\\119\\119\\119\\119\\119\\119\\119\\119\\119\end{pmatrix} lb$$

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 =

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

$$Extreme\_Wind_{Vert} = \begin{pmatrix}187\\187\\187\\187\\187\\187\\187\\187\\187\\187\\187\\187\end{pmatrix} lb \qquad Extreme\_Wind_{Trans} = \begin{pmatrix}369\\369\\369\\369\\369\\369\\369\\369\\369\\369\\369\\369\end{pmatrix} lb$$

Extreme Ice w/ Wind Vertical Load =

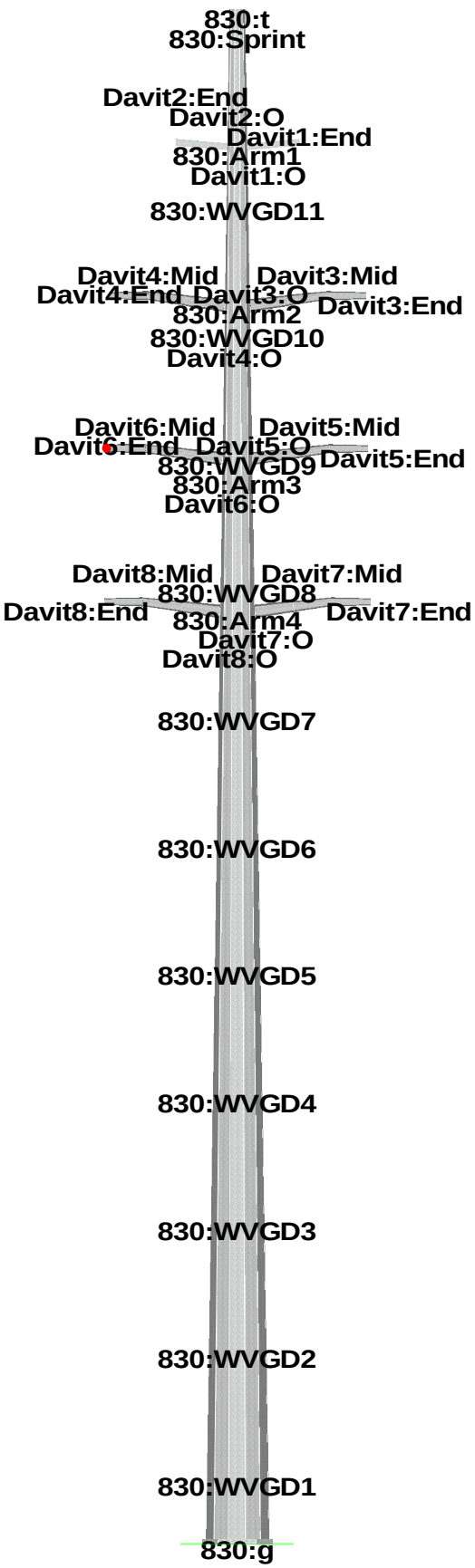
$$Extreme\_Ice_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax} + W_{ice.ex}\right) \cdot Coax_{Span} \cdot OF_{EIV}\right]}$$

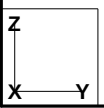
Extreme Ice w/ Wind Transverse Load =

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

$$Extreme\_Ice_{Vert} = \begin{pmatrix} 637 \\ 637 \\ 637 \\ 637 \\ 637 \\ 637 \\ 637 \\ 637 \\ 637 \\ 637 \\ 637 \end{pmatrix} lb \qquad Extreme\_Ice_{Trans} = \begin{pmatrix} 80 \\ 80 \\ 80 \\ 80 \\ 80 \\ 80 \\ 80 \\ 80 \\ 80 \\ 80 \\ 80 \end{pmatrix} lb$$

Centek Engineering Inc, Project: "Structure # 830"
PLS-POLE Version 12.50, 10:06:26 AM Monday, January 22, 2018
Undeformed geometry displayed





Project Name : 17159.23 - Stratford, CT
Project Notes: Str # 830/Sprint - CT81XC008
Project File : J:\Jobs\1715900.WI\23_CT81XC008 Stratford\04_Structural\Backup Documentation\Rev (2)\Calcs\PLS Pole\Structure # 830.pol
Date run : 10:05:53 AM Monday, January 22, 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\1715900.wi\23_ct81xc008 stratford\04_structural\backup documentation\rev (2)\calcs\pls pole\cl&p #830.lca

*** Analysis Results:

Maximum element usage is 72.20% for Base Plate "830" in load case "NESC Heavy Wind"
Maximum insulator usage is 8.23% for Clamp "Clamp3" in load case "NESC Heavy 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	830:g	-0.13	-49.59	-71.72	49.59	4368.31	-6.50	4368.32	-0.00	0.00
NESC Extreme Wind	830:g	-0.04	-54.80	-39.52	54.80	4370.80	-2.05	4370.80	-0.00	0.00
NESC Extreme Ice w/ Wind	830:g	-0.05	-38.31	-60.72	38.31	3421.46	-2.59	3421.46	-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	830:t	0.06	58.00	-1.57	58.02	0.00	-3.95	0.00
NESC Extreme Wind	830:t	0.02	56.03	-1.44	56.04	0.00	-3.86	0.00
NESC Extreme Ice w/ Wind	830:t	0.03	46.09	-1.01	46.10	0.00	-3.19	0.00

Tubes Summary:

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)
830	1	355	NESC Extreme Wind	8.08	23.81
830	2	6342	NESC Heavy Wind	59.38	1325.63
830	3	7608	NESC Heavy Wind	64.23	2750.35
830	4	8350	NESC Heavy Wind	70.12	4368.32

*** 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)
830	70.12	NESC Heavy Wind	33	24767.1

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
Davit1	12.33	NESC Extreme Ice w/ Wind	1	97.1
Davit2	9.10	NESC Extreme Ice w/ Wind	1	97.1
Davit3	27.54	NESC Extreme Ice w/ Wind	1	210.4
Davit4	22.44	NESC Extreme Ice w/ Wind	1	210.4
Davit5	27.68	NESC Extreme Ice w/ Wind	1	210.4
Davit6	22.61	NESC Extreme Ice w/ Wind	1	210.4
Davit7	27.88	NESC Extreme Ice w/ Wind	1	210.4
Davit8	22.84	NESC Extreme Ice w/ Wind	1	210.4

*** 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	72.20	830	Base Plate
NESC Extreme Wind	71.30	830	Base Plate
NESC Extreme Ice w/ Wind	56.64	830	Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC Heavy Wind	70.12	830	33
NESC Extreme Wind	69.51	830	33
NESC Extreme Ice w/ Wind	54.99	830	33

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	830	11	21.996	69.605	4368.313	-6.500	36.100	116.491	4	145.724	2.762	72.20
NESC Extreme Wind	830	11	21.996	37.405	4370.804	-2.050	35.648	115.030	4	144.129	2.744	71.30
NESC Extreme Ice w/ Wind	830	11	21.996	58.605	3421.463	-2.595	28.318	91.379	4	114.305	2.446	56.64

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Segment Number
NESC Heavy Wind	26.84	Davit7	1
NESC Extreme Wind	12.76	Davit7	1
NESC Extreme Ice w/ Wind	27.88	Davit7	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	5.55	NESC Heavy Wind	0.0
Clamp2	Clamp	5.55	NESC Heavy Wind	0.0
Clamp3	Clamp	8.23	NESC Heavy Wind	0.0
Clamp4	Clamp	8.23	NESC Heavy Wind	0.0
Clamp5	Clamp	8.23	NESC Heavy Wind	0.0
Clamp6	Clamp	8.23	NESC Heavy Wind	0.0
Clamp7	Clamp	8.23	NESC Heavy Wind	0.0
Clamp8	Clamp	8.23	NESC Heavy Wind	0.0
Clamp9	Clamp	4.47	NESC Heavy Wind	0.0
Clamp10	Clamp	0.88	NESC Heavy Wind	0.0
Clamp11	Clamp	0.88	NESC Heavy Wind	0.0
Clamp12	Clamp	0.88	NESC Heavy Wind	0.0
Clamp13	Clamp	0.88	NESC Heavy Wind	0.0
Clamp14	Clamp	0.88	NESC Heavy Wind	0.0
Clamp15	Clamp	0.88	NESC Heavy Wind	0.0
Clamp16	Clamp	0.88	NESC Heavy Wind	0.0
Clamp17	Clamp	0.88	NESC Heavy Wind	0.0
Clamp18	Clamp	0.88	NESC Heavy Wind	0.0
Clamp19	Clamp	0.88	NESC Heavy Wind	0.0
Clamp20	Clamp	0.88	NESC Heavy Wind	0.0

*** Weight of structure (lbs):

Weight of Tubular Davit Arms:	1456.6
Weight of Steel Poles:	24767.1
Total:	26223.6

*** End of Report

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

Project Name : 17159.23 - Stratford, CT
Project Notes: Str # 830/Sprint - CT81XC008
Project File : J:\Jobs\1715900.WI\23_CT81XC008 Stratford\04_Structural\Backup Documentation\Rev (2)\Calcs\PLS Pole\Structure # 830.pol
Date run     : 10:05:52 AM Monday, January 22, 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)				Coef. (in)	Override (in)	Override (in/ft)		Override (ksi)	Override (lbs/ft^3)	Base	Type	Tip (ft)	Trans. Load (kips)	Long. Load (kips)
830	830	120.00	0	Yes	12F	15.63	59.5	0	1.3	4 tubes	0	0	Calculated	0.000	0.0000	0.0000

Steel Tubes Properties:

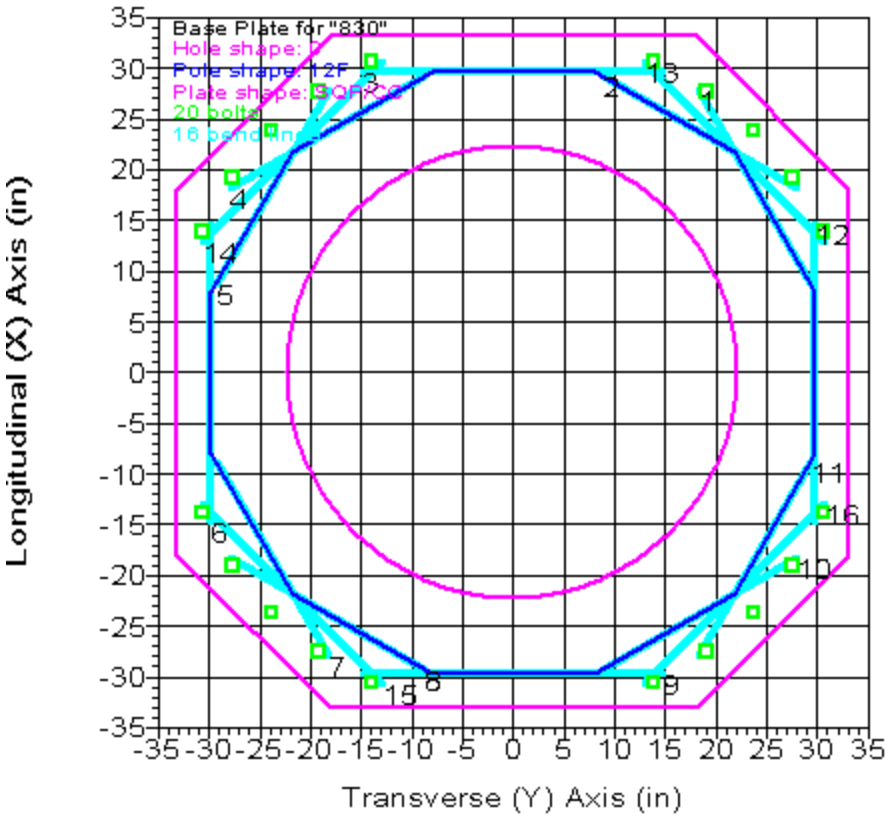
Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Gap (in)	Yield Stress (ksi)	Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. Diameter (in)	1.5x Lap Length (ft)	Actual Diam. Overlap (ft)
830	1	10	0.1875	0.000	0.000	0.000	65.000	0.000	355	5.18	0.37604	15.63	19.39	2.376	0.000
830	2	52.75	0.375	5.500	0.000	0.000	65.000	0.000	6342	29.35	0.37604	19.76	39.60	4.856	5.500
830	3	36.75	0.4375	7.000	0.000	0.000	65.000	0.000	7608	19.35	0.37604	36.78	50.60	6.215	7.000
830	4	33	0.4375	0.000	0.000	0.000	65.000	0.000	8350	17.15	0.37604	47.09	59.50	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)
830	66.250	SQP/CC	3.250	2112	0.000	44.625	0	490.00	50.000	2.250	67.250	20	44905.08	44905.08

Base Plate Bolt Coordinates for Property "830":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0.4126	0.9108	0
0.5688	0.8216	0
0.7063	0.7063	0
0.8216	0.5688	0
0.9108	0.4126	0



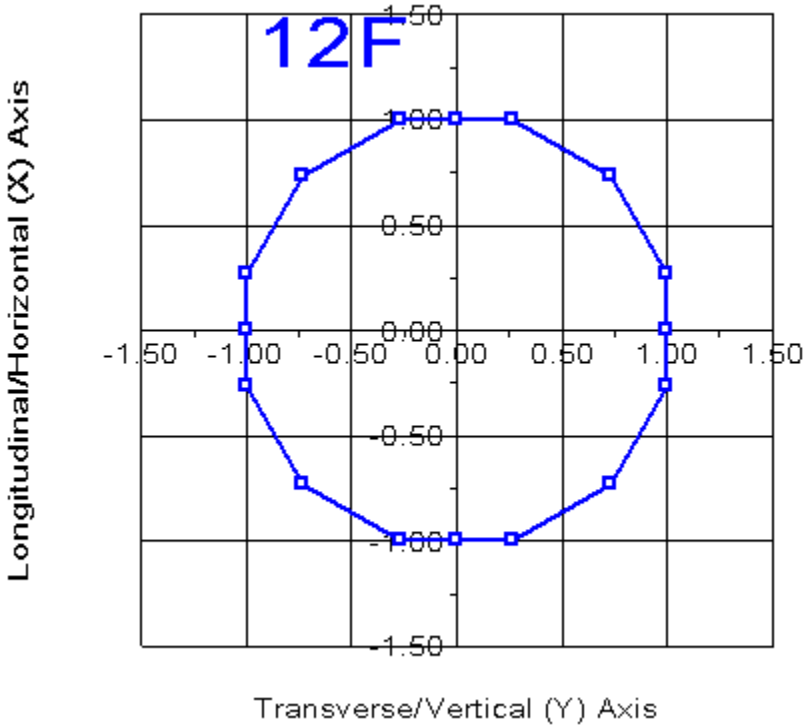
Steel Pole Connectivity:

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)
830			0	0	0	0	0	830	16 labels		0.00	0

Relative Attachment Labels for Steel Pole "830":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
830:Arm1	0.00	109.25
830:Arm2	0.00	96.83
830:Arm3	0.00	84.83
830:Arm4	0.00	72.83
830:Sprint	0.00	119.90

830:WVGD1	0.00	5.00
830:WVGD2	0.00	15.00
830:WVGD3	0.00	25.00
830:WVGD4	0.00	35.00
830:WVGD5	0.00	45.00
830:WVGD6	0.00	55.00
830:WVGD7	0.00	65.00
830:WVGD8	0.00	75.00
830:WVGD9	0.00	85.00
830:WVGD10	0.00	95.00
830:WVGD11	0.00	105.00



Pole Steel Properties:

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

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	T-Moment Inertia (in^4)	L-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	T-Moment Capacity (ft-k)	L-Moment Capacity (ft-k)
830	830:t	830:t Ori	0.00	15.63	9.31	283.93	283.93	0.00	19.6	65.00	65.00	196.86	196.86
830	830:Sprint	830:Sprint End	0.10	15.66	9.33	286.01	286.01	0.00	19.7	65.00	65.00	197.82	197.82
830	830:Sprint	830:Sprint Ori	0.10	15.66	9.33	286.01	286.01	0.00	19.7	65.00	65.00	197.82	197.82
830	#830:0	Tube 1 End	5.05	17.52	10.45	402.12	402.12	0.00	22.4	65.00	65.00	248.59	248.59

830	#830:0	Tube 1 Ori	5.05	17.52	10.45	402.12	402.12	0.00	22.4	65.00	65.00	248.59	248.59
830	#830:1	SpliceT End	10.00	19.39	11.57	546.03	546.03	0.00	25.0	65.00	65.00	305.14	305.14
830	#830:1	SpliceT Ori	10.00	19.76	23.37	1124.68	1124.68	0.00	11.4	65.00	65.00	616.59	616.59
830	830:Arm1	830:Arm1 End	10.75	20.04	23.71	1174.47	1174.47	0.00	11.6	65.00	65.00	634.82	634.82
830	830:Arm1	830:Arm1 Ori	10.75	20.04	23.71	1174.47	1174.47	0.00	11.6	65.00	65.00	634.82	634.82
830	830:WVGD11	830:WVGD11 End	15.00	21.64	25.64	1484.61	1484.61	0.00	12.8	65.00	65.00	743.20	743.20
830	830:WVGD11	830:WVGD11 Ori	15.00	21.64	25.64	1484.61	1484.61	0.00	12.8	65.00	65.00	743.20	743.20
830	#830:2	Tube 2 End	19.08	23.18	27.49	1829.92	1829.92	0.00	13.9	65.00	65.00	855.37	855.37
830	#830:2	Tube 2 Ori	19.08	23.18	27.49	1829.92	1829.92	0.00	13.9	65.00	65.00	855.37	855.37
830	830:Arm2	830:Arm2 End	23.17	24.71	29.34	2225.02	2225.02	0.00	15.0	65.00	65.00	975.42	975.42
830	830:Arm2	830:Arm2 Ori	23.17	24.71	29.34	2225.02	2225.02	0.00	15.0	65.00	65.00	975.42	975.42
830	830:WVGD10	830:WVGD10 End	25.00	25.40	30.18	2419.45	2419.45	0.00	15.5	65.00	65.00	1031.88	1031.88
830	830:WVGD10	830:WVGD10 Ori	25.00	25.40	30.18	2419.46	2419.46	0.00	15.5	65.00	65.00	1031.88	1031.88
830	#830:3	Tube 2 End	30.00	27.28	32.44	3006.68	3006.68	0.00	16.8	65.00	65.00	1193.95	1193.95
830	#830:3	Tube 2 Ori	30.00	27.28	32.44	3006.69	3006.69	0.00	16.8	65.00	65.00	1193.95	1193.95
830	830:WVGD9	830:WVGD9 End	35.00	29.16	34.71	3681.99	3681.99	0.00	18.2	65.00	65.00	1367.84	1367.84
830	830:WVGD9	830:WVGD9 Ori	35.00	29.16	34.71	3681.99	3681.99	0.00	18.2	65.00	65.00	1367.84	1367.84
830	830:Arm3	830:Arm3 End	35.17	29.22	34.79	3706.14	3706.14	0.00	18.2	65.00	65.00	1373.85	1373.85
830	830:Arm3	830:Arm3 Ori	35.17	29.22	34.79	3706.14	3706.14	0.00	18.2	65.00	65.00	1373.85	1373.85
830	#830:4	Tube 2 End	40.08	31.07	37.01	4465.22	4465.22	0.00	19.5	65.00	65.00	1556.75	1556.75
830	#830:4	Tube 2 Ori	40.08	31.07	37.01	4465.22	4465.22	0.00	19.5	65.00	65.00	1556.75	1556.75
830	830:WVGD8	830:WVGD8 End	45.00	32.92	39.24	5321.45	5321.45	0.00	20.8	65.00	65.00	1751.08	1751.08
830	830:WVGD8	830:WVGD8 Ori	45.00	32.92	39.24	5321.46	5321.46	0.00	20.8	65.00	65.00	1751.09	1751.09
830	830:Arm4	830:Arm4 End	47.17	33.74	40.23	5731.21	5731.21	0.00	21.4	65.00	65.00	1840.37	1840.37
830	830:Arm4	830:Arm4 Ori	47.17	33.74	40.23	5731.21	5731.21	0.00	21.4	65.00	65.00	1840.37	1840.37
830	#830:5	Tube 2 End	51.08	35.21	42.00	6524.17	6524.17	0.00	22.5	65.00	65.00	2007.36	2007.36
830	#830:5	Tube 2 Ori	51.08	35.21	42.00	6524.17	6524.17	0.00	22.5	65.00	65.00	2007.36	2007.36
830	830:WVGD7	830:WVGD7 End	55.00	36.68	43.78	7387.08	7387.08	0.00	23.5	65.00	65.00	2181.61	2181.61
830	830:WVGD7	830:WVGD7 Ori	55.00	36.68	43.78	7387.08	7387.08	0.00	23.5	65.00	65.00	2181.61	2181.61
830	#830:6	SpliceT End	57.25	37.53	44.80	7915.61	7915.61	0.00	24.1	65.00	65.00	2285.00	2285.00
830	#830:6	SpliceT Ori	57.25	37.53	44.80	7915.61	7915.61	0.00	24.1	65.00	65.00	2285.00	2285.00
830	#830:7	Tube 2 End	60.00	37.81	52.58	9401.45	9401.45	0.00	20.5	65.00	65.00	2693.52	2693.52
830	#830:7	Tube 2 Ori	60.00	37.81	52.58	9401.45	9401.45	0.00	20.5	65.00	65.00	2693.52	2693.52
830	#830:8	SpliceB End	62.75	38.85	54.03	10203.54	10203.54	0.00	21.1	65.00	65.00	2845.50	2845.50
830	#830:8	SpliceB Ori	62.75	38.85	54.03	10203.54	10203.54	0.00	21.1	65.00	65.00	2845.50	2845.50
830	830:WVGD6	830:WVGD6 End	65.00	39.69	55.22	10892.75	10892.75	0.00	21.6	65.00	65.00	2972.95	2972.95
830	830:WVGD6	830:WVGD6 Ori	65.00	39.69	55.22	10892.75	10892.75	0.00	21.6	65.00	65.00	2972.95	2972.95
830	#830:9	Tube 3 End	70.00	41.57	57.87	12533.97	12533.97	0.00	22.8	65.00	65.00	3266.18	3266.18
830	#830:9	Tube 3 Ori	70.00	41.57	57.87	12533.97	12533.97	0.00	22.8	65.00	65.00	3266.18	3266.18
830	830:WVGD5	830:WVGD5 End	75.00	43.45	60.51	14332.29	14332.29	0.00	23.9	65.00	65.00	3573.19	3573.19
830	830:WVGD5	830:WVGD5 Ori	75.00	43.45	60.51	14332.29	14332.29	0.00	23.9	65.00	65.00	3573.19	3573.19
830	#830:10	Tube 3 End	80.00	45.33	63.16	16294.89	16294.89	0.00	25.1	65.00	65.00	3893.99	3893.99
830	#830:10	Tube 3 Ori	80.00	45.33	63.16	16294.89	16294.89	0.00	25.1	65.00	65.00	3893.99	3893.99
830	830:WVGD4	830:WVGD4 End	85.00	47.21	65.80	18428.94	18428.94	0.00	26.2	65.00	65.00	4228.59	4228.59
830	830:WVGD4	830:WVGD4 Ori	85.00	47.21	65.80	18428.95	18428.95	0.00	26.2	65.00	65.00	4228.59	4228.59
830	#830:11	SpliceT End	87.00	47.97	66.86	19332.19	19332.19	0.00	26.7	65.00	65.00	4366.29	4366.29
830	#830:11	SpliceT Ori	87.00	47.97	66.86	19332.19	19332.19	0.00	26.7	65.00	65.00	4366.29	4366.29
830	#830:12	Tube 3 End	90.50	48.41	67.48	19875.48	19875.48	0.00	27.0	65.00	65.00	4448.08	4448.08
830	#830:12	Tube 3 Ori	90.50	48.41	67.48	19875.48	19875.48	0.00	27.0	65.00	65.00	4448.08	4448.08
830	#830:13	SpliceB End	94.00	49.72	69.33	21556.67	21556.67	0.00	27.8	65.00	65.00	4696.63	4696.63
830	#830:13	SpliceB Ori	94.00	49.72	69.33	21556.67	21556.67	0.00	27.8	65.00	65.00	4696.63	4696.63
830	830:WVGD3	830:WVGD3 End	95.00	50.10	69.86	22053.84	22053.84	0.00	28.0	65.00	65.00	4768.89	4768.89
830	830:WVGD3	830:WVGD3 Ori	95.00	50.10	69.86	22053.85	22053.85	0.00	28.0	65.00	65.00	4768.89	4768.89
830	#830:14	Tube 4 End	100.00	51.98	72.51	24654.65	24654.65	0.00	29.2	65.00	65.00	5138.44	5138.44
830	#830:14	Tube 4 Ori	100.00	51.98	72.51	24654.66	24654.66	0.00	29.2	65.00	65.00	5138.44	5138.44
830	830:WVGD2	830:WVGD2 End	105.00	53.86	75.15	27452.30	27452.30	0.00	30.3	65.00	64.54	5482.88	5482.88
830	830:WVGD2	830:WVGD2 Ori	105.00	53.86	75.15	27452.31	27452.31	0.00	30.3	65.00	64.54	5482.88	5482.88
830	#830:15	Tube 4 End	110.00	55.74	77.80	30453.97	30453.97	0.00	31.5	65.00	63.41	5774.43	5774.43
830	#830:15	Tube 4 Ori	110.00	55.74	77.80	30453.98	30453.98	0.00	31.5	65.00	63.41	5774.43	5774.43

830	830:WVGD1	830:WVGD1 End	115.00	57.62	80.44	33666.85	33666.85	0.00	32.6	65.00	62.28	6065.40	6065.40			
830	830:WVGD1	830:WVGD1 Ori	115.00	57.62	80.44	33666.85	33666.85	0.00	32.6	65.00	62.28	6065.40	6065.40			
830	830:g	830:g End	120.00	59.50	83.09	37098.10	37098.10	0.00	33.8	65.00	61.16	6355.07	6355.07			

Tubular Davit Properties:

Davit Property Label	Stock Number	Steel Shape	Thickness (in)	Base Diameter or Depth (in)	Tip Diameter or Depth (in)	Taper (in/ft)	Drag Coef.	Modulus of Elasticity (ksi)	Geometry	Strength Check Type	Vertical Capacity (lbs)	Tension Capacity (lbs)	Compres. Capacity (lbs)	Long. Capacity (lbs)	Yield Stress (ksi)	Weight Density Override (lbs/ft^3)
AK	AK	4F	0.3125	6	6	0	1	29000	1 point	Calculated	0	0	0	0	65	0
AL	AL	8T	0.25	11	6	0	1	29000	2 points	Calculated	0	0	0	0	65	0

Intermediate Joints for Davit Property "AK":

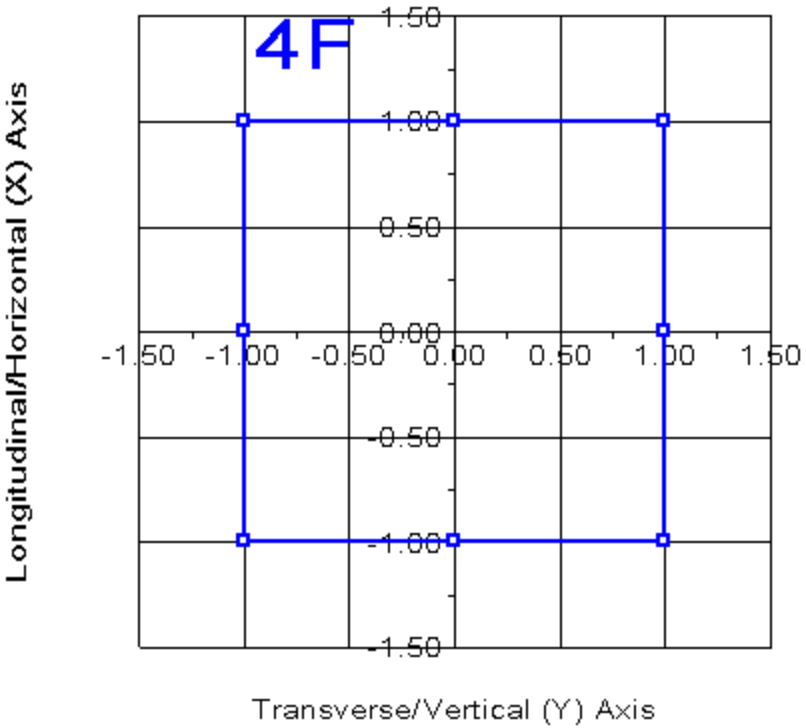
Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
End	4	-0.333

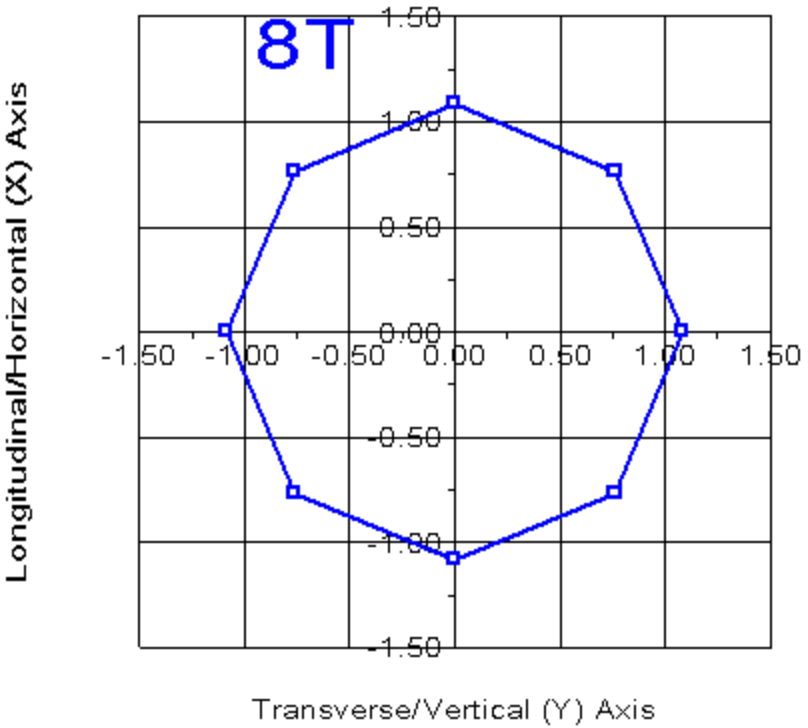
Intermediate Joints for Davit Property "AL":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
Mid	6	-0.75
End	9	-0.75

Tubular Davit Arm Connectivity:

Davit Label	Attach Label	Davit Property Set	Azimuth (deg)
Davit1	830:Arm1	AK	0
Davit2	830:Arm1	AK	180
Davit3	830:Arm2	AL	0
Davit4	830:Arm2	AL	180
Davit5	830:Arm3	AL	0
Davit6	830:Arm3	AL	180
Davit7	830:Arm4	AL	0
Davit8	830:Arm4	AL	180


4F
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
Longitudinal/Horizontal (X) Axis
Transverse/Vertical (Y) Axis



Tubular Davit Arm Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	V-Moment Inertia (in^4)	H-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	V-Moment Capacity (ft-k)	H-Moment Capacity (ft-k)
Davit1	Davit1:O	Origin	0.00	6.00	7.11	38.44	38.44	0.00	9.2	65.00	65.00	69.41	69.41
Davit1	Davit1:End	End	4.01	6.00	7.11	38.44	38.44	0.00	9.2	65.00	65.00	69.41	69.41
Davit2	Davit2:O	Origin	0.00	6.00	7.11	38.44	38.44	0.00	9.2	65.00	65.00	69.41	69.41
Davit2	Davit2:End	End	4.01	6.00	7.11	38.44	38.44	0.00	9.2	65.00	65.00	69.41	69.41
Davit3	Davit3:O	Origin	0.00	11.00	8.91	136.07	136.07	0.00	14.1	65.00	65.00	123.81	123.81
Davit3	#Davit3:0	End	3.02	9.33	7.52	81.99	81.99	0.00	11.3	65.00	65.00	87.96	87.96
Davit3	#Davit3:0	Origin	3.02	9.33	7.52	81.99	81.99	0.00	11.3	65.00	65.00	87.96	87.96
Davit3	Davit3:Mid	End	6.05	7.66	6.14	44.56	44.56	0.00	8.5	65.00	65.00	58.23	58.23
Davit3	Davit3:Mid	Origin	6.05	7.66	6.14	44.56	44.56	0.00	8.5	65.00	65.00	58.23	58.23
Davit3	Davit3:End	End	9.05	6.00	4.76	20.85	20.85	0.00	5.8	65.00	65.00	34.78	34.78
Davit4	Davit4:O	Origin	0.00	11.00	8.91	136.07	136.07	0.00	14.1	65.00	65.00	123.81	123.81
Davit4	#Davit4:0	End	3.02	9.33	7.52	81.99	81.99	0.00	11.3	65.00	65.00	87.96	87.96
Davit4	#Davit4:0	Origin	3.02	9.33	7.52	81.99	81.99	0.00	11.3	65.00	65.00	87.96	87.96
Davit4	Davit4:Mid	End	6.05	7.66	6.14	44.56	44.56	0.00	8.5	65.00	65.00	58.23	58.23

Davit4	Davit4:Mid	Origin	6.05	7.66	6.14	44.56	44.56	0.00	8.5	65.00	65.00	58.23	58.23
Davit4	Davit4:End	End	9.05	6.00	4.76	20.85	20.85	0.00	5.8	65.00	65.00	34.78	34.78
Davit5	Davit5:O	Origin	0.00	11.00	8.91	136.07	136.07	0.00	14.1	65.00	65.00	123.81	123.81
Davit5	#Davit5:0	End	3.02	9.33	7.52	81.99	81.99	0.00	11.3	65.00	65.00	87.96	87.96
Davit5	#Davit5:0	Origin	3.02	9.33	7.52	81.99	81.99	0.00	11.3	65.00	65.00	87.96	87.96
Davit5	Davit5:Mid	End	6.05	7.66	6.14	44.56	44.56	0.00	8.5	65.00	65.00	58.23	58.23
Davit5	Davit5:Mid	Origin	6.05	7.66	6.14	44.56	44.56	0.00	8.5	65.00	65.00	58.23	58.23
Davit5	Davit5:End	End	9.05	6.00	4.76	20.85	20.85	0.00	5.8	65.00	65.00	34.78	34.78
Davit6	Davit6:O	Origin	0.00	11.00	8.91	136.07	136.07	0.00	14.1	65.00	65.00	123.81	123.81
Davit6	#Davit6:0	End	3.02	9.33	7.52	81.99	81.99	0.00	11.3	65.00	65.00	87.96	87.96
Davit6	#Davit6:0	Origin	3.02	9.33	7.52	81.99	81.99	0.00	11.3	65.00	65.00	87.96	87.96
Davit6	Davit6:Mid	End	6.05	7.66	6.14	44.56	44.56	0.00	8.5	65.00	65.00	58.23	58.23
Davit6	Davit6:Mid	Origin	6.05	7.66	6.14	44.56	44.56	0.00	8.5	65.00	65.00	58.23	58.23
Davit6	Davit6:End	End	9.05	6.00	4.76	20.85	20.85	0.00	5.8	65.00	65.00	34.78	34.78
Davit7	Davit7:O	Origin	0.00	11.00	8.91	136.07	136.07	0.00	14.1	65.00	65.00	123.81	123.81
Davit7	#Davit7:0	End	3.02	9.33	7.52	81.99	81.99	0.00	11.3	65.00	65.00	87.96	87.96
Davit7	#Davit7:0	Origin	3.02	9.33	7.52	81.99	81.99	0.00	11.3	65.00	65.00	87.96	87.96
Davit7	Davit7:Mid	End	6.05	7.66	6.14	44.56	44.56	0.00	8.5	65.00	65.00	58.23	58.23
Davit7	Davit7:Mid	Origin	6.05	7.66	6.14	44.56	44.56	0.00	8.5	65.00	65.00	58.23	58.23
Davit7	Davit7:End	End	9.05	6.00	4.76	20.85	20.85	0.00	5.8	65.00	65.00	34.78	34.78
Davit8	Davit8:O	Origin	0.00	11.00	8.91	136.07	136.07	0.00	14.1	65.00	65.00	123.81	123.81
Davit8	#Davit8:0	End	3.02	9.33	7.52	81.99	81.99	0.00	11.3	65.00	65.00	87.96	87.96
Davit8	#Davit8:0	Origin	3.02	9.33	7.52	81.99	81.99	0.00	11.3	65.00	65.00	87.96	87.96
Davit8	Davit8:Mid	End	6.05	7.66	6.14	44.56	44.56	0.00	8.5	65.00	65.00	58.23	58.23
Davit8	Davit8:Mid	Origin	6.05	7.66	6.14	44.56	44.56	0.00	8.5	65.00	65.00	58.23	58.23
Davit8	Davit8:End	End	9.05	6.00	4.76	20.85	20.85	0.00	5.8	65.00	65.00	34.78	34.78

*** 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	830:Sprint	clamp	No Limit
Clamp10	830:WVGD1	clamp	No Limit
Clamp11	830:WVGD2	clamp	No Limit

Clamp12	830:WVGD3	clamp	No Limit
Clamp13	830:WVGD4	clamp	No Limit
Clamp14	830:WVGD5	clamp	No Limit
Clamp15	830:WVGD6	clamp	No Limit
Clamp16	830:WVGD7	clamp	No Limit
Clamp17	830:WVGD8	clamp	No Limit
Clamp18	830:WVGD9	clamp	No Limit
Clamp19	830:WVGD10	clamp	No Limit
Clamp20	830:WVGD11	clamp	No Limit

*** Loads Data

Loads from file: j:\jobs\1715900.wi\23_ct81xc008 stratford\04_structural\backup documentation\rev (2)\calcs\pls pole\cl&p #830.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)   120.00 (ft)
  Structure height   120.00 (ft)
  Structure height above ground   120.00 (ft)

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Poles Deflection Tubular Arms and Towers	SF for Wood Poles Deflection	SF for Conc. Poles Check	SF for Conc. Ult. Limit	SF for First Crack	SF for Guys Zero Tens.	SF for and Tubular Cables	SF for Non Tubular Arms	SF For Braces	SF for Insuls.	SF for Found.	Point Loads	Wind/Ice Model	Trans. Wind Pressure (psf)	Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature (deg F)
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	1.0000	20 loads	Wind on All	4	0	0.000	0.000	0.0
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	1.0000	20 loads	NESC 2012	31	0	0.000	0.000	0.0
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	1.0000	20 loads	Wind on All	6.4	0	0.000	0.000	0.0

	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit	No Limit							
	0	0	0	0	0	0	0	0	0	0	0	0	0							

Point Loads for Load Case "NESC Heavy Wind":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	1292	4252	0	Shield Wire
Davit2:End	1292	4252	0	Shield Wire
Davit3:End	3262	5721	0	Conductor
Davit4:End	3262	5721	0	Conductor
Davit5:End	3262	5721	0	Conductor
Davit6:End	3262	5721	0	Conductor
Davit7:End	3262	5721	0	Conductor
Davit8:End	3262	5721	0	Conductor
830:Sprint	3534	536	0	Sprint Equipment
830:WVGD1	690	119	0	Coax Cables
830:WVGD2	690	119	0	Coax Cables
830:WVGD3	690	119	0	Coax Cables
830:WVGD4	690	119	0	Coax Cables
830:WVGD5	690	119	0	Coax Cables

830:WVGD6	690	119	0	Coax Cables
830:WVGD7	690	119	0	Coax Cables
830:WVGD8	690	119	0	Coax Cables
830:WVGD9	690	119	0	Coax Cables
830:WVGD10	690	119	0	Coax Cables
830:WVGD11	690	119	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	359	2616	0	Shield Wire
Davit2:End	359	2616	0	Shield Wire
Davit3:End	1374	5224	0	Conductor
Davit4:End	1374	5224	0	Conductor
Davit5:End	1374	5224	0	Conductor
Davit6:End	1374	5224	0	Conductor
Davit7:End	1374	5224	0	Conductor
Davit8:End	1374	5224	0	Conductor
830:Sprint	1903	2042	0	Sprint Equipment
830:WVGD1	187	369	0	Coax Cables
830:WVGD2	187	369	0	Coax Cables
830:WVGD3	187	369	0	Coax Cables
830:WVGD4	187	369	0	Coax Cables
830:WVGD5	187	369	0	Coax Cables
830:WVGD6	187	369	0	Coax Cables
830:WVGD7	187	369	0	Coax Cables
830:WVGD8	187	369	0	Coax Cables
830:WVGD9	187	369	0	Coax Cables
830:WVGD10	187	369	0	Coax Cables
830:WVGD11	187	369	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 Vertical Load (lbs)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
830	830:t	830:Sprint	120.00	119.90	119.95	15.644	1.33e+006	1.000	32.03	0.00	3.17	4.18	0.00	0.00	4.18	0.00
830	830:Sprint		119.90	114.95	117.43	16.593	1.41e+006	1.000	32.03	0.00	166.60	219.24	0.00	0.00	219.24	0.00
830			114.95	110.00	112.47	18.455	1.56e+006	1.000	32.03	0.00	185.50	243.84	0.00	0.00	243.84	0.00
830		830:Arm1	110.00	109.25	109.62	19.901	1.69e+006	1.000	32.03	0.00	60.09	39.84	0.00	0.00	39.84	0.00
830	830:Arm1	830:WVGD11	109.25	105.00	107.13	20.842	1.77e+006	1.000	32.03	0.00	356.89	236.43	0.00	0.00	236.43	0.00
830	830:WVGD11		105.00	100.92	102.96	22.408	1.9e+006	1.000	32.03	0.00	369.16	244.25	0.00	0.00	244.25	0.00
830		830:Arm2	100.92	96.83	98.87	23.944	2.03e+006	1.000	32.03	0.00	394.89	260.99	0.00	0.00	260.99	0.00
830	830:Arm2	830:WVGD10	96.83	95.00	95.92	25.056	2.12e+006	1.000	32.03	0.00	185.62	122.59	0.00	0.00	122.59	0.00
830	830:WVGD10		95.00	90.00	92.50	26.341	2.23e+006	1.000	32.03	0.00	532.69	351.56	0.00	0.00	351.56	0.00
830		830:WVGD9	90.00	85.00	87.50	28.221	2.39e+006	1.000	32.03	0.00	571.26	376.65	0.00	0.00	376.65	0.00
830	830:WVGD9	830:Arm3	85.00	84.83	84.92	29.193	2.47e+006	1.000	32.03	0.00	19.75	13.01	0.00	0.00	13.01	0.00
830	830:Arm3		84.83	79.92	82.37	30.149	2.55e+006	1.000	32.03	0.00	600.60	395.65	0.00	0.00	395.65	0.00
830		830:WVGD8	79.92	75.00	77.46	31.997	2.71e+006	1.000	32.03	0.00	637.90	419.92	0.00	0.00	419.92	0.00
830	830:WVGD8	830:Arm4	75.00	72.83	73.92	33.329	2.82e+006	1.000	32.03	0.00	293.00	192.79	0.00	0.00	192.79	0.00
830	830:Arm4		72.83	68.92	70.87	34.473	2.92e+006	1.000	32.03	0.00	547.93	360.39	0.00	0.00	360.39	0.00

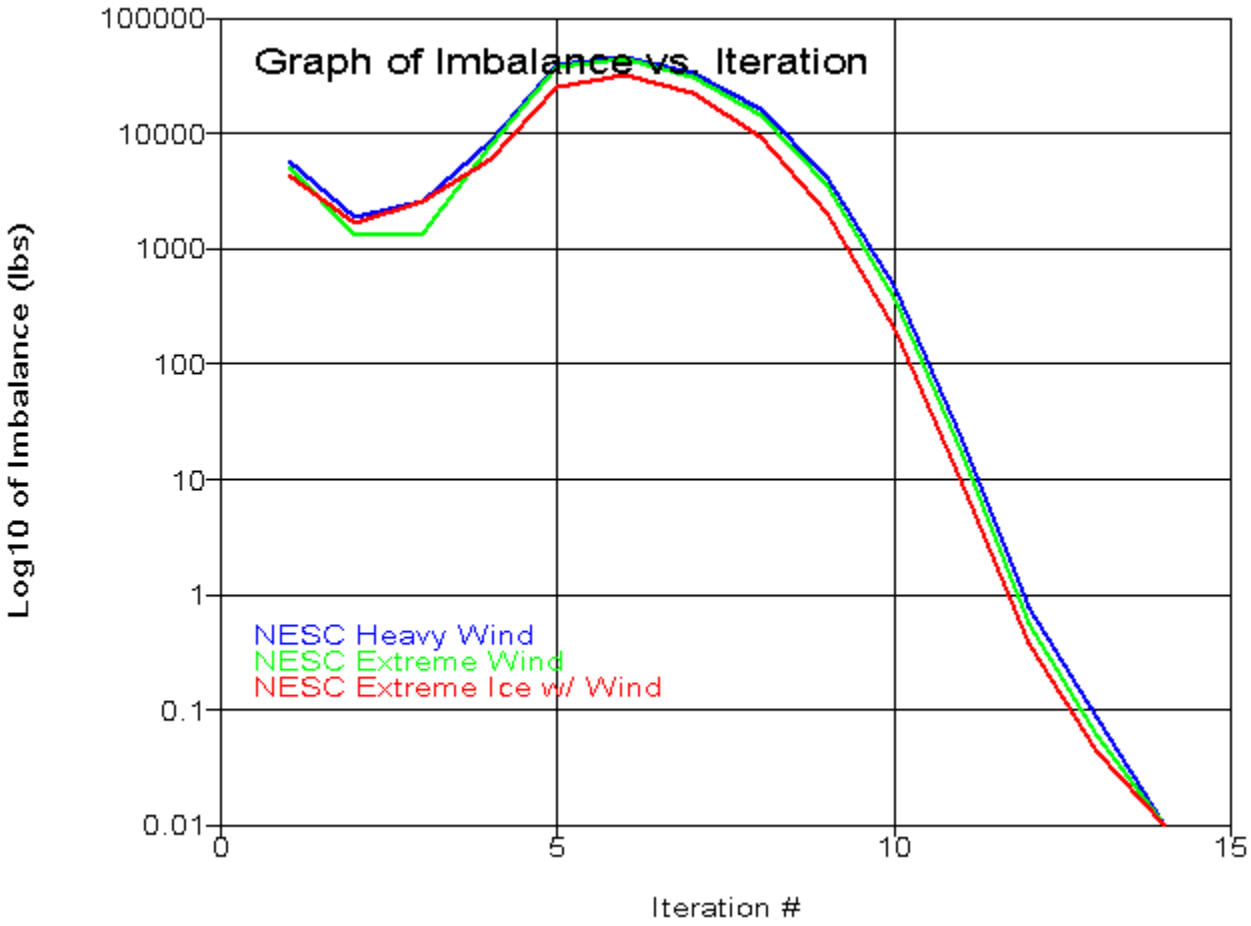
830		830:WVGD7	68.92	65.00	66.96	35.946	3.05e+006	1.000	32.03	0.00	571.60	375.78	0.00	0.00	375.78	0.00
830	830:WVGD7		65.00	62.75	63.87	37.105	3.14e+006	1.000	32.03	0.00	339.08	222.85	0.00	0.00	222.85	0.00
830			62.75	60.00	61.37	37.670	3.19e+006	1.000	32.03	0.00	910.23	276.52	0.00	0.00	276.52	0.00
830			60.00	57.25	58.62	38.330	3.25e+006	1.000	32.03	0.00	935.29	281.36	0.00	0.00	281.36	0.00
830		830:WVGD6	57.25	55.00	56.12	39.270	3.33e+006	1.000	32.03	0.00	418.23	235.85	0.00	0.00	235.85	0.00
830	830:WVGD6		55.00	50.00	52.50	40.633	3.44e+006	1.000	32.03	0.00	962.03	542.30	0.00	0.00	542.30	0.00
830		830:WVGD5	50.00	45.00	47.50	42.513	3.6e+006	1.000	32.03	0.00	1007.04	567.39	0.00	0.00	567.39	0.00
830	830:WVGD5		45.00	40.00	42.50	44.393	3.76e+006	1.000	32.03	0.00	1052.04	592.49	0.00	0.00	592.49	0.00
830		830:WVGD4	40.00	35.00	37.50	46.273	3.92e+006	1.000	32.03	0.00	1097.04	617.58	0.00	0.00	617.58	0.00
830	830:WVGD4		35.00	33.00	34.00	47.590	4.03e+006	1.000	32.03	0.00	451.42	254.06	0.00	0.00	254.06	0.00
830			33.00	29.50	31.25	48.186	4.08e+006	1.000	32.03	0.00	1599.94	450.18	0.00	0.00	450.18	0.00
830			29.50	26.00	27.75	49.065	4.16e+006	1.000	32.03	0.00	1644.05	458.38	0.00	0.00	458.38	0.00
830		830:WVGD3	26.00	25.00	25.50	49.911	4.23e+006	1.000	32.03	0.00	236.82	133.23	0.00	0.00	133.23	0.00
830	830:WVGD3		25.00	20.00	22.50	51.039	4.32e+006	1.000	32.03	0.00	1211.10	681.18	0.00	0.00	681.18	0.00
830		830:WVGD2	20.00	15.00	17.50	52.919	4.48e+006	1.000	32.03	0.00	1256.10	706.28	0.00	0.00	706.28	0.00
830	830:WVGD2		15.00	10.00	12.50	54.799	4.64e+006	1.000	32.03	0.00	1301.10	731.37	0.00	0.00	731.37	0.00
830		830:WVGD1	10.00	5.00	7.50	56.680	4.8e+006	1.000	32.03	0.00	1346.10	756.46	0.00	0.00	756.46	0.00
830	830:WVGD1	830:g	5.00	0.00	2.50	58.560	4.96e+006	1.000	32.03	0.00	1391.10	781.56	0.00	0.00	781.56	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	1861	3366	0	Shield Wire
Davit2:End	1861	3366	0	Shield Wire
Davit3:End	3472	4426	0	Conductor
Davit4:End	3472	4426	0	Conductor
Davit5:End	3472	4426	0	Conductor
Davit6:End	3472	4426	0	Conductor
Davit7:End	3472	4426	0	Conductor
Davit8:End	3472	4426	0	Conductor
830:Sprint	2852	989	0	Sprint Equipment
830:WVGD1	637	80	0	Coax Cables
830:WVGD2	637	80	0	Coax Cables
830:WVGD3	637	80	0	Coax Cables
830:WVGD4	637	80	0	Coax Cables
830:WVGD5	637	80	0	Coax Cables
830:WVGD6	637	80	0	Coax Cables
830:WVGD7	637	80	0	Coax Cables
830:WVGD8	637	80	0	Coax Cables
830:WVGD9	637	80	0	Coax Cables
830:WVGD10	637	80	0	Coax Cables
830:WVGD11	637	80	0	Coax Cables

*** Analysis Results:

Maximum element usage is 72.20% for Base Plate "830" in load case "NESC Heavy Wind"
Maximum insulator usage is 8.23% for Clamp "Clamp3" in load case "NESC Heavy Wind"



*** Analysis Results for Load Case No. 1 "NESC Heavy Wind" - Number of iterations in SAPS 14

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)
830:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
830:t	0.005377	4.833	-0.131	-3.9522	0.0042	0.0000	0.005377	4.833	119.9
830:Sprint	0.005369	4.827	-0.1307	-3.9522	0.0042	0.0000	0.005369	4.827	119.8

830:Arm1	0.004592	4.095	-0.1054	-3.9229	0.0041	0.0000	0.004592	4.095	109.1
830:WVGD11	0.004287	3.805	-0.09545	-3.8927	0.0041	0.0000	0.004287	3.805	104.9
830:Arm2	0.003712	3.257	-0.07702	-3.7741	0.0040	0.0000	0.003712	3.257	96.76
830:WVGD10	0.003586	3.137	-0.07304	-3.7370	0.0039	0.0000	0.003586	3.137	94.93
830:WVGD9	0.002921	2.507	-0.05299	-3.4593	0.0037	0.0000	0.002921	2.507	84.95
830:Arm3	0.002911	2.497	-0.05268	-3.4540	0.0037	0.0000	0.002911	2.497	84.78
830:WVGD8	0.002308	1.934	-0.03628	-3.0855	0.0033	0.0000	0.002308	1.934	74.96
830:Arm4	0.002183	1.819	-0.03317	-2.9958	0.0033	0.0000	0.002183	1.819	72.8
830:WVGD7	0.001757	1.432	-0.02337	-2.6438	0.0030	0.0000	0.001757	1.432	64.98
830:WVGD6	0.001277	1.01	-0.01416	-2.1908	0.0026	0.0000	0.001277	1.01	54.99
830:WVGD5	0.0008663	0.6646	-0.007922	-1.7533	0.0021	0.0000	0.0008663	0.6646	44.99
830:WVGD4	0.0005306	0.3946	-0.003995	-1.3329	0.0017	0.0000	0.0005306	0.3946	35
830:WVGD3	0.0002736	0.197	-0.00175	-0.9224	0.0012	0.0000	0.0002736	0.197	25
830:WVGD2	9.994e-005	0.06956	-0.0006398	-0.5323	0.0007	0.0000	9.994e-005	0.06956	15
830:WVGD1	1.172e-005	0.00779	-0.0001505	-0.1706	0.0002	0.0000	1.172e-005	0.00779	5
Davit1:O	0.004588	4.093	-0.1625	-3.9229	0.0041	0.0000	0.004588	4.928	109.1
Davit1:End	0.00459	4.106	-0.441	-4.0077	0.0041	0.0000	0.00459	8.941	109.1
Davit2:O	0.004597	4.096	-0.04827	-3.9229	0.0041	0.0000	0.004597	3.261	109.2
Davit2:End	0.004643	4.128	0.2226	-3.8806	0.0041	0.0000	0.004643	-0.7067	109.8
Davit3:O	0.003707	3.255	-0.1448	-3.7741	0.0040	0.0000	0.003707	4.285	96.69
Davit3:Mid	0.003727	3.293	-0.5637	-4.1690	0.0040	0.0000	0.003727	10.32	97.02
Davit3:End	0.00371	3.285	-0.7859	-4.2814	0.0040	0.0000	0.00371	13.31	96.8
Davit4:O	0.003717	3.26	-0.009248	-3.7741	0.0040	0.0000	0.003717	2.23	96.82
Davit4:Mid	0.003799	3.319	0.367	-3.4536	0.0040	0.0000	0.003799	-3.711	97.95
Davit4:End	0.003814	3.324	0.5435	-3.3377	0.0040	0.0000	0.003814	-6.705	98.13
Davit5:O	0.002905	2.495	-0.126	-3.4540	0.0037	0.0000	0.002905	3.713	84.71
Davit5:Mid	0.002926	2.531	-0.5115	-3.8527	0.0037	0.0000	0.002926	9.748	85.07
Davit5:End	0.002912	2.524	-0.7171	-3.9664	0.0037	0.0000	0.002912	12.74	84.87
Davit6:O	0.002916	2.499	0.02068	-3.4540	0.0037	0.0000	0.002916	1.282	84.85
Davit6:Mid	0.002989	2.552	0.3635	-3.1294	0.0037	0.0000	0.002989	-4.665	85.95
Davit6:End	0.003002	2.557	0.523	-3.0122	0.0037	0.0000	0.003002	-7.661	86.11
Davit7:O	0.002179	1.817	-0.1066	-2.9958	0.0033	0.0000	0.002179	3.222	72.73
Davit7:Mid	0.0022	1.85	-0.4441	-3.3999	0.0033	0.0000	0.0022	9.255	73.14
Davit7:End	0.002189	1.844	-0.6262	-3.5154	0.0033	0.0000	0.002189	12.25	72.96
Davit8:O	0.002188	1.821	0.0403	-2.9958	0.0033	0.0000	0.002188	0.4149	72.87
Davit8:Mid	0.00225	1.865	0.3352	-2.6652	0.0033	0.0000	0.00225	-5.541	73.92
Davit8:End	0.00226	1.868	0.4704	-2.5461	0.0033	0.0000	0.00226	-8.537	74.05

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 %
830:g	-0.13	0.0	-49.59	0.0	0.0	-71.72	0.0	0.0	87.19	0.0	4368.31	0.0	-6.5	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)	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.
830	830:t	Origin	0.00	58.00	0.06	-1.57	-0.00	-0.00	0.0	-0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.0	5
830	830:Sprint	End	0.10	57.92	0.06	-1.57	0.00	-0.00	0.0	-0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.0	5
830	830:Sprint	Origin	0.10	57.92	0.06	-1.57	0.00	-0.00	0.0	-3.62	0.83	-0.00	-0.39	0.00	0.18	0.00	0.8	5
830	Tube 1	End	5.05	53.83	0.06	-1.43	4.12	-0.01	0.0	-3.62	0.83	-0.00	-0.35	1.08	0.04	0.00	1.43	2.2	2
830	Tube 1	Origin	5.05	53.83	0.06	-1.43	4.12	-0.01	0.0	-3.88	0.94	-0.00	-0.37	1.08	0.05	0.00	1.45	2.2	2
830	SpliceT	End	10.00	49.75	0.06	-1.29	8.80	-0.03	0.0	-3.88	0.94	-0.00	-0.34	1.88	0.04	0.00	2.21	3.4	2

830	SpliceT	Origin	10.00	49.75	0.06	-1.29	8.80	-0.03	-0.0	-4.07	1.01	-0.01	-0.17	0.93	0.02	0.00	1.10	1.7	2
830	830:Arm1	End	10.75	49.13	0.06	-1.26	9.56	-0.03	-0.0	-4.07	1.01	-0.01	-0.17	0.98	0.02	0.00	1.15	1.8	2
830	830:Arm1	Origin	10.75	49.13	0.06	-1.26	12.42	-0.03	0.0	-6.67	9.77	-0.01	-0.28	1.27	0.22	0.00	1.60	2.5	2
830	830:WVGD11	End	15.00	45.65	0.05	-1.15	53.94	-0.06	0.0	-6.67	9.77	-0.01	-0.26	4.72	0.20	0.00	4.99	7.7	2
830	830:WVGD11	Origin	15.00	45.65	0.05	-1.15	53.94	-0.06	0.0	-7.90	10.06	-0.01	-0.31	4.72	0.21	0.00	5.04	7.8	2
830	Tube 2	End	19.08	42.35	0.05	-1.03	95.03	-0.10	0.0	-7.90	10.06	-0.01	-0.29	7.22	0.19	0.00	7.52	11.6	2
830	Tube 2	Origin	19.08	42.35	0.05	-1.03	95.03	-0.10	0.0	-8.48	10.20	-0.01	-0.31	7.22	0.20	0.00	7.54	11.6	2
830	830:Arm2	End	23.17	39.09	0.04	-0.92	136.67	-0.15	0.0	-8.48	10.20	-0.01	-0.29	9.11	0.18	0.00	9.40	14.5	2
830	830:Arm2	Origin	23.17	39.09	0.04	-0.92	145.08	-0.15	0.0	-15.31	22.18	-0.02	-0.52	9.67	0.40	0.00	10.22	15.7	2
830	830:WVGD10	End	25.00	37.65	0.04	-0.88	185.74	-0.18	0.0	-15.31	22.18	-0.02	-0.51	11.70	0.39	0.00	12.23	18.8	2
830	830:WVGD10	Origin	25.00	37.65	0.04	-0.88	185.74	-0.18	0.0	-16.56	22.45	-0.02	-0.55	11.70	0.40	0.00	12.27	18.9	2
830	Tube 2	End	30.00	33.79	0.04	-0.75	298.00	-0.27	0.0	-16.56	22.45	-0.02	-0.51	16.23	0.37	0.00	16.75	25.8	2
830	Tube 2	Origin	30.00	33.79	0.04	-0.75	298.00	-0.27	0.0	-17.44	22.61	-0.02	-0.54	16.23	0.37	0.00	16.78	25.8	2
830	830:WVGD9	End	35.00	30.09	0.04	-0.64	411.06	-0.38	0.0	-17.44	22.61	-0.02	-0.50	19.54	0.35	0.00	20.05	30.8	2
830	830:WVGD9	Origin	35.00	30.09	0.04	-0.64	411.06	-0.38	0.0	-18.60	22.85	-0.02	-0.54	19.54	0.35	0.00	20.08	30.9	2
830	830:Arm3	End	35.17	29.97	0.03	-0.63	414.88	-0.39	0.0	-18.60	22.85	-0.02	-0.53	19.63	0.35	0.00	20.18	31.0	2
830	830:Arm3	Origin	35.17	29.97	0.03	-0.63	423.25	-0.39	0.0	-25.56	34.78	-0.03	-0.73	20.03	0.53	0.00	20.79	32.0	2
830	Tube 2	End	40.08	26.49	0.03	-0.53	594.24	-0.52	0.0	-25.56	34.78	-0.03	-0.69	24.82	0.50	0.00	25.52	39.3	2
830	Tube 2	Origin	40.08	26.49	0.03	-0.53	594.24	-0.52	0.0	-26.60	34.91	-0.03	-0.72	24.82	0.50	0.00	25.55	39.3	2
830	830:WVGD8	End	45.00	23.21	0.03	-0.44	765.89	-0.67	0.0	-26.60	34.91	-0.03	-0.68	28.44	0.47	0.00	29.13	44.8	2
830	830:WVGD8	Origin	45.00	23.21	0.03	-0.44	765.89	-0.67	0.0	-28.07	35.16	-0.03	-0.72	28.44	0.47	0.00	29.16	44.9	2
830	830:Arm4	End	47.17	21.82	0.03	-0.40	842.08	-0.75	0.0	-28.07	35.16	-0.03	-0.70	29.75	0.46	0.00	30.46	46.9	2
830	830:Arm4	Origin	47.17	21.82	0.03	-0.40	850.42	-0.75	0.0	-35.34	47.04	-0.04	-0.88	30.04	0.62	0.00	30.94	47.6	2
830	Tube 2	End	51.08	19.43	0.02	-0.34	1034.63	-0.90	0.0	-35.34	47.04	-0.04	-0.84	33.51	0.59	0.00	34.37	52.9	2
830	Tube 2	Origin	51.08	19.43	0.02	-0.34	1034.63	-0.90	0.0	-36.32	47.12	-0.04	-0.86	33.51	0.59	0.00	34.39	52.9	2
830	830:WVGD7	End	55.00	17.18	0.02	-0.28	1219.15	-1.06	0.0	-36.32	47.12	-0.04	-0.83	36.33	0.57	0.00	37.18	57.2	2
830	830:WVGD7	Origin	55.00	17.18	0.02	-0.28	1219.15	-1.06	0.0	-37.81	47.33	-0.05	-0.86	36.33	0.57	0.00	37.21	57.2	2
830	SpliceT	End	57.25	15.96	0.02	-0.25	1325.63	-1.16	0.0	-37.81	47.33	-0.05	-0.84	37.72	0.56	0.00	38.57	59.3	2
830	SpliceT	Origin	57.25	15.96	0.02	-0.25	1325.63	-1.16	0.0	-38.84	47.39	-0.05	-0.87	37.72	0.56	0.00	38.60	59.4	2
830	Tube 2	End	60.00	14.53	0.02	-0.22	1455.95	-1.29	0.0	-38.84	47.39	-0.05	-0.74	35.14	0.48	0.00	35.89	55.2	2
830	Tube 2	Origin	60.00	14.53	0.02	-0.22	1455.95	-1.29	0.0	-40.33	47.48	-0.05	-0.77	35.14	0.48	0.00	35.92	55.3	2
830	SpliceB	End	62.75	13.17	0.02	-0.19	1586.51	-1.43	0.0	-40.33	47.48	-0.05	-0.75	36.25	0.47	0.00	37.00	56.9	2
830	SpliceB	Origin	62.75	13.17	0.02	-0.19	1586.51	-1.43	0.0	-41.43	47.54	-0.05	-0.77	36.25	0.47	0.00	37.03	57.0	2
830	830:WVGD6	End	65.00	12.12	0.02	-0.17	1693.47	-1.55	0.0	-41.43	47.54	-0.05	-0.75	37.03	0.46	0.00	37.79	58.1	2
830	830:WVGD6	Origin	65.00	12.12	0.02	-0.17	1693.47	-1.55	0.0	-43.29	47.77	-0.06	-0.78	37.03	0.46	0.00	37.83	58.2	2
830	Tube 3	End	70.00	9.93	0.01	-0.13	1932.30	-1.84	0.0	-43.29	47.77	-0.06	-0.75	38.46	0.44	0.00	39.22	60.3	2
830	Tube 3	Origin	70.00	9.93	0.01	-0.13	1932.30	-1.84	0.0	-44.94	47.87	-0.06	-0.78	38.46	0.44	0.00	39.25	60.4	2
830	830:WVGD5	End	75.00	7.98	0.01	-0.10	2171.67	-2.16	0.0	-44.94	47.87	-0.06	-0.74	39.52	0.42	0.00	40.26	61.9	2
830	830:WVGD5	Origin	75.00	7.98	0.01	-0.10	2171.67	-2.16	0.0	-47.35	48.12	-0.07	-0.78	39.52	0.42	0.00	40.30	62.0	2
830	Tube 3	End	80.00	6.24	0.01	-0.07	2412.28	-2.50	0.0	-47.35	48.12	-0.07	-0.75	40.28	0.40	0.00	41.03	63.1	2
830	Tube 3	Origin	80.00	6.24	0.01	-0.07	2412.28	-2.50	0.0	-49.14	48.24	-0.08	-0.78	40.28	0.40	0.00	41.06	63.2	2
830	830:WVGD4	End	85.00	4.73	0.01	-0.05	2653.45	-2.88	0.0	-49.14	48.24	-0.08	-0.75	40.80	0.39	0.00	41.55	63.9	2
830	830:WVGD4	Origin	85.00	4.73	0.01	-0.05	2653.45	-2.88	0.0	-51.11	48.45	-0.08	-0.78	40.80	0.39	0.00	41.58	64.0	2
830	SpliceT	End	87.00	4.19	0.01	-0.04	2750.34	-3.04	0.0	-51.11	48.45	-0.08	-0.76	40.96	0.38	0.00	41.73	64.2	2
830	SpliceT	Origin	87.00	4.19	0.01	-0.04	2750.34	-3.04	0.0	-52.75	48.52	-0.08	-0.79	40.96	0.38	0.00	41.75	64.2	2
830	Tube 3	End	90.50	3.32	0.00	-0.03	2920.17	-3.34	0.0	-52.75	48.52	-0.08	-0.78	42.69	0.38	0.00	43.47	66.9	2
830	Tube 3	Origin	90.50	3.32	0.00	-0.03	2920.17	-3.34	0.0	-55.30	48.62	-0.09	-0.82	42.69	0.38	0.00	43.51	66.9	2
830	SpliceB	End	94.00	2.56	0.00	-0.02	3090.32	-3.65	0.0	-55.30	48.62	-0.09	-0.80	42.78	0.37	0.00	43.59	67.1	2
830	SpliceB	Origin	94.00	2.56	0.00	-0.02	3090.32	-3.65	0.0	-56.79	48.67	-0.09	-0.82	42.78	0.37	0.00	43.61	67.1	2
830	830:WVGD3	End	95.00	2.36	0.00	-0.02	3138.99	-3.74	0.0	-56.79	48.67	-0.09	-0.81	42.80	0.37	0.00	43.62	67.1	2
830	830:WVGD3	Origin	95.00	2.36	0.00	-0.02	3138.99	-3.74	0.0	-58.67	48.86	-0.10	-0.84	42.80	0.37	0.00	43.64	67.1	2
830	Tube 4	End	100.00	1.50	0.00	-0.01	3383.30	-4.22	0.0	-58.67	48.86	-0.10	-0.81	42.81	0.36	0.00	43.63	67.1	2
830	Tube 4	Origin	100.00	1.50	0.00	-0.01	3383.30	-4.22	0.0	-60.68	48.96	-0.10	-0.84	42.81	0.36	0.00	43.65	67.2	2
830	830:WVGD2	End	105.00	0.83	0.00	-0.01	3628.11	-4.73	0.0	-60.68	48.96	-0.10	-0.81	42.72	0.34	0.00	43.54	67.5	2
830	830:WVGD2	Origin	105.00	0.83	0.00	-0.01	3628.11	-4.73	0.0	-63.45	49.20	-0.11	-0.84	42.72	0.35	0.00	43.57	67.5	2
830	Tube 4	End	110.00	0.37	0.00	-0.00	3874.09	-5.28	0.0	-63.45	49.20	-0.11	-0.82	42.56	0.33	0.00	43.38	68.4	2
830	Tube 4	Origin	110.00	0.37	0.00	-0.00	3874.09	-5.28	0.0	-65.59	49.31	-0.12	-0.84	42.56	0.33	0.00	43.41	68.5	2
830	830:WVGD1	End	115.00	0.09	0.00	-0.00	4120.61	-5.87	0.0	-65.59	49.31	-0.12	-0.82	42.33	0.32	0.00	43.15	69.3	2
830	830:WVGD1	Origin	115.00	0.09	0.00	-0.00	4120.61	-5.87	0.0	-68.48	49.54	-0.13	-0.85	42.33	0.32	0.00	43.19	69.3	2

830	830:g	End	120.00	0.00	0.00	0.00	4368.31	-6.50	0.0	-68.48	49.54	-0.13	-0.82	42.05	0.31	0.00	42.88	70.1	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	49.11	0.06	-1.95	-5.71	-0.00	0.0	4.23	1.42	0.00	0.60	5.35	0.32	0.00	5.97	9.2	2
Davit1	Davit1:End	End	4.01	49.27	0.06	-5.29	0.00	0.00	0.0	4.23	1.42	0.00	0.60	0.00	0.46	0.00	1.00	1.5	3
Davit2	Davit2:O	Origin	0.00	49.16	0.06	-0.58	-2.85	0.00	0.0	-4.41	0.71	-0.00	-0.62	2.67	0.16	0.00	3.30	5.1	2
Davit2	Davit2:End	End	4.01	49.54	0.06	2.67	-0.00	0.00	0.0	-4.41	0.71	-0.00	-0.62	0.00	0.23	0.00	0.74	1.1	3
Davit3	Davit3:O	Origin	0.00	39.06	0.04	-1.74	-31.37	-0.00	-0.0	5.51	3.83	0.00	0.62	16.47	0.00	0.00	17.09	26.3	1
Davit3	#Davit3:0	End	3.02	39.29	0.04	-4.19	-19.79	-0.00	-0.0	5.51	3.83	0.00	0.73	14.62	0.00	0.00	15.36	23.6	1
Davit3	#Davit3:0	Origin	3.02	39.29	0.04	-4.19	-19.79	-0.00	-0.0	5.53	3.70	0.00	0.74	14.62	0.00	0.00	15.36	23.6	1
Davit3	Davit3:Mid	End	6.05	39.52	0.04	-6.76	-8.61	-0.00	-0.0	5.53	3.70	0.00	0.90	9.61	0.00	0.00	10.52	16.2	1
Davit3	Davit3:Mid	Origin	6.05	39.52	0.04	-6.76	-8.61	-0.00	0.0	5.95	2.87	0.00	0.97	9.61	0.00	0.00	10.58	16.3	1
Davit3	Davit3:End	End	9.05	39.42	0.04	-9.43	-0.00	0.00	0.0	5.95	2.87	0.00	1.25	0.00	1.26	0.00	2.51	3.9	3
Davit4	Davit4:O	Origin	0.00	39.12	0.04	-0.11	-22.97	0.00	0.0	-6.28	2.38	-0.00	-0.71	12.06	0.00	0.00	12.76	19.6	1
Davit4	#Davit4:0	End	3.02	39.48	0.05	2.20	-15.78	0.00	0.0	-6.28	2.38	-0.00	-0.83	11.66	0.00	0.00	12.50	19.2	1
Davit4	#Davit4:0	Origin	3.02	39.48	0.05	2.20	-15.78	0.00	0.0	-6.25	2.28	-0.00	-0.83	11.66	0.00	0.00	12.49	19.2	1
Davit4	Davit4:Mid	End	6.05	39.83	0.05	4.40	-8.88	0.00	0.0	-6.25	2.28	-0.00	-1.02	9.92	0.00	0.00	10.93	16.8	1
Davit4	Davit4:Mid	Origin	6.05	39.83	0.05	4.40	-8.88	0.00	0.0	-5.91	2.96	-0.00	-0.96	9.92	0.00	0.00	10.88	16.7	1
Davit4	Davit4:End	End	9.05	39.89	0.05	6.52	-0.00	0.00	0.0	-5.91	2.96	-0.00	-1.24	0.00	1.30	0.00	2.56	3.9	3
Davit5	Davit5:O	Origin	0.00	29.94	0.03	-1.51	-31.66	-0.00	-0.0	5.49	3.86	0.00	0.62	16.62	0.00	0.00	17.24	26.5	1
Davit5	#Davit5:0	End	3.02	30.15	0.03	-3.76	-19.98	-0.00	-0.0	5.49	3.86	0.00	0.73	14.76	0.00	0.00	15.49	23.8	1
Davit5	#Davit5:0	Origin	3.02	30.15	0.03	-3.76	-19.98	-0.00	-0.0	5.51	3.73	0.00	0.73	14.76	0.00	0.00	15.50	23.8	1
Davit5	Davit5:Mid	End	6.05	30.37	0.04	-6.14	-8.71	-0.00	-0.0	5.51	3.73	0.00	0.90	9.72	0.00	0.00	10.62	16.3	1
Davit5	Davit5:Mid	Origin	6.05	30.37	0.04	-6.14	-8.71	-0.00	0.0	5.93	2.90	0.00	0.97	9.72	0.00	0.00	10.69	16.4	1
Davit5	Davit5:End	End	9.05	30.29	0.03	-8.61	-0.00	0.00	0.0	5.93	2.90	0.00	1.25	0.00	1.27	0.00	2.53	3.9	3
Davit6	Davit6:O	Origin	0.00	29.99	0.03	0.25	-23.28	0.00	0.0	-6.27	2.41	-0.00	-0.70	12.22	0.00	0.00	12.93	19.9	1
Davit6	#Davit6:0	End	3.02	30.32	0.04	2.36	-15.99	0.00	0.0	-6.27	2.41	-0.00	-0.83	11.81	0.00	0.00	12.65	19.5	1
Davit6	#Davit6:0	Origin	3.02	30.32	0.04	2.36	-15.99	0.00	0.0	-6.24	2.32	-0.00	-0.83	11.81	0.00	0.00	12.64	19.5	1
Davit6	Davit6:Mid	End	6.05	30.63	0.04	4.36	-8.98	0.00	0.0	-6.24	2.32	-0.00	-1.02	10.03	0.00	0.00	11.04	17.0	1
Davit6	Davit6:Mid	Origin	6.05	30.63	0.04	4.36	-8.98	0.00	0.0	-5.89	2.99	-0.00	-0.96	10.03	0.00	0.00	10.99	16.9	1
Davit6	Davit6:End	End	9.05	30.68	0.04	6.28	-0.00	0.00	0.0	-5.89	2.99	-0.00	-1.24	0.00	1.31	0.00	2.58	4.0	3
Davit7	Davit7:O	Origin	0.00	21.80	0.03	-1.28	-32.06	-0.00	-0.0	5.46	3.91	0.00	0.61	16.83	0.00	0.00	17.45	26.8	1
Davit7	#Davit7:0	End	3.02	21.99	0.03	-3.24	-20.25	-0.00	-0.0	5.46	3.91	0.00	0.73	14.96	0.00	0.00	15.69	24.1	1
Davit7	#Davit7:0	Origin	3.02	21.99	0.03	-3.24	-20.25	-0.00	-0.0	5.48	3.77	0.00	0.73	14.96	0.00	0.00	15.69	24.1	1
Davit7	Davit7:Mid	End	6.05	22.19	0.03	-5.33	-8.85	-0.00	-0.0	5.48	3.77	0.00	0.89	9.88	0.00	0.00	10.77	16.6	1
Davit7	Davit7:Mid	Origin	6.05	22.19	0.03	-5.33	-8.85	-0.00	0.0	5.91	2.95	0.00	0.96	9.88	0.00	0.00	10.84	16.7	1
Davit7	Davit7:End	End	9.05	22.13	0.03	-7.51	-0.00	0.00	0.0	5.91	2.95	0.00	1.24	0.00	1.29	0.00	2.56	3.9	3
Davit8	Davit8:O	Origin	0.00	21.85	0.03	0.48	-23.73	0.00	0.0	-6.25	2.46	-0.00	-0.70	12.46	0.00	0.00	13.16	20.2	1
Davit8	#Davit8:0	End	3.02	22.12	0.03	2.31	-16.28	0.00	0.0	-6.25	2.46	-0.00	-0.83	12.03	0.00	0.00	12.86	19.8	1
Davit8	#Davit8:0	Origin	3.02	22.12	0.03	2.31	-16.28	0.00	0.0	-6.22	2.37	-0.00	-0.83	12.03	0.00	0.00	12.86	19.8	1
Davit8	Davit8:Mid	End	6.05	22.38	0.03	4.02	-9.13	0.00	0.0	-6.22	2.37	-0.00	-1.01	10.19	0.00	0.00	11.20	17.2	1
Davit8	Davit8:Mid	Origin	6.05	22.38	0.03	4.02	-9.13	0.00	0.0	-5.86	3.04	-0.00	-0.96	10.19	0.00	0.00	11.14	17.1	1
Davit8	Davit8:End	End	9.05	22.42	0.03	5.64	-0.00	0.00	0.0	-5.86	3.04	-0.00	-1.23	0.00	1.33	0.00	2.61	4.0	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	4.444	80.00	80.00	5.55
Clamp2	4.444	80.00	80.00	5.55
Clamp3	6.586	80.00	80.00	8.23
Clamp4	6.586	80.00	80.00	8.23
Clamp5	6.586	80.00	80.00	8.23
Clamp6	6.586	80.00	80.00	8.23
Clamp7	6.586	80.00	80.00	8.23
Clamp8	6.586	80.00	80.00	8.23
Clamp9	3.574	80.00	80.00	4.47
Clamp10	0.700	80.00	80.00	0.88
Clamp11	0.700	80.00	80.00	0.88
Clamp12	0.700	80.00	80.00	0.88
Clamp13	0.700	80.00	80.00	0.88
Clamp14	0.700	80.00	80.00	0.88
Clamp15	0.700	80.00	80.00	0.88
Clamp16	0.700	80.00	80.00	0.88
Clamp17	0.700	80.00	80.00	0.88
Clamp18	0.700	80.00	80.00	0.88
Clamp19	0.700	80.00	80.00	0.88
Clamp20	0.700	80.00	80.00	0.88

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

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)
830:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
830:t	0.001681	4.669	-0.1204	-3.8556	0.0013	0.0000	0.001681	4.669	119.9
830:Sprint	0.001679	4.662	-0.1202	-3.8556	0.0013	0.0000	0.001679	4.662	119.8
830:Arm1	0.001437	3.951	-0.09636	-3.7757	0.0013	0.0000	0.001437	3.951	109.2
830:WVGD11	0.001342	3.673	-0.0872	-3.7349	0.0013	0.0000	0.001342	3.673	104.9
830:Arm2	0.001162	3.149	-0.07032	-3.6124	0.0012	0.0000	0.001162	3.149	96.76
830:WVGD10	0.001123	3.033	-0.06669	-3.5764	0.0012	0.0000	0.001123	3.033	94.93
830:WVGD9	0.0009157	2.43	-0.0484	-3.3140	0.0011	0.0000	0.0009157	2.43	84.95
830:Arm3	0.0009123	2.421	-0.04812	-3.3090	0.0011	0.0000	0.0009123	2.421	84.78
830:WVGD8	0.0007241	1.88	-0.03315	-2.9643	0.0010	0.0000	0.0007241	1.88	74.97
830:Arm4	0.000685	1.77	-0.0303	-2.8804	0.0010	0.0000	0.000685	1.77	72.8
830:WVGD7	0.0005518	1.397	-0.02132	-2.5507	0.0009	0.0000	0.0005518	1.397	64.98
830:WVGD6	0.0004011	0.9889	-0.01284	-2.1242	0.0008	0.0000	0.0004011	0.9889	54.99
830:WVGD5	0.0002724	0.6534	-0.007064	-1.7092	0.0007	0.0000	0.0002724	0.6534	44.99
830:WVGD4	0.000167	0.3895	-0.003435	-1.3065	0.0005	0.0000	0.000167	0.3895	35
830:WVGD3	8.618e-005	0.1953	-0.001392	-0.9094	0.0004	0.0000	8.618e-005	0.1953	25
830:WVGD2	3.15e-005	0.06927	-0.0004358	-0.5279	0.0002	0.0000	3.15e-005	0.06927	15
830:WVGD1	3.699e-006	0.007807	-8.332e-005	-0.1702	0.0001	0.0000	3.699e-006	0.007807	5
Davit1:O	0.001436	3.95	-0.1514	-3.7757	0.0013	0.0000	0.001436	4.785	109.1
Davit1:End	0.001436	3.963	-0.4168	-3.8026	0.0013	0.0000	0.001436	8.798	109.2
Davit2:O	0.001438	3.953	-0.04137	-3.7757	0.0013	0.0000	0.001438	3.118	109.2
Davit2:End	0.001453	3.984	0.2213	-3.7748	0.0013	0.0000	0.001453	-0.8512	109.8
Davit3:O	0.001161	3.146	-0.1352	-3.6124	0.0012	0.0000	0.001161	4.176	96.7
Davit3:Mid	0.001168	3.183	-0.5245	-3.7809	0.0012	0.0000	0.001168	10.21	97.06
Davit3:End	0.001163	3.176	-0.7238	-3.8221	0.0012	0.0000	0.001163	13.21	96.86
Davit4:O	0.001164	3.151	-0.005447	-3.6124	0.0012	0.0000	0.001164	2.121	96.83
Davit4:Mid	0.00119	3.209	0.3661	-3.5153	0.0012	0.0000	0.00119	-3.821	97.95
Davit4:End	0.001194	3.215	0.5486	-3.4730	0.0012	0.0000	0.001194	-6.815	98.13
Davit5:O	0.0009108	2.419	-0.1184	-3.3090	0.0011	0.0000	0.0009108	3.636	84.71
Davit5:Mid	0.0009179	2.453	-0.4759	-3.4808	0.0011	0.0000	0.0009179	9.67	85.11
Davit5:End	0.0009139	2.447	-0.6596	-3.5231	0.0011	0.0000	0.0009139	12.66	84.92
Davit6:O	0.0009139	2.423	0.02216	-3.3090	0.0011	0.0000	0.0009139	1.205	84.86
Davit6:Mid	0.0009368	2.475	0.3621	-3.2085	0.0011	0.0000	0.0009368	-4.742	85.95
Davit6:End	0.0009408	2.48	0.5284	-3.1651	0.0011	0.0000	0.0009408	-7.738	86.11
Davit7:O	0.0006836	1.768	-0.1009	-2.8804	0.0010	0.0000	0.0006836	3.174	72.73
Davit7:Mid	0.0006909	1.799	-0.4136	-3.0569	0.0010	0.0000	0.0006909	9.205	73.17
Davit7:End	0.0006878	1.795	-0.5752	-3.1006	0.0010	0.0000	0.0006878	12.2	73.01
Davit8:O	0.0006864	1.771	0.04034	-2.8804	0.0010	0.0000	0.0006864	0.3658	72.87
Davit8:Mid	0.0007059	1.816	0.3355	-2.7750	0.0010	0.0000	0.0007059	-5.59	73.92
Davit8:End	0.000709	1.819	0.4791	-2.7300	0.0010	0.0000	0.000709	-8.586	74.06

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 %
830:g	-0.04	0.0	-54.80	0.0	0.0	-39.52	0.0	0.0	67.56	0.0	4370.80	0.0	-2.1	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.
830	830:t	Origin	0.00	56.03	0.02	-1.44	-0.00	-0.00	-0.0	-0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5
830	830:Sprint	End	0.10	55.94	0.02	-1.44	0.00	-0.00	-0.0	-0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5
830	830:Sprint	Origin	0.10	55.94	0.02	-1.44	0.00	-0.00	-0.0	-1.85	2.28	-0.00	-0.20	0.00	0.50	0.00	0.88	1.4	5
830	Tube 1	End	5.05	51.96	0.02	-1.31	11.31	-0.00	-0.0	-1.85	2.28	-0.00	-0.18	2.96	0.12	0.00	3.14	4.8	2
830	Tube 1	Origin	5.05	51.96	0.02	-1.31	11.31	-0.00	0.0	-2.03	2.53	-0.00	-0.19	2.96	0.13	0.00	3.16	4.9	2
830	SpliceT	End	10.00	48.01	0.02	-1.18	23.81	-0.01	0.0	-2.03	2.53	-0.00	-0.17	5.07	0.12	0.00	5.25	8.1	2
830	SpliceT	Origin	10.00	48.01	0.02	-1.18	23.81	-0.01	-0.0	-2.15	2.67	-0.00	-0.09	2.51	0.06	0.00	2.60	4.0	2
830	830:Arm1	End	10.75	47.42	0.02	-1.16	25.81	-0.01	-0.0	-2.15	2.67	-0.00	-0.09	2.64	0.06	0.00	2.74	4.2	2
830	830:Arm1	Origin	10.75	47.42	0.02	-1.16	27.57	-0.01	0.0	-2.92	8.10	-0.00	-0.12	2.82	0.18	0.00	2.96	4.6	2
830	830:WVGD11	End	15.00	44.07	0.02	-1.05	62.01	-0.02	0.0	-2.92	8.10	-0.00	-0.11	5.42	0.17	0.00	5.55	8.5	2
830	830:WVGD11	Origin	15.00	44.07	0.02	-1.05	62.01	-0.02	0.0	-3.46	8.75	-0.00	-0.13	5.42	0.18	0.00	5.57	8.6	2
830	Tube 2	End	19.08	40.90	0.02	-0.94	97.72	-0.03	0.0	-3.46	8.75	-0.00	-0.13	7.43	0.17	0.00	7.56	11.6	2
830	Tube 2	Origin	19.08	40.90	0.02	-0.94	97.72	-0.03	0.0	-3.85	9.02	-0.00	-0.14	7.43	0.17	0.00	7.57	11.7	2
830	830:Arm2	End	23.17	37.78	0.01	-0.84	134.55	-0.05	0.0	-3.85	9.02	-0.00	-0.13	8.97	0.16	0.00	9.10	14.0	2
830	830:Arm2	Origin	23.17	37.78	0.01	-0.84	142.36	-0.05	0.0	-6.65	19.85	-0.00	-0.23	9.49	0.36	0.00	9.73	15.0	2
830	830:WVGD10	End	25.00	36.40	0.01	-0.80	178.75	-0.06	0.0	-6.65	19.85	-0.00	-0.22	11.26	0.35	0.00	11.50	17.7	2
830	830:WVGD10	Origin	25.00	36.40	0.01	-0.80	178.75	-0.06	0.0	-7.19	20.48	-0.01	-0.24	11.26	0.36	0.00	11.52	17.7	2
830	Tube 2	End	30.00	32.71	0.01	-0.69	281.15	-0.08	0.0	-7.19	20.48	-0.01	-0.22	15.31	0.33	0.00	15.54	23.9	2
830	Tube 2	Origin	30.00	32.71	0.01	-0.69	281.15	-0.08	0.0	-7.79	20.86	-0.01	-0.24	15.31	0.34	0.00	15.56	23.9	2
830	830:WVGD9	End	35.00	29.16	0.01	-0.58	385.44	-0.12	0.0	-7.79	20.86	-0.01	-0.22	18.32	0.32	0.00	18.55	28.5	2
830	830:WVGD9	Origin	35.00	29.16	0.01	-0.58	385.44	-0.12	0.0	-8.28	21.44	-0.01	-0.24	18.32	0.33	0.00	18.56	28.6	2
830	830:Arm3	End	35.17	29.05	0.01	-0.58	389.02	-0.12	0.0	-8.28	21.44	-0.01	-0.24	18.41	0.33	0.00	18.65	28.7	2
830	830:Arm3	Origin	35.17	29.05	0.01	-0.58	396.82	-0.12	0.0	-11.19	32.26	-0.01	-0.32	18.78	0.49	0.00	19.12	29.4	2
830	Tube 2	End	40.08	25.72	0.01	-0.48	555.42	-0.16	0.0	-11.19	32.26	-0.01	-0.30	23.19	0.46	0.00	23.51	36.2	2
830	Tube 2	Origin	40.08	25.72	0.01	-0.48	555.42	-0.16	0.0	-11.91	32.66	-0.01	-0.32	23.19	0.47	0.00	23.53	36.2	2
830	830:WVGD8	End	45.00	22.56	0.01	-0.40	716.02	-0.21	0.0	-11.91	32.66	-0.01	-0.30	26.58	0.44	0.00	26.89	41.4	2
830	830:WVGD8	Origin	45.00	22.56	0.01	-0.40	716.02	-0.21	0.0	-12.62	33.34	-0.01	-0.32	26.58	0.45	0.00	26.91	41.4	2
830	830:Arm4	End	47.17	21.24	0.01	-0.36	788.27	-0.23	0.0	-12.62	33.34	-0.01	-0.31	27.84	0.44	0.00	28.17	43.3	2
830	830:Arm4	Origin	47.17	21.24	0.01	-0.36	796.06	-0.23	0.0	-15.76	44.21	-0.01	-0.39	28.12	0.58	0.00	28.53	43.9	2
830	Tube 2	End	51.08	18.93	0.01	-0.31	969.18	-0.28	0.0	-15.76	44.21	-0.01	-0.38	31.39	0.56	0.00	31.78	48.9	2
830	Tube 2	Origin	51.08	18.93	0.01	-0.31	969.18	-0.28	0.0	-16.44	44.55	-0.01	-0.39	31.39	0.56	0.00	31.79	48.9	2
830	830:WVGD7	End	55.00	16.77	0.01	-0.26	1143.67	-0.33	0.0	-16.44	44.55	-0.01	-0.38	34.08	0.54	0.00	34.47	53.0	2
830	830:WVGD7	Origin	55.00	16.77	0.01	-0.26	1143.67	-0.33	0.0	-17.17	45.21	-0.01	-0.39	34.08	0.55	0.00	34.48	53.1	2
830	SpliceT	End	57.25	15.59	0.01	-0.23	1245.39	-0.36	0.0	-17.17	45.21	-0.01	-0.38	35.43	0.53	0.00	35.82	55.1	2
830	SpliceT	Origin	57.25	15.59	0.01	-0.23	1245.39	-0.36	0.0	-17.89	45.45	-0.01	-0.40	35.43	0.54	0.00	35.84	55.1	2
830	Tube 2	End	60.00	14.21	0.01	-0.20	1370.38	-0.40	0.0	-17.89	45.45	-0.01	-0.34	33.07	0.46	0.00	33.42	51.4	2
830	Tube 2	Origin	60.00	14.21	0.01	-0.20	1370.38	-0.40	0.0	-18.90	45.73	-0.02	-0.36	33.07	0.46	0.00	33.44	51.4	2
830	SpliceB	End	62.75	12.89	0.01	-0.17	1496.14	-0.45	0.0	-18.90	45.73	-0.02	-0.35	34.18	0.45	0.00	34.54	53.1	2
830	SpliceB	Origin	62.75	12.89	0.01	-0.17	1496.14	-0.45	0.0	-19.66	45.98	-0.02	-0.36	34.18	0.45	0.00	34.55	53.2	2
830	830:WVGD6	End	65.00	11.87	0.00	-0.15	1599.59	-0.48	0.0	-19.66	45.98	-0.02	-0.36	34.98	0.44	0.00	35.34	54.4	2
830	830:WVGD6	Origin	65.00	11.87	0.00	-0.15	1599.59	-0.48	0.0	-20.64	46.72	-0.02	-0.37	34.98	0.45	0.00	35.36	54.4	2
830	Tube 3	End	70.00	9.75	0.00	-0.12	1833.17	-0.57	0.0	-20.64	46.72	-0.02	-0.36	36.48	0.43	0.00	36.85	56.7	2
830	Tube 3	Origin	70.00	9.75	0.00	-0.12	1833.17	-0.57	0.0	-21.80	47.23	-0.02	-0.38	36.48	0.43	0.00	36.87	56.7	2
830	830:WVGD5	End	75.00	7.84	0.00	-0.08	2069.30	-0.67	0.0	-21.80	47.23	-0.02	-0.36	37.65	0.41	0.00	38.01	58.5	2
830	830:WVGD5	Origin	75.00	7.84	0.00	-0.08	2069.30	-0.67	0.0	-23.17	48.13	-0.02	-0.38	37.65	0.42	0.00	38.04	58.5	2
830	Tube 3	End	80.00	6.15	0.00	-0.06	2309.95	-0.78	0.0	-23.17	48.13	-0.02	-0.37	38.56	0.40	0.00	38.94	59.9	2
830	Tube 3	Origin	80.00	6.15	0.00	-0.06	2309.95	-0.78	0.0	-24.42	48.68	-0.02	-0.39	38.56	0.41	0.00	38.96	59.9	2
830	830:WVGD4	End	85.00	4.67	0.00	-0.04	2553.34	-0.90	0.0	-24.42	48.68	-0.02	-0.37	39.25	0.39	0.00	39.63	61.0	2
830	830:WVGD4	Origin	85.00	4.67	0.00	-0.04	2553.34	-0.90	0.0	-25.49	49.45	-0.03	-0.39	39.25	0.40	0.00	39.65	61.0	2
830	SpliceT	End	87.00	4.14	0.00	-0.03	2652.23	-0.95	0.0	-25.49	49.45	-0.03	-0.38	39.49	0.39	0.00	39.87	61.3	2
830	SpliceT	Origin	87.00	4.14	0.00	-0.03	2652.23	-0.95	0.0	-26.61	49.77	-0.03	-0.40	39.49	0.39	0.00	39.89	61.4	2
830	Tube 3	End	90.50	3.29	0.00	-0.03	2826.43	-1.05	0.0	-26.61	49.77	-0.03	-0.39	41.31	0.39	0.00	41.71	64.2	2
830	Tube 3	Origin	90.50	3.29	0.00	-0.03	2826.43	-1.05	0.0	-28.35	50.19	-0.03	-0.42	41.31	0.39	0.00	41.73	64.2	2

830	SpliceB	End	94.00	2.54	0.00	-0.02	3002.08	-1.14	0.0	-28.35	50.19	-0.03	-0.41	41.55	0.38	0.00	41.97	64.6	2
830	SpliceB	Origin	94.00	2.54	0.00	-0.02	3002.08	-1.14	0.0	-29.37	50.45	-0.03	-0.42	41.55	0.38	0.00	41.98	64.6	2
830	830:WVGD3	End	95.00	2.34	0.00	-0.02	3052.54	-1.17	0.0	-29.37	50.45	-0.03	-0.42	41.61	0.38	0.00	42.04	64.7	2
830	830:WVGD3	Origin	95.00	2.34	0.00	-0.02	3052.54	-1.17	0.0	-30.38	51.18	-0.03	-0.43	41.61	0.39	0.00	42.05	64.7	2
830	Tube 4	End	100.00	1.49	0.00	-0.01	3308.45	-1.32	0.0	-30.38	51.18	-0.03	-0.42	41.86	0.37	0.00	42.28	65.0	2
830	Tube 4	Origin	100.00	1.49	0.00	-0.01	3308.45	-1.32	0.0	-31.79	51.79	-0.03	-0.44	41.86	0.38	0.00	42.30	65.1	2
830	830:WVGD2	End	105.00	0.83	0.00	-0.01	3567.40	-1.49	0.0	-31.79	51.79	-0.03	-0.42	42.00	0.36	0.00	42.43	65.7	2
830	830:WVGD2	Origin	105.00	0.83	0.00	-0.01	3567.40	-1.49	0.0	-33.42	52.79	-0.04	-0.44	42.00	0.37	0.00	42.45	65.8	2
830	Tube 4	End	110.00	0.37	0.00	-0.00	3831.33	-1.66	0.0	-33.42	52.79	-0.04	-0.43	42.08	0.36	0.00	42.51	67.0	2
830	Tube 4	Origin	110.00	0.37	0.00	-0.00	3831.33	-1.66	0.0	-34.91	53.43	-0.04	-0.45	42.08	0.36	0.00	42.53	67.1	2
830	830:WVGD1	End	115.00	0.09	0.00	-0.00	4098.48	-1.85	0.0	-34.91	53.43	-0.04	-0.43	42.09	0.35	0.00	42.53	68.3	2
830	830:WVGD1	Origin	115.00	0.09	0.00	-0.00	4098.48	-1.85	0.0	-36.62	54.47	-0.04	-0.46	42.09	0.36	0.00	42.55	68.3	2
830	830:g	End	120.00	0.00	0.00	0.00	4370.80	-2.05	0.0	-36.62	54.47	-0.04	-0.44	42.07	0.35	0.00	42.51	69.5	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	47.39	0.02	-1.82	-1.81	-0.00	0.0	2.61	0.45	0.00	0.37	1.70	0.10	0.00	2.07	3.2	2
Davit1	Davit1:End	End	4.01	47.55	0.02	-5.00	0.00	0.00	0.0	2.61	0.45	0.00	0.37	0.00	0.15	0.00	0.45	0.7	3
Davit2	Davit2:O	Origin	0.00	47.44	0.02	-0.50	-0.06	0.00	0.0	-2.65	0.01	-0.00	-0.37	0.05	0.00	0.00	0.43	0.7	2
Davit2	Davit2:End	End	4.01	47.81	0.02	2.66	-0.00	0.00	0.0	-2.65	0.01	-0.00	-0.37	0.00	0.00	0.00	0.37	0.6	3
Davit3	Davit3:O	Origin	0.00	37.76	0.01	-1.62	-14.11	-0.00	-0.0	5.12	1.86	0.00	0.58	7.41	0.00	0.00	7.98	12.3	1
Davit3	#Davit3:0	End	3.02	37.97	0.01	-3.93	-8.51	-0.00	-0.0	5.12	1.86	0.00	0.68	6.29	0.00	0.00	6.97	10.7	1
Davit3	#Davit3:0	Origin	3.02	37.97	0.01	-3.93	-8.51	-0.00	-0.0	5.13	1.77	0.00	0.68	6.29	0.00	0.00	6.97	10.7	1
Davit3	Davit3:Mid	End	6.05	38.19	0.01	-6.29	-3.15	-0.00	-0.0	5.13	1.77	0.00	0.84	3.52	0.00	0.00	4.36	6.7	1
Davit3	Davit3:Mid	Origin	6.05	38.19	0.01	-6.29	-3.15	-0.00	0.0	5.31	1.05	0.00	0.86	3.52	0.00	0.00	4.39	6.7	1
Davit3	Davit3:End	End	9.05	38.11	0.01	-8.69	-0.00	0.00	0.0	5.31	1.05	0.00	1.11	0.00	0.46	0.00	1.37	2.1	3
Davit4	Davit4:O	Origin	0.00	37.81	0.01	-0.07	-6.30	0.00	0.0	-5.42	0.54	-0.00	-0.61	3.31	0.00	0.00	3.92	6.0	1
Davit4	#Davit4:0	End	3.02	38.16	0.01	2.18	-4.67	0.00	0.0	-5.42	0.54	-0.00	-0.72	3.45	0.00	0.00	4.17	6.4	1
Davit4	#Davit4:0	Origin	3.02	38.16	0.01	2.18	-4.67	0.00	0.0	-5.40	0.47	-0.00	-0.72	3.45	0.00	0.00	4.17	6.4	1
Davit4	Davit4:Mid	End	6.05	38.51	0.01	4.39	-3.24	0.00	0.0	-5.40	0.47	-0.00	-0.88	3.62	0.00	0.00	4.50	6.9	1
Davit4	Davit4:Mid	Origin	6.05	38.51	0.01	4.39	-3.24	0.00	0.0	-5.30	1.08	-0.00	-0.86	3.62	0.00	0.00	4.48	6.9	1
Davit4	Davit4:End	End	9.05	38.58	0.01	6.58	-0.00	0.00	0.0	-5.30	1.08	-0.00	-1.11	0.00	0.47	0.00	1.38	2.1	3
Davit5	Davit5:O	Origin	0.00	29.02	0.01	-1.42	-14.36	-0.00	-0.0	5.11	1.88	0.00	0.57	7.54	0.00	0.00	8.11	12.5	1
Davit5	#Davit5:0	End	3.02	29.23	0.01	-3.54	-8.67	-0.00	-0.0	5.11	1.88	0.00	0.68	6.41	0.00	0.00	7.09	10.9	1
Davit5	#Davit5:0	Origin	3.02	29.23	0.01	-3.54	-8.67	-0.00	-0.0	5.12	1.80	0.00	0.68	6.41	0.00	0.00	7.09	10.9	1
Davit5	Davit5:Mid	End	6.05	29.43	0.01	-5.71	-3.24	-0.00	-0.0	5.12	1.80	0.00	0.83	3.61	0.00	0.00	4.45	6.8	1
Davit5	Davit5:Mid	Origin	6.05	29.43	0.01	-5.71	-3.24	-0.00	0.0	5.30	1.08	0.00	0.86	3.61	0.00	0.00	4.48	6.9	1
Davit5	Davit5:End	End	9.05	29.37	0.01	-7.92	-0.00	0.00	0.0	5.30	1.08	0.00	1.11	0.00	0.47	0.00	1.38	2.1	3
Davit6	Davit6:O	Origin	0.00	29.07	0.01	0.27	-6.56	0.00	0.0	-5.42	0.57	-0.00	-0.61	3.45	0.00	0.00	4.05	6.2	1
Davit6	#Davit6:0	End	3.02	29.39	0.01	2.32	-4.84	0.00	0.0	-5.42	0.57	-0.00	-0.72	3.58	0.00	0.00	4.30	6.6	1
Davit6	#Davit6:0	Origin	3.02	29.39	0.01	2.32	-4.84	0.00	0.0	-5.40	0.50	-0.00	-0.72	3.58	0.00	0.00	4.30	6.6	1
Davit6	Davit6:Mid	End	6.05	29.70	0.01	4.35	-3.33	0.00	0.0	-5.40	0.50	-0.00	-0.88	3.72	0.00	0.00	4.60	7.1	1
Davit6	Davit6:Mid	Origin	6.05	29.70	0.01	4.35	-3.33	0.00	0.0	-5.29	1.11	-0.00	-0.86	3.72	0.00	0.00	4.58	7.0	1
Davit6	Davit6:End	End	9.05	29.76	0.01	6.34	-0.00	0.00	0.0	-5.29	1.11	-0.00	-1.11	0.00	0.49	0.00	1.39	2.1	3
Davit7	Davit7:O	Origin	0.00	21.22	0.01	-1.21	-14.71	-0.00	-0.0	5.10	1.92	0.00	0.57	7.72	0.00	0.00	8.29	12.8	1
Davit7	#Davit7:0	End	3.02	21.40	0.01	-3.06	-8.90	-0.00	-0.0	5.10	1.92	0.00	0.68	6.58	0.00	0.00	7.26	11.2	1
Davit7	#Davit7:0	Origin	3.02	21.40	0.01	-3.06	-8.90	-0.00	-0.0	5.11	1.83	0.00	0.68	6.58	0.00	0.00	7.26	11.2	1
Davit7	Davit7:Mid	End	6.05	21.59	0.01	-4.96	-3.36	-0.00	-0.0	5.11	1.83	0.00	0.83	3.75	0.00	0.00	4.58	7.0	1

Davit7	Davit7:Mid	Origin	6.05	21.59	0.01	-4.96	-3.36	-0.00	0.0	5.29	1.12	0.00	0.86	3.75	0.00	0.00	4.61	7.1	1
Davit7	Davit7:End	End	9.05	21.54	0.01	-6.90	-0.00	0.00	0.0	5.29	1.12	0.00	1.11	0.00	0.49	0.00	1.40	2.1	3
Davit8	Davit8:O	Origin	0.00	21.26	0.01	0.48	-6.93	0.00	0.0	-5.41	0.61	-0.00	-0.61	3.64	0.00	0.00	4.25	6.5	1
Davit8	#Davit8:0	End	3.02	21.53	0.01	2.27	-5.09	0.00	0.0	-5.41	0.61	-0.00	-0.72	3.76	0.00	0.00	4.48	6.9	1
Davit8	#Davit8:0	Origin	3.02	21.53	0.01	2.27	-5.09	0.00	0.0	-5.40	0.54	-0.00	-0.72	3.76	0.00	0.00	4.48	6.9	1
Davit8	Davit8:Mid	End	6.05	21.79	0.01	4.03	-3.45	0.00	0.0	-5.40	0.54	-0.00	-0.88	3.85	0.00	0.00	4.73	7.3	1
Davit8	Davit8:Mid	Origin	6.05	21.79	0.01	4.03	-3.45	0.00	0.0	-5.29	1.15	-0.00	-0.86	3.85	0.00	0.00	4.71	7.2	1
Davit8	Davit8:End	End	9.05	21.83	0.01	5.75	-0.00	0.00	0.0	-5.29	1.15	-0.00	-1.11	0.00	0.50	0.00	1.41	2.2	3

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
Clamp1	2.641	80.00	80.00	3.30
Clamp2	2.641	80.00	80.00	3.30
Clamp3	5.402	80.00	80.00	6.75
Clamp4	5.402	80.00	80.00	6.75
Clamp5	5.402	80.00	80.00	6.75
Clamp6	5.402	80.00	80.00	6.75
Clamp7	5.402	80.00	80.00	6.75
Clamp8	5.402	80.00	80.00	6.75
Clamp9	2.791	80.00	80.00	3.49
Clamp10	0.414	80.00	80.00	0.52
Clamp11	0.414	80.00	80.00	0.52
Clamp12	0.414	80.00	80.00	0.52
Clamp13	0.414	80.00	80.00	0.52
Clamp14	0.414	80.00	80.00	0.52
Clamp15	0.414	80.00	80.00	0.52
Clamp16	0.414	80.00	80.00	0.52
Clamp17	0.414	80.00	80.00	0.52
Clamp18	0.414	80.00	80.00	0.52
Clamp19	0.414	80.00	80.00	0.52
Clamp20	0.414	80.00	80.00	0.52

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

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)
830:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
830:t	0.002145	3.841	-0.08386	-3.1884	0.0017	0.0000	0.002145	3.841	119.9
830:Sprint	0.002142	3.835	-0.0837	-3.1884	0.0017	0.0000	0.002142	3.835	119.8
830:Arm1	0.001832	3.246	-0.06727	-3.1475	0.0016	0.0000	0.001832	3.246	109.2
830:WVGD11	0.00171	3.013	-0.06086	-3.1177	0.0016	0.0000	0.00171	3.013	104.9
830:Arm2	0.001481	2.576	-0.04905	-3.0115	0.0016	0.0000	0.001481	2.576	96.78
830:WVGD10	0.001431	2.48	-0.04651	-2.9794	0.0016	0.0000	0.001431	2.48	94.95
830:WVGD9	0.001166	1.979	-0.03375	-2.7473	0.0015	0.0000	0.001166	1.979	84.97
830:Arm3	0.001161	1.971	-0.03355	-2.7429	0.0015	0.0000	0.001161	1.971	84.8
830:WVGD8	0.0009209	1.524	-0.02315	-2.4425	0.0013	0.0000	0.0009209	1.524	74.98
830:Arm4	0.0008711	1.433	-0.02119	-2.3701	0.0013	0.0000	0.0008711	1.433	72.81
830:WVGD7	0.0007012	1.127	-0.01498	-2.0876	0.0012	0.0000	0.0007012	1.127	64.99
830:WVGD6	0.0005093	0.7939	-0.009162	-1.7265	0.0010	0.0000	0.0005093	0.7939	54.99
830:WVGD5	0.0003457	0.5221	-0.005212	-1.3797	0.0009	0.0000	0.0003457	0.5221	44.99
830:WVGD4	0.0002117	0.3097	-0.002708	-1.0475	0.0007	0.0000	0.0002117	0.3097	35
830:WVGD3	0.0001092	0.1545	-0.001249	-0.7241	0.0005	0.0000	0.0001092	0.1545	25
830:WVGD2	3.989e-005	0.05452	-0.0004947	-0.4175	0.0003	0.0000	3.989e-005	0.05452	15
830:WVGD1	4.68e-006	0.0061	-0.0001257	-0.1337	0.0001	0.0000	4.68e-006	0.0061	5
Davit1:O	0.001831	3.245	-0.1131	-3.1475	0.0016	0.0000	0.001831	4.08	109.1
Davit1:End	0.001833	3.257	-0.3389	-3.2667	0.0016	0.0000	0.001833	8.092	109.2
Davit2:O	0.001834	3.247	-0.02142	-3.1475	0.0016	0.0000	0.001834	2.412	109.2
Davit2:End	0.00185	3.271	0.1937	-3.0622	0.0016	0.0000	0.00185	-1.564	109.8
Davit3:O	0.001479	2.574	-0.1031	-3.0115	0.0016	0.0000	0.001479	3.604	96.73
Davit3:Mid	0.00149	2.607	-0.4433	-3.4369	0.0016	0.0000	0.00149	9.637	97.14
Davit3:End	0.001484	2.602	-0.6277	-3.5630	0.0016	0.0000	0.001484	12.63	96.96
Davit4:O	0.001483	2.577	0.005041	-3.0115	0.0016	0.0000	0.001483	1.548	96.84
Davit4:Mid	0.001513	2.622	0.2994	-2.6431	0.0016	0.0000	0.001513	-4.408	97.88
Davit4:End	0.001517	2.625	0.4331	-2.5140	0.0016	0.0000	0.001517	-7.405	98.02
Davit5:O	0.00116	1.969	-0.09182	-2.7429	0.0015	0.0000	0.00116	3.187	84.74
Davit5:Mid	0.00117	2	-0.4038	-3.1708	0.0015	0.0000	0.00117	9.218	85.18
Davit5:End	0.001165	1.995	-0.5744	-3.2977	0.0015	0.0000	0.001165	12.21	85.01
Davit6:O	0.001163	1.972	0.02472	-2.7429	0.0015	0.0000	0.001163	0.7542	84.86
Davit6:Mid	0.00119	2.011	0.291	-2.3718	0.0015	0.0000	0.00119	-5.206	85.87
Davit6:End	0.001194	2.014	0.4105	-2.2418	0.0015	0.0000	0.001194	-8.204	85.99
Davit7:O	0.0008696	1.431	-0.07932	-2.3701	0.0013	0.0000	0.0008696	2.837	72.75
Davit7:Mid	0.0008798	1.459	-0.3523	-2.8014	0.0013	0.0000	0.0008798	8.865	73.23
Davit7:End	0.0008761	1.456	-0.5035	-2.9295	0.0013	0.0000	0.0008761	11.86	73.08
Davit8:O	0.0008725	1.434	0.03695	-2.3701	0.0013	0.0000	0.0008725	0.02818	72.87
Davit8:Mid	0.0008956	1.467	0.2643	-1.9952	0.0013	0.0000	0.0008956	-5.939	73.85
Davit8:End	0.0008984	1.469	0.364	-1.8641	0.0013	0.0000	0.0008984	-8.937	73.95

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 %	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 %
830:g	-0.05	0.0	-38.31	0.0	0.0	-60.72	0.0	0.0	71.79	0.0	3421.46	0.0	-2.6	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.
830	830:t	Origin	0.00	46.09	0.03	-1.01	-0.00	-0.00	-0.0	-0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5
830	830:Sprint	End	0.10	46.03	0.03	-1.00	0.00	-0.00	-0.0	-0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5
830	830:Sprint	Origin	0.10	46.03	0.03	-1.00	0.00	-0.00	-0.0	-2.88	1.18	-0.00	-0.31	0.00	0.26	0.00	0.54	0.8	5
830	Tube 1	End	5.05	42.73	0.02	-0.91	5.84	-0.00	-0.0	-2.88	1.18	-0.00	-0.28	1.53	0.06	0.00	1.81	2.8	2
830	Tube 1	Origin	5.05	42.73	0.02	-0.91	5.84	-0.00	0.0	-3.06	1.25	-0.00	-0.29	1.53	0.06	0.00	1.82	2.8	2
830	SpliceT	End	10.00	39.45	0.02	-0.82	12.02	-0.01	0.0	-3.06	1.25	-0.00	-0.26	2.56	0.06	0.00	2.83	4.4	2
830	SpliceT	Origin	10.00	39.45	0.02	-0.82	12.02	-0.01	-0.0	-3.18	1.29	-0.00	-0.14	1.27	0.03	0.00	1.40	2.2	2
830	830:Arm1	End	10.75	38.95	0.02	-0.81	12.99	-0.01	-0.0	-3.18	1.29	-0.00	-0.13	1.33	0.03	0.00	1.47	2.3	2
830	830:Arm1	Origin	10.75	38.95	0.02	-0.81	15.27	-0.01	0.0	-6.93	8.27	-0.00	-0.29	1.56	0.19	0.00	1.88	2.9	2
830	830:WVGD11	End	15.00	36.16	0.02	-0.73	50.43	-0.02	0.0	-6.93	8.27	-0.00	-0.27	4.41	0.17	0.00	4.69	7.2	2
830	830:WVGD11	Origin	15.00	36.16	0.02	-0.73	50.43	-0.02	0.0	-7.93	8.47	-0.00	-0.31	4.41	0.18	0.00	4.73	7.3	2
830	Tube 2	End	19.08	33.51	0.02	-0.66	85.00	-0.04	0.0	-7.93	8.47	-0.00	-0.29	6.46	0.16	0.00	6.75	10.4	2
830	Tube 2	Origin	19.08	33.51	0.02	-0.66	85.00	-0.04	0.0	-8.32	8.54	-0.01	-0.30	6.46	0.17	0.00	6.77	10.4	2
830	830:Arm2	End	23.17	30.91	0.02	-0.59	119.89	-0.06	0.0	-8.32	8.54	-0.01	-0.28	7.99	0.15	0.00	8.28	12.7	2
830	830:Arm2	Origin	23.17	30.91	0.02	-0.59	126.38	-0.06	0.0	-15.50	17.83	-0.01	-0.53	8.42	0.32	0.00	8.97	13.8	2
830	830:WVGD10	End	25.00	29.76	0.02	-0.56	159.05	-0.07	0.0	-15.50	17.83	-0.01	-0.51	10.02	0.31	0.00	10.55	16.2	2
830	830:WVGD10	Origin	25.00	29.76	0.02	-0.56	159.05	-0.07	0.0	-16.52	18.00	-0.01	-0.55	10.02	0.32	0.00	10.58	16.3	2
830	Tube 2	End	30.00	26.69	0.02	-0.48	249.06	-0.11	0.0	-16.52	18.00	-0.01	-0.51	13.56	0.29	0.00	14.08	21.7	2
830	Tube 2	Origin	30.00	26.69	0.02	-0.48	249.06	-0.11	0.0	-17.10	18.09	-0.01	-0.53	13.56	0.30	0.00	14.10	21.7	2
830	830:WVGD9	End	35.00	23.74	0.01	-0.40	339.51	-0.15	0.0	-17.10	18.09	-0.01	-0.49	16.14	0.28	0.00	16.64	25.6	2
830	830:WVGD9	Origin	35.00	23.74	0.01	-0.40	339.51	-0.15	0.0	-18.05	18.24	-0.01	-0.52	16.14	0.28	0.00	16.66	25.6	2
830	830:Arm3	End	35.17	23.65	0.01	-0.40	342.56	-0.15	0.0	-18.05	18.24	-0.01	-0.52	16.21	0.28	0.00	16.73	25.7	2
830	830:Arm3	Origin	35.17	23.65	0.01	-0.40	349.02	-0.15	0.0	-25.33	27.48	-0.01	-0.73	16.51	0.42	0.00	17.26	26.6	2
830	Tube 2	End	40.08	20.89	0.01	-0.34	484.10	-0.21	0.0	-25.33	27.48	-0.01	-0.68	20.22	0.39	0.00	20.91	32.2	2
830	Tube 2	Origin	40.08	20.89	0.01	-0.34	484.10	-0.21	0.0	-26.02	27.54	-0.01	-0.70	20.22	0.39	0.00	20.93	32.2	2
830	830:WVGD8	End	45.00	18.29	0.01	-0.28	619.52	-0.27	0.0	-26.02	27.54	-0.01	-0.66	23.00	0.37	0.00	23.67	36.4	2
830	830:WVGD8	Origin	45.00	18.29	0.01	-0.28	619.52	-0.27	0.0	-27.17	27.70	-0.01	-0.69	23.00	0.37	0.00	23.70	36.5	2
830	830:Arm4	End	47.17	17.19	0.01	-0.25	679.53	-0.30	0.0	-27.17	27.70	-0.01	-0.68	24.00	0.36	0.00	24.69	38.0	2
830	830:Arm4	Origin	47.17	17.19	0.01	-0.25	685.96	-0.30	0.0	-34.64	36.88	-0.02	-0.86	24.23	0.49	0.00	25.11	38.6	2
830	Tube 2	End	51.08	15.30	0.01	-0.21	830.38	-0.36	0.0	-34.64	36.88	-0.02	-0.82	26.89	0.46	0.00	27.73	42.7	2
830	Tube 2	Origin	51.08	15.30	0.01	-0.21	830.38	-0.36	0.0	-35.30	36.91	-0.02	-0.84	26.89	0.46	0.00	27.74	42.7	2
830	830:WVGD7	End	55.00	13.52	0.01	-0.18	974.92	-0.42	0.0	-35.30	36.91	-0.02	-0.81	29.05	0.45	0.00	29.87	45.9	2
830	830:WVGD7	Origin	55.00	13.52	0.01	-0.18	974.92	-0.42	0.0	-36.46	37.03	-0.02	-0.83	29.05	0.45	0.00	29.89	46.0	2
830	SpliceT	End	57.25	12.56	0.01	-0.16	1058.25	-0.46	0.0	-36.46	37.03	-0.02	-0.81	30.11	0.44	0.00	30.93	47.6	2
830	SpliceT	Origin	57.25	12.56	0.01	-0.16	1058.25	-0.46	0.0	-37.14	37.06	-0.02	-0.83	30.11	0.44	0.00	30.95	47.6	2
830	Tube 2	End	60.00	11.43	0.01	-0.14	1160.16	-0.52	0.0	-37.14	37.06	-0.02	-0.71	28.00	0.37	0.00	28.71	44.2	2
830	Tube 2	Origin	60.00	11.43	0.01	-0.14	1160.16	-0.52	0.0	-38.13	37.10	-0.02	-0.73	28.00	0.37	0.00	28.73	44.2	2
830	SpliceB	End	62.75	10.36	0.01	-0.12	1262.17	-0.57	0.0	-38.13	37.10	-0.02	-0.71	28.84	0.36	0.00	29.55	45.5	2
830	SpliceB	Origin	62.75	10.36	0.01	-0.12	1262.17	-0.57	0.0	-38.86	37.13	-0.02	-0.72	28.84	0.36	0.00	29.56	45.5	2
830	830:WVGD6	End	65.00	9.53	0.01	-0.11	1345.71	-0.62	0.0	-38.86	37.13	-0.02	-0.70	29.43	0.36	0.00	30.14	46.4	2
830	830:WVGD6	Origin	65.00	9.53	0.01	-0.11	1345.71	-0.62	0.0	-40.27	37.26	-0.02	-0.73	29.43	0.36	0.00	30.16	46.4	2
830	Tube 3	End	70.00	7.80	0.01	-0.08	1532.01	-0.73	0.0	-40.27	37.26	-0.02	-0.70	30.49	0.34	0.00	31.19	48.0	2
830	Tube 3	Origin	70.00	7.80	0.01	-0.08	1532.01	-0.73	0.0	-41.37	37.31	-0.03	-0.71	30.49	0.34	0.00	31.21	48.0	2
830	830:WVGD5	End	75.00	6.26	0.00	-0.06	1718.54	-0.86	0.0	-41.37	37.31	-0.03	-0.68	31.27	0.33	0.00	31.95	49.2	2
830	830:WVGD5	Origin	75.00	6.26	0.00	-0.06	1718.54	-0.86	0.0	-43.14	37.45	-0.03	-0.71	31.27	0.33	0.00	31.98	49.2	2
830	Tube 3	End	80.00	4.90	0.00	-0.05	1905.80	-1.00	0.0	-43.14	37.45	-0.03	-0.68	31.82	0.31	0.00	32.50	50.0	2
830	Tube 3	Origin	80.00	4.90	0.00	-0.05	1905.80	-1.00	0.0	-44.32	37.51	-0.03	-0.70	31.82	0.31	0.00	32.52	50.0	2
830	830:WVGD4	End	85.00	3.72	0.00	-0.03	2093.32	-1.15	0.0	-44.32	37.51	-0.03	-0.67	32.18	0.30	0.00	32.86	50.6	2
830	830:WVGD4	Origin	85.00	3.72	0.00	-0.03	2093.32	-1.15	0.0	-45.81	37.63	-0.03	-0.70	32.18	0.30	0.00	32.88	50.6	2
830	SpliceT	End	87.00	3.29	0.00	-0.03	2168.59	-1.21	0.0	-45.81	37.63	-0.03	-0.69	32.29	0.30	0.00	32.98	50.7	2
830	SpliceT	Origin	87.00	3.29	0.00	-0.03	2168.59	-1.21	0.0	-46.89	37.67	-0.03	-0.70	32.29	0.30	0.00	32.99	50.8	2
830	Tube 3	End	90.50	2.61	0.00	-0.02	2300.44	-1.33	0.0	-46.89	37.67	-0.03	-0.69	33.62	0.29	0.00	34.32	52.8	2
830	Tube 3	Origin	90.50	2.61	0.00	-0.02	2300.44	-1.33	0.0	-48.59	37.72	-0.04	-0.72	33.62	0.30	0.00	34.35	52.8	2

830	SpliceB	End	94.00	2.01	0.00	-0.02	2432.45	-1.45	0.0	-48.59	37.72	-0.04	-0.70	33.67	0.29	0.00	34.37	52.9	2
830	SpliceB	Origin	94.00	2.01	0.00	-0.02	2432.45	-1.45	0.0	-49.58	37.75	-0.04	-0.72	33.67	0.29	0.00	34.39	52.9	2
830	830:WVGD3	End	95.00	1.85	0.00	-0.01	2470.20	-1.49	0.0	-49.58	37.75	-0.04	-0.71	33.67	0.29	0.00	34.39	52.9	2
830	830:WVGD3	Origin	95.00	1.85	0.00	-0.01	2470.20	-1.49	0.0	-51.00	37.87	-0.04	-0.73	33.67	0.29	0.00	34.41	52.9	2
830	Tube 4	End	100.00	1.17	0.00	-0.01	2659.53	-1.68	0.0	-51.00	37.87	-0.04	-0.70	33.65	0.28	0.00	34.35	52.9	2
830	Tube 4	Origin	100.00	1.17	0.00	-0.01	2659.53	-1.68	0.0	-52.34	37.92	-0.04	-0.72	33.65	0.28	0.00	34.37	52.9	2
830	830:WVGD2	End	105.00	0.65	0.00	-0.01	2849.13	-1.89	0.0	-52.34	37.92	-0.04	-0.70	33.54	0.27	0.00	34.24	53.1	2
830	830:WVGD2	Origin	105.00	0.65	0.00	-0.01	2849.13	-1.89	0.0	-54.35	38.06	-0.04	-0.72	33.54	0.27	0.00	34.27	53.1	2
830	Tube 4	End	110.00	0.29	0.00	-0.00	3039.45	-2.11	0.0	-54.35	38.06	-0.04	-0.70	33.38	0.26	0.00	34.09	53.8	2
830	Tube 4	Origin	110.00	0.29	0.00	-0.00	3039.45	-2.11	0.0	-55.77	38.13	-0.05	-0.72	33.38	0.26	0.00	34.10	53.8	2
830	830:WVGD1	End	115.00	0.07	0.00	-0.00	3230.08	-2.34	0.0	-55.77	38.13	-0.05	-0.69	33.18	0.25	0.00	33.87	54.4	2
830	830:WVGD1	Origin	115.00	0.07	0.00	-0.00	3230.08	-2.34	0.0	-57.86	38.28	-0.05	-0.72	33.18	0.25	0.00	33.90	54.4	2
830	830:g	End	120.00	0.00	0.00	0.00	3421.46	-2.59	0.0	-57.86	38.28	-0.05	-0.70	32.93	0.24	0.00	33.63	55.0	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	38.94	0.02	-1.36	-8.02	-0.00	0.0	3.31	2.00	0.00	0.47	7.51	0.44	0.00	8.02	12.3	2
Davit1	Davit1:End	End	4.01	39.09	0.02	-4.07	0.00	0.00	0.0	3.31	2.00	0.00	0.47	0.00	0.65	0.00	1.22	1.9	3
Davit2	Davit2:O	Origin	0.00	38.97	0.02	-0.26	-5.75	0.00	0.0	-3.60	1.43	-0.00	-0.51	5.38	0.32	0.00	5.91	9.1	2
Davit2	Davit2:End	End	4.01	39.25	0.02	2.32	-0.00	0.00	0.0	-3.60	1.43	-0.00	-0.51	0.00	0.47	0.00	0.96	1.5	3
Davit3	Davit3:O	Origin	0.00	30.89	0.02	-1.24	-33.20	-0.00	-0.0	4.16	3.94	0.00	0.47	17.43	0.00	0.00	17.90	27.5	1
Davit3	#Davit3:0	End	3.02	31.09	0.02	-3.21	-21.29	-0.00	-0.0	4.16	3.94	0.00	0.55	15.73	0.00	0.00	16.29	25.1	1
Davit3	#Davit3:0	Origin	3.02	31.09	0.02	-3.21	-21.29	-0.00	-0.0	4.18	3.85	0.00	0.56	15.73	0.00	0.00	16.29	25.1	1
Davit3	Davit3:Mid	End	6.05	31.29	0.02	-5.32	-9.66	-0.00	-0.0	4.18	3.85	0.00	0.68	10.79	0.00	0.00	11.47	17.6	1
Davit3	Davit3:Mid	Origin	6.05	31.29	0.02	-5.32	-9.66	-0.00	0.0	4.63	3.22	0.00	0.75	10.79	0.00	0.00	11.54	17.8	1
Davit3	Davit3:End	End	9.05	31.22	0.02	-7.53	-0.00	0.00	0.0	4.63	3.22	0.00	0.97	0.00	1.41	0.00	2.63	4.0	3
Davit4	Davit4:O	Origin	0.00	30.93	0.02	0.06	-26.72	0.00	0.0	-4.99	2.81	-0.00	-0.56	14.03	0.00	0.00	14.59	22.4	1
Davit4	#Davit4:0	End	3.02	31.20	0.02	1.89	-18.22	0.00	0.0	-4.99	2.81	-0.00	-0.66	13.46	0.00	0.00	14.13	21.7	1
Davit4	#Davit4:0	Origin	3.02	31.20	0.02	1.89	-18.22	0.00	0.0	-4.97	2.75	-0.00	-0.66	13.46	0.00	0.00	14.12	21.7	1
Davit4	Davit4:Mid	End	6.05	31.46	0.02	3.59	-9.90	0.00	0.0	-4.97	2.75	-0.00	-0.81	11.05	0.00	0.00	11.86	18.2	1
Davit4	Davit4:Mid	Origin	6.05	31.46	0.02	3.59	-9.90	0.00	0.0	-4.58	3.30	-0.00	-0.75	11.05	0.00	0.00	11.79	18.1	1
Davit4	Davit4:End	End	9.05	31.50	0.02	5.20	-0.00	0.00	0.0	-4.58	3.30	-0.00	-0.96	0.00	1.44	0.00	2.68	4.1	3
Davit5	Davit5:O	Origin	0.00	23.63	0.01	-1.10	-33.39	-0.00	-0.0	4.14	3.96	0.00	0.47	17.53	0.00	0.00	17.99	27.7	1
Davit5	#Davit5:0	End	3.02	23.81	0.01	-2.90	-21.42	-0.00	-0.0	4.14	3.96	0.00	0.55	15.83	0.00	0.00	16.38	25.2	1
Davit5	#Davit5:0	Origin	3.02	23.81	0.01	-2.90	-21.42	-0.00	-0.0	4.16	3.87	0.00	0.55	15.83	0.00	0.00	16.38	25.2	1
Davit5	Davit5:Mid	End	6.05	24.00	0.01	-4.85	-9.73	-0.00	-0.0	4.16	3.87	0.00	0.68	10.86	0.00	0.00	11.54	17.7	1
Davit5	Davit5:Mid	Origin	6.05	24.00	0.01	-4.85	-9.73	-0.00	0.0	4.62	3.24	0.00	0.75	10.86	0.00	0.00	11.61	17.9	1
Davit5	Davit5:End	End	9.05	23.94	0.01	-6.89	0.00	0.00	0.0	4.62	3.24	0.00	0.97	0.00	1.42	0.00	2.64	4.1	3
Davit6	Davit6:O	Origin	0.00	23.66	0.01	0.30	-26.93	0.00	0.0	-4.98	2.84	-0.00	-0.56	14.14	0.00	0.00	14.70	22.6	1
Davit6	#Davit6:0	End	3.02	23.91	0.01	1.95	-18.36	0.00	0.0	-4.98	2.84	-0.00	-0.66	13.56	0.00	0.00	14.23	21.9	1
Davit6	#Davit6:0	Origin	3.02	23.91	0.01	1.95	-18.36	0.00	0.0	-4.96	2.78	-0.00	-0.66	13.56	0.00	0.00	14.22	21.9	1
Davit6	Davit6:Mid	End	6.05	24.14	0.01	3.49	-9.96	0.00	0.0	-4.96	2.78	-0.00	-0.81	11.12	0.00	0.00	11.93	18.3	1
Davit6	Davit6:Mid	Origin	6.05	24.14	0.01	3.49	-9.96	0.00	0.0	-4.56	3.32	-0.00	-0.74	11.12	0.00	0.00	11.86	18.3	1
Davit6	Davit6:End	End	9.05	24.17	0.01	4.93	-0.00	0.00	0.0	-4.56	3.32	-0.00	-0.96	0.00	1.45	0.00	2.69	4.1	3
Davit7	Davit7:O	Origin	0.00	17.18	0.01	-0.95	-33.64	-0.00	-0.0	4.12	3.99	0.00	0.46	17.66	0.00	0.00	18.12	27.9	1
Davit7	#Davit7:0	End	3.02	17.34	0.01	-2.52	-21.59	-0.00	-0.0	4.12	3.99	0.00	0.55	15.95	0.00	0.00	16.50	25.4	1
Davit7	#Davit7:0	Origin	3.02	17.34	0.01	-2.52	-21.59	-0.00	-0.0	4.14	3.89	0.00	0.55	15.95	0.00	0.00	16.50	25.4	1
Davit7	Davit7:Mid	End	6.05	17.51	0.01	-4.23	-9.82	-0.00	-0.0	4.14	3.89	0.00	0.67	10.96	0.00	0.00	11.63	17.9	1

Davit7	Davit7:Mid	Origin	6.05	17.51	0.01	-4.23	-9.82	-0.00	0.0	4.60	3.27	0.00	0.75	10.96	0.00	0.00	11.71	18.0	1
Davit7	Davit7:End	End	9.05	17.47	0.01	-6.04	0.00	0.00	0.0	4.60	3.27	0.00	0.97	0.00	1.43	0.00	2.66	4.1	3
Davit8	Davit8:O	Origin	0.00	17.21	0.01	0.44	-27.21	0.00	0.0	-4.96	2.87	-0.00	-0.56	14.29	0.00	0.00	14.84	22.8	1
Davit8	#Davit8:0	End	3.02	17.41	0.01	1.87	-18.54	0.00	0.0	-4.96	2.87	-0.00	-0.66	13.70	0.00	0.00	14.36	22.1	1
Davit8	#Davit8:0	Origin	3.02	17.41	0.01	1.87	-18.54	0.00	0.0	-4.94	2.81	-0.00	-0.66	13.70	0.00	0.00	14.36	22.1	1
Davit8	Davit8:Mid	End	6.05	17.60	0.01	3.17	-10.05	0.00	0.0	-4.94	2.81	-0.00	-0.80	11.22	0.00	0.00	12.02	18.5	1
Davit8	Davit8:Mid	Origin	6.05	17.60	0.01	3.17	-10.05	0.00	0.0	-4.54	3.35	-0.00	-0.74	11.22	0.00	0.00	11.96	18.4	1
Davit8	Davit8:End	End	9.05	17.62	0.01	4.37	-0.00	0.00	0.0	-4.54	3.35	-0.00	-0.95	0.00	1.47	0.00	2.71	4.2	3

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
Clamp1	3.846	80.00	80.00	4.81
Clamp2	3.846	80.00	80.00	4.81
Clamp3	5.625	80.00	80.00	7.03
Clamp4	5.625	80.00	80.00	7.03
Clamp5	5.625	80.00	80.00	7.03
Clamp6	5.625	80.00	80.00	7.03
Clamp7	5.625	80.00	80.00	7.03
Clamp8	5.625	80.00	80.00	7.03
Clamp9	3.019	80.00	80.00	3.77
Clamp10	0.642	80.00	80.00	0.80
Clamp11	0.642	80.00	80.00	0.80
Clamp12	0.642	80.00	80.00	0.80
Clamp13	0.642	80.00	80.00	0.80
Clamp14	0.642	80.00	80.00	0.80
Clamp15	0.642	80.00	80.00	0.80
Clamp16	0.642	80.00	80.00	0.80
Clamp17	0.642	80.00	80.00	0.80
Clamp18	0.642	80.00	80.00	0.80
Clamp19	0.642	80.00	80.00	0.80
Clamp20	0.642	80.00	80.00	0.80

*** 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)
830	70.12	NESC Heavy Wind	33	24767.1

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 %
830	NESC Heavy Wind	1	2.321	1.522	0.734	2.439	21.996	36.027	116.256	4	145.532	2.759	3.250	72.05
830	NESC Heavy Wind	2	2.439	0.734	1.522	2.321	21.996	25.393	81.940	4	131.574	2.316	3.250	50.79
830	NESC Heavy Wind	3	2.479	-1.229	2.479	1.229	29.499	2.172	9.398	2	67.663	0.677	3.250	4.34
830	NESC Heavy Wind	4	1.522	-2.321	2.439	-0.734	21.996	23.562	76.032	4	-124.878	2.231	3.250	47.12
830	NESC Heavy Wind	5	0.734	-2.439	2.321	-1.522	21.996	34.165	110.246	4	-138.763	2.687	3.250	68.33
830	NESC Heavy Wind	6	-1.229	-2.479	1.229	-2.479	29.499	4.676	20.237	2	-138.763	0.994	3.250	9.35
830	NESC Heavy Wind	7	-2.321	-1.522	-0.734	-2.439	21.996	34.092	110.011	4	-138.572	2.684	3.250	68.18
830	NESC Heavy Wind	8	-2.439	-0.734	-1.522	-2.321	21.996	23.458	75.695	4	-124.614	2.226	3.250	46.92
830	NESC Heavy Wind	9	-2.479	1.229	-2.479	-1.229	29.499	2.172	9.398	2	68.086	0.677	3.250	4.34
830	NESC Heavy Wind	10	-1.522	2.321	-2.439	0.734	21.996	25.497	82.277	4	131.839	2.321	3.250	50.99
830	NESC Heavy Wind	11	-0.734	2.439	-2.321	1.522	21.996	36.100	116.491	4	145.724	2.762	3.250	72.20
830	NESC Heavy Wind	12	1.229	2.479	-1.229	2.479	29.499	4.911	21.253	2	145.724	1.019	3.250	9.82
830	NESC Heavy Wind	13	2.552	1.078	1.078	2.552	25.024	21.879	80.318	5	145.532	2.150	3.250	43.76
830	NESC Heavy Wind	14	1.078	-2.552	2.552	-1.078	25.024	20.577	75.539	5	-138.763	2.085	3.250	41.15
830	NESC Heavy Wind	15	-2.552	-1.078	-1.078	-2.552	25.024	20.514	75.307	5	-138.572	2.082	3.250	41.03
830	NESC Heavy Wind	16	-1.078	2.552	-2.552	1.078	25.024	21.942	80.550	5	145.724	2.153	3.250	43.88
830	NESC Extreme Wind	1	2.321	1.522	0.734	2.439	21.996	35.625	114.956	4	144.069	2.743	3.250	71.25
830	NESC Extreme Wind	2	2.439	0.734	1.522	2.321	21.996	24.995	80.656	4	130.128	2.298	3.250	49.99
830	NESC Extreme Wind	3	2.479	-1.229	2.479	1.229	29.499	2.173	9.403	2	66.234	0.678	3.250	4.35
830	NESC Extreme Wind	4	1.522	-2.321	2.439	-0.734	21.996	23.988	77.406	4	-126.471	2.251	3.250	47.98
830	NESC Extreme Wind	5	0.734	-2.439	2.321	-1.522	21.996	34.608	111.674	4	-140.389	2.704	3.250	69.22
830	NESC Extreme Wind	6	-1.229	-2.479	1.229	-2.479	29.499	4.733	20.484	2	-140.389	1.000	3.250	9.47
830	NESC Extreme Wind	7	-2.321	-1.522	-0.734	-2.439	21.996	34.585	111.600	4	-140.328	2.703	3.250	69.17
830	NESC Extreme Wind	8	-2.439	-0.734	-1.522	-2.321	21.996	23.955	77.300	4	-126.388	2.250	3.250	47.91
830	NESC Extreme Wind	9	-2.479	1.229	-2.479	-1.229	29.499	2.173	9.403	2	66.368	0.678	3.250	4.35
830	NESC Extreme Wind	10	-1.522	2.321	-2.439	0.734	21.996	25.028	80.762	4	130.211	2.299	3.250	50.06
830	NESC Extreme Wind	11	-0.734	2.439	-2.321	1.522	21.996	35.648	115.030	4	144.129	2.744	3.250	71.30
830	NESC Extreme Wind	12	1.229	2.479	-1.229	2.479	29.499	4.860	21.030	2	144.129	1.013	3.250	9.72
830	NESC Extreme Wind	13	2.552	1.078	1.078	2.552	25.024	21.597	79.283	5	144.069	2.136	3.250	43.19
830	NESC Extreme Wind	14	1.078	-2.552	2.552	-1.078	25.024	20.884	76.663	5	-140.389	2.100	3.250	41.77
830	NESC Extreme Wind	15	-2.552	-1.078	-1.078	-2.552	25.024	20.864	76.590	5	-140.328	2.099	3.250	41.73
830	NESC Extreme Wind	16	-1.078	2.552	-2.552	1.078	25.024	21.617	79.356	5	144.129	2.137	3.250	43.23
830	NESC Extreme Ice w/ Wind	1	2.321	1.522	0.734	2.439	21.996	28.289	91.285	4	114.229	2.445	3.250	56.58
830	NESC Extreme Ice w/ Wind	2	2.439	0.734	1.522	2.321	21.996	19.966	64.427	4	103.310	2.054	3.250	39.93
830	NESC Extreme Ice w/ Wind	3	2.479	-1.229	2.479	1.229	29.499	1.701	7.361	2	53.282	0.599	3.250	3.40
830	NESC Extreme Ice w/ Wind	4	1.522	-2.321	2.439	-0.734	21.996	18.378	59.304	4	-97.555	1.970	3.250	36.76
830	NESC Extreme Ice w/ Wind	5	0.734	-2.439	2.321	-1.522	21.996	26.689	86.121	4	-108.445	2.374	3.250	53.38
830	NESC Extreme Ice w/ Wind	6	-1.229	-2.479	1.229	-2.479	29.499	3.656	15.821	2	-108.445	0.879	3.250	7.31
830	NESC Extreme Ice w/ Wind	7	-2.321	-1.522	-0.734	-2.439	21.996	26.660	86.027	4	-108.368	2.373	3.250	53.32
830	NESC Extreme Ice w/ Wind	8	-2.439	-0.734	-1.522	-2.321	21.996	18.336	59.169	4	-97.450	1.968	3.250	36.67

830	NESC Extreme Ice w/ Wind	9	-2.479	1.229	-2.479	-1.229	29.499	1.701	7.361	2	53.451	0.599	3.250	3.40
830	NESC Extreme Ice w/ Wind	10	-1.522	2.321	-2.439	0.734	21.996	20.008	64.562	4	103.416	2.056	3.250	40.02
830	NESC Extreme Ice w/ Wind	11	-0.734	2.439	-2.321	1.522	21.996	28.318	91.379	4	114.305	2.446	3.250	56.64
830	NESC Extreme Ice w/ Wind	12	1.229	2.479	-1.229	2.479	29.499	3.854	16.676	2	114.305	0.902	3.250	7.71
830	NESC Extreme Ice w/ Wind	13	2.552	1.078	1.078	2.552	25.024	17.189	63.100	5	114.229	1.906	3.250	34.38
830	NESC Extreme Ice w/ Wind	14	1.078	-2.552	2.552	-1.078	25.024	16.065	58.974	5	-108.445	1.842	3.250	32.13
830	NESC Extreme Ice w/ Wind	15	-2.552	-1.078	-1.078	-2.552	25.024	16.040	58.882	5	-108.368	1.841	3.250	32.08
830	NESC Extreme Ice w/ Wind	16	-1.078	2.552	-2.552	1.078	25.024	17.214	63.193	5	114.305	1.907	3.250	34.43

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
Davit1	12.33	NESC Extreme Ice w/ Wind	1	97.1
Davit2	9.10	NESC Extreme Ice w/ Wind	1	97.1
Davit3	27.54	NESC Extreme Ice w/ Wind	1	210.4
Davit4	22.44	NESC Extreme Ice w/ Wind	1	210.4
Davit5	27.68	NESC Extreme Ice w/ Wind	1	210.4
Davit6	22.61	NESC Extreme Ice w/ Wind	1	210.4
Davit7	27.88	NESC Extreme Ice w/ Wind	1	210.4
Davit8	22.84	NESC Extreme Ice w/ Wind	1	210.4

*** 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	72.20	830	Base Plate
NESC Extreme Wind	71.30	830	Base Plate
NESC Extreme Ice w/ Wind	56.64	830	Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC Heavy Wind	70.12	830	33
NESC Extreme Wind	69.51	830	33
NESC Extreme Ice w/ Wind	54.99	830	33

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	830	11	21.996	69.605	4368.313	-6.500	36.100	116.491	4	145.724	2.762	72.20
NESC Extreme Wind	830	11	21.996	37.405	4370.804	-2.050	35.648	115.030	4	144.129	2.744	71.30
NESC Extreme Ice w/ Wind	830	11	21.996	58.605	3421.463	-2.595	28.318	91.379	4	114.305	2.446	56.64

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Tubular Davit Segment

	Usage %	Label	Number
NESC Heavy Wind	26.84	Davit7	1
NESC Extreme Wind	12.76	Davit7	1
NESC Extreme Ice w/ Wind	27.88	Davit7	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	5.55	NESC Heavy Wind	0.0
Clamp2	Clamp	5.55	NESC Heavy Wind	0.0
Clamp3	Clamp	8.23	NESC Heavy Wind	0.0
Clamp4	Clamp	8.23	NESC Heavy Wind	0.0
Clamp5	Clamp	8.23	NESC Heavy Wind	0.0
Clamp6	Clamp	8.23	NESC Heavy Wind	0.0
Clamp7	Clamp	8.23	NESC Heavy Wind	0.0
Clamp8	Clamp	8.23	NESC Heavy Wind	0.0
Clamp9	Clamp	4.47	NESC Heavy Wind	0.0
Clamp10	Clamp	0.88	NESC Heavy Wind	0.0
Clamp11	Clamp	0.88	NESC Heavy Wind	0.0
Clamp12	Clamp	0.88	NESC Heavy Wind	0.0
Clamp13	Clamp	0.88	NESC Heavy Wind	0.0
Clamp14	Clamp	0.88	NESC Heavy Wind	0.0
Clamp15	Clamp	0.88	NESC Heavy Wind	0.0
Clamp16	Clamp	0.88	NESC Heavy Wind	0.0
Clamp17	Clamp	0.88	NESC Heavy Wind	0.0
Clamp18	Clamp	0.88	NESC Heavy Wind	0.0
Clamp19	Clamp	0.88	NESC Heavy Wind	0.0
Clamp20	Clamp	0.88	NESC Heavy 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	4.252	1.292	4.444
NESC Heavy Wind	Clamp2	Clamp	Davit2:End	0.000	4.252	1.292	4.444
NESC Heavy Wind	Clamp3	Clamp	Davit3:End	0.000	5.721	3.262	6.586
NESC Heavy Wind	Clamp4	Clamp	Davit4:End	0.000	5.721	3.262	6.586
NESC Heavy Wind	Clamp5	Clamp	Davit5:End	0.000	5.721	3.262	6.586
NESC Heavy Wind	Clamp6	Clamp	Davit6:End	0.000	5.721	3.262	6.586
NESC Heavy Wind	Clamp7	Clamp	Davit7:End	0.000	5.721	3.262	6.586
NESC Heavy Wind	Clamp8	Clamp	Davit8:End	0.000	5.721	3.262	6.586
NESC Heavy Wind	Clamp9	Clamp	830:Sprint	0.000	0.536	3.534	3.574
NESC Heavy Wind	Clamp10	Clamp	830:WVGD1	0.000	0.119	0.690	0.700
NESC Heavy Wind	Clamp11	Clamp	830:WVGD2	0.000	0.119	0.690	0.700
NESC Heavy Wind	Clamp12	Clamp	830:WVGD3	0.000	0.119	0.690	0.700
NESC Heavy Wind	Clamp13	Clamp	830:WVGD4	0.000	0.119	0.690	0.700
NESC Heavy Wind	Clamp14	Clamp	830:WVGD5	0.000	0.119	0.690	0.700
NESC Heavy Wind	Clamp15	Clamp	830:WVGD6	0.000	0.119	0.690	0.700
NESC Heavy Wind	Clamp16	Clamp	830:WVGD7	0.000	0.119	0.690	0.700
NESC Heavy Wind	Clamp17	Clamp	830:WVGD8	0.000	0.119	0.690	0.700
NESC Heavy Wind	Clamp18	Clamp	830:WVGD9	0.000	0.119	0.690	0.700
NESC Heavy Wind	Clamp19	Clamp	830:WVGD10	0.000	0.119	0.690	0.700

NESC Heavy Wind	Clamp20	Clamp 830:WVGD11	0.000	0.119	0.690	0.700
NESC Extreme Wind	Clamp1	Clamp Davit1:End	0.000	2.616	0.359	2.641
NESC Extreme Wind	Clamp2	Clamp Davit2:End	0.000	2.616	0.359	2.641
NESC Extreme Wind	Clamp3	Clamp Davit3:End	0.000	5.224	1.374	5.402
NESC Extreme Wind	Clamp4	Clamp Davit4:End	0.000	5.224	1.374	5.402
NESC Extreme Wind	Clamp5	Clamp Davit5:End	0.000	5.224	1.374	5.402
NESC Extreme Wind	Clamp6	Clamp Davit6:End	0.000	5.224	1.374	5.402
NESC Extreme Wind	Clamp7	Clamp Davit7:End	0.000	5.224	1.374	5.402
NESC Extreme Wind	Clamp8	Clamp Davit8:End	0.000	5.224	1.374	5.402
NESC Extreme Wind	Clamp9	Clamp 830:Sprint	0.000	2.042	1.903	2.791
NESC Extreme Wind	Clamp10	Clamp 830:WVGD1	0.000	0.369	0.187	0.414
NESC Extreme Wind	Clamp11	Clamp 830:WVGD2	0.000	0.369	0.187	0.414
NESC Extreme Wind	Clamp12	Clamp 830:WVGD3	0.000	0.369	0.187	0.414
NESC Extreme Wind	Clamp13	Clamp 830:WVGD4	0.000	0.369	0.187	0.414
NESC Extreme Wind	Clamp14	Clamp 830:WVGD5	0.000	0.369	0.187	0.414
NESC Extreme Wind	Clamp15	Clamp 830:WVGD6	0.000	0.369	0.187	0.414
NESC Extreme Wind	Clamp16	Clamp 830:WVGD7	0.000	0.369	0.187	0.414
NESC Extreme Wind	Clamp17	Clamp 830:WVGD8	0.000	0.369	0.187	0.414
NESC Extreme Wind	Clamp18	Clamp 830:WVGD9	0.000	0.369	0.187	0.414
NESC Extreme Wind	Clamp19	Clamp 830:WVGD10	0.000	0.369	0.187	0.414
NESC Extreme Wind	Clamp20	Clamp 830:WVGD11	0.000	0.369	0.187	0.414
NESC Extreme Ice w/ Wind	Clamp1	Clamp Davit1:End	0.000	3.366	1.861	3.846
NESC Extreme Ice w/ Wind	Clamp2	Clamp Davit2:End	0.000	3.366	1.861	3.846
NESC Extreme Ice w/ Wind	Clamp3	Clamp Davit3:End	0.000	4.426	3.472	5.625
NESC Extreme Ice w/ Wind	Clamp4	Clamp Davit4:End	0.000	4.426	3.472	5.625
NESC Extreme Ice w/ Wind	Clamp5	Clamp Davit5:End	0.000	4.426	3.472	5.625
NESC Extreme Ice w/ Wind	Clamp6	Clamp Davit6:End	0.000	4.426	3.472	5.625
NESC Extreme Ice w/ Wind	Clamp7	Clamp Davit7:End	0.000	4.426	3.472	5.625
NESC Extreme Ice w/ Wind	Clamp8	Clamp Davit8:End	0.000	4.426	3.472	5.625
NESC Extreme Ice w/ Wind	Clamp9	Clamp 830:Sprint	0.000	0.989	2.852	3.019
NESC Extreme Ice w/ Wind	Clamp10	Clamp 830:WVGD1	0.000	0.080	0.637	0.642
NESC Extreme Ice w/ Wind	Clamp11	Clamp 830:WVGD2	0.000	0.080	0.637	0.642
NESC Extreme Ice w/ Wind	Clamp12	Clamp 830:WVGD3	0.000	0.080	0.637	0.642
NESC Extreme Ice w/ Wind	Clamp13	Clamp 830:WVGD4	0.000	0.080	0.637	0.642
NESC Extreme Ice w/ Wind	Clamp14	Clamp 830:WVGD5	0.000	0.080	0.637	0.642
NESC Extreme Ice w/ Wind	Clamp15	Clamp 830:WVGD6	0.000	0.080	0.637	0.642
NESC Extreme Ice w/ Wind	Clamp16	Clamp 830:WVGD7	0.000	0.080	0.637	0.642
NESC Extreme Ice w/ Wind	Clamp17	Clamp 830:WVGD8	0.000	0.080	0.637	0.642
NESC Extreme Ice w/ Wind	Clamp18	Clamp 830:WVGD9	0.000	0.080	0.637	0.642
NESC Extreme Ice w/ Wind	Clamp19	Clamp 830:WVGD10	0.000	0.080	0.637	0.642
NESC Extreme Ice w/ Wind	Clamp20	Clamp 830:WVGD11	0.000	0.080	0.637	0.642

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	44.675	0.000	33.280	4005.877	-0.000	-0.000
NESC Extreme Wind	42.677	0.000	12.922	3723.933	-0.000	-0.000
NESC Extreme Ice w/ Wind	35.157	0.000	34.413	3177.436	-0.000	-0.000

*** Weight of structure (lbs):
    Weight of Tubular Davit Arms: 1456.6
    Weight of Steel Poles: 24767.1
    Total: 26223.6

*** End of Report

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

Subject:	Anchor Bolt Analysis Pole #830
Location:	Stratford, CT
Rev. 0: 12/5/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.23

Anchor Bolt Analysis:

Input Data:

Bolt Force:

Maximum Tensile Force = $T_{Max} := 146 \cdot kips$ (User Input from PLS-Pole)

Anchor Bolt Data:

Use AST MA615 Grade 75

Number of Anchor Bolts = $N := 20$ (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 = $\frac{T_{Max}}{T_{ALL.Net}} = 59.94 \cdot \%$

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

Condition1 = "OK"

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

Subject:	CAISSON FOUNDATION
Location:	120-ft Transmission Pole Stratford, CT
Rev. 2: 1/22/18	Prepared by: TJL Checked by: C.F.C. Job No. 17159.23

Caisson Foundation:

Input Data:

Shear Force =	$S := 54.8k \cdot 1.1 = 60.28 \cdot kips$	*USER INPUT-FROM tnxTower*
Overturning Moment =	$M := 4370.8ft \cdot k \cdot 1.1 = 4808 \cdot ft \cdot k$	*USER INPUT-FROM tnxTower*
Applied Axial Load =	$A1 := 71.7k \cdot 1.1 = 78.87 \cdot kips$	*USER INPUT-FROM tnxTower*
Bending Moment =	$Mu := 5084ft \cdot k$	*USER INPUT--FROM LPILE*
Moment Capacity =	$Mn := 16312ft \cdot k$	*USER INPUT--FROM LPILE*
Foundation Diameter =	$d := 9.0ft$	*USER INPUT*
Overall Length of Caisson =	$L_c := 14.0ft$	*USER INPUT*
Depth From Top of Caisson to Grade =	$L_{pag} := 0.5ft$	*USER INPUT*
Number of Rebar =	$n := 32$	*USER INPUT*
Area of Rebar =	$Ar := 2.25in^2$	*USER INPUT*
Rebar Yield Strength =	$fy := 60ksi$	*USER INPUT*
Concrete Comp Strength =	$f'c := 3ksi$	*USER INPUT*

Check Moment Capacity:

Factor of Safety = $FS := \frac{0.9 \cdot Mn}{Mu} = 2.9$

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\1715900.WI\23_CT81XC008 Stratford\04_Structural\Backup Documentation\Rev (2)\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: January 22, 2018 Time: 10:09:17

Problem Title

17159.23 - CT81XC008 / Structure #830

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 = 168.00 in

Depth of ground surface below top of pile = 6.00 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	108.00000	6678285.	9160.9000	3122018.
2	168.0000	108.00000	6678285.	9160.9000	3122018.

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 2 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   6.000 in
Distance from top of pile to bottom of layer =   54.000 in
p-y subgrade modulus k for top of soil layer =   90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer   =   90.000 lbs/in**3

Layer 2 is strong rock (vuggy limestone)
Distance from top of pile to top of layer   =   54.000 in
Distance from top of pile to bottom of layer =   180.000 in

(Depth of lowest layer extends   12.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 4 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	6.00	0.06900
2	54.00	0.06900
3	54.00	0.08970
4	180.00	0.08970

**** WARNING - POSSIBLE INPUT DATA ERROR ****

Values entered for effective unit weights of soil were outside
the limits of 0.011574 pci (20 pcf) or 0.0810019 pci (140 pcf)
This data may be erroneous. Please check your data.

Shear Strength of Soils

Shear strength parameters with depth defined using 4 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	6.000	0.00000	30.00	------	------
2	54.000	0.00000	30.00	------	------
3	54.000	4000.00000	0.00	------	------
4	180.000	4000.00000	0.00	------	------

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 = 60280.000 lbs
Bending moment at pile head = 57696000.000 in-lbs
Axial load at pile head = 78870.000 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 = 108.0000 in

Material Properties:

Compressive Strength of Concrete	=	3.000 kip/in**2
Yield Stress of Reinforcement	=	60. kip/in**2
Modulus of Elasticity of Reinforcement	=	29000. kip/in**2
Number of Reinforcing Bars	=	32
Area of Single Bar	=	2.25000 in**2
Number of Rows of Reinforcing Bars	=	17
Area of Steel	=	72.000 in**2
Area of Shaft	=	9160.884 in**2
Percentage of Steel Reinforcement	=	0.786 percent
Cover Thickness (edge to bar center)	=	4.000 in

Unfactored Axial Squash Load Capacity = 27496.66 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	2.250	50.000
2	4.500	49.039
3	4.500	46.194
4	4.500	41.573
5	4.500	35.355
6	4.500	27.779
7	4.500	19.134
8	4.500	9.755
9	4.500	0.000
10	4.500	-9.755
11	4.500	-19.134
12	4.500	-27.779
13	4.500	-35.355

14	4.500	-41.573
15	4.500	-46.194
16	4.500	-49.039
17	2.250	-50.000

Axial Thrust Force = 78870.00 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
11788754.	2.357751E+13	5.000000E-07	0.00002968	59.35590094	91.21992701	802.66056
23457117.	2.345712E+13	0.00000100	0.00005678	56.78353590	172.96301	1530.72254
35004930.	2.333662E+13	0.00000150	0.00008387	55.91357964	253.26819	2258.24071
46437837.	2.321892E+13	0.00000200	0.00011103	55.51578337	332.41187	2987.91544
57748468.	2.309939E+13	0.00000250	0.00013814	55.25473469	410.00656	3715.96827
57748468.	1.924949E+13	0.00000300	0.00009002	30.00595754	267.58514	6437.48169
57748468.	1.649956E+13	0.00000350	0.00010347	29.56180948	306.15085	7555.47634
57748468.	1.443712E+13	0.00000400	0.00011693	29.23303074	344.43871	8672.96843
57748468.	1.283299E+13	0.00000450	0.00013042	28.98119062	382.44775	9789.95462
57748468.	1.154969E+13	0.00000500	0.00014400	28.79999989	420.41829	10904.00002
57748468.	1.049972E+13	0.00000550	0.00015772	28.67694122	458.44848	12014.02788
57748468.	9.624745E+12	0.00000600	0.00017123	28.53836221	495.52494	13130.32498
57748468.	8.884380E+12	0.00000650	0.00018476	28.42403895	532.32331	14246.06866
57748468.	8.249781E+12	0.00000700	0.00019830	28.32879263	568.84247	15361.25510
57748468.	7.699796E+12	0.00000750	0.00021187	28.24883169	605.08147	16475.87911
57748468.	7.218559E+12	0.00000800	0.00022545	28.18130440	641.03911	17589.93738
57748468.	6.793937E+12	0.00000850	0.00023905	28.12403494	676.71434	

18703.42539					
57748468.	6.416496E+12	0.00000900	0.00025268	28.07533354	712.10612
19816.33795					
57748468.	6.078786E+12	0.00000950	0.00026632	28.03385800	747.21319
20928.67212					
57748468.	5.774847E+12	0.00001000	0.00027999	27.99854618	782.03458
22040.42161					
57748468.	5.499854E+12	0.00001050	0.00029367	27.96853226	816.56915
23151.58193					
58535256.	5.321387E+12	0.00001100	0.00030737	27.94310492	850.81564
24262.14953					
61059737.	5.309542E+12	0.00001150	0.00032110	27.92168158	884.77292
25372.11919					
63581010.	5.298418E+12	0.00001200	0.00033485	27.90377623	918.43984
26481.48587					
66099064.	5.287925E+12	0.00001250	0.00034861	27.88898331	951.81531
27590.24355					
68613856.	5.277989E+12	0.00001300	0.00036240	27.87694877	984.89785
28698.39031					
71125384.	5.268547E+12	0.00001350	0.00037621	27.86738616	1017.68648
29805.91832					
73633619.	5.259544E+12	0.00001400	0.00039004	27.86004120	1050.17991
30912.82327					
76138545.	5.250934E+12	0.00001450	0.00040389	27.85469824	1082.37692
32019.09939					
78640123.	5.242675E+12	0.00001500	0.00041777	27.85116416	1114.27607
33124.74359					
81138347.	5.234732E+12	0.00001550	0.00043166	27.84928125	1145.87629
34229.74808					
83633190.	5.227074E+12	0.00001600	0.00044558	27.84890467	1177.17622
35334.10823					
86124626.	5.219674E+12	0.00001650	0.00045952	27.84990889	1208.17453
36437.81860					
88612626.	5.212507E+12	0.00001700	0.00047349	27.85218126	1238.86981
37540.87464					
91097179.	5.205553E+12	0.00001750	0.00048747	27.85562843	1269.26090
38643.26857					
93578249.	5.198792E+12	0.00001800	0.00050148	27.86016029	1299.34628
39744.99633					
96055823.	5.192207E+12	0.00001850	0.00051552	27.86570281	1329.12471
40846.05044					
98529856.	5.185782E+12	0.00001900	0.00052957	27.87218195	1358.59458
41946.42774					
1.010003E+08	5.179505E+12	0.00001950	0.00054365	27.87954301	1387.75476
43046.11843					
1.059306E+08	5.167344E+12	0.00002050	0.00057188	27.89668232	1445.13976
45243.42236					
1.108462E+08	5.155639E+12	0.00002150	0.00060021	27.91674095	1501.26801
47437.91202					

1.157472E+08	5.144319E+12	0.00002250	0.00062864	27.93940991	1556.12753
49629.53503					
1.206331E+08	5.133325E+12	0.00002350	0.00065716	27.96443492	1609.70598
51818.23760					
1.255039E+08	5.122609E+12	0.00002450	0.00068579	27.99160355	1661.99061
54003.96568					
1.303592E+08	5.112126E+12	0.00002550	0.00071453	28.02074200	1712.96842
56186.66129					
1.351989E+08	5.101844E+12	0.00002650	0.00074337	28.05170864	1762.62621
58366.26191					
1.399294E+08	5.088344E+12	0.00002750	0.00077213	28.07748681	1810.62868
60000.00000					
1.436916E+08	5.041809E+12	0.00002850	0.00079903	28.03608531	1854.05961
60000.00000					
1.467675E+08	4.975171E+12	0.00002950	0.00082456	27.95108396	1893.99105
60000.00000					
1.497115E+08	4.908575E+12	0.00003050	0.00084989	27.86536485	1932.44544
60000.00000					
1.520220E+08	4.826094E+12	0.00003150	0.00087384	27.74106055	1967.65302
60000.00000					
1.542886E+08	4.747341E+12	0.00003250	0.00089777	27.62368602	2001.79316
60000.00000					
1.565243E+08	4.672366E+12	0.00003350	0.00092170	27.51336032	2034.90408
60000.00000					
1.582032E+08	4.585600E+12	0.00003450	0.00094426	27.36981493	2065.10850
60000.00000					
1.598763E+08	4.503556E+12	0.00003550	0.00096687	27.23583859	2094.47043
60000.00000					
1.615434E+08	4.425846E+12	0.00003650	0.00098954	27.11065882	2122.98386
60000.00000					
1.627591E+08	4.340243E+12	0.00003750	0.00101250	26.99999839	2150.94235
60000.00000					
1.645921E+08	4.275120E+12	0.00003850	0.00103702	26.93547088	2179.82234
60000.00000					
1.657600E+08	4.196456E+12	0.00003950	0.00105796	26.78391749	2203.48941
60000.00000					
1.669235E+08	4.121567E+12	0.00004050	0.00107896	26.64099652	2226.42689
60000.00000					
1.680825E+08	4.050181E+12	0.00004150	0.00110000	26.50609642	2248.62989
60000.00000					
1.692371E+08	3.982049E+12	0.00004250	0.00112109	26.37866038	2270.09329
60000.00000					
1.703872E+08	3.916946E+12	0.00004350	0.00114223	26.25818950	2290.81221
60000.00000					
1.713778E+08	3.851186E+12	0.00004450	0.00116281	26.13056356	2310.19464
60000.00000					
1.721553E+08	3.783632E+12	0.00004550	0.00118261	25.99143416	2328.10109
60000.00000					
1.729292E+08	3.718908E+12	0.00004650	0.00120245	25.85917014	2345.34937

60000.00000					
1.736997E+08	3.656835E+12	0.00004750	0.00122233	25.73334342	2361.93518
60000.00000					
1.744665E+08	3.597247E+12	0.00004850	0.00124226	25.61356455	2377.85430
60000.00000					
1.752297E+08	3.539993E+12	0.00004950	0.00126222	25.49947304	2393.10233
60000.00000					
1.759892E+08	3.484935E+12	0.00005050	0.00128223	25.39074057	2407.67496
60000.00000					
1.767451E+08	3.431943E+12	0.00005150	0.00130228	25.28706461	2421.56782
60000.00000					
1.775953E+08	3.382768E+12	0.00005250	0.00132300	25.20000011	2435.19201
60000.00000					
1.783509E+08	3.333662E+12	0.00005350	0.00134774	25.19139022	2450.57023
60000.00000					
1.788560E+08	3.281761E+12	0.00005450	0.00136618	25.06748825	2461.17834
60000.00000					
1.793235E+08	3.231054E+12	0.00005550	0.00138446	24.94524711	2471.10202
60000.00000					
1.797884E+08	3.182095E+12	0.00005650	0.00140278	24.82798845	2480.45728
60000.00000					
1.802506E+08	3.134793E+12	0.00005750	0.00142114	24.71545154	2489.24032
60000.00000					
1.807101E+08	3.089062E+12	0.00005850	0.00143953	24.60740143	2497.44759
60000.00000					
1.811669E+08	3.044823E+12	0.00005950	0.00145797	24.50362247	2505.07551
60000.00000					
1.820724E+08	2.960527E+12	0.00006150	0.00149495	24.30805725	2518.57806
60000.00000					
1.829667E+08	2.881366E+12	0.00006350	0.00153208	24.12725919	2529.71727
60000.00000					
1.838497E+08	2.806866E+12	0.00006550	0.00156938	23.95992798	2538.46184
60000.00000					
1.847212E+08	2.736611E+12	0.00006750	0.00160683	23.80490810	2544.77927
60000.00000					
1.853927E+08	2.667521E+12	0.00006950	0.00164303	23.64076978	2548.53084
60000.00000					
1.859081E+08	2.600114E+12	0.00007150	0.00167828	23.47246653	2549.97148
60000.00000					
1.862007E+08	2.533342E+12	0.00007350	0.00171990	23.39999861	2543.96682
60000.00000					
1.870285E+08	2.477198E+12	0.00007550	0.00175721	23.27426845	2545.76464
60000.00000					
1.874887E+08	2.419208E+12	0.00007750	0.00179149	23.11598486	2548.66054
60000.00000					
1.879441E+08	2.364077E+12	0.00007950	0.00182592	22.96753424	2549.93651
60000.00000					
1.883918E+08	2.311556E+12	0.00008150	0.00186057	22.82904536	2546.28793
60000.00000					

1.888347E+08	2.261494E+12	0.00008350	0.00189537	22.69901508	2541.13087
60000.00000					
1.892741E+08	2.213732E+12	0.00008550	0.00193029	22.57652932	2544.70231
60000.00000					
1.897098E+08	2.168112E+12	0.00008750	0.00196535	22.46109885	2547.78218
60000.00000					
1.901419E+08	2.124490E+12	0.00008950	0.00200053	22.35227627	2549.54743
60000.00000					
1.905693E+08	2.082725E+12	0.00009150	0.00203587	22.24989420	2549.16493
60000.00000					
1.909899E+08	2.042672E+12	0.00009350	0.00207142	22.15417153	2544.50793
60000.00000					
1.912303E+08	2.002412E+12	0.00009550	0.00210472	22.03894061	2540.24488
60000.00000					
1.914569E+08	1.963660E+12	0.00009750	0.00213795	21.92764288	2541.10183
60000.00000					
1.916818E+08	1.926450E+12	0.00009950	0.00217126	21.82167846	2544.53795
60000.00000					
1.919050E+08	1.890690E+12	0.00010150	0.00220465	21.72073835	2547.14883
60000.00000					
1.921266E+08	1.856296E+12	0.00010350	0.00223814	21.62454575	2548.92414
60000.00000					
1.930520E+08	1.829877E+12	0.00010550	0.00227880	21.60000032	2549.97374
60000.00000					
1.941870E+08	1.806391E+12	0.00010750	0.00232200	21.60000032	2545.54546
60000.00000					
1.941870E+08	1.773397E+12	0.00010950	0.00235493	21.50623780	2541.97891
60000.00000					
1.941870E+08	1.741587E+12	0.00011150	0.00238733	21.41103333	2538.50636
60000.00000					
1.941870E+08	1.710899E+12	0.00011350	0.00241978	21.31968802	2536.24826
60000.00000					
1.941870E+08	1.681273E+12	0.00011550	0.00245230	21.23200876	2539.76224
60000.00000					
1.941870E+08	1.652655E+12	0.00011750	0.00248487	21.14780885	2542.76845
60000.00000					
1.941870E+08	1.624996E+12	0.00011950	0.00251750	21.06692415	2545.26152
60000.00000					
1.941870E+08	1.598247E+12	0.00012150	0.00255019	20.98919052	2547.23575
60000.00000					
1.942684E+08	1.573024E+12	0.00012350	0.00258357	20.91961616	2548.73061
60000.00000					
1.944383E+08	1.549309E+12	0.00012550	0.00261718	20.85402328	2549.65916
60000.00000					
1.946072E+08	1.526331E+12	0.00012750	0.00265086	20.79105037	2549.99856
60000.00000					
1.947726E+08	1.504036E+12	0.00012950	0.00268474	20.73160833	2547.11653
60000.00000					
1.949374E+08	1.482414E+12	0.00013150	0.00271868	20.67439681	2544.00484

```
  60000.00000
  1.950651E+08  1.461162E+12    0.00013350    0.00275417   20.63051051    2540.62125
  60000.00000
  1.951876E+08  1.440499E+12    0.00013550    0.00278991   20.58974308    2537.19432
  60000.00000
  1.953093E+08  1.420431E+12    0.00013750    0.00282571   20.55063325    2533.75602
  60000.00000
  1.954301E+08  1.400933E+12    0.00013950    0.00286158   20.51311666    2531.25939
  60000.00000
  1.956677E+08  1.363538E+12    0.00014350    0.00293346   20.44221300    2538.96101
  60000.00000
  1.957464E+08  1.327094E+12    0.00014750    0.00300039   20.34160119    2543.89769
  60000.00000
  1.958235E+08  1.292564E+12    0.00015150    0.00306752   20.24762625    2547.40206
  60000.00000
  1.958986E+08  1.259798E+12    0.00015550    0.00313485   20.15980536    2549.44210
  60000.00000
  1.959714E+08  1.228661E+12    0.00015950    0.00320244   20.07800335    2549.29188
  60000.00000
  1.960395E+08  1.199018E+12    0.00016350    0.00327048   20.00292510    2544.30389
  60000.00000
  1.961068E+08  1.170787E+12    0.00016750    0.00333863   19.93212122    2539.29567
  60000.00000
  1.961733E+08  1.143868E+12    0.00017150    0.00340690   19.86530846    2534.26674
  60000.00000
  1.961897E+08  1.117890E+12    0.00017550    0.00347858   19.82099086    2528.63908
  60000.00000
  1.961897E+08  1.092979E+12    0.00017950    0.00355410   19.79999882    2523.39599
  60000.00000
  1.961897E+08  1.069154E+12    0.00018350    0.00363330   19.79999882    2532.79781
  60000.00000
  1.961897E+08  1.046345E+12    0.00018750    0.00371250   19.79999882    2540.15800
  60000.00000
  1.961897E+08  1.024490E+12    0.00019150    0.00379170   19.79999882    2545.47656
  60000.00000
  1.961897E+08  1.003528E+12    0.00019550    0.00387090   19.79999882    2548.75350
  60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 =  195745.97901
in-kip



--------------------------------------------------------------------------------
             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 = 60280.000 lbs
Specified moment at pile head = 57696000.000 in-lbs
Specified axial load at pile head = 78870.000 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	0.044425	5.77E+07	60280.	-0.000808	475.134	2.22E+13	0.000	0.000
13.440	0.033846	5.85E+07	60190.	-0.000761	481.690	1.20E+13	-22.663	1124.928
26.880	0.024179	5.93E+07	59708.	-0.000666	488.214	6.05E+12	-45.438	3157.056
40.320	0.016214	6.01E+07	59051.	-0.000517	494.673	5.31E+12	-50.080	5189.184
53.760	0.010290	6.09E+07	58410.	-0.000364	501.058	5.31E+12	-44.229	7221.312
67.200	0.006430	5.90E+07	-3.47E+05	-0.000214	485.297	7.89E+12	-25720.	6.72E+06
80.640	0.003866	5.23E+07	-6.22E+05	-0.000174	431.333	2.32E+13	-15463.	6.72E+06
94.080	0.001713	4.28E+07	-7.70E+05	-0.000147	354.588	2.32E+13	-6851.234	6.72E+06
107.520	-0.000108	3.20E+07	-8.12E+05	-0.000125	267.678	2.34E+13	433.932	6.72E+06
120.960	-0.001682	2.14E+07	-7.63E+05	-0.000110	181.282	2.35E+13	6727.662	6.72E+06
134.400	-0.003090	1.19E+07	-6.34E+05	-0.000101	104.634	2.36E+13	12361.	6.72E+06
147.840	-0.004406	4.62E+06	-4.33E+05	-9.60E-05	45.995	2.36E+13	17623.	6.72E+06
161.280	-0.005684	5.53E+05	-1.61E+05	-9.47E-05	13.079	2.36E+13	22737.	6.72E+06

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	=	0.04442462 in
Computed slope at pile head	=	-0.00080756
Maximum bending moment	=	61000184. lbs-in
Maximum shear force	=	-812272.14855 lbs
Depth of maximum bending moment	=	55.44000000 in
Depth of maximum shear force	=	105.84000 in
Number of iterations	=	52
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= 60280.	M= 5.77E+07	78870.0000	0.0444246	6.1000E+07	-812272.

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

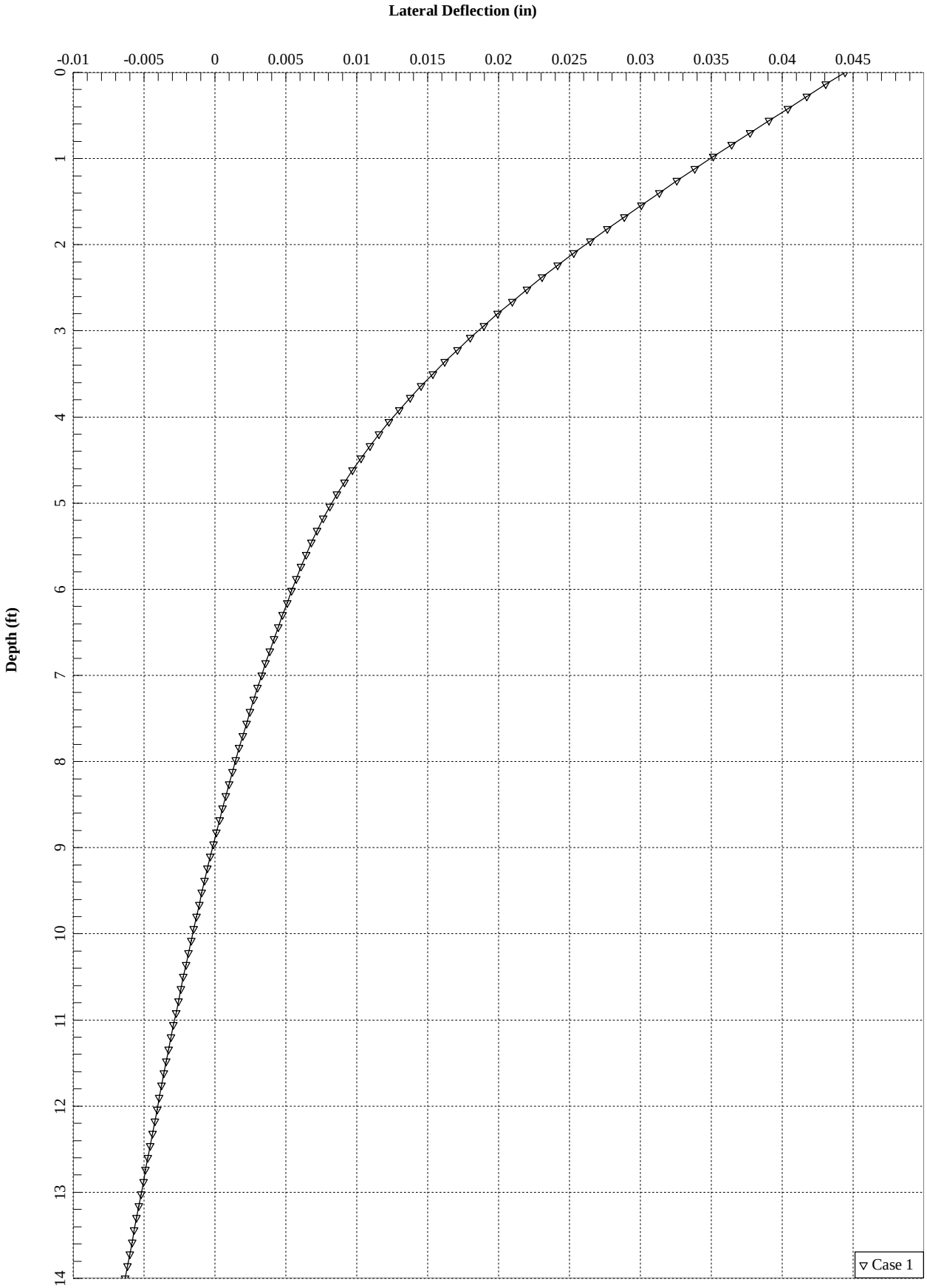
Top y in	Shear React. lbs	Mom. React. in-lbs	K22 lbs/in	K32 in-lbs/in
0.00006393	6028.00009	408697.99949	94294604.	6.393168E+09
0.00019244	18146.08814	1230304.	94294604.	6.393168E+09
0.00030501	28760.86923	1949985.	94294604.	6.393168E+09
0.00038488	36292.17628	2460607.	94294604.	6.393168E+09
0.00044683	42133.91186	2856676.	94294604.	6.393168E+09
0.00049745	46906.95737	3180289.	94294604.	6.393168E+09

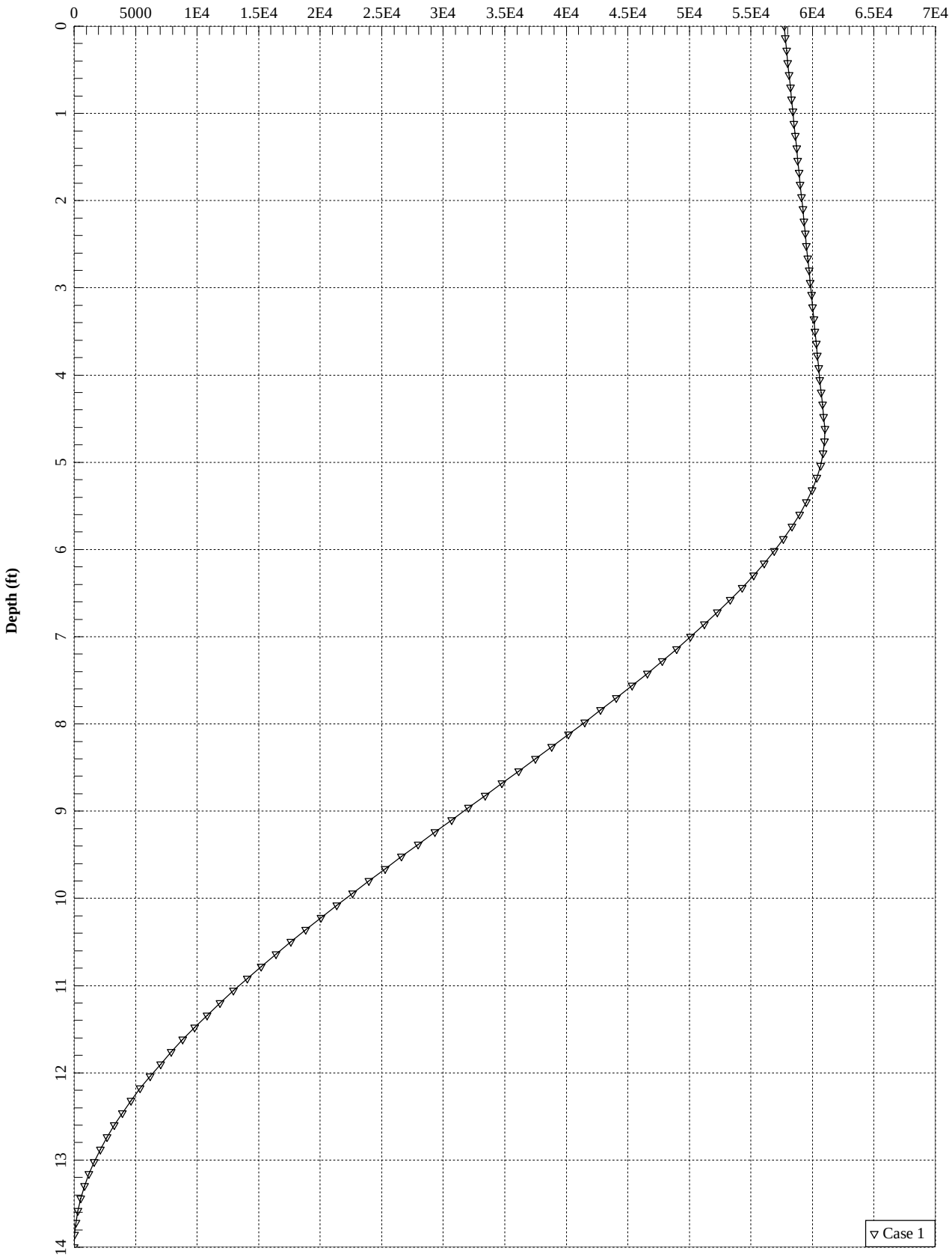
0.00054025	50942.50985	3453899.	94294604.	6.393168E+09
0.00057732	54438.26442	3690911.	94294604.	6.393168E+09
0.00061002	57521.73847	3899970.	94294604.	6.393168E+09
0.00063927	60280.00000	4086980.	94294604.	6.393168E+09

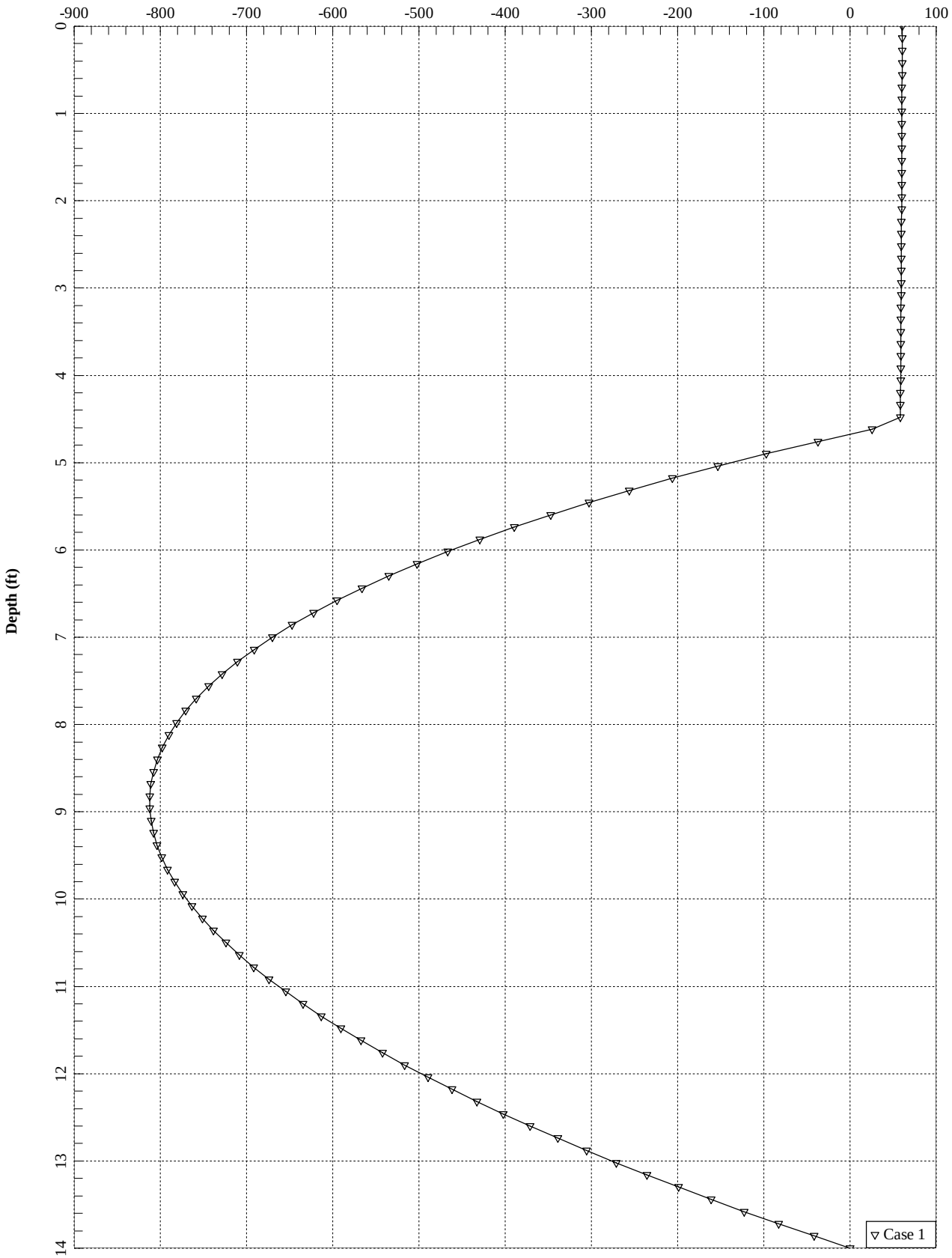
Top Rota. rad	Shear React. lbs	Mom. React. in-lbs	K23 lbs/rad	K33 in-lbs/rad
0.00000966	61767.78151	5769600.	6.393168E+09	5.971725E+11
0.00002912	185949.01329	17368227.	6.386290E+09	5.964997E+11
0.00004626	294793.28175	27527988.	6.372763E+09	5.950928E+11
0.00005848	372063.73313	34736453.	6.362422E+09	5.940057E+11
0.00006799	432025.11593	40327773.	6.354445E+09	5.931614E+11
0.00007578	481034.57783	44896215.	6.347821E+09	5.924587E+11
0.00008238	522483.26988	48758777.	6.342370E+09	5.918777E+11
0.00008811	558396.53019	52104680.	6.337444E+09	5.913549E+11
0.00009317	590081.28959	55055976.	6.333080E+09	5.908913E+11
0.00009771	618429.79307	57696000.	6.329264E+09	5.904845E+11

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)
-0.01
-0.005
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
0.045
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Case 1


Bending Moment (in-kips)
0
5000
1E4
1.5E4
2E4
2.5E4
3E4
3.5E4
4E4
4.5E4
5E4
5.5E4
6E4
6.5E4
7E4
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Case 1


Shear Force (kips)
-900
-800
-700
-600
-500
-400
-300
-200
-100
0
100
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Case 1

Product Specifications

DHHTT65B-3XR

Multiband Antenna, 790–960, 2 x 1710–2180 and 2 x 2490-2690 MHz, 65° horizontal beamwidth, internal electrical tilt with individual tilt available for the 850 MHz band, 1900 MHz bands and 2500 MHz bands.

Electrical Specifications

Frequency Band, MHz	790–896	870–960	1710–1880	1850–1990	1920–2180	2490–2690
Connector Interface	7-16 DIN Female	7-16 DIN Female	7-16 DIN Female	7-16 DIN Female	7-16 DIN Female	4.1-9.5 DIN Female
Connector Location	Bottom	Bottom	Bottom	Bottom	Bottom	Bottom
Gain, dBi	15.5	15.5	17.3	17.4	17.5	17.2
Beamwidth, Horizontal, degrees	64	63	71	69	66	60
Beamwidth, Vertical, degrees	11.2	10.3	5.6	5.4	5.1	4.3
Beam Tilt, degrees	0–10	0–10	0–8	0–8	0–8	0–8
USLS (First Lobe), dB	15	16	15	16	15	18
Front-to-Back Ratio at 180°, dB	28	31	31	29	25	26
CPR at Boresight, dB	20	19	20	20	18	16
CPR at Sector, dB	9	9	9	9	7	4
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-150
Input Power per Port, maximum, watts	350	350	300	300	300	250
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	790–896	870–960	1710–1880	1850–1990	1920–2180	2490–2690
Gain by all Beam Tilts, average, dBi	15.0	15.1	17.0	17.1	17.1	17.1
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.3	±0.3	±0.3	±0.6
Gain by Beam Tilt, average, dBi	0 ° | 15.0	0 ° | 15.0	0 ° | 16.8	0 ° | 17.0	0 ° | 17.0	0 ° | 17.1
	5 ° | 15.1	5 ° | 15.1	4 ° | 17.0	4 ° | 17.1	4 ° | 17.1	4 ° | 17.2
	10 ° | 15.0	10 ° | 15.0	8 ° | 17.0	8 ° | 17.1	8 ° | 17.1	8 ° | 17.0
Beamwidth, Horizontal Tolerance, degrees	±2.5	±1.8	±3.2	±2.7	±5	±6.6
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.6	±0.2	±0.2	±0.4	±0.3
USLS, beampeak to 20° above beampeak, dB	16	17	16	17	16	19
Front-to-Back Total Power at 180° ± 30°, dB	24	26	26	25	23	23
CPR at Boresight, dB	21	20	22	22	21	16
CPR at Sector, dB	9	10	13	10	8	5

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® multiband with internal RET
Band	Multiband
Brand	DualPol®

Product Specifications

DHHTT65B-3XR

Operating Frequency Band	1710 – 2180 MHz | 2490 – 2690 MHz | 790 – 960 MHz
Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Copper | Low loss circuit board
Radome Material	ASA, UV stabilized
Reflector Material	Aluminum
RF Connector Interface	4.1-9.5 DIN Female | 7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	10
Wind Loading, frontal	618.0 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Depth	181.0 mm | 7.1 in
Length	1832.0 mm | 72.1 in
Width	301.0 mm | 11.9 in
Net Weight	20.6 kg | 45.4 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	13.0 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male

Packed Dimensions

Depth	299.0 mm | 11.8 in
Length	1954.0 mm | 76.9 in
Width	409.0 mm | 16.1 in
Shipping Weight	33.2 kg | 73.2 lb

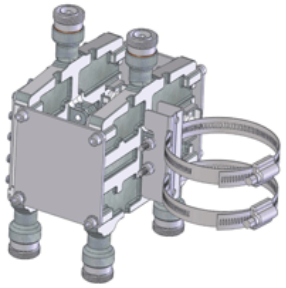
Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	

RADIO FREQUENCY SYSTEMS
The Clear Choice®

ShareLite™ Wideband Diplexer Kit – In-line 698-960 MHz/1710-2200 MHz, full DC/AISG pass

The ShareLite FD9R6004 Series of diplexers are designed to enable feeder sharing between systems in the 698-960 MHz range and in the 1710-2200 MHz range, including all the new AWS-3 paired spectrum blocks (G, H, I, J).. The diplexer is equipped with in-line connector placement so it can be installed in the BTS cabinet or at the tower top. This is especially valuable in crowded sites or when the feeders are not easily accessible. Due to its wideband design, the FD9R6004 Series can accommodate many combining solutions between 698-960 MHz and 1710-2200 MHz systems such as LTE 700 MHz, Cellular 800 MHz with PCS, GSM900 with GSM1800, or GSM900 with UMTS. This diplexer features a highly selective filter. It provides a high level of isolation between ports, while keeping the insertion loss on both paths at an extremely low level. The FD9R6004 diplexers are available with various DC pass options, helpful in configurations with or without the Tower Mount Amplifiers installed.



FEATURES / BENEFITS

- LTE and AWS-3 ready design
- Extremely Low Insertion Loss
- High level of Rejection between bands – Protection against interferences
- Extremely High Power Handling Capability
- DC/AISG 1.1/2.0 pass through all ports
- Very compact & small size design – Easy installation and reduced tower load
- In-line long-neck connectors for easy connection & waterproofing
- Exceptional reliability & environmental protection (IP 67)
- Equipped with 1 * Breathable Vent – Prevent any humidity inside the product
- Mounting hardware for Wall and Pole mount provided (P/N SEM2-1A)
- Grounding already provided through the mounting bracket

Technical Features

GENERAL SPECIFICATIONS		
Product Type		Diplexer/Cross Band Combiner
Application		LTE700, GSM900, UMTS, GSM1800, Cellular 800, PCS, AWS-1, AWS-3
Configuration		ShareLite Kit consisting of (2) in-line long neck connector diplexers (Full DC Pass), (1) mounting hardware SEM2-1A, & (1) assembly kit SEM2-3 disassembled
ELECTRICAL SPECIFICATIONS		
Frequency Range 1	MHz	698 - 960
Frequency Range 2	MHz	1710 - 2200
Return Loss All Ports	dB	19 Min/23 Typ.
Power Handling Continuous, Max	W	1250 at common port; 750 in low frequency path & 500 in high frequency path
Power Handling Peak, Max	W	15000 in low frequency path & 8000 in high frequency path
Impedance	Ω	50.0
Insertion Loss, Path 1	dB	0.07 typ.
Insertion Loss, Path 2	dB	0.13 typ.
Rejection Between Bands Min/Typ	dB	58/64@698-960MHz 57/70@1710-2200MHz
Group Delay, Path 1	ns	3 Max.
Group Delay, Path 2	ns	3 Max.
IMP Level at the COM Port	dBm (dBc)	-112 (-155) @2x43 typ.
DC Pass in Path 1		Yes
DC Pass in Path 2		Yes

MECHANICAL SPECIFICATIONS		
Mounting		Wall Mounting: With 4 screws (maximum 6mm diameter) Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
RF Connectors		In-line long-neck 7-16-Female
Weight	kg (lb)	2.9 (6.4)
Dimensions, H x W x D	mm (in)	147 x 164 x 118 (5.8 x 6.5 x 4.6)
Shipping Dimensions, H x W x D	mm (in)	254 x 406 x 82 (10 x 16 x 3.2) for 1 * Dual unit in 1 * box, 280 x 406 x 241 (11 x 16 x 9.5) for 3 * Dual units = 3 * Boxes in 1 * overwrap
Housing		Aluminum
TESTING AND ENVIRONMENTAL		
Temperature Range	°C (°F)	-40 to 60 (-40 to 140)
Environmental		ETSI 300-019-2-4 Class 4.1E
Ingress Protection		IP 67
Lightning Protection		EN/IEC61000-4-5 Level 4

External Document Links

RFS Diplexer Field Test Procedure□□

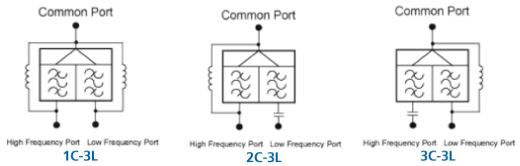
KIT-FD9R6004/1C-DL Installation Instructions

Notes

RADIO FREQUENCY SYSTEMS
The Clear Choice®

ShareLite™ Wideband Diplexer Kit – In-line 698-960 MHz/1710-2200 MHz, full DC/AISG pass

Selection Guide Diplexer 698-960 / 1710-2200MHz					
	Model Number	Full DC Pass	DC Pass High Band	DC Pass Low Band	Mounting Hardware Included
Single	FD9R6004/1C-3L				X
	FD9R6004/2C-3L				X
	FD9R6004/3C-3L				X
Dual	KIT-FD9R6004/1C-DL				X
	KIT-FD9R6004/2C-DL				X
	KIT-FD9R6004/3C-DL				X



The FD9R6004 Series is upgradeable to a Dual Diplexer kit by means of 2 diplexers and mounting hardware kits SEM2-1A and SEM2-3

Mounting Hardware and Ground Cable Ordering Information		
Model Number	**Description**	
SEM2-1A	Mounting Hardware, Pole mount ø40-110mm (Included with the Single and Dual Diplexer) Wall Screws M6 (Not included with the product)	
SEM2-3	Assembly kit for 2 pcs of FD9R6004/xC-3L (Can be ordered separately but included with the Dual Diplexer Kit)	
CA020-2	Ground Cable, 2m, includes lugs (Optional)	
CA030-2	Ground Cable, 3m, includes lugs (Optional)	
SEM6	Mounting Hardware for 6 Diplexers, Tower Base (Optional)	

DATA SHEET

Outdoor Diplexer

DPO-7126Y-0x1

- Combines the frequencies covering PCS/AWS (1695-2180 MHz) with BRS (2496-2690 MHz)
- High power 250 W per port with low insertion loss in a small, lightweight enclosure
- Low intermodulation with isolation of >50 dB port to port
- High reliability of >500K Hours MTBF and multi-strike lightning protection
- Designed and produced to ISO 9001:2008 certification standards
- Weatherproof enclosure (IP67) with available outdoor pole or wall mounting options

Overview

The CCI Outdoor Diplexer passes the PCS and AWS bands covering 1695-2180 MHz on its low band input port and the full BRS band which covers 2496-2690 MHz on its high band input port. The Diplexer combines the low band and high band signals on to a common port and is specifically intended for use in multi-band systems with limited feeder lines. The Diplexer facilitates the addition of new technologies including LTE and new spectrum to existing sites while providing a high degree of isolation between systems. Decreasing the number of feeder lines lowers tower loading, leasing and installation expenditures and significantly reduces the total cost to upgrade a site.
The CCI Outdoor Diplexer provides full band performance for each band with low insertion loss, low Intermodulation, and high 250 W per port power handling. Excellent return loss performance delivers the best match to the antennas and base station, saving precious transmit power. The CCI Diplexer is available in a single, twin or quad unit configuration.

Technical Description:

The CCI Outdoor Diplexer consists of multiple filters and can be used as either a splitter or combiner to aggregate the PCS/AWS with the BRS bands on to a common feeder line. The fully weatherproof tower mount Diplexer has internal multi-strike lightning protection using a multi-stage surge protection circuit.
The unit has been designed to minimize insertion loss while maximizing isolation. Particular attention has been given to the intermodulation performance of the Diplexer to minimize any passive intermodulation products from occurring. The Diplexer housing is constructed from die cast aluminum and consists of an IP67 moisture proof enclosure, with IP68 immersion proof connectors suited to long-life masthead mounting. The Diplexer can be pole or wall mounted with the included bracket. The RF ports are configured with DIN 7-16.
CCI filter and combiner products are designed and produced to ISO 9001:2008 certification standards for reliability and quality at our state-of-the-art engineering and manufacturing facilities.

SPECIFICATIONS

Outdoor Diplexer

DPO-7126Y-0x1

Electrical

RF Parameters	Ports	Frequency(MHz)	Specification
Return Loss	COMMON	1695 - 2180	18 dB minimum, 20 dB typical
		2496 - 2690	18 dB minimum, 20 dB typical
	PCS/AWS	1695 - 2180	18 dB minimum, 20 dB typical
	BRS	2496 - 2690	18 dB minimum, 20 dB typical
Insertion Loss	COMMON to PCS/AWS	1695 - 2180	0.2 dB typical, 0.25 dB maximum
	COMMON to BRS	2496 - 2690	0.2 dB typical, 0.25 dB maximum
Rejection	COMMON to PCS/AWS	2496 - 2690	50 dB minimum
	COMMON to BRS	1695 - 2180	50 dB minimum
Isolation	PCS/AWS to BRS	1695 - 2180	50 dB minimum
	BRS to PCS/AWS	2496 - 2690	50 dB minimum

General Characteristics	
General Impedance	50 ohms
Continuous Average Power	250 W maximum (input ports), 500 W maximum (Common port)
Peak Envelope Power	1 kW maximum (input ports), 3 kW maximum (Common port)
Intermodulation Performance	<-117 dBm (-160 dBc) at 2 × +43 dBm tones all bands

Environmental

Operating Temperature	-40˚C to +65˚C
Enclosure	Enclosure IP67, Connectors IP68
MTBF	>500,000 hours
Lightning Protection	8/20us, ±20KA maximum, 10 strikes per IEC61000-4-5

Mechanical

Model	DPO-7126Y-0-S1	DPO-7126Y-0-T1	DPO-7126Y-0-Q1
Modularity	Single	Twin	Quad
Weight with brackets	3.7 lbs (1.6 Kg)	7.3 lbs (3.3 Kg)	14.4 lbs (6.6 Kg)
Dimensions with brackets	6.26 x 7.42 x 2.02 in. (159 x 188.5 x 51.4 mm)	6.26 x 7.42 x 4.07 in. (159 x 188.5 x 103.4 mm)	6.26x 7.42 x 8.17 in. (159 x 188.5 x 207.4 mm)
Dimensions enclosure only	2.95 x 7.42 x 1.95 in. (75 x 188.5 x 48.8 mm)		
Connectors	3 x 7-16 DIN female long neck		
Mounting	Pole/Wall mounting bracket		

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions Report

CT81XC008 – Stratford

560B Hawley Lane, Stratford, CT 06614

February 6, 2018

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed installation of Sprint antennas on the replacement transmission tower to be located at 560B Hawley Lane in Stratford, CT. The existing transmission tower and Sprint antennas will be removed and a replacement tower will be erected in the same location. The coordinates of the replacement tower are 41° 13' 59.28" N, 73° 08' 58.64" W. There are no collocators on the existing tower.

Sprint is proposing to install the following:

1) Install three 865/1900/2500 MHz CDMA/LTE panel antennas (one per sector);
2) Install nine remote radio units (RRUs) for their 865/1900/2500 MHz networks (three per sector).

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times EIRP}{4\pi \times R^2} \right) \times OffBeamLoss$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{\left(H^2 + V^2\right)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna patterns

These calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final site configuration.

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed Sprint antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical patterns of the proposed Sprint antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Sprint	*99*	*851*	*1*	*350*	*0.0146*	*0.5673*	*0.26%*
Sprint	*99*	*1962.5*	*1*	*1556*	*0.0647*	*1.0000*	*0.65%*
Sprint	*99*	*1962.5*	*5*	*622*	*0.1294*	*1.0000*	*1.29%*
Sprint - CDMA	120	865	1	438	0.0121	0.5767	0.21%
Sprint - CDMA	120	1900	5	542	0.0750	1.0000	0.75%
Sprint - LTE	120	865	1	875	0.0242	0.5767	0.42%
Sprint - LTE	120	1900	1	2711	0.0751	1.0000	0.75%
Sprint - LTE	120	2500	1	5178	0.1434	1.0000	1.43%
						Total:	**3.56%**

Table 1: Carrier Information[1] [2]

[1] The existing CSC filing for Sprint should be removed and replaced with the updated Sprint values provided in Table 1. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

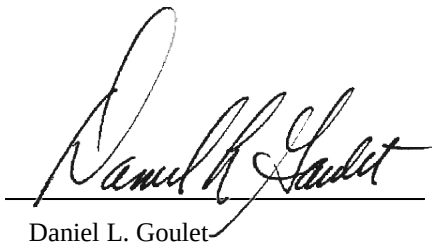
[2] Antenna heights listed for Sprint are in reference to the Centek Engineering Construction Drawings, dated 1/25/2018.

5. Conclusion

The above analysis verifies that emissions from the final site configuration will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. The highest, cumulative expected percent of Maximum Permissible Exposure at ground level is **3.56% of the FCC Uncontrolled/General Population limit.**

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.



Daniel L. Goulet
C Squared Systems, LLC

February 6, 2018
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[3]

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

(B) Limits for General Population/Uncontrolled Exposure[4]

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

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

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[3] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[4] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

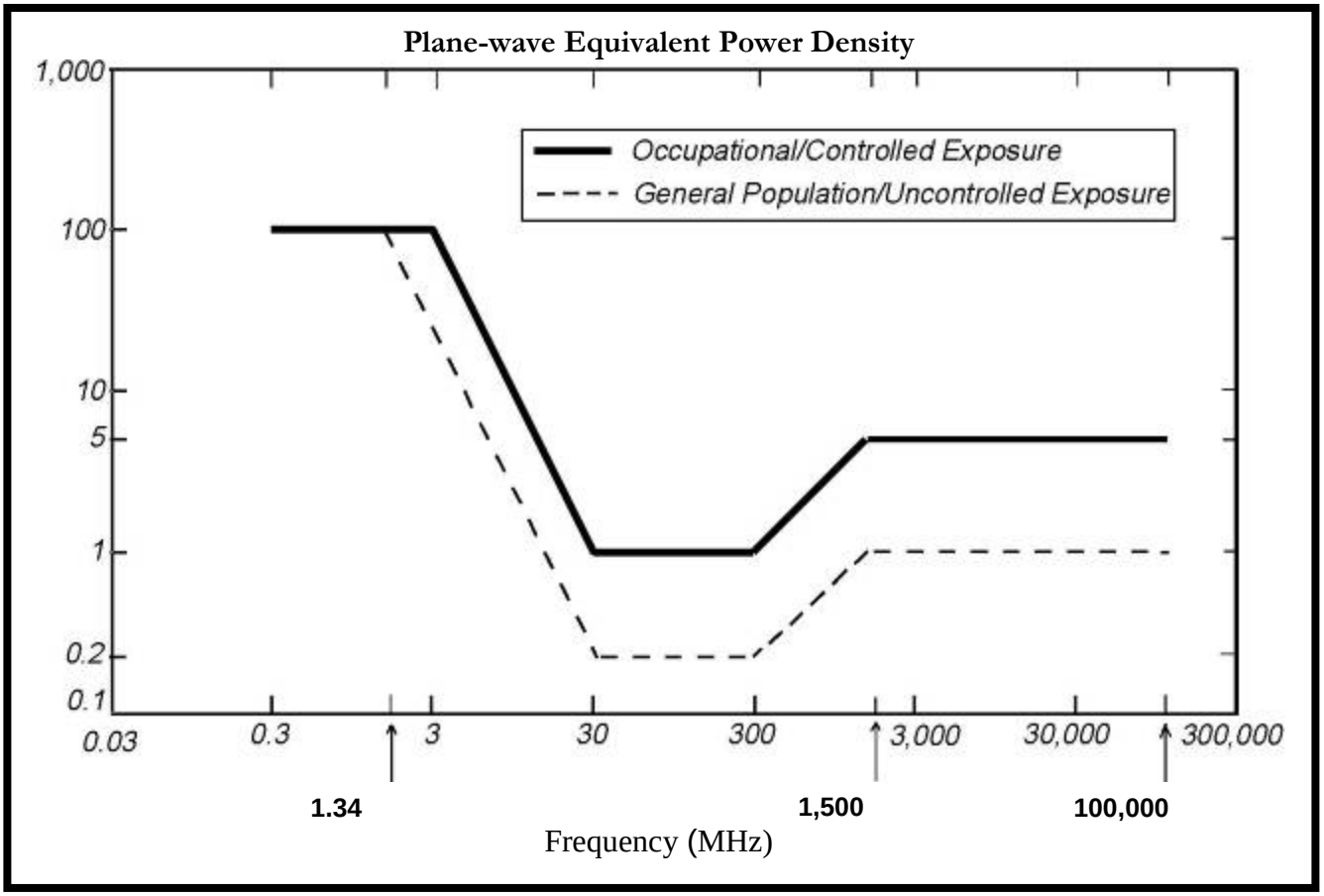
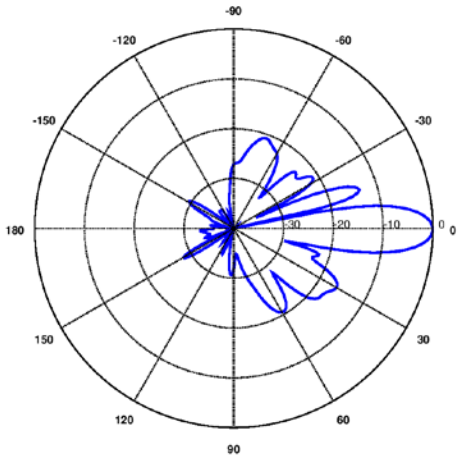


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Sprint's Antenna Model Data Sheets and Electrical Patterns

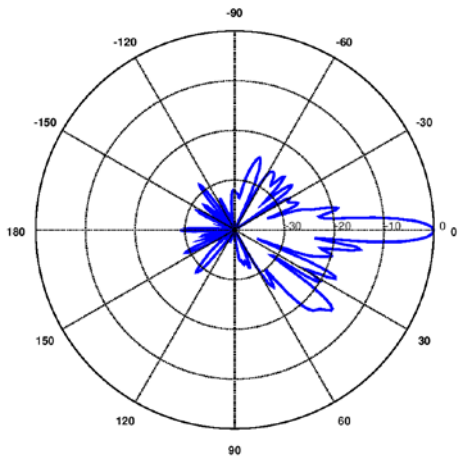
865 MHz CDMA/LTE

Manufacturer:	Commscope
Model #:	DHHTT65B-3XR_0
Frequency Band:	790-896 MHz
Gain:	15.5 dBi
Vertical Beamwidth:	11.2°
Horizontal Beamwidth:	64°
Polarization:	± 45°
Size L x W x D:	72.1" x 11.9" x 7.1"



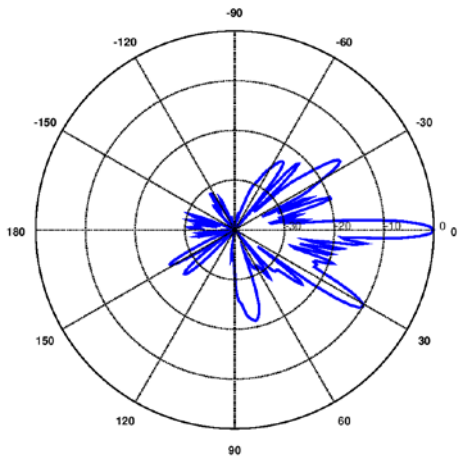
1900 MHz CDMA/LTE

Manufacturer:	Commscope
Model #:	DHHTT65B-3XR_0
Frequency Band:	1850-1990 MHz
Gain:	17.4 dBi
Vertical Beamwidth:	5.4°
Horizontal Beamwidth:	69°
Polarization:	± 45°
Size L x W x D:	72.1" x 11.9" x 7.1"

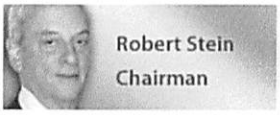


2500 MHz LTE

Manufacturer:	Commscope
Model #:	DHHTT65B-3XR_0
Frequency Band:	2490-2690 MHz
Gain:	17.2 dBi
Vertical Beamwidth:	4.3°
Horizontal Beamwidth:	60°
Polarization:	± 45°
Size L x W x D:	72.1" x 11.9" x 7.1"



CT81XC008



Filing Guides
Meetings & Minutes
Public Participation
Audio Link to New Britain Hearing Rooms
Programs & Services
Telecommunications Database
Publications
Other Resources
Statutes & Regulations
Electric Transmission Upgrade Projects
Frequently Asked Questions

PetitionsNo.1291_1300

Printable Version

PETITION NO. 1291 - Eversource Energy petition for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the Towantic Line Upgrades Project that includes rebuilding and reconductoring approximately 4.4 miles of its existing 115-kilovolt electric transmission lines within existing Eversource right of way between Devon 7R Substation and East Devon Junction both located in the City of Milford, Connecticut; between the West Devon Junction located in the Town of Stratford, Connecticut and Trumbull Junction located in the Town of Trumbull, Connecticut; and between Devon 7R Substation located in the City of Milford, Connecticut and West Devon Junction located in the Town of Stratford, Connecticut and related transmission line structure improvements.

PETITION FILING

Petition Filing received 2/21/2017

PROCEDURAL CORRESPONDENCE

Town Letters, 2/24/2017

Council Interrogatories to Petitioner, 3/13/2017

Field Review, 3/16/2017

Petitioner's Responses to Interrogatories, 3/23/2017

Set Date for Decision Letter, 3/31/2017

Council Interrogatories to Petitioner-Set Two, 4/7/2017

Petitioner's Responses to Set Two Interrogatories, 4/17/2017

DECISION

Council Decision and Staff Report, 04/28/17

Project Revisions Request, 09/01/17
Council Decision on Revisions Request, 09/05/17

Temporary Hours Revision Request and CSC Approval, 09/20/17

Extended Work Hours Request and CSC Approval, 11/2/17

Condition 6 Compliance of the Council 4/26/17 Decision Letter, 11/10/17

Council Acknowledgement of Condition 6 Compliance, 11/15/17

Extended Work Hours Request and CSC Approval, 11/13/17

Project Revisions Request, 12/20/17

Council Decision on Revision Request, 12/21/17

Semi-annual Status of Construction Report, 12/21/17

Shift of Location for Structure #830, 01/19/18

Council Decision on Shift Location, 01/19/18

Content Last Modified on 1/23/2018 7:34:58 AM