10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

Transcend Wireless

March 1st, 2023

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

RE: Notice of Exempt Modification
153 Old Salem Road, Norwich, CT 06360
Latitude: 41.303574
Longitude: -72.072977
T-Mobile Site#: CTNL463A - Sprint Keep Project

Dear Ms. Bachman:

Sprint currently maintains six (6) antennas at the 110-foot level of the existing 112-foot Utility Tower at 761-763 Federal Road, Brookfield, Connecticut. The 112-foot Utility Tower and property are owned and operated by Connecticut Light and Power Company (% Eversoucre). T-Mobile now intends to remove all existing Sprint equipment and replace it with their own. T-Mobile will be installing (6) antennas at the 110-foot level of the tower. The new antennas support 5G services.

Planned Modifications:
Tower:
Remove
(3) Sprint Antennas
All Existing Sprint RRHs
All Existing Sprint Hybrid Cables

Install New:
(3) APXVAALL24 43-U-NA20 Antennas
(3) Commscope VV-65A-R1 Antennas
(3) Ericsson Radio 4460 B25+B66
(3) Ericsson 4480 B71+B85
(3) Ericsson Radio 8863 B41
(6) Commscope Bias-T-ATSBT-TOP-MF-4G

(36) 1 1/4” Coax Cables
(3) 6/24 Hybrid Cables

Ground:
Install New:
(1) 6160 Cabinet and (1) B160 Battery Cabinet.

To Be Removed:
All Sprint Ground Equipment

This facility was originally approved by the Connecticut Siting Council in Petition No. 595 dated December 19, 2002. A copy of this approval is attached. This modification complies with this approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mayor Peter Nystrom, Elected Official, and Francis Lollie, Zoning Enforcement Officer, as well as the tower and property owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S;A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.

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

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

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

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

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

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

Sincerely,

Eric Breun
Transcend Wireless
Cell: 201-658-7728
Email: ebreun@transcendwireless.com

Attachments
cc: Peter Nystrom - Mayor of Norwich
Deanna Rhodes - Director of Planning
Connecticut Light and Power Co (℅ Eversource) - Land Owner

ERIC BREUN
2016587728
1 INTERNATIONAL BLVD.
MAHWAH NJ 07495

1 LBS 1 OF 1

SHIP TO:
MAYOR PETER NYSTROM
100 BROADWAY
NORWICH CT 06360

CT 063 0-01

UPS GROUND
TRACKING #: 1Z V25 742 03 9905 9791

BILLING: P/P

Reference #1: CTNL463A

XOL 23.01.06 NV45 5.0A 01/2023*

ERIC BREUN
2016587728
1 INTERNATIONAL BLVD.
MAHWAH NJ 07495

1 LBS 1 OF 1

SHIP TO:
DIRECTOR OF PLANNING/ZONING
DEANNA RHODES
100 BROADWAY
NORWICH CT 06360

CT 063 0-01

UPS GROUND
TRACKING #: 1Z V25 742 03 9946 9786

BILLING: P/P

Reference #1: CTNL463A

XOL 23.01.06 NV45 5.0A 01/2023*


ERIC BREUN
2016587728
1 INTERNATIONAL BLVD.
MAHWAH NJ 07495
1 LBS
1 OF 1
SHIP TO:
CHRIS GELINAS
860-665-2008
EVERSOURCE ENERGY
107 SELDEN ST.
BERLIN CT 06037
CT 061 9-02
UPS GROUND
TRACKING #: 1Z V25 742 03 9232 4140
BILLING: P/P
Reference #1: CTNL463A
XOL 23.01.06 NV45 5.0A 01/2023*

Hello, your package has been delivered.

Delivery Date: Thursday, 02/02/2023

Delivery Time: 10:26 AM

Left At: DOCK

Signed by: KEITH

Set Delivery Instructions | Manage Preferences

TRANSCEND WIRELESS

Tracking Number:	1ZV257420392324140
Ship To:	EVERSOURCE ENERGY 107 SELDEN ST. BERLIN, CT 06037 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTNL463A

Hello, your package has been delivered.

Delivery Date: Thursday, 02/02/2023

Delivery Time: 1:43 PM

Signed by: MUSKARELA

TRANSCEND WIRELESS

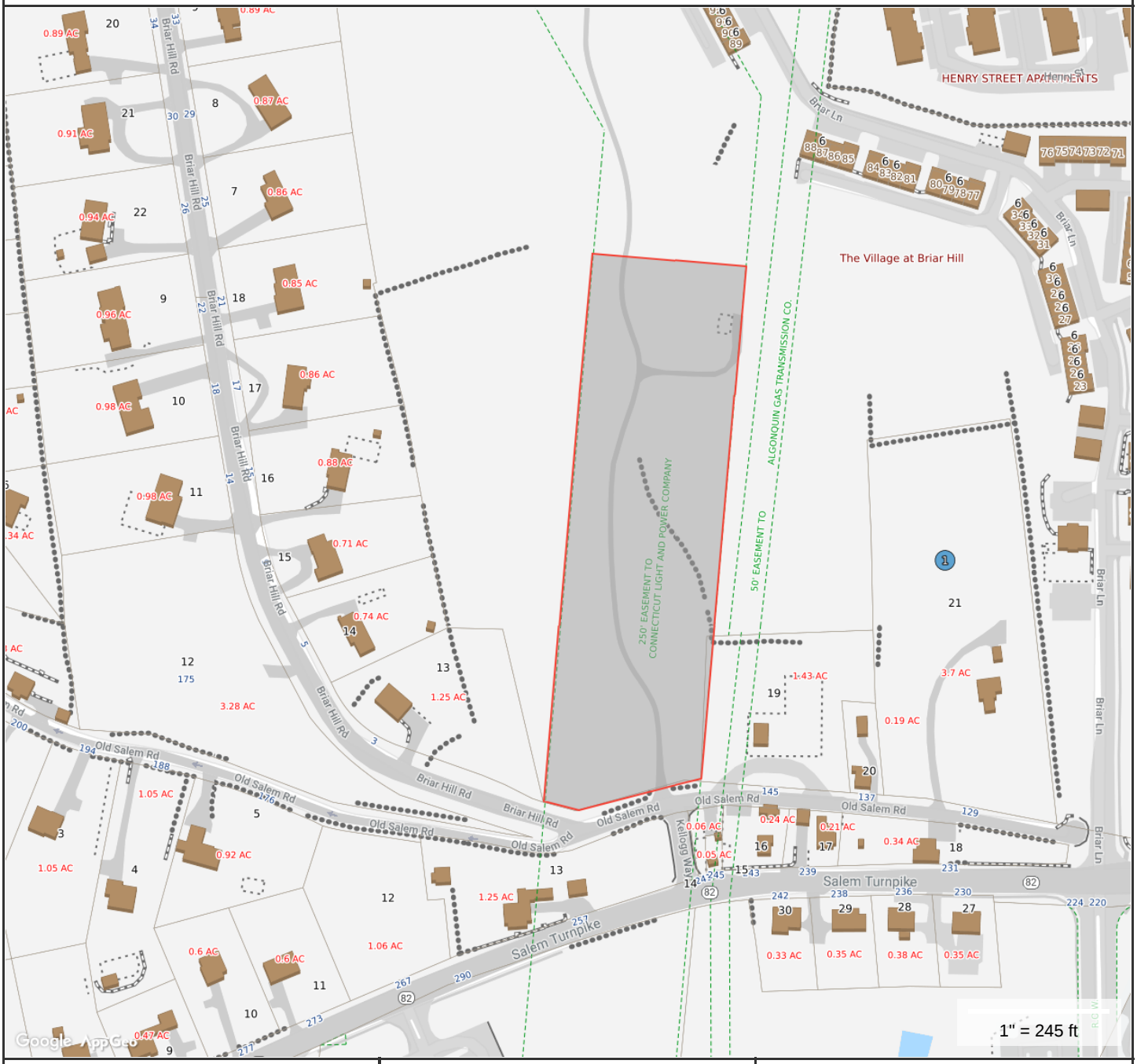
Tracking Number:	1ZV257420399059791
Ship To:	MAYOR PETER NYSTROM 100 BROADWAY NORWICH, CT 06360 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTNL463A

Your shipment
1ZV257420399469786

Estimated delivery
The delivery date will be provided as soon as possible.

- Label Created
- **On the Way**
  Picked Up by UPS
- Out for Delivery
- Delivery

Ship To
NORWICH, CT US



MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

City of Norwich, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 1/22/2019
Data updated 1/22/2019

NV - CT54XC775

RIGHT OF WAY GRANT

19

TO ALL PEOPLE TO WHOM THESE PRESENTS SHALL COME, GREETING: 10-57. 226-A-23

KNOW YE that I we RICHARD M. HARDING

of NORWICH, County of New London and State of Connecticut

for the consideration of a valuable sum in dollars

hereby acknowledged received to my our full satisfaction of The Connecticut Light and Power Company, a Connecticut corporation located in Hartford, Connecticut, do give, grant, bargain, sell, and confirm unto the said Connecticut Light and Power Company the following rights and rights of way:

The right to construct, maintain, rebuild, and relocate, at all times, forever, on, over, or/and under any part of a strip of land 250 feet in width, said strip being bounded and described as follows:

A certain parcel of land situated in the Town of Norwich, lying between parallel lines, said parallel lines being 125 feet distant on each side (measuring at right angles) from the center line of location of said strip as surveyed and staked out this date, said center line, at each angle point being considered to extend to the outside of said strip.

Said center line is described as follows: Beginning at a point in the northerly boundary line of the Back Road (so called) leading from the Salem Turnpike to Leffingwell, said point being about two feet southerly as measured along the line being described from an iron pin and being about 136 feet westerly as measured along the northerly boundary of said road from the intersection of said northerly boundary of said road, the westerly boundary of land now or formerly of A. H. Beebe and the easterly boundary of land of Grantor; thence N.18° - 55' E about 1079 feet to an iron pin; thence N.15° - 10' W. about 2953 feet to land of Cipryan Szablinski

any number and all kinds and sizes of poles, towers, wires, guy wires, and all fixtures and things, except buildings, useful at this time or hereafter for the transmission of electricity of every voltage and for telephone, telegraph, and signal purposes, and the right to transmit by the same, for any and every purpose, electricity of every voltage and use the same for telephone, telegraph, and signal purposes; and the right to cut, fell, trim, and remove any tree on my our land which, if it fell, could fall within ten feet of anything hereafter located on said strip of land by virtue of this grant, and the right to cut and remove all trees, brush, or other growth on said strip, all wood cut to be the property of the owner of the land at the time the same is cut; and the right to travel on and carry materials over said strip in exercising all rights which said The Connecticut Light and Power Company now has or may hereafter have in other lands, doing no damage thereby.

TO HAVE AND TO HOLD the above granted and bargained rights and rights of way unto it, the said grantee, its successors and assigns, forever, to its and their own proper use and behoof. And also I we the said grantor~~s~~ do for myself ~~ourselves~~, my our heirs, executors, and administrators, covenant with the said grantee, its successors and assigns, that at and until the ensealing of these presents I we am ~~are~~ well seized of said strip of land as a good indefeasible estate in fee simple and have good right to grant, bargain, and sell said rights and rights of way in manner and form as is above written, and that said strip of land and said rights and rights of way are free from all encumbrances whatsoever.

AND FURTHERMORE I we, the said grantor~~s~~ do by these presents bind myself ~~ourselves~~ and my ~~our~~ heirs, forever, to warrant and defend the above granted and bargained rights and rights of way to the said grantee, its successors and assigns, against all claims and demands whatsoever.

IN WITNESS WHEREOF I we have hereunto set my our hand~~s~~ and seal~~s~~ this 7th day of October, A. D. 19 30.

Signed, sealed and delivered in presence of

William B. Mitchell
Freda E. Barker

Richard M. Harding (SEAL)

(SEAL)

(SEAL)

STATE OF CONNECTICUT

COUNTY OF New London ss. Norwich, Connecticut, October 7th, 1930.

Personally appeared RICHARD M. HARDING signer and ~~sealer~~ of the foregoing instrument, and acknowledged the same to be his free act and deed, before me,

William B. Mitchell
Notary Public

NV - CT54XC775

1

Right of Way Grant

FROM

RICHARD M. HARDING

THE CONNECTICUT LIGHT & POWER COMPANY.

TO

TOWN OF NORWICH CONN.
Received for Record OCT 17 1930
at 11.30 o'clock A M. and Recorded in
Norwich Land Records, Vol 197 Page 18
H. Edward Cox

Compared and Found Correct
Harold L. Burt, Town Clerk

2.75

State of Connecticut, County of New London, ss. May 24th, 1930. Then and there before me a Justice of the Peace within and for the County and State aforesaid, duly commissioned and acting as such, personally appeared Mr.Eli Jacobson, signer and sealer of the foregoing instrument and acknowledged the same to be his free act and deed. Maurice W.Meyer, Justice of the Peace (Seal). Commission expires January 1st, 1931. Approved as to: Terms, R.W.Swenson; Description, A.U.Hersey, Form, A.U.Hersey, Jun 28, 1930. A.U.H. to R.H. A.U.H. 7/10,1930. R.H. to A.U.H. R.H. 7/10,1930. Abstracted on Aug. 2, 1930. By H.D.F.

Vol 197 P. 18

Received for Record October 17, 1930, at 9.02 o'clock A.M.

Harold Burt Town Clerk.

V 164 P. 43

TO ALL PEOPLE TO WHOM THESE PRESENTS SHALL COME, GREETING: KNOW YE, THAT I, RICHARD M.HARDING of Norwich, County of New London and State of Connecticut, for the consideration of a valuable sum in dollars hereby acknowledged received to my full satisfaction of The CONNECTICUT LIGHT AND POWER COMPANY, a Connecticut corporation located in Hartford, Connecticut, do give, grant, bargain, sell, and confirm unto the said Connecticut Light and Power Company the following rights and rights of way: The right to construct, maintain, rebuild, and relocate, at all times, forever, on, over, or/and under any part of a strip of land 250 feet in width, said strip being bounded and described as follows: A certain parcel of land situated in the Town of Norwich, lying between parallel lines, said parallel lines being 125 feet distant on each side (measuring at right angles) from the center line of location of said strip as surveyed and staked out this date, said center line, at each angle point being considered to extend to the outside of said strip. Said center line is described as follows: Beginning at a point in the northerly boundary line of the Back Road (so called) leading from the Salem Turnpike to Leffingwell, said point being about two feet southerly as measured along the line being described from an iron pin and being about 136 feet westerly as measured along the northerly boundary of said road from the intersection of said northerly boundary of said road, the westerly boundary of land now or formerly of A.H.Beebe and the easterly boundary of land of Grantor; thence N.18°55' E about 1079 feet to an iron pin; thence N. 15° 10' W. about 2953 feet to land of Cipryan Szablinski, any number and all kinds and sizes of poles, towers, wires, guy wires, and all fixtures and things, except buildings, useful at this time or hereafter for the transmission of electricity of every voltage and for telephone, telegraph, and signal purposes, and the right to transmit by the same, for any and every purpose electricity of every voltage and use the same for telephone, telegraph, and signal purposes; and the right to ~~transmit by the same, for any and every purpose, electricity of every voltage and use the same for telephone, telegraph, and signal purposes; and the~~ right to cut, fell, trim, and remove any tree on my land which, if it fell, could fall within ten feet of anything hereafter located on said strip of land by virtue of this grant, and the right to cut and remove all trees, brush, or other growth on said strip, all wood cut to be the property of the owner of the land at the time the same is cut; and the right to travel on and carry materials over said strip in exercising all rights which said The Connecticut Light and Power Company now has or may hereafter have in other lands, doing no damage thereby.

TO HAVE AND TO HOLD the above granted and bargained rights and rights of way unto it, the said grantee, its successors and assigns forever, to its and their own proper use and behoof. And also, I, the said grantor, do for myself, my heirs, executors, and administrators, covenant with the said grantee, its successors and assigns, that at and until the ensealing of these presents, I am well seized of said strip of land as a good indefeasible estate in fee simple and have good right to

MISCELLANEOUS No. 197

grant, bargain, and sell said rights and rights of way in manner and form as is above written, and that said strip of land and said rights and rights of way are free from all encumbrances whatsoever. And Furthermore, I, the said grantor, do by these presents bind myself and my heirs, forever, to warrant and defend the above granted and bargained rights and rights of way to the said grantee, its successors and assigns, against all claims and demands whatsoever.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 7th day of October, A.D.1930. Signed, sealed and delivered in presence of

William B.Mitchell Richard M.Harding (Seal)

Fred E.Gerber

State of Connecticut, County of New London, ss. Norwich, Connecticut, October 7th, 1930. Personally appeared Richard M.Harding, signer and sealer of the foregoing instrument, and acknowledged the same to be his free act and deed, before me, William B.Mitchell, Notary Public (Seal).

Received for Record October 17, 1930, at 11.30 o'clock A.M.

Town Clerk.

KNOW ALL MEN BY THESE PRESENTS: THAT the subscriber, EUNICE HARDING MARVIN, of Lyme, in the County of New London, State of Connecticut, for the consideration of a valuable sum in dollars, received to the subscriber's full satisfaction of THE CONNECTICUT LIGHT AND POWER COMPANY, a Connecticut corporation, does hereby release and forever quit-claim to said The Connecticut Light and Power Company, all the right, and interest of the subscriber in or to a certain easement and right of way granted the said The Connecticut Light and Power Company by Richard M.Harding, of Norwich, the grant of which easement and right of way is dated October 7, 1930.

The intention of this instrument is to release such easement and right of way above described from the burden of a certain Mortgage dated April 3, 1928, recorded in the land records of the Town of Norwich, in Volume 186, at Page 302, but not to release any other part of the property of the grantor of such easement and right of way from the burden of such encumbrance.

IN WITNESS WHEREOF, the subscriber has hereunto set her hand and seal at Norwich this seventh day of October, 1930.

Witnessed by: William B.Mitchell Eunice Harding Marvin (L.S.)

(Mrs.) Emma Harding

State of Connecticut, County of New London, ss. Norwich, October 7, 1930. Personally appeared before me Eunice Harding Marvin, and acknowledged the foregoing to be her free act and deed, William B.Mitchell, Notary Public (Seal).

Received for Record October 17, 1930, at 11.32 o'clock A.M.

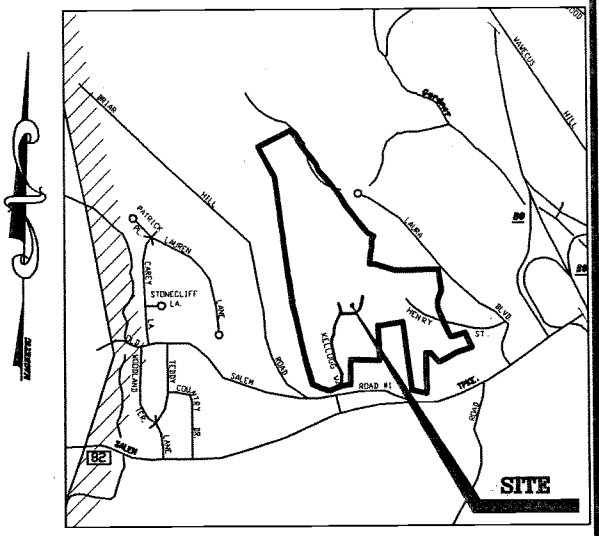
Town Clerk.

TO ALL PEOPLE TO WHOM THESE PRESENTS SHALL COME, GREETING: KNOW YE, THAT I, CHARLES C.BROWNING of the Town of Norwich, County of New London and State of Connecticut, for the consideration of a valuable sum in dollars, hereby acknowledged received to my full satisfaction of THE CONNECTICUT LIGHT AND POWER COMPANY, a Connecticut corporation located in Hartford, Connecticut, do give, grant, bargain,

PROJECT INFORMATION

SITE NAME:	MONTVILLE NORTH – CL&P POLE # 6347 ½
SITE NUMBER:	CT54XC775
DATE PREPARED:	APRIL 29, 2002
TYPE OF BUILD:	CO–LOCATION
SITE ADDRESS:	153 OLD SALEM ROAD NORWICH, CT 06360
COUNTY:	NEW LONDON
MAP/BLOCK/LOT:	201/4/12
LATITUDE:	N 41°30'36"
LONGITUDE:	W 72°07'30"
SITE OWNER:	CONN. LIGHT & POWER P.O. BOX 270 HARTFORD, CT 06141–0270
APPLICANT:	SPRINT PCS CROSSROADS CORPORATE CENTER 1 INTERNATIONAL BLVD. 8TH FLOOR MAHWAH, NJ 07495 CONTACT: JEFF GUTOWSKI PHONE: 201/684–4078
ARCHITECT/ENGINEER:	MCFARLAND–JOHNSON, INC. 400 BAYONET STREET SUITE 301 NEW LONDON, CT 06320 CONTACT: PAUL BISCUTI PHONE: 860/447–2844 FAX: 860/447–1622

LOCATION MAP



NOTE:
SPRINT PCS RESERVES THE RIGHT TO MODIFY THIS LEASE EXHIBIT.

REVISED: 6/19/02
OWNER'S INITIALS:
DATE:

SHEET: L1

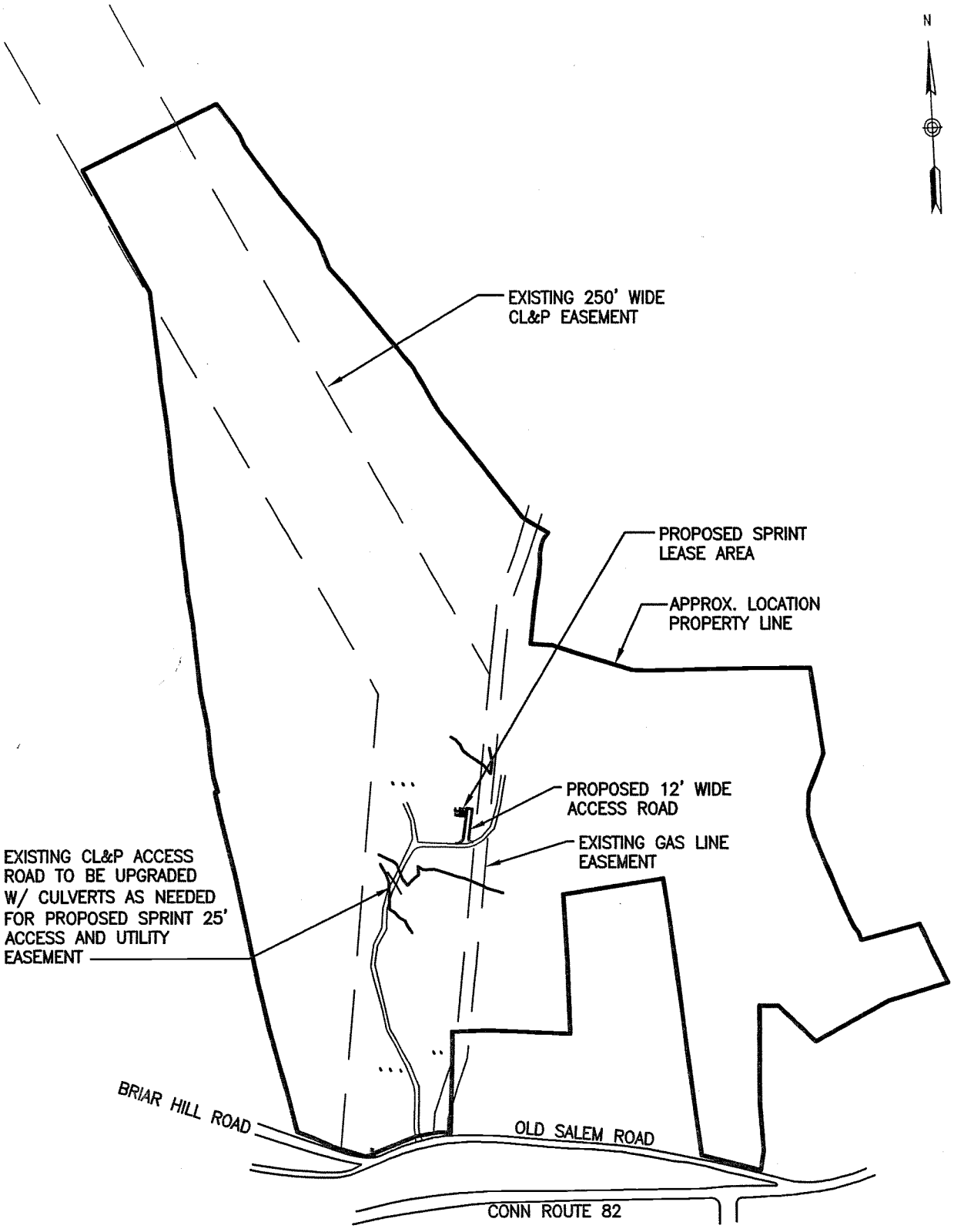
PROJECT: 15805.36
SCALE: NONE
DATE: APR 29, 2002

Sprint PCS
SITE NO. CT54XC775

LEASE EXHIBIT

MONTVILLE NORTH NU
153 OLD SALEM ROAD
NORWICH, CONNECTICUT

McFARLAND – JOHNSON, INC.
400 BAYONET STREET SUITE 301 NEW LONDON, CT 06320
PHONE (860) 447–2844 FAX (860) 447–1622



REVISED: 6/19/02
OWNER'S INITIALS:
DATE:

SITE PLAN

NTS

SHEET: L2

PROJECT: 15805.36
SCALE: NONE
DATE: APR 29, 2002

Sprint PCS

SITE NO. CT54XC775

LEASE EXHIBIT

MONTVILLE NORTH NU
153 OLD SALEM ROAD
NORWICH, CONNECTICUT

McFARLAND - JOHNSON, INC.
400 BAYONET STREET SUITE 301 NEW LONDON, CT 06320
PHONE (860) 447-2844 FAX (860) 447-1622

Petition No. 595
Sprint Spectrum, L.P. d/b/a Sprint PCS
Staff Report
December 19, 2002

On December 12, 2002, Connecticut Siting Council (Council) member Brian Emerick and Christina Lepage of the Council staff met with Sprint PCS (Sprint) representative Thomas J. Regan at 153 Old Salem Road, Norwich, Connecticut for the inspection of an electric transmission structure. The structure is owned by Connecticut Light and Power (CL&P). Sprint, with the agreement of CL&P, proposes to modify the structure by installing antennas and associated equipment for telecommunications use and is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the modification.

Sprint proposes to replace one side of the existing 57-foot transmission pole with an 88-foot laminated wood pole. Three panel antennas would be attached to the pole with a centerline of 83 feet above ground level (agl), and a GPS antenna would be installed at the 75 feet agl on the southwest side of the structure.

The proposed equipment would be housed in equipment cabinets and installed on a 10-foot by 20-foot platform within a 390-foot lease area. The proposed equipment cabinets would be covered by an ice canopy and ice bridge, which would connect the equipment cabinets to the monopole. An 8-foot chain-link fence would surround the equipment compound.

Access to the site would be via an existing access road, which crosses a wetland area. Surface water runs down the existing access road and ponding occurs at various locations along the road. Sprint proposes to upgrade the existing access road to a 12-foot wide gravel surface drive with rip rap lined roadside swales and install culverts to allow water flow. Sprint would install sedimentation and erosion controls to protect regulated wetland areas. An underground conduit from an existing utility pole will provide power and telephone service to the site.

The calculated cumulative worst case power density would not exceed 35.1% of the applicable standard.

Sprint contends that the proposed modification of the existing transmission structure would not cause a significant change or alteration in the physical and environmental characteristics of the site, and would not cause a substantial adverse environmental effect.

EVERSOURCE ENERGY

56 Prospect Street,
Hartford, CT 06103

P.O. Box 270
Hartford, CT 06141-0270
(860) 665-5000

January 27, 2023

Kyle Richers
Transcend Wireless
10 Industrial Ave Suite 3
Mahwah NJ 07430

RE: T-Mobile Antenna Site CTNL463A, Old Salem Road, Norwich CT, Eversource Structure 6347.5

Dear Mr. Richers:

Based on our reviews of the site drawings, the structural analysis and foundation review provided by Centek Engineering, along with a third-party review performed by Paul J. Ford and Company, we accept the proposed modification.

Please work with Christopher Gelinas of Eversource Real Estate to process the site lease amendment. Please do not hesitate to contact us with questions or concerns. Christopher can be contacted at 860-665-2008, and I can be contacted at (203) 623-0409.

Sincerely,

Richard Badon

Richard Badon
Transmission Line Engineering

Ref: 2023-0123 - CTNL463A - Structural Analysis Rev1 (21005.41)
2023-0127_21005.41 CTNL463A_CT54XC775 - Rev1 CDs (S&S)

Sprint Now part of T Mobile

SPRINT ID: CT54XC775
SITE ID: CTNL463A
153 OLD SALEM RD
NORWICH, CT 06360

T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS)
67G5C998G 6160

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2022 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA–222 REVISION "H" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2022 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 MANUFACTURER'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 CONDUITS 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 THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

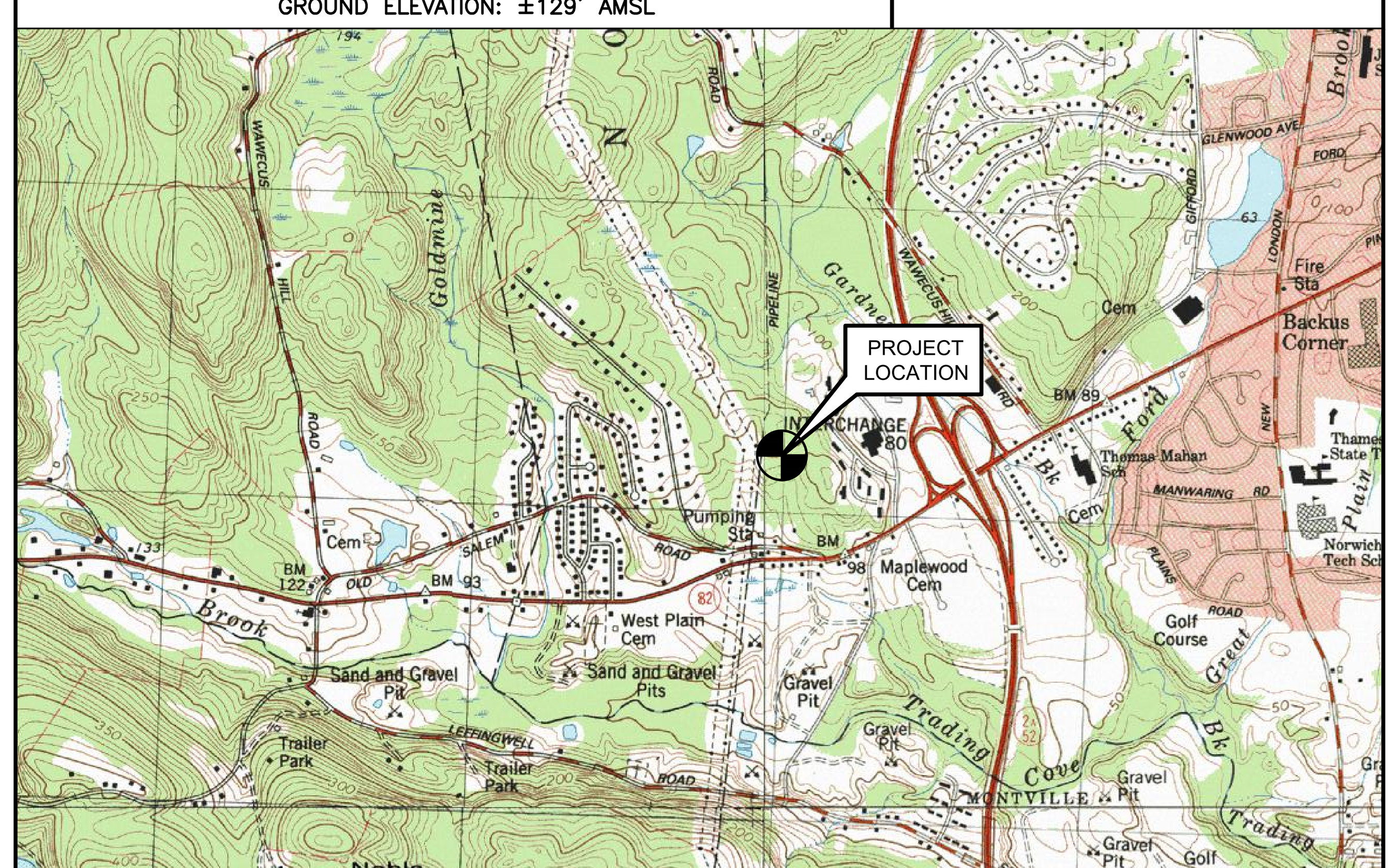
SITE DIRECTIONS

FROM: 35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002
TO: 153 OLD SALEM RD, NORWICH, CT 06360

1.	GET ON I–91 S IN WINDSOR FROM DAY HILL RD.	4.30 MI.
2.	MERGE ONTO I–91 S.	7.10 MI.
3.	TAKE EXIT 30 ON THE LEFT TO MERGE ONTO I–84 E.	0.70 MI.
4.	TAKE EXIT 55 FOR CT–2 E TOWARD NORWICH/NEW LONDON/I–84 E.	0.40 MI.
5.	CONTINUE ONTO CT–2 E.	23.4 MI.
6.	KEEP LEFT AT THE FORK TO STAY ON CT–2 E. FOLLOW SIGNS FOR 2 E.	12.5 MI.
7.	TAKE EXIT 28S FOR I–395 S/CT–2A S TOWARD NEW HAVEN.	0.40 MI.
8.	MERGE ONTO CT–2A E/I–395 S.	2.10 MI.
9.	TAKE EXIT 11 FOR CT–82 TOWARD DOWNTOWN/NORWICH/SALEM.	0.30 MI.
10.	TURN RIGHT ONTO CT–82 W/SALEM TURNPIKE.	0.40 MI.
11.	TURN RIGHT ONTO KELLOGG WAY.	0.08 MI.
12.	TURN RIGHT ONTO OLD SALEM RD.	0.10 MI.

SITE COORDINATES: LATITUDE: 41° 30' 35.74" N
LONGITUDE: 72° 07' 29.77" W
GROUND ELEVATION: ±129' AMSL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH



VICINITY MAP

NORTH

PROJECT SUMMARY

THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

1. INSTALL (1) RADIO 4460 B25+B66 PER SECTOR AT GRADE; TOTAL (3).
2. INSTALL (1) RADIO 4480 B71+B85 PER SECTOR AT GRADE; TOTAL (3).
3. INSTALL (1) RADIO 8863 B41 PER SECTOR AT GRADE; TOTAL (3).
4. INSTALL (1) ANTENNA APXVAALL24_43 U–NA20 PER SECTOR; TOTAL (3).
5. INSTALL (1) ANTENNA W–65A–R1 PER SECTOR; TOTAL (3).
6. INSTALL (2) SMART–BIAST PER SECTOR; TOTAL (6).
7. INSTALL NEW POWER ENCLOSURE 6160.
8. INSTALL NEW BATTERY ENCLOSURE B160.
9. REMOVE EXISTING SPRINT EQUIPMENT.
10. REMOVE EXISTING SPRINT ANTENNA MOUNTS
11. NEW 90' STEEL EVERSOURCE UTILITY STRUCTURE (INSTALL BY OTHERS)
12. INSTALL (36) 1–1/4" COAX CABLES
13. INSTALL (3) 6/24 4AWG HYBRID CABLES.
14. INSTALL NEW PLATFORM ANTENNA MOUNT
15. INSTALL ANTENNA ICE–BRIDGE. CONTRACTOR TO VERIFY FINAL LENGTH IN FIELD

PROJECT INFORMATION

SPRINT ID:	CT54XC775
SITE ID:	CTNL463A
SITE ADDRESS:	153 OLD SALEM RD NORWICH, CT 06360
APPLICANT:	T–MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	KYLE RICHERS TRANSCEND WIRELESS, (908) 447–4716
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD RD. BRANFORD, CT 06405 CARLO F. CENTORE, PE (203) 488–0580 EXT. 122
PROJECT COORDINATES:	LATITUDE: 41°–30'–35.74" N LONGITUDE: 72°–07'–29.77" W GROUND ELEVATION: 129'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

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C–3	ANTENNA PLANS AND ELEVATIONS	0
C–4	TYPICAL EQUIPMENT DETAILS	0
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E–1	ELECTRICAL RISER DIAGRAM AND CONDUIT ROUTING	0
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SPRINT ID: CT54XC775
SITE ID: CTNL463A
153 OLD SALEM RD
NORWICH, CT 06360

DATE:	12/23/21
SCALE:	AS NOTED
JOB NO.	21005.41

TITLE SHEET

T–1

Sheet No. 1 of 13

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2021 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2022 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 105 MPH (Vasd) (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-16).

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2022 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "H" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2022 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 IT'S 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 SITE OWNER'S 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.
18. CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
19. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
20. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

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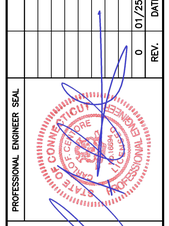

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153 OLD SALEM RD
NORWICH, CT 06360

DATE: 12/23/21
SCALE: AS NOTED
JOB NO. 21005.41

GENERAL NOTES AND SPECIFICATIONS

N-1

NOTE:
ALL COAX LENGTHS TO BE MEASURED
AND VERIFIED IN FIELD BEFORE ORDERING

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) TMA (QTY)	(QTY) PROPOSED HYBRID/COAX CABLES
A1	PROPOSED	RFS–APXVAALL24_43–U–NA20	95.9 x 24 x 8.5	86'	30°	(P) RADIO 4480 B71+B85 (1), (P) RADIO 4460 B25+B66 (1)	(P) COMMSCOPE: BIAST – ATSBT–TOP–MF–4G	(36) 1–1/4" COAX CABLES (3) 6/24 4AWG HYBRID CABLES
A2	PROPOSED	COMMSCOPE–VV–65A–R1	54.7 x 12 x 4.6	86'	30°	(P) RADIO 8863 B41 (1)	(P) COMMSCOPE: BIAST – ATSBT–TOP–MF–4G	
B1	PROPOSED	RFS–APXVAALL24_43–U–NA20	95.9 x 24 x 8.5	86'	120°	(P) RADIO 4480 B71+B85 (1), (P) RADIO 4460 B25+B66 (1)	(P) COMMSCOPE: BIAST – ATSBT–TOP–MF–4G	
B2	PROPOSED	COMMSCOPE–VV–65A–R1	54.7 x 12 x 4.6	86'	120°	(P) RADIO 8863 B41 (1)	(P) COMMSCOPE: BIAST – ATSBT–TOP–MF–4G	
C1	PROPOSED	RFS–APXVAALL24_43–U–NA20	95.9 x 24 x 8.5	86'	260°	(P) RADIO 4480 B71+B85 (1), (P) RADIO 4460 B25+B66 (1)	(P) COMMSCOPE: BIAST – ATSBT–TOP–MF–4G	
C2	PROPOSED	COMMSCOPE–VV–65A–R1	54.7 x 12 x 4.6	86'	260°	(P) RADIO 8863 B41 (1)	(P) COMMSCOPE: BIAST – ATSBT–TOP–MF–4G	

1 C–1 **SITE LOCATION PLAN**
SCALE: NOT TO SCALE

TRUE NORTH

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SCALE: AS NOTED
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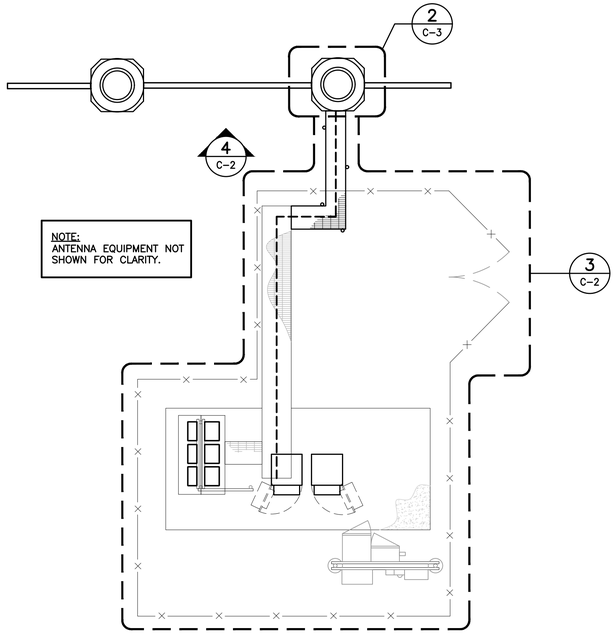
SITE LOCATION PLAN

C–1

Sheet No. 3 of 13



1 C-2 **PROPOSED COMPOUND PLAN**
SCALE: 1" = 5'
TRUE NORTH

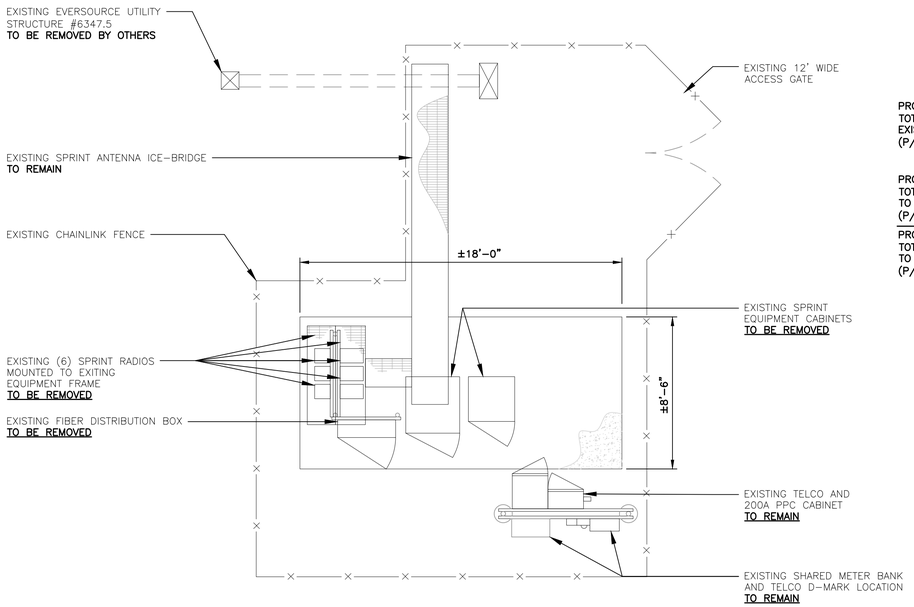
STRUCTURAL COMPLIANCE

TOWER AND TOWER FOUNDATION

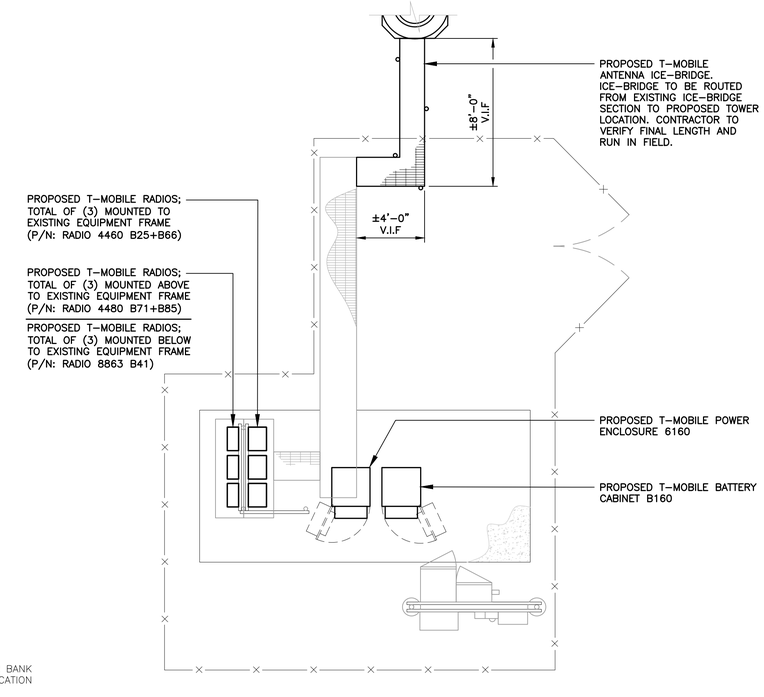
A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21005.41) DATED 01/23/23 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

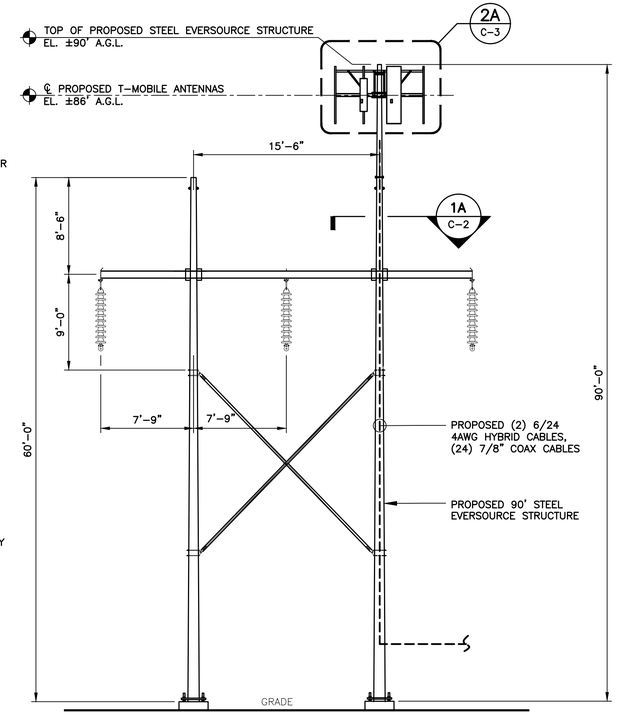
NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.



2 C-2 **EXISTING EQUIPMENT PLAN**
SCALE: 1/4" = 1'
TRUE NORTH



3 C-2 **PROPOSED EQUIPMENT PLAN**
SCALE: 1/4" = 1'
TRUE NORTH



4 C-2 **PROPOSED TOWER ELEVATION**
SCALE: 1" = 10'

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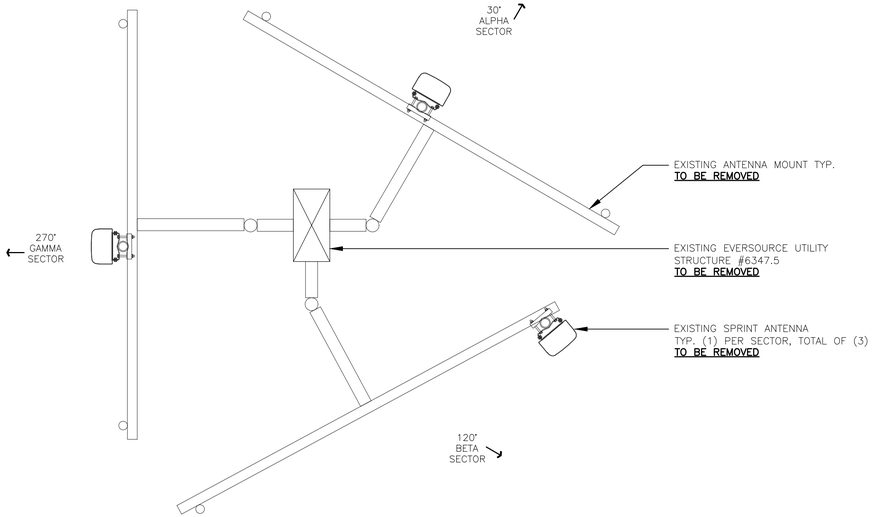
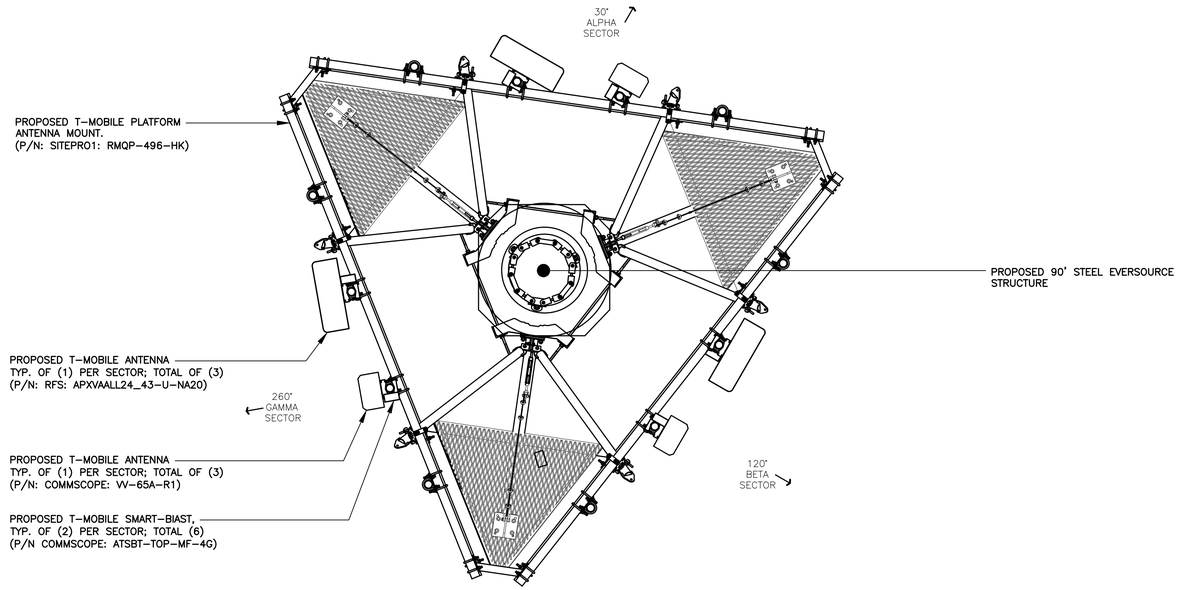
COMPOUND PLAN, EQUIPMENT PLANS, AND ELEVATION

C-2

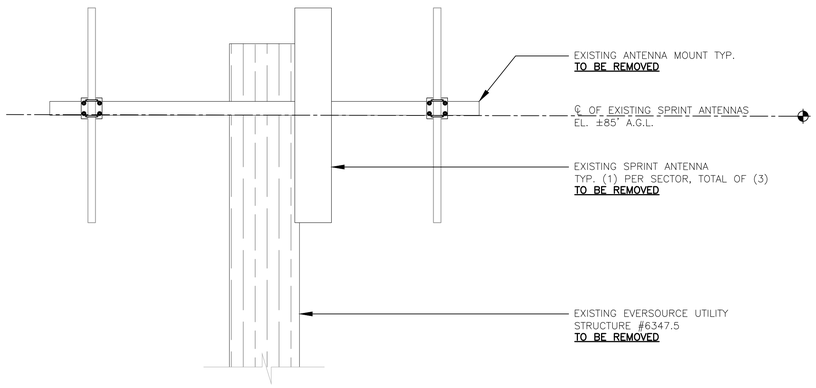
Sheet No. 4 of 13



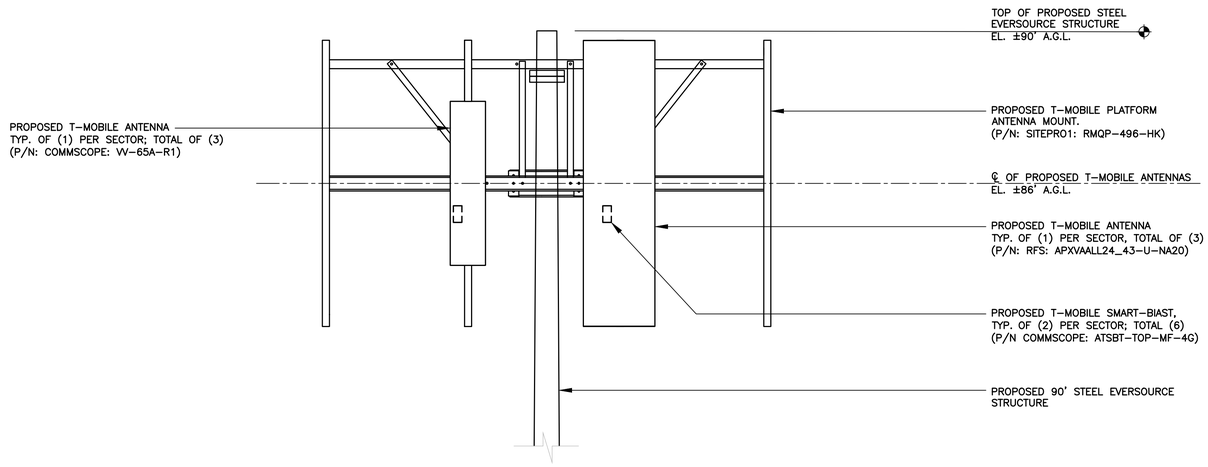
1 / C-3 **EXISTING ANTENNA PLAN**
SCALE: 1/2" = 1'
TRUE NORTH



2 / C-3 **PROPOSED ANTENNA PLAN**
SCALE: 1/2" = 1'
TRUE NORTH



1A / C-3 **EXISTING ANTENNA ELEVATION**
SCALE: 1/2" = 1'



2A / C-3 **PROPOSED ANTENNA ELEVATION**
SCALE: 3/4" = 1'

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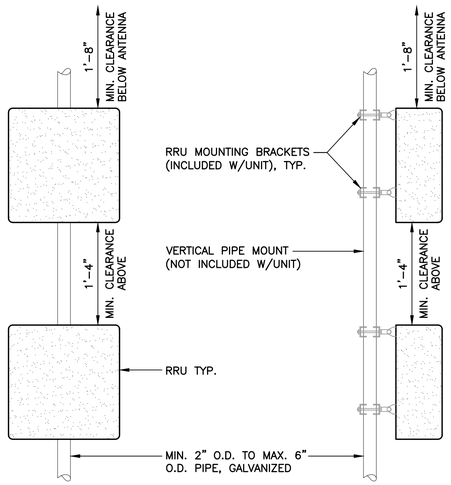
ANTENNA PLANS AND ELEVATIONS

C-3

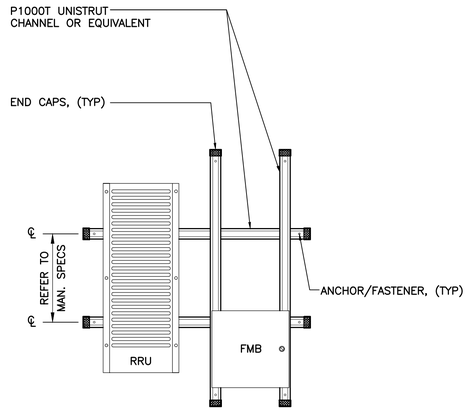
Sheet No. 5 of 13



FRONT ELEVATION SIDE ELEVATION

NOTES: (PIPE MOUNTING)

1. T–MOBILE SHALL SUPPLY RRU, AND RRU POLE–MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE–MOUNTING BRACKET.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.



FRONT ELEVATION

NOTES: (UNISTRUT MOUNTING)

1. INSTALL A MINIMUM OF (2) ANCHORS PER UNISTRUT (± 16"o/c MIN).
2. MOUNT RRU TO UNISTRUT WITH 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET.
3. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

1 C–4 TYPICAL RRU MOUNTING DETAILS

SCALE: NOT TO SCALE

APXVAALL24_43-U-NA20

VV-65A-R1

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXVAALL24_43–U–NA20	95.9"L x 24.0"W x 8.5"D	±150 LBS.
MAKE: COMMSCOPE MODEL: VV–65A–R1	54.7"L x 12.08"W x 4.6"D	±23 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

4 C–4 PROPOSED ANTENNA DETAIL

SCALE: NOT TO SCALE

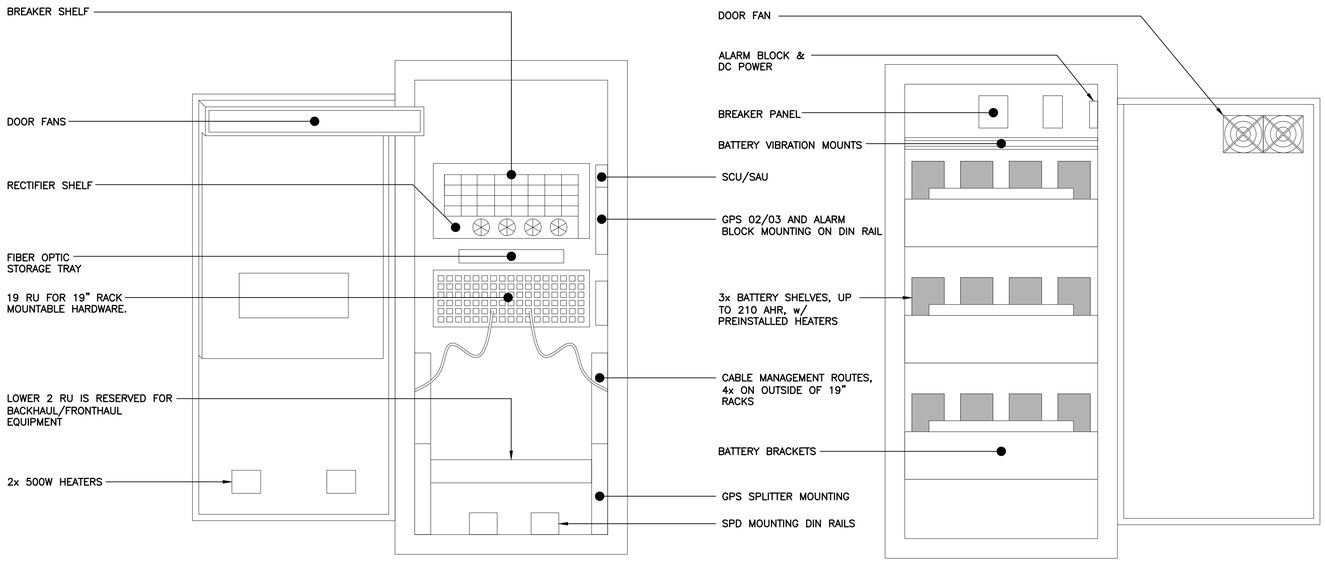
RADIO 4460 B25+B66

RADIO 4480 B71+B85
RADIO 8863 B41

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4460 B25+B66	19.6"L x 15.7"W x 12.1"D	±109 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4480 B71+B85	21.8"L x 15.7"W x 7.5"D	±84 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 8863 B41	18.5"L x 14.5"W x 5.5"D	±51 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.			

3 C–4 PROPOSED RRU DETAIL

SCALE: NOT TO SCALE



EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: ENCLOSURE 6160 CABINET	62.0"H x 26.0"W x 26.0"D	±1200 LBS

4 C–4 ENCLOSURE 6160 CABINET DETAIL

SCALE: NOT TO SCALE

EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: BATTERY B160 CABINET	62.0"H x 26.0"W x 26.0"D	±1883 LBS

5 C–4 BATTERY B160 CABINET DETAIL

SCALE: NOT TO SCALE

ANDREW SMART BIAST		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: ATSBT–TOP–MF–4G	5.63"L x 3.7"W x 2"D	±1.7 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

6 C–4 PROPOSED BIAS-TEE DETAIL

SCALE: NOT TO SCALE

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TYPICAL EQUIPMENT DETAILS

C-4

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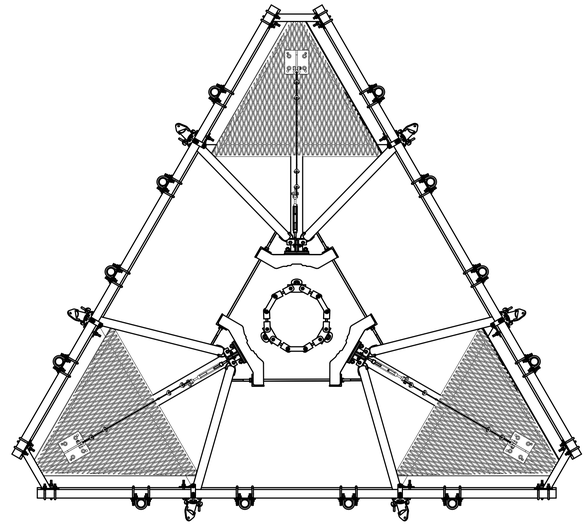
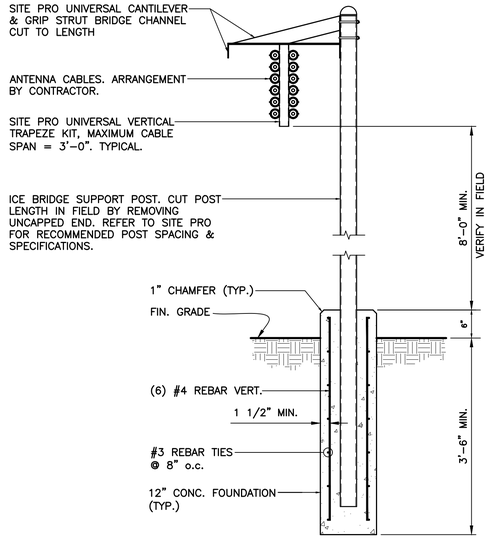


SITEPRO1:
RMQP-496-HK

1
C-5

PLATFORM ANTENNA MOUNT DETAIL

SCALE: NOT SCALE



2
C-5

TYPICAL ICE-BRIDGE DETAIL

SCALE: NOT TO SCALE

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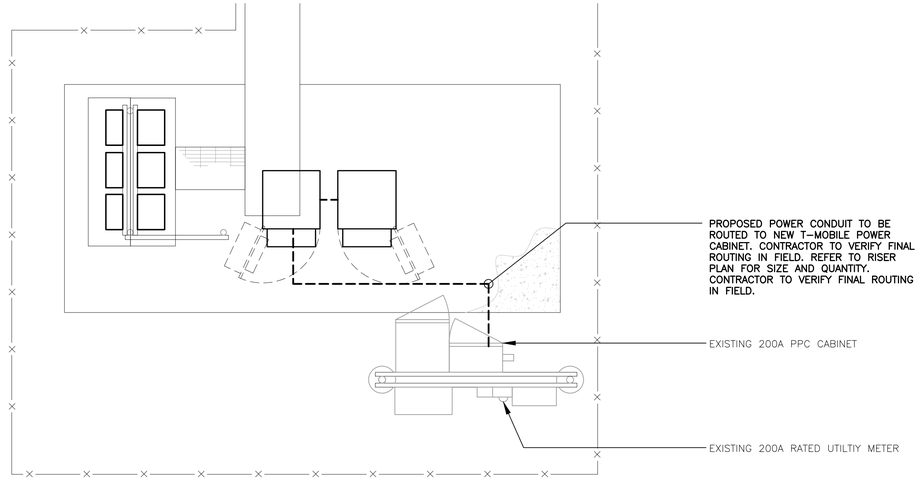
TYPICAL EQUIPMENT DETAILS

C-5

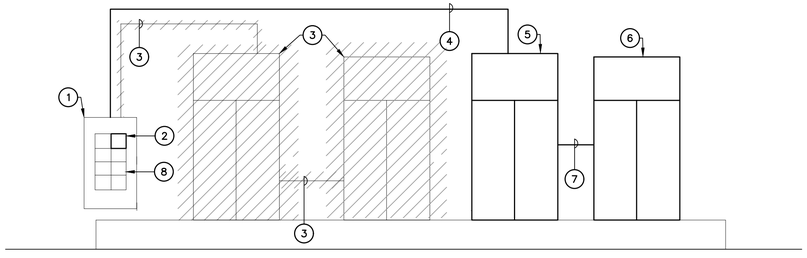
NOTE: CONDUITS SHOWN HEREIN ARE DIAGRAMMATICAL IN NATURE. CONTRACTOR IS RESPONSIBLE FOR ALL CONDUIT ROUTING REGARDING LENGTH OF RUN, FEASIBILITY, AND SAFETY PROTOCOLS. CONDUITS SHOULD BE INSTALLED IN A MANOR OF LEAST OBSTRUCTION TO EGRESS PATHS/WALKWAYS TO AVOID TRIPPING HAZARDS.



1 / E-1 **ELECTRICAL CONDUIT ROUTING PLAN**
SCALE: 3/8" = 1'

RISER DIAGRAM NOTES

1. EXISTING 200A, PPC CABINET TO REMAIN.
2. NEW 150A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.
3. EXISTING CABINETS AND ASSOCIATED CONDUITS AND CONDUCTORS TO BE REMOVED.
4. (3) 1/0 AWG, (1) #6 AWG GROUND, 1-1/2" CONDUIT.
5. NEW T-MOBILE EQUIPMENT CABINET
6. NEW T-MOBILE BATTERY CABINET
7. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.
8. EXISTING 100A CIRCUIT BREAKER TO BE REMOVED.



2 / E-1 **ELECTRICAL POWER RISER DIAGRAM**
SCALE: NOT TO SCALE

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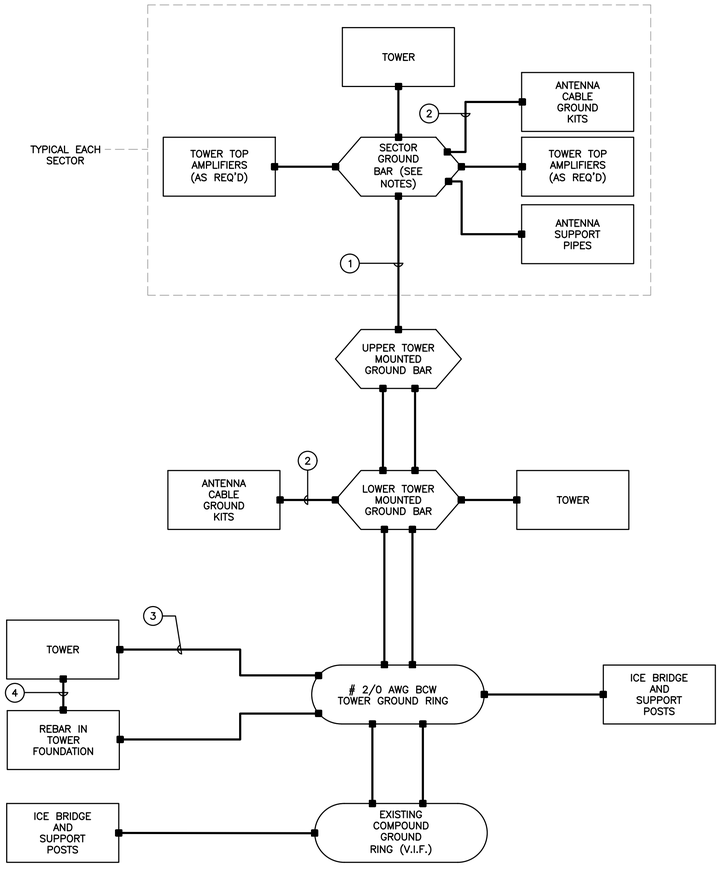
ELECTRICAL RISER DIAGRAM AND CONDUIT ROUTING

E-1

Sheet No. 8 of 13



1 / E-2 **ELECTRICAL GROUNDING SCHEMATIC**
SCALE: NOT TO SCALE

GROUNDING SCHEMATIC NOTES

1. #2/0 GREEN INSULATED
2. #6 AWG
3. FOUR #2/0 GREEN INSULATED
4. BOND WITH LISTED MECHANICAL CONNECTION

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
3. BOND CABLE TRAY AND ICE BRIDGE SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. ALL BONDS TO TOWER SHALL BE MADE IN STRICT ACCORDANCE WITH SPECIFICATIONS OF TOWER MANUFACTURER OR STRUCTURAL ENGINEER.
7. REFER TO GROUNDING PLAN FOR LOCATION OF GROUNDING DEVICES.
8. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
9. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
10. ALL TOWER MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
11. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.
12. COORDINATE WITH EVERSOURCE TRANSMISSION DEPARTMENT REPRESENTATIVE TO DETERMINE ADDITIONAL GROUNDING REQUIREMENTS. PROVIDE ALL REQUIRED ELEMENTS TO MEET EVERSOURCE APPROVAL.
13. COORDINATE WITH TOWER OWNER BEFORE INSTALLING ANY GROUNDING ELEMENTS ON TOWER OR BONDING TO EXISTING TOWER GROUND RING.

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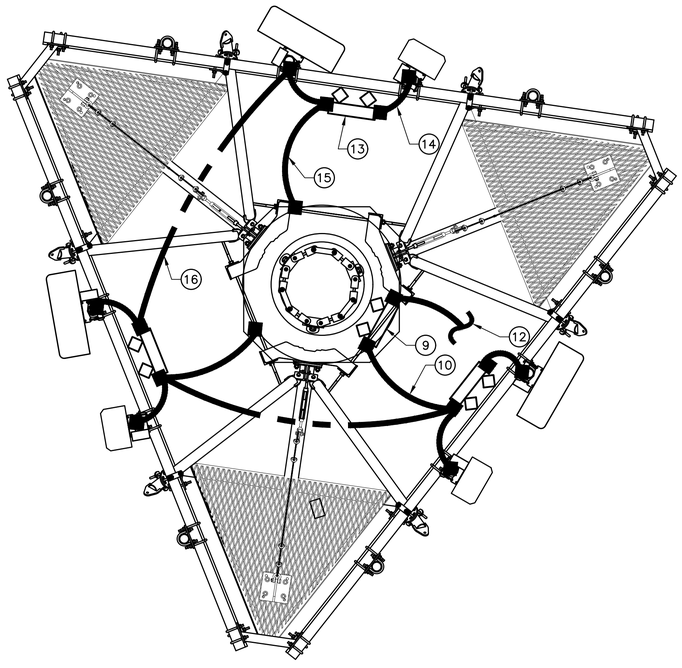
ELECTRICAL SCHEMATIC DIAGRAM

E-2

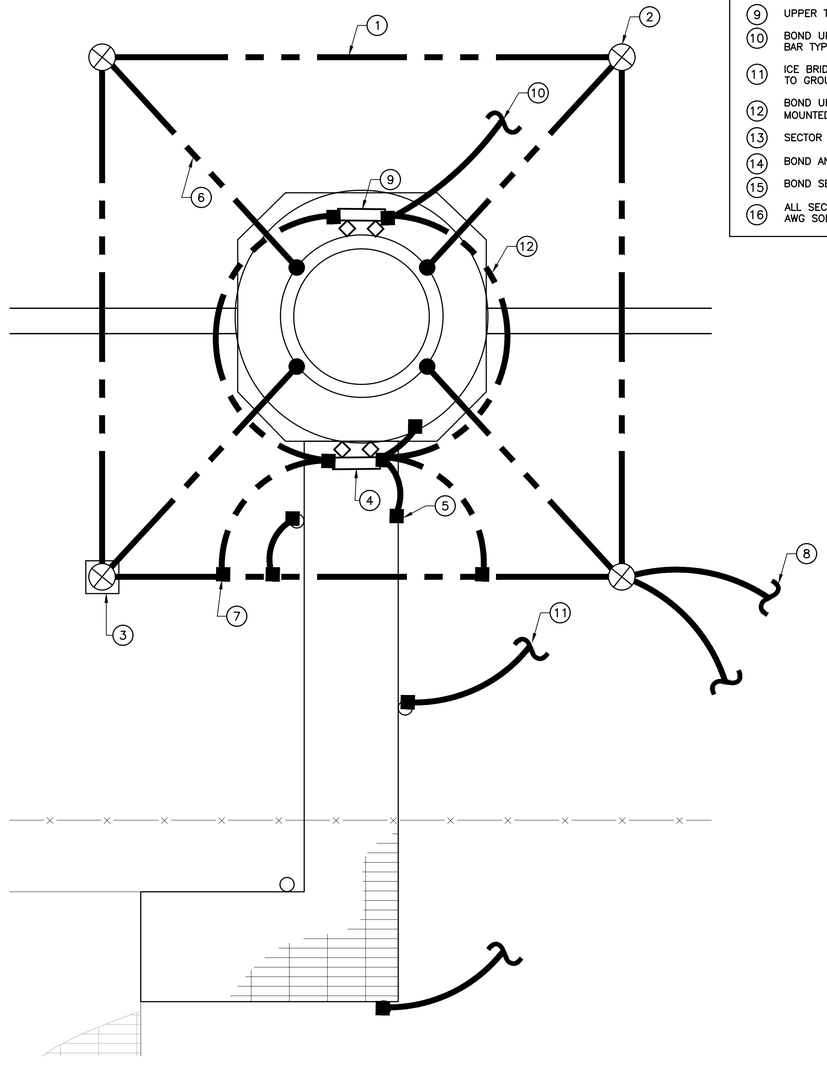
Sheet No. 9 of 13

GROUNDING PLAN NOTES

1. 2/0 AWG TOWER GROUND RING.
2. GROUNDING ROD TYP.
3. GROUNDING ROD WITH ACCESS TYP.
4. LOWER TOWER MOUNTED GROUND BAR PER DETAILS.
5. BOND GROUND BAR TO ICE-BRIDGE TYP.
6. CONNECT TOWER BASE TO GROUND ROD/PLATE IN TOWER RING. TYPICAL FOUR PLACES. CADWELD TO TOWER BASE PLATE OR GROUNDING LUG PROVIDED BY TOWER MANUFACTURER. DO NOT CADWELD TO TOWER.
7. BOND LOWER TOWER MOUNTED GROUND BAR TO GROUND RING TYP 2 PLACES.
8. BOND TOWER GROUND RING TO EXISTING COMPOUND GROUND RING WITH #2 AWG BCW TYP. 2. VERIFY LOCATION OF EXISTING GROUND RING IN FIELD.
9. UPPER TOWER MOUNTED GROUND BAR.
10. BOND UPPER TOWER MOUNTED GROUND BAR TO SECTOR GROUND BAR TYP.
11. ICE BRIDGE POST AND COVER. BOND EACH SECTION AND SUPPORT TO GROUND RING.
12. BOND UPPER TOWER MOUNTED GROUND BAR TO LOWER TOWER MOUNTED GROUND BAR (2) # 2/0 GROUND LEADS.
13. SECTOR GROUND BAR TYP.
14. BOND ANTENNA MOUNTING PIPES TO SECTOR GROUND BAR. (TYPICAL)
15. BOND SECTOR GROUND BAR TO TOWER STEEL.
16. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.



1 E-3 **ELECTRICAL GROUNDING PLAN - ANTENNA**
SCALE: NOT TO SCALE



2 E-3 **ELECTRICAL GROUNDING PLAN - TOWER**
SCALE: NOT TO SCALE

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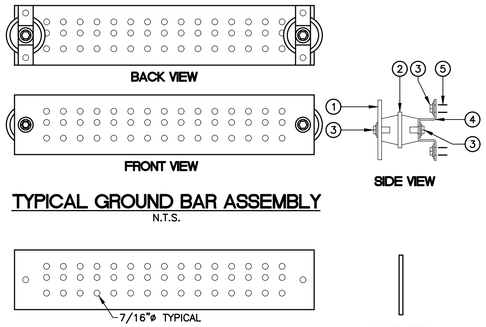
ELECTRICAL GROUNDING PLANS

E-3

Sheet No. 10 of 13

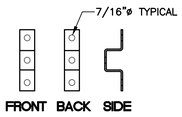


TYPICAL GROUND BAR ASSEMBLY
N.T.S.

TYPICAL GROUND BAR - DIMENSIONS
N.T.S.

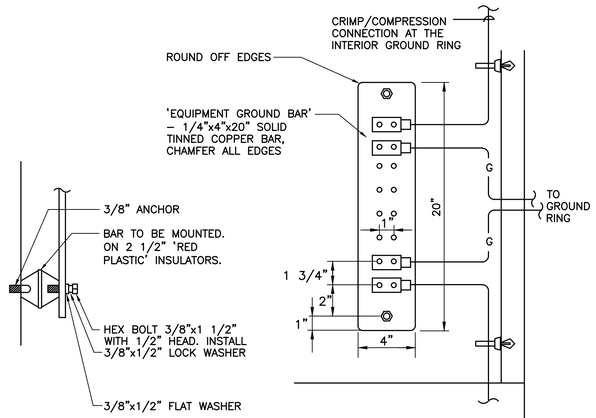
NOTES

1. HIGH CONDUCTIVITY TINNED COPPER BAR 1'-8"Lx4"Wx1/4"D.
2. RED COLORED STANDOFF INSULATOR PLASTIC #1872-1A.
3. STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS, SPLIT LOCKWASHER AND FLAT WASHER.
4. 1"Wx1/8"T STAINLESS STEEL TYPE 304 BRACKET.
5. STAINLESS STEEL TYPE 304 HARDWARE - 3/8"ø EXPANSION BOLT FOR CONCRETE.

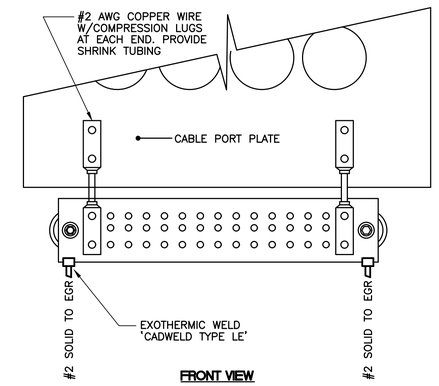


BRACKET FOR GROUND BAR-DIMENSIONS
N.T.S.

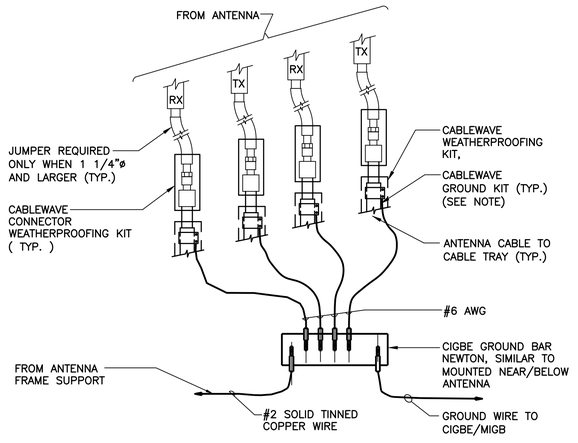
1 E-4 MASTER/EQUIPMENT GROUND BAR DETAILS
SCALE: NOT TO SCALE



2 E-4 EQUIPMENT GROUND BAR DETAIL
SCALE: NOT TO SCALE



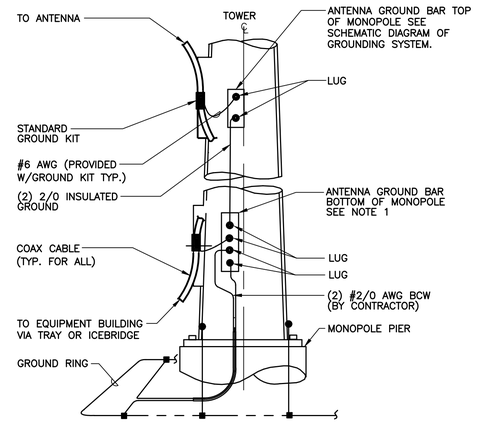
3 E-4 CABLEPORT GROUND BAR LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

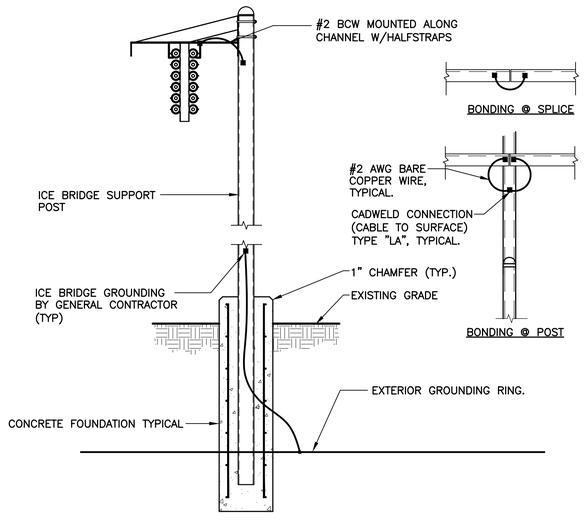
4 E-4 CONNECTION OF GROUND WIRES TO GROUND BAR
SCALE: NOT TO SCALE



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

5 E-6 ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



6 E-4 ICE BRIDGE BONDING DETAIL
SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

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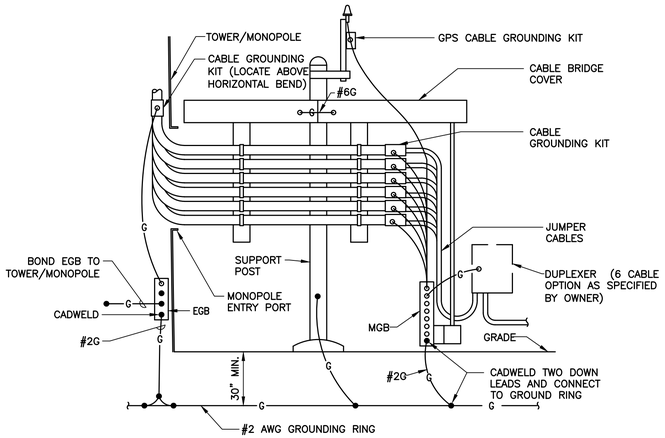
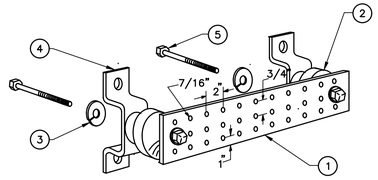


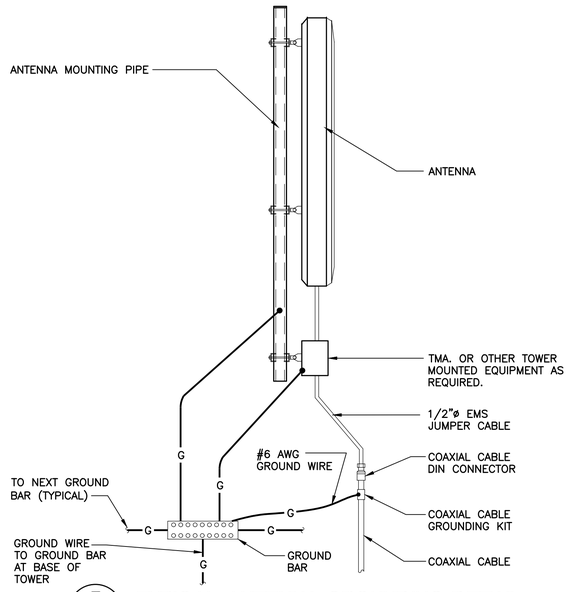
1 / E-5 **CABLE BRIDGE GROUNDING DIAGRAM**
SCALE: NOT TO SCALE



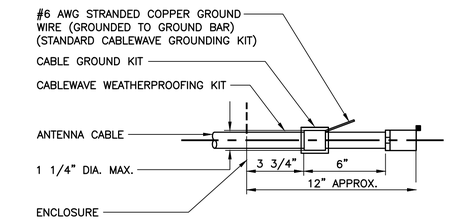
NOTES

1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

2 / E-5 **GROUND BAR DETAIL**
SCALE: NOT TO SCALE



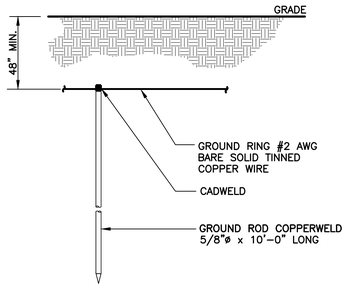
3 / E-5 **TYPICAL ANTENNA GROUNDING DETAIL**
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

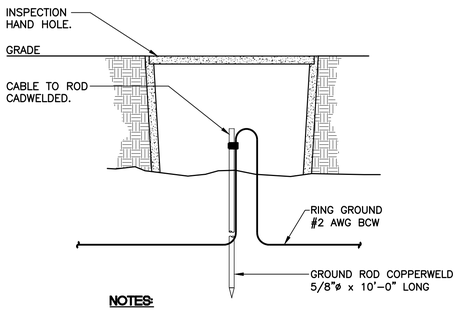
8 / E-5 **ANTENNA CABLE GROUNDING DETAIL**
SCALE: NOT TO SCALE



NOTES:

1. USE GROUND PLATE DETAIL IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

5 / E-5 **GROUND ROD DETAIL**
SCALE: NOT TO SCALE

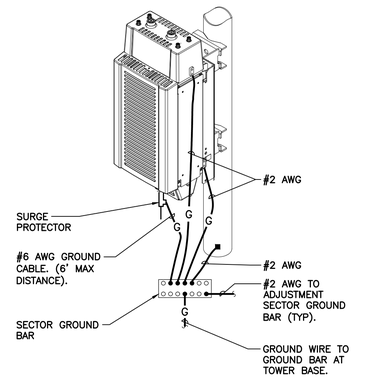


NOTES:

1. INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA x 18" DEEP.

6 / E-5 **GROUND ROD WITH ACCESS DETAIL**
SCALE: NOT TO SCALE

EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:
1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



7 / E-5 **RRH POLE MOUNT GROUNDING**
SCALE; NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E-5

Sheet No. 12 of 13

ELECTRICAL SPECIFICATIONS

SECTION 16010

1.1. SCOPE OF WORK

A. WORK SHALL INCLUDE ALL LABOR, EQUIPMENT AND SERVICES REQUIRED TO COMPLETE (MAKE READY FOR OPERATION) ALL THE ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

1. INSTALL 150A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT
2. EXISTING 100A CIRCUIT BREAKER TO BE REMOVED
3. CELLULAR GROUNDING SYSTEMS, CONSISTING OF ANTENNA GROUNDING, EXTERIOR GROUNDING RING, GROUND BARS, ETC.
4. FEEDERS AND BRANCH CIRCUIT WIRING TO PANELS AND EQUIPMENTS AS INDICATED OR NOTED ON PLANS.
5. FIELD MEASURE EXISTING ELECTRICAL SERVICES TO CONFIRM AVAILABLE EXISTING POWER.

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR THE SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

F. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

G. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

H. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

I. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

J. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

K. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

L. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

M. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.
2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

N. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUIT

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.

B. THE INTERIOR OF RACEWAYS/ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION, INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

C. CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.

D. PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS

E. ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

CONDUIT SCHEDULE SECTION 16111

CONDUIT TYPE	NEC REFERENCE	APPLICATION	MIN. BURIAL DEPTH (PER NEC TABLE 300.5) [2,3]
EMT	ARTICLE 358	INTERIOR CIRCUITING, EQUIPMENT ROOMS, SHELTERS	N/A
RMC, RIGID GALV. STEEL	ARTICLE 344, 300.5, 300.50	ALL INTERIOR/ EXTERIOR CIRCUITING, ALL UNDERGROUND INSTALLATIONS.	6 INCHES
PVC, SCHEDULE 40	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
PVC, SCHEDULE 80	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
LIQUID TIGHT FLEX. METAL	ARTICLE 350	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A
FLEX. METAL	ARTICLE 348	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A

[1] PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

[2] UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, DRIVEWAYS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".

[3] WHERE SOLID ROCK PREVENTS COMPLIANCE WITH MINIMUM COVER DEPTHS, WIRING SHALL BE INSTALLED IN PERMITTED RACEWAY FOR DIRECT BURIAL. THE RACEWAY SHALL BE COVERED BY A MINIMUM OF 2" OF CONCRETE EXTENDING DOWN TO ROCK.

SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH - INTERMATIC #FF15M (INTERIOR LIGHTS)
2. DUPLEX RECEPTACLE - P&S #2095 (GFCI) SPECIFICATION GRADE
3. SINGLE POLE SWITCH - P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE
4. DUPLEX RECEPTACLE - P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES - ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

SECTION 16450

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.
2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.
3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 10 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

PROVIDE THE GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS
2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
3. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	01/25/23	RTS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

Sprint by T-Mobile | Transcend Wireless

CENTEK engineering
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63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC

SPRINT ID: CT54XC775
SITE ID: CTNL463A
153 OLD SALEM RD
NORWICH, CT 06360

DATE: 12/23/21
SCALE: AS NOTED
JOB NO. 21005.41

ELECTRICAL SPECIFICATIONS

E-6

CENTEK engineering

Centered on Solutions℠

Antenna Mount Analysis Report

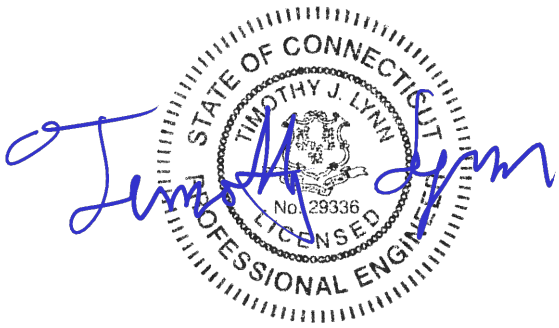
T-Mobile Site #: CTNL463A

153 Old Salem Road
Norwich, CT

Centek Project No. 21005.41

Date: January 31, 2023

Max Stress Ratio =85%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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CENTEK engineering

Centered on Solutions℠

January 31, 2023

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTNL463A
153 Old Salem Road
Norwich, CT

Centek Project No. 21005.41

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above-referenced site. The purpose of the review is to determine the structural adequacy of the proposed 12'-6" low profile platform with handrail (SitePro P/N: RMQP-496-HK). The review considered the effects of wind load, dead load and ice load in accordance with the 2021 International Building Code as modified by the 2022 Connecticut State Building Code (CTBC) including ASCE 7-16 and ANSI/TIA-222-H *Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures"*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  Platform w/ handrail: Three (3) Commscope VV-65A-R1 panel antennas, three (3) RFS APXVAALL24_43 panel antennas and six (6) ATSBT-TOP-MF-4G Bias Tees mounted on one (1) platform w/ handrail with a RAD center elevation of 86 ft +/- AGL.

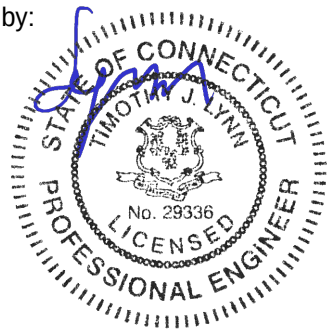
The antenna mount was analyzed per the requirements of the 2021 International Building Code as modified by the 2022 Connecticut State Building Code considering a Ultimate design wind speed of 135 mph for Norwich as required in Appendix P of the 2022 Connecticut State Building Code.

Based on our review of the installation, it is our opinion that the subject antenna mount has sufficient capacity to support the aforementioned antenna configuration.

If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer



Section 2 - Calculations

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:	TIA-222-H Loads
Location:	Norwich, CT
Rev. 0: 1/31/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21005.41

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

Wind Speeds

Basic Wind Speed	$V := 135$	mph	(User Input - CSBC 2022 Appendix P)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input - TIA-222-H Annex B)
Basic Wind Speed (Mount)	$V_m := 30$	mph	(User Input - TIA-222-H Section 16.3)

Input

Structure Type =	Structure_Type := Flexible		(User Input)
Structure Category =	SC := III		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 90$	ft	(User Input)
Height to Center of Antennas =	$z_{ant} := 86$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.0$	in	(User Input per Annex B of TIA-222-H)
Radial Ice Density =	Id := 56.00	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1$		(User Input)
Shielding Factor for Appurtenances =	$K_a := 1.0$		(User Input)
Rooftop Wind Speed-up Factor =	$K_s := 1.0$		(User Input)
Ground Elevation Factor =	$K_e = 0.996$		(User Input)
Gust Response Factor =	$G_H = 1.35$		(User Input)

Output

Wind Direction Probability Factor = $K_d := 0.95$ (Per Table 2-2 of TIA-222-H)

Importance Factors =

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \\ 1.25 & \text{if } SC = 4 \end{cases} = 1.15$$

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

$$I_{Seismic} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \\ 1.50 & \text{if } SC = 4 \end{cases} = 1.25$$

$$K_{iz} := \left(\frac{z_{ant}}{33}\right)^{0.1} = 1.101$$

$$t_{iz} := t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.266$$

Velocity Pressure Coefficient Antennas =

$$Kz_{ant} := 2.01\left(\left(\frac{z_{ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.226$$

Velocity Pressure w/o Ice Antennas = $qz_{ant} := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V^2 = 54.104$

Velocity Pressure with Ice Antennas = $qz_{ice.ant} := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_i^2 = 7.422$

Velocity Pressure with Ice Antennas = $qz_m := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_m^2 = 2.672$

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	RFSAPXVAALL24_43		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 95.9$	in	(User Input)
Appurtenance Width =	$W_{app} := 24$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 8.5$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 150$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 4.0$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.27$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 16$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 1479$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 5.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 524$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 18.1$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 230$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 7.5$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 96$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 16$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 73$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 5.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 26$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2 \times 10^4$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 9244$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 300$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 300$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Commscope VV-65A-R1		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 54.724$	in	(User Input)
Appurtenance Width =	$W_{app} := 12.087$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 4.646$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 30$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 4.5$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.29$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 4.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 433$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.8$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 166$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 5.8$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 75$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 2.9$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 37$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 4.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 21$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.8$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 8$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 3073$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 2934$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 95$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 95$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	ATSBT-TOP-MF-4G Bias Tee		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 5.63$	in	(User Input)
Appurtenance Width =	$W_{app} := 3.7$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 2$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 2$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.5$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 0.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 13$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 0.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 7$	lbs

Wind Load (with ice)

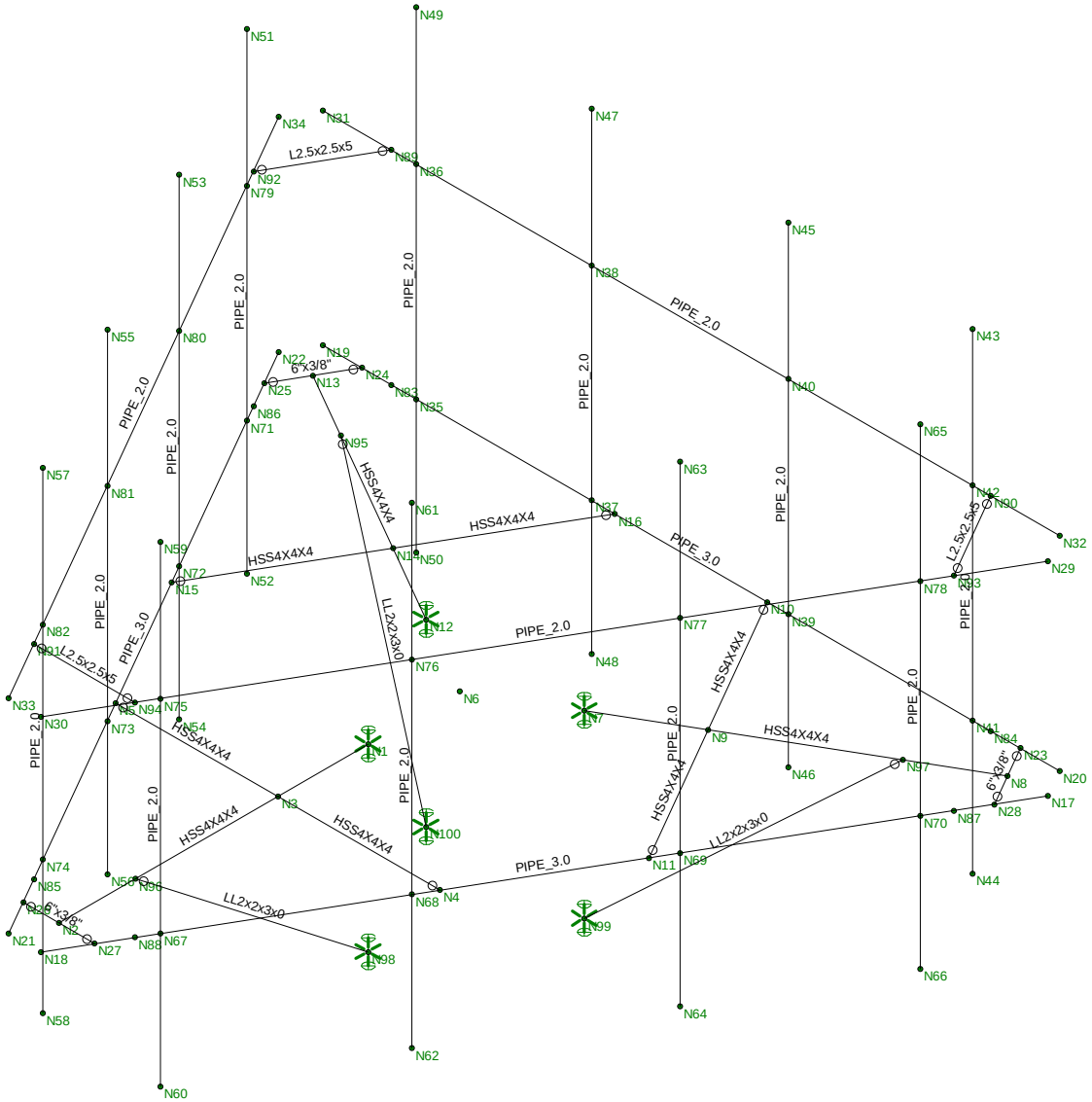
Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 0.4$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 4$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 0.3$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 3$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 0.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 1$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 0.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 0$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 42$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 189$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 6$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 6$	lbs



Envelope Only Solution

Centek Engineering		
TJL	CTNL463A - Mount	Jan 31, 2023 at 8:41 AM
21005.41	Member Framing	Mount.R3D

(Global) Model Settings

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

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

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

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Outrigger_HSS4X4	HSS4X4X4	Beam	HSS Pipe	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
2	Face Tube_Pipe 3.0 STD	PIPE_3.0	Beam	Pipe	A53 Grade B	Typical	2.07	2.85	2.85	5.69
3	Handrails _Pipe 2.0 STD	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Antenna Mast_Pipe 2.0 ...	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
5	Plat. Horz_HSS4X4	HSS4X4X4	Beam	HSS Pipe	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
6	PL 3/8"x6 "	6"x3/8"	Beam	RECT	A36 Gr.36	Typical	2.25	.026	6.75	.101
7	Side railings	L2.5x2.5x5	Beam	RECT	A36 Gr.36	Typical	1.46	.837	.837	.05
8	Mount Reinforcement	LL2x2x3x0	Beam	RECT	A36 Gr.36	Typical	1.44	.994	.542	.018

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Outrigger_HSS4X4	5.248			Lbyy						Lateral
2	M2	Plat. Horz_HSS4X4	2.75			Lbyy						Lateral
3	M3	Plat. Horz_HSS4X4	2.75			Lbyy						Lateral
4	M4	Outrigger_HSS4X4	5.248			Lbyy						Lateral
5	M5	Plat. Horz_HSS4X4	2.75			Lbyy						Lateral
6	M6	Plat. Horz_HSS4X4	2.75			Lbyy						Lateral
7	M7	Outrigger_HSS4X4	5.248			Lbyy						Lateral
8	M8	Plat. Horz_HSS4X4	2.75			Lbyy						Lateral
9	M9	Plat. Horz_HSS4X4	2.75			Lbyy						Lateral
10	M10	Face Tube_Pipe 3.0...	12.5			Lbyy						Lateral
11	M13	Face Tube_Pipe 3.0...	12.5			Lbyy						Lateral
12	M14	Face Tube_Pipe 3.0...	12.5			Lbyy						Lateral
13	M13A	PL 3/8"x6 "	1.212			Lbyy						Lateral
14	M14A	PL 3/8"x6 "	1.212			Lbyy						Lateral
15	M15	PL 3/8"x6 "	1.212			Lbyy						Lateral
16	M16	Handrails _Pipe 2.0...	12.5			Lbyy						Lateral
17	M17	Handrails _Pipe 2.0...	12.5			Lbyy						Lateral
18	M18	Handrails _Pipe 2.0...	12.5			Lbyy						Lateral
19	PSA.1	Antenna Mast_Pipe...	8			Lbyy						Lateral
20	PSA.2	Antenna Mast_Pipe...	8			Lbyy						Lateral
21	PSA.3	Antenna Mast_Pipe...	8			Lbyy						Lateral
22	PSA.4	Antenna Mast_Pipe...	8			Lbyy						Lateral
23	PSB.1	Antenna Mast_Pipe...	8			Lbyy						Lateral
24	PSB.2	Antenna Mast_Pipe...	8			Lbyy						Lateral
25	PSB.3	Antenna Mast_Pipe...	8			Lbyy						Lateral
26	PSB.4	Antenna Mast_Pipe...	8			Lbyy						Lateral
27	PSC.1	Antenna Mast_Pipe...	8			Lbyy						Lateral
28	PSC.2	Antenna Mast_Pipe...	8			Lbyy						Lateral
29	PSC.3	Antenna Mast_Pipe...	8			Lbyy						Lateral
30	PSC.4	Antenna Mast_Pipe...	8			Lbyy						Lateral
31	M31	Side railings	1.712			Lbyy						Lateral
32	M32	Side railings	1.712			Lbyy						Lateral
33	M33	Side railings	1.712			Lbyy						Lateral
34	M34	Mount Reinforcement	4.991			Lbyy						Lateral
35	M35	Mount Reinforcement	4.991			Lbyy						Lateral
36	M36	Mount Reinforcement	4.991			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	M1	N1	N2			Outrigger_HSS4X4	Beam	HSS Pipe	A500 Gr.46	Typical
2	M2	N4	N3		180	Plat. Horz_HSS4X4	Beam	HSS Pipe	A500 Gr.46	Typical
3	M3	N5	N3			Plat. Horz_HSS4X4	Beam	HSS Pipe	A500 Gr.46	Typical
4	M4	N7	N8			Outrigger_HSS4X4	Beam	HSS Pipe	A500 Gr.46	Typical
5	M5	N10	N9		180	Plat. Horz_HSS4X4	Beam	HSS Pipe	A500 Gr.46	Typical
6	M6	N11	N9			Plat. Horz_HSS4X4	Beam	HSS Pipe	A500 Gr.46	Typical
7	M7	N12	N13			Outrigger_HSS4X4	Beam	HSS Pipe	A500 Gr.46	Typical
8	M8	N15	N14		180	Plat. Horz_HSS4X4	Beam	HSS Pipe	A500 Gr.46	Typical
9	M9	N16	N14			Plat. Horz_HSS4X4	Beam	HSS Pipe	A500 Gr.46	Typical
10	M10	N17	N18			Face Tube_Pipe 3.0 STD	Beam	Pipe	A53 Grade B	Typical
11	M13	N19	N20			Face Tube_Pipe 3.0 STD	Beam	Pipe	A53 Grade B	Typical
12	M14	N21	N22			Face Tube_Pipe 3.0 STD	Beam	Pipe	A53 Grade B	Typical
13	M13A	N28	N23			PL 3/8"x6 "	Beam	RECT	A36 Gr.36	Typical
14	M14A	N24	N25			PL 3/8"x6 "	Beam	RECT	A36 Gr.36	Typical
15	M15	N27	N26			PL 3/8"x6 "	Beam	RECT	A36 Gr.36	Typical
16	M16	N29	N30			Handrails _Pipe 2.0 STD	Beam	Pipe	A53 Grade B	Typical
17	M17	N31	N32			Handrails _Pipe 2.0 STD	Beam	Pipe	A53 Grade B	Typical
18	M18	N33	N34			Handrails _Pipe 2.0 STD	Beam	Pipe	A53 Grade B	Typical
19	PSA.1	N43	N44			Antenna Mast_Pipe 2.0 S...	Column	Pipe	A53 Grade B	Typical
20	PSA.2	N45	N46			Antenna Mast_Pipe 2.0 S...	Column	Pipe	A53 Grade B	Typical
21	PSA.3	N47	N48			Antenna Mast_Pipe 2.0 S...	Column	Pipe	A53 Grade B	Typical
22	PSA.4	N49	N50			Antenna Mast_Pipe 2.0 S...	Column	Pipe	A53 Grade B	Typical
23	PSB.1	N51	N52			Antenna Mast_Pipe 2.0 S...	Column	Pipe	A53 Grade B	Typical
24	PSB.2	N53	N54			Antenna Mast_Pipe 2.0 S...	Column	Pipe	A53 Grade B	Typical
25	PSB.3	N55	N56			Antenna Mast_Pipe 2.0 S...	Column	Pipe	A53 Grade B	Typical
26	PSB.4	N57	N58			Antenna Mast_Pipe 2.0 S...	Column	Pipe	A53 Grade B	Typical
27	PSC.1	N59	N60			Antenna Mast_Pipe 2.0 S...	Column	Pipe	A53 Grade B	Typical
28	PSC.2	N61	N62			Antenna Mast_Pipe 2.0 S...	Column	Pipe	A53 Grade B	Typical
29	PSC.3	N63	N64			Antenna Mast_Pipe 2.0 S...	Column	Pipe	A53 Grade B	Typical
30	PSC.4	N65	N66			Antenna Mast_Pipe 2.0 S...	Column	Pipe	A53 Grade B	Typical
31	M31	N91	N94		180	Side railings	Beam	RECT	A36 Gr.36	Typical
32	M32	N93	N90		180	Side railings	Beam	RECT	A36 Gr.36	Typical
33	M33	N89	N92		180	Side railings	Beam	RECT	A36 Gr.36	Typical
34	M34	N97	N99			Mount Reinforcement	Beam	RECT	A36 Gr.36	Typical
35	M35	N95	N100			Mount Reinforcement	Beam	RECT	A36 Gr.36	Typical
36	M36	N96	N98			Mount Reinforcement	Beam	RECT	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	-0.	0	1.548833	0	
2	N2	-0.	0	6.796922	0	
3	N3	-0.	0	3.083333	0	
4	N4	2.75	0	3.083333	0	
5	N5	-2.75	0	3.083333	0	
6	N6	-0.	0	0.	0	
7	N7	1.341329	0	-0.774417	0	
8	N8	5.886307	0	-3.398461	0	
9	N9	2.670245	0	-1.541667	0	
10	N10	1.295245	0	-3.923237	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
11	N11	4.045245	0	0.839903	0	
12	N12	-1.341329	0	-0.774417	0	
13	N13	-5.886307	0	-3.398461	0	
14	N14	-2.670245	0	-1.541667	0	
15	N15	-4.045245	0	0.839903	0	
16	N16	-1.295245	0	-3.923237	0	
17	N17	6.52262	0	-3.451036	0	
18	N18	0.272625	0	7.374273	0	
19	N19	-6.249995	0	-3.923237	0	
20	N20	6.249995	0	-3.923237	0	
21	N21	-0.272625	0	7.374273	0	
22	N22	-6.52262	0	-3.451036	0	
23	N23	5.583328	0	-3.923237	0	
24	N24	-5.583328	0	-3.923237	0	
25	N25	-6.189287	0	-2.873686	0	
26	N26	-0.605958	0	6.796922	0	
27	N27	0.605958	0	6.796922	0	
28	N28	6.189287	0	-2.873686	0	
29	N29	6.52262	3.45	-3.451036	0	
30	N30	0.272625	3.45	7.374273	0	
31	N31	-6.249995	3.45	-3.923237	0	
32	N32	6.249995	3.45	-3.923237	0	
33	N33	-0.272625	3.45	7.374273	0	
34	N34	-6.52262	3.45	-3.451036	0	
35	N35	-4.666662	0	-3.923237	0	
36	N36	-4.666662	3.45	-3.923237	0	
37	N37	-1.687495	0	-3.923237	0	
38	N38	-1.687495	3.45	-3.923237	0	
39	N39	1.645838	0	-3.923237	0	
40	N40	1.645838	3.45	-3.923237	0	
41	N41	4.770838	0	-3.923237	0	
42	N42	4.770838	3.45	-3.923237	0	
43	N43	4.770838	5.75	-3.923237	0	
44	N44	4.770838	-2.25	-3.923237	0	
45	N45	1.645838	5.75	-3.923237	0	
46	N46	1.645838	-2.25	-3.923237	0	
47	N47	-1.687495	5.75	-3.923237	0	
48	N48	-1.687495	-2.25	-3.923237	0	
49	N49	-4.666662	5.75	-3.923237	0	
50	N50	-4.666662	-2.25	-3.923237	0	
51	N51	-5.783042	5.75	-2.170049	0	
52	N52	-5.783042	-2.25	-2.170049	0	
53	N53	-4.220542	5.75	0.53628	0	
54	N54	-4.220542	-2.25	0.53628	0	
55	N55	-2.553875	5.75	3.423032	0	
56	N56	-2.553875	-2.25	3.423032	0	
57	N57	-1.064292	5.75	6.003066	0	
58	N58	-1.064292	-2.25	6.003066	0	
59	N59	1.012203	5.75	6.093285	0	
60	N60	1.012203	-2.25	6.093285	0	
61	N61	2.574703	5.75	3.386956	0	
62	N62	2.574703	-2.25	3.386956	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
63	N63	4.24137	5.75	0.500205	0	
64	N64	4.24137	-2.25	0.500205	0	
65	N65	5.730953	5.75	-2.079829	0	
66	N66	5.730953	-2.25	-2.079829	0	
67	N67	1.012203	0	6.093285	0	
68	N68	2.574703	0	3.386956	0	
69	N69	4.24137	0	0.500205	0	
70	N70	5.730953	0	-2.079829	0	
71	N71	-5.783042	0	-2.170049	0	
72	N72	-4.220542	0	0.53628	0	
73	N73	-2.553875	0	3.423032	0	
74	N74	-1.064292	0	6.003066	0	
75	N75	1.012203	3.45	6.093285	0	
76	N76	2.574703	3.45	3.386956	0	
77	N77	4.24137	3.45	0.500205	0	
78	N78	5.730953	3.45	-2.079829	0	
79	N79	-5.783042	3.45	-2.170049	0	
80	N80	-4.220542	3.45	0.53628	0	
81	N81	-2.553875	3.45	3.423032	0	
82	N82	-1.064292	3.45	6.003066	0	
83	N83	-5.083328	0	-3.923237	0	
84	N84	5.083328	0	-3.923237	0	
85	N85	-0.855958	0	6.36391	0	
86	N86	-5.939287	0	-2.440673	0	
87	N87	5.939287	0	-2.440673	0	
88	N88	0.855958	0	6.36391	0	
89	N89	-5.083328	3.45	-3.923237	0	
90	N90	5.083328	3.45	-3.923237	0	
91	N91	-0.855958	3.45	6.36391	0	
92	N92	-5.939287	3.45	-2.440673	0	
93	N93	5.939287	3.45	-2.440673	0	
94	N94	0.855958	3.45	6.36391	0	
95	N95	-4.763371	0	-2.750133	0	
96	N96	-0.	0	5.500267	0	
97	N97	4.763371	0	-2.750133	0	
98	N98	-0.	-3.049275	1.548833	0	
99	N99	1.341329	-3.049275	-0.774417	0	
100	N100	-1.341329	-3.049275	-0.774417	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction		Reaction	
2	N7	Reaction	Reaction	Reaction		Reaction	
3	N12	Reaction	Reaction	Reaction		Reaction	
4	N95						
5	N96						
6	N97						
7	N98	Reaction	Reaction	Reaction		Reaction	
8	N99	Reaction	Reaction	Reaction		Reaction	
9	N100	Reaction	Reaction	Reaction		Reaction	

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.4	Y	-.075	.5
2	PSB.4	Y	-.075	.5
3	PSC.4	Y	-.075	.5
4	PSA.4	Y	-.075	7.5
5	PSB.4	Y	-.075	7.5
6	PSC.4	Y	-.075	7.5
7	PSA.1	Y	-.015	.5
8	PSB.1	Y	-.015	.5
9	PSC.1	Y	-.015	.5
10	PSA.1	Y	-.015	7.5
11	PSB.1	Y	-.015	7.5
12	PSC.1	Y	-.015	7.5
13	PSA.1	Y	-.002	%50
14	PSA.4	Y	-.002	%50
15	PSB.1	Y	-.002	%50
16	PSB.4	Y	-.002	%50
17	PSC.1	Y	-.002	%50
18	PSC.4	Y	-.002	%50

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.4	Y	-.15	.5
2	PSB.4	Y	-.15	.5
3	PSC.4	Y	-.15	.5
4	PSA.4	Y	-.15	7.5
5	PSB.4	Y	-.15	7.5
6	PSC.4	Y	-.15	7.5
7	PSA.1	Y	-.048	.5
8	PSB.1	Y	-.048	.5
9	PSC.1	Y	-.048	.5
10	PSA.1	Y	-.048	7.5
11	PSB.1	Y	-.048	7.5
12	PSC.1	Y	-.048	7.5
13	PSA.1	Y	-.006	%50
14	PSA.4	Y	-.006	%50
15	PSB.1	Y	-.006	%50
16	PSB.4	Y	-.006	%50
17	PSC.1	Y	-.006	%50
18	PSC.4	Y	-.006	%50

Member Point Loads (BLC 4 : Lm Maintenance Load (500lb))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSC.1	Y	-.5	%50

Member Point Loads (BLC 5 : Lv Maintenance Load (250lb))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	Y	-.25	%50

Member Point Loads (BLC 6 : Wind with Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.4	X	.048	.5
2	PSA.4	X	.048	7.5
3	PSB.4	X	.115	.5
4	PSC.4	X	.115	.5
5	PSB.4	X	.115	7.5
6	PSC.4	X	.115	7.5
7	PSA.1	X	.019	.5
8	PSA.1	X	.019	7.5
9	PSB.1	X	.038	.5
10	PSC.1	X	.038	.5
11	PSB.1	X	.038	7.5
12	PSC.1	X	.038	7.5
13	PSA.1	X	.004	%50
14	PSA.4	X	.004	%50
15	PSB.1	X	.004	%50
16	PSB.4	X	.004	%50
17	PSC.1	X	.004	%50
18	PSC.4	X	.004	%50

Member Point Loads (BLC 7 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.4	X	.262	.5
2	PSA.4	X	.262	7.5
3	PSB.4	X	.74	.5
4	PSC.4	X	.74	.5
5	PSB.4	X	.74	7.5
6	PSC.4	X	.74	7.5
7	PSA.1	X	.083	.5
8	PSA.1	X	.083	7.5
9	PSB.1	X	.217	.5
10	PSC.1	X	.217	.5
11	PSB.1	X	.217	7.5
12	PSC.1	X	.217	7.5
13	PSA.1	X	.013	%50
14	PSA.4	X	.013	%50
15	PSB.1	X	.013	%50
16	PSB.4	X	.013	%50
17	PSC.1	X	.013	%50
18	PSC.4	X	.013	%50

Member Point Loads (BLC 8 : Wm Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.4	X	.013	.5
2	PSA.4	X	.013	7.5
3	PSB.4	X	.037	.5
4	PSC.4	X	.037	.5
5	PSB.4	X	.037	7.5
6	PSC.4	X	.037	7.5
7	PSA.1	X	.004	.5
8	PSA.1	X	.004	7.5
9	PSB.1	X	.011	.5

Member Point Loads (BLC 8 : Wm Wind X) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
10	PSC.1	X	.011	.5
11	PSB.1	X	.011	7.5
12	PSC.1	X	.011	7.5
13	PSA.1	X	.001	%50
14	PSA.4	X	.001	%50
15	PSB.1	X	.001	%50
16	PSB.4	X	.001	%50
17	PSC.1	X	.001	%50
18	PSC.4	X	.001	%50

Member Point Loads (BLC 9 : Wind with Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.4	Z	.115	.5
2	PSA.4	Z	.115	7.5
3	PSB.4	Z	.048	.5
4	PSC.4	Z	.048	.5
5	PSB.4	Z	.048	7.5
6	PSC.4	Z	.048	7.5
7	PSA.1	Z	.038	.5
8	PSA.1	Z	.038	7.5
9	PSB.1	Z	.019	.5
10	PSC.1	Z	.019	.5
11	PSB.1	Z	.019	7.5
12	PSC.1	Z	.019	7.5
13	PSA.1	Z	.004	%50
14	PSA.4	Z	.004	%50
15	PSB.1	Z	.004	%50
16	PSB.4	Z	.004	%50
17	PSC.1	Z	.004	%50
18	PSC.4	Z	.004	%50

Member Point Loads (BLC 10 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.4	Z	.74	.5
2	PSA.4	Z	.74	7.5
3	PSB.4	Z	.262	.5
4	PSC.4	Z	.262	.5
5	PSB.4	Z	.262	7.5
6	PSC.4	Z	.262	7.5
7	PSA.1	Z	.217	.5
8	PSA.1	Z	.217	7.5
9	PSB.1	Z	.083	.5
10	PSC.1	Z	.083	.5
11	PSB.1	Z	.083	7.5
12	PSC.1	Z	.083	7.5
13	PSA.1	Z	.013	%50
14	PSA.4	Z	.013	%50
15	PSB.1	Z	.013	%50
16	PSB.4	Z	.013	%50
17	PSC.1	Z	.013	%50
18	PSC.4	Z	.013	%50

Member Point Loads (BLC 11 : Wm Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.4	Z	.037	.5
2	PSA.4	Z	.037	7.5
3	PSB.4	Z	.013	.5
4	PSC.4	Z	.013	.5
5	PSB.4	Z	.013	7.5
6	PSC.4	Z	.013	7.5
7	PSA.1	Z	.011	.5
8	PSA.1	Z	.011	7.5
9	PSB.1	Z	.004	.5
10	PSC.1	Z	.004	.5
11	PSB.1	Z	.004	7.5
12	PSC.1	Z	.004	7.5
13	PSA.1	Z	.001	%50
14	PSA.4	Z	.001	%50
15	PSB.1	Z	.001	%50
16	PSB.4	Z	.001	%50
17	PSC.1	Z	.001	%50
18	PSC.4	Z	.001	%50

Member Distributed Loads (BLC 6 : Wind with Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
1	M16	PX	.003	.003	0	0
2	M17	PX	.003	.003	0	0
3	M18	PX	.003	.003	0	0
4	PSA.1	PX	.003	.003	0	0
5	PSA.2	PX	.003	.003	0	0
6	PSA.3	PX	.003	.003	0	0
7	PSA.4	PX	.003	.003	0	0
8	PSB.1	PX	.003	.003	0	0
9	PSB.2	PX	.003	.003	0	0
10	PSB.3	PX	.003	.003	0	0
11	PSB.4	PX	.003	.003	0	0
12	PSC.1	PX	.003	.003	0	0
13	PSC.2	PX	.003	.003	0	0
14	PSC.3	PX	.003	.003	0	0
15	PSC.4	PX	.003	.003	0	0
16	M10	PX	.004	.004	0	0
17	M13	PX	.004	.004	0	0
18	M14	PX	.004	.004	0	0

Member Distributed Loads (BLC 7 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
1	M16	PX	.009	.009	0	0
2	M17	PX	.009	.009	0	0
3	M18	PX	.009	.009	0	0
4	PSA.1	PX	.009	.009	0	0
5	PSA.2	PX	.009	.009	0	0
6	PSA.3	PX	.009	.009	0	0
7	PSA.4	PX	.009	.009	0	0
8	PSB.1	PX	.009	.009	0	0

Member Distributed Loads (BLC 7 : Wind X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
9	PSB.2	PX	.009	.009	0	0
10	PSB.3	PX	.009	.009	0	0
11	PSB.4	PX	.009	.009	0	0
12	PSC.1	PX	.009	.009	0	0
13	PSC.2	PX	.009	.009	0	0
14	PSC.3	PX	.009	.009	0	0
15	PSC.4	PX	.009	.009	0	0
16	M10	PX	.013	.013	0	0
17	M13	PX	.013	.013	0	0
18	M14	PX	.013	.013	0	0

Member Distributed Loads (BLC 8 : Wm Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
1	M16	PX	.002	.002	0	0
2	M17	PX	.002	.002	0	0
3	M18	PX	.002	.002	0	0
4	PSA.1	PX	.002	.002	0	0
5	PSA.2	PX	.002	.002	0	0
6	PSA.3	PX	.002	.002	0	0
7	PSA.4	PX	.002	.002	0	0
8	PSB.1	PX	.002	.002	0	0
9	PSB.2	PX	.002	.002	0	0
10	PSB.3	PX	.002	.002	0	0
11	PSB.4	PX	.002	.002	0	0
12	PSC.1	PX	.002	.002	0	0
13	PSC.2	PX	.002	.002	0	0
14	PSC.3	PX	.002	.002	0	0
15	PSC.4	PX	.002	.002	0	0
16	M10	PX	.003	.003	0	0
17	M13	PX	.003	.003	0	0
18	M14	PX	.003	.003	0	0

Member Distributed Loads (BLC 9 : Wind with Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
1	M16	PZ	.003	.003	0	0
2	M17	PZ	.003	.003	0	0
3	M18	PZ	.003	.003	0	0
4	PSA.1	PZ	.003	.003	0	0
5	PSA.2	PZ	.003	.003	0	0
6	PSA.3	PZ	.003	.003	0	0
7	PSA.4	PZ	.003	.003	0	0
8	PSB.1	PZ	.003	.003	0	0
9	PSB.2	PZ	.003	.003	0	0
10	PSB.3	PZ	.003	.003	0	0
11	PSB.4	PZ	.003	.003	0	0
12	PSC.1	PZ	.003	.003	0	0
13	PSC.2	PZ	.003	.003	0	0
14	PSC.3	PZ	.003	.003	0	0
15	PSC.4	PZ	.003	.003	0	0
16	M10	PZ	.003	.003	0	0
17	M13	PZ	.003	.003	0	0

Member Distributed Loads (BLC 9 : Wind with Ice Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
18	M14	PZ	.003	.003	0	0

Member Distributed Loads (BLC 10 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
1	M16	PZ	.009	.009	0	0
2	M17	PZ	.009	.009	0	0
3	M18	PZ	.009	.009	0	0
4	PSA.1	PZ	.009	.009	0	0
5	PSA.2	PZ	.009	.009	0	0
6	PSA.3	PZ	.009	.009	0	0
7	PSA.4	PZ	.009	.009	0	0
8	PSB.1	PZ	.009	.009	0	0
9	PSB.2	PZ	.009	.009	0	0
10	PSB.3	PZ	.009	.009	0	0
11	PSB.4	PZ	.009	.009	0	0
12	PSC.1	PZ	.009	.009	0	0
13	PSC.2	PZ	.009	.009	0	0
14	PSC.3	PZ	.009	.009	0	0
15	PSC.4	PZ	.009	.009	0	0
16	M10	PZ	.001	.001	0	0
17	M13	PZ	.001	.001	0	0
18	M14	PZ	.001	.001	0	0

Member Distributed Loads (BLC 11 : Wm Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
1	M16	PZ	.002	.002	0	0
2	M17	PZ	.002	.002	0	0
3	M18	PZ	.002	.002	0	0
4	PSA.1	PZ	.002	.002	0	0
5	PSA.2	PZ	.002	.002	0	0
6	PSA.3	PZ	.002	.002	0	0
7	PSA.4	PZ	.002	.002	0	0
8	PSB.1	PZ	.002	.002	0	0
9	PSB.2	PZ	.002	.002	0	0
10	PSB.3	PZ	.002	.002	0	0
11	PSB.4	PZ	.002	.002	0	0
12	PSC.1	PZ	.002	.002	0	0
13	PSC.2	PZ	.002	.002	0	0
14	PSC.3	PZ	.002	.002	0	0
15	PSC.4	PZ	.002	.002	0	0
16	M10	PZ	.0003	.0003	0	0
17	M13	PZ	.0003	.0003	0	0
18	M14	PZ	.0003	.0003	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	None		-1						
2	Dead Load	None					18			
3	Ice Load	None					18			

Basic Load Cases (Continued)

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
4	Lm Maintenance Load (500lb)	None					1			
5	Lv Maintenance Load (250lb)	None					1			
6	Wind with Ice X	None					18	18		
7	Wind X	None					18	18		
8	Wm Wind X	None					18	18		
9	Wind with Ice Z	None					18	18		
10	Wind Z	None					18	18		
11	Wm Wind Z	None					18	18		

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.4D	Yes	Y		1	1.4	2	1.4																		
2	1.2D +1.5Lv	Yes	Y		1	1.2	2	1.2	5	1.5																
3	1.2D + 1.0W (X-directi...	Yes	Y		1	1.2	2	1.2	7	1																
4	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	6	1														
5	1.2D +1.5Lm+ 1.0Wm ...	Yes	Y		1	1.2	2	1.2	4	1.5	8	1														
6	1.2D + 1.0W (Z-directi...	Yes	Y		1	1.2	2	1.2	10	1																
7	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	9	1														
8	1.2D +1.5Lm+ 1.0Wm ...	Yes	Y		1	1.2	2	1.2	4	1.5	11	1														

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	0	1	.27	2	-.39	3	0	8	0	1	0	8
2		min	-2.709	3	-.218	6	-3.516	6	0	1	-3.79	3	0	1
3	N7	max	-.186	6	.271	8	1.305	3	0	8	1.256	6	0	8
4		min	-3.854	3	-.207	3	-.98	6	0	1	0	1	0	1
5	N12	max	1.016	7	.438	3	.439	1	0	8	.093	3	0	8
6		min	-2.005	3	-.021	2	-2.097	6	0	1	-2.486	6	0	1
7	N98	max	.002	3	1.713	6	2.202	6	0	8	0	8	0	8
8		min	0	7	.579	3	.732	3	0	1	-.003	3	0	1
9	N99	max	1.957	3	1.757	3	-.053	6	0	8	.001	6	0	8
10		min	.091	6	.096	6	-1.128	3	0	1	0	2	0	1
11	N100	max	.674	3	.908	7	.389	3	0	8	0	3	0	8
12		min	-1.002	7	-.586	3	-.578	7	0	1	-.002	6	0	1
13	Totals:	max	0	8	3.355	7	0	5						
14		min	-5.936	3	2.131	3	-4.493	6						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	N1	max	0	8	0	8	0	8	3.945e-04	3	0	8	5.745e-04	6
2		min	0	1	0	1	0	1	9.83e-05	5	0	1	-1.064e-03	5
3	N2	max	.192	3	-.002	3	.002	6	1.462e-03	8	4.022e-03	3	1.867e-03	3
4		min	0	6	-.03	8	0	3	-4.073e-05	3	-1.011e-04	6	-2.317e-03	8
5	N3	max	.03	3	-.002	5	0	6	5.773e-04	6	2.091e-03	3	5.745e-04	6
6		min	0	1	-.008	6	0	3	5.394e-05	1	4.589e-07	2	-1.064e-03	5
7	N4	max	.03	3	-.01	6	.026	6	6.588e-03	3	1.041e-03	3	-9.644e-06	1
8		min	0	1	-.049	5	-.051	3	-7.132e-05	2	-2.662e-06	2	-1.836e-02	3

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
9	N5	max	.03	3	.013	5	.044	6	3.944e-03	6	1.655e-03	3	8.732e-03	6
10		min	0	1	-.046	6	0	2	-4.813e-03	3	-8.961e-04	6	-1.409e-02	3
11	N6	max	0	8	0	8	0	8	0	8	0	8	0	8
12		min	0	1	0	1	0	1	0	1	0	1	0	1
13	N7	max	0	8	0	8	0	8	7.178e-04	3	0	8	-7.212e-05	6
14		min	0	1	0	1	0	1	3.583e-06	1	0	1	-7.426e-04	2
15	N8	max	.037	3	-.007	6	.063	6	1.074e-03	2	1.172e-06	1	-1.06e-04	6
16		min	0	1	-.027	3	0	1	-7.129e-04	6	-1.829e-03	3	-1.365e-03	4
17	N9	max	.005	6	.003	6	.008	6	7.678e-04	2	7.106e-07	1	9.78e-05	6
18		min	0	1	-.006	3	0	1	5.873e-05	1	-6.515e-04	6	-8.819e-04	3
19	N10	max	.02	3	.015	6	.01	6	1.421e-02	6	-1.249e-07	1	7.615e-05	2
20		min	0	2	-.01	1	-.007	3	-9.264e-06	1	-8.414e-04	6	-2.331e-03	6
21	N11	max	.063	3	-.01	6	.018	6	9.683e-03	3	2.63e-06	2	-5.988e-05	1
22		min	-.012	6	-.057	3	-.032	3	-2.232e-04	1	-2.381e-03	3	-1.316e-02	3
23	N12	max	0	8	0	8	0	8	3.904e-04	6	0	8	4.734e-04	6
24		min	0	1	0	1	0	1	-3.294e-04	5	0	1	-1.933e-04	5
25	N13	max	.012	3	.003	3	.126	6	3.102e-04	3	3.234e-03	6	3.424e-04	4
26		min	-.072	6	-.017	7	-.018	3	-1.255e-03	7	-6.144e-04	3	-5.364e-04	6
27	N14	max	0	3	.005	3	.016	6	4.963e-04	6	1.207e-03	6	2.9e-04	6
28		min	-.009	6	-.003	6	0	4	-3.245e-04	5	-3.079e-07	4	-4.152e-04	3
29	N15	max	.044	3	.01	5	.034	6	9.045e-03	6	8.472e-04	6	1.067e-02	6
30		min	0	2	-.034	6	0	2	-7.302e-03	3	-1.202e-03	3	-9.498e-03	3
31	N16	max	.02	3	.014	6	.023	6	1.479e-02	6	2.164e-03	6	2.455e-03	6
32		min	0	1	-.016	4	0	1	5.973e-05	1	-2.452e-06	2	1.705e-04	3
33	N17	max	.131	3	-.006	6	.061	6	8.335e-03	3	9.695e-07	1	2.369e-04	1
34		min	0	1	-.023	3	0	1	4.003e-04	1	-1.415e-03	6	-1.203e-02	3
35	N18	max	.222	3	.013	3	.059	3	1.249e-02	3	4.304e-03	3	5.935e-05	6
36		min	-.002	6	-.038	8	0	1	-9.068e-04	8	-2.488e-04	6	-2.186e-02	3
37	N19	max	.02	3	.003	3	.184	6	1.543e-02	6	1.955e-03	6	4.097e-04	3
38		min	0	1	-.018	7	-.018	3	-2.566e-03	3	-5.554e-04	3	-7.6e-04	7
39	N20	max	.02	3	0	2	.093	6	1.489e-02	6	5.669e-06	2	2.031e-04	6
40		min	0	2	-.024	3	0	1	-4.257e-05	1	-1.768e-03	3	-1.011e-04	3
41	N21	max	.215	3	-.002	3	.044	6	2.593e-03	6	3.381e-03	3	6.511e-03	6
42		min	0	2	-.023	7	-.072	3	-1.045e-02	3	-4.265e-06	2	-1.454e-02	3
43	N22	max	.065	3	.011	6	.12	6	1.107e-02	6	3.377e-03	6	1.858e-02	6
44		min	-.129	6	-.01	4	0	2	-4.782e-03	3	-2.205e-06	2	-8.834e-03	3
45	N23	max	.02	3	.001	2	.082	6	1.489e-02	6	5.669e-06	2	2.04e-04	6
46		min	0	2	-.023	3	0	1	-4.257e-05	1	-1.768e-03	3	-1.002e-04	3
47	N24	max	.02	3	.006	3	.169	6	1.543e-02	6	1.954e-03	6	4.088e-04	3
48		min	0	1	-.024	7	-.013	3	-2.566e-03	3	-5.554e-04	3	-7.609e-04	7
49	N25	max	.065	3	.009	6	.107	6	1.107e-02	6	3.377e-03	6	1.858e-02	6
50		min	-.106	6	-.011	4	0	2	-4.781e-03	3	-2.205e-06	2	-8.835e-03	3
51	N26	max	.192	3	-.004	2	.045	6	2.592e-03	6	3.38e-03	3	6.511e-03	6
52		min	0	6	-.029	7	-.059	3	-1.045e-02	3	-4.265e-06	2	-1.454e-02	3
53	N27	max	.192	3	.012	3	.041	3	1.249e-02	3	4.303e-03	3	5.889e-05	6
54		min	0	6	-.047	8	0	1	-9.076e-04	8	-2.488e-04	6	-2.186e-02	3
55	N28	max	.13	3	-.003	6	.055	6	8.336e-03	3	9.695e-07	1	2.374e-04	1
56		min	0	1	-.033	3	0	2	4.012e-04	1	-1.415e-03	6	-1.203e-02	3
57	N29	max	1.277	3	.083	6	.671	6	1.796e-02	3	2.393e-04	5	-8.565e-05	1
58		min	0	1	-.139	3	-.002	1	-1.979e-04	1	-1.029e-02	6	-4.089e-02	3
59	N30	max	1.797	3	.096	3	.766	3	1.878e-02	3	1.133e-02	3	2.414e-03	6
60		min	-.264	6	-.072	8	-.001	1	-2.292e-05	2	-7.098e-03	6	-4.205e-02	3

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
61	N31	max	.198	3	.103	3	1.762	6	5.251e-02	6	7.681e-03	6	8.342e-04	6
62		min	-.003	2	-.042	7	-.546	3	-8.061e-03	3	-1.078e-02	3	-4.831e-03	3
63	N32	max	.198	3	0	2	1.282	3	2.988e-02	6	1.237e-04	6	-6.39e-05	1
64		min	-.003	2	-.099	3	-.001	1	-1.324e-05	1	-1.425e-02	3	-4.328e-03	3
65	N33	max	1.819	3	-.01	2	.284	6	9.201e-03	6	1.311e-02	3	7.939e-03	6
66		min	-.102	6	-.154	3	-.855	3	-2.144e-02	3	-9.299e-07	1	-4.958e-02	3
67	N34	max	.546	3	.077	6	1.036	6	2.134e-02	6	1.501e-02	6	2.899e-02	6
68		min	-1.405	6	-.011	1	-.12	3	-8.034e-03	3	1.948e-05	1	-1.847e-02	3
69	N35	max	.02	3	.01	3	.146	6	1.554e-02	6	2.545e-03	6	3.093e-04	3
70		min	0	1	-.032	7	-.006	3	-2.588e-03	3	-7.761e-04	3	-6.034e-04	6
71	N36	max	.198	3	.011	3	1.616	6	5.27e-02	6	8.016e-03	6	4.817e-04	6
72		min	-.003	2	-.032	7	-.342	3	-8.118e-03	3	-1.046e-02	3	-4.767e-03	3
73	N37	max	.02	3	.012	3	.035	6	1.572e-02	6	2.726e-03	6	1.786e-03	6
74		min	0	1	-.018	7	0	2	5.261e-05	1	-1.005e-04	3	-2.331e-04	3
75	N38	max	.197	3	.012	3	1.261	6	3.867e-02	6	8.607e-03	6	2.121e-04	2
76		min	-.003	2	-.019	7	-.002	5	-1.107e-04	5	-9.934e-03	3	-1.025e-03	3
77	N39	max	.02	3	.007	2	.014	6	1.482e-02	6	3.313e-07	1	-9.71e-06	2
78		min	0	2	-.01	1	-.005	3	-1.113e-05	1	-1.025e-03	6	-1.84e-03	6
79	N40	max	.197	3	.007	2	1.031	6	3.111e-02	6	2.235e-03	6	1.659e-04	8
80		min	-.003	2	-.01	1	0	1	1.692e-06	1	-1.186e-02	3	-1.428e-03	3
81	N41	max	.02	3	.002	2	.069	6	1.499e-02	6	2.359e-06	2	1.813e-04	6
82		min	0	2	-.022	3	0	1	-3.468e-05	1	-1.996e-03	3	-2.81e-04	3
83	N42	max	.198	3	.002	2	1.029	3	2.996e-02	6	6.843e-05	6	-3.441e-05	1
84		min	-.003	2	-.023	3	0	1	-1.283e-05	1	-1.399e-02	3	-4.093e-03	3
85	N43	max	.342	3	.002	2	1.909	6	3.364e-02	6	6.843e-05	6	-3.442e-05	1
86		min	-.001	1	-.023	3	-.001	1	-1.284e-05	1	-1.399e-02	3	-5.607e-03	3
87	N44	max	.042	3	.002	2	0	1	1.459e-02	3	2.359e-06	2	1.146e-03	3
88		min	-.003	2	-.022	3	-.342	3	-3.467e-05	1	-1.996e-03	3	-9.753e-05	2
89	N45	max	.24	3	.007	2	1.894	6	3.13e-02	6	2.235e-03	6	1.66e-04	8
90		min	-.006	8	-.011	1	0	1	1.692e-06	1	-1.186e-02	3	-1.609e-03	3
91	N46	max	.002	5	.007	2	0	1	1.464e-02	6	3.313e-07	1	-2.914e-06	5
92		min	-.047	6	-.01	1	-.383	6	-1.113e-05	1	-1.025e-03	6	-1.839e-03	6
93	N47	max	.229	3	.012	3	2.333	6	3.885e-02	6	8.607e-03	6	2.121e-04	2
94		min	-.009	2	-.019	7	-.005	5	-1.107e-04	5	-9.934e-03	3	-1.206e-03	3
95	N48	max	.05	6	.012	3	-.001	1	1.555e-02	6	2.726e-03	6	1.786e-03	6
96		min	.007	1	-.018	7	-.386	6	5.26e-05	1	-1.005e-04	3	-6.396e-05	3
97	N49	max	.42	3	.011	3	3.321	6	6.483e-02	6	8.016e-03	6	4.823e-04	6
98		min	-.012	7	-.033	7	-.566	3	-8.129e-03	3	-1.046e-02	3	-9.16e-03	3
99	N50	max	.112	3	.01	3	.063	3	4.141e-03	6	2.545e-03	6	4.446e-03	3
100		min	-.014	6	-.032	7	-.043	6	-2.585e-03	3	-7.761e-04	3	-6.027e-04	6
101	N51	max	1.216	3	.007	6	1.52	6	2.274e-02	6	1.475e-02	6	2.924e-02	6
102		min	-1.982	6	-.013	4	-.387	3	-7.975e-03	3	1.948e-05	1	-2.223e-02	3
103	N52	max	.427	6	.006	6	.139	3	9.734e-03	6	3.599e-03	6	1.867e-02	6
104		min	-.105	3	-.013	4	-.182	6	-4.694e-03	3	-6.709e-06	4	-5.496e-03	3
105	N53	max	1.436	3	.008	5	1.029	6	1.439e-02	6	1.122e-02	6	2.198e-02	6
106		min	-1.314	6	-.024	6	-.591	3	-1.146e-02	3	2.474e-05	1	-2.262e-02	3
107	N54	max	.337	6	.008	5	.208	3	9.222e-03	6	1.521e-03	6	1.192e-02	6
108		min	-.219	3	-.024	6	-.214	6	-6.846e-03	3	-1.009e-03	3	-9.831e-03	3
109	N55	max	2.053	3	.011	5	.708	6	9.256e-03	6	1.239e-02	3	1.354e-02	6
110		min	-.77	6	-.043	6	-.978	3	-1.847e-02	3	1.239e-05	1	-3.278e-02	3
111	N56	max	.223	6	.011	5	.183	3	4.332e-03	6	2.608e-03	3	8.293e-03	6
112		min	-.362	3	-.043	6	-.072	6	-5.722e-03	3	-6.098e-04	6	-1.481e-02	3

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
113	N57	max	3.222	3	-.006	2	.689	6	1.364e-02	6	1.324e-02	3	7.966e-03	6
114		min	-.424	6	-.04	6	-1.334	3	-2.188e-02	3	-9.155e-07	1	-6.17e-02	3
115	N58	max	.166	6	-.005	2	.238	3	3.361e-04	8	3.932e-03	3	6.313e-03	6
116		min	-.02	5	-.039	6	-.006	8	-1.028e-02	3	-4.117e-08	2	-3.399e-03	3
117	N59	max	2.86	3	.012	3	1.191	3	1.905e-02	3	1.119e-02	3	2.404e-03	6
118		min	-.221	6	-.059	8	0	1	-4.468e-05	2	-6.957e-03	6	-4.574e-02	3
119	N60	max	.006	6	.012	3	.051	6	1.251e-02	3	4.493e-03	3	1.675e-04	6
120		min	-.369	3	-.058	8	-.317	3	-1.289e-03	6	-3.37e-04	6	-1.856e-02	3
121	N61	max	2.259	3	-.009	6	.985	3	1.86e-02	3	6.724e-03	3	-4.66e-05	1
122		min	.002	1	-.051	5	-.004	1	-1.e-04	2	-6.872e-03	6	-3.525e-02	3
123	N62	max	0	8	-.01	6	.002	2	7.683e-03	3	1.846e-03	3	1.311e-05	8
124		min	-.48	3	-.051	5	-.256	3	-7.907e-05	2	-2.738e-06	2	-1.906e-02	3
125	N63	max	2.12	3	-.006	6	.912	3	1.779e-02	3	9.87e-05	5	-1.856e-05	1
126		min	0	1	-.05	3	-.004	1	-5.089e-05	1	-8.77e-03	6	-3.336e-02	3
127	N64	max	-.002	1	-.005	6	.006	1	9.021e-03	3	3.651e-06	2	-7.607e-05	1
128		min	-.306	3	-.051	3	-.27	3	-2.37e-04	1	-2.38e-03	3	-1.399e-02	3
129	N65	max	2.657	3	.002	6	1.092	6	1.989e-02	6	2.109e-04	5	-6.82e-05	1
130		min	.002	1	-.046	3	-.007	1	-1.667e-04	1	-1.009e-02	6	-5.328e-02	3
131	N66	max	.025	3	.002	6	-.006	1	7.982e-03	3	1.084e-06	1	1.544e-04	1
132		min	-.225	6	-.045	3	-.211	3	2.326e-04	1	-1.692e-03	6	-9.68e-03	6
133	N67	max	.155	3	.012	3	.026	6	1.251e-02	3	4.493e-03	3	1.675e-04	6
134		min	0	2	-.058	8	0	1	-5.13e-04	8	-3.37e-04	6	-2.202e-02	3
135	N68	max	.036	3	-.01	6	.027	6	7.684e-03	3	1.846e-03	3	1.311e-05	8
136		min	0	2	-.051	5	-.048	3	-7.908e-05	2	-2.738e-06	2	-1.923e-02	3
137	N69	max	.073	3	-.005	6	.02	6	9.022e-03	3	3.651e-06	2	-7.608e-05	1
138		min	-.009	6	-.051	3	-.027	3	-2.37e-04	1	-2.38e-03	3	-1.416e-02	3
139	N70	max	.127	3	.002	6	.047	6	7.992e-03	3	1.084e-06	1	1.546e-04	1
140		min	0	1	-.044	3	0	2	2.33e-04	1	-1.692e-03	6	-1.23e-02	3
141	N71	max	.066	3	.006	6	.09	6	1.116e-02	6	3.599e-03	6	1.867e-02	6
142		min	-.077	6	-.013	4	0	1	-4.696e-03	3	-6.709e-06	4	-8.956e-03	3
143	N72	max	.048	3	.008	5	.036	6	9.392e-03	6	1.521e-03	6	1.192e-02	6
144		min	0	2	-.024	6	0	1	-6.847e-03	3	-1.009e-03	3	-1.e-02	3
145	N73	max	.039	3	.011	5	.046	6	4.501e-03	6	2.608e-03	3	8.294e-03	6
146		min	0	6	-.043	6	0	2	-5.723e-03	3	-6.098e-04	6	-1.498e-02	3
147	N74	max	.159	3	-.005	2	.048	6	2.966e-03	6	3.932e-03	3	6.321e-03	6
148		min	-.004	6	-.039	6	-.039	3	-1.029e-02	3	-4.117e-08	2	-1.479e-02	3
149	N75	max	1.623	3	.012	3	.666	3	1.904e-02	3	1.119e-02	3	2.403e-03	6
150		min	-.154	6	-.059	8	-.001	1	-4.466e-05	2	-6.957e-03	6	-4.206e-02	3
151	N76	max	1.288	3	-.009	6	.472	3	1.86e-02	3	6.724e-03	3	-4.66e-05	1
152		min	.001	1	-.051	5	-.002	1	-1.e-04	2	-6.872e-03	6	-3.506e-02	3
153	N77	max	1.201	3	-.006	6	.422	3	1.778e-02	3	9.87e-05	5	-1.855e-05	1
154		min	0	1	-.05	3	-.002	1	-5.088e-05	1	-8.77e-03	6	-3.318e-02	3
155	N78	max	1.271	3	.002	6	.574	6	1.782e-02	3	2.109e-04	5	-6.809e-05	1
156		min	0	1	-.045	3	-.002	1	-1.665e-04	1	-1.009e-02	6	-4.117e-02	3
157	N79	max	.628	3	.007	6	.903	6	2.122e-02	6	1.475e-02	6	2.923e-02	6
158		min	-1.175	6	-.013	4	-.167	3	-7.972e-03	3	1.948e-05	1	-1.856e-02	3
159	N80	max	.813	3	.008	5	.633	6	1.42e-02	6	1.122e-02	6	2.198e-02	6
160		min	-.707	6	-.024	6	-.274	3	-1.145e-02	3	2.474e-05	1	-2.244e-02	3
161	N81	max	1.149	3	.011	5	.453	6	9.074e-03	6	1.239e-02	3	1.354e-02	6
162		min	-.396	6	-.043	6	-.468	3	-1.847e-02	3	1.239e-05	1	-3.259e-02	3
163	N82	max	1.603	3	-.006	2	.343	6	9.244e-03	6	1.324e-02	3	7.956e-03	6
164		min	-.205	6	-.04	6	-.73	3	-2.185e-02	3	-9.155e-07	1	-4.957e-02	3

Envelope Joint Displacements (Continued)

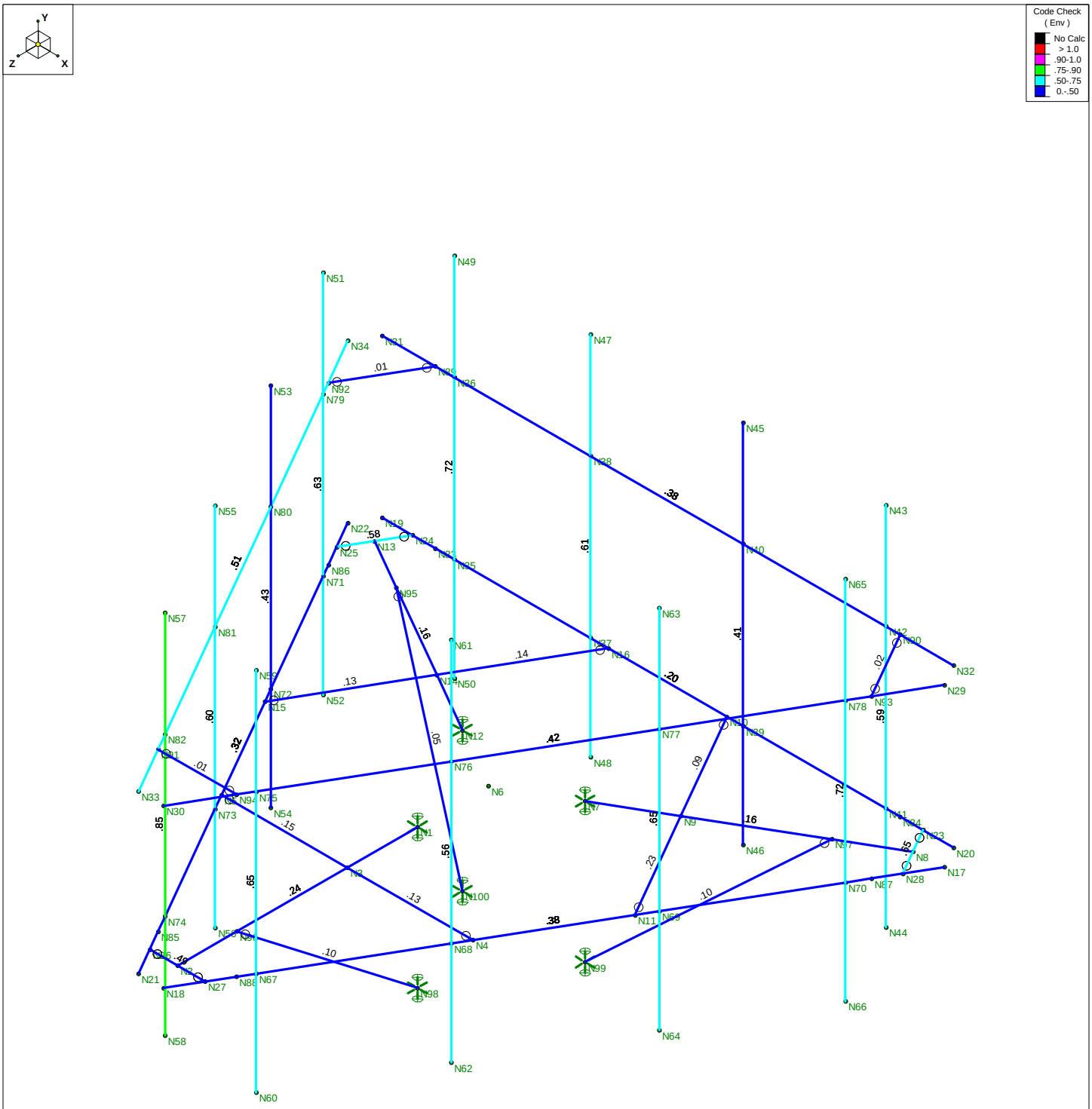
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
165	N83	max	.02	3	.009	3	.157	6	1.549e-02	6	2.13e-03	6	3.877e-04	3
166		min	0	1	-.029	7	-.01	3	-2.578e-03	3	-6.21e-04	3	-7.011e-04	6
167	N84	max	.02	3	.002	2	.074	6	1.495e-02	6	4.416e-06	2	2.338e-04	6
168		min	0	2	-.023	3	0	1	-3.771e-05	1	-1.854e-03	3	-1.29e-04	3
169	N85	max	.174	3	-.005	2	.047	6	2.714e-03	6	3.544e-03	3	6.455e-03	6
170		min	-.002	6	-.035	6	-.049	3	-1.047e-02	3	-3.009e-06	2	-1.462e-02	3
171	N86	max	.066	3	.007	6	.097	6	1.108e-02	6	3.461e-03	6	1.867e-02	6
172		min	-.088	6	-.012	4	0	1	-4.734e-03	3	-1.092e-06	2	-8.906e-03	3
173	N87	max	.129	3	0	6	.051	6	8.218e-03	3	1.003e-06	1	2.184e-04	1
174		min	0	1	-.04	3	0	2	3.547e-04	1	-1.497e-03	6	-1.214e-02	3
175	N88	max	.17	3	.012	3	.029	3	1.257e-02	3	4.374e-03	3	9.986e-05	6
176		min	0	2	-.055	8	0	1	-7.716e-04	8	-2.822e-04	6	-2.193e-02	3
177	N89	max	.198	3	.035	3	1.655	6	5.251e-02	6	7.657e-03	6	8.232e-04	6
178		min	-.003	2	-.035	7	-.395	3	-8.061e-03	3	-1.078e-02	3	-4.842e-03	3
179	N90	max	.198	3	.002	2	1.083	3	2.988e-02	6	1.473e-04	6	-5.116e-05	1
180		min	-.003	2	-.038	3	-.001	1	-1.324e-05	1	-1.425e-02	3	-4.317e-03	3
181	N91	max	1.66	3	-.007	2	.328	6	9.192e-03	6	1.309e-02	3	7.945e-03	6
182		min	-.178	6	-.067	3	-.763	3	-2.145e-02	3	-9.299e-07	1	-4.958e-02	3
183	N92	max	.611	3	.021	6	.931	6	2.135e-02	6	1.5e-02	6	2.899e-02	6
184		min	-1.223	6	-.011	4	-.157	3	-8.024e-03	3	1.948e-05	1	-1.848e-02	3
185	N93	max	1.273	3	.023	6	.599	6	1.797e-02	3	2.432e-04	5	-7.929e-05	1
186		min	0	1	-.071	3	-.002	1	-1.869e-04	1	-1.029e-02	6	-4.089e-02	3
187	N94	max	1.66	3	.029	3	.687	3	1.877e-02	3	1.131e-02	3	2.409e-03	6
188		min	-.178	6	-.062	8	-.001	1	-3.237e-05	2	-7.104e-03	6	-4.205e-02	3
189	N95	max	.006	3	.004	3	.08	6	1.626e-04	3	3.319e-03	6	2.556e-04	3
190		min	-.046	6	-.005	7	-.009	3	-8.228e-04	7	-6.472e-04	3	-3.009e-04	6
191	N96	max	.127	3	-.003	3	.002	6	9.041e-04	8	4.094e-03	3	1.094e-03	3
192		min	0	1	-.01	6	0	3	-1.707e-04	3	-1.123e-04	6	-1.854e-03	8
193	N97	max	.023	6	0	6	.04	6	1.02e-03	2	1.106e-06	1	-1.902e-04	6
194		min	0	1	-.011	3	0	1	-4.129e-04	6	-1.91e-03	3	-9.421e-04	3
195	N98	max	0	8	0	8	0	8	4.329e-04	6	0	8	6.138e-07	1
196		min	0	1	0	1	0	1	3.218e-04	3	0	1	-3.439e-03	3
197	N99	max	0	8	0	8	0	8	9.532e-04	6	0	8	-2.948e-04	2
198		min	0	1	0	1	0	1	-1.9e-04	1	0	1	-9.18e-04	3
199	N100	max	0	8	0	8	0	8	2.03e-03	6	0	8	1.49e-03	6
200		min	0	1	0	1	0	1	-3.622e-04	3	0	1	3.707e-05	3

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

	Memb...	Shape	Code Check	L...	LC	Sh...	L...	Dir	...phi*P...	phi*Pn...	phi*Mn y-y [k-ft]	phi*...	Cb	Eqn
1	M1	HSS4X4X4	.236	0	3	.071	0	z	3 124.3...	139.518	16.181	16....	2....	H1...
2	M2	HSS4X4X4	.132	2....	6	.176	2....	y	3 135.1...	139.518	16.181	16....	1....	H1...
3	M3	HSS4X4X4	.146	2....	6	.147	0	z	3 135.1...	139.518	16.181	16....	1....	H1...
4	M4	HSS4X4X4	.162	1....	3	.029	3....	y	3 124.3...	139.518	16.181	16....	1....	H1...
5	M5	HSS4X4X4	.091	2....	3	.136	0	z	6 135.1...	139.518	16.181	16....	1....	H1...
6	M6	HSS4X4X4	.230	2....	3	.188	0	z	3 135.1...	139.518	16.181	16....	1....	H1...
7	M7	HSS4X4X4	.157	0	6	.051	0	z	6 124.3...	139.518	16.181	16....	2....	H1...
8	M8	HSS4X4X4	.134	2....	3	.129	2....	y	6 135.1...	139.518	16.181	16....	1....	H1...
9	M9	HSS4X4X4	.140	2....	6	.159	0	z	6 135.1...	139.518	16.181	16....	1....	H1...
10	M10	PIPE_3.0	.384	7....	3	.360	7....		3 28.251	65.205	5.749	5.749	1....	H3...
11	M13	PIPE_3.0	.202	5....	6	.267	7....		3 28.251	65.205	5.749	5.749	1....	H1...

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

	Memb...	Shape	Code Check	L...	LC	Sh...	L...	Dir	...	phi*P...	phi*Pn...	phi*Mn y-y [k-ft]	phi*...	Cb	Eqn
12	M14	PIPE_3.0	.325	4....	3	.335	7....		6	28.251	65.205	5.749	5.749	1....	H3..
13	M13A	6"x3/8"	.645	.6...	3	.264	.6...	y	3	28.164	72.9	.57	9.113	1....	H1..
14	M14A	6"x3/8"	.584	.6...	6	.328	1....	y	6	28.164	72.9	.57	9.113	1....	H1..
15	M15	6"x3/8"	.493	.6...	3	.390	.6...	y	3	28.164	72.9	.57	9.113	1....	H1..
16	M16	PIPE_2.0	.424	1....	3	.206	4....		6	6.295	32.13	1.872	1.872	3....	H1..
17	M17	PIPE_2.0	.382	1....	3	.299	4....		6	6.295	32.13	1.872	1.872	3....	H1..
18	M18	PIPE_2.0	.508	1....	3	.363	4....		3	6.295	32.13	1.872	1.872	3....	H3..
19	PSA.1	PIPE_2.0	.593	5....	3	.250	5....		3	14.916	32.13	1.872	1.872	2....	H1..
20	PSA.2	PIPE_2.0	.414	5....	6	.220	5....		3	14.916	32.13	1.872	1.872	2....	H1..
21	PSA.3	PIPE_2.0	.611	5....	6	.206	5....		3	14.916	32.13	1.872	1.872	3....	H1..
22	PSA.4	PIPE_2.0	.720	5....	6	.200	5....		3	14.916	32.13	1.872	1.872	3....	H1..
23	PSB.1	PIPE_2.0	.631	5....	6	.235	5....		6	14.916	32.13	1.872	1.872	3....	H1..
24	PSB.2	PIPE_2.0	.431	5....	3	.193	5....		6	14.916	32.13	1.872	1.872	2....	H1..
25	PSB.3	PIPE_2.0	.595	5....	3	.198	5....		3	14.916	32.13	1.872	1.872	2....	H1..
26	PSB.4	PIPE_2.0	.853	5....	3	.236	5....		3	14.916	32.13	1.872	1.872	1....	H1..
27	PSC.1	PIPE_2.0	.645	5....	3	.151	5....		3	14.916	32.13	1.872	1.872	2....	H1..
28	PSC.2	PIPE_2.0	.557	5....	3	.148	5....		6	14.916	32.13	1.872	1.872	2....	H1..
29	PSC.3	PIPE_2.0	.646	5....	3	.162	5....		6	14.916	32.13	1.872	1.872	2....	H1..
30	PSC.4	PIPE_2.0	.724	5....	3	.174	5....		6	14.916	32.13	1.872	1.872	1....	H1..
31	M31	L2.5x2.5x5	.009	.8...	6	.293	0	y	3	42.973	47.304	1.316	3.061	1....	H2..
32	M32	L2.5x2.5x5	.015	.8...	3	.256	0	y	3	42.973	47.304	1.316	3.061	1....	H2..
33	M33	L2.5x2.5x5	.015	.8...	6	.292	1....	y	6	42.973	47.304	1.316	3.061	1....	H2..
34	M34	LL2x2x3x0	.101	4....	3	.004	4....	y	6	28.249	46.656	2.147	1.607	1....	H1..
35	M35	LL2x2x3x0	.052	4....	7	.007	4....	y	6	28.249	46.656	2.147	1.607	1....	H1..
36	M36	LL2x2x3x0	.099	4....	6	.010	4....	y	3	28.249	46.656	2.147	1.607	1....	H1..



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek Engineering		
TJL	CTNL463A - Mount	Jan 31, 2023 at 8:41 AM
21005.41	Unity Check	Mount.R3D

RAN Template:	A&L Template:
67G5C998G 6160	

CTNL463A_Sprint Retain_1_draft

Print Name: Standard (Ground Anchor)
PORs: New Build_Sprint Keep

Section 1 - Site Information

Site ID: CTNL463A
Status: Draft
Version: 1
Project Type: Sprint Retain
Approved: Not Approved
Approved By: Not Approved
Last Modified: 2/23/2022 11:30:05 AM
Last Modified By: Michael.Low1@T-Mobile.com

Site Name: CT54XC775
Site Class: Utility Lattice Tower
Site Type: Structure Non Building
Plan Year: 2021
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Not Specified

Latitude: 41.50992500
Longitude: -72.12493100
Address: 153 Old Salem Rd
City, State: Norwich, CT
Region: NORTHEAST

RAN Template: 67G5C998G 6160			AL Template:	
Sector Count: 3	**Antenna Count:** 6	**Coax Line Count:** 36	**TMA Count:** 6	**RRU Count:** 9

Section 2 - Existing Template Images

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

Section 3 - Proposed Template Images

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

Section 4 - Siteplan Images

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

RAN Template:	A&L Template:
67G5C998G 6160	

CTNL463A_Sprint Retain_1_draft

Print Name: Standard (Ground Anchor)
PORs: New Build_Sprint Keep

Section 5 - RAN Equipment

Existing RAN Equipment

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

Proposed RAN Equipment

Template: 67G5C998G 6160

Enclosure	1	2
Enclosure Type	Enclosure 6160 AC V1	B160
Baseband	BB 6648 (L2500, N2500); BB 6648 (L700, L600, N600, L2100, L1900); DUG20 (G1900)	
Hybrid Cable System	PSU 4813 vR4A (Kit) **(x 2)**	
Transport System	CSR IXRe V2 (Gen2)	
Functionality Groups	Ericsson Hybrid Trunk 6/24 4AWG *Select Length* **(x 3)**	

RAN Scope of Work:

CT54XC775
200A existing.
Existing Azimuth 30/120/270
New Azimuth 30/120/260

RAN Template: 67G5C998G 6160 | **A&L Template:**

CTNL463A_Sprint Retain_1_draft

Print Name: Standard (Ground Anchor)
PORs: New Build_Sprint Keep

Section 6 - A&L Equipment

Existing Template: Custom
Proposed Template:

Sector 1 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				Commscope_VV-65A-R1 (Quad)	
Azimuth	30				30	
M. Tilt	0				0	
Height	86				86	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L700 L600 N600	L700 L600 N600	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**
TMAs	Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Cabinet)	SHARED Radio 4480 B71+B85 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)	SHARED Radio 4460 B25+B66 (At Cabinet)	Radio 8863 B41 (At Cabinet)	SHARED Radio 8863 B41 (At Cabinet)
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template: 67G5C998G 6160 | **A&L Template:**

CTNL463A_Sprint Retain_1_draft

Print Name: Standard (Ground Anchor)
PORs: New Build_Sprint Keep

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				Commscope_VV-65A-R1 (Quad)	
Azimuth	120				120	
M. Tilt	0				0	
Height	86				86	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L700 L600 N600	L700 L600 N600	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**
TMAs	Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Cabinet)	SHARED Radio 4480 B71+B85 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)	SHARED Radio 4460 B25+B66 (At Cabinet)	Radio 8863 B41 (At Cabinet)	SHARED Radio 8863 B41 (At Cabinet)
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template: 67G5C998G 6160 | **A&L Template:**

CTNL463A_Sprint Retain_1_draft

Print Name: Standard (Ground Anchor)
PORs: New Build_Sprint Keep

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				Commscope_VV-65A-R1 (Quad)	
Azimuth	260				260	
M. Tilt	0				0	
Height	86				86	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L700 L600 N600	L700 L600 N600	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**
TMAs	Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Cabinet)	SHARED Radio 4480 B71+B85 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)	SHARED Radio 4460 B25+B66 (At Cabinet)	Radio 8863 B41 (At Cabinet)	SHARED Radio 8863 B41 (At Cabinet)
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67G5C998G 6160	

CTNL463A_Sprint Retain_1_draft

Print Name: Standard (Ground Anchor)
PORs: New Build_Sprint Keep

Section 7 - Power Systems Equipment

Existing Power Systems Equipment
----- This section is intentionally blank. -----

	Proposed Power Systems Equipment
Enclosure	1
Enclosure Type	Enclosure 6160 AC V1

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Utility Pole

T-Mobile Site Ref: CTNL463A

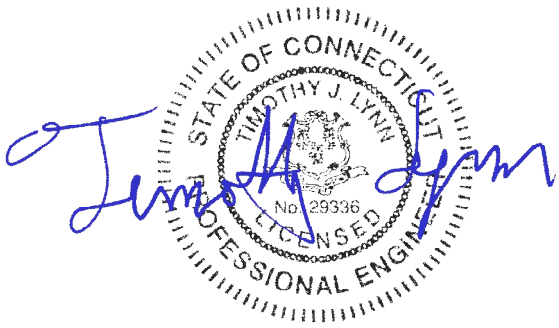
Eversource Structure No. 6347.5
90' Tall Electric Transmission Pole

153 Old Salem Road
Norwich, CT

CENTEK Project No. 21005.41

~~Date: January 12, 2023~~
Rev 1: January 23, 2023

Max Stress Ratio = 78.9%



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

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Utility Pole

T-Mobile Site Ref: CTNL463A

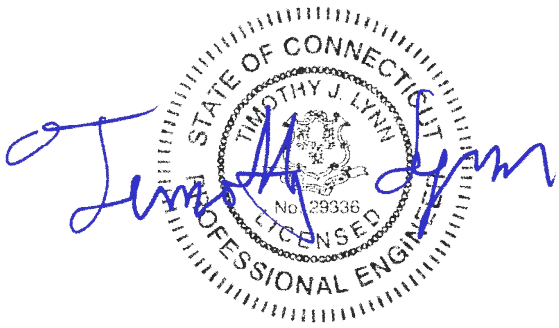
Eversource Structure No. 6347.5
90' Tall Electric Transmission Pole

153 Old Salem Road
Norwich, CT

CENTEK Project No. 21005.41

~~Date: January 12, 2023~~
Rev 2: February 28, 2023

Max Stress Ratio = 75.0%



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 90' utility pole located in Norwich, CT for the proposed antenna and equipment upgrade by T-Mobile.

The loads consist of the following:

- **T-MOBILE (Proposed Final Configuraiton):**
  Antennas: Three (3) RFS APXVAALL24_43 panel antennas, three (3) Commscope VV-65A-R1 panel antennas and six (6) ATSBT-TOP-MF-4G Bias Tees mounted on one (1) platform (SitePro p/n RMQP-496-HK) to the proposed pipe mast with RAD center elevation of 86-ft above grade.
  Coax Cables: Thirty-six (36) 1-5/8" ∅ coax cables running on the exterior of the pole and antenna mast.

Primary assumptions used in the analysis

- Design steel stresses are defined by AISC-LRFD 14th edition for design of the antenna Mast and antenna supporting elements.
- ASCE Manual No. 48-19, "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.
- Pipe mast will be properly installed and maintained.
- 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.
- Pipe mast and utility pole will be in plumb condition.
- Utility pole was properly installed and maintained and all members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.

Analysis

Structural analysis of the utility pole was independently completed using the current version of PLSPole computer program licensed to CENTEK Engineering, Inc.

NESC prescribed loads for the proposed wireless equipment were calculated to analyze the utility tower. Section 5 of this report details these loads.

Design Basis

Our analysis was performed in accordance with ASCE 48-19, "Design of Steel Transmission Pole Structures", NESC C2-2023 and Eversource Design Criteria.

- 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 Eversource Design Criteria Table, NESC C2-2023 ~ Construction Grade B, and ASCE Manual No. 48-19.

  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..... 120 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 C2-2023, 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. 48-19, "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 **55.14%** occurs in the utility pole X-Brace under the **NESC Extreme** loading condition.

POLE SECTION:

The utility pole was found to be within allowable limits.

Tower Section	Elevation	Stress Ratio (% of capacity)	Result
LP - Section 2	0.00' -40.00' (AGL)	33.81%	**PASS**
RP - Section 3	0.00' -40.00' (AGL)	36.32%	**PASS**
Davit Arm A1	51.5-ft (AGL)	46.68%	**PASS**
X-Arm X1	51.5-ft (AGL)	51.06%	**PASS**
Brace BR1	34.75-ft (AGL)	55.14%	**PASS**

BASE PLATE:

The base plate was found to be within allowable limits from the PLS output.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
LP - Base Plate	Bending	50.81%	**PASS**
RP - Base Plate	Bending	54.43%	**PASS**

FLANGE PLATES/BOLTS:

The flange bolts and plates were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (% of capacity)	Result
LP - Flange Bolts	Tension	20.0%	**PASS**
LP - Flange Plate	Bending	22.7%	**PASS**
RP - Flange Bolts	Tension	31.6%	**PASS**
RP - Flange Plate	Bending	30.1%	**PASS**

- FOUNDATION AND ANCHORS

The base of the tower is connected to the foundation by means of (8) 2.25"∅, ASTM A615-75 anchor bolts (each pole) embedded into the concrete foundation structure. Review of the foundation consisted of a comparison of the base reactions obtained from the proposed tower analysis and the original foundation design.

BASE REACTIONS:

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

Load Case	Shear	Axial	Moment
LP -NESC Heavy Wind (+)	12.79 kips	(-)24.63 kips	227.59 ft-kips
LP - NESC Extreme Wind (+)	29.17 kips	(-)122.16 kips	492.01 ft-kips
LP - NESC Extreme Ice w/ Wind (+)	7.84 kips	(-)3.09 kips	144.73 ft-kips
LP -NESC Heavy Wind (-)	15.76 kips	109.96 kips	256.69 ft-kips
LP - NESC Extreme Wind (-)	29.71 kips	162.35 kips	502.88 ft-kips
LP - NESC Extreme Ice w/ Wind (-)	11.00 kips	86.45 kips	175.14 ft-kips
RP -NESC Heavy Wind (+)	17.31 kips	130.35 kips	273.22 ft-kips
RP - NESC Extreme Wind (+)	34.00 kips	170.53 kips	543.11 ft-kips
RP - NESC Extreme Ice w/ Wind (+)	12.05 kips	103.92 kips	186.79 ft-kips
RP -NESC Heavy Wind (-)	14.34 kips	(-)4.24 kips	238.62 ft-kips
RP - NESC Extreme Wind (-)	33.45 kips	(-)113.98 kips	529.75 ft-kips
RP - NESC Extreme Ice w/ Wind (-)	8.89 kips	14.37 kips	151.73 ft-kips

Note 1 – 10% increase to be applied to tower base reactions for foundation verification per OTRM 051

ANCHOR BOLTS:

The anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (% of capacity)	Result
LP - Anchor Bolts	Tension	31.2%	**PASS**
RP - Anchor Bolts	Tension	33.3%	**PASS**

FOUNDATION:

Force	Original Design Loading	Proposed Loading	Result
LP - Moment	930.0 ft-kips	553.2 ft-kips	**PASS**
LP - Shear	49.3 kips	32.7 kips	**PASS**
LP – Uplfit	192.0 kips	134.4 kips	**PASS**
LP - Compression	246.3 kips	178.6 kips	**PASS**
RP - Moment	930.0 ft-kips	697.4 ft-kips	**PASS**
RP – Shear	48.3 kips	37.4 kips	**PASS**
RP – Uplift	192.0 kips	125.4 kips	**PASS**
RP – Compression	246.3 kips	187.6 kips	**PASS**

Note 1: Taken from Sabre design calculations dated 12/20/22.

Note 2: 10% increase has been applied to tower base reactions for foundation verification per OTRM 051

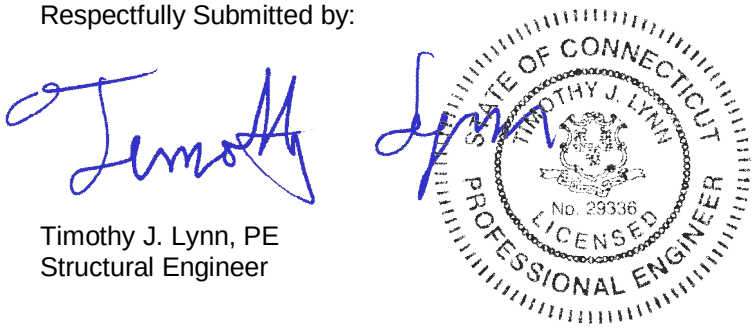
C o n c l u s i o n

This analysis shows that the subject utility pole **is adequate** to support the proposed equipment upgrade.

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES

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

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

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

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

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

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

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-POLE

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

Modeling Features:

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

Analysis Features:

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

Results Features:

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

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

Introduction

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

ANSI Standard TIA-222 covering the design of telecommunications structures specifies a limit state design approach. This approach applies the loads from extreme weather loading conditions, and designs the structure so that the design strength exceeds the required strength.

ANSI Standard C2-2017 (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.

P C S M a s t

The PCS facility (mast, external cable/trays, including the initial and any planned future support platforms, antennas, etc. extending the full height above the top level of the electric transmission structure) shall be designed in accordance with the provisions of TIA 222-G:

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 “Eversource 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 2017 Edition Extreme Wind (Rule 250C), Combined Ice and Wind (Rule 250B-Heavy) and Extreme Ice w/ Wind (Rule 250D) Loadings. These provide equivalent loadings compared to TIA and its loads and factors with the exceptions noted above. (Note that the NESC does not require the projected wind surfaces of structures and equipment to be increased by the ice covering.)

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

Attachment A
Eversource Design Criteria

		Attachment A ES Design Criteria	Basic Wind Speed	Pressure	Height Factor	Gust Factor	Load or Stress Factor	Force Coef. - Shape Factor
			V (MPH)	Q (PSF)	Kz	Gh		
Ice Condition	TIA/EIA	Antenna Mount	TIA	TIA (0.75Wi)	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Heavy	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	-----	4	1	1	2.5	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole (on two faces)	-----	4	1	1	2.5	1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by ES					
High Wind Condition	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Apply a 1.25 x Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by ES					
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 ES					
		*Only for structures installed after 2007						

determined from NESC applied loading conditions (not TIA Loads) on the structure and mount as specified below, and shall include the wireless communication mast and antenna loads per NESC criteria)

The strength reduction factor obtained from the field investigation shall be applied to the members or connections that are showing signs of deterioration from their original condition With the written approval of Eversource Transmission Line Engineering on a case by case the existing structures may be analyzed initially using the current NESC code, then it is permitted to use the original design code with the original conductor load should the existing tower fail the current NESC code.

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

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

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

c) Electric Transmission Structure

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

ii) Shape Factor Multiplier:

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

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

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

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

EVERSOURCE

Wire Loads

Project Name	Card - Montville 2
Work Order	
Structure #	6347.5
Line #	1080
Prepared By	HBH
Date	4/5/2022
Checked By	
Date	

Structure Data

Structure Height (AGL)	90	Load Zone	SE CT Coastal
# of Circuits	1	Insulation Type	Suspension (Concrete Foundation
Insulator Weight	150	Broken Wire Side	Ahead
Broken Wire Side	Left	Structure Type	Single Circuit Steel H-Frame

Wire Data

Circuit #	Left	Right
Shield Wire	0.646 OPGW 48	(Select)
Conductor	FALCON/ACSS	(Select)
# of Conductors	2	1

Line Geometry

	Circuit 1			Circuit 2		
	Ahead	Back	Total	Ahead	Back	Total
Wind Span	550	550	1100			0
Weight Span	850	850	1700			0
Minimum Line Angle	-1	-1	-2			0
Maximum Line Angle	1	1	2			0

Wire Tensions

	Left Circuit		Right Circuit		
	Ahead	Back	Ahead	Back	
NESC Rule 250B	11400	11400			Conductor
NESC Rule 250C	11952	11952			
NESC Rule 250D	15002	15002			
60°F, No wind or ice	5911	5911			
NESC Rule 250B	5500	5500			Shield Wire
NESC Rule 250C	6052	6052			
NESC Rule 250D	7752	7752			
60°F, No wind or ice	1824	1824			

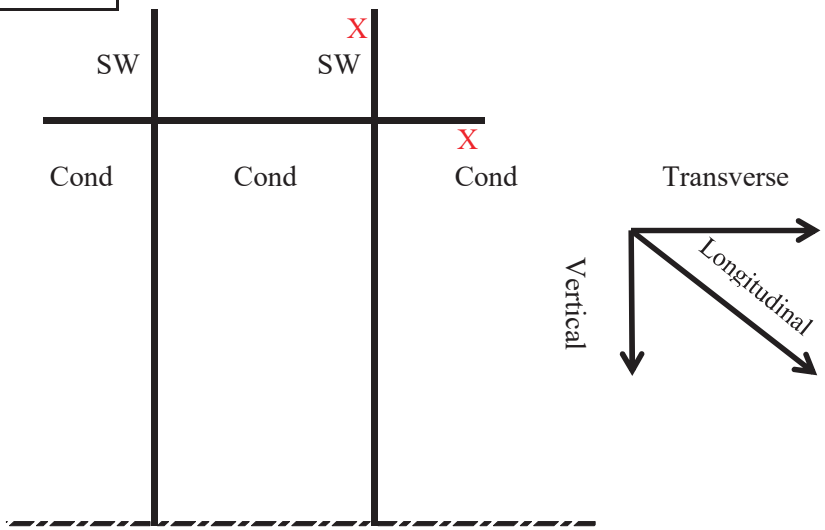
All Loads include Overload Factors but not Pole Shape Factors

Load Case	Description
1	NESC Rule 250B; 0°F, ½" of ice, 4 psf wind
2	NESC Rule 250C; (Extreme Wind Loading)
3	NESC Rule 250C; Extreme Wind Longtitudinal On The Pole Only
4	NESC Rule 250D; 15°F 1" of ice, 4 psf or NU Ice Case; 32°F 1" Ice
5	NESC Rule 250B with no OLFs (Service Load)
6	60°F, No wind or Ice (Deflection)
7a	NESC Rule 250B/261C Broken Wire Case (Broken SW and Borken Conductor)
7b	NESC Rule 250B/261C Broken Wire Case (Broken SW or Broken Phase)

EVERSOURCE

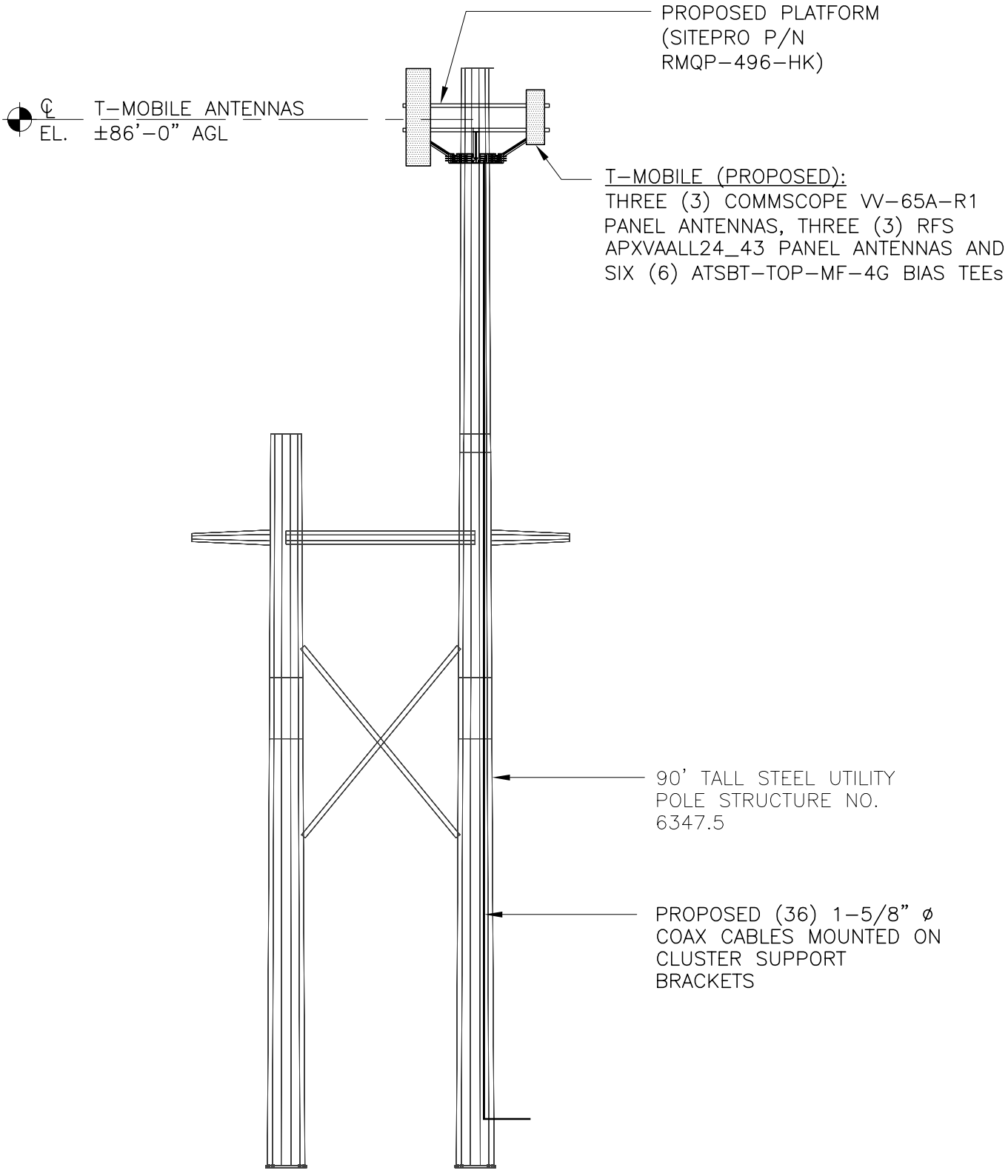
Wire Loads
Load Tree

Project Number
Card - Montville 2
Structure Number
6347.5
Line Number
1080



Single Circuit Steel H-Frame Configuration
X Denotes Broken Wire Location

	Case	Vertical	Transverse	Longitudinal
Conductor	1	17348.289	5741.246	0
	2	7240.76	11144.865	0
	3	7240.76	412.6447	0
	4	18005.092	3726.9507	0
	5	11565.526	2742.1631	0
	6	7240.76	412.6447	0
	7a	13348.717	4305.9345	-12538.09
	7b	8674.1445	2870.623	-25076.18
Shield Wire	Case	Vertical	Transverse	Longitudinal
	1	2980.4706	1720.0075	0
	2	775.2	2224.6106	0
	3	775.2	63.666379	0
	4	4256.1608	1240.7821	0
	5	1986.9804	795.5098	0
	6	775.2	63.666379	0
	7a	1490.2353	860.00373	-6049.079
	7b	1490.2353	860.00373	-6049.079



1
SK-1

TOWER ELEVATION

SCALE: NOT TO SCALE

REVISIONS		
00	1/12/23	ISSUED FOR REVIEW
01	1/23/23	CONSTRUCTION

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

CTNL463A
STRUCTURE 6347.5

153 OLD SALEM ROAD
NORWICH, CT

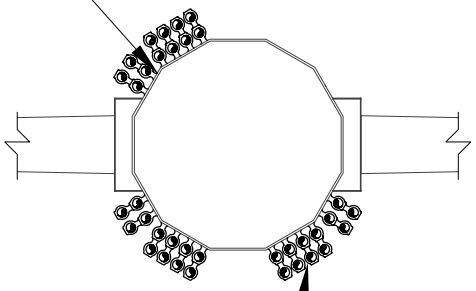
PROJECT NO:	21005.41
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	1/12/23

TOWER ELEVATION

SK-1

DWG. 1 OF 2

90' TALL STEEL UTILITY POLE STRUCTURE NO. 6347.5



PROPOSED (36) 1–5/8" ø COAX CABLES MOUNTED ON CLUSTER SUPPORT BRACKETS

1 / SK–2 COAX CABLE PLAN

SCALE: NOT TO SCALE

REVISIONS		
00	1/12/23	ISSUED FOR REVIEW
01	1/23/23	CONSTRUCTION

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Centered on Solutions℠
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CTNL463A
STRUCTURE 6347.5

153 OLD SALEM ROAD
NORWICH, CT

PROJECT NO:	21005.41
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	1/12/23

FEELINE PLAN

SK-2

DWG. 2 OF 2

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: Loads - Structure #6347.5

Location: Norwich, CT

Rev. 2: 2/28/23

Prepared by: T.J.L Checked by: C.F.C.
Job No. 21005.41

Basic Components

Heavy Wind Pressure =	$p := 4.00$	psf	(User Input NESC 2023 Figure 250-1 & Table 250-1)
Basic Windspeed =	$V := 120$	mph	(User Input)
Radial Ice Thickness =	$Ir := 0.50$	in	(User Input NESC 2023 Figure 250-1 & Table 250-1)
Radial Ice Density =	$Id := 56.0$	pcf	(User Input)

Factors for Extreme Wind Calculation

Elevation of Top of Tower Above Grade = $TME := 90$ ft (User Input)

Multiplier Gust Response Factor = $m := 1.00$ (User Input - Only for NESC Extreme wind case)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.238$ (NESC 2023 Table 250-2)

Turbulence Intensity Constant = $C_{exp} := 0.2$ (NESC 2023 Table 250-3)

Integral Length Scale of Turbulence Constant = $L_s := 220$ (NESC 2023 Table 250-3)

Effective Height = $z_s := 0.67 \cdot TME = 60.3$ (NESC 2023 Table 250-3)

Turbulence Intensity = $I_z := C_{exp} \cdot \left(\frac{33}{z_s}\right)^{\frac{1}{6}} = 0.181$ (NESC 2023 Table 250-3)

Response Term = $B_t := \left[\frac{1}{\left[1 + \left(0.56 \cdot \frac{z_s}{L_s}\right)\right]}\right]^{0.5} = 0.931$ (NESC 2023 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(4.61 \cdot I_z \cdot B_t\right)\right]}{\left(1 + 6.1 \cdot I_z\right)} = 0.845$ (NESC 2023 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf = 38.5$ psf (NESC 2023 Section 250.C.1)

NESC Extreme Ice w/ Wind Components

Heavy Wind Pressure =	$p_{ex} := 6.4$	psf	(User Input NESC 2023 Figure 250-3 & Table 250-4)
Radial Ice Thickness =	$Ir_{ex} := 0.75$	in	(User Input NESC 2023 Figure 250-3)

Shape Factors

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 Open Lattice =	$Cd_{OL} := 3.2$	(User Input)
Shape Factor for Coax Cables Attached to Outside of Pole =	$Cd_{coax} := 1.6$	(User Input)

Overload Factors

Overload Factors for Wind Loads:

NESC Heavy Loading =	**2.5**	(User Input)	Apply in PLS-Pole Analysis
NESC Extreme Loading =	**1.0**	(User Input)	Apply in PLS-Pole Analysis
NESC Extreme Ice w/ Wind Loading =	**1.0**	(User Input)	Apply in PLS-Pole Analysis

Overload Factors for Vertical Loads:

NESC Heavy Loading =	**1.5**	(User Input)	Apply in PLS-Pole Analysis
NESC Extreme Loading =	**1.0**	(User Input)	Apply in PLS-Pole Analysis
NESC Extreme Ice w/ Wind Loading =	**1.0**	(User Input)	Apply in PLS-Pole Analysis

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPXVAALL24_43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 150$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant1} := WT_{ant} \cdot N_{ant} = 450$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 19564$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 3450$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 112$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 335$ lbs

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 5273$ cu in

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := \frac{V_{ice.ex}}{1728} \cdot Id = 171$ lbs

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant1} := W_{ICE.exant} \cdot N_{ant} = 513$ lbs

Wind Load (NESC Heavy)

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

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

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

Wind Load (NESC Extreme)

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

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

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 2957$ lbs

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := \frac{(L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex})}{144} = 17.2$ sf

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 51.7$ sf

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant1} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 530$ lbs

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Subject: Loads - Structure #6347.5

Location: Norwich, CT

Rev. 2: 2/28/23

Prepared by: T.J.L Checked by: C.F.C.
Job No. 21005.41

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Commscope VV-65A-R1		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 54.724$	in	(User Input)
Antenna Width =	$W_{ant} := 12.087$	in	(User Input)
Antenna Thickness =	$T_{ant} := 4.646$	in	(User Input)
Antenna Weight =	$WT_{ant} := 30$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant2} := WT_{ant} \cdot N_{ant} = 90$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3073$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot Ir\right)\left(W_{ant} + 2 \cdot Ir\right)\left(T_{ant} + 2 \cdot Ir\right) - V_{ant} = 1044$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 34$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant2} := W_{ICEant} \cdot N_{ant} = 102$ lbs

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := \left(L_{ant} + 2 \cdot Ir_{ex}\right)\left(W_{ant} + 2 \cdot Ir_{ex}\right)\left(T_{ant} + 2 \cdot Ir_{ex}\right) - V_{ant} = 1622$ cu in

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := \frac{V_{ice.ex}}{1728} \cdot Id = 53$ lbs

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant2} := W_{ICE.exant} \cdot N_{ant} = 158$ lbs

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{\left(L_{ant} + 2 \cdot Ir\right) \cdot \left(W_{ant} + 2 \cdot Ir\right)}{144} = 5.1$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 15.2$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant2} := p \cdot Cd_F \cdot A_{ICEant} = 97$ lbs

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.6$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 13.8$ sf

Total Antenna Wind Force = $F_{ant2} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 850$ lbs

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := \frac{\left(L_{ant} + 2 \cdot Ir_{ex}\right) \cdot \left(W_{ant} + 2 \cdot Ir_{ex}\right)}{144} = 5.3$ sf

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 15.9$ sf

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant2} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 163$ lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	AT SBT-TOP-MF-4G Bias Tee		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 5.63$	in	(User Input)
Antenna Width =	$W_{ant} := 3.7$	in	(User Input)
Antenna Thickness =	$T_{ant} := 2.0$	in	(User Input)
Antenna Weight =	$WT_{ant} := 2$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 6$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant3} := WT_{ant} \cdot N_{ant} = 12$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 42$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot Ir\right)\left(W_{ant} + 2 \cdot Ir\right)\left(T_{ant} + 2 \cdot Ir\right) - V_{ant} = 52$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 2$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant3} := W_{ICEant} \cdot N_{ant} = 10$ lbs

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := \left(L_{ant} + 2 \cdot Ir_{ex}\right)\left(W_{ant} + 2 \cdot Ir_{ex}\right)\left(T_{ant} + 2 \cdot Ir_{ex}\right) - V_{ant} = 88$ cu in

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := \frac{V_{ice.ex}}{1728} \cdot Id = 3$ lbs

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant3} := W_{ICE.exant} \cdot N_{ant} = 17$ lbs

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{\left(L_{ant} + 2 \cdot Ir\right) \cdot \left(W_{ant} + 2 \cdot Ir\right)}{144} = 0.2$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 1.3$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant3} := p \cdot Cd_F \cdot A_{ICEant} = 8$ lbs

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.1$ sf

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

Total Antenna Wind Force = $F_{ant3} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 54$ lbs

Wind Load (NESC Extreme Ice w/ Wind)

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 = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 1.5$ sf

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant3} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 16$ lbs

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	RMQP-496-HK		
Mount Shape =	Flat		
Mount Projected Surface Area =	$CdAa := 46$	sf	(User Input)
Mount Projected Surface Area w/ Ice =	$CdAa_{ice} := 58.1$	sf	(User Input)
Mount Projected Surface Area w/ Extreme Ice =	$CdAa_{ice.ex} := 70.2$	sf	(User Input)
Mount Weight =	$WT_{mnt} := 2449$	lbs	(User Input)
Mount Weight w/ Ice =	$WT_{mnt.ice} := 2742$	lbs	(User Input)
Mount Weight w/ Extreme Ice =	$WT_{mnt.ice.ex} := 3134$	lbs	(User Input)

Gravity Loads (without ice)

Weight of All Mounts = $Wt_{mnt1} := WT_{mnt} = 2449$ lbs **BLC 2**

Gravity Load (ice only)

Weight of Ice on All Mounts = $Wt_{ice.mnt1} := \left(WT_{mnt.ice} - WT_{mnt}\right) = 293$ lbs **BLC 3**

Gravity Load (extreme ice only)

Weight of Ice on All Mounts = $Wt_{ice.ex.mnt1} := \left(WT_{mnt.ice.ex} - WT_{mnt}\right) = 685$ lbs **BLC 4**

Wind Load (NESC Heavy)

Total Mount Wind Force w/ Ice = $Fi_{mnt1} := p \cdot CdAa_{ice} = 232$ lbs **BLC 5**

Wind Load (NESC Extreme)

Total Mount Wind Force = $F_{mnt1} := qz \cdot CdAa \cdot m = 1773$ lbs **BLC 6**

Wind Load (NESC Extreme Ice w/ Wind)

Total Mount Wind Force w/ Extreme Ice = $Fi_{ex.mnt1} := p_{ex} \cdot CdAa_{ice.ex} = 449$ lbs **BLC 7**

Total Pipe Length =	$TPL := 8 \cdot ft \cdot 12 = 96\,ft$
Total Antenna Length =	$TAL := 95.9 \cdot in \cdot 3 + 54.7 \cdot in \cdot 3 = 37.65\,ft$
Exposed Pipe Area =	$ExPA := (TPL - TAL)2.875 \cdot in = 13.98\,ft^2$
CaAa =	$1.3 \cdot ExPA = 18.2\,ft^2$
Exposed Pipe Area (with Ice) =	$ExPA := (TPL - TAL)3.875 \cdot in = 18.842\,ft^2$
CaAa (with ice) =	$1.3 \cdot ExPA = 24.5\,ft^2$
Exposed Pipe Area (with Extreme Ice) =	$ExPA := (TPL - TAL)4.875 \cdot in = 23.705\,ft^2$
CaAa (with Extreme Ice) =	$1.3 \cdot ExPA = 30.8\,ft^2$

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Subject:	Loads - Structure #6347.5
Location:	Norwich, CT
Rev. 2: 2/28/23	Prepared by: T.J.L Checked by: C.F.C. Job No. 21005.41

Total Equipment Loads:

NESC Heavy Wind Vertical =

$Wt_{tot} := \left(Wt_{ant1} + Wt_{ant2} + Wt_{ant3} + Wt_{mnt1}\right) = 3001$

$Wt_{ice.tot} := \left(Wt_{ice.ant1} + Wt_{ice.ant2} + Wt_{ice.ant3} + Wt_{ice.mnt1}\right) = 740$

$\left(Wt_{tot} + Wt_{ice.tot}\right) \cdot 1.5 = 5612$

NESC Heavy Wind Trasnsverse = $\left(Fi_{ant1} + Fi_{ant2} + Fi_{ant3} + Fi_{mnt1}\right) \cdot 2.5 = 1652$

NESC Extreme Wind Vertical = $\left(Wt_{ant1} + Wt_{ant2} + Wt_{ant3} + Wt_{mnt1}\right) = 3001$

NESC Extreme Wind Trasnsverse = $\left(F_{ant1} + F_{ant2} + F_{ant3} + F_{mnt1}\right) = 5633$

NESC Extreme Ice w/ Wind Vertical =

$Wt_{ice.ex.tot} := \left(Wt_{ice.ex.ant1} + Wt_{ice.ex.ant2} + Wt_{ice.ex.ant3} + Wt_{ice.ex.mnt1}\right) = 1373$

$\left(Wt_{tot} + Wt_{ice.ex.tot}\right) = 4374$

NESC Extreme Ice w/ Wind Trasnsverse = $\left(Fi_{ex.ant1} + Fi_{ex.ant2} + Fi_{ex.ant3} + Fi_{ex.mnt1}\right) = 1158$

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Subject:	Coax Cable on Pole #6347.5
Location:	Norwich, CT
Rev. 2: 2/28/23	Prepared by: T.J.L Checked by: C.F.C. Job No. 21005.41

Coax Cable on CL&P Pole

Coaxial Cable Span	$Coax_{Span} := 10ft$		(User Input)
Heavy Wind Pressure =	$p := 4 \cdot psf$		(User Input NESC 2023 Figure 250-1 & Table 250-1)
Radial Ice Thickness =	$Ir := 0.5 \cdot in$		(User Input NESC 2023 Figure 250-1 & Table 250-1)
Radial Ice Density =	$Id := 56 \cdot pcf$		(User Input)
Extreme Ice w/ Wind Pressure =	$p_{ex} := 6.4 \cdot psf$		(User Input NESC 2023 Figure 250-3 & Table 250-4)
Extreme Radial Ice Thickness =	$Ir_{ex} := 0.75 \cdot in$		(User Input NESC 2023 Figure 250-3)
Basic Windspeed =	$V := 120$	mph	(User Input)
Height to Top of Coax Above Grade =	$TC := 90$	ft	(User Input)
Velocity Pressure Coefficient =	$Kz := 2.01 \cdot \left(\frac{0.67TC}{900}\right)^{\frac{2}{9.5}} = 1.138$		(NESC 2023 Table 250-2)
Turbulence Intensity Constant =	$C_{exp} := 0.2$		(NESC 2023 Table 250-3)
Integral Length Scale of Turbulence Constant =	$L_s := 220$		(NESC 2023 Table 250-3)
Effective Height =	$z_s := 0.67 \cdot TC = 60.3$		(NESC 2023 Table 250-3)
Turbulence Intensity =	$I_z := C_{exp} \cdot \left(\frac{33}{z_s}\right)^{\frac{1}{6}} = 0.181$		(NESC 2023 Table 250-3)
Response Term =	$B_t := \left[\frac{1}{\left[1 + \left(0.56 \cdot \frac{z_s}{L_s}\right)\right]}\right]^{0.5} = 0.931$		(NESC 2023 Table 250-3)
Gust Response Factor =	$Grf := \frac{\left[1 + \left(4.61 \cdot I_z \cdot B_t\right)\right]}{\left(1 + 6.1 \cdot I_z\right)} = 0.845$		(NESC 2023 Table 250-3)
Wind Pressure =	$qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf = 35.4$	psf	(NESC 2023 Section 250.C.1)

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 =	$N_{coax} := 36$	*(User Input)*
Number of Projected Coax Cables =	$NP_{coax} := 6$	*(User Input - Conservative Assumption)*

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Subject:	Coax Cable on Pole #6347.5
Location:	Norwich, CT
Rev. 2: 2/28/23	Prepared by: T.J.L Checked by: C.F.C. Job No. 21005.41

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 = $A := \left(NP_{coax} \cdot D_{coax}\right) = 11.88 \cdot in$

Wind Area with Ice = $A_{ice} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right) = 12.88 \cdot in$

Wind Area with Extreme Ice = $A_{ice.ex} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir_{ex}\right) = 13.38 \cdot in$

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

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 54.538 \cdot plf$

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 = $W_{ice.ex} := Ai_{coax.ex} \cdot Id \cdot N_{coax} = 90.054 \cdot plf$

Heavy Wind Vertical Load =

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

Heavy Wind Transverse Load =

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

$Heavy\_WInd_{Vert} = 1380\,lb$ $Heavy\_Wind_{Trans} = 172\,lb$

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 =

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

$Extreme\_Wind_{Vert} = 374\,lb$ $Extreme\_Wind_{Trans} = 561\,lb$

Extreme Ice w/ Wind Vertical Load =

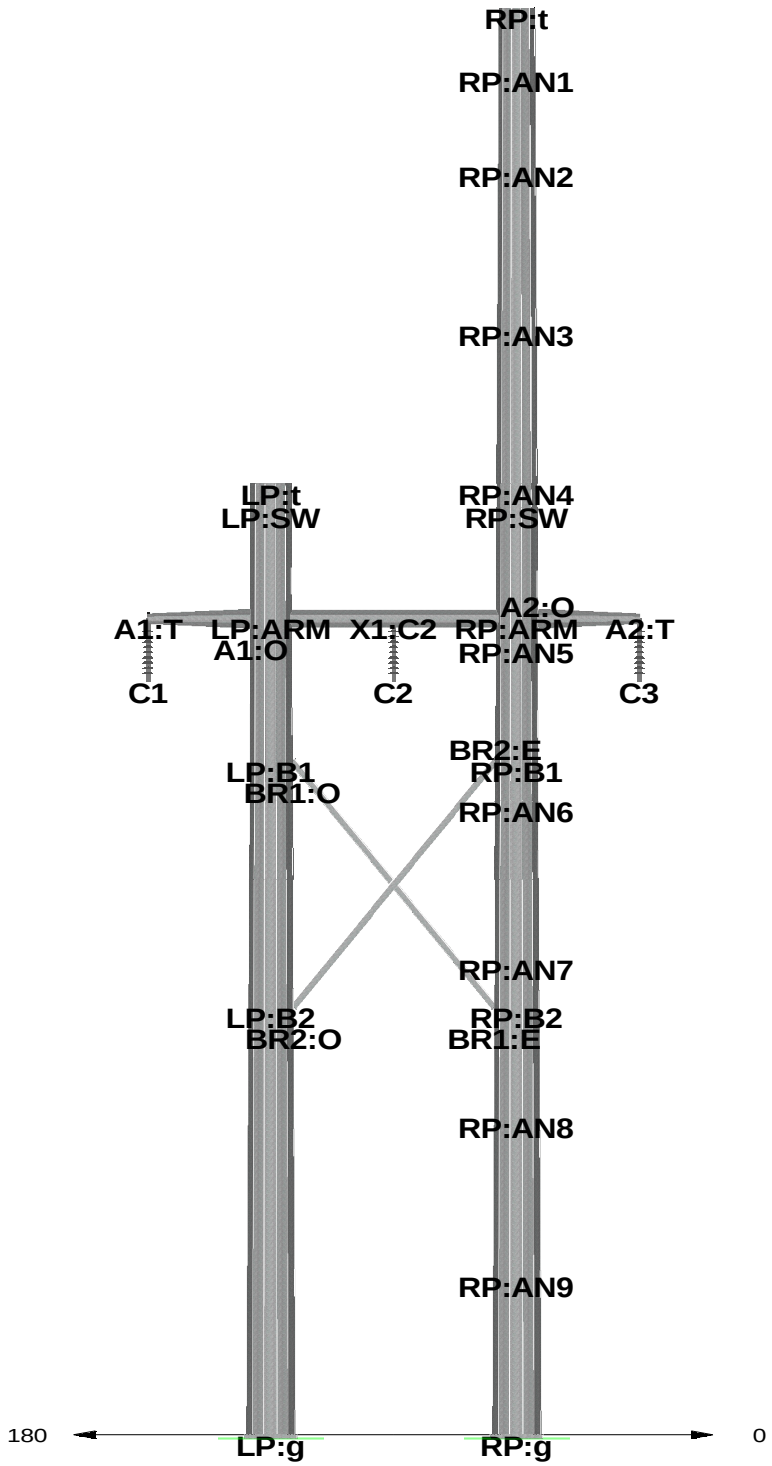
$$Extreme\_Ice_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax} + W_{ice.ex}\right) \cdot Coax_{Span} \cdot OF_{EIV}\right]}$$

Extreme Ice w/ Wind Transverse Load =

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

$Extreme\_Ice_{Vert} = 1275\,lb$ $Extreme\_Ice_{Trans} = 114\,lb$

Centek Engineering Inc, Project: "005&006-23-22435-60,90FT"
PLS-POLE Version 16.81, 10:27:11 AM Thursday, January 12, 2023
Undeformed geometry displayed



Z
X
Y

10 (ft)

Project Name : 21005.41 - Structure 6347.5
Project Notes: T-Mobile - CTNL463A
Project File : J:\Jobs\2100500.WI\41_CTNL463A_CT54XC775\05_Structural\Tower Analysis\Backup Documentation\Rev (2)\Calcs\PLS-Pole\005&006-23-22435-60,90FT.POL
Date run : 4:24:47 PM Tuesday, February 28, 2023
by : PLS-POLE Version 17.50
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Successfully performed nonlinear analysis

Load case 'NESC EXT. WIND (250C)' uses loading method NESC 2023 which is still being tested and/or is a draft. Carefully check your results. ??
Load case 'NESC EXT. WIND (250C)(-)' uses loading method NESC 2023 which is still being tested and/or is a draft. Carefully check your results. ??
The model has 2 warnings. ??

Loads from file: J:\Jobs\2100500.WI\41_CTNL463A_CT54XC775\05_Structural\Tower Analysis\Backup Documentation\Rev (2)\Calcs\PLS-Pole\005&006-23-22435.lca

*** Analysis Results:

Maximum element usage is 55.14% for Brace "BR1" in load case "NESC EXT. WIND (250C)"
Maximum insulator usage is 61.46% for Suspension "C1" in load case "NESC EXT. ICE (250D)"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description		Axial Force (kips)	Shear Force (kips)	Resultant Force (kips)	Bending Moment (ft-k)	Foundation Usage %
NESC HEAVY (250B)		LP:g	-24.63	12.79	27.75	227.59	0.00
NESC HEAVY (250B)		RP:g	130.35	17.31	131.50	273.22	0.00
NESC EXT. WIND (250C)		LP:g	-122.16	29.17	125.60	492.01	0.00
NESC EXT. WIND (250C)		RP:g	170.53	34.00	173.89	543.11	0.00
NESC EXT. ICE (250D)		LP:g	-3.09	7.84	8.43	144.73	0.00
NESC EXT. ICE (250D)		RP:g	103.92	12.05	104.61	186.79	0.00
NESC HEAVY (250B) (-)		LP:g	109.96	15.76	111.09	256.69	0.00
NESC HEAVY (250B) (-)		RP:g	-4.24	14.34	14.95	238.64	0.00
NESC EXT. WIND (250C)(-)		LP:g	162.35	29.71	165.05	502.88	0.00
NESC EXT. WIND (250C)(-)		RP:g	-113.98	33.45	118.79	529.75	0.00
NESC EXT. ICE (250D)(-)		LP:g	86.45	11.00	87.15	175.14	0.00
NESC EXT. ICE (250D)(-)		RP:g	14.37	8.89	16.90	151.74	0.00

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 (250B)		LP:g	-0.09	-12.79	24.63	12.79	227.57	-3.25	227.59	0.18	0.00
NESC HEAVY (250B)		RP:g	-0.08	-17.31	-130.35	17.31	273.20	-3.34	273.22	0.19	0.00
NESC EXT. WIND (250C)		LP:g	-0.02	-29.17	122.16	29.17	492.01	-0.82	492.01	0.04	0.00
NESC EXT. WIND (250C)		RP:g	-0.02	-34.00	-170.53	34.00	543.11	-0.79	543.11	0.04	0.00
NESC EXT. ICE (250D)		LP:g	-0.04	-7.84	3.09	7.84	144.72	-1.31	144.73	0.08	0.00
NESC EXT. ICE (250D)		RP:g	-0.03	-12.05	-103.92	12.05	186.79	-1.36	186.79	0.08	0.00
NESC HEAVY (250B) (-)		LP:g	-0.08	15.76	-109.96	15.76	-256.67	-3.18	256.69	0.19	0.00
NESC HEAVY (250B) (-)		RP:g	-0.09	14.34	4.24	14.34	-238.62	-3.41	238.64	0.20	0.00
NESC EXT. WIND (250C)(-)		LP:g	-0.02	29.71	-162.35	29.71	-502.88	-0.78	502.88	0.04	0.00
NESC EXT. WIND (250C)(-)		RP:g	-0.02	33.45	113.98	33.45	-529.75	-0.83	529.75	0.04	0.00

NESC EXT. ICE (250D)(-)	LP:g	-0.03	11.00	-86.45	11.00	-175.13	-1.29	175.14	0.08	0.00
NESC EXT. ICE (250D)(-)	RP:g	-0.03	8.89	-14.37	8.89	-151.73	-1.38	151.74	0.08	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
NESC HEAVY (250B)	LP:t	0.03	0.88	0.01	0.88	0.00	-0.07	-0.00
NESC HEAVY (250B)	RP:t	0.08	3.04	-0.07	3.04	0.01	-0.33	-0.00
NESC EXT. WIND (250C)	LP:t	0.01	1.95	0.05	1.95	0.00	-0.20	-0.00
NESC EXT. WIND (250C)	RP:t	0.02	6.80	-0.11	6.81	0.00	-0.78	-0.00
NESC EXT. ICE (250D)	LP:t	0.01	0.57	-0.00	0.57	0.00	-0.03	-0.00
NESC EXT. ICE (250D)	RP:t	0.03	2.17	-0.06	2.17	0.00	-0.24	-0.00
NESC HEAVY (250B) (-)	LP:t	0.03	-0.98	-0.05	0.98	0.00	0.14	-0.00
NESC HEAVY (250B) (-)	RP:t	0.08	-2.32	-0.01	2.32	0.01	0.24	-0.00
NESC EXT. WIND (250C)(-)	LP:t	0.01	-1.99	-0.08	1.99	0.00	0.23	-0.00
NESC EXT. WIND (250C)(-)	RP:t	0.02	-6.51	0.01	6.51	0.00	0.75	-0.00
NESC EXT. ICE (250D)(-)	LP:t	0.01	-0.68	-0.04	0.68	0.00	0.11	-0.00
NESC EXT. ICE (250D)(-)	RP:t	0.03	-1.44	-0.02	1.44	0.00	0.15	-0.00

Tubes Summary:

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)
LP	1	2135	NESC EXT. WIND (250C)(-)	21.75	291.88
LP	2	4718	NESC EXT. WIND (250C)(-)	33.81	502.88
RP	1	2330	NESC EXT. WIND (250C)	20.63	202.16
RP	2	2134	NESC EXT. WIND (250C)	27.68	371.43
RP	3	4717	NESC EXT. WIND (250C)	36.32	543.11

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

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
LP	33.81	NESC EXT. WIND (250C)(-)	1.7	15	7474.8
RP	36.32	NESC EXT. WIND (250C)	2.5	23	9802.8

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
A1	46.68	NESC EXT. ICE (250D)	51.5	1	204.2
A2	46.67	NESC EXT. ICE (250D)(-)	51.5	1	204.2

Summary of Tubular X-Arm Usages:

Tubular X-Arm Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)

X1 51.06 NESC EXT. WIND (250C) 51.5 4 557.1

Summary of Brace Usages:

Brace Label	Maximum Usage %	Load Case	Weight (lbs)
BR1	55.14	NESC EXT. WIND (250C)	350.1
BR2	44.76	NESC EXT. WIND (250C)(-)	350.1

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC HEAVY (250B)	45.46	A1	Tubular Davit
NESC EXT. WIND (250C)	55.14	BR1	Brace
NESC EXT. ICE (250D)	46.68	A1	Tubular Davit
NESC HEAVY (250B) (-)	45.46	A2	Tubular Davit
NESC EXT. WIND (250C)(-)	53.80	BR1	Brace
NESC EXT. ICE (250D)(-)	46.67	A2	Tubular Davit

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Height AGL (ft)	Segment Number
NESC HEAVY (250B)	20.14	RP	2.5	23
NESC EXT. WIND (250C)	36.32	RP	2.5	23
NESC EXT. ICE (250D)	14.37	RP	2.5	23
NESC HEAVY (250B) (-)	18.41	LP	1.7	15
NESC EXT. WIND (250C)(-)	33.81	LP	1.7	15
NESC EXT. ICE (250D)(-)	13.01	LP	1.7	15

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 (250B)	LP	12	15.500	25.252	227.571	-3.250	9.388	10.231	2	28.445	0.975	18.78
NESC EXT. WIND (250C)	LP	12	15.500	122.784	492.012	-0.822	23.222	25.308	2	69.506	1.533	46.44
NESC EXT. ICE (250D)	LP	12	15.500	3.716	144.723	-1.310	5.373	5.856	2	16.484	0.738	10.75
NESC HEAVY (250B) (-)	LP	11	15.500	109.342	-256.668	-3.176	14.302	15.587	2	42.149	1.203	28.60
NESC EXT. WIND (250C)(-)	LP	11	15.500	161.727	-502.882	-0.785	25.405	27.688	2	75.566	1.604	50.81
NESC EXT. ICE (250D)(-)	LP	11	15.500	85.832	-175.133	-1.290	10.246	11.166	2	30.090	1.019	20.49
NESC HEAVY (250B)	RP	12	15.500	129.731	273.203	-3.339	15.838	17.261	2	46.529	1.266	31.68
NESC EXT. WIND (250C)	RP	12	15.500	169.907	543.108	-0.794	27.216	29.661	2	81.012	1.660	54.43
NESC EXT. ICE (250D)	RP	12	15.500	103.296	186.789	-1.357	11.469	12.500	2	33.560	1.078	22.94
NESC HEAVY (250B) (-)	RP	11	15.500	4.865	-238.620	-3.414	8.846	9.641	2	27.125	0.946	17.69
NESC EXT. WIND (250C)(-)	RP	11	15.500	114.606	-529.749	-0.832	24.189	26.363	2	72.634	1.565	48.38
NESC EXT. ICE (250D)(-)	RP	11	15.500	13.747	-151.733	-1.378	6.089	6.636	2	18.514	0.785	12.18

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Tubular Davit Usage %	Davit Label	Height AGL (ft)	Segment Number
NESC HEAVY (250B)	45.46	A1	51.5	1
NESC EXT. WIND (250C)	20.16	A1	51.5	1
NESC EXT. ICE (250D)	46.68	A1	51.5	1
NESC HEAVY (250B) (-)	45.46	A2	51.5	1
NESC EXT. WIND (250C)(-)	20.11	A2	51.5	1
NESC EXT. ICE (250D)(-)	46.67	A2	51.5	1

Summary of Tubular X-Arm Usages by Load Case:

Load Case	Maximum Tubular X-Arm Usage %	X-Arm Label	Height AGL (ft)	Segment Number
NESC HEAVY (250B)	39.29	X1	51.5	4
NESC EXT. WIND (250C)	51.06	X1	51.5	4
NESC EXT. ICE (250D)	34.17	X1	51.5	4
NESC HEAVY (250B) (-)	35.86	X1	51.5	1
NESC EXT. WIND (250C)(-)	45.53	X1	51.5	1
NESC EXT. ICE (250D)(-)	31.81	X1	51.5	1

Summary of Brace Usages by Load Case:

Load Case	Maximum Usage %	Brace Label
NESC HEAVY (250B)	28.85	BR1
NESC EXT. WIND (250C)	55.14	BR1
NESC EXT. ICE (250D)	20.77	BR1
NESC HEAVY (250B) (-)	25.56	BR2
NESC EXT. WIND (250C)(-)	53.80	BR1
NESC EXT. ICE (250D)(-)	18.54	BR2

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	8.87	NESC EXT. ICE (250D)	0.0
2	Clamp	8.87	NESC EXT. ICE (250D)	0.0
3	Clamp	12.77	NESC EXT. WIND (250C)	0.0
4	Clamp	2.78	NESC HEAVY (250B)	0.0
5	Clamp	2.78	NESC HEAVY (250B)	0.0
6	Clamp	2.78	NESC HEAVY (250B)	0.0
7	Clamp	2.78	NESC HEAVY (250B)	0.0
8	Clamp	2.78	NESC HEAVY (250B)	0.0
9	Clamp	2.78	NESC HEAVY (250B)	0.0
10	Clamp	2.78	NESC HEAVY (250B)	0.0
11	Clamp	2.78	NESC HEAVY (250B)	0.0
C1	Suspension	61.46	NESC EXT. ICE (250D)	50.0
C2	Suspension	61.46	NESC EXT. ICE (250D)	50.0
C3	Suspension	61.46	NESC EXT. ICE (250D)	50.0

*** Weight of structure (lbs):
Weight of Braces: 700.3

Weight of Tubular Davit Arms:	408.5
Weight of Tubular X-Arms:	557.1
Weight of Steel Poles:	17277.7
Weight of Suspensions:	150.0
Total:	19093.5

*** End of Report

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**************************************************************************
*                                                                        *
*                              PLS-POLE                                  *
*                   POLE AND FRAME ANALYSIS AND DESIGN                   *
*               Copyright Power Line Systems 1999-2022                   *
*                                                                        *
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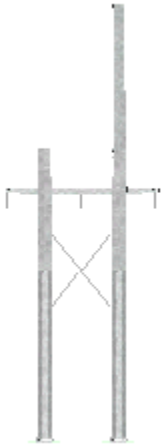
Project Name : 21005.41 - Structure 6347.5
Project Notes: T-Mobile - CTNL463A
Project File : J:\Jobs\2100500.WI\41_CTNL463A_CT54XC775\05_Structural\Tower Analysis\Backup Documentation\Rev (2)\Calcs\PLS-Pole\005&006-23-22435-60,90FT.POL
Date run : 4:24:46 PM Tuesday, February 28, 2023
by : PLS-POLE Version 17.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

Load case 'NESC EXT. WIND (250C)' uses loading method NESC 2023 which is still being tested and/or is a draft. Carefully check your results. ??
Load case 'NESC EXT. WIND (250C)(-)' uses loading method NESC 2023 which is still being tested and/or is a draft. Carefully check your results. ??
The model has 2 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 and tubular arms checked with ASCE/SEI 48-05

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

Steel Pole Properties:

Steel Pole Property Label	Stock Length Number (ft)	Default Embedded Length (ft)	Base Plate	Shape	Tip Diameter (in)	Base Diameter (in)	Taper (in/ft)	Default Drag Coef.	Tubes	Modulus of Elasticity Override (ksi)	Weight Density Override (lbs/ft^3)	Shape At Base	Strength Check Type	Distance From Tip (ft)	Ultimate Trans. Load (kips)	Ultimate Long. Load (kips)	Texture
005,006-23-22435-90FT	90.00	0	Yes	12F	27	37	0	1.6	3 tubes	0	0		Calculated	0.000	0.0000	0.0000	
005,006-23-22435-60FT	60.00	0	Yes	12F	30.44	37	0	1.3	2 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 or Butt Offset (in)	Yield Stress (ksi)	Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. Diameter (in)	1.5x Diam. Lap Length (ft)	Actual Overlap (ft)
005,006-23-22435-90FT	1	30	0.25	0.000	0.000	0.000	65.000	0.000	2330	15.29	0.10972	27.00	30.29	3.724	0.000
005,006-23-22435-90FT	2	20	0.3125	0.000	0.000	0.000	65.000	0.000	2134	10.12	0.10972	30.42	32.61	3.998	0.000
005,006-23-22435-90FT	3	40	0.3125	0.000	0.000	0.000	65.000	0.000	4717	20.42	0.10972	32.61	37.00	0.000	0.000

Steel Tubes Properties:

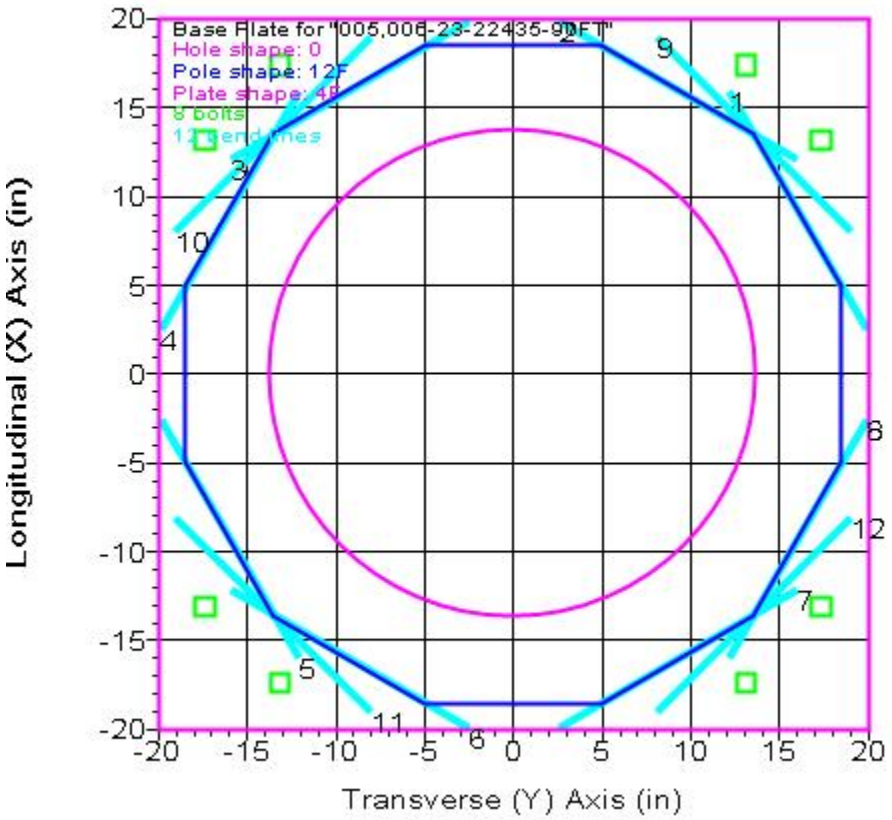
Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Gap or Butt Offset (in)	Yield Stress (ksi)	Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. Diameter (in)	1.5x Diam. Lap Length (ft)	Actual Overlap (ft)
005,006-23-22435-60FT	1	20	0.3125	0.000	0.000	0.000	65.000	0.000	2135	10.12	0.10937	30.44	32.62	4.000	0.000
005,006-23-22435-60FT	2	40	0.3125	0.000	0.000	0.000	65.000	0.000	4718	20.42	0.10937	32.63	37.00	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)
005,006-23-22435-60FT	40.000	4F	2.250	622	15.500	27.500	0	490.00	50.000	2.250	43.500	8	7541.29	7541.29
005,006-23-22435-90FT	40.000	4F	2.250	622	15.500	27.500	0	490.00	50.000	2.250	43.500	8	7541.29	7541.29

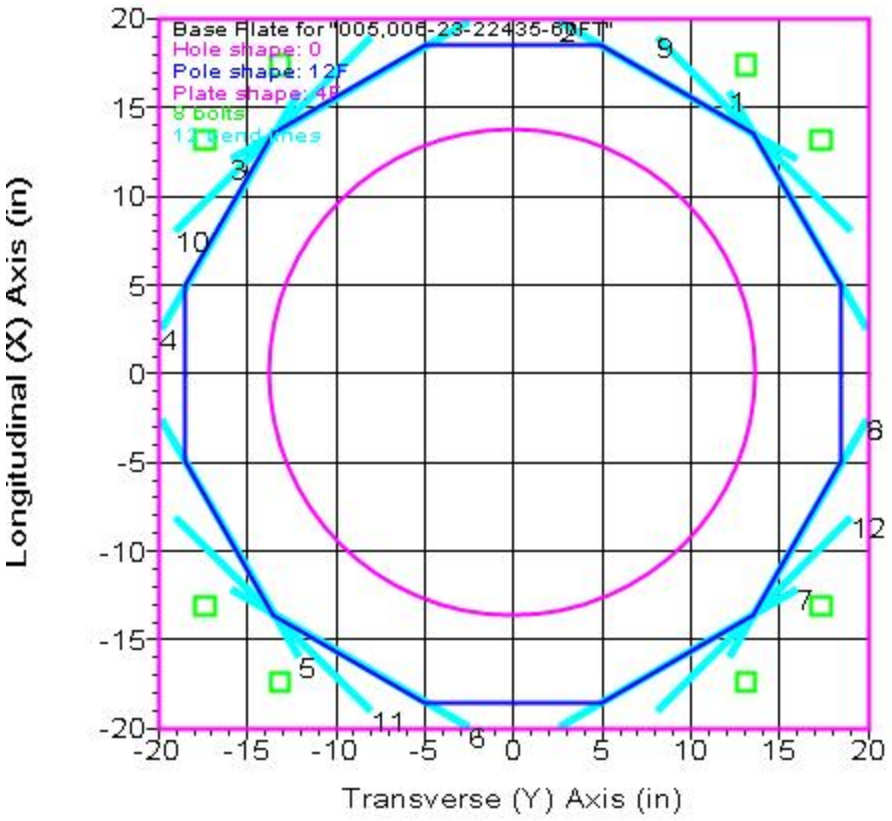
Base Plate Bolt Coordinates for Property "005,006-23-22435-90FT":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0.6034	0.7989	0
0.7989	0.6034	0



Base Plate Bolt Coordinates for Property "005,006-23-22435-60FT":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0.6034	0.7989	0
0.7989	0.6034	0



Steel Pole Connectivity:

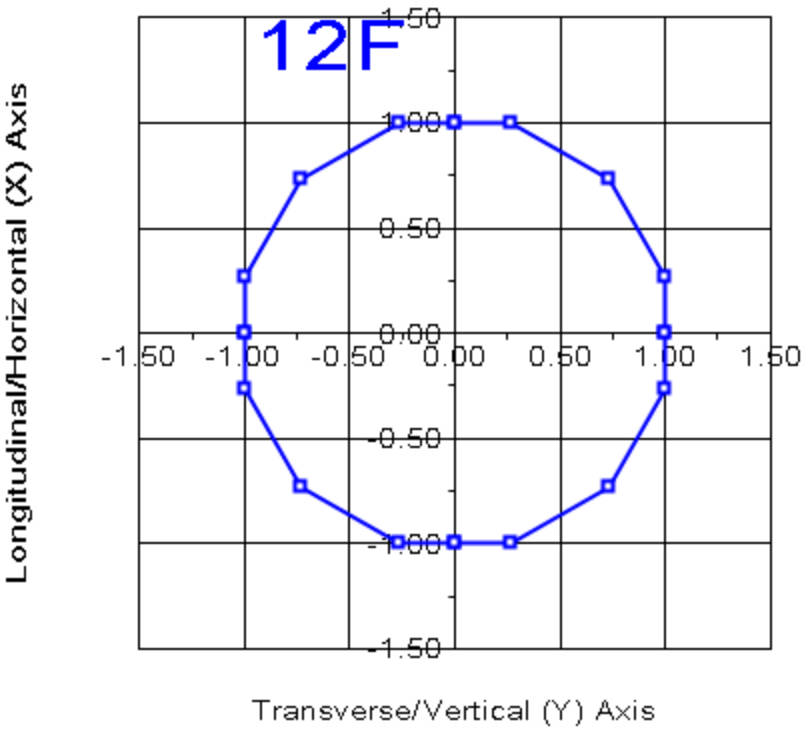
Pole Label	Tip Joint	Base X of Base (ft)	Y of Base (ft)	Z of Base (ft)	Inclin. About X (deg)	Inclin. About Y (deg)	Property Set	Attach. Labels	Base Connect	Embed % Override	Embed C. Override (ft)
LP		0	-7.75	0	0	0	005,006-23-22435-60FT	4 labels		0.00	0
RP		0	7.75	0	0	0	005,006-23-22435-90FT	13 labels		0.00	0

Relative Attachment Labels for Steel Pole "LP":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
LP:SW	1.50	0.00
LP:ARM	8.50	0.00
LP:B1	17.50	0.00
LP:B2	33.00	0.00

Relative Attachment Labels for Steel Pole "RP":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
RP:AN1	4.00	0.00
RP:AN2	10.00	0.00
RP:AN3	20.00	0.00
RP:AN4	30.00	0.00
RP:SW	31.50	0.00
RP:AN5	40.00	0.00
RP:ARM	38.50	0.00
RP:AN6	50.00	0.00
RP:B1	47.50	0.00
RP:AN7	60.00	0.00
RP:B2	63.00	0.00
RP:AN8	70.00	0.00
RP:AN9	80.00	0.00



Pole Steel Properties:

Element	Joint	Joint	Rel. Outer	Area	T-Moment	L-Moment	D/t	W/t	Fy	Fa	T-Moment	L-Moment

Label	Label	Position	Dist. (ft)	Diam. (in)	(in^2)	Inertia (in^4)	Inertia (in^4)		Max. (ksi)		Min. (ksi)	Capacity (ft-k)	Capacity (ft-k)
LP	LP:t	LP:t Ori	0.00	30.44	30.27	3516.35	3516.35	0.00	23.4	65.00	65.00	1251.54	1251.54
LP	LP:SW	LP:SW End	1.50	30.60	30.43	3574.11	3574.11	0.00	23.6	65.00	65.00	1265.28	1265.28
LP	LP:SW	LP:SW Ori	1.50	30.60	30.43	3574.11	3574.11	0.00	23.6	65.00	65.00	1265.28	1265.28
LP	#LP:0	Tube 1 End	5.00	30.98	30.82	3711.33	3711.33	0.00	23.9	65.00	65.00	1297.62	1297.62
LP	#LP:0	Tube 1 Ori	5.00	30.98	30.82	3711.33	3711.33	0.00	23.9	65.00	65.00	1297.62	1297.62
LP	LP:ARM	LP:ARM End	8.50	31.37	31.20	3852.03	3852.03	0.00	24.2	65.00	65.00	1330.38	1330.38
LP	LP:ARM	LP:ARM Ori	8.50	31.37	31.20	3852.03	3852.03	0.00	24.2	65.00	65.00	1330.38	1330.38
LP	#LP:1	Tube 1 End	13.00	31.86	31.70	4038.09	4038.09	0.00	24.6	65.00	65.00	1373.09	1373.09
LP	#LP:1	Tube 1 Ori	13.00	31.86	31.70	4038.09	4038.09	0.00	24.6	65.00	65.00	1373.09	1373.09
LP	LP:B1	LP:B1 End	17.50	32.35	32.19	4230.04	4230.04	0.00	25.1	65.00	65.00	1416.48	1416.48
LP	LP:B1	LP:B1 Ori	17.50	32.35	32.19	4230.04	4230.04	0.00	25.1	65.00	65.00	1416.48	1416.48
LP	#LP:2	SpliceT End	20.00	32.62	32.47	4339.27	4339.27	0.00	25.3	65.00	65.00	1440.88	1440.88
LP	#LP:2	SpliceT Ori	20.00	32.63	32.47	4339.27	4339.27	0.00	25.3	65.00	65.00	1440.88	1440.88
LP	#LP:3	Tube 2 End	25.00	33.17	33.02	4563.32	4563.32	0.00	25.8	65.00	65.00	1490.30	1490.30
LP	#LP:3	Tube 2 Ori	25.00	33.17	33.02	4563.32	4563.32	0.00	25.8	65.00	65.00	1490.30	1490.30
LP	#LP:4	Tube 2 End	29.00	33.61	33.46	4748.02	4748.02	0.00	26.1	65.00	65.00	1530.43	1530.43
LP	#LP:4	Tube 2 Ori	29.00	33.61	33.46	4748.02	4748.02	0.00	26.1	65.00	65.00	1530.43	1530.43
LP	LP:B2	LP:B2 End	33.00	34.05	33.90	4937.64	4937.64	0.00	26.5	65.00	65.00	1571.10	1571.10
LP	LP:B2	LP:B2 Ori	33.00	34.05	33.90	4937.64	4937.64	0.00	26.5	65.00	65.00	1571.10	1571.10
LP	#LP:5	Tube 2 End	38.00	34.59	34.45	5181.67	5181.67	0.00	27.0	65.00	65.00	1622.68	1622.68
LP	#LP:5	Tube 2 Ori	38.00	34.59	34.45	5181.67	5181.67	0.00	27.0	65.00	65.00	1622.68	1622.68
LP	#LP:6	Tube 2 End	43.00	35.14	35.00	5433.62	5433.62	0.00	27.5	65.00	65.00	1675.10	1675.10
LP	#LP:6	Tube 2 Ori	43.00	35.14	35.00	5433.62	5433.62	0.00	27.5	65.00	65.00	1675.10	1675.10
LP	#LP:7	Tube 2 End	48.00	35.69	35.55	5693.61	5693.61	0.00	27.9	65.00	65.00	1728.35	1728.35
LP	#LP:7	Tube 2 Ori	48.00	35.69	35.55	5693.61	5693.61	0.00	27.9	65.00	65.00	1728.35	1728.35
LP	#LP:8	Tube 2 End	53.00	36.23	36.09	5961.75	5961.75	0.00	28.4	65.00	65.00	1782.44	1782.44
LP	#LP:8	Tube 2 Ori	53.00	36.23	36.09	5961.75	5961.75	0.00	28.4	65.00	65.00	1782.44	1782.44
LP	#LP:9	Tube 2 End	56.50	36.62	36.48	6154.38	6154.38	0.00	28.7	65.00	65.00	1820.79	1820.79
LP	#LP:9	Tube 2 Ori	56.50	36.62	36.48	6154.38	6154.38	0.00	28.7	65.00	65.00	1820.79	1820.79
LP	LP:g	LP:g End	60.00	37.00	36.86	6351.12	6351.12	0.00	29.0	65.00	65.00	1859.56	1859.56
RP	RP:t	RP:t Ori	0.00	27.00	21.50	1969.53	1969.53	0.00	26.3	65.00	65.00	790.24	790.24
RP	RP:AN1	RP:AN1 End	4.00	27.44	21.86	2068.07	2068.07	0.00	26.7	65.00	65.00	816.51	816.51
RP	RP:AN1	RP:AN1 Ori	4.00	27.44	21.86	2068.07	2068.07	0.00	26.7	65.00	65.00	816.51	816.51
RP	#RP:10	Tube 1 End	7.00	27.77	22.12	2144.09	2144.09	0.00	27.1	65.00	65.00	836.49	836.49
RP	#RP:10	Tube 1 Ori	7.00	27.77	22.12	2144.09	2144.09	0.00	27.1	65.00	65.00	836.49	836.49
RP	RP:AN2	RP:AN2 End	10.00	28.10	22.38	2221.95	2221.95	0.00	27.4	65.00	65.00	856.71	856.71
RP	RP:AN2	RP:AN2 Ori	10.00	28.10	22.38	2221.95	2221.95	0.00	27.4	65.00	65.00	856.71	856.71
RP	#RP:11	Tube 1 End	15.00	28.65	22.83	2355.87	2355.87	0.00	28.0	65.00	65.00	890.95	890.95
RP	#RP:11	Tube 1 Ori	15.00	28.65	22.83	2355.87	2355.87	0.00	28.0	65.00	65.00	890.95	890.95
RP	RP:AN3	RP:AN3 End	20.00	29.19	23.27	2495.07	2495.07	0.00	28.6	65.00	65.00	925.86	925.86
RP	RP:AN3	RP:AN3 Ori	20.00	29.19	23.27	2495.07	2495.07	0.00	28.6	65.00	65.00	925.86	925.86
RP	#RP:12	Tube 1 End	25.00	29.74	23.71	2639.64	2639.64	0.00	29.2	65.00	65.00	961.44	961.44
RP	#RP:12	Tube 1 Ori	25.00	29.74	23.71	2639.64	2639.64	0.00	29.2	65.00	65.00	961.44	961.44
RP	RP:AN4	RP:AN4 End	30.00	30.29	24.15	2789.69	2789.69	0.00	29.8	65.00	65.05	998.48	998.48
RP	RP:AN4	RP:AN4 Ori	30.00	30.42	30.25	3509.06	3509.06	0.00	23.4	65.00	65.00	1249.80	1249.80
RP	RP:SW	RP:SW End	31.50	30.58	30.41	3566.92	3566.92	0.00	23.5	65.00	65.00	1263.57	1263.57
RP	RP:SW	RP:SW Ori	31.50	30.58	30.41	3566.92	3566.92	0.00	23.5	65.00	65.00	1263.57	1263.57
RP	#RP:13	Tube 2 End	35.00	30.97	30.80	3704.41	3704.41	0.00	23.9	65.00	65.00	1296.00	1296.00
RP	#RP:13	Tube 2 Ori	35.00	30.97	30.80	3704.41	3704.41	0.00	23.9	65.00	65.00	1296.00	1296.00
RP	RP:ARM	RP:ARM End	38.50	31.35	31.19	3845.38	3845.38	0.00	24.2	65.00	65.00	1328.84	1328.84
RP	RP:ARM	RP:ARM Ori	38.50	31.35	31.19	3845.38	3845.38	0.00	24.2	65.00	65.00	1328.84	1328.84
RP	RP:AN5	RP:AN5 End	40.00	31.51	31.35	3906.87	3906.87	0.00	24.3	65.00	65.00	1343.04	1343.04
RP	RP:AN5	RP:AN5 Ori	40.00	31.51	31.35	3906.87	3906.87	0.00	24.3	65.00	65.00	1343.04	1343.04
RP	#RP:14	Tube 2 End	43.75	31.93	31.76	4063.47	4063.47	0.00	24.7	65.00	65.00	1378.87	1378.87
RP	#RP:14	Tube 2 Ori	43.75	31.93	31.76	4063.47	4063.47	0.00	24.7	65.00	65.00	1378.87	1378.87

RP	RP:B1	RP:B1 End	47.50	32.34	32.18	4224.20	4224.20	0.00	25.0	65.00	65.00	1415.17	1415.17
RP	RP:B1	RP:B1 Ori	47.50	32.34	32.18	4224.20	4224.20	0.00	25.0	65.00	65.00	1415.17	1415.17
RP	RP:AN6	RP:AN6 End	50.00	32.61	32.45	4333.67	4333.67	0.00	25.3	65.00	65.00	1439.63	1439.63
RP	RP:AN6	RP:AN6 Ori	50.00	32.61	32.45	4333.67	4333.67	0.00	25.3	65.00	65.00	1439.63	1439.63
RP	#RP:15	Tube 3 End	55.00	33.16	33.01	4558.26	4558.26	0.00	25.8	65.00	65.00	1489.19	1489.19
RP	#RP:15	Tube 3 Ori	55.00	33.16	33.01	4558.26	4558.26	0.00	25.8	65.00	65.00	1489.19	1489.19
RP	RP:AN7	RP:AN7 End	60.00	33.71	33.56	4790.48	4790.48	0.00	26.2	65.00	65.00	1539.58	1539.58
RP	RP:AN7	RP:AN7 Ori	60.00	33.71	33.56	4790.48	4790.48	0.00	26.2	65.00	65.00	1539.58	1539.58
RP	RP:B2	RP:B2 End	63.00	34.04	33.89	4933.52	4933.52	0.00	26.5	65.00	65.00	1570.22	1570.22
RP	RP:B2	RP:B2 Ori	63.00	34.04	33.89	4933.52	4933.52	0.00	26.5	65.00	65.00	1570.22	1570.22
RP	#RP:16	Tube 3 End	66.50	34.42	34.27	5103.98	5103.98	0.00	26.8	65.00	65.00	1606.35	1606.35
RP	#RP:16	Tube 3 Ori	66.50	34.42	34.27	5103.98	5103.98	0.00	26.8	65.00	65.00	1606.35	1606.35
RP	RP:AN8	RP:AN8 End	70.00	34.81	34.66	5278.31	5278.31	0.00	27.2	65.00	65.00	1642.89	1642.89
RP	RP:AN8	RP:AN8 Ori	70.00	34.81	34.66	5278.31	5278.31	0.00	27.2	65.00	65.00	1642.89	1642.89
RP	#RP:17	Tube 3 End	75.00	35.35	35.21	5534.18	5534.18	0.00	27.6	65.00	65.00	1695.80	1695.80
RP	#RP:17	Tube 3 Ori	75.00	35.35	35.21	5534.18	5534.18	0.00	27.6	65.00	65.00	1695.80	1695.80
RP	RP:AN9	RP:AN9 End	80.00	35.90	35.76	5798.18	5798.18	0.00	28.1	65.00	65.00	1749.55	1749.55
RP	RP:AN9	RP:AN9 Ori	80.00	35.90	35.76	5798.18	5798.18	0.00	28.1	65.00	65.00	1749.55	1749.55
RP	#RP:18	Tube 3 End	85.00	36.45	36.31	6070.45	6070.45	0.00	28.6	65.00	65.00	1804.13	1804.13
RP	#RP:18	Tube 3 Ori	85.00	36.45	36.31	6070.45	6070.45	0.00	28.6	65.00	65.00	1804.13	1804.13
RP	RP:g	RP:g End	90.00	37.00	36.86	6351.12	6351.12	0.00	29.0	65.00	65.00	1859.56	1859.56

Brace Properties:

Brace Label	Stock Number	Cross Section	Length	Depth	Width	Weight	Unit Wt. (If Unknown)	Modulus of Elasticity	Drag Coef.	Strength Check Type	Use Steel S.F.	Tension Capacity	Compres. Capacity	Net Area	Design Normal Stress	X-Moment Of Inertia	Z-Moment Of Inertia	Unbraced Length Ratio-X	Unbraced Length Ratio-Z	Texture
		Area																		
		(in^2)	(ft)	(in)	(in)	(lbs)	(lbs/ft)	(ksi)				(lbs)	(lbs)	(in^2)	(ksi)	(in^4)	(in^4)			
SQUARE TUBE - 5 x 5 x 1/4	16	4.3	0	5	5	0	15.97	29000	1.6	Calculated	Yes	0	0	3.443	50	16	16	0.5	0.5	

Brace Connectivity:

Brace Label	Origin Label	End Label	Brace Property Set	Element Type
BR1	LP:B1	RP:B2	SQUARE TUBE - 5 x 5 x 1/4	Standard
BR2	LP:B2	RP:B1	SQUARE TUBE - 5 x 5 x 1/4	Standard

Tubular Davit Properties:

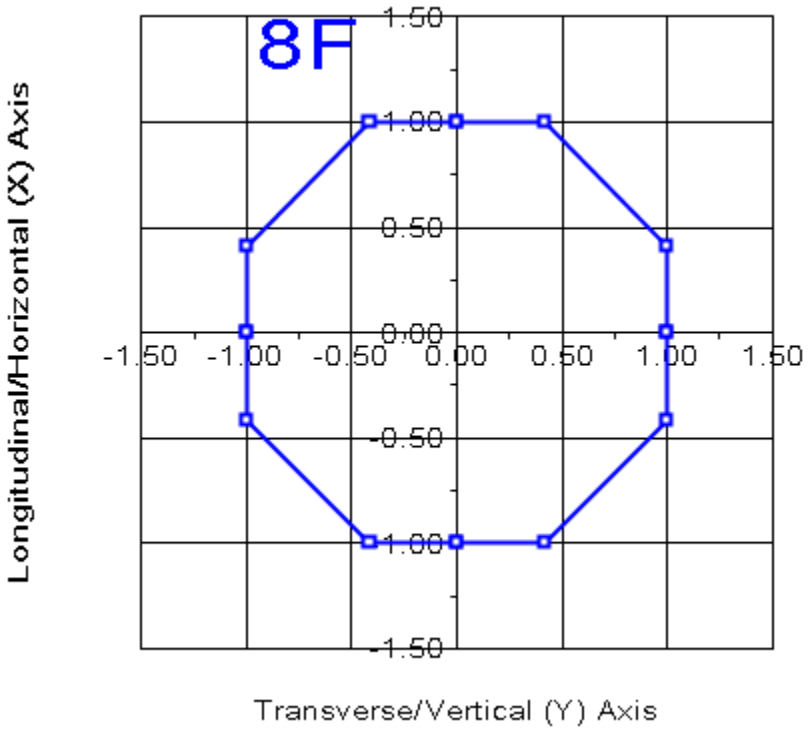
Davit Label	Stock Number	Steel Shape	Thickness (in)	Base Diameter or Depth (in)	Tip Diameter or Depth (in)	Taper (in/ft)	Drag Coef.	Modulus of Elasticity (ksi)	Geometry Type	Strength Check	Vertical Capacity (lbs)	Tension Capacity (lbs)	Compres. Capacity (lbs)	Long. Capacity (lbs)	Yield Stress (ksi)	Weight Override (lbs/ft^3)	Steel Texture Shape At End
7.5FT ARM	8F		0.25	15	8	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0	

Intermediate Joints for Davit Property "7.5FT ARM":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
T	6.44	0

Tubular Davit Arm Connectivity:

Davit Attach Label	Attach Label	Davit Property Set	Azimuth (deg)
A1	LP:ARM 7.5FT ARM		180
A2	RP:ARM 7.5FT ARM		0



Tubular Davit Arm Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	V-Moment Inertia (in^4)	H-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	V-Moment Capacity (ft-k)	H-Moment Capacity (ft-k)

A1	A1:O	Origin	0.00	15.00	12.22	351.41	351.41	0.00	20.7	65.00	65.00	253.80	253.80
A1	#A1:0	End	3.22	11.50	9.32	155.95	155.95	0.00	14.9	65.00	65.00	146.91	146.91
A1	#A1:0	Origin	3.22	11.50	9.32	155.95	155.95	0.00	14.9	65.00	65.00	146.91	146.91
A1	A1:T	End	6.44	8.00	6.42	51.01	51.01	0.00	9.1	65.00	65.00	69.08	69.08
A2	A2:O	Origin	0.00	15.00	12.22	351.41	351.41	0.00	20.7	65.00	65.00	253.80	253.80
A2	#A2:0	End	3.22	11.50	9.32	155.95	155.95	0.00	14.9	65.00	65.00	146.91	146.91
A2	#A2:0	Origin	3.22	11.50	9.32	155.95	155.95	0.00	14.9	65.00	65.00	146.91	146.91
A2	A2:T	End	6.44	8.00	6.42	51.01	51.01	0.00	9.1	65.00	65.00	69.08	69.08

Tubular X-Arm Properties:

Cross Arm Property Label	Stock Number	Steel Shape	Thickness (in)	Diameter or Depth (in)	Length (ft)	Modulus of Elasticity (ksi)	Drag Coef.	Geometry	Strength Check Type	Vertical Capacity (lbs)	Trans. Capacity (lbs)	Long. Capacity (lbs)	Steel Yield Stress (ksi)	Weight Density Override (lbs/ft^3)	Texture
001-X arm		8F	0.25	13	15.5	29000	1.3	1 point	Calculated	0	0	0	65	0	

Joints Relative to the Origin for Cross Arm Property "001-X arm":

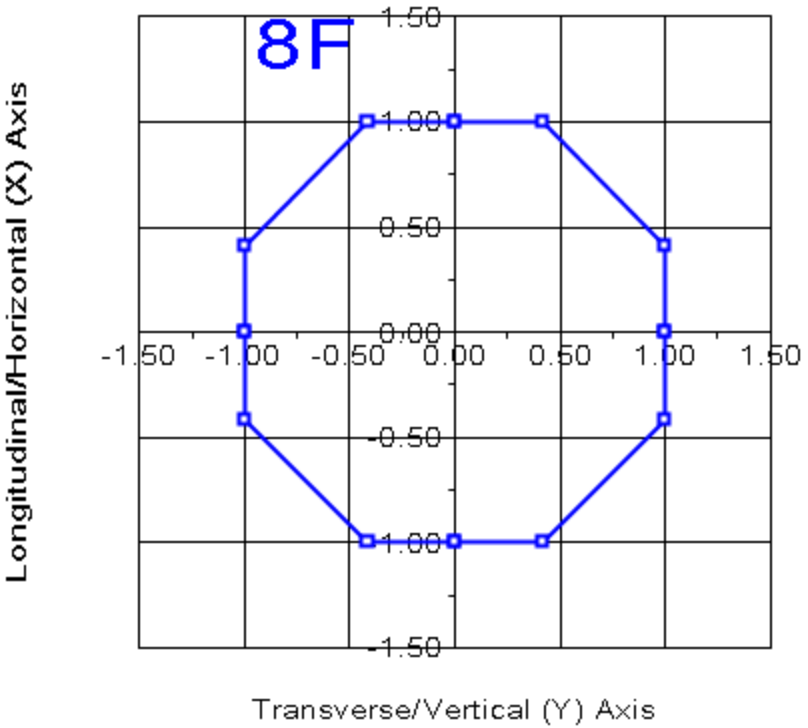
Joint Label	Offset (ft)
C2	7.75

Tubular X-Arm Connectivity:

X-Arm Label	X-Arm Property Set	Azimuth (deg)	Slope (deg)	Attach. Labels	Connects
X1	001-X arm	0	0		3 connections

X-Arm Connections for "X1":

Attach Label	Offset (ft)	Connect At	Connection Code Type
X1:O	0.000	LP:ARM	Fixed
X1:C2	7.750		
X1:E	15.500	RP:ARM	Fixed



Tubular X-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)
X1	X1:O	Origin	0.00	13.00	10.56	226.99	226.99	0.00	17.4	65.00	65.00	189.16	189.16
X1	#sX1:0	End	3.88	13.00	10.56	226.99	226.99	0.00	17.4	65.00	65.00	189.16	189.16
X1	#sX1:0	Origin	3.88	13.00	10.56	226.99	226.99	0.00	17.4	65.00	65.00	189.16	189.16
X1	X1:C2	End	7.75	13.00	10.56	226.99	226.99	0.00	17.4	65.00	65.00	189.16	189.16
X1	X1:C2	Origin	7.75	13.00	10.56	226.99	226.99	0.00	17.4	65.00	65.00	189.16	189.16
X1	#sX1:1	End	11.63	13.00	10.56	226.99	226.99	0.00	17.4	65.00	65.00	189.16	189.16
X1	#sX1:1	Origin	11.63	13.00	10.56	226.99	226.99	0.00	17.4	65.00	65.00	189.16	189.16
X1	X1:E	End	15.50	13.00	10.56	226.99	226.99	0.00	17.4	65.00	65.00	189.16	189.16

*** Insulator Data

Clamp Properties:

Label	Stock Number	Holding Capacity (lbs)	Hardware Capacity (lbs)	Notes

CLAMP	5e+04	0

Clamp Insulator Connectivity:

Clamp Label	Structure And Tip Attach	Property Set	Min. Required Vertical Load (uplift) (lbs)
1	LP:SW	CLAMP	No Limit
2	RP:SW	CLAMP	No Limit
3	RP:AN1	CLAMP	No Limit
4	RP:AN2	CLAMP	No Limit
5	RP:AN3	CLAMP	No Limit
6	RP:AN4	CLAMP	No Limit
7	RP:AN5	CLAMP	No Limit
8	RP:AN6	CLAMP	No Limit
9	RP:AN7	CLAMP	No Limit
10	RP:AN8	CLAMP	No Limit
11	RP:AN9	CLAMP	No Limit

Suspension Properties:

Label	Stock Number	Length (ft)	Weight (lbs)	Wind Area (ft^2)	Tension Capacity (lbs)	Top Rect Width (ft)	Top Rect Height (ft)	Bot. Rect Width (ft)	Bot. Rect Height (ft)	Vert. Rect Width (ft)	Vert. Rect Height (ft)	Hardware Notes Capacity (lbs)	Draw Rigid
COND INS		4	50	2	3e+04	0	0	0	0	0	0	Sheds	No

Suspension Insulator Connectivity:

Suspension Label	Structure Attach	Tip Label	Property Set	Cond. 1 Minimum Swing (deg)	Cond. 1 Maximum Swing (deg)	Cond. 2 Minimum Swing (deg)	Cond. 2 Maximum Swing (deg)	Cond. 3 Minimum Swing (deg)	Cond. 3 Maximum Swing (deg)	Cond. 4 Minimum Swing (deg)	Cond. 4 Maximum Swing (deg)	Min. Required Vertical Load (uplift) (lbs)
C1	A1:T	C1 COND INS		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	No Limit
C2	X1:C2	C2 COND INS		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	No Limit
C3	A2:T	C3 COND INS		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	No Limit

*** Loads Data

Loads from file: J:\Jobs\2100500.WI\41_CTNL463A_CT54XC775\05_Structural\Tower Analysis\Backup Documentation\Rev (2)\Calcs\PLS-Pole\005&006-23-22435.lca

Insulator dead and wind loads are calculated by the program and are not 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)	90.00 (ft)	
Structure height	90.00 (ft)	
Structure height above ground	90.00 (ft)	

Vector Load Cases:

Load Case Description	Dead Load	Wind Area	SF for Steel Poles Deflection	SF for Wood Poles Deflection	SF for Conc. Poles	SF for Conc. Poles	SF for Guys and Tubular Arms	SF for Non Tubular Arms	SF for Braces and Towers	SF for Insuls.	SF For Hardware	Point Found.	Wind/Ice Loads	Trans. Wind Pressure	Longit. Wind Pressure	Ice Thick.	Ice Density	Temperature	Pole Ult. Check	Pole First Crack	Zero Tens.	Cables	Limit	Model
			Factor	Factor										(psf)	(psf)	(in)	(lbs/ft^3)	(deg F)		% or (ft)			
NESC HEAVY (250B)	1.5000	2.5000	1.00000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	14 loads	Wind on All										
4	0	0.500	57.000		0.0	No Limit		0																
NESC EXT. WIND (250C)	1.0000	1.0000	1.00000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	14 loads	NESC 2023										
37	0	0.000	57.000		60.0	No Limit		0																
NESC EXT. ICE (250D)	1.0000	1.0000	1.00000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	14 loads	Wind on All										
6.4	0	0.750	57.000		15.0	No Limit		0																
NESC HEAVY (250B) (-)	1.5000	2.5000	1.00000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	14 loads	Wind on All										
-4	0	0.500	57.000		0.0	No Limit		0																
NESC EXT. WIND (250C)(-)	1.0000	1.0000	1.00000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	14 loads	NESC 2023										
-37	0	0.000	57.000		60.0	No Limit		0																
NESC EXT. ICE (250D)(-)	1.0000	1.0000	1.00000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	14 loads	Wind on All										
-6.4	0	0.750	57.000		15.0	No Limit		0																

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

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
LP:SW	2980.47	1720.01	0	
C1	17348.3	5741.25	0	
C2	17348.3	5741.25	0	
C3	17348.3	5741.25	0	
RP:SW	2980.47	1720.01	0	
RP:AN1	5612	1652	0	Antennas
RP:AN2	1380	172	0	Coax

RP:AN3	1380	172	0	Coax
RP:AN4	1380	172	0	Coax
RP:AN5	1380	172	0	Coax
RP:AN6	1380	172	0	Coax
RP:AN7	1380	172	0	Coax
RP:AN8	1380	172	0	Coax
RP:AN9	1380	172	0	Coax

Detailed Pole Loading Data for Load Case "NESC HEAVY (250B)":

Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.
Wind load is calculated for the undeformed shape of a pole.

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Ice Vertical Load (lbs)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
LP	LP:t	LP:SW	60.00	58.50	59.25	30.520	1.44e+06	1.300	10.00	0.50	232.38	49.60	29.13	1.63	51.22	0.00
LP	LP:SW		58.50	55.00	56.75	30.793	1.46e+06	1.300	10.00	0.50	547.14	116.76	68.59	3.79	120.55	0.00
LP		LP:ARM	55.00	51.50	53.25	31.176	1.48e+06	1.300	10.00	0.50	554.01	118.21	69.44	3.79	122.01	0.00
LP	LP:ARM		51.50	47.00	49.25	31.613	1.5e+06	1.300	10.00	0.50	722.40	154.12	90.53	4.88	159.00	0.00
LP		LP:B1	47.00	42.50	44.75	32.105	1.52e+06	1.300	10.00	0.50	733.76	156.52	91.94	4.88	161.40	0.00
LP	LP:B1		42.50	40.00	41.25	32.488	1.54e+06	1.300	10.00	0.50	412.55	87.99	51.69	2.71	90.70	0.00
LP			40.00	35.00	37.50	32.898	1.56e+06	1.300	10.00	0.50	835.62	178.21	104.68	5.42	183.63	0.00
LP			35.00	31.00	33.00	33.391	1.58e+06	1.300	10.00	0.50	678.59	144.70	85.00	4.33	149.03	0.00
LP		LP:B2	31.00	27.00	29.00	33.828	1.6e+06	1.300	10.00	0.50	687.57	146.60	86.11	4.33	150.93	0.00
LP	LP:B2		27.00	22.00	24.50	34.320	1.62e+06	1.300	10.00	0.50	872.08	185.91	109.20	5.42	191.33	0.00
LP			22.00	17.00	19.50	34.867	1.65e+06	1.300	10.00	0.50	886.11	188.87	110.94	5.42	194.29	0.00
LP			17.00	12.00	14.50	35.414	1.68e+06	1.300	10.00	0.50	900.13	191.84	112.68	5.42	197.25	0.00
LP			12.00	7.00	9.50	35.961	1.7e+06	1.300	10.00	0.50	914.15	194.80	114.42	5.42	200.22	0.00
LP			7.00	3.50	5.25	36.426	1.72e+06	1.300	10.00	0.50	648.25	138.12	81.13	3.79	141.91	0.00
LP		LP:g	3.50	0.00	1.75	36.809	1.74e+06	1.300	10.00	0.50	655.12	139.57	81.98	3.79	143.37	0.00
RP	RP:t	RP:AN1	90.00	86.00	88.00	27.219	1.29e+06	1.600	10.00	0.50	442.62	145.18	69.29	5.33	150.51	0.00
RP	RP:AN1		86.00	83.00	84.50	27.603	1.31e+06	1.600	10.00	0.50	336.69	110.42	52.70	4.00	114.42	0.00
RP		RP:AN2	83.00	80.00	81.50	27.933	1.32e+06	1.600	10.00	0.50	340.74	111.74	53.33	4.00	115.74	0.00
RP	RP:AN2		80.00	75.00	77.50	28.372	1.34e+06	1.600	10.00	0.50	576.91	189.15	90.28	6.67	195.82	0.00
RP		RP:AN3	75.00	70.00	72.50	28.920	1.37e+06	1.600	10.00	0.50	588.16	192.81	92.02	6.67	199.48	0.00
RP	RP:AN3		70.00	65.00	67.50	29.469	1.4e+06	1.600	10.00	0.50	599.42	196.47	93.77	6.67	203.14	0.00
RP		RP:AN4	65.00	60.00	62.50	30.017	1.42e+06	1.600	10.00	0.50	610.67	200.13	95.51	6.67	206.79	0.00
RP	RP:AN4	RP:SW	60.00	58.50	59.25	30.499	1.44e+06	1.600	10.00	0.50	232.21	61.00	29.11	2.00	63.00	0.00
RP	RP:SW		58.50	55.00	56.75	30.773	1.46e+06	1.600	10.00	0.50	546.79	143.62	68.54	4.67	148.28	0.00
RP		RP:ARM	55.00	51.50	53.25	31.157	1.48e+06	1.600	10.00	0.50	553.68	145.41	69.40	4.67	150.08	0.00
RP	RP:ARM	RP:AN5	51.50	50.00	50.75	31.432	1.49e+06	1.600	10.00	0.50	239.40	62.87	30.00	2.00	64.87	0.00
RP	RP:AN5		50.00	46.25	48.13	31.720	1.5e+06	1.600	10.00	0.50	604.04	158.61	75.70	5.00	163.61	0.00
RP		RP:B1	46.25	42.50	44.38	32.131	1.52e+06	1.600	10.00	0.50	611.96	160.66	76.68	5.00	165.66	0.00
RP	RP:B1	RP:AN6	42.50	40.00	41.25	32.474	1.54e+06	1.600	10.00	0.50	412.37	108.25	51.66	3.33	111.59	0.00
RP	RP:AN6		40.00	35.00	37.50	32.885	1.56e+06	1.600	10.00	0.50	835.29	219.25	104.64	6.67	225.91	0.00
RP		RP:AN7	35.00	30.00	32.50	33.434	1.58e+06	1.600	10.00	0.50	849.35	222.91	106.38	6.67	229.57	0.00
RP	RP:AN7	RP:B2	30.00	27.00	28.50	33.873	1.6e+06	1.600	10.00	0.50	516.37	135.50	64.67	4.00	139.50	0.00
RP	RP:B2		27.00	23.50	25.25	34.230	1.62e+06	1.600	10.00	0.50	608.83	159.75	76.24	4.67	164.41	0.00
RP		RP:AN8	23.50	20.00	21.75	34.614	1.64e+06	1.600	10.00	0.50	615.72	161.54	77.10	4.67	166.21	0.00
RP	RP:AN8		20.00	15.00	17.50	35.080	1.66e+06	1.600	10.00	0.50	891.56	233.88	111.62	6.67	240.55	0.00
RP		RP:AN9	15.00	10.00	12.50	35.628	1.69e+06	1.600	10.00	0.50	905.63	237.54	113.37	6.67	244.20	0.00
RP	RP:AN9		10.00	5.00	7.50	36.177	1.71e+06	1.600	10.00	0.50	919.70	241.19	115.11	6.67	247.86	0.00
RP		RP:g	5.00	0.00	2.50	36.726	1.74e+06	1.600	10.00	0.50	933.76	244.85	116.86	6.67	251.52	0.00

Point Loads for Load Case "NESC EXT. WIND (250C)":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
LP:SW	775.2	2224.61	0	
C1	7240.76	11144.9	0	
C2	7240.76	11144.9	0	
C3	7240.76	11144.9	0	
RP:SW	775.2	2224.61	0	
RP:AN1	3001	5633	0	Antennas
RP:AN2	374	561	0	Coax
RP:AN3	374	561	0	Coax
RP:AN4	374	561	0	Coax
RP:AN5	374	561	0	Coax
RP:AN6	374	561	0	Coax
RP:AN7	374	561	0	Coax
RP:AN8	374	561	0	Coax
RP:AN9	374	561	0	Coax

Detailed Pole Loading Data for Load Case "NESC EXT. WIND (250C)":

Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.
Wind load is calculated for the undeformed shape of a pole.

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Ice Vertical Load (lbs)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
LP	LP:t	LP:SW	60.00	58.50	59.25	30.520	2.72e+06	1.000	35.50	0.00	154.92	135.44	0.00	0.00	135.44	0.00
LP	LP:SW		58.50	55.00	56.75	30.793	2.75e+06	1.000	35.50	0.00	364.76	318.87	0.00	0.00	318.87	0.00
LP		LP:ARM	55.00	51.50	53.25	31.176	2.78e+06	1.000	35.50	0.00	369.34	322.83	0.00	0.00	322.83	0.00
LP	LP:ARM		51.50	47.00	49.25	31.613	2.82e+06	1.000	35.50	0.00	481.60	420.90	0.00	0.00	420.90	0.00
LP		LP:B1	47.00	42.50	44.75	32.105	2.86e+06	1.000	35.50	0.00	489.17	427.45	0.00	0.00	427.45	0.00
LP	LP:B1		42.50	40.00	41.25	32.488	2.9e+06	1.000	35.50	0.00	275.03	240.30	0.00	0.00	240.30	0.00
LP			40.00	35.00	37.50	32.898	2.93e+06	1.000	35.50	0.00	557.08	486.67	0.00	0.00	486.67	0.00
LP			35.00	31.00	33.00	33.391	2.98e+06	1.000	35.50	0.00	452.40	395.16	0.00	0.00	395.16	0.00
LP		LP:B2	31.00	27.00	29.00	33.828	3.02e+06	1.000	35.50	0.00	458.38	400.34	0.00	0.00	400.34	0.00
LP	LP:B2		27.00	22.00	24.50	34.320	3.06e+06	1.000	35.50	0.00	581.39	507.71	0.00	0.00	507.71	0.00
LP			22.00	17.00	19.50	34.867	3.11e+06	1.000	35.50	0.00	590.74	515.80	0.00	0.00	515.80	0.00
LP			17.00	12.00	14.50	35.414	3.16e+06	1.000	35.50	0.00	600.09	523.89	0.00	0.00	523.89	0.00
LP			12.00	7.00	9.50	35.961	3.21e+06	1.000	35.50	0.00	609.44	531.98	0.00	0.00	531.98	0.00
LP			7.00	3.50	5.25	36.426	3.25e+06	1.000	35.50	0.00	432.17	377.20	0.00	0.00	377.20	0.00
LP		LP:g	3.50	0.00	1.75	36.809	3.28e+06	1.000	35.50	0.00	436.75	381.16	0.00	0.00	381.16	0.00
RP	RP:t	RP:AN1	90.00	86.00	88.00	27.219	2.43e+06	1.000	35.50	0.00	295.08	322.13	0.00	0.00	322.13	0.00
RP	RP:AN1		86.00	83.00	84.50	27.603	2.46e+06	1.000	35.50	0.00	224.46	245.01	0.00	0.00	245.01	0.00
RP		RP:AN2	83.00	80.00	81.50	27.933	2.49e+06	1.000	35.50	0.00	227.16	247.93	0.00	0.00	247.93	0.00
RP	RP:AN2		80.00	75.00	77.50	28.372	2.53e+06	1.000	35.50	0.00	384.61	419.71	0.00	0.00	419.71	0.00
RP		RP:AN3	75.00	70.00	72.50	28.920	2.58e+06	1.000	35.50	0.00	392.11	427.82	0.00	0.00	427.82	0.00
RP	RP:AN3		70.00	65.00	67.50	29.469	2.63e+06	1.000	35.50	0.00	399.61	435.94	0.00	0.00	435.94	0.00
RP		RP:AN4	65.00	60.00	62.50	30.017	2.68e+06	1.000	35.50	0.00	407.12	444.05	0.00	0.00	444.05	0.00
RP	RP:AN4	RP:SW	60.00	58.50	59.25	30.499	2.72e+06	1.000	35.50	0.00	154.80	135.35	0.00	0.00	135.35	0.00
RP	RP:SW		58.50	55.00	56.75	30.773	2.75e+06	1.000	35.50	0.00	364.52	318.67	0.00	0.00	318.67	0.00
RP		RP:ARM	55.00	51.50	53.25	31.157	2.78e+06	1.000	35.50	0.00	369.12	322.64	0.00	0.00	322.64	0.00
RP	RP:ARM	RP:AN5	51.50	50.00	50.75	31.432	2.8e+06	1.000	35.50	0.00	159.60	139.49	0.00	0.00	139.49	0.00
RP	RP:AN5		50.00	46.25	48.13	31.720	2.83e+06	1.000	35.50	0.00	402.70	351.93	0.00	0.00	351.93	0.00
RP		RP:B1	46.25	42.50	44.38	32.131	2.87e+06	1.000	35.50	0.00	407.97	356.49	0.00	0.00	356.49	0.00
RP	RP:B1	RP:AN6	42.50	40.00	41.25	32.474	2.9e+06	1.000	35.50	0.00	274.91	240.20	0.00	0.00	240.20	0.00
RP	RP:AN6		40.00	35.00	37.50	32.885	2.93e+06	1.000	35.50	0.00	556.86	486.48	0.00	0.00	486.48	0.00

RP	RP:AN7	35.00	30.00	32.50	33.434	2.98e+06	1.000	35.50	0.00	566.24	494.60	0.00	0.00	494.60	0.00
RP	RP:AN7 RP:B2	30.00	27.00	28.50	33.873	3.02e+06	1.000	35.50	0.00	344.24	300.65	0.00	0.00	300.65	0.00
RP	RP:B2	27.00	23.50	25.25	34.230	3.05e+06	1.000	35.50	0.00	405.88	354.46	0.00	0.00	354.46	0.00
RP	RP:AN8	23.50	20.00	21.75	34.614	3.09e+06	1.000	35.50	0.00	410.48	358.43	0.00	0.00	358.43	0.00
RP	RP:AN8	20.00	15.00	17.50	35.080	3.13e+06	1.000	35.50	0.00	594.37	518.94	0.00	0.00	518.94	0.00
RP	RP:AN9	15.00	10.00	12.50	35.628	3.18e+06	1.000	35.50	0.00	603.75	527.06	0.00	0.00	527.06	0.00
RP	RP:AN9	10.00	5.00	7.50	36.177	3.23e+06	1.000	35.50	0.00	613.13	535.18	0.00	0.00	535.18	0.00
RP	RP:g	5.00	0.00	2.50	36.726	3.28e+06	1.000	35.50	0.00	622.51	543.29	0.00	0.00	543.29	0.00

Point Loads for Load Case "NESC EXT. ICE (250D)":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
LP:SW	4256.16	1240.78	0	
C1	18005.1	3726.95	0	
C2	18005.1	3726.95	0	
C3	18005.1	3726.95	0	
RP:SW	4256.16	1240.78	0	
RP:AN1	4374	1158	0	Antennas
RP:AN2	1275	114	0	Coax
RP:AN3	1275	114	0	Coax
RP:AN4	1275	114	0	Coax
RP:AN5	1275	114	0	Coax
RP:AN6	1275	114	0	Coax
RP:AN7	1275	114	0	Coax
RP:AN8	1275	114	0	Coax
RP:AN9	1275	114	0	Coax

Detailed Pole Loading Data for Load Case "NESC EXT. ICE (250D)":

Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.
Wind load is calculated for the undeformed shape of a pole.

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Ice Vertical Load (lbs)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
LP	LP:t	LP:SW	60.00	58.50	59.25	30.520	1.16e+06	1.300	6.40	0.75	154.92	31.74	43.70	1.56	33.30	0.00
LP	LP:SW		58.50	55.00	56.75	30.793	1.17e+06	1.300	6.40	0.75	364.76	74.73	102.88	3.64	78.37	0.00
LP		LP:ARM	55.00	51.50	53.25	31.176	1.18e+06	1.300	6.40	0.75	369.34	75.66	104.16	3.64	79.30	0.00
LP	LP:ARM		51.50	47.00	49.25	31.613	1.2e+06	1.300	6.40	0.75	481.60	98.65	135.80	4.68	103.33	0.00
LP		LP:B1	47.00	42.50	44.75	32.105	1.22e+06	1.300	6.40	0.75	489.17	100.18	137.91	4.68	104.86	0.00
LP	LP:B1		42.50	40.00	41.25	32.488	1.23e+06	1.300	6.40	0.75	275.03	56.32	77.53	2.60	58.92	0.00
LP			40.00	35.00	37.50	32.898	1.25e+06	1.300	6.40	0.75	557.08	114.06	157.02	5.20	119.26	0.00
LP			35.00	31.00	33.00	33.391	1.26e+06	1.300	6.40	0.75	452.40	92.62	127.49	4.16	96.78	0.00
LP		LP:B2	31.00	27.00	29.00	33.828	1.28e+06	1.300	6.40	0.75	458.38	93.83	129.17	4.16	97.99	0.00
LP	LP:B2		27.00	22.00	24.50	34.320	1.3e+06	1.300	6.40	0.75	581.39	118.99	163.81	5.20	124.19	0.00
LP			22.00	17.00	19.50	34.867	1.32e+06	1.300	6.40	0.75	590.74	120.89	166.42	5.20	126.09	0.00
LP			17.00	12.00	14.50	35.414	1.34e+06	1.300	6.40	0.75	600.09	122.78	169.03	5.20	127.99	0.00
LP			12.00	7.00	9.50	35.961	1.36e+06	1.300	6.40	0.75	609.44	124.68	171.64	5.20	129.88	0.00
LP			7.00	3.50	5.25	36.426	1.38e+06	1.300	6.40	0.75	432.17	88.40	121.70	3.64	92.05	0.00
LP		LP:g	3.50	0.00	1.75	36.809	1.39e+06	1.300	6.40	0.75	436.75	89.33	122.98	3.64	92.97	0.00
RP	RP:t	RP:AN1	90.00	86.00	88.00	27.219	1.03e+06	1.600	6.40	0.75	295.08	92.92	103.93	5.12	98.04	0.00
RP	RP:AN1		86.00	83.00	84.50	27.603	1.05e+06	1.600	6.40	0.75	224.46	70.67	79.05	3.84	74.51	0.00
RP		RP:AN2	83.00	80.00	81.50	27.933	1.06e+06	1.600	6.40	0.75	227.16	71.52	79.99	3.84	75.36	0.00
RP	RP:AN2		80.00	75.00	77.50	28.372	1.07e+06	1.600	6.40	0.75	384.61	121.07	135.41	6.40	127.47	0.00

RP	RP:AN3	75.00	70.00	72.50	28.920	1.1e+06	1.600	6.40	0.75	392.11	123.41	138.03	6.40	129.81	0.00
RP	RP:AN3	70.00	65.00	67.50	29.469	1.12e+06	1.600	6.40	0.75	399.61	125.75	140.65	6.40	132.15	0.00
RP	RP:AN4	65.00	60.00	62.50	30.017	1.14e+06	1.600	6.40	0.75	407.12	128.09	143.27	6.40	134.49	0.00
RP	RP:AN4 RP:SW	60.00	58.50	59.25	30.499	1.16e+06	1.600	6.40	0.75	154.80	39.04	43.67	1.92	40.96	0.00
RP	RP:SW	58.50	55.00	56.75	30.773	1.17e+06	1.600	6.40	0.75	364.52	91.92	102.81	4.48	96.40	0.00
RP	RP:ARM	55.00	51.50	53.25	31.157	1.18e+06	1.600	6.40	0.75	369.12	93.07	104.10	4.48	97.55	0.00
RP	RP:ARM RP:AN5	51.50	50.00	50.75	31.432	1.19e+06	1.600	6.40	0.75	159.60	40.24	45.01	1.92	42.16	0.00
RP	RP:AN5	50.00	46.25	48.13	31.720	1.2e+06	1.600	6.40	0.75	402.70	101.52	113.54	4.80	106.32	0.00
RP	RP:B1	46.25	42.50	44.38	32.131	1.22e+06	1.600	6.40	0.75	407.97	102.83	115.02	4.80	107.63	0.00
RP	RP:B1 RP:AN6	42.50	40.00	41.25	32.474	1.23e+06	1.600	6.40	0.75	274.91	69.29	77.50	3.20	72.49	0.00
RP	RP:AN6	40.00	35.00	37.50	32.885	1.25e+06	1.600	6.40	0.75	556.86	140.33	156.96	6.40	146.73	0.00
RP	RP:AN7	35.00	30.00	32.50	33.434	1.27e+06	1.600	6.40	0.75	566.24	142.67	159.58	6.40	149.07	0.00
RP	RP:AN7 RP:B2	30.00	27.00	28.50	33.873	1.28e+06	1.600	6.40	0.75	344.24	86.73	97.00	3.84	90.57	0.00
RP	RP:B2	27.00	23.50	25.25	34.230	1.3e+06	1.600	6.40	0.75	405.88	102.25	114.36	4.48	106.73	0.00
RP	RP:AN8	23.50	20.00	21.75	34.614	1.31e+06	1.600	6.40	0.75	410.48	103.39	115.64	4.48	107.87	0.00
RP	RP:AN8	20.00	15.00	17.50	35.080	1.33e+06	1.600	6.40	0.75	594.37	149.69	167.43	6.40	156.09	0.00
RP	RP:AN9	15.00	10.00	12.50	35.628	1.35e+06	1.600	6.40	0.75	603.75	152.03	170.05	6.40	158.44	0.00
RP	RP:AN9	10.00	5.00	7.50	36.177	1.37e+06	1.600	6.40	0.75	613.13	154.38	172.67	6.40	160.78	0.00
RP	RP:g	5.00	0.00	2.50	36.726	1.39e+06	1.600	6.40	0.75	622.51	156.72	175.29	6.40	163.12	0.00

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

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
LP:SW	2980.47	-1720.01	0	
C1	17348.3	-5741.25	0	
C2	17348.3	-5741.25	0	
C3	17348.3	-5741.25	0	
RP:SW	2980.47	-1720.01	0	
RP:AN1	5612	-1652	0	Antennas
RP:AN2	1380	-172	0	Coax
RP:AN3	1380	-172	0	Coax
RP:AN4	1380	-172	0	Coax
RP:AN5	1380	-172	0	Coax
RP:AN6	1380	-172	0	Coax
RP:AN7	1380	-172	0	Coax
RP:AN8	1380	-172	0	Coax
RP:AN9	1380	-172	0	Coax

Detailed Pole Loading Data for Load Case "NESC HEAVY (250B) (-)":

Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.
Wind load is calculated for the undeformed shape of a pole.

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Ice Vertical Load (lbs)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
LP	LP:t	LP:SW	60.00	58.50	59.25	30.520	1.44e+06	1.300	10.00	0.50	232.38	49.60	29.13	1.63	-51.22	0.00
LP	LP:SW		58.50	55.00	56.75	30.793	1.46e+06	1.300	10.00	0.50	547.14	116.76	68.59	3.79	-120.55	0.00
LP		LP:ARM	55.00	51.50	53.25	31.176	1.48e+06	1.300	10.00	0.50	554.01	118.21	69.44	3.79	-122.01	0.00
LP	LP:ARM		51.50	47.00	49.25	31.613	1.5e+06	1.300	10.00	0.50	722.40	154.12	90.53	4.88	-159.00	0.00
LP		LP:B1	47.00	42.50	44.75	32.105	1.52e+06	1.300	10.00	0.50	733.76	156.52	91.94	4.88	-161.40	0.00
LP	LP:B1		42.50	40.00	41.25	32.488	1.54e+06	1.300	10.00	0.50	412.55	87.99	51.69	2.71	-90.70	0.00
LP			40.00	35.00	37.50	32.898	1.56e+06	1.300	10.00	0.50	835.62	178.21	104.68	5.42	-183.63	0.00
LP			35.00	31.00	33.00	33.391	1.58e+06	1.300	10.00	0.50	678.59	144.70	85.00	4.33	-149.03	0.00

LP	LP:B2	31.00	27.00	29.00	33.828	1.6e+06	1.300	10.00	0.50	687.57	146.60	86.11	4.33	-150.93	0.00
LP	LP:B2	27.00	22.00	24.50	34.320	1.62e+06	1.300	10.00	0.50	872.08	185.91	109.20	5.42	-191.33	0.00
LP		22.00	17.00	19.50	34.867	1.65e+06	1.300	10.00	0.50	886.11	188.87	110.94	5.42	-194.29	0.00
LP		17.00	12.00	14.50	35.414	1.68e+06	1.300	10.00	0.50	900.13	191.84	112.68	5.42	-197.25	0.00
LP		12.00	7.00	9.50	35.961	1.7e+06	1.300	10.00	0.50	914.15	194.80	114.42	5.42	-200.22	0.00
LP		7.00	3.50	5.25	36.426	1.72e+06	1.300	10.00	0.50	648.25	138.12	81.13	3.79	-141.91	0.00
LP	LP:g	3.50	0.00	1.75	36.809	1.74e+06	1.300	10.00	0.50	655.12	139.57	81.98	3.79	-143.37	0.00
RP	RP:t RP:AN1	90.00	86.00	88.00	27.219	1.29e+06	1.600	10.00	0.50	442.62	145.18	69.29	5.33	-150.51	0.00
RP	RP:AN1	86.00	83.00	84.50	27.603	1.31e+06	1.600	10.00	0.50	336.69	110.42	52.70	4.00	-114.42	0.00
RP	RP:AN2	83.00	80.00	81.50	27.933	1.32e+06	1.600	10.00	0.50	340.74	111.74	53.33	4.00	-115.74	0.00
RP	RP:AN2	80.00	75.00	77.50	28.372	1.34e+06	1.600	10.00	0.50	576.91	189.15	90.28	6.67	-195.82	0.00
RP	RP:AN3	75.00	70.00	72.50	28.920	1.37e+06	1.600	10.00	0.50	588.16	192.81	92.02	6.67	-199.48	0.00
RP	RP:AN3	70.00	65.00	67.50	29.469	1.4e+06	1.600	10.00	0.50	599.42	196.47	93.77	6.67	-203.14	0.00
RP	RP:AN4	65.00	60.00	62.50	30.017	1.42e+06	1.600	10.00	0.50	610.67	200.13	95.51	6.67	-206.79	0.00
RP	RP:AN4 RP:SW	60.00	58.50	59.25	30.499	1.44e+06	1.600	10.00	0.50	232.21	61.00	29.11	2.00	-63.00	0.00
RP	RP:SW	58.50	55.00	56.75	30.773	1.46e+06	1.600	10.00	0.50	546.79	143.62	68.54	4.67	-148.28	0.00
RP	RP:ARM	55.00	51.50	53.25	31.157	1.48e+06	1.600	10.00	0.50	553.68	145.41	69.40	4.67	-150.08	0.00
RP	RP:ARM RP:AN5	51.50	50.00	50.75	31.432	1.49e+06	1.600	10.00	0.50	239.40	62.87	30.00	2.00	-64.87	0.00
RP	RP:AN5	50.00	46.25	48.13	31.720	1.5e+06	1.600	10.00	0.50	604.04	158.61	75.70	5.00	-163.61	0.00
RP	RP:B1	46.25	42.50	44.38	32.131	1.52e+06	1.600	10.00	0.50	611.96	160.66	76.68	5.00	-165.66	0.00
RP	RP:B1 RP:AN6	42.50	40.00	41.25	32.474	1.54e+06	1.600	10.00	0.50	412.37	108.25	51.66	3.33	-111.59	0.00
RP	RP:AN6	40.00	35.00	37.50	32.885	1.56e+06	1.600	10.00	0.50	835.29	219.25	104.64	6.67	-225.91	0.00
RP	RP:AN7	35.00	30.00	32.50	33.434	1.58e+06	1.600	10.00	0.50	849.35	222.91	106.38	6.67	-229.57	0.00
RP	RP:AN7 RP:B2	30.00	27.00	28.50	33.873	1.6e+06	1.600	10.00	0.50	516.37	135.50	64.67	4.00	-139.50	0.00
RP	RP:B2	27.00	23.50	25.25	34.230	1.62e+06	1.600	10.00	0.50	608.83	159.75	76.24	4.67	-164.41	0.00
RP	RP:AN8	23.50	20.00	21.75	34.614	1.64e+06	1.600	10.00	0.50	615.72	161.54	77.10	4.67	-166.21	0.00
RP	RP:AN8	20.00	15.00	17.50	35.080	1.66e+06	1.600	10.00	0.50	891.56	233.88	111.62	6.67	-240.55	0.00
RP	RP:AN9	15.00	10.00	12.50	35.628	1.69e+06	1.600	10.00	0.50	905.63	237.54	113.37	6.67	-244.20	0.00
RP	RP:AN9	10.00	5.00	7.50	36.177	1.71e+06	1.600	10.00	0.50	919.70	241.19	115.11	6.67	-247.86	0.00
RP	RP:g	5.00	0.00	2.50	36.726	1.74e+06	1.600	10.00	0.50	933.76	244.85	116.86	6.67	-251.52	0.00

Point Loads for Load Case "NESC EXT. WIND (250C)(-)":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
LP:SW	775.2	-2224.61	0	
C1	7240.76	-11144.9	0	
C2	7240.76	-11144.9	0	
C3	7240.76	-11144.9	0	
RP:SW	775.2	-2224.61	0	
RP:AN1	3001	-5633	0	Antennas
RP:AN2	374	-561	0	Coax
RP:AN3	374	-561	0	Coax
RP:AN4	374	-561	0	Coax
RP:AN5	374	-561	0	Coax
RP:AN6	374	-561	0	Coax
RP:AN7	374	-561	0	Coax
RP:AN8	374	-561	0	Coax
RP:AN9	374	-561	0	Coax

Detailed Pole Loading Data for Load Case "NESC EXT. WIND (250C)(-)":

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	Section Bottom	Section Average	Outer Diameter	Reynolds Number	Drag Coef.	Adjusted Wind	Adjusted Ice	Pole Vert.	Pole Wind	Pole Ice Vertical	Pole Ice Wind	Tran. Wind	Long. Wind

			Z (ft)	Z Elevation (ft)	(in)			Pressure (psf)	Thickness (in)	Load (lbs)	Load (lbs)	Load (lbs)	Load (lbs)	Load (lbs)	Load (lbs)
LP	LP:t	LP:SW	60.00	58.50	59.25	30.520	2.72e+06 1.000	35.50	0.00	154.92	135.44	0.00	0.00	-135.44	0.00
LP	LP:SW		58.50	55.00	56.75	30.793	2.75e+06 1.000	35.50	0.00	364.76	318.87	0.00	0.00	-318.87	0.00
LP		LP:ARM	55.00	51.50	53.25	31.176	2.78e+06 1.000	35.50	0.00	369.34	322.83	0.00	0.00	-322.83	0.00
LP	LP:ARM		51.50	47.00	49.25	31.613	2.82e+06 1.000	35.50	0.00	481.60	420.90	0.00	0.00	-420.90	0.00
LP		LP:B1	47.00	42.50	44.75	32.105	2.86e+06 1.000	35.50	0.00	489.17	427.45	0.00	0.00	-427.45	0.00
LP	LP:B1		42.50	40.00	41.25	32.488	2.9e+06 1.000	35.50	0.00	275.03	240.30	0.00	0.00	-240.30	0.00
LP			40.00	35.00	37.50	32.898	2.93e+06 1.000	35.50	0.00	557.08	486.67	0.00	0.00	-486.67	0.00
LP			35.00	31.00	33.00	33.391	2.98e+06 1.000	35.50	0.00	452.40	395.16	0.00	0.00	-395.16	0.00
LP		LP:B2	31.00	27.00	29.00	33.828	3.02e+06 1.000	35.50	0.00	458.38	400.34	0.00	0.00	-400.34	0.00
LP	LP:B2		27.00	22.00	24.50	34.320	3.06e+06 1.000	35.50	0.00	581.39	507.71	0.00	0.00	-507.71	0.00
LP			22.00	17.00	19.50	34.867	3.11e+06 1.000	35.50	0.00	590.74	515.80	0.00	0.00	-515.80	0.00
LP			17.00	12.00	14.50	35.414	3.16e+06 1.000	35.50	0.00	600.09	523.89	0.00	0.00	-523.89	0.00
LP			12.00	7.00	9.50	35.961	3.21e+06 1.000	35.50	0.00	609.44	531.98	0.00	0.00	-531.98	0.00
LP			7.00	3.50	5.25	36.426	3.25e+06 1.000	35.50	0.00	432.17	377.20	0.00	0.00	-377.20	0.00
LP		LP:g	3.50	0.00	1.75	36.809	3.28e+06 1.000	35.50	0.00	436.75	381.16	0.00	0.00	-381.16	0.00
RP	RP:t	RP:AN1	90.00	86.00	88.00	27.219	2.43e+06 1.000	35.50	0.00	295.08	322.13	0.00	0.00	-322.13	0.00
RP	RP:AN1		86.00	83.00	84.50	27.603	2.46e+06 1.000	35.50	0.00	224.46	245.01	0.00	0.00	-245.01	0.00
RP		RP:AN2	83.00	80.00	81.50	27.933	2.49e+06 1.000	35.50	0.00	227.16	247.93	0.00	0.00	-247.93	0.00
RP	RP:AN2		80.00	75.00	77.50	28.372	2.53e+06 1.000	35.50	0.00	384.61	419.71	0.00	0.00	-419.71	0.00
RP		RP:AN3	75.00	70.00	72.50	28.920	2.58e+06 1.000	35.50	0.00	392.11	427.82	0.00	0.00	-427.82	0.00
RP	RP:AN3		70.00	65.00	67.50	29.469	2.63e+06 1.000	35.50	0.00	399.61	435.94	0.00	0.00	-435.94	0.00
RP		RP:AN4	65.00	60.00	62.50	30.017	2.68e+06 1.000	35.50	0.00	407.12	444.05	0.00	0.00	-444.05	0.00
RP	RP:AN4	RP:SW	60.00	58.50	59.25	30.499	2.72e+06 1.000	35.50	0.00	154.80	135.35	0.00	0.00	-135.35	0.00
RP	RP:SW		58.50	55.00	56.75	30.773	2.75e+06 1.000	35.50	0.00	364.52	318.67	0.00	0.00	-318.67	0.00
RP		RP:ARM	55.00	51.50	53.25	31.157	2.78e+06 1.000	35.50	0.00	369.12	322.64	0.00	0.00	-322.64	0.00
RP	RP:ARM	RP:AN5	51.50	50.00	50.75	31.432	2.8e+06 1.000	35.50	0.00	159.60	139.49	0.00	0.00	-139.49	0.00
RP	RP:AN5		50.00	46.25	48.13	31.720	2.83e+06 1.000	35.50	0.00	402.70	351.93	0.00	0.00	-351.93	0.00
RP		RP:B1	46.25	42.50	44.38	32.131	2.87e+06 1.000	35.50	0.00	407.97	356.49	0.00	0.00	-356.49	0.00
RP	RP:B1	RP:AN6	42.50	40.00	41.25	32.474	2.9e+06 1.000	35.50	0.00	274.91	240.20	0.00	0.00	-240.20	0.00
RP	RP:AN6		40.00	35.00	37.50	32.885	2.93e+06 1.000	35.50	0.00	556.86	486.48	0.00	0.00	-486.48	0.00
RP		RP:AN7	35.00	30.00	32.50	33.434	2.98e+06 1.000	35.50	0.00	566.24	494.60	0.00	0.00	-494.60	0.00
RP	RP:AN7	RP:B2	30.00	27.00	28.50	33.873	3.02e+06 1.000	35.50	0.00	344.24	300.65	0.00	0.00	-300.65	0.00
RP	RP:B2		27.00	23.50	25.25	34.230	3.05e+06 1.000	35.50	0.00	405.88	354.46	0.00	0.00	-354.46	0.00
RP		RP:AN8	23.50	20.00	21.75	34.614	3.09e+06 1.000	35.50	0.00	410.48	358.43	0.00	0.00	-358.43	0.00
RP	RP:AN8		20.00	15.00	17.50	35.080	3.13e+06 1.000	35.50	0.00	594.37	518.94	0.00	0.00	-518.94	0.00
RP		RP:AN9	15.00	10.00	12.50	35.628	3.18e+06 1.000	35.50	0.00	603.75	527.06	0.00	0.00	-527.06	0.00
RP	RP:AN9		10.00	5.00	7.50	36.177	3.23e+06 1.000	35.50	0.00	613.13	535.18	0.00	0.00	-535.18	0.00
RP		RP:g	5.00	0.00	2.50	36.726	3.28e+06 1.000	35.50	0.00	622.51	543.29	0.00	0.00	-543.29	0.00

Point Loads for Load Case "NESC EXT. ICE (250D)(-)":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
LP:SW	4256.16	-1240.78	0	
C1	18005.1	-3726.95	0	
C2	18005.1	-3726.95	0	
C3	18005.1	-3726.95	0	
RP:SW	4256.16	-1240.78	0	
RP:AN1	4374	-1158	0	Antennas
RP:AN2	1275	-114	0	Coax
RP:AN3	1275	-114	0	Coax
RP:AN4	1275	-114	0	Coax
RP:AN5	1275	-114	0	Coax
RP:AN6	1275	-114	0	Coax

RP:AN7	1275	-114	0	Coax
RP:AN8	1275	-114	0	Coax
RP:AN9	1275	-114	0	Coax

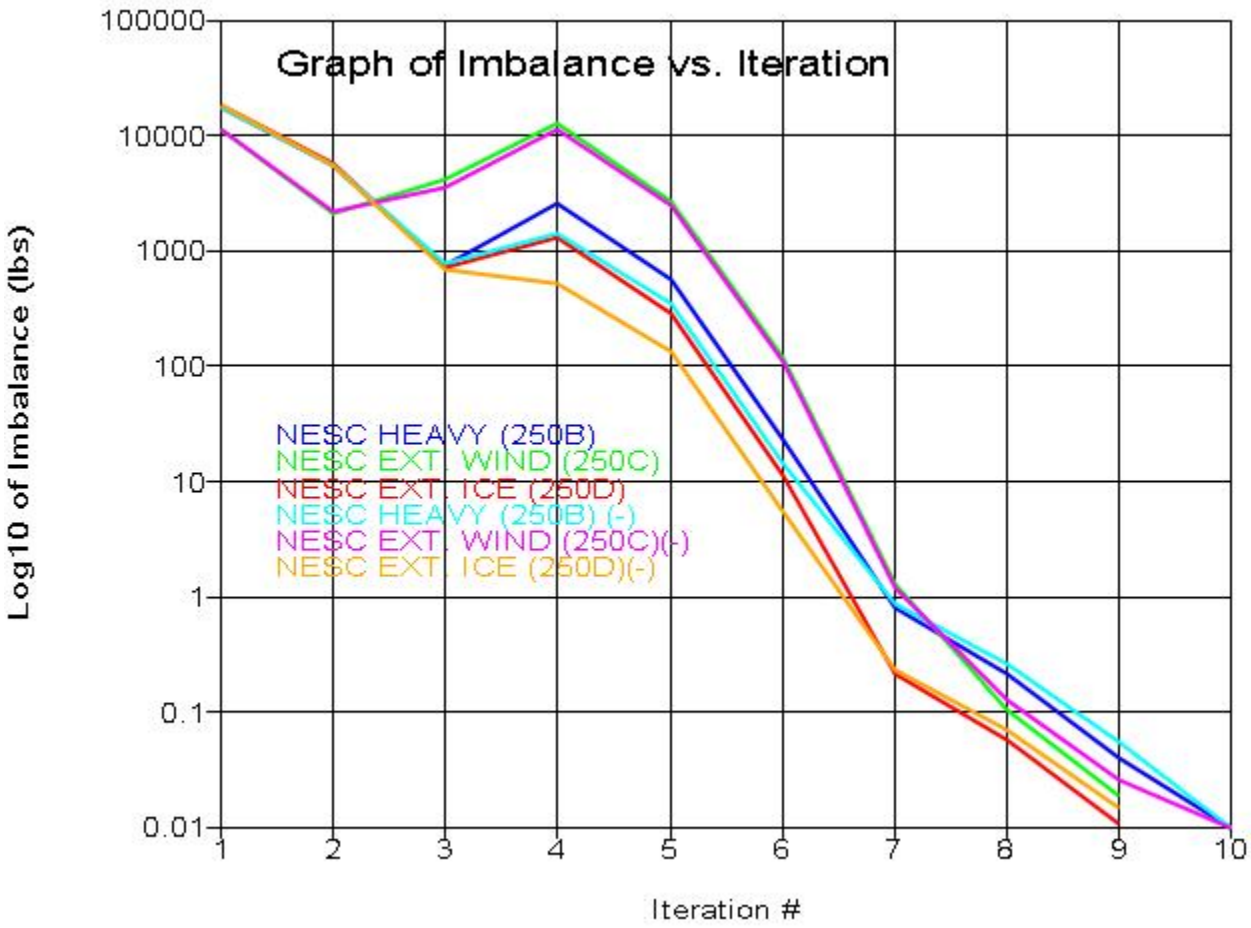
Detailed Pole Loading Data for Load Case "NESC EXT. ICE (250D)(-)":

Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.
Wind load is calculated for the undeformed shape of a pole.

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Ice Vertical Load (lbs)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
LP	LP:t	LP:SW	60.00	58.50	59.25	30.520	1.16e+06	1.300	6.40	0.75	154.92	31.74	43.70	1.56	-33.30	0.00
LP	LP:SW		58.50	55.00	56.75	30.793	1.17e+06	1.300	6.40	0.75	364.76	74.73	102.88	3.64	-78.37	0.00
LP		LP:ARM	55.00	51.50	53.25	31.176	1.18e+06	1.300	6.40	0.75	369.34	75.66	104.16	3.64	-79.30	0.00
LP	LP:ARM		51.50	47.00	49.25	31.613	1.2e+06	1.300	6.40	0.75	481.60	98.65	135.80	4.68	-103.33	0.00
LP		LP:B1	47.00	42.50	44.75	32.105	1.22e+06	1.300	6.40	0.75	489.17	100.18	137.91	4.68	-104.86	0.00
LP	LP:B1		42.50	40.00	41.25	32.488	1.23e+06	1.300	6.40	0.75	275.03	56.32	77.53	2.60	-58.92	0.00
LP			40.00	35.00	37.50	32.898	1.25e+06	1.300	6.40	0.75	557.08	114.06	157.02	5.20	-119.26	0.00
LP			35.00	31.00	33.00	33.391	1.26e+06	1.300	6.40	0.75	452.40	92.62	127.49	4.16	-96.78	0.00
LP		LP:B2	31.00	27.00	29.00	33.828	1.28e+06	1.300	6.40	0.75	458.38	93.83	129.17	4.16	-97.99	0.00
LP	LP:B2		27.00	22.00	24.50	34.320	1.3e+06	1.300	6.40	0.75	581.39	118.99	163.81	5.20	-124.19	0.00
LP			22.00	17.00	19.50	34.867	1.32e+06	1.300	6.40	0.75	590.74	120.89	166.42	5.20	-126.09	0.00
LP			17.00	12.00	14.50	35.414	1.34e+06	1.300	6.40	0.75	600.09	122.78	169.03	5.20	-127.99	0.00
LP			12.00	7.00	9.50	35.961	1.36e+06	1.300	6.40	0.75	609.44	124.68	171.64	5.20	-129.88	0.00
LP			7.00	3.50	5.25	36.426	1.38e+06	1.300	6.40	0.75	432.17	88.40	121.70	3.64	-92.05	0.00
LP		LP:g	3.50	0.00	1.75	36.809	1.39e+06	1.300	6.40	0.75	436.75	89.33	122.98	3.64	-92.97	0.00
RP	RP:t	RP:AN1	90.00	86.00	88.00	27.219	1.03e+06	1.600	6.40	0.75	295.08	92.92	103.93	5.12	-98.04	0.00
RP	RP:AN1		86.00	83.00	84.50	27.603	1.05e+06	1.600	6.40	0.75	224.46	70.67	79.05	3.84	-74.51	0.00
RP		RP:AN2	83.00	80.00	81.50	27.933	1.06e+06	1.600	6.40	0.75	227.16	71.52	79.99	3.84	-75.36	0.00
RP	RP:AN2		80.00	75.00	77.50	28.372	1.07e+06	1.600	6.40	0.75	384.61	121.07	135.41	6.40	-127.47	0.00
RP		RP:AN3	75.00	70.00	72.50	28.920	1.1e+06	1.600	6.40	0.75	392.11	123.41	138.03	6.40	-129.81	0.00
RP	RP:AN3		70.00	65.00	67.50	29.469	1.12e+06	1.600	6.40	0.75	399.61	125.75	140.65	6.40	-132.15	0.00
RP		RP:AN4	65.00	60.00	62.50	30.017	1.14e+06	1.600	6.40	0.75	407.12	128.09	143.27	6.40	-134.49	0.00
RP	RP:AN4	RP:SW	60.00	58.50	59.25	30.499	1.16e+06	1.600	6.40	0.75	154.80	39.04	43.67	1.92	-40.96	0.00
RP	RP:SW		58.50	55.00	56.75	30.773	1.17e+06	1.600	6.40	0.75	364.52	91.92	102.81	4.48	-96.40	0.00
RP		RP:ARM	55.00	51.50	53.25	31.157	1.18e+06	1.600	6.40	0.75	369.12	93.07	104.10	4.48	-97.55	0.00
RP	RP:ARM	RP:AN5	51.50	50.00	50.75	31.432	1.19e+06	1.600	6.40	0.75	159.60	40.24	45.01	1.92	-42.16	0.00
RP	RP:AN5		50.00	46.25	48.13	31.720	1.2e+06	1.600	6.40	0.75	402.70	101.52	113.54	4.80	-106.32	0.00
RP		RP:B1	46.25	42.50	44.38	32.131	1.22e+06	1.600	6.40	0.75	407.97	102.83	115.02	4.80	-107.63	0.00
RP	RP:B1	RP:AN6	42.50	40.00	41.25	32.474	1.23e+06	1.600	6.40	0.75	274.91	69.29	77.50	3.20	-72.49	0.00
RP	RP:AN6		40.00	35.00	37.50	32.885	1.25e+06	1.600	6.40	0.75	556.86	140.33	156.96	6.40	-146.73	0.00
RP		RP:AN7	35.00	30.00	32.50	33.434	1.27e+06	1.600	6.40	0.75	566.24	142.67	159.58	6.40	-149.07	0.00
RP	RP:AN7	RP:B2	30.00	27.00	28.50	33.873	1.28e+06	1.600	6.40	0.75	344.24	86.73	97.00	3.84	-90.57	0.00
RP	RP:B2		27.00	23.50	25.25	34.230	1.3e+06	1.600	6.40	0.75	405.88	102.25	114.36	4.48	-106.73	0.00
RP		RP:AN8	23.50	20.00	21.75	34.614	1.31e+06	1.600	6.40	0.75	410.48	103.39	115.64	4.48	-107.87	0.00
RP	RP:AN8		20.00	15.00	17.50	35.080	1.33e+06	1.600	6.40	0.75	594.37	149.69	167.43	6.40	-156.09	0.00
RP		RP:AN9	15.00	10.00	12.50	35.628	1.35e+06	1.600	6.40	0.75	603.75	152.03	170.05	6.40	-158.44	0.00
RP	RP:AN9		10.00	5.00	7.50	36.177	1.37e+06	1.600	6.40	0.75	613.13	154.38	172.67	6.40	-160.78	0.00
RP		RP:g	5.00	0.00	2.50	36.726	1.39e+06	1.600	6.40	0.75	622.51	156.72	175.29	6.40	-163.12	0.00

*** Analysis Results:

Maximum element usage is 55.14% for Brace "BR1" in load case "NESC EXT. WIND (250C)"
Maximum insulator usage is 61.46% for Suspension "C1" in load case "NESC EXT. ICE (250D)"



*** Analysis Results for Load Case No. 1 "NESC HEAVY (250B)" - Number of iterations in SAPS 10

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

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)
LP:g	0	0	0	0.0000	0.0000	0.0000	0	-7.75	0
LP:t	0.002853	0.07365	0.0005309	-0.0670	0.0039	-0.0007	0.002853	-7.676	60
LP:SW	0.002752	0.07189	0.0005321	-0.0670	0.0039	-0.0007	0.002752	-7.678	58.5

LP:ARM	0.002282	0.06381	0.000567	-0.0635	0.0038	-0.0007	0.002282	-7.686	51.5
LP:B1	0.001686	0.05116	0.000852	-0.0665	0.0037	-0.0006	0.001686	-7.699	42.5
LP:B2	0.0007746	0.03517	0.0007137	-0.0736	0.0029	-0.0003	0.0007746	-7.715	27
RP:g	0	0	0	0.0000	0.0000	0.0000	0	7.75	0
RP:t	0.006487	0.2529	-0.006136	-0.3254	0.0060	-0.0007	0.006487	8.003	89.99
RP:AN1	0.006069	0.2302	-0.006069	-0.3253	0.0060	-0.0007	0.006069	7.98	85.99
RP:AN2	0.005443	0.1963	-0.005913	-0.3205	0.0060	-0.0007	0.005443	7.946	79.99
RP:AN3	0.004412	0.1424	-0.005632	-0.2917	0.0058	-0.0007	0.004412	7.892	69.99
RP:AN4	0.003424	0.09577	-0.005353	-0.2364	0.0054	-0.0007	0.003424	7.846	59.99
RP:SW	0.003282	0.08967	-0.005317	-0.2281	0.0054	-0.0007	0.003282	7.84	58.49
RP:ARM	0.002644	0.06449	-0.005133	-0.1795	0.0050	-0.0007	0.002644	7.814	51.49
RP:AN5	0.002513	0.06004	-0.005045	-0.1602	0.0049	-0.0007	0.002513	7.81	49.99
RP:B1	0.001895	0.04522	-0.004611	-0.0661	0.0045	-0.0006	0.001895	7.795	42.5
RP:AN6	0.001702	0.04296	-0.004408	-0.0446	0.0043	-0.0005	0.001702	7.793	40
RP:AN7	0.001014	0.03833	-0.003586	-0.0322	0.0035	-0.0004	0.001014	7.788	30
RP:B2	0.0008352	0.03639	-0.003336	-0.0488	0.0033	-0.0003	0.0008352	7.786	27
RP:AN8	0.0004769	0.02678	-0.002469	-0.0961	0.0026	-0.0002	0.0004769	7.777	20
RP:AN9	0.0001267	0.009122	-0.001227	-0.0873	0.0014	-0.0001	0.0001267	7.759	9.999
A1:O	0.002265	0.06381	0.002015	-0.0635	0.0038	-0.0007	0.002265	-8.993	51.5
A1:T	0.002183	0.06405	-0.02812	0.4928	0.0038	-0.0007	0.002183	-15.43	51.47
A2:O	0.00266	0.06448	-0.009225	-0.1795	0.0050	-0.0007	0.00266	9.121	51.49
A2:T	0.002737	0.06435	-0.06647	-0.7327	0.0050	-0.0007	0.002737	15.56	51.43
X1:O	0.002282	0.06381	0.000567	-0.0635	0.0038	-0.0007	0.002282	-7.686	51.5
X1:C2	0.002462	0.06422	-0.006511	0.0262	0.0044	-0.0016	0.002462	0.06422	51.49
X1:E	0.002644	0.06449	-0.005133	-0.1795	0.0050	-0.0007	0.002644	7.814	51.49
BR1:O	0.001699	0.05116	-0.0007133	-0.0665	0.0037	-0.0006	0.001699	-6.351	42.5
BR1:E	0.0008268	0.03639	-0.002128	-0.0488	0.0033	-0.0003	0.0008268	6.368	27
BR2:O	0.0007828	0.03516	-0.001109	-0.0736	0.0029	-0.0003	0.0007828	-6.296	27
BR2:E	0.001881	0.04522	-0.003058	-0.0661	0.0045	-0.0006	0.001881	6.448	42.5

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

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 %
LP:g	-0.09	0.0	-12.79	0.0	0.0	24.63	0.0	0.0	27.75	0.0	227.57	0.0	-3.3	0.0	0.0	0.18	0.0	0.0
RP:g	-0.08	0.0	-17.31	0.0	0.0	-130.35	0.0	0.0	131.50	0.0	273.20	0.0	-3.3	0.0	0.0	0.19	0.0	0.0

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

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.
LP	LP:t	Origin	0.00	0.88	0.03	0.01	-0.00	0.00	0.0	-0.13	0.03	-0.00	-0.00	0.00	0.00	0.00	0.01	0.0	5
LP	LP:SW	End	1.50	0.86	0.03	0.01	0.04	-0.00	0.0	-0.13	0.03	-0.00	-0.00	0.00	0.00	0.00	0.01	0.0	2
LP	LP:SW	Origin	1.50	0.86	0.03	0.01	0.04	-0.00	-0.0	-3.55	1.84	-0.00	-0.12	0.00	0.12	0.00	0.24	0.4	5
LP	Tube 1	End	5.00	0.81	0.03	0.01	6.46	-0.01	-0.0	-3.55	1.84	-0.00	-0.12	0.32	0.03	0.00	0.44	0.7	2
LP	Tube 1	Origin	5.00	0.81	0.03	0.01	6.46	-0.01	-0.0	-4.17	1.96	-0.01	-0.14	0.32	0.03	0.00	0.46	0.7	2
LP	LP:ARM	End	8.50	0.77	0.03	0.01	13.31	-0.03	-0.0	-4.17	1.96	-0.01	-0.13	0.65	0.03	0.00	0.79	1.2	2
LP	LP:ARM	Origin	8.50	0.77	0.03	0.01	-112.87	-0.08	-0.2	-27.79	24.26	-0.04	-0.89	5.52	0.41	0.00	6.45	9.9	2
LP	Tube 1	End	13.00	0.69	0.02	0.01	-3.68	-0.24	-0.2	-27.79	24.26	-0.04	-0.88	0.01	1.56	0.00	2.84	4.4	5
LP	Tube 1	Origin	13.00	0.69	0.02	0.01	-3.68	-0.24	-0.2	-28.61	24.43	-0.04	-0.90	0.01	1.57	0.00	2.87	4.4	5
LP	LP:B1	End	17.50	0.61	0.02	0.01	106.23	-0.42	-0.2	-28.61	24.43	-0.04	-0.89	4.88	0.40	0.00	5.81	8.9	2
LP	LP:B1	Origin	17.50	0.61	0.02	0.01	52.93	-0.42	-0.2	10.28	-8.12	-0.04	0.32	2.43	0.13	0.00	2.76	4.3	2
LP	SpliceT	End	20.00	0.58	0.02	0.01	32.63	-0.54	-0.2	10.28	-8.12	-0.04	0.32	1.48	0.13	0.00	1.81	2.8	2
LP	SpliceT	Origin	20.00	0.58	0.02	0.01	32.63	-0.54	-0.2	9.58	-7.98	-0.05	0.29	1.48	0.13	0.00	1.79	2.8	2

LP	Tube 2	End	25.00	0.52	0.01	0.01	-7.26	-0.78	-0.2	9.58	-7.98	-0.05	0.29	0.12	0.47	0.00	0.93	1.4	4
LP	Tube 2	Origin	25.00	0.52	0.01	0.01	-7.26	-0.78	-0.2	8.72	-7.81	-0.05	0.26	0.12	0.47	0.00	0.90	1.4	4
LP	Tube 2	End	29.00	0.48	0.01	0.01	-38.51	-0.99	-0.2	8.72	-7.81	-0.05	0.26	1.65	0.12	0.00	1.92	3.0	2
LP	Tube 2	Origin	29.00	0.48	0.01	0.01	-38.51	-0.99	-0.2	7.95	-7.66	-0.06	0.24	1.65	0.12	0.00	1.90	2.9	2
LP	LP:B2	End	33.00	0.42	0.01	0.01	-69.16	-1.22	-0.2	7.95	-7.66	-0.06	0.23	2.87	0.12	0.00	3.12	4.8	2
LP	LP:B2	Origin	33.00	0.42	0.01	0.01	-102.06	-1.22	-0.2	30.27	11.77	-0.06	0.89	4.24	0.18	0.00	5.14	7.9	2
LP	Tube 2	End	38.00	0.33	0.01	0.01	-43.22	-1.54	-0.2	30.27	11.77	-0.06	0.88	1.75	0.18	0.00	2.65	4.1	2
LP	Tube 2	Origin	38.00	0.33	0.01	0.01	-43.22	-1.54	-0.2	29.28	11.96	-0.07	0.85	1.75	0.18	0.00	2.62	4.0	2
LP	Tube 2	End	43.00	0.23	0.00	0.01	16.56	-1.88	-0.2	29.28	11.96	-0.07	0.84	0.52	0.49	0.00	1.61	2.5	3
LP	Tube 2	Origin	43.00	0.23	0.00	0.01	16.56	-1.88	-0.2	28.27	12.16	-0.07	0.81	0.52	0.50	0.00	1.59	2.5	3
LP	Tube 2	End	48.00	0.13	0.00	0.00	77.34	-2.25	-0.2	28.27	12.16	-0.07	0.80	2.93	0.18	0.00	3.74	5.8	2
LP	Tube 2	Origin	48.00	0.13	0.00	0.00	77.34	-2.25	-0.2	27.25	12.37	-0.08	0.77	2.93	0.18	0.00	3.71	5.7	2
LP	Tube 2	End	53.00	0.05	0.00	0.00	139.17	-2.65	-0.2	27.25	12.37	-0.08	0.75	5.10	0.18	0.00	5.86	9.0	2
LP	Tube 2	Origin	53.00	0.05	0.00	0.00	139.17	-2.65	-0.2	26.36	12.55	-0.08	0.73	5.10	0.18	0.00	5.84	9.0	2
LP	Tube 2	End	56.50	0.01	0.00	0.00	183.10	-2.94	-0.2	26.36	12.55	-0.08	0.72	6.56	0.18	0.00	7.29	11.2	2
LP	Tube 2	Origin	56.50	0.01	0.00	0.00	183.10	-2.94	-0.2	25.63	12.71	-0.09	0.70	6.56	0.18	0.00	7.27	11.2	2
LP	LP:g	End	60.00	0.00	0.00	0.00	227.57	-3.25	-0.2	25.63	12.71	-0.09	0.70	7.99	0.18	0.00	8.69	13.4	2
RP	RP:t	Origin	0.00	3.04	0.08	-0.07	-0.00	-0.00	-0.0	-0.26	0.08	-0.00	-0.01	0.00	0.01	0.00	0.02	0.0	5
RP	RP:AN1	End	4.00	2.76	0.07	-0.07	0.31	-0.01	-0.0	-0.26	0.08	-0.00	-0.01	0.02	0.00	0.00	0.04	0.1	2
RP	RP:AN1	Origin	4.00	2.76	0.07	-0.07	0.31	-0.01	-0.0	-6.31	1.90	-0.01	-0.29	0.00	0.18	0.00	0.42	0.6	5
RP	Tube 1	End	7.00	2.56	0.07	-0.07	5.99	-0.03	-0.0	-6.31	1.90	-0.01	-0.29	0.47	0.05	0.00	0.76	1.2	2
RP	Tube 1	Origin	7.00	2.56	0.07	-0.07	5.99	-0.03	-0.0	-6.70	2.01	-0.01	-0.30	0.47	0.05	0.00	0.77	1.2	2
RP	RP:AN2	End	10.00	2.36	0.07	-0.07	12.03	-0.05	-0.0	-6.70	2.01	-0.01	-0.30	0.91	0.05	0.00	1.22	1.9	2
RP	RP:AN2	Origin	10.00	2.36	0.07	-0.07	12.03	-0.05	-0.0	-8.61	2.35	-0.01	-0.38	0.91	0.06	0.00	1.30	2.0	2
RP	Tube 1	End	15.00	2.02	0.06	-0.07	23.78	-0.12	-0.0	-8.61	2.35	-0.01	-0.38	1.74	0.05	0.00	2.12	3.3	2
RP	Tube 1	Origin	15.00	2.02	0.06	-0.07	23.78	-0.12	-0.0	-9.29	2.55	-0.02	-0.41	1.74	0.06	0.00	2.15	3.3	2
RP	RP:AN3	End	20.00	1.71	0.05	-0.07	36.53	-0.21	-0.0	-9.29	2.55	-0.02	-0.40	2.57	0.06	0.00	2.97	4.6	2
RP	RP:AN3	Origin	20.00	1.71	0.05	-0.07	36.53	-0.21	-0.0	-11.35	2.93	-0.02	-0.49	2.57	0.07	0.00	3.06	4.7	2
RP	Tube 1	End	25.00	1.41	0.05	-0.07	51.17	-0.33	-0.0	-11.35	2.93	-0.02	-0.48	3.47	0.07	0.00	3.95	6.1	2
RP	Tube 1	Origin	25.00	1.41	0.05	-0.07	51.17	-0.33	-0.0	-12.05	3.13	-0.03	-0.51	3.47	0.07	0.00	3.98	6.1	2
RP	RP:AN4	End	30.00	1.15	0.04	-0.06	66.83	-0.48	-0.0	-12.05	3.13	-0.03	-0.50	4.36	0.07	0.00	4.86	7.5	2
RP	RP:AN4	Origin	30.00	1.15	0.04	-0.06	66.83	-0.48	-0.0	-13.92	3.44	-0.03	-0.46	3.48	0.06	0.00	3.94	6.1	2
RP	RP:SW	End	31.50	1.08	0.04	-0.06	71.99	-0.53	-0.0	-13.92	3.44	-0.03	-0.46	3.71	0.06	0.00	4.17	6.4	2
RP	RP:SW	Origin	31.50	1.08	0.04	-0.06	71.99	-0.53	-0.0	-17.33	5.28	-0.04	-0.57	3.71	0.09	0.00	4.28	6.6	2
RP	Tube 2	End	35.00	0.92	0.04	-0.06	90.46	-0.66	-0.0	-17.33	5.28	-0.04	-0.56	4.55	0.09	0.00	5.11	7.9	2
RP	Tube 2	Origin	35.00	0.92	0.04	-0.06	90.46	-0.66	-0.0	-17.95	5.42	-0.04	-0.58	4.55	0.09	0.00	5.13	7.9	2
RP	RP:ARM	End	38.50	0.77	0.03	-0.06	109.43	-0.80	-0.0	-17.95	5.42	-0.04	-0.58	5.36	0.09	0.00	5.94	9.1	2
RP	RP:ARM	Origin	38.50	0.77	0.03	-0.06	174.20	-0.75	-0.2	-49.20	0.77	-0.02	-1.58	8.53	0.01	0.00	10.11	15.6	2
RP	RP:AN5	End	40.00	0.72	0.03	-0.06	175.35	-0.78	-0.2	-49.20	0.77	-0.02	-1.57	8.50	0.01	0.00	10.07	15.5	2
RP	RP:AN5	Origin	40.00	0.72	0.03	-0.06	175.35	-0.78	-0.2	-51.05	1.03	-0.02	-1.63	8.50	0.02	0.00	10.12	15.6	2
RP	Tube 2	End	43.75	0.61	0.03	-0.06	179.20	-0.87	-0.2	-51.05	1.03	-0.02	-1.61	8.46	0.02	0.00	10.07	15.5	2
RP	Tube 2	Origin	43.75	0.61	0.03	-0.06	179.20	-0.87	-0.2	-51.74	1.15	-0.03	-1.63	8.46	0.02	0.00	10.09	15.5	2
RP	RP:B1	End	47.50	0.54	0.02	-0.06	183.52	-0.98	-0.2	-51.74	1.15	-0.03	-1.61	8.44	0.02	0.00	10.05	15.5	2
RP	RP:B1	Origin	47.50	0.54	0.02	-0.06	151.56	-0.98	-0.2	-76.02	-17.96	-0.03	-2.36	6.97	0.29	0.00	9.35	14.4	2
RP	RP:AN6	End	50.00	0.52	0.02	-0.05	106.67	-1.06	-0.2	-76.02	-17.96	-0.03	-2.34	4.83	0.29	0.00	7.19	11.1	2
RP	RP:AN6	Origin	50.00	0.52	0.02	-0.05	106.67	-1.06	-0.2	-78.10	-17.64	-0.04	-2.41	4.83	0.29	0.00	7.25	11.2	2
RP	Tube 3	End	55.00	0.48	0.02	-0.05	18.45	-1.25	-0.2	-78.10	-17.64	-0.04	-2.37	0.63	0.77	0.00	3.28	5.1	3
RP	Tube 3	Origin	55.00	0.48	0.02	-0.05	18.45	-1.25	-0.2	-79.05	-17.42	-0.04	-2.39	0.63	0.76	0.00	3.30	5.1	3
RP	RP:AN7	End	60.00	0.46	0.01	-0.04	-68.66	-1.46	-0.2	-79.05	-17.42	-0.04	-2.36	2.92	0.27	0.00	5.29	8.1	2
RP	RP:AN7	Origin	60.00	0.46	0.01	-0.04	-68.66	-1.46	-0.2	-81.20	-17.05	-0.05	-2.42	2.92	0.27	0.00	5.36	8.2	2
RP	RP:B2	End	63.00	0.44	0.01	-0.04	-119.81	-1.61	-0.2	-81.20	-17.05	-0.05	-2.40	4.98	0.27	0.00	7.39	11.4	2
RP	RP:B2	Origin	63.00	0.44	0.01	-0.04	-176.50	-1.61	-0.2	-121.81	15.87	-0.05	-3.59	7.32	0.25	0.00	10.93	16.8	2
RP	Tube 3	End	66.50	0.39	0.01	-0.03	-120.95	-1.79	-0.2	-121.81	15.87	-0.05	-3.55	4.91	0.24	0.00	8.48	13.0	2
RP	Tube 3	Origin	66.50	0.39	0.01	-0.03	-120.95	-1.79	-0.2	-122.49	16.09	-0.06	-3.57	4.91	0.25	0.00	8.50	13.1	2
RP	RP:AN8	End	70.00	0.32	0.01	-0.03	-64.65	-1.98	-0.2	-122.49	16.09	-0.06	-3.53	2.58	0.25	0.00	6.13	9.4	2
RP	RP:AN8	Origin	70.00	0.32	0.01	-0.03	-64.65	-1.98	-0.2	-124.71	16.50	-0.06	-3.60	2.58	0.25	0.00	6.19	9.5	2
RP	Tube 3	End	75.00	0.21	0.00	-0.02	17.83	-2.28	-0.2	-124.71	16.50	-0.06	-3.54	0.56	0.68	0.00	4.27	6.6	3
RP	Tube 3	Origin	75.00	0.21	0.00	-0.02	17.83	-2.28	-0.2	-125.73	16.73	-0.07	-3.57	0.56	0.68	0.00	4.30	6.6	3

RP	RP:AN9	End	80.00	0.11	0.00	-0.01	101.48	-2.61	-0.2	-125.73	16.73	-0.07	-3.52	3.80	0.25	0.00	7.32	11.3	2
RP	RP:AN9	Origin	80.00	0.11	0.00	-0.01	101.48	-2.61	-0.2	-128.14	17.10	-0.07	-3.58	3.80	0.25	0.00	7.39	11.4	2
RP	Tube 3	End	85.00	0.03	0.00	-0.01	186.96	-2.96	-0.2	-128.14	17.10	-0.07	-3.53	6.76	0.25	0.00	10.30	15.9	2
RP	Tube 3	Origin	85.00	0.03	0.00	-0.01	186.96	-2.96	-0.2	-129.20	17.25	-0.08	-3.56	6.76	0.25	0.00	10.33	15.9	2
RP	RP:g	End	90.00	0.00	0.00	0.00	273.20	-3.34	-0.2	-129.20	17.25	-0.08	-3.50	9.58	0.25	0.00	13.09	20.1	2

Summary of Brace Forces and Usages for Load Case "NESC HEAVY (250B)":

Brace Label	Forces (kips)	Allowable Compression (kips)	Allowable Tension (kips)	Usage %
BR1	-51.47	178.44	172.12	28.85
BR2	30.33	178.44	172.12	17.62

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

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.
A1	A1:O	Origin	0.00	0.77	0.03	0.02	-113.29	0.01	0.0	-5.73	17.65	-0.00	-0.47	29.01	1.15	0.00	29.55	45.5	2
A1	#A1:0	End	3.22	0.77	0.03	-0.05	-56.44	0.00	0.0	-5.73	17.65	-0.00	-0.61	24.97	1.52	0.00	25.72	39.6	2
A1	#A1:0	Origin	3.22	0.77	0.03	-0.05	-56.44	0.00	-0.0	-5.63	17.53	-0.00	-0.60	24.97	1.51	0.00	25.71	39.6	2
A1	A1:T	End	6.44	0.77	0.03	-0.34	0.00	0.00	-0.0	-5.63	17.53	-0.00	-0.88	0.00	5.69	0.00	9.89	15.2	4
A2	A2:O	Origin	0.00	0.77	0.03	-0.11	-112.78	-0.01	-0.0	5.87	17.60	0.00	0.48	28.89	1.15	0.00	29.43	45.3	2
A2	#A2:0	End	3.22	0.77	0.03	-0.35	-56.09	-0.00	-0.0	5.87	17.60	0.00	0.63	24.82	1.51	0.00	25.58	39.4	2
A2	#A2:0	Origin	3.22	0.77	0.03	-0.35	-56.09	-0.00	-0.0	5.96	17.42	0.00	0.64	24.82	1.50	0.00	25.59	39.4	2
A2	A2:T	End	6.44	0.77	0.03	-0.80	-0.00	0.00	-0.0	5.96	17.42	0.00	0.93	0.00	5.65	0.00	9.83	15.1	4

Detailed Tubular X-Arm Usages for Load Case "NESC HEAVY (250B)":

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.
X1	X1:O	Origin	0.00	0.77	0.03	0.01	-10.27	-0.19	0.0	16.38	5.08	0.02	1.55	3.55	0.38	0.01	5.15	7.9	2
X1	#sX1:0	End	3.88	0.77	0.03	-0.05	9.43	-0.09	0.0	16.38	5.08	0.02	1.55	3.25	0.38	0.01	4.85	7.5	2
X1	#sX1:0	Origin	3.88	0.77	0.03	-0.05	9.43	-0.09	0.0	16.37	4.89	0.02	1.55	3.25	0.37	0.01	4.85	7.5	2
X1	X1:C2	End	7.75	0.77	0.03	-0.08	28.36	0.00	0.0	16.37	4.89	0.02	1.55	9.75	0.37	0.01	11.31	17.4	2
X1	X1:C2	Origin	7.75	0.77	0.03	-0.08	28.36	0.00	0.0	10.62	-12.73	0.02	1.01	9.75	0.96	0.01	10.88	16.7	2
X1	#sX1:1	End	11.63	0.77	0.03	-0.03	-20.96	0.09	0.0	10.62	-12.73	0.02	1.01	7.21	0.96	0.01	8.39	12.9	2
X1	#sX1:1	Origin	11.63	0.77	0.03	-0.03	-20.96	0.09	0.0	10.60	-12.95	0.02	1.00	7.21	0.98	0.01	8.39	12.9	2
X1	X1:E	End	15.50	0.77	0.03	-0.06	-71.16	0.18	0.0	10.60	-12.95	0.02	1.00	24.48	0.98	0.01	25.54	39.3	2

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
1	3.441	50.00	50.00	6.88	0.00	0.00	0.00	6.88
2	3.441	50.00	50.00	6.88	0.00	0.00	0.00	6.88
3	5.850	50.00	50.00	11.70	0.00	0.00	0.00	11.70
4	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78

5	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
6	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
7	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
8	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
9	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
10	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
11	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78

Summary of Suspension Capacities and Usages for Load Case "NESC HEAVY (250B)":

Suspension Label	Tension (kips)	Input Tension Capacity (kips)	Factored Tension Capacity (kips)	Tension Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
C1	18.351	30.00	30.00	61.17	0.00	0.00	0.00	61.17
C2	18.351	30.00	30.00	61.17	0.00	0.00	0.00	61.17
C3	18.351	30.00	30.00	61.17	0.00	0.00	0.00	61.17

*** Analysis Results for Load Case No. 2 "NESC EXT. WIND (250C)" - Number of iterations in SAPS 9

Equilibrium Joint Positions and Rotations for Load Case "NESC EXT. WIND (250C)":

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)
LP:g	0	0	0	0.0000	0.0000	0.0000	0	-7.75	0
LP:t	0.0006947	0.1622	0.004119	-0.2019	0.0009	-0.0001	0.0006947	-7.588	60
LP:SW	0.0006704	0.1569	0.004128	-0.2019	0.0009	-0.0001	0.0006704	-7.593	58.5
LP:ARM	0.000557	0.1324	0.004181	-0.1970	0.0009	-0.0001	0.000557	-7.618	51.5
LP:B1	0.0004134	0.102	0.004276	-0.1402	0.0009	-0.0001	0.0004134	-7.648	42.5
LP:B2	0.0001919	0.07264	0.003169	-0.1376	0.0007	-0.0001	0.0001919	-7.677	27
RP:g	0	0	0	0.0000	0.0000	0.0000	0	7.75	0
RP:t	0.001531	0.5671	-0.009156	-0.7837	0.0014	-0.0001	0.001531	8.317	89.99
RP:AN1	0.001433	0.5124	-0.008781	-0.7836	0.0014	-0.0001	0.001433	8.262	85.99
RP:AN2	0.001286	0.4307	-0.008193	-0.7684	0.0014	-0.0001	0.001286	8.181	79.99
RP:AN3	0.001044	0.3029	-0.00731	-0.6784	0.0014	-0.0001	0.001044	8.053	69.99
RP:AN4	0.0008121	0.1977	-0.006672	-0.5098	0.0013	-0.0001	0.0008121	7.948	59.99
RP:SW	0.0007787	0.1847	-0.006604	-0.4845	0.0013	-0.0001	0.0007787	7.935	58.49
RP:ARM	0.0006282	0.1334	-0.006354	-0.3444	0.0012	-0.0001	0.0006282	7.883	51.49
RP:AN5	0.0005973	0.1247	-0.006282	-0.3139	0.0012	-0.0001	0.0005973	7.875	49.99
RP:B1	0.0004508	0.09426	-0.005978	-0.1419	0.0011	-0.0001	0.0004508	7.844	42.49
RP:AN6	0.0004052	0.08927	-0.005739	-0.1002	0.0010	-0.0001	0.0004052	7.839	39.99
RP:AN7	0.0002414	0.07798	-0.004808	-0.0750	0.0008	-0.0001	0.0002414	7.828	30
RP:B2	0.0001989	0.07356	-0.00453	-0.1063	0.0008	-0.0001	0.0001989	7.824	27
RP:AN8	0.0001136	0.05367	-0.003331	-0.1954	0.0006	-0.0000	0.0001136	7.804	20
RP:AN9	3.014e-05	0.01818	-0.001626	-0.1744	0.0003	-0.0000	3.014e-05	7.768	9.998
A1:O	0.0005538	0.1324	0.008674	-0.1970	0.0009	-0.0001	0.0005538	-8.925	51.51
A1:T	0.0005379	0.1327	0.0152	0.0360	0.0009	-0.0001	0.0005379	-15.36	51.52
A2:O	0.0006311	0.1334	-0.01421	-0.3444	0.0012	-0.0001	0.0006311	9.19	51.49
A2:T	0.0006454	0.1334	-0.06833	-0.5742	0.0012	-0.0001	0.0006454	15.63	51.43
X1:O	0.000557	0.1324	0.004181	-0.1970	0.0009	-0.0001	0.000557	-7.618	51.5
X1:C2	0.0005928	0.133	0.0004391	0.0702	0.0011	-0.0003	0.0005928	0.133	51.5
X1:E	0.0006282	0.1334	-0.006354	-0.3444	0.0012	-0.0001	0.0006282	7.883	51.49
BR1:O	0.000416	0.102	0.0009768	-0.1402	0.0009	-0.0001	0.000416	-6.3	42.5
BR1:E	0.0001974	0.07357	-0.001898	-0.1063	0.0008	-0.0001	0.0001974	6.405	27
BR2:O	0.0001936	0.07263	-0.0002383	-0.1376	0.0007	-0.0001	0.0001936	-6.259	27
BR2:E	0.0004482	0.09426	-0.002642	-0.1419	0.0011	-0.0001	0.0004482	6.497	42.5

Joint Support Reactions for Load Case "NESC EXT. WIND (250C)":

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 %
LP:g	-0.02	0.0	-29.17	0.0	0.0	122.16	0.0	0.0	125.60	0.0	492.01	0.0	-0.8	0.0	0.0	0.04	0.0	0.0
RP:g	-0.02	0.0	-34.00	0.0	0.0	-170.53	0.0	0.0	173.89	0.0	543.11	0.0	-0.8	0.0	0.0	0.04	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC EXT. WIND (250C)":

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.
LP	LP:t	Origin	0.00	1.95	0.01	0.05	-0.00	-0.00	0.0	-0.08	0.07	-0.00	-0.00	0.00	0.00	0.00	0.01	0.0	5

LP	LP:SW	End	1.50	1.88	0.01	0.05	0.10	-0.00	0.0	-0.08	0.07	-0.00	-0.00	0.00	0.00	0.00	0.01	0.0	4
LP	LP:SW	Origin	1.50	1.88	0.01	0.05	0.10	-0.00	-0.0	-1.10	2.52	-0.00	-0.04	0.00	0.17	0.00	0.29	0.5	5
LP	Tube 1	End	5.00	1.74	0.01	0.05	8.93	-0.00	-0.0	-1.10	2.52	-0.00	-0.04	0.45	0.04	0.00	0.49	0.8	2
LP	Tube 1	Origin	5.00	1.74	0.01	0.05	8.93	-0.00	-0.0	-1.47	2.85	-0.00	-0.05	0.45	0.05	0.00	0.50	0.8	2
LP	LP:ARM	End	8.50	1.59	0.01	0.05	18.89	-0.01	-0.0	-1.47	2.85	-0.00	-0.05	0.92	0.05	0.00	0.97	1.5	2
LP	LP:ARM	Origin	8.50	1.59	0.01	0.05	-86.24	-0.02	-0.0	-4.13	39.40	-0.01	-0.13	3.09	1.82	0.00	4.51	6.9	3
LP	Tube 1	End	13.00	1.39	0.01	0.05	91.06	-0.05	-0.0	-4.13	39.40	-0.01	-0.13	4.31	0.66	0.00	4.59	7.1	2
LP	Tube 1	Origin	13.00	1.39	0.01	0.05	91.06	-0.05	-0.0	-4.63	39.82	-0.01	-0.15	4.31	0.66	0.00	4.60	7.1	2
LP	LP:B1	End	17.50	1.22	0.00	0.05	270.27	-0.09	-0.0	-4.63	39.82	-0.01	-0.14	12.40	0.65	0.00	12.60	19.4	2
LP	LP:B1	Origin	17.50	1.22	0.00	0.05	167.99	-0.09	-0.0	70.84	-22.27	-0.01	2.20	7.71	0.37	0.00	9.93	15.3	2
LP	SpliceT	End	20.00	1.16	0.00	0.05	112.32	-0.12	-0.0	70.84	-22.27	-0.01	2.18	5.07	0.36	0.00	7.28	11.2	2
LP	SpliceT	Origin	20.00	1.16	0.00	0.05	112.32	-0.12	-0.0	70.43	-21.87	-0.01	2.17	5.07	0.36	0.00	7.26	11.2	2
LP	Tube 2	End	25.00	1.05	0.00	0.04	2.95	-0.18	-0.0	70.43	-21.87	-0.01	2.13	0.01	1.35	0.00	3.17	4.9	5
LP	Tube 2	Origin	25.00	1.05	0.00	0.04	2.95	-0.18	-0.0	69.93	-21.43	-0.01	2.12	0.01	1.32	0.00	3.12	4.8	5
LP	Tube 2	End	29.00	0.97	0.00	0.04	-82.76	-0.23	-0.0	69.93	-21.43	-0.01	2.09	3.52	0.34	0.00	5.64	8.7	2
LP	Tube 2	Origin	29.00	0.97	0.00	0.04	-82.76	-0.23	-0.0	69.46	-21.05	-0.01	2.08	3.52	0.33	0.00	5.62	8.7	2
LP	LP:B2	End	33.00	0.87	0.00	0.04	-166.98	-0.28	-0.0	69.46	-21.05	-0.01	2.05	6.91	0.33	0.00	8.98	13.8	2
LP	LP:B2	Origin	33.00	0.87	0.00	0.04	-247.67	-0.28	-0.0	125.83	26.21	-0.02	3.71	10.25	0.41	0.00	13.98	21.5	2
LP	Tube 2	End	38.00	0.69	0.00	0.03	-116.61	-0.36	-0.0	125.83	26.21	-0.02	3.65	4.68	0.40	0.00	8.36	12.9	2
LP	Tube 2	Origin	38.00	0.69	0.00	0.03	-116.61	-0.36	-0.0	125.26	26.65	-0.02	3.64	4.68	0.41	0.00	8.34	12.8	2
LP	Tube 2	End	43.00	0.48	0.00	0.02	16.66	-0.45	-0.0	125.26	26.65	-0.02	3.58	0.19	1.50	0.00	4.58	7.0	4
LP	Tube 2	Origin	43.00	0.48	0.00	0.02	16.66	-0.45	-0.0	124.66	27.18	-0.02	3.56	0.19	1.53	0.00	4.59	7.1	4
LP	Tube 2	End	48.00	0.27	0.00	0.02	152.59	-0.55	-0.0	124.66	27.18	-0.02	3.51	5.74	0.40	0.00	9.28	14.3	2
LP	Tube 2	Origin	48.00	0.27	0.00	0.02	152.59	-0.55	-0.0	124.04	27.79	-0.02	3.49	5.74	0.41	0.00	9.26	14.2	2
LP	Tube 2	End	53.00	0.11	0.00	0.01	291.58	-0.66	-0.0	124.04	27.79	-0.02	3.44	10.64	0.41	0.00	14.09	21.7	2
LP	Tube 2	Origin	53.00	0.11	0.00	0.01	291.58	-0.66	-0.0	123.49	28.37	-0.02	3.42	10.64	0.41	0.00	14.08	21.7	2
LP	Tube 2	End	56.50	0.03	0.00	0.00	390.89	-0.74	-0.0	123.49	28.37	-0.02	3.39	13.96	0.41	0.00	17.36	26.7	2
LP	Tube 2	Origin	56.50	0.03	0.00	0.00	390.89	-0.74	-0.0	123.02	28.89	-0.02	3.37	13.96	0.42	0.00	17.35	26.7	2
LP	LP:g	End	60.00	0.00	0.00	0.00	492.01	-0.82	-0.0	123.02	28.89	-0.02	3.34	17.21	0.41	0.00	20.56	31.6	2
RP	RP:t	Origin	0.00	6.80	0.02	-0.11	-0.00	-0.00	-0.0	-0.15	0.16	-0.00	-0.01	0.00	0.02	0.00	0.03	0.0	5
RP	RP:AN1	End	4.00	6.15	0.02	-0.11	0.65	-0.00	-0.0	-0.15	0.16	-0.00	-0.01	0.05	0.00	0.00	0.06	0.1	2
RP	RP:AN1	Origin	4.00	6.15	0.02	-0.11	0.65	-0.00	-0.0	-3.33	6.12	-0.00	-0.15	0.00	0.57	0.00	1.00	1.5	5
RP	Tube 1	End	7.00	5.66	0.02	-0.10	19.02	-0.01	-0.0	-3.33	6.12	-0.00	-0.15	1.48	0.15	0.00	1.65	2.5	2
RP	Tube 1	Origin	7.00	5.66	0.02	-0.10	19.02	-0.01	-0.0	-3.56	6.37	-0.00	-0.16	1.48	0.15	0.00	1.66	2.6	2
RP	RP:AN2	End	10.00	5.17	0.02	-0.10	38.14	-0.01	-0.0	-3.56	6.37	-0.00	-0.16	2.89	0.15	0.00	3.06	4.7	2
RP	RP:AN2	Origin	10.00	5.17	0.02	-0.10	38.14	-0.01	-0.0	-4.23	7.27	-0.00	-0.19	2.89	0.17	0.00	3.10	4.8	2
RP	Tube 1	End	15.00	4.38	0.01	-0.09	74.52	-0.03	-0.0	-4.23	7.27	-0.00	-0.19	5.44	0.17	0.00	5.63	8.7	2
RP	Tube 1	Origin	15.00	4.38	0.01	-0.09	74.52	-0.03	-0.0	-4.63	7.70	-0.00	-0.20	5.44	0.18	0.00	5.65	8.7	2
RP	RP:AN3	End	20.00	3.64	0.01	-0.09	113.02	-0.05	-0.0	-4.63	7.70	-0.00	-0.20	7.94	0.17	0.00	8.14	12.5	2
RP	RP:AN3	Origin	20.00	3.64	0.01	-0.09	113.02	-0.05	-0.0	-5.40	8.70	-0.01	-0.23	7.94	0.20	0.00	8.17	12.6	2
RP	Tube 1	End	25.00	2.96	0.01	-0.08	156.50	-0.07	-0.0	-5.40	8.70	-0.01	-0.23	10.58	0.19	0.00	10.81	16.6	2
RP	Tube 1	Origin	25.00	2.96	0.01	-0.08	156.50	-0.07	-0.0	-5.82	9.13	-0.01	-0.25	10.58	0.20	0.00	10.83	16.7	2
RP	RP:AN4	End	30.00	2.37	0.01	-0.08	202.16	-0.11	-0.0	-5.82	9.13	-0.01	-0.24	13.17	0.20	0.00	13.42	20.6	2
RP	RP:AN4	Origin	30.00	2.37	0.01	-0.08	202.16	-0.11	-0.0	-6.48	9.98	-0.01	-0.21	10.52	0.17	0.00	10.73	16.5	2
RP	RP:SW	End	31.50	2.22	0.01	-0.08	217.13	-0.12	-0.0	-6.48	9.98	-0.01	-0.21	11.17	0.17	0.00	11.39	17.5	2
RP	RP:SW	Origin	31.50	2.22	0.01	-0.08	217.13	-0.12	-0.0	-7.50	12.44	-0.01	-0.25	11.17	0.22	0.00	11.42	17.6	2
RP	Tube 2	End	35.00	1.88	0.01	-0.08	260.66	-0.15	-0.0	-7.50	12.44	-0.01	-0.24	13.08	0.21	0.00	13.32	20.5	2
RP	Tube 2	Origin	35.00	1.88	0.01	-0.08	260.66	-0.15	-0.0	-7.88	12.75	-0.01	-0.26	13.08	0.22	0.00	13.34	20.5	2
RP	RP:ARM	End	38.50	1.60	0.01	-0.08	305.29	-0.18	-0.0	-7.88	12.75	-0.01	-0.25	14.94	0.22	0.00	15.19	23.4	2
RP	RP:ARM	Origin	38.50	1.60	0.01	-0.08	269.27	-0.17	-0.0	-28.65	10.57	-0.01	-0.92	13.17	0.18	0.00	14.10	21.7	2
RP	RP:AN5	End	40.00	1.50	0.01	-0.08	285.13	-0.18	-0.0	-28.65	10.57	-0.01	-0.91	13.80	0.18	0.00	14.72	22.6	2
RP	RP:AN5	Origin	40.00	1.50	0.01	-0.08	285.13	-0.18	-0.0	-29.31	11.35	-0.01	-0.93	13.80	0.19	0.00	14.74	22.7	2
RP	Tube 2	End	43.75	1.28	0.01	-0.07	327.70	-0.20	-0.0	-29.31	11.35	-0.01	-0.92	15.45	0.19	0.00	16.38	25.2	2
RP	Tube 2	Origin	43.75	1.28	0.01	-0.07	327.70	-0.20	-0.0	-29.73	11.66	-0.01	-0.94	15.45	0.19	0.00	16.39	25.2	2
RP	RP:B1	End	47.50	1.13	0.01	-0.07	371.43	-0.22	-0.0	-29.73	11.66	-0.01	-0.92	17.06	0.19	0.00	17.99	27.7	2
RP	RP:B1	Origin	47.50	1.13	0.01	-0.07	294.12	-0.22	-0.0	-87.45	-34.78	-0.01	-2.72	13.51	0.57	0.00	16.26	25.0	2
RP	RP:AN6	End	50.00	1.07	0.00	-0.07	207.18	-0.25	-0.0	-87.45	-34.78	-0.01	-2.69	9.36	0.57	0.00	12.09	18.6	2
RP	RP:AN6	Origin	50.00	1.07	0.00	-0.07	207.18	-0.25	-0.0	-88.21	-33.92	-0.01	-2.72	9.36	0.55	0.00	12.11	18.6	2

RP	Tube 3	End	55.00	1.00	0.00	-0.06	37.58	-0.29	-0.0	-88.21	-33.92	-0.01	-2.67	0.45	2.02	0.00	4.69	7.2	4
RP	Tube 3	Origin	55.00	1.00	0.00	-0.06	37.58	-0.29	-0.0	-88.77	-33.45	-0.01	-2.69	0.45	1.99	0.00	4.67	7.2	4
RP	RP:AN7	End	60.00	0.94	0.00	-0.06	-129.65	-0.35	-0.0	-88.77	-33.45	-0.01	-2.65	5.48	0.53	0.00	8.17	12.6	2
RP	RP:AN7	Origin	60.00	0.94	0.00	-0.06	-129.65	-0.35	-0.0	-89.61	-32.45	-0.01	-2.67	5.48	0.51	0.00	8.20	12.6	2
RP	RP:B2	End	63.00	0.88	0.00	-0.05	-226.99	-0.38	-0.0	-89.61	-32.45	-0.01	-2.64	9.40	0.51	0.00	12.08	18.6	2
RP	RP:B2	Origin	63.00	0.88	0.00	-0.05	-334.84	-0.38	-0.0	-166.03	30.63	-0.01	-4.90	13.87	0.48	0.00	18.78	28.9	2
RP	Tube 3	End	66.50	0.78	0.00	-0.05	-227.67	-0.42	-0.0	-166.03	30.63	-0.01	-4.84	9.22	0.47	0.00	14.09	21.7	2
RP	Tube 3	Origin	66.50	0.78	0.00	-0.05	-227.67	-0.42	-0.0	-166.41	31.11	-0.01	-4.86	9.22	0.48	0.00	14.10	21.7	2
RP	RP:AN8	End	70.00	0.64	0.00	-0.04	-118.79	-0.47	-0.0	-166.41	31.11	-0.01	-4.80	4.70	0.47	0.00	9.54	14.7	2
RP	RP:AN8	Origin	70.00	0.64	0.00	-0.04	-118.79	-0.47	-0.0	-167.28	32.19	-0.01	-4.83	4.70	0.49	0.00	9.57	14.7	2
RP	Tube 3	End	75.00	0.43	0.00	-0.03	42.11	-0.54	-0.0	-167.28	32.19	-0.01	-4.75	1.62	0.48	0.00	6.43	9.9	2
RP	Tube 3	Origin	75.00	0.43	0.00	-0.03	42.11	-0.54	-0.0	-167.88	32.68	-0.02	-4.77	1.62	0.49	0.00	6.44	9.9	2
RP	RP:AN9	End	80.00	0.22	0.00	-0.02	205.48	-0.62	-0.0	-167.88	32.68	-0.02	-4.69	7.64	0.48	0.00	12.36	19.0	2
RP	RP:AN9	Origin	80.00	0.22	0.00	-0.02	205.48	-0.62	-0.0	-168.89	33.63	-0.02	-4.72	7.64	0.50	0.00	12.39	19.1	2
RP	Tube 3	End	85.00	0.06	0.00	-0.01	373.59	-0.71	-0.0	-168.89	33.63	-0.02	-4.65	13.47	0.49	0.00	18.14	27.9	2
RP	Tube 3	Origin	85.00	0.06	0.00	-0.01	373.59	-0.71	-0.0	-169.56	33.91	-0.02	-4.67	13.47	0.49	0.00	18.16	27.9	2
RP	RP:g	End	90.00	0.00	0.00	0.00	543.11	-0.79	-0.0	-169.56	33.91	-0.02	-4.60	18.99	0.49	0.00	23.61	36.3	2

Summary of Brace Forces and Usages for Load Case "NESC EXT. WIND (250C)":

Brace Label	Forces (kips)	Allowable Compression (kips)	Allowable Tension (kips)	Usage %
BR1	-98.39	178.44	172.12	55.14
BR2	73.84	178.44	172.12	42.90

Detailed Tubular Davit Arm Usages for Load Case "NESC EXT. WIND (250C)":

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.
A1	A1:O	Origin	0.00	1.59	0.01	0.10	-47.48	0.00	0.0	-11.23	7.41	-0.00	-0.92	12.16	0.48	0.00	13.11	20.2	2
A1	#A1:0	End	3.22	1.59	0.01	0.19	-23.62	0.00	0.0	-11.23	7.41	-0.00	-1.21	10.45	0.64	0.00	11.71	18.0	2
A1	#A1:0	Origin	3.22	1.59	0.01	0.19	-23.62	0.00	0.0	-11.22	7.34	-0.00	-1.20	10.45	0.63	0.00	11.70	18.0	2
A1	A1:T	End	6.44	1.59	0.01	0.18	-0.00	0.00	0.0	-11.22	7.34	-0.00	-1.75	0.00	2.38	0.00	4.48	6.9	4
A2	A2:O	Origin	0.00	1.60	0.01	-0.17	-46.95	-0.00	-0.0	11.27	7.35	0.00	0.92	12.03	0.48	0.00	12.97	20.0	2
A2	#A2:0	End	3.22	1.60	0.01	-0.45	-23.27	-0.00	-0.0	11.27	7.35	0.00	1.21	10.30	0.63	0.00	11.56	17.8	2
A2	#A2:0	Origin	3.22	1.60	0.01	-0.45	-23.27	-0.00	-0.0	11.29	7.23	0.00	1.21	10.30	0.62	0.00	11.56	17.8	2
A2	A2:T	End	6.44	1.60	0.01	-0.82	-0.00	0.00	-0.0	11.29	7.23	0.00	1.76	0.00	2.34	0.00	4.42	6.8	4

Detailed Tubular X-Arm Usages for Load Case "NESC EXT. WIND (250C)":

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.
X1	X1:O	Origin	0.00	1.59	0.01	0.05	47.90	-0.04	0.0	24.95	-5.24	0.00	2.36	16.46	0.40	0.00	18.84	29.0	2
X1	#sX1:0	End	3.88	1.59	0.01	-0.03	27.58	-0.02	0.0	24.95	-5.24	0.00	2.36	9.48	0.40	0.00	11.86	18.2	2
X1	#sX1:0	Origin	3.88	1.59	0.01	-0.03	27.58	-0.02	0.0	24.96	-5.32	0.00	2.36	9.48	0.40	0.00	11.86	18.3	2
X1	X1:C2	End	7.75	1.60	0.01	0.01	6.95	0.00	0.0	24.96	-5.32	0.00	2.36	2.39	0.40	0.00	4.80	7.4	2
X1	X1:C2	Origin	7.75	1.60	0.01	0.01	6.95	0.00	0.0	13.75	-12.76	0.00	1.30	0.99	2.32	0.00	4.63	7.1	3
X1	#sX1:1	End	11.63	1.60	0.01	0.05	-42.50	0.02	0.0	13.75	-12.76	0.00	1.30	14.61	0.96	0.00	16.00	24.6	2
X1	#sX1:1	Origin	11.63	1.60	0.01	0.05	-42.50	0.02	0.0	13.71	-12.95	0.00	1.30	14.61	0.98	0.00	15.99	24.6	2
X1	X1:E	End	15.50	1.60	0.01	-0.08	-92.67	0.04	0.0	13.71	-12.95	0.00	1.30	31.85	0.98	0.00	33.19	51.1	2

Summary of Clamp Capacities and Usages for Load Case "NESC EXT. WIND (250C)":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
1	2.356	50.00	50.00	4.71	0.00	0.00	0.00	4.71
2	2.356	50.00	50.00	4.71	0.00	0.00	0.00	4.71
3	6.383	50.00	50.00	12.77	0.00	0.00	0.00	12.77
4	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
5	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
6	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
7	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
8	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
9	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
10	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
11	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35

Summary of Suspension Capacities and Usages for Load Case "NESC EXT. WIND (250C)":

Suspension Label	Tension (kips)	Input Tension Capacity (kips)	Factored Tension Capacity (kips)	Tension Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
C1	13.377	30.00	30.00	44.59	0.00	0.00	0.00	44.59
C2	13.377	30.00	30.00	44.59	0.00	0.00	0.00	44.59
C3	13.377	30.00	30.00	44.59	0.00	0.00	0.00	44.59

*** Analysis Results for Load Case No. 3 "NESC EXT. ICE (250D)" - Number of iterations in SAPS 9

Equilibrium Joint Positions and Rotations for Load Case "NESC EXT. ICE (250D)":

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)
LP:g	0	0	0	0.0000	0.0000	0.0000	0	-7.75	0
LP:t	0.001154	0.04719	-0.0002747	-0.0315	0.0016	-0.0003	0.001154	-7.703	60
LP:SW	0.001114	0.04636	-0.0002743	-0.0315	0.0016	-0.0003	0.001114	-7.704	58.5
LP:ARM	0.000923	0.04258	-0.0002347	-0.0290	0.0016	-0.0003	0.000923	-7.707	51.5
LP:B1	0.0006818	0.03482	7.142e-05	-0.0452	0.0015	-0.0002	0.0006818	-7.715	42.5
LP:B2	0.000313	0.02315	0.0001431	-0.0522	0.0012	-0.0001	0.000313	-7.727	27
RP:g	0	0	0	0.0000	0.0000	0.0000	0	7.75	0
RP:t	0.002623	0.1807	-0.004886	-0.2355	0.0024	-0.0003	0.002623	7.931	90
RP:AN1	0.002454	0.1643	-0.004851	-0.2355	0.0024	-0.0003	0.002454	7.914	86
RP:AN2	0.002201	0.1397	-0.004754	-0.2322	0.0024	-0.0003	0.002201	7.89	80
RP:AN3	0.001785	0.1006	-0.004569	-0.2123	0.0023	-0.0003	0.001785	7.851	70
RP:AN4	0.001386	0.06649	-0.004372	-0.1746	0.0022	-0.0003	0.001386	7.816	60
RP:SW	0.001329	0.06198	-0.004345	-0.1689	0.0022	-0.0003	0.001329	7.812	58.5
RP:ARM	0.00107	0.04319	-0.004193	-0.1356	0.0020	-0.0003	0.00107	7.793	51.5
RP:AN5	0.001018	0.03987	-0.004111	-0.1189	0.0020	-0.0003	0.001018	7.79	50
RP:B1	0.0007674	0.02936	-0.003705	-0.0447	0.0018	-0.0002	0.0007674	7.779	42.5
RP:AN6	0.0006896	0.02788	-0.003536	-0.0284	0.0017	-0.0002	0.0006896	7.778	40
RP:AN7	0.0004109	0.02539	-0.002853	-0.0176	0.0014	-0.0002	0.0004109	7.775	30
RP:B2	0.0003386	0.02429	-0.002645	-0.0293	0.0013	-0.0001	0.0003386	7.774	27
RP:AN8	0.0001935	0.01808	-0.001959	-0.0636	0.0010	-0.0001	0.0001935	7.768	20
RP:AN9	5.144e-05	0.006214	-0.0009756	-0.0592	0.0006	-0.0000	5.144e-05	7.756	9.999
A1:O	0.0009164	0.04259	0.0004275	-0.0290	0.0016	-0.0003	0.0009164	-9.014	51.5
A1:T	0.0008829	0.04279	-0.03483	0.5460	0.0016	-0.0003	0.0008829	-15.45	51.47
A2:O	0.001077	0.04319	-0.007284	-0.1356	0.0020	-0.0003	0.001077	9.099	51.49
A2:T	0.001109	0.04303	-0.06092	-0.7086	0.0020	-0.0003	0.001109	15.54	51.44
X1:O	0.000923	0.04258	-0.0002347	-0.0290	0.0016	-0.0003	0.000923	-7.707	51.5
X1:C2	0.0009963	0.04293	-0.006985	0.0173	0.0018	-0.0007	0.0009963	0.04293	51.49
X1:E	0.00107	0.04319	-0.004193	-0.1356	0.0020	-0.0003	0.00107	7.793	51.5
BR1:O	0.0006872	0.03482	-0.0009917	-0.0452	0.0015	-0.0002	0.0006872	-6.367	42.5
BR1:E	0.0003352	0.02429	-0.001919	-0.0293	0.0013	-0.0001	0.0003352	6.356	27
BR2:O	0.0003163	0.02315	-0.001149	-0.0522	0.0012	-0.0001	0.0003163	-6.308	27
BR2:E	0.0007619	0.02936	-0.002654	-0.0447	0.0018	-0.0002	0.0007619	6.432	42.5

Joint Support Reactions for Load Case "NESC EXT. ICE (250D)":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Uplift Usage %	Comp. Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
LP:g	-0.04	0.0	-7.84	0.0	0.0	3.09	0.0	0.0	8.43	0.0	144.72	0.0	-1.3	0.0	0.0	0.08	0.0	0.0
RP:g	-0.03	0.0	-12.05	0.0	0.0	-103.92	0.0	0.0	104.61	0.0	186.79	0.0	-1.4	0.0	0.0	0.08	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC EXT. ICE (250D)":

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.
LP	LP:t	Origin	0.00	0.57	0.01	-0.00	-0.00	0.00	0.0	-0.10	0.02	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5

LP	LP:SW	End	1.50	0.56	0.01	-0.00	0.03	-0.00	0.0	-0.10	0.02	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	2
LP	LP:SW	Origin	1.50	0.56	0.01	-0.00	0.03	-0.00	-0.0	-4.69	1.32	-0.00	-0.15	0.00	0.09	0.00	0.22	0.3	5
LP	Tube 1	End	5.00	0.53	0.01	-0.00	4.63	-0.00	-0.0	-4.69	1.32	-0.00	-0.15	0.23	0.02	0.00	0.39	0.6	2
LP	Tube 1	Origin	5.00	0.53	0.01	-0.00	4.63	-0.00	-0.0	-5.16	1.39	-0.00	-0.17	0.23	0.02	0.00	0.40	0.6	2
LP	LP:ARM	End	8.50	0.51	0.01	-0.00	9.51	-0.01	-0.0	-5.16	1.39	-0.00	-0.17	0.46	0.02	0.00	0.63	1.0	2
LP	LP:ARM	Origin	8.50	0.51	0.01	-0.00	-110.76	-0.03	-0.1	-30.61	19.15	-0.01	-0.98	5.41	0.32	0.00	6.42	9.9	2
LP	Tube 1	End	13.00	0.47	0.01	-0.00	-24.59	-0.10	-0.1	-30.61	19.15	-0.01	-0.97	0.32	1.19	0.00	2.43	3.7	4
LP	Tube 1	Origin	13.00	0.47	0.01	-0.00	-24.59	-0.10	-0.1	-31.23	19.26	-0.02	-0.99	0.32	1.19	0.00	2.45	3.8	4
LP	LP:B1	End	17.50	0.42	0.01	0.00	62.08	-0.17	-0.1	-31.23	19.26	-0.02	-0.97	2.85	0.32	0.00	3.86	5.9	2
LP	LP:B1	Origin	17.50	0.42	0.01	0.00	23.67	-0.17	-0.1	-3.23	-4.18	-0.02	-0.10	1.09	0.07	0.00	1.20	1.8	2
LP	SpliceT	End	20.00	0.40	0.01	0.00	13.22	-0.22	-0.1	-3.23	-4.18	-0.02	-0.10	0.60	0.07	0.00	0.71	1.1	2
LP	SpliceT	Origin	20.00	0.40	0.01	0.00	13.22	-0.22	-0.1	-3.77	-4.09	-0.02	-0.12	0.60	0.07	0.00	0.72	1.1	2
LP	Tube 2	End	25.00	0.35	0.01	0.00	-7.25	-0.32	-0.1	-3.77	-4.09	-0.02	-0.11	0.10	0.24	0.00	0.48	0.7	4
LP	Tube 2	Origin	25.00	0.35	0.01	0.00	-7.25	-0.32	-0.1	-4.41	-3.98	-0.02	-0.13	0.24	0.17	0.00	0.48	0.7	3
LP	Tube 2	End	29.00	0.32	0.00	0.00	-23.19	-0.40	-0.1	-4.41	-3.98	-0.02	-0.13	0.99	0.06	0.00	1.13	1.7	2
LP	Tube 2	Origin	29.00	0.32	0.00	0.00	-23.19	-0.40	-0.1	-5.00	-3.89	-0.02	-0.15	0.99	0.06	0.00	1.14	1.8	2
LP	LP:B2	End	33.00	0.28	0.00	0.00	-38.74	-0.50	-0.1	-5.00	-3.89	-0.02	-0.15	1.61	0.06	0.00	1.76	2.7	2
LP	LP:B2	Origin	33.00	0.28	0.00	0.00	-57.44	-0.50	-0.1	7.52	7.20	-0.03	0.22	2.38	0.11	0.00	2.61	4.0	2
LP	Tube 2	End	38.00	0.22	0.00	0.00	-21.41	-0.62	-0.1	7.52	7.20	-0.03	0.22	0.86	0.11	0.00	1.10	1.7	2
LP	Tube 2	Origin	38.00	0.22	0.00	0.00	-21.41	-0.62	-0.1	6.77	7.33	-0.03	0.20	0.86	0.11	0.00	1.08	1.7	2
LP	Tube 2	End	43.00	0.15	0.00	0.00	15.24	-0.76	-0.1	6.77	7.33	-0.03	0.19	0.45	0.30	0.00	0.83	1.3	3
LP	Tube 2	Origin	43.00	0.15	0.00	0.00	15.24	-0.76	-0.1	6.00	7.46	-0.03	0.17	0.45	0.31	0.00	0.82	1.3	3
LP	Tube 2	End	48.00	0.08	0.00	0.00	52.53	-0.91	-0.1	6.00	7.46	-0.03	0.17	1.98	0.11	0.00	2.16	3.3	2
LP	Tube 2	Origin	48.00	0.08	0.00	0.00	52.53	-0.91	-0.1	5.23	7.59	-0.03	0.15	1.98	0.11	0.00	2.14	3.3	2
LP	Tube 2	End	53.00	0.03	0.00	0.00	90.48	-1.07	-0.1	5.23	7.59	-0.03	0.14	3.31	0.11	0.00	3.46	5.3	2
LP	Tube 2	Origin	53.00	0.03	0.00	0.00	90.48	-1.07	-0.1	4.56	7.70	-0.03	0.13	3.31	0.11	0.00	3.44	5.3	2
LP	Tube 2	End	56.50	0.01	0.00	0.00	117.44	-1.19	-0.1	4.56	7.70	-0.03	0.12	4.20	0.11	0.00	4.33	6.7	2
LP	Tube 2	Origin	56.50	0.01	0.00	0.00	117.44	-1.19	-0.1	4.00	7.80	-0.04	0.11	4.20	0.11	0.00	4.32	6.6	2
LP	LP:g	End	60.00	0.00	0.00	0.00	144.72	-1.31	-0.1	4.00	7.80	-0.04	0.11	5.07	0.11	0.00	5.18	8.0	2
RP	RP:t	Origin	0.00	2.17	0.03	-0.06	-0.00	-0.00	0.0	-0.20	0.05	-0.00	-0.01	0.00	0.00	0.00	0.01	0.0	5
RP	RP:AN1	End	4.00	1.97	0.03	-0.06	0.20	-0.00	0.0	-0.20	0.05	-0.00	-0.01	0.02	0.00	0.00	0.03	0.0	2
RP	RP:AN1	Origin	4.00	1.97	0.03	-0.06	0.20	-0.00	-0.0	-4.92	1.31	-0.00	-0.23	0.00	0.12	0.00	0.31	0.5	5
RP	Tube 1	End	7.00	1.82	0.03	-0.06	4.14	-0.01	-0.0	-4.92	1.31	-0.00	-0.22	0.32	0.03	0.00	0.55	0.8	2
RP	Tube 1	Origin	7.00	1.82	0.03	-0.06	4.14	-0.01	-0.0	-5.23	1.39	-0.00	-0.24	0.32	0.03	0.00	0.56	0.9	2
RP	RP:AN2	End	10.00	1.68	0.03	-0.06	8.31	-0.02	-0.0	-5.23	1.39	-0.00	-0.23	0.63	0.03	0.00	0.87	1.3	2
RP	RP:AN2	Origin	10.00	1.68	0.03	-0.06	8.31	-0.02	-0.0	-6.91	1.61	-0.01	-0.31	0.63	0.04	0.00	0.94	1.4	2
RP	Tube 1	End	15.00	1.44	0.02	-0.06	16.36	-0.05	-0.0	-6.91	1.61	-0.01	-0.30	1.19	0.04	0.00	1.50	2.3	2
RP	Tube 1	Origin	15.00	1.44	0.02	-0.06	16.36	-0.05	-0.0	-7.44	1.74	-0.01	-0.33	1.19	0.04	0.00	1.52	2.3	2
RP	RP:AN3	End	20.00	1.21	0.02	-0.05	25.07	-0.09	-0.0	-7.44	1.74	-0.01	-0.32	1.76	0.04	0.00	2.08	3.2	2
RP	RP:AN3	Origin	20.00	1.21	0.02	-0.05	25.07	-0.09	-0.0	-9.25	1.99	-0.01	-0.40	1.76	0.05	0.00	2.16	3.3	2
RP	Tube 1	End	25.00	0.99	0.02	-0.05	35.02	-0.13	-0.0	-9.25	1.99	-0.01	-0.39	2.37	0.04	0.00	2.76	4.2	2
RP	Tube 1	Origin	25.00	0.99	0.02	-0.05	35.02	-0.13	-0.0	-9.80	2.12	-0.01	-0.41	2.37	0.05	0.00	2.78	4.3	2
RP	RP:AN4	End	30.00	0.80	0.02	-0.05	45.63	-0.19	-0.0	-9.80	2.12	-0.01	-0.41	2.98	0.05	0.00	3.38	5.2	2
RP	RP:AN4	Origin	30.00	0.80	0.02	-0.05	45.63	-0.19	-0.0	-11.44	2.33	-0.01	-0.38	2.38	0.04	0.00	2.76	4.2	2
RP	RP:SW	End	31.50	0.74	0.02	-0.05	49.12	-0.21	-0.0	-11.44	2.33	-0.01	-0.38	2.53	0.04	0.00	2.91	4.5	2
RP	RP:SW	Origin	31.50	0.74	0.02	-0.05	49.12	-0.21	-0.0	-16.03	3.65	-0.01	-0.53	2.53	0.06	0.00	3.06	4.7	2
RP	Tube 2	End	35.00	0.62	0.01	-0.05	61.88	-0.26	-0.0	-16.03	3.65	-0.01	-0.52	3.11	0.06	0.00	3.63	5.6	2
RP	Tube 2	Origin	35.00	0.62	0.01	-0.05	61.88	-0.26	-0.0	-16.50	3.74	-0.02	-0.54	3.11	0.06	0.00	3.64	5.6	2
RP	RP:ARM	End	38.50	0.52	0.01	-0.05	74.98	-0.32	-0.0	-16.50	3.74	-0.02	-0.53	3.67	0.06	0.00	4.20	6.5	2
RP	RP:ARM	Origin	38.50	0.52	0.01	-0.05	153.86	-0.30	-0.1	-47.07	-2.55	-0.01	-1.51	7.53	0.04	0.00	9.04	13.9	2
RP	RP:AN5	End	40.00	0.48	0.01	-0.05	150.03	-0.31	-0.1	-47.07	-2.55	-0.01	-1.50	7.27	0.04	0.00	8.77	13.5	2
RP	RP:AN5	Origin	40.00	0.48	0.01	-0.05	150.03	-0.31	-0.1	-48.70	-2.38	-0.01	-1.55	7.27	0.04	0.00	8.82	13.6	2
RP	Tube 2	End	43.75	0.40	0.01	-0.05	141.09	-0.35	-0.1	-48.70	-2.38	-0.01	-1.53	6.66	0.04	0.00	8.19	12.6	2
RP	Tube 2	Origin	43.75	0.40	0.01	-0.05	141.09	-0.35	-0.1	-49.22	-2.31	-0.01	-1.55	6.66	0.04	0.00	8.21	12.6	2
RP	RP:B1	End	47.50	0.35	0.01	-0.04	132.44	-0.39	-0.1	-49.22	-2.31	-0.01	-1.53	6.09	0.04	0.00	7.62	11.7	2
RP	RP:B1	Origin	47.50	0.35	0.01	-0.04	114.21	-0.39	-0.1	-63.19	-13.19	-0.01	-1.96	5.25	0.22	0.00	7.22	11.1	2
RP	RP:AN6	End	50.00	0.33	0.01	-0.04	81.25	-0.43	-0.1	-63.19	-13.19	-0.01	-1.95	3.67	0.21	0.00	5.63	8.7	2
RP	RP:AN6	Origin	50.00	0.33	0.01	-0.04	81.25	-0.43	-0.1	-64.99	-12.98	-0.02	-2.00	3.67	0.21	0.00	5.69	8.8	2

RP	Tube 3	End	55.00	0.32	0.01	-0.04	16.35	-0.50	-0.1	-64.99	-12.98	-0.02	-1.97	0.72	0.21	0.00	2.71	4.2	2
RP	Tube 3	Origin	55.00	0.32	0.01	-0.04	16.35	-0.50	-0.1	-65.71	-12.84	-0.02	-1.99	0.72	0.21	0.00	2.73	4.2	2
RP	RP:AN7	End	60.00	0.30	0.00	-0.03	-47.84	-0.59	-0.1	-65.71	-12.84	-0.02	-1.96	2.03	0.20	0.00	4.00	6.2	2
RP	RP:AN7	Origin	60.00	0.30	0.00	-0.03	-47.84	-0.59	-0.1	-67.57	-12.59	-0.02	-2.01	2.03	0.20	0.00	4.05	6.2	2
RP	RP:B2	End	63.00	0.29	0.00	-0.03	-85.61	-0.65	-0.1	-67.57	-12.59	-0.02	-1.99	3.55	0.20	0.00	5.56	8.5	2
RP	RP:B2	Origin	63.00	0.29	0.00	-0.03	-126.43	-0.65	-0.1	-96.83	11.09	-0.02	-2.86	5.24	0.17	0.00	8.10	12.5	2
RP	Tube 3	End	66.50	0.26	0.00	-0.03	-87.62	-0.72	-0.1	-96.83	11.09	-0.02	-2.83	3.55	0.17	0.00	6.39	9.8	2
RP	Tube 3	Origin	66.50	0.26	0.00	-0.03	-87.62	-0.72	-0.1	-97.35	11.23	-0.02	-2.84	3.55	0.17	0.00	6.40	9.8	2
RP	RP:AN8	End	70.00	0.22	0.00	-0.02	-48.34	-0.80	-0.1	-97.35	11.23	-0.02	-2.81	1.92	0.17	0.00	4.74	7.3	2
RP	RP:AN8	Origin	70.00	0.22	0.00	-0.02	-48.34	-0.80	-0.1	-99.27	11.49	-0.02	-2.86	1.92	0.18	0.00	4.79	7.4	2
RP	Tube 3	End	75.00	0.14	0.00	-0.02	9.11	-0.92	-0.1	-99.27	11.49	-0.02	-2.82	0.28	0.47	0.00	3.21	4.9	3
RP	Tube 3	Origin	75.00	0.14	0.00	-0.02	9.11	-0.92	-0.1	-100.04	11.65	-0.03	-2.84	0.28	0.48	0.00	3.23	5.0	3
RP	RP:AN9	End	80.00	0.07	0.00	-0.01	67.33	-1.06	-0.1	-100.04	11.65	-0.03	-2.80	2.51	0.17	0.00	5.32	8.2	2
RP	RP:AN9	Origin	80.00	0.07	0.00	-0.01	67.33	-1.06	-0.1	-102.10	11.89	-0.03	-2.85	2.51	0.18	0.00	5.38	8.3	2
RP	Tube 3	End	85.00	0.02	0.00	-0.01	126.79	-1.20	-0.1	-102.10	11.89	-0.03	-2.81	4.58	0.17	0.00	7.40	11.4	2
RP	Tube 3	Origin	85.00	0.02	0.00	-0.01	126.79	-1.20	-0.1	-102.89	12.00	-0.03	-2.83	4.58	0.17	0.00	7.42	11.4	2
RP	RP:g	End	90.00	0.00	0.00	0.00	186.79	-1.36	-0.1	-102.89	12.00	-0.03	-2.79	6.54	0.17	0.00	9.34	14.4	2

Summary of Brace Forces and Usages for Load Case "NESC EXT. ICE (250D)":

Brace Label	Forces (kips)	Allowable Compression (kips)	Allowable Tension (kips)	Usage %
BR1	-37.07	178.44	172.12	20.77
BR2	17.28	178.44	172.12	10.04

Detailed Tubular Davit Arm Usages for Load Case "NESC EXT. ICE (250D)":

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.
A1	A1:O	Origin	0.00	0.51	0.01	0.01	-117.01	0.00	0.0	-3.69	18.21	-0.00	-0.30	29.97	1.19	0.00	30.34	46.7	2
A1	#A1:0	End	3.22	0.51	0.01	-0.10	-58.37	0.00	0.0	-3.69	18.21	-0.00	-0.40	25.83	1.56	0.00	26.36	40.6	2
A1	#A1:0	Origin	3.22	0.51	0.01	-0.10	-58.37	0.00	-0.0	-3.59	18.13	-0.00	-0.39	25.83	1.56	0.00	26.35	40.5	2
A1	A1:T	End	6.44	0.51	0.01	-0.42	0.00	0.00	-0.0	-3.59	18.13	-0.00	-0.56	0.00	5.88	0.00	10.20	15.7	4
A2	A2:O	Origin	0.00	0.52	0.01	-0.09	-116.68	-0.00	-0.0	3.84	18.18	0.00	0.31	29.88	1.19	0.00	30.27	46.6	2
A2	#A2:0	End	3.22	0.52	0.01	-0.30	-58.14	-0.00	-0.0	3.84	18.18	0.00	0.41	25.72	1.56	0.00	26.28	40.4	2
A2	#A2:0	Origin	3.22	0.52	0.01	-0.30	-58.14	-0.00	-0.0	3.94	18.06	0.00	0.42	25.72	1.55	0.00	26.28	40.4	2
A2	A2:T	End	6.44	0.52	0.01	-0.73	-0.00	0.00	-0.0	3.94	18.06	0.00	0.61	0.00	5.86	0.00	10.16	15.6	4

Detailed Tubular X-Arm Usages for Load Case "NESC EXT. ICE (250D)":

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.
X1	X1:O	Origin	0.00	0.51	0.01	-0.00	-20.60	-0.08	0.0	13.91	6.58	0.01	1.32	7.09	0.50	0.00	8.45	13.0	2
X1	#sX1:0	End	3.88	0.51	0.01	-0.05	4.89	-0.04	0.0	13.91	6.58	0.01	1.32	1.69	0.50	0.00	3.13	4.8	2
X1	#sX1:0	Origin	3.88	0.51	0.01	-0.05	4.89	-0.04	0.0	13.91	6.44	0.01	1.32	1.69	0.49	0.00	3.12	4.8	2
X1	X1:C2	End	7.75	0.52	0.01	-0.08	29.87	0.00	0.0	13.91	6.44	0.01	1.32	10.26	0.49	0.00	11.61	17.9	2
X1	X1:C2	Origin	7.75	0.52	0.01	-0.08	29.87	0.00	0.0	10.18	-11.73	0.01	0.96	10.26	0.89	0.00	11.33	17.4	2
X1	#sX1:1	End	11.63	0.52	0.01	-0.04	-15.59	0.04	0.0	10.18	-11.73	0.01	0.96	5.36	0.89	0.00	6.51	10.0	2
X1	#sX1:1	Origin	11.63	0.52	0.01	-0.04	-15.59	0.04	0.0	10.16	-11.88	0.01	0.96	5.36	0.90	0.00	6.51	10.0	2
X1	X1:E	End	15.50	0.52	0.01	-0.05	-61.64	0.07	0.0	10.16	-11.88	0.01	0.96	21.19	0.90	0.00	22.21	34.2	2

Summary of Clamp Capacities and Usages for Load Case "NESC EXT. ICE (250D)":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
1	4.433	50.00	50.00	8.87	0.00	0.00	0.00	8.87
2	4.433	50.00	50.00	8.87	0.00	0.00	0.00	8.87
3	4.525	50.00	50.00	9.05	0.00	0.00	0.00	9.05
4	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
5	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
6	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
7	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
8	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
9	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
10	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
11	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56

Summary of Suspension Capacities and Usages for Load Case "NESC EXT. ICE (250D)":

Suspension Label	Tension (kips)	Input Tension Capacity (kips)	Factored Tension Capacity (kips)	Tension Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
C1	18.438	30.00	30.00	61.46	0.00	0.00	0.00	61.46
C2	18.438	30.00	30.00	61.46	0.00	0.00	0.00	61.46
C3	18.438	30.00	30.00	61.46	0.00	0.00	0.00	61.46

*** Analysis Results for Load Case No. 4 "NESC HEAVY (250B) (-)" - Number of iterations in SAPS 10

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

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)
LP:g	0	0	0	0.0000	0.0000	0.0000	0	-7.75	0
LP:t	0.002847	-0.08173	-0.004339	0.1386	0.0039	-0.0007	0.002847	-7.832	60
LP:SW	0.002746	-0.0781	-0.004334	0.1386	0.0039	-0.0007	0.002746	-7.828	58.5
LP:ARM	0.002274	-0.06127	-0.004284	0.1351	0.0039	-0.0007	0.002274	-7.811	51.5
LP:B1	0.001677	-0.04519	-0.003916	0.0601	0.0037	-0.0006	0.001677	-7.795	42.5
LP:B2	0.0007664	-0.03538	-0.00283	0.0533	0.0029	-0.0003	0.0007664	-7.785	27
RP:g	0	0	0	0.0000	0.0000	0.0000	0	7.75	0
RP:t	0.006489	-0.1934	-0.001191	0.2416	0.0060	-0.0008	0.006489	7.557	90
RP:AN1	0.006071	-0.1766	-0.001154	0.2415	0.0060	-0.0008	0.006071	7.573	86
RP:AN2	0.005446	-0.1514	-0.00104	0.2367	0.0060	-0.0008	0.005446	7.599	80
RP:AN3	0.004417	-0.1121	-0.0008274	0.2080	0.0058	-0.0008	0.004417	7.638	70
RP:AN4	0.003431	-0.08008	-0.0006056	0.1531	0.0054	-0.0008	0.003431	7.67	60
RP:SW	0.003289	-0.07617	-0.0005767	0.1448	0.0054	-0.0008	0.003289	7.674	58.5
RP:ARM	0.002652	-0.06115	-0.0004221	0.0964	0.0050	-0.0008	0.002652	7.689	51.5
RP:AN5	0.002521	-0.05853	-0.0003516	0.0974	0.0049	-0.0007	0.002521	7.691	50
RP:B1	0.001903	-0.04702	1.14e-05	0.0620	0.0045	-0.0006	0.001903	7.703	42.5
RP:AN6	0.001711	-0.04467	3.758e-05	0.0502	0.0043	-0.0006	0.001711	7.705	40
RP:AN7	0.001022	-0.03729	0.0001652	0.0493	0.0035	-0.0004	0.001022	7.713	30
RP:B2	0.0008429	-0.03449	0.0002112	0.0617	0.0033	-0.0004	0.0008429	7.716	27
RP:AN8	0.0004828	-0.02439	0.0001309	0.0936	0.0026	-0.0003	0.0004828	7.726	20
RP:AN9	0.0001289	-0.008065	5.245e-05	0.0783	0.0014	-0.0001	0.0001289	7.742	10
A1:O	0.002257	-0.06127	-0.007365	0.1351	0.0039	-0.0007	0.002257	-9.118	51.49
A1:T	0.00217	-0.06118	-0.05964	0.6885	0.0038	-0.0007	0.00217	-15.56	51.44
A2:O	0.00267	-0.06115	0.001776	0.0964	0.0050	-0.0008	0.00267	8.995	51.5
A2:T	0.002755	-0.06137	-0.02465	-0.4598	0.0050	-0.0008	0.002755	15.43	51.48
X1:O	0.002274	-0.06127	-0.004284	0.1351	0.0039	-0.0007	0.002274	-7.811	51.5
X1:C2	0.002461	-0.06128	-0.009199	-0.0336	0.0044	-0.0017	0.002461	-0.06128	51.49
X1:E	0.002652	-0.06115	-0.0004221	0.0964	0.0050	-0.0008	0.002652	7.689	51.5
BR1:O	0.001691	-0.04519	-0.002503	0.0601	0.0037	-0.0006	0.001691	-6.447	42.5
BR1:E	0.0008341	-0.03449	-0.001316	0.0617	0.0033	-0.0004	0.0008341	6.297	27
BR2:O	0.0007749	-0.03538	-0.001509	0.0533	0.0029	-0.0003	0.0007749	-6.367	27
BR2:E	0.001889	-0.04702	-0.001447	0.0620	0.0045	-0.0006	0.001889	6.356	42.5

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

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 %
LP:g	-0.08	0.0	15.76	0.0	0.0	-109.96	0.0	0.0	111.09	0.0	-256.67	0.0	-3.2	0.0	0.0	0.19	0.0	0.0
RP:g	-0.09	0.0	14.34	0.0	0.0	4.24	0.0	0.0	14.95	0.0	-238.62	0.0	-3.4	0.0	0.0	0.20	0.0	0.0

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

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.
LP	LP:t	Origin	0.00	-0.98	0.03	-0.05	-0.00	0.00	0.0	-0.13	-0.03	-0.00	-0.00	0.00	0.00	0.00	0.01	0.0	5

LP	LP:SW	End	1.50	-0.94	0.03	-0.05	-0.04	-0.00	0.0	-0.13	-0.03	-0.00	-0.00	0.00	0.00	0.00	0.01	0.0	2
LP	LP:SW	Origin	1.50	-0.94	0.03	-0.05	-0.04	-0.00	0.0	-3.55	-1.84	-0.00	-0.12	0.00	0.12	0.00	0.24	0.4	5
LP	Tube 1	End	5.00	-0.84	0.03	-0.05	-6.48	-0.01	0.0	-3.55	-1.84	-0.00	-0.12	0.32	0.03	0.00	0.44	0.7	2
LP	Tube 1	Origin	5.00	-0.84	0.03	-0.05	-6.48	-0.01	0.0	-4.17	-1.96	-0.01	-0.14	0.32	0.03	0.00	0.46	0.7	2
LP	LP:ARM	End	8.50	-0.74	0.03	-0.05	-13.35	-0.03	0.0	-4.17	-1.96	-0.01	-0.13	0.65	0.03	0.00	0.79	1.2	2
LP	LP:ARM	Origin	8.50	-0.74	0.03	-0.05	-81.82	-0.08	-0.2	-35.70	-8.17	-0.04	-1.14	4.00	0.14	0.00	5.15	7.9	2
LP	Tube 1	End	13.00	-0.62	0.02	-0.05	-118.58	-0.25	-0.2	-35.70	-8.17	-0.04	-1.13	5.62	0.14	0.00	6.75	10.4	2
LP	Tube 1	Origin	13.00	-0.62	0.02	-0.05	-118.58	-0.25	-0.2	-36.52	-8.31	-0.04	-1.15	5.62	0.14	0.00	6.77	10.4	2
LP	LP:B1	End	17.50	-0.54	0.02	-0.05	-155.96	-0.44	-0.2	-36.52	-8.31	-0.04	-1.13	7.16	0.14	0.00	8.30	12.8	2
LP	LP:B1	Origin	17.50	-0.54	0.02	-0.05	-117.51	-0.44	-0.2	-65.69	14.75	-0.05	-2.04	5.40	0.24	0.00	7.45	11.5	2
LP	SpliceT	End	20.00	-0.52	0.02	-0.04	-80.64	-0.55	-0.2	-65.69	14.75	-0.05	-2.02	3.64	0.24	0.00	5.68	8.7	2
LP	SpliceT	Origin	20.00	-0.52	0.02	-0.04	-80.64	-0.55	-0.2	-66.39	14.63	-0.05	-2.04	3.64	0.24	0.00	5.70	8.8	2
LP	Tube 2	End	25.00	-0.48	0.01	-0.04	-7.48	-0.80	-0.2	-66.39	14.63	-0.05	-2.01	0.12	0.87	0.00	2.62	4.0	4
LP	Tube 2	Origin	25.00	-0.48	0.01	-0.04	-7.48	-0.80	-0.2	-67.24	14.47	-0.05	-2.04	0.12	0.86	0.00	2.63	4.0	4
LP	Tube 2	End	29.00	-0.46	0.01	-0.04	50.39	-1.01	-0.2	-67.24	14.47	-0.05	-2.01	2.15	0.23	0.00	4.18	6.4	2
LP	Tube 2	Origin	29.00	-0.46	0.01	-0.04	50.39	-1.01	-0.2	-68.01	14.30	-0.06	-2.03	2.15	0.23	0.00	4.20	6.5	2
LP	LP:B2	End	33.00	-0.42	0.01	-0.03	107.60	-1.24	-0.2	-68.01	14.30	-0.06	-2.01	4.47	0.22	0.00	6.48	10.0	2
LP	LP:B2	Origin	33.00	-0.42	0.01	-0.03	157.88	-1.24	-0.2	-104.33	-14.92	-0.06	-3.08	6.55	0.23	0.00	9.63	14.8	2
LP	Tube 2	End	38.00	-0.35	0.01	-0.03	83.29	-1.56	-0.2	-104.33	-14.92	-0.06	-3.03	3.35	0.23	0.00	6.39	9.8	2
LP	Tube 2	Origin	38.00	-0.35	0.01	-0.03	83.29	-1.56	-0.2	-105.31	-15.16	-0.07	-3.06	3.35	0.23	0.00	6.42	9.9	2
LP	Tube 2	End	43.00	-0.24	0.00	-0.02	7.51	-1.89	-0.2	-105.31	-15.16	-0.07	-3.01	0.15	0.85	0.00	3.49	5.4	4
LP	Tube 2	Origin	43.00	-0.24	0.00	-0.02	7.51	-1.89	-0.2	-106.31	-15.36	-0.07	-3.04	0.15	0.86	0.00	3.52	5.4	4
LP	Tube 2	End	48.00	-0.14	0.00	-0.01	-69.26	-2.24	-0.2	-106.31	-15.36	-0.07	-2.99	2.63	0.23	0.00	5.63	8.7	2
LP	Tube 2	Origin	48.00	-0.14	0.00	-0.01	-69.26	-2.24	-0.2	-107.34	-15.53	-0.07	-3.02	2.63	0.23	0.00	5.66	8.7	2
LP	Tube 2	End	53.00	-0.05	0.00	-0.01	-146.88	-2.62	-0.2	-107.34	-15.53	-0.07	-2.97	5.38	0.23	0.00	8.37	12.9	2
LP	Tube 2	Origin	53.00	-0.05	0.00	-0.01	-146.88	-2.62	-0.2	-108.23	-15.64	-0.08	-3.00	5.38	0.23	0.00	8.39	12.9	2
LP	Tube 2	End	56.50	-0.02	0.00	-0.00	-201.63	-2.89	-0.2	-108.23	-15.64	-0.08	-2.97	7.23	0.23	0.00	10.20	15.7	2
LP	Tube 2	Origin	56.50	-0.02	0.00	-0.00	-201.63	-2.89	-0.2	-108.97	-15.73	-0.08	-2.99	7.23	0.23	0.00	10.22	15.7	2
LP	LP:g	End	60.00	0.00	0.00	0.00	-256.67	-3.18	-0.2	-108.97	-15.73	-0.08	-2.96	9.00	0.23	0.00	11.96	18.4	2
RP	RP:t	Origin	0.00	-2.32	0.08	-0.01	-0.00	-0.00	0.0	-0.26	-0.08	-0.00	-0.01	0.00	0.01	0.00	0.02	0.0	5
RP	RP:AN1	End	4.00	-2.12	0.07	-0.01	-0.31	-0.01	0.0	-0.26	-0.08	-0.00	-0.01	0.02	0.00	0.00	0.04	0.1	2
RP	RP:AN1	Origin	4.00	-2.12	0.07	-0.01	-0.31	-0.01	0.0	-6.31	-1.89	-0.01	-0.29	0.00	0.18	0.00	0.42	0.6	5
RP	Tube 1	End	7.00	-1.97	0.07	-0.01	-5.96	-0.03	0.0	-6.31	-1.89	-0.01	-0.29	0.46	0.05	0.00	0.75	1.2	2
RP	Tube 1	Origin	7.00	-1.97	0.07	-0.01	-5.96	-0.03	0.0	-6.70	-2.00	-0.01	-0.30	0.46	0.05	0.00	0.77	1.2	2
RP	RP:AN2	End	10.00	-1.82	0.07	-0.01	-11.97	-0.05	0.0	-6.70	-2.00	-0.01	-0.30	0.91	0.05	0.00	1.21	1.9	2
RP	RP:AN2	Origin	10.00	-1.82	0.07	-0.01	-11.97	-0.05	0.0	-8.61	-2.34	-0.01	-0.38	0.91	0.06	0.00	1.30	2.0	2
RP	Tube 1	End	15.00	-1.57	0.06	-0.01	-23.66	-0.12	0.0	-8.61	-2.34	-0.01	-0.38	1.73	0.05	0.00	2.11	3.2	2
RP	Tube 1	Origin	15.00	-1.57	0.06	-0.01	-23.66	-0.12	0.0	-9.29	-2.54	-0.02	-0.41	1.73	0.06	0.00	2.14	3.3	2
RP	RP:AN3	End	20.00	-1.35	0.05	-0.01	-36.34	-0.21	0.0	-9.29	-2.54	-0.02	-0.40	2.56	0.06	0.00	2.96	4.5	2
RP	RP:AN3	Origin	20.00	-1.35	0.05	-0.01	-36.34	-0.21	0.0	-11.35	-2.91	-0.02	-0.49	2.56	0.07	0.00	3.05	4.7	2
RP	Tube 1	End	25.00	-1.14	0.05	-0.01	-50.90	-0.33	0.0	-11.35	-2.91	-0.02	-0.48	3.45	0.06	0.00	3.93	6.0	2
RP	Tube 1	Origin	25.00	-1.14	0.05	-0.01	-50.90	-0.33	0.0	-12.06	-3.11	-0.03	-0.51	3.45	0.07	0.00	3.96	6.1	2
RP	RP:AN4	End	30.00	-0.96	0.04	-0.01	-66.47	-0.48	0.0	-12.06	-3.11	-0.03	-0.50	4.34	0.07	0.00	4.84	7.4	2
RP	RP:AN4	Origin	30.00	-0.96	0.04	-0.01	-66.47	-0.48	0.0	-13.92	-3.42	-0.03	-0.46	3.46	0.06	0.00	3.93	6.0	2
RP	RP:SW	End	31.50	-0.91	0.04	-0.01	-71.60	-0.53	0.0	-13.92	-3.42	-0.03	-0.46	3.69	0.06	0.00	4.15	6.4	2
RP	RP:SW	Origin	31.50	-0.91	0.04	-0.01	-71.60	-0.53	0.0	-17.34	-5.25	-0.04	-0.57	3.69	0.09	0.00	4.26	6.6	2
RP	Tube 2	End	35.00	-0.82	0.04	-0.01	-89.98	-0.66	0.0	-17.34	-5.25	-0.04	-0.56	4.52	0.09	0.00	5.09	7.8	2
RP	Tube 2	Origin	35.00	-0.82	0.04	-0.01	-89.98	-0.66	0.0	-17.96	-5.39	-0.04	-0.58	4.52	0.09	0.00	5.11	7.9	2
RP	RP:ARM	End	38.50	-0.73	0.03	-0.01	-108.87	-0.80	0.0	-17.96	-5.39	-0.04	-0.58	5.34	0.09	0.00	5.91	9.1	2
RP	RP:ARM	Origin	38.50	-0.73	0.03	-0.01	21.55	-0.75	-0.2	-41.28	-16.82	-0.02	-1.32	0.80	0.78	0.01	2.52	3.9	3
RP	RP:AN5	End	40.00	-0.70	0.03	-0.00	-3.68	-0.78	-0.2	-41.28	-16.82	-0.02	-1.32	0.04	1.09	0.00	2.33	3.6	5
RP	RP:AN5	Origin	40.00	-0.70	0.03	-0.00	-3.68	-0.78	-0.2	-43.13	-17.11	-0.02	-1.38	0.04	1.11	0.00	2.39	3.7	5
RP	Tube 2	End	43.75	-0.63	0.03	-0.00	-67.84	-0.87	-0.2	-43.13	-17.11	-0.02	-1.36	3.21	0.28	0.00	4.59	7.1	2
RP	Tube 2	Origin	43.75	-0.63	0.03	-0.00	-67.84	-0.87	-0.2	-43.82	-17.26	-0.03	-1.38	3.21	0.29	0.00	4.62	7.1	2
RP	RP:B1	End	47.50	-0.56	0.02	0.00	-132.58	-0.97	-0.2	-43.82	-17.26	-0.03	-1.36	6.10	0.28	0.00	7.48	11.5	2
RP	RP:B1	Origin	47.50	-0.56	0.02	0.00	-85.41	-0.97	-0.2	-9.40	11.55	-0.03	-0.29	3.93	0.19	0.00	4.24	6.5	2
RP	RP:AN6	End	50.00	-0.54	0.02	0.00	-56.52	-1.05	-0.2	-9.40	11.55	-0.03	-0.29	2.56	0.19	0.00	2.87	4.4	2
RP	RP:AN6	Origin	50.00	-0.54	0.02	0.00	-56.52	-1.05	-0.2	-11.48	11.21	-0.04	-0.35	2.56	0.18	0.00	2.94	4.5	2

RP	Tube 3	End	55.00	-0.49	0.02	0.00	-0.45	-1.23	-0.2	-11.48	11.21	-0.04	-0.35	0.05	0.69	0.00	1.27	2.0	5
RP	Tube 3	Origin	55.00	-0.49	0.02	0.00	-0.45	-1.23	-0.2	-12.43	10.99	-0.04	-0.38	0.05	0.68	0.00	1.26	1.9	5
RP	RP:AN7	End	60.00	-0.45	0.01	0.00	54.48	-1.44	-0.2	-12.43	10.99	-0.04	-0.37	2.32	0.17	0.00	2.70	4.2	2
RP	RP:AN7	Origin	60.00	-0.45	0.01	0.00	54.48	-1.44	-0.2	-14.58	10.62	-0.05	-0.43	2.32	0.17	0.00	2.77	4.3	2
RP	RP:B2	End	63.00	-0.41	0.01	0.00	86.35	-1.59	-0.2	-14.58	10.62	-0.05	-0.43	3.59	0.17	0.00	4.03	6.2	2
RP	RP:B2	Origin	63.00	-0.41	0.01	0.00	126.05	-1.59	-0.2	12.79	-12.74	-0.05	0.38	5.24	0.20	0.00	5.62	8.7	2
RP	Tube 3	End	66.50	-0.36	0.01	0.00	81.45	-1.77	-0.2	12.79	-12.74	-0.05	0.37	3.31	0.20	0.00	3.70	5.7	2
RP	Tube 3	Origin	66.50	-0.36	0.01	0.00	81.45	-1.77	-0.2	12.10	-12.91	-0.06	0.35	3.31	0.20	0.00	3.68	5.7	2
RP	RP:AN8	End	70.00	-0.29	0.01	0.00	36.27	-1.97	-0.2	12.10	-12.91	-0.06	0.35	1.46	0.20	0.00	1.84	2.8	2
RP	RP:AN8	Origin	70.00	-0.29	0.01	0.00	36.27	-1.97	-0.2	9.87	-13.28	-0.06	0.28	1.46	0.20	0.00	1.78	2.7	2
RP	Tube 3	End	75.00	-0.19	0.00	0.00	-30.15	-2.28	-0.2	9.87	-13.28	-0.06	0.28	0.91	0.54	0.00	1.52	2.3	3
RP	Tube 3	Origin	75.00	-0.19	0.00	0.00	-30.15	-2.28	-0.2	8.86	-13.53	-0.07	0.25	0.91	0.55	0.00	1.51	2.3	3
RP	RP:AN9	End	80.00	-0.10	0.00	0.00	-97.80	-2.63	-0.2	8.86	-13.53	-0.07	0.25	3.66	0.20	0.00	3.92	6.0	2
RP	RP:AN9	Origin	80.00	-0.10	0.00	0.00	-97.80	-2.63	-0.2	6.45	-13.95	-0.08	0.18	3.66	0.21	0.00	3.86	5.9	2
RP	Tube 3	End	85.00	-0.03	0.00	0.00	-167.57	-3.00	-0.2	6.45	-13.95	-0.08	0.18	6.07	0.20	0.00	6.25	9.6	2
RP	Tube 3	Origin	85.00	-0.03	0.00	0.00	-167.57	-3.00	-0.2	5.40	-14.21	-0.08	0.15	6.07	0.21	0.00	6.23	9.6	2
RP	RP:g	End	90.00	0.00	0.00	0.00	-238.62	-3.41	-0.2	5.40	-14.21	-0.08	0.15	8.37	0.20	0.00	8.53	13.1	2

Summary of Brace Forces and Usages for Load Case "NESC HEAVY (250B) (-)":

Brace Label	Forces (kips)	Allowable Compression (kips)	Allowable Tension (kips)	Usage %
BR1	36.55	178.44	172.12	21.24
BR2	-45.61	178.44	172.12	25.56

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

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.
A1	A1:O	Origin	0.00	-0.74	0.03	-0.09	-112.81	0.01	0.0	5.86	17.61	-0.00	0.48	28.89	1.15	0.00	29.44	45.3	2
A1	#A1:0	End	3.22	-0.74	0.03	-0.30	-56.11	0.00	0.0	5.86	17.61	-0.00	0.63	24.83	1.51	0.00	25.59	39.4	2
A1	#A1:0	Origin	3.22	-0.74	0.03	-0.30	-56.11	0.00	-0.0	5.95	17.42	-0.00	0.64	24.83	1.50	0.00	25.60	39.4	2
A1	A1:T	End	6.44	-0.73	0.03	-0.72	0.00	0.00	-0.0	5.95	17.42	-0.00	0.93	0.00	5.65	0.00	9.83	15.1	4
A2	A2:O	Origin	0.00	-0.73	0.03	0.02	-113.26	-0.01	-0.0	-5.74	17.65	0.00	-0.47	29.01	1.15	0.00	29.55	45.5	2
A2	#A2:0	End	3.22	-0.73	0.03	-0.03	-56.43	-0.01	-0.0	-5.74	17.65	0.00	-0.62	24.97	1.52	0.00	25.72	39.6	2
A2	#A2:0	Origin	3.22	-0.73	0.03	-0.03	-56.43	-0.01	-0.0	-5.64	17.53	0.00	-0.61	24.97	1.51	0.00	25.71	39.6	2
A2	A2:T	End	6.44	-0.74	0.03	-0.30	-0.00	0.00	-0.0	-5.64	17.53	0.00	-0.88	0.00	5.68	0.00	9.88	15.2	4

Detailed Tubular X-Arm Usages for Load Case "NESC HEAVY (250B) (-)":

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.
X1	X1:O	Origin	0.00	-0.74	0.03	-0.05	-67.50	-0.20	0.0	-0.24	12.99	0.03	-0.02	23.22	0.98	0.01	23.31	35.9	2
X1	#sX1:0	End	3.88	-0.74	0.03	-0.05	-17.16	-0.10	0.0	-0.24	12.99	0.03	-0.02	5.91	0.98	0.01	6.18	9.5	2
X1	#sX1:0	Origin	3.88	-0.74	0.03	-0.05	-17.16	-0.10	0.0	-0.22	12.78	0.03	-0.02	5.91	0.97	0.01	6.17	9.5	2
X1	X1:C2	End	7.75	-0.74	0.03	-0.11	32.37	0.00	0.0	-0.22	12.78	0.03	-0.02	11.12	0.97	0.01	11.27	17.3	2
X1	X1:C2	Origin	7.75	-0.74	0.03	-0.11	32.37	0.00	0.0	5.53	-4.85	0.02	0.52	11.12	0.37	0.01	11.66	17.9	2
X1	#sX1:1	End	11.63	-0.73	0.03	-0.08	13.58	0.10	0.0	5.53	-4.85	0.02	0.52	4.68	0.37	0.01	5.24	8.1	2
X1	#sX1:1	Origin	11.63	-0.73	0.03	-0.08	13.58	0.10	0.0	5.53	-5.05	0.02	0.52	4.68	0.38	0.01	5.25	8.1	2
X1	X1:E	End	15.50	-0.73	0.03	-0.01	-5.99	0.19	0.0	5.53	-5.05	0.02	0.52	2.09	0.38	0.01	2.70	4.1	2

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
1	3.441	50.00	50.00	6.88	0.00	0.00	0.00	6.88
2	3.441	50.00	50.00	6.88	0.00	0.00	0.00	6.88
3	5.850	50.00	50.00	11.70	0.00	0.00	0.00	11.70
4	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
5	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
6	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
7	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
8	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
9	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
10	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78
11	1.391	50.00	50.00	2.78	0.00	0.00	0.00	2.78

Summary of Suspension Capacities and Usages for Load Case "NESC HEAVY (250B) (-)":

Suspension Label	Tension (kips)	Input Tension Capacity (kips)	Factored Tension Capacity (kips)	Tension Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
C1	18.351	30.00	30.00	61.17	0.00	0.00	0.00	61.17
C2	18.351	30.00	30.00	61.17	0.00	0.00	0.00	61.17
C3	18.351	30.00	30.00	61.17	0.00	0.00	0.00	61.17

*** Analysis Results for Load Case No. 5 "NESC EXT. WIND (250C)(-)" - Number of iterations in SAPS 10

Equilibrium Joint Positions and Rotations for Load Case "NESC EXT. WIND (250C)(-)":

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)
LP:g	0	0	0	0.0000	0.0000	0.0000	0	-7.75	0
LP:t	0.0006916	-0.1656	-0.006252	0.2315	0.0009	-0.0002	0.0006916	-7.916	59.99
LP:SW	0.0006672	-0.1595	-0.006239	0.2315	0.0009	-0.0002	0.0006672	-7.91	58.49
LP:ARM	0.0005532	-0.1314	-0.006173	0.2266	0.0009	-0.0002	0.0005532	-7.881	51.49
LP:B1	0.0004091	-0.0996	-0.005895	0.1371	0.0009	-0.0001	0.0004091	-7.85	42.49
LP:B2	0.0001879	-0.07286	-0.004322	0.1294	0.0007	-0.0001	0.0001879	-7.823	27
RP:g	0	0	0	0.0000	0.0000	0.0000	0	7.75	0
RP:t	0.001532	-0.5428	0.0009948	0.7496	0.0014	-0.0002	0.001532	7.207	90
RP:AN1	0.001435	-0.4905	0.001338	0.7494	0.0014	-0.0002	0.001435	7.26	86
RP:AN2	0.001288	-0.4124	0.001878	0.7342	0.0014	-0.0002	0.001288	7.338	80
RP:AN3	0.001047	-0.2906	0.002688	0.6442	0.0014	-0.0002	0.001047	7.459	70
RP:AN4	0.0008158	-0.1914	0.003265	0.4757	0.0013	-0.0002	0.0008158	7.559	60
RP:SW	0.0007825	-0.1792	0.003325	0.4504	0.0013	-0.0002	0.0007825	7.571	58.5
RP:ARM	0.0006324	-0.1321	0.003545	0.3104	0.0012	-0.0002	0.0006324	7.618	51.5
RP:AN5	0.0006016	-0.1241	0.003583	0.2882	0.0012	-0.0002	0.0006016	7.626	50
RP:B1	0.0004554	-0.095	0.003734	0.1408	0.0011	-0.0001	0.0004554	7.655	42.5
RP:AN6	0.0004098	-0.08995	0.003607	0.1031	0.0010	-0.0001	0.0004098	7.66	40
RP:AN7	0.0002457	-0.07744	0.003107	0.0823	0.0008	-0.0001	0.0002457	7.673	30
RP:B2	0.000203	-0.07266	0.002965	0.1116	0.0008	-0.0001	0.000203	7.677	27
RP:AN8	0.0001166	-0.05259	0.002161	0.1939	0.0006	-0.0001	0.0001166	7.697	20
RP:AN9	3.13e-05	-0.01774	0.001076	0.1704	0.0003	-0.0000	3.13e-05	7.732	10
A1:O	0.0005495	-0.1314	-0.01134	0.2266	0.0009	-0.0002	0.0005495	-9.188	51.49
A1:T	0.0005312	-0.1315	-0.05228	0.4572	0.0009	-0.0002	0.0005312	-15.63	51.45
A2:O	0.0006362	-0.1321	0.01062	0.3104	0.0012	-0.0002	0.0006362	8.924	51.51
A2:T	0.0006548	-0.1324	0.02994	0.0781	0.0012	-0.0002	0.0006548	15.36	51.53
X1:O	0.0005532	-0.1314	-0.006173	0.2266	0.0009	-0.0002	0.0005532	-7.881	51.49
X1:C2	0.0005926	-0.1319	-0.007612	-0.0738	0.0011	-0.0004	0.0005926	-0.1319	51.49
X1:E	0.0006324	-0.1321	0.003545	0.3104	0.0012	-0.0002	0.0006324	7.618	51.5
BR1:O	0.000412	-0.0996	-0.00267	0.1371	0.0009	-0.0001	0.000412	-6.502	42.5
BR1:E	0.0002012	-0.07266	0.0002011	0.1116	0.0008	-0.0001	0.0002012	6.259	27
BR2:O	0.0001897	-0.07286	-0.001118	0.1294	0.0007	-0.0001	0.0001897	-6.404	27
BR2:E	0.0004524	-0.09499	0.0004242	0.1408	0.0011	-0.0001	0.0004524	6.308	42.5

Joint Support Reactions for Load Case "NESC EXT. WIND (250C)(-)":

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 %
LP:g	-0.02	0.0	29.71	0.0	0.0	-162.35	0.0	0.0	165.05	0.0	-502.88	0.0	-0.8	0.0	0.0	0.04	0.0	0.0
RP:g	-0.02	0.0	33.45	0.0	0.0	113.98	0.0	0.0	118.79	0.0	-529.75	0.0	-0.8	0.0	0.0	0.04	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC EXT. WIND (250C)(-)":

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.
LP	LP:t	Origin	0.00	-1.99	0.01	-0.08	-0.00	-0.00	0.0	-0.08	-0.07	-0.00	-0.00	0.00	0.00	0.00	0.01	0.0	5

LP	LP:SW	End	1.50	-1.91	0.01	-0.07	-0.10	-0.00	0.0	-0.08	-0.07	-0.00	-0.00	0.00	0.00	0.00	0.01	0.0	4
LP	LP:SW	Origin	1.50	-1.91	0.01	-0.07	-0.10	-0.00	0.0	-1.10	-2.52	-0.00	-0.04	0.00	0.17	0.00	0.29	0.5	5
LP	Tube 1	End	5.00	-1.74	0.01	-0.07	-8.94	-0.00	0.0	-1.10	-2.52	-0.00	-0.04	0.45	0.04	0.00	0.49	0.8	2
LP	Tube 1	Origin	5.00	-1.74	0.01	-0.07	-8.94	-0.00	0.0	-1.47	-2.85	-0.00	-0.05	0.45	0.05	0.00	0.50	0.8	2
LP	LP:ARM	End	8.50	-1.58	0.01	-0.07	-18.90	-0.01	0.0	-1.47	-2.85	-0.00	-0.05	0.92	0.05	0.00	0.97	1.5	2
LP	LP:ARM	Origin	8.50	-1.58	0.01	-0.07	5.18	-0.02	-0.0	-22.29	-32.80	-0.01	-0.71	0.00	2.14	0.00	3.77	5.8	5
LP	Tube 1	End	13.00	-1.36	0.01	-0.07	-142.43	-0.06	-0.0	-22.29	-32.80	-0.01	-0.70	6.74	0.55	0.00	7.51	11.5	2
LP	Tube 1	Origin	13.00	-1.36	0.01	-0.07	-142.43	-0.06	-0.0	-22.80	-33.21	-0.01	-0.72	6.74	0.55	0.00	7.52	11.6	2
LP	LP:B1	End	17.50	-1.20	0.00	-0.07	-291.88	-0.10	-0.0	-22.80	-33.21	-0.01	-0.71	13.39	0.55	0.00	14.13	21.7	2
LP	LP:B1	Origin	17.50	-1.20	0.00	-0.07	-194.98	-0.10	-0.0	-95.08	25.09	-0.01	-2.95	8.95	0.41	0.00	11.92	18.3	2
LP	SpliceT	End	20.00	-1.13	0.00	-0.07	-132.27	-0.13	-0.0	-95.08	25.09	-0.01	-2.93	5.97	0.41	0.00	8.92	13.7	2
LP	SpliceT	Origin	20.00	-1.13	0.00	-0.07	-132.27	-0.13	-0.0	-95.48	24.77	-0.01	-2.94	5.97	0.40	0.00	8.94	13.7	2
LP	Tube 2	End	25.00	-1.04	0.00	-0.06	-8.43	-0.19	-0.0	-95.48	24.77	-0.01	-2.89	0.11	1.47	0.00	3.94	6.1	4
LP	Tube 2	Origin	25.00	-1.04	0.00	-0.06	-8.43	-0.19	-0.0	-95.99	24.34	-0.01	-2.91	0.11	1.45	0.00	3.92	6.0	4
LP	Tube 2	End	29.00	-0.96	0.00	-0.06	88.90	-0.24	-0.0	-95.99	24.34	-0.01	-2.87	3.78	0.38	0.00	6.68	10.3	2
LP	Tube 2	Origin	29.00	-0.96	0.00	-0.06	88.90	-0.24	-0.0	-96.45	23.90	-0.01	-2.88	3.78	0.38	0.00	6.69	10.3	2
LP	LP:B2	End	33.00	-0.87	0.00	-0.05	184.50	-0.30	-0.0	-96.45	23.90	-0.01	-2.85	7.64	0.37	0.00	10.50	16.2	2
LP	LP:B2	Origin	33.00	-0.87	0.00	-0.05	272.05	-0.30	-0.0	-158.68	-27.59	-0.02	-4.68	11.26	0.43	0.00	15.96	24.6	2
LP	Tube 2	End	38.00	-0.70	0.00	-0.04	134.14	-0.37	-0.0	-158.68	-27.59	-0.02	-4.61	5.38	0.42	0.00	10.01	15.4	2
LP	Tube 2	Origin	38.00	-0.70	0.00	-0.04	134.14	-0.37	-0.0	-159.25	-28.20	-0.02	-4.62	5.38	0.43	0.00	10.03	15.4	2
LP	Tube 2	End	43.00	-0.49	0.00	-0.03	-6.85	-0.46	-0.0	-159.25	-28.20	-0.02	-4.55	0.09	1.58	0.00	5.39	8.3	4
LP	Tube 2	Origin	43.00	-0.49	0.00	-0.03	-6.85	-0.46	-0.0	-159.85	-28.72	-0.02	-4.57	0.09	1.61	0.00	5.43	8.4	4
LP	Tube 2	End	48.00	-0.28	0.00	-0.02	-150.43	-0.55	-0.0	-159.85	-28.72	-0.02	-4.50	5.66	0.43	0.00	10.19	15.7	2
LP	Tube 2	Origin	48.00	-0.28	0.00	-0.02	-150.43	-0.55	-0.0	-160.47	-29.15	-0.02	-4.51	5.66	0.43	0.00	10.21	15.7	2
LP	Tube 2	End	53.00	-0.11	0.00	-0.01	-296.14	-0.64	-0.0	-160.47	-29.15	-0.02	-4.45	10.81	0.43	0.00	15.27	23.5	2
LP	Tube 2	Origin	53.00	-0.11	0.00	-0.01	-296.14	-0.64	-0.0	-161.02	-29.44	-0.02	-4.46	10.81	0.43	0.00	15.28	23.5	2
LP	Tube 2	End	56.50	-0.03	0.00	-0.01	-399.16	-0.71	-0.0	-161.02	-29.44	-0.02	-4.41	14.26	0.43	0.00	18.69	28.7	2
LP	Tube 2	Origin	56.50	-0.03	0.00	-0.01	-399.16	-0.71	-0.0	-161.49	-29.64	-0.02	-4.43	14.26	0.43	0.00	18.70	28.8	2
LP	LP:g	End	60.00	0.00	0.00	0.00	-502.88	-0.78	-0.0	-161.49	-29.64	-0.02	-4.38	17.59	0.42	0.00	21.98	33.8	2
RP	RP:t	Origin	0.00	-6.51	0.02	0.01	-0.00	-0.00	0.0	-0.15	-0.16	-0.00	-0.01	0.00	0.02	0.00	0.03	0.0	5
RP	RP:AN1	End	4.00	-5.89	0.02	0.02	-0.65	-0.00	0.0	-0.15	-0.16	-0.00	-0.01	0.05	0.00	0.00	0.06	0.1	2
RP	RP:AN1	Origin	4.00	-5.89	0.02	0.02	-0.65	-0.00	0.0	-3.33	-6.12	-0.00	-0.15	0.00	0.57	0.00	1.00	1.5	5
RP	Tube 1	End	7.00	-5.41	0.02	0.02	-19.02	-0.01	0.0	-3.33	-6.12	-0.00	-0.15	1.48	0.15	0.00	1.65	2.5	2
RP	Tube 1	Origin	7.00	-5.41	0.02	0.02	-19.02	-0.01	0.0	-3.56	-6.37	-0.00	-0.16	1.48	0.15	0.00	1.66	2.6	2
RP	RP:AN2	End	10.00	-4.95	0.02	0.02	-38.13	-0.01	0.0	-3.56	-6.37	-0.00	-0.16	2.89	0.15	0.00	3.06	4.7	2
RP	RP:AN2	Origin	10.00	-4.95	0.02	0.02	-38.13	-0.01	0.0	-4.24	-7.27	-0.00	-0.19	2.89	0.17	0.00	3.10	4.8	2
RP	Tube 1	End	15.00	-4.19	0.01	0.03	-74.49	-0.03	0.0	-4.24	-7.27	-0.00	-0.19	5.44	0.17	0.00	5.63	8.7	2
RP	Tube 1	Origin	15.00	-4.19	0.01	0.03	-74.49	-0.03	0.0	-4.63	-7.70	-0.00	-0.20	5.44	0.18	0.00	5.65	8.7	2
RP	RP:AN3	End	20.00	-3.49	0.01	0.03	-112.98	-0.05	0.0	-4.63	-7.70	-0.00	-0.20	7.93	0.17	0.00	8.14	12.5	2
RP	RP:AN3	Origin	20.00	-3.49	0.01	0.03	-112.98	-0.05	0.0	-5.40	-8.69	-0.01	-0.23	7.93	0.20	0.00	8.17	12.6	2
RP	Tube 1	End	25.00	-2.85	0.01	0.04	-156.44	-0.08	0.0	-5.40	-8.69	-0.01	-0.23	10.58	0.19	0.00	10.81	16.6	2
RP	Tube 1	Origin	25.00	-2.85	0.01	0.04	-156.44	-0.08	0.0	-5.82	-9.13	-0.01	-0.25	10.58	0.20	0.00	10.83	16.7	2
RP	RP:AN4	End	30.00	-2.30	0.01	0.04	-202.09	-0.11	0.0	-5.82	-9.13	-0.01	-0.24	13.17	0.20	0.00	13.41	20.6	2
RP	RP:AN4	Origin	30.00	-2.30	0.01	0.04	-202.09	-0.11	0.0	-6.48	-9.98	-0.01	-0.21	10.51	0.17	0.00	10.73	16.5	2
RP	RP:SW	End	31.50	-2.15	0.01	0.04	-217.06	-0.12	0.0	-6.48	-9.98	-0.01	-0.21	11.17	0.17	0.00	11.38	17.5	2
RP	RP:SW	Origin	31.50	-2.15	0.01	0.04	-217.06	-0.12	0.0	-7.51	-12.43	-0.01	-0.25	11.17	0.22	0.00	11.42	17.6	2
RP	Tube 2	End	35.00	-1.84	0.01	0.04	-260.57	-0.15	0.0	-7.51	-12.43	-0.01	-0.24	13.07	0.21	0.00	13.32	20.5	2
RP	Tube 2	Origin	35.00	-1.84	0.01	0.04	-260.57	-0.15	0.0	-7.89	-12.75	-0.01	-0.26	13.07	0.22	0.00	13.33	20.5	2
RP	RP:ARM	End	38.50	-1.58	0.01	0.04	-305.18	-0.18	0.0	-7.89	-12.75	-0.01	-0.25	14.93	0.22	0.00	15.19	23.4	2
RP	RP:ARM	Origin	38.50	-1.58	0.01	0.04	-188.22	-0.17	-0.0	-10.47	-17.13	-0.00	-0.34	9.21	0.29	0.00	9.56	14.7	2
RP	RP:AN5	End	40.00	-1.49	0.01	0.04	-213.92	-0.18	-0.0	-10.47	-17.13	-0.00	-0.33	10.36	0.29	0.00	10.70	16.5	2
RP	RP:AN5	Origin	40.00	-1.49	0.01	0.04	-213.92	-0.18	-0.0	-11.14	-17.93	-0.01	-0.36	10.36	0.30	0.00	10.72	16.5	2
RP	Tube 2	End	43.75	-1.29	0.01	0.04	-281.16	-0.20	-0.0	-11.14	-17.93	-0.01	-0.35	13.26	0.30	0.00	13.62	20.9	2
RP	Tube 2	Origin	43.75	-1.29	0.01	0.04	-281.16	-0.20	-0.0	-11.57	-18.27	-0.01	-0.36	13.26	0.30	0.00	13.63	21.0	2
RP	RP:B1	End	47.50	-1.14	0.01	0.04	-349.68	-0.22	-0.0	-11.57	-18.27	-0.01	-0.36	16.06	0.30	0.00	16.43	25.3	2
RP	RP:B1	Origin	47.50	-1.14	0.01	0.04	-266.72	-0.22	-0.0	49.66	32.11	-0.01	1.54	12.25	0.53	0.00	13.83	21.3	2
RP	RP:AN6	End	50.00	-1.08	0.00	0.04	-186.45	-0.24	-0.0	49.66	32.11	-0.01	1.53	8.42	0.52	0.00	9.99	15.4	2
RP	RP:AN6	Origin	50.00	-1.08	0.00	0.04	-186.45	-0.24	-0.0	48.89	31.15	-0.01	1.51	8.42	0.51	0.00	9.97	15.3	2

RP	Tube 3	End	55.00	-1.00	0.00	0.04	-30.71	-0.28	-0.0	48.89	31.15	-0.01	1.48	0.37	1.85	0.00	3.71	5.7	4
RP	Tube 3	Origin	55.00	-1.00	0.00	0.04	-30.71	-0.28	-0.0	48.34	30.65	-0.01	1.46	0.37	1.82	0.00	3.66	5.6	4
RP	RP:AN7	End	60.00	-0.93	0.00	0.04	122.53	-0.34	-0.0	48.34	30.65	-0.01	1.44	5.18	0.48	0.00	6.67	10.3	2
RP	RP:AN7	Origin	60.00	-0.93	0.00	0.04	122.53	-0.34	-0.0	47.50	29.71	-0.01	1.42	5.18	0.47	0.00	6.64	10.2	2
RP	RP:B2	End	63.00	-0.87	0.00	0.04	211.65	-0.37	-0.0	47.50	29.71	-0.01	1.40	8.77	0.46	0.00	10.20	15.7	2
RP	RP:B2	Origin	63.00	-0.87	0.00	0.04	312.85	-0.37	-0.0	118.48	-29.38	-0.01	3.50	12.95	0.46	0.00	16.47	25.3	2
RP	Tube 3	End	66.50	-0.77	0.00	0.03	210.03	-0.42	-0.0	118.48	-29.38	-0.01	3.46	8.50	0.45	0.00	11.99	18.4	2
RP	Tube 3	Origin	66.50	-0.77	0.00	0.03	210.03	-0.42	-0.0	118.10	-29.65	-0.01	3.45	8.50	0.46	0.00	11.98	18.4	2
RP	RP:AN8	End	70.00	-0.63	0.00	0.03	106.24	-0.47	-0.0	118.10	-29.65	-0.01	3.41	4.21	0.45	0.00	7.66	11.8	2
RP	RP:AN8	Origin	70.00	-0.63	0.00	0.03	106.24	-0.47	-0.0	117.23	-30.61	-0.02	3.38	4.21	0.47	0.00	7.63	11.7	2
RP	Tube 3	End	75.00	-0.42	0.00	0.02	-46.82	-0.54	-0.0	117.23	-30.61	-0.02	3.33	1.80	0.46	0.00	5.19	8.0	2
RP	Tube 3	Origin	75.00	-0.42	0.00	0.02	-46.82	-0.54	-0.0	116.63	-31.16	-0.02	3.31	1.80	0.47	0.00	5.18	8.0	2
RP	RP:AN9	End	80.00	-0.21	0.00	0.01	-202.62	-0.63	-0.0	116.63	-31.16	-0.02	3.26	7.53	0.46	0.00	10.82	16.7	2
RP	RP:AN9	Origin	80.00	-0.21	0.00	0.01	-202.62	-0.63	-0.0	115.62	-32.35	-0.02	3.23	7.53	0.48	0.00	10.80	16.6	2
RP	Tube 3	End	85.00	-0.06	0.00	0.01	-364.41	-0.73	-0.0	115.62	-32.35	-0.02	3.18	13.14	0.47	0.00	16.34	25.1	2
RP	Tube 3	Origin	85.00	-0.06	0.00	0.01	-364.41	-0.73	-0.0	114.95	-33.06	-0.02	3.17	13.14	0.48	0.00	16.32	25.1	2
RP	RP:g	End	90.00	0.00	0.00	0.00	-529.75	-0.83	-0.0	114.95	-33.06	-0.02	3.12	18.52	0.47	0.00	21.66	33.3	2

Summary of Brace Forces and Usages for Load Case "NESC EXT. WIND (250C)(-)":

Brace Label	Forces (kips)	Allowable Compression (kips)	Allowable Tension (kips)	Usage %
BR1	92.61	178.44	172.12	53.80
BR2	-79.87	178.44	172.12	44.76

Detailed Tubular Davit Arm Usages for Load Case "NESC EXT. WIND (250C)(-)":

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.
A1	A1:O	Origin	0.00	-1.58	0.01	-0.14	-47.10	0.00	0.0	11.25	7.38	-0.00	0.92	12.06	0.48	0.00	13.01	20.0	2
A1	#A1:0	End	3.22	-1.58	0.01	-0.34	-23.35	0.00	0.0	11.25	7.38	-0.00	1.21	10.33	0.63	0.00	11.59	17.8	2
A1	#A1:0	Origin	3.22	-1.58	0.01	-0.34	-23.35	0.00	-0.0	11.27	7.25	-0.00	1.21	10.33	0.62	0.00	11.59	17.8	2
A1	A1:T	End	6.44	-1.58	0.01	-0.63	0.00	-0.00	-0.0	11.27	7.25	-0.00	1.76	0.00	2.35	0.00	4.43	6.8	4
A2	A2:O	Origin	0.00	-1.58	0.01	0.13	-47.34	-0.00	-0.0	-11.25	7.39	0.00	-0.92	12.12	0.48	0.00	13.07	20.1	2
A2	#A2:0	End	3.22	-1.59	0.01	0.29	-23.55	-0.00	-0.0	-11.25	7.39	0.00	-1.21	10.42	0.63	0.00	11.68	18.0	2
A2	#A2:0	Origin	3.22	-1.59	0.01	0.29	-23.55	-0.00	-0.0	-11.23	7.31	0.00	-1.20	10.42	0.63	0.00	11.67	18.0	2
A2	A2:T	End	6.44	-1.59	0.01	0.36	-0.00	-0.00	-0.0	-11.23	7.31	0.00	-1.75	0.00	2.37	0.00	4.46	6.9	4

Detailed Tubular X-Arm Usages for Load Case "NESC EXT. WIND (250C)(-)":

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.
X1	X1:O	Origin	0.00	-1.58	0.01	-0.07	-80.92	-0.04	0.0	-18.30	12.92	0.01	-1.73	27.81	0.98	0.00	29.59	45.5	2
X1	#sX1:0	End	3.88	-1.58	0.01	-0.02	-30.84	-0.02	0.0	-18.30	12.92	0.01	-1.73	10.60	0.98	0.00	12.45	19.2	2
X1	#sX1:0	Origin	3.88	-1.58	0.01	-0.02	-30.84	-0.02	0.0	-18.27	12.83	0.01	-1.73	10.60	0.97	0.00	12.44	19.1	2
X1	X1:C2	End	7.75	-1.58	0.01	-0.09	18.88	0.00	0.0	-18.27	12.83	0.01	-1.73	6.49	0.97	0.00	8.39	12.9	2
X1	X1:C2	Origin	7.75	-1.58	0.01	-0.09	18.88	0.00	0.0	-7.07	5.38	0.01	-0.67	6.49	0.41	0.00	7.19	11.1	2
X1	#sX1:1	End	11.63	-1.58	0.01	-0.10	39.71	0.02	0.0	-7.07	5.38	0.01	-0.67	13.65	0.41	0.00	14.33	22.1	2
X1	#sX1:1	Origin	11.63	-1.58	0.01	-0.10	39.71	0.02	0.0	-7.09	5.21	0.01	-0.67	13.65	0.39	0.00	14.34	22.1	2
X1	X1:E	End	15.50	-1.58	0.01	0.04	59.91	0.04	0.0	-7.09	5.21	0.01	-0.67	20.59	0.39	0.00	21.27	32.7	2

Summary of Clamp Capacities and Usages for Load Case "NESC EXT. WIND (250C)(-)":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
1	2.356	50.00	50.00	4.71	0.00	0.00	0.00	4.71
2	2.356	50.00	50.00	4.71	0.00	0.00	0.00	4.71
3	6.383	50.00	50.00	12.77	0.00	0.00	0.00	12.77
4	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
5	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
6	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
7	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
8	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
9	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
10	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35
11	0.674	50.00	50.00	1.35	0.00	0.00	0.00	1.35

Summary of Suspension Capacities and Usages for Load Case "NESC EXT. WIND (250C)(-)":

Suspension Label	Tension (kips)	Input Tension Capacity (kips)	Factored Tension Capacity (kips)	Tension Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
C1	13.377	30.00	30.00	44.59	0.00	0.00	0.00	44.59
C2	13.377	30.00	30.00	44.59	0.00	0.00	0.00	44.59
C3	13.377	30.00	30.00	44.59	0.00	0.00	0.00	44.59

*** Analysis Results for Load Case No. 6 "NESC EXT. ICE (250D)(-)" - Number of iterations in SAPS 9

Equilibrium Joint Positions and Rotations for Load Case "NESC EXT. ICE (250D)(-)":

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)
LP:g	0	0	0	0.0000	0.0000	0.0000	0	-7.75	0
LP:t	0.001153	-0.05629	-0.003519	0.1069	0.0016	-0.0003	0.001153	-7.806	60
LP:SW	0.001112	-0.05349	-0.003516	0.1069	0.0016	-0.0003	0.001112	-7.803	58.5
LP:ARM	0.000921	-0.0405	-0.003465	0.1044	0.0016	-0.0003	0.000921	-7.791	51.5
LP:B1	0.0006795	-0.02899	-0.003103	0.0397	0.0015	-0.0002	0.0006795	-7.779	42.5
LP:B2	0.0003107	-0.02347	-0.002215	0.0318	0.0012	-0.0001	0.0003107	-7.773	27
RP:g	0	0	0	0.0000	0.0000	0.0000	0	7.75	0
RP:t	0.002624	-0.1203	-0.00159	0.1498	0.0024	-0.0003	0.002624	7.63	90
RP:AN1	0.002455	-0.1099	-0.001575	0.1497	0.0024	-0.0003	0.002455	7.64	86
RP:AN2	0.002202	-0.09428	-0.001507	0.1464	0.0024	-0.0003	0.002202	7.656	80
RP:AN3	0.001786	-0.07011	-0.001369	0.1267	0.0023	-0.0003	0.001786	7.68	70
RP:AN4	0.001388	-0.05092	-0.001212	0.0892	0.0022	-0.0003	0.001388	7.699	60
RP:SW	0.00133	-0.04865	-0.001191	0.0835	0.0022	-0.0003	0.00133	7.701	58.5
RP:ARM	0.001073	-0.04027	-0.001059	0.0505	0.0020	-0.0003	0.001073	7.71	51.5
RP:AN5	0.00102	-0.03883	-0.0009889	0.0547	0.0020	-0.0003	0.00102	7.711	50
RP:B1	0.0007697	-0.03164	-0.0006303	0.0413	0.0018	-0.0002	0.0007697	7.718	42.5
RP:AN6	0.000692	-0.03004	-0.0005793	0.0350	0.0017	-0.0002	0.000692	7.72	40
RP:AN7	0.0004131	-0.02457	-0.0003577	0.0361	0.0014	-0.0002	0.0004131	7.725	30
RP:B2	0.0003407	-0.02255	-0.0002856	0.0434	0.0013	-0.0001	0.0003407	7.727	27
RP:AN8	0.0001951	-0.01575	-0.0002291	0.0617	0.0010	-0.0001	0.0001951	7.734	20
RP:AN9	5.205e-05	-0.005152	-0.0001245	0.0503	0.0006	-0.0000	5.205e-05	7.745	10
A1:O	0.0009141	-0.0405	-0.005847	0.1044	0.0016	-0.0003	0.0009141	-9.097	51.49
A1:T	0.0008794	-0.04038	-0.05598	0.6775	0.0016	-0.0003	0.0008794	-15.54	51.44
A2:O	0.00108	-0.04027	9.168e-05	0.0505	0.0020	-0.0003	0.00108	9.016	51.5
A2:T	0.001113	-0.04047	-0.03275	-0.5246	0.0020	-0.0003	0.001113	15.46	51.47
X1:O	0.000921	-0.0405	-0.003465	0.1044	0.0016	-0.0003	0.000921	-7.791	51.5
X1:C2	0.0009961	-0.04043	-0.008815	-0.0234	0.0018	-0.0007	0.0009961	-0.04043	51.49
X1:E	0.001073	-0.04027	-0.001059	0.0505	0.0020	-0.0003	0.001073	7.71	51.5
BR1:O	0.000685	-0.02899	-0.002169	0.0397	0.0015	-0.0002	0.000685	-6.431	42.5
BR1:E	0.0003372	-0.02255	-0.001361	0.0434	0.0013	-0.0001	0.0003372	6.309	27
BR2:O	0.0003141	-0.02347	-0.001427	0.0318	0.0012	-0.0001	0.0003141	-6.355	27
BR2:E	0.000764	-0.03164	-0.0016	0.0413	0.0018	-0.0002	0.000764	6.371	42.5

Joint Support Reactions for Load Case "NESC EXT. ICE (250D)(-)":

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 %
LP:g	-0.03	0.0	11.00	0.0	0.0	-86.45	0.0	0.0	87.15	0.0	-175.13	0.0	-1.3	0.0	0.0	0.08	0.0	0.0
RP:g	-0.03	0.0	8.89	0.0	0.0	-14.37	0.0	0.0	16.90	0.0	-151.73	0.0	-1.4	0.0	0.0	0.08	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC EXT. ICE (250D)(-)":

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.
LP	LP:t	Origin	0.00	-0.68	0.01	-0.04	-0.00	0.00	0.0	-0.10	-0.02	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5

LP	LP:SW	End	1.50	-0.64	0.01	-0.04	-0.03	-0.00	0.0	-0.10	-0.02	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	2
LP	LP:SW	Origin	1.50	-0.64	0.01	-0.04	-0.03	-0.00	0.0	-4.69	-1.32	-0.00	-0.15	0.00	0.09	0.00	0.22	0.3	5
LP	Tube 1	End	5.00	-0.56	0.01	-0.04	-4.65	-0.01	0.0	-4.69	-1.32	-0.00	-0.15	0.23	0.02	0.00	0.39	0.6	2
LP	Tube 1	Origin	5.00	-0.56	0.01	-0.04	-4.65	-0.01	0.0	-5.16	-1.40	-0.00	-0.17	0.23	0.02	0.00	0.40	0.6	2
LP	LP:ARM	End	8.50	-0.49	0.01	-0.04	-9.56	-0.01	0.0	-5.16	-1.40	-0.00	-0.17	0.47	0.02	0.00	0.63	1.0	2
LP	LP:ARM	Origin	8.50	-0.49	0.01	-0.04	-90.92	-0.03	-0.1	-35.94	-2.48	-0.02	-1.15	4.44	0.04	0.00	5.59	8.6	2
LP	Tube 1	End	13.00	-0.40	0.01	-0.04	-102.08	-0.10	-0.1	-35.94	-2.48	-0.02	-1.13	4.83	0.04	0.00	5.97	9.2	2
LP	Tube 1	Origin	13.00	-0.40	0.01	-0.04	-102.08	-0.10	-0.1	-36.57	-2.57	-0.02	-1.15	4.83	0.04	0.00	5.99	9.2	2
LP	LP:B1	End	17.50	-0.35	0.01	-0.04	-113.63	-0.18	-0.1	-36.57	-2.57	-0.02	-1.14	5.22	0.04	0.00	6.35	9.8	2
LP	LP:B1	Origin	17.50	-0.35	0.01	-0.04	-90.93	-0.18	-0.1	-53.90	11.03	-0.02	-1.67	4.17	0.18	0.00	5.86	9.0	2
LP	SpliceT	End	20.00	-0.33	0.01	-0.04	-63.36	-0.22	-0.1	-53.90	11.03	-0.02	-1.66	2.86	0.18	0.00	4.53	7.0	2
LP	SpliceT	Origin	20.00	-0.33	0.01	-0.04	-63.36	-0.22	-0.1	-54.43	10.95	-0.02	-1.68	2.86	0.18	0.00	4.55	7.0	2
LP	Tube 2	End	25.00	-0.31	0.01	-0.03	-8.61	-0.32	-0.1	-54.43	10.95	-0.02	-1.65	0.29	0.48	0.00	2.10	3.2	3
LP	Tube 2	Origin	25.00	-0.31	0.01	-0.03	-8.61	-0.32	-0.1	-55.07	10.85	-0.02	-1.67	0.29	0.47	0.00	2.12	3.3	3
LP	Tube 2	End	29.00	-0.30	0.00	-0.03	34.78	-0.41	-0.1	-55.07	10.85	-0.02	-1.65	1.48	0.17	0.00	3.14	4.8	2
LP	Tube 2	Origin	29.00	-0.30	0.00	-0.03	34.78	-0.41	-0.1	-55.66	10.74	-0.02	-1.66	1.48	0.17	0.00	3.16	4.9	2
LP	LP:B2	End	33.00	-0.28	0.00	-0.03	77.74	-0.50	-0.1	-55.66	10.74	-0.02	-1.64	3.22	0.17	0.00	4.87	7.5	2
LP	LP:B2	Origin	33.00	-0.28	0.00	-0.03	114.20	-0.50	-0.1	-82.03	-10.43	-0.03	-2.42	4.73	0.16	0.00	7.16	11.0	2
LP	Tube 2	End	38.00	-0.23	0.00	-0.02	62.05	-0.63	-0.1	-82.03	-10.43	-0.03	-2.38	2.49	0.16	0.00	4.88	7.5	2
LP	Tube 2	Origin	38.00	-0.23	0.00	-0.02	62.05	-0.63	-0.1	-82.78	-10.58	-0.03	-2.40	2.49	0.16	0.00	4.90	7.5	2
LP	Tube 2	End	43.00	-0.17	0.00	-0.02	9.14	-0.76	-0.1	-82.78	-10.58	-0.03	-2.37	0.28	0.44	0.00	2.75	4.2	3
LP	Tube 2	Origin	43.00	-0.17	0.00	-0.02	9.14	-0.76	-0.1	-83.54	-10.71	-0.03	-2.39	0.28	0.44	0.00	2.78	4.3	3
LP	Tube 2	End	48.00	-0.10	0.00	-0.01	-44.42	-0.91	-0.1	-83.54	-10.71	-0.03	-2.35	1.68	0.16	0.00	4.04	6.2	2
LP	Tube 2	Origin	48.00	-0.10	0.00	-0.01	-44.42	-0.91	-0.1	-84.32	-10.83	-0.03	-2.37	1.68	0.16	0.00	4.06	6.2	2
LP	Tube 2	End	53.00	-0.04	0.00	-0.01	-98.55	-1.06	-0.1	-84.32	-10.83	-0.03	-2.34	3.60	0.16	0.00	5.95	9.1	2
LP	Tube 2	Origin	53.00	-0.04	0.00	-0.01	-98.55	-1.06	-0.1	-84.99	-10.91	-0.03	-2.35	3.60	0.16	0.00	5.97	9.2	2
LP	Tube 2	End	56.50	-0.01	0.00	-0.00	-136.74	-1.17	-0.1	-84.99	-10.91	-0.03	-2.33	4.89	0.16	0.00	7.23	11.1	2
LP	Tube 2	Origin	56.50	-0.01	0.00	-0.00	-136.74	-1.17	-0.1	-85.55	-10.97	-0.03	-2.35	4.89	0.16	0.00	7.24	11.1	2
LP	LP:g	End	60.00	0.00	0.00	0.00	-175.13	-1.29	-0.1	-85.55	-10.97	-0.03	-2.32	6.13	0.16	0.00	8.46	13.0	2
RP	RP:t	Origin	0.00	-1.44	0.03	-0.02	-0.00	0.00	0.0	-0.20	-0.05	-0.00	-0.01	0.00	0.00	0.00	0.01	0.0	5
RP	RP:AN1	End	4.00	-1.32	0.03	-0.02	-0.20	-0.00	0.0	-0.20	-0.05	-0.00	-0.01	0.02	0.00	0.00	0.03	0.0	2
RP	RP:AN1	Origin	4.00	-1.32	0.03	-0.02	-0.20	-0.00	0.0	-4.92	-1.31	-0.00	-0.23	0.00	0.12	0.00	0.31	0.5	5
RP	Tube 1	End	7.00	-1.22	0.03	-0.02	-4.12	-0.01	0.0	-4.92	-1.31	-0.00	-0.22	0.32	0.03	0.00	0.55	0.8	2
RP	Tube 1	Origin	7.00	-1.22	0.03	-0.02	-4.12	-0.01	0.0	-5.23	-1.38	-0.00	-0.24	0.32	0.03	0.00	0.56	0.9	2
RP	RP:AN2	End	10.00	-1.13	0.03	-0.02	-8.26	-0.02	0.0	-5.23	-1.38	-0.00	-0.23	0.63	0.03	0.00	0.86	1.3	2
RP	RP:AN2	Origin	10.00	-1.13	0.03	-0.02	-8.26	-0.02	0.0	-6.92	-1.60	-0.01	-0.31	0.63	0.04	0.00	0.94	1.4	2
RP	Tube 1	End	15.00	-0.98	0.02	-0.02	-16.27	-0.05	0.0	-6.92	-1.60	-0.01	-0.30	1.19	0.04	0.00	1.49	2.3	2
RP	Tube 1	Origin	15.00	-0.98	0.02	-0.02	-16.27	-0.05	0.0	-7.44	-1.73	-0.01	-0.33	1.19	0.04	0.00	1.52	2.3	2
RP	RP:AN3	End	20.00	-0.84	0.02	-0.02	-24.91	-0.09	0.0	-7.44	-1.73	-0.01	-0.32	1.75	0.04	0.00	2.07	3.2	2
RP	RP:AN3	Origin	20.00	-0.84	0.02	-0.02	-24.91	-0.09	0.0	-9.25	-1.98	-0.01	-0.40	1.75	0.04	0.00	2.15	3.3	2
RP	Tube 1	End	25.00	-0.72	0.02	-0.02	-34.80	-0.13	0.0	-9.25	-1.98	-0.01	-0.39	2.35	0.04	0.00	2.75	4.2	2
RP	Tube 1	Origin	25.00	-0.72	0.02	-0.02	-34.80	-0.13	0.0	-9.80	-2.11	-0.01	-0.41	2.35	0.05	0.00	2.77	4.3	2
RP	RP:AN4	End	30.00	-0.61	0.02	-0.01	-45.33	-0.19	0.0	-9.80	-2.11	-0.01	-0.41	2.96	0.05	0.00	3.36	5.2	2
RP	RP:AN4	Origin	30.00	-0.61	0.02	-0.01	-45.33	-0.19	0.0	-11.45	-2.31	-0.01	-0.38	2.36	0.04	0.00	2.74	4.2	2
RP	RP:SW	End	31.50	-0.58	0.02	-0.01	-48.80	-0.21	0.0	-11.45	-2.31	-0.01	-0.38	2.51	0.04	0.00	2.89	4.4	2
RP	RP:SW	Origin	31.50	-0.58	0.02	-0.01	-48.80	-0.21	0.0	-16.03	-3.62	-0.01	-0.53	2.51	0.06	0.00	3.04	4.7	2
RP	Tube 2	End	35.00	-0.53	0.01	-0.01	-61.48	-0.26	0.0	-16.03	-3.62	-0.01	-0.52	3.09	0.06	0.00	3.61	5.6	2
RP	Tube 2	Origin	35.00	-0.53	0.01	-0.01	-61.48	-0.26	0.0	-16.51	-3.72	-0.02	-0.54	3.09	0.06	0.00	3.62	5.6	2
RP	RP:ARM	End	38.50	-0.48	0.01	-0.01	-74.49	-0.32	0.0	-16.51	-3.72	-0.02	-0.53	3.65	0.06	0.00	4.18	6.4	2
RP	RP:ARM	Origin	38.50	-0.48	0.01	-0.01	48.72	-0.30	-0.1	-41.72	-14.09	-0.01	-1.34	2.39	0.24	0.00	3.75	5.8	2
RP	RP:AN5	End	40.00	-0.47	0.01	-0.01	27.59	-0.32	-0.1	-41.72	-14.09	-0.01	-1.33	1.34	0.24	0.00	2.70	4.2	2
RP	RP:AN5	Origin	40.00	-0.47	0.01	-0.01	27.59	-0.32	-0.1	-43.36	-14.28	-0.01	-1.38	1.34	0.24	0.00	2.75	4.2	2
RP	Tube 2	End	43.75	-0.42	0.01	-0.01	-25.95	-0.35	-0.1	-43.36	-14.28	-0.01	-1.36	1.23	0.24	0.00	2.63	4.0	2
RP	Tube 2	Origin	43.75	-0.42	0.01	-0.01	-25.95	-0.35	-0.1	-43.88	-14.38	-0.01	-1.38	1.23	0.24	0.00	2.64	4.1	2
RP	RP:B1	End	47.50	-0.38	0.01	-0.01	-79.88	-0.39	-0.1	-43.88	-14.38	-0.01	-1.36	3.67	0.24	0.00	5.05	7.8	2
RP	RP:B1	Origin	47.50	-0.38	0.01	-0.01	-45.63	-0.39	-0.1	-18.90	6.53	-0.01	-0.59	2.10	0.11	0.00	2.70	4.1	2
RP	RP:AN6	End	50.00	-0.36	0.01	-0.01	-29.30	-0.43	-0.1	-18.90	6.53	-0.01	-0.58	1.33	0.11	0.00	1.92	3.0	2
RP	RP:AN6	Origin	50.00	-0.36	0.01	-0.01	-29.30	-0.43	-0.1	-20.71	6.31	-0.01	-0.64	1.33	0.10	0.00	1.97	3.0	2

RP	Tube 3	End	55.00	-0.33	0.01	-0.01	2.25	-0.50	-0.1	-20.71	6.31	-0.01	-0.63	0.05	0.38	0.00	0.94	1.4	4
RP	Tube 3	Origin	55.00	-0.33	0.01	-0.01	2.25	-0.50	-0.1	-21.43	6.16	-0.02	-0.65	0.05	0.37	0.00	0.95	1.5	4
RP	RP:AN7	End	60.00	-0.29	0.00	-0.00	33.07	-0.59	-0.1	-21.43	6.16	-0.02	-0.64	1.40	0.10	0.00	2.05	3.2	2
RP	RP:AN7	Origin	60.00	-0.29	0.00	-0.00	33.07	-0.59	-0.1	-23.29	5.92	-0.02	-0.69	1.40	0.09	0.00	2.10	3.2	2
RP	RP:B2	End	63.00	-0.27	0.00	-0.00	50.84	-0.64	-0.1	-23.29	5.92	-0.02	-0.69	2.11	0.09	0.00	2.80	4.3	2
RP	RP:B2	Origin	63.00	-0.27	0.00	-0.00	74.22	-0.64	-0.1	-7.28	-7.87	-0.02	-0.21	3.08	0.12	0.00	3.30	5.1	2
RP	Tube 3	End	66.50	-0.23	0.00	-0.00	46.67	-0.72	-0.1	-7.28	-7.87	-0.02	-0.21	1.90	0.12	0.00	2.12	3.3	2
RP	Tube 3	Origin	66.50	-0.23	0.00	-0.00	46.67	-0.72	-0.1	-7.81	-7.98	-0.02	-0.23	1.90	0.12	0.00	2.13	3.3	2
RP	RP:AN8	End	70.00	-0.19	0.00	-0.00	18.73	-0.80	-0.1	-7.81	-7.98	-0.02	-0.23	0.75	0.12	0.00	1.00	1.5	2
RP	RP:AN8	Origin	70.00	-0.19	0.00	-0.00	18.73	-0.80	-0.1	-9.72	-8.23	-0.03	-0.28	0.75	0.13	0.00	1.05	1.6	2
RP	Tube 3	End	75.00	-0.12	0.00	-0.00	-22.42	-0.92	-0.1	-9.72	-8.23	-0.03	-0.28	0.87	0.12	0.00	1.17	1.8	2
RP	Tube 3	Origin	75.00	-0.12	0.00	-0.00	-22.42	-0.92	-0.1	-10.49	-8.39	-0.03	-0.30	0.87	0.13	0.00	1.19	1.8	2
RP	RP:AN9	End	80.00	-0.06	0.00	-0.00	-64.36	-1.06	-0.1	-10.49	-8.39	-0.03	-0.29	2.40	0.12	0.00	2.70	4.2	2
RP	RP:AN9	Origin	80.00	-0.06	0.00	-0.00	-64.36	-1.06	-0.1	-12.55	-8.66	-0.03	-0.35	2.40	0.13	0.00	2.76	4.2	2
RP	Tube 3	End	85.00	-0.02	0.00	-0.00	-107.65	-1.21	-0.1	-12.55	-8.66	-0.03	-0.35	3.89	0.13	0.00	4.24	6.5	2
RP	Tube 3	Origin	85.00	-0.02	0.00	-0.00	-107.65	-1.21	-0.1	-13.35	-8.82	-0.03	-0.37	3.89	0.13	0.00	4.26	6.6	2
RP	RP:g	End	90.00	0.00	0.00	0.00	-151.73	-1.38	-0.1	-13.35	-8.82	-0.03	-0.36	5.32	0.13	0.00	5.68	8.7	2

Summary of Brace Forces and Usages for Load Case "NESC EXT. ICE (250D)(-)":

Brace Label	Forces (kips)	Allowable Compression (kips)	Allowable Tension (kips)	Usage %
BR1	21.56	178.44	172.12	12.52
BR2	-33.09	178.44	172.12	18.54

Detailed Tubular Davit Arm Usages for Load Case "NESC EXT. ICE (250D)(-)":

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.
A1	A1:O	Origin	0.00	-0.49	0.01	-0.07	-116.69	0.00	0.0	3.83	18.18	-0.00	0.31	29.89	1.19	0.00	30.27	46.6	2
A1	#A1:0	End	3.22	-0.49	0.01	-0.26	-58.15	0.00	0.0	3.83	18.18	-0.00	0.41	25.73	1.56	0.00	26.28	40.4	2
A1	#A1:0	Origin	3.22	-0.49	0.01	-0.26	-58.15	0.00	-0.0	3.93	18.06	-0.00	0.42	25.73	1.55	0.00	26.29	40.4	2
A1	A1:T	End	6.44	-0.48	0.01	-0.67	0.00	0.00	-0.0	3.93	18.06	-0.00	0.61	0.00	5.86	0.00	10.16	15.6	4
A2	A2:O	Origin	0.00	-0.48	0.01	0.00	-117.00	-0.00	-0.0	-3.70	18.21	0.00	-0.30	29.97	1.19	0.00	30.34	46.7	2
A2	#A2:0	End	3.22	-0.48	0.01	-0.09	-58.37	-0.00	-0.0	-3.70	18.21	0.00	-0.40	25.83	1.56	0.00	26.36	40.6	2
A2	#A2:0	Origin	3.22	-0.48	0.01	-0.09	-58.37	-0.00	-0.0	-3.60	18.13	0.00	-0.39	25.83	1.56	0.00	26.35	40.5	2
A2	A2:T	End	6.44	-0.49	0.01	-0.39	-0.00	0.00	-0.0	-3.60	18.13	0.00	-0.56	0.00	5.88	0.00	10.20	15.7	4

Detailed Tubular X-Arm Usages for Load Case "NESC EXT. ICE (250D)(-)":

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.
X1	X1:O	Origin	0.00	-0.49	0.01	-0.04	-59.19	-0.08	0.0	2.80	11.91	0.01	0.27	20.35	0.90	0.00	20.67	31.8	2
X1	#sX1:0	End	3.88	-0.49	0.01	-0.05	-13.02	-0.04	0.0	2.80	11.91	0.01	0.27	4.48	0.90	0.00	5.00	7.7	2
X1	#sX1:0	Origin	3.88	-0.49	0.01	-0.05	-13.02	-0.04	0.0	2.81	11.77	0.01	0.27	4.48	0.89	0.00	4.99	7.7	2
X1	X1:C2	End	7.75	-0.49	0.01	-0.11	32.59	0.00	0.0	2.81	11.77	0.01	0.27	11.20	0.89	0.00	11.57	17.8	2
X1	X1:C2	Origin	7.75	-0.49	0.01	-0.11	32.59	0.00	0.0	6.54	-6.41	0.01	0.62	11.20	0.49	0.00	11.85	18.2	2
X1	#sX1:1	End	11.63	-0.48	0.01	-0.07	7.74	0.04	0.0	6.54	-6.41	0.01	0.62	2.66	0.49	0.00	3.39	5.2	2
X1	#sX1:1	Origin	11.63	-0.48	0.01	-0.07	7.74	0.04	0.0	6.55	-6.55	0.01	0.62	2.66	0.50	0.00	3.39	5.2	2
X1	X1:E	End	15.50	-0.48	0.01	-0.01	-17.65	0.08	0.0	6.55	-6.55	0.01	0.62	6.07	0.50	0.00	6.75	10.4	2

Summary of Clamp Capacities and Usages for Load Case "NESC EXT. ICE (250D)(-)":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
1	4.433	50.00	50.00	8.87	0.00	0.00	0.00	8.87
2	4.433	50.00	50.00	8.87	0.00	0.00	0.00	8.87
3	4.525	50.00	50.00	9.05	0.00	0.00	0.00	9.05
4	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
5	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
6	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
7	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
8	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
9	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
10	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56
11	1.280	50.00	50.00	2.56	0.00	0.00	0.00	2.56

Summary of Suspension Capacities and Usages for Load Case "NESC EXT. ICE (250D)(-)":

Suspension Label	Tension (kips)	Input Tension Capacity (kips)	Factored Tension Capacity (kips)	Tension Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
C1	18.438	30.00	30.00	61.46	0.00	0.00	0.00	61.46
C2	18.438	30.00	30.00	61.46	0.00	0.00	0.00	61.46
C3	18.438	30.00	30.00	61.46	0.00	0.00	0.00	61.46

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

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
LP	33.81	NESC EXT. WIND (250C)(-)	1.7	15	7474.8
RP	36.32	NESC EXT. WIND (250C)	2.5	23	9802.8

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 %
LP	NESC HEAVY (250B)	1	1.330	1.012	0.212	1.658	15.500	6.636	7.232	1	27.905	0.820	2.250	13.27
LP	NESC HEAVY (250B)	2	1.658	0.212	1.012	1.330	15.500	5.159	5.623	1	21.695	0.723	2.250	10.32
LP	NESC HEAVY (250B)	3	1.012	-1.330	1.658	-0.212	15.500	3.828	4.172	1	-16.097	0.623	2.250	7.66
LP	NESC HEAVY (250B)	4	0.212	-1.658	1.330	-1.012	15.500	5.263	5.736	1	-22.132	0.730	2.250	10.53
LP	NESC HEAVY (250B)	5	-1.330	-1.012	-0.212	-1.658	15.500	5.135	5.596	1	-21.592	0.721	2.250	10.27
LP	NESC HEAVY (250B)	6	-1.658	-0.212	-1.012	-1.330	15.500	3.658	3.987	1	-15.382	0.609	2.250	7.32
LP	NESC HEAVY (250B)	7	-1.012	1.330	-1.658	0.212	15.500	5.329	5.808	1	22.410	0.735	2.250	10.66
LP	NESC HEAVY (250B)	8	-0.212	1.658	-1.330	1.012	15.500	6.764	7.372	1	28.445	0.828	2.250	13.53
LP	NESC HEAVY (250B)	9	1.585	0.672	0.672	1.585	15.500	9.156	9.979	2	27.905	0.963	2.250	18.31
LP	NESC HEAVY (250B)	10	0.672	-1.585	1.585	-0.672	15.500	7.057	7.691	2	-22.132	0.845	2.250	14.11
LP	NESC HEAVY (250B)	11	-1.585	-0.672	-0.672	-1.585	15.500	6.825	7.439	2	-21.592	0.831	2.250	13.65
LP	NESC HEAVY (250B)	12	-0.672	1.585	-1.585	0.672	15.500	9.388	10.231	2	28.445	0.975	2.250	18.78
LP	NESC EXT. WIND (250C)	1	1.330	1.012	0.212	1.658	15.500	16.497	17.979	1	69.370	1.292	2.250	32.99
LP	NESC EXT. WIND (250C)	2	1.658	0.212	1.012	1.330	15.500	13.344	14.543	1	56.111	1.162	2.250	26.69
LP	NESC EXT. WIND (250C)	3	1.012	-1.330	1.658	-0.212	15.500	6.087	6.634	1	-25.596	0.785	2.250	12.17
LP	NESC EXT. WIND (250C)	4	0.212	-1.658	1.330	-1.012	15.500	9.230	10.059	1	-38.810	0.967	2.250	18.46
LP	NESC EXT. WIND (250C)	5	-1.330	-1.012	-0.212	-1.658	15.500	9.197	10.023	1	-38.674	0.965	2.250	18.39
LP	NESC EXT. WIND (250C)	6	-1.658	-0.212	-1.012	-1.330	15.500	6.044	6.587	1	-25.415	0.782	2.250	12.09
LP	NESC EXT. WIND (250C)	7	-1.012	1.330	-1.658	0.212	15.500	13.387	14.590	1	56.292	1.164	2.250	26.77
LP	NESC EXT. WIND (250C)	8	-0.212	1.658	-1.330	1.012	15.500	16.529	18.014	1	69.506	1.294	2.250	33.06
LP	NESC EXT. WIND (250C)	9	1.585	0.672	0.672	1.585	15.500	23.164	25.245	2	69.370	1.531	2.250	46.33
LP	NESC EXT. WIND (250C)	10	0.672	-1.585	1.585	-0.672	15.500	11.889	12.957	2	-38.810	1.097	2.250	23.78
LP	NESC EXT. WIND (250C)	11	-1.585	-0.672	-0.672	-1.585	15.500	11.831	12.894	2	-38.674	1.094	2.250	23.66
LP	NESC EXT. WIND (250C)	12	-0.672	1.585	-1.585	0.672	15.500	23.222	25.308	2	69.506	1.533	2.250	46.44
LP	NESC EXT. ICE (250D)	1	1.330	1.012	0.212	1.658	15.500	3.868	4.216	1	16.266	0.626	2.250	7.74
LP	NESC EXT. ICE (250D)	2	1.658	0.212	1.012	1.330	15.500	2.934	3.198	1	12.337	0.545	2.250	5.87
LP	NESC EXT. ICE (250D)	3	1.012	-1.330	1.658	-0.212	15.500	2.782	3.031	1	-11.697	0.531	2.250	5.56
LP	NESC EXT. ICE (250D)	4	0.212	-1.658	1.330	-1.012	15.500	3.699	4.031	1	-15.555	0.612	2.250	7.40
LP	NESC EXT. ICE (250D)	5	-1.330	-1.012	-0.212	-1.658	15.500	3.647	3.975	1	-15.337	0.608	2.250	7.29
LP	NESC EXT. ICE (250D)	6	-1.658	-0.212	-1.012	-1.330	15.500	2.713	2.957	1	-11.408	0.524	2.250	5.43
LP	NESC EXT. ICE (250D)	7	-1.012	1.330	-1.658	0.212	15.500	3.002	3.272	1	12.625	0.551	2.250	6.00
LP	NESC EXT. ICE (250D)	8	-0.212	1.658	-1.330	1.012	15.500	3.920	4.272	1	16.484	0.630	2.250	7.84
LP	NESC EXT. ICE (250D)	9	1.585	0.672	0.672	1.585	15.500	5.280	5.754	2	16.266	0.731	2.250	10.56
LP	NESC EXT. ICE (250D)	10	0.672	-1.585	1.585	-0.672	15.500	5.031	5.482	2	-15.555	0.714	2.250	10.06
LP	NESC EXT. ICE (250D)	11	-1.585	-0.672	-0.672	-1.585	15.500	4.937	5.381	2	-15.337	0.707	2.250	9.87
LP	NESC EXT. ICE (250D)	12	-0.672	1.585	-1.585	0.672	15.500	5.373	5.856	2	16.484	0.738	2.250	10.75
LP	NESC HEAVY (250B) (-)	1	1.330	1.012	0.212	1.658	15.500	3.523	3.839	1	-14.813	0.597	2.250	7.05
LP	NESC HEAVY (250B) (-)	2	1.658	0.212	1.012	1.330	15.500	1.901	2.072	1	-7.994	0.439	2.250	3.80

LP	NESC HEAVY (250B) (-)	3	1.012	-1.330	1.658	-0.212	15.500	8.236	8.975	1	34.631	0.913	2.250	16.47
LP	NESC HEAVY (250B) (-)	4	0.212	-1.658	1.330	-1.012	15.500	9.898	10.787	1	41.621	1.001	2.250	19.80
LP	NESC HEAVY (250B) (-)	5	-1.330	-1.012	-0.212	-1.658	15.500	10.023	10.924	1	42.149	1.007	2.250	20.05
LP	NESC HEAVY (250B) (-)	6	-1.658	-0.212	-1.012	-1.330	15.500	8.402	9.156	1	35.329	0.922	2.250	16.80
LP	NESC HEAVY (250B) (-)	7	-1.012	1.330	-1.658	0.212	15.500	1.735	1.891	1	-7.295	0.419	2.250	3.47
LP	NESC HEAVY (250B) (-)	8	-0.212	1.658	-1.330	1.012	15.500	3.397	3.703	1	-14.286	0.586	2.250	6.79
LP	NESC HEAVY (250B) (-)	9	1.585	0.672	0.672	1.585	15.500	4.210	4.588	2	-14.813	0.653	2.250	8.42
LP	NESC HEAVY (250B) (-)	10	0.672	-1.585	1.585	-0.672	15.500	14.076	15.341	2	41.621	1.194	2.250	28.15
LP	NESC HEAVY (250B) (-)	11	-1.585	-0.672	-0.672	-1.585	15.500	14.302	15.587	2	42.149	1.203	2.250	28.60
LP	NESC HEAVY (250B) (-)	12	-0.672	1.585	-1.585	0.672	15.500	3.984	4.342	2	-14.286	0.635	2.250	7.97
LP	NESC EXT. WIND (250C)(-)	1	1.330	1.012	0.212	1.658	15.500	8.355	9.106	1	-35.134	0.920	2.250	16.71
LP	NESC EXT. WIND (250C)(-)	2	1.658	0.212	1.012	1.330	15.500	5.143	5.605	1	-21.627	0.722	2.250	10.29
LP	NESC EXT. WIND (250C)(-)	3	1.012	-1.330	1.658	-0.212	15.500	14.717	16.039	1	61.886	1.221	2.250	29.43
LP	NESC EXT. WIND (250C)(-)	4	0.212	-1.658	1.330	-1.012	15.500	17.939	19.551	1	75.436	1.348	2.250	35.88
LP	NESC EXT. WIND (250C)(-)	5	-1.330	-1.012	-0.212	-1.658	15.500	17.970	19.585	1	75.566	1.349	2.250	35.94
LP	NESC EXT. WIND (250C)(-)	6	-1.658	-0.212	-1.012	-1.330	15.500	14.758	16.084	1	62.058	1.222	2.250	29.52
LP	NESC EXT. WIND (250C)(-)	7	-1.012	1.330	-1.658	0.212	15.500	5.102	5.560	1	-21.454	0.719	2.250	10.20
LP	NESC EXT. WIND (250C)(-)	8	-0.212	1.658	-1.330	1.012	15.500	8.324	9.072	1	-35.004	0.918	2.250	16.65
LP	NESC EXT. WIND (250C)(-)	9	1.585	0.672	0.672	1.585	15.500	10.478	11.419	2	-35.134	1.030	2.250	20.96
LP	NESC EXT. WIND (250C)(-)	10	0.672	-1.585	1.585	-0.672	15.500	25.349	27.627	2	75.436	1.602	2.250	50.70
LP	NESC EXT. WIND (250C)(-)	11	-1.585	-0.672	-0.672	-1.585	15.500	25.405	27.688	2	75.566	1.604	2.250	50.81
LP	NESC EXT. WIND (250C)(-)	12	-0.672	1.585	-1.585	0.672	15.500	10.422	11.358	2	-35.004	1.027	2.250	20.84
LP	NESC EXT. ICE (250D)(-)	1	1.330	1.012	0.212	1.658	15.500	2.053	2.237	1	-8.632	0.456	2.250	4.11
LP	NESC EXT. ICE (250D)(-)	2	1.658	0.212	1.012	1.330	15.500	0.941	1.025	1	-3.955	0.309	2.250	1.88
LP	NESC EXT. ICE (250D)(-)	3	1.012	-1.330	1.658	-0.212	15.500	5.976	6.513	1	25.129	0.778	2.250	11.95
LP	NESC EXT. ICE (250D)(-)	4	0.212	-1.658	1.330	-1.012	15.500	7.105	7.743	1	29.875	0.848	2.250	14.21
LP	NESC EXT. ICE (250D)(-)	5	-1.330	-1.012	-0.212	-1.658	15.500	7.156	7.799	1	30.090	0.851	2.250	14.31
LP	NESC EXT. ICE (250D)(-)	6	-1.658	-0.212	-1.012	-1.330	15.500	6.043	6.586	1	25.413	0.782	2.250	12.09
LP	NESC EXT. ICE (250D)(-)	7	-1.012	1.330	-1.658	0.212	15.500	0.873	0.951	1	-3.671	0.297	2.250	1.75
LP	NESC EXT. ICE (250D)(-)	8	-0.212	1.658	-1.330	1.012	15.500	2.002	2.182	1	-8.417	0.450	2.250	4.00
LP	NESC EXT. ICE (250D)(-)	9	1.585	0.672	0.672	1.585	15.500	2.323	2.532	2	-8.632	0.485	2.250	4.65
LP	NESC EXT. ICE (250D)(-)	10	0.672	-1.585	1.585	-0.672	15.500	10.154	11.066	2	29.875	1.014	2.250	20.31
LP	NESC EXT. ICE (250D)(-)	11	-1.585	-0.672	-0.672	-1.585	15.500	10.246	11.166	2	30.090	1.019	2.250	20.49
LP	NESC EXT. ICE (250D)(-)	12	-0.672	1.585	-1.585	0.672	15.500	2.232	2.432	2	-8.417	0.475	2.250	4.46
RP	NESC HEAVY (250B)	1	1.330	1.012	0.212	1.658	15.500	10.933	11.915	1	45.974	1.052	2.250	21.87
RP	NESC HEAVY (250B)	2	1.658	0.212	1.012	1.330	15.500	9.164	9.987	1	38.534	0.963	2.250	18.33
RP	NESC HEAVY (250B)	3	1.012	-1.330	1.658	-0.212	15.500	1.626	1.772	1	-6.836	0.406	2.250	3.25
RP	NESC HEAVY (250B)	4	0.212	-1.658	1.330	-1.012	15.500	3.352	3.653	1	-14.096	0.583	2.250	6.70
RP	NESC HEAVY (250B)	5	-1.330	-1.012	-0.212	-1.658	15.500	3.220	3.510	1	-13.541	0.571	2.250	6.44
RP	NESC HEAVY (250B)	6	-1.658	-0.212	-1.012	-1.330	15.500	1.451	1.581	1	-6.102	0.383	2.250	2.90
RP	NESC HEAVY (250B)	7	-1.012	1.330	-1.658	0.212	15.500	9.338	10.177	1	39.269	0.972	2.250	18.68
RP	NESC HEAVY (250B)	8	-0.212	1.658	-1.330	1.012	15.500	11.065	12.059	1	46.529	1.058	2.250	22.13
RP	NESC HEAVY (250B)	9	1.585	0.672	0.672	1.585	15.500	15.600	17.002	2	45.974	1.257	2.250	31.20
RP	NESC HEAVY (250B)	10	0.672	-1.585	1.585	-0.672	15.500	3.864	4.211	2	-14.096	0.625	2.250	7.73
RP	NESC HEAVY (250B)	11	-1.585	-0.672	-0.672	-1.585	15.500	3.626	3.952	2	-13.541	0.606	2.250	7.25
RP	NESC HEAVY (250B)	12	-0.672	1.585	-1.585	0.672	15.500	15.838	17.261	2	46.529	1.266	2.250	31.68
RP	NESC EXT. WIND (250C)	1	1.330	1.012	0.212	1.658	15.500	19.234	20.962	1	80.880	1.396	2.250	38.47
RP	NESC EXT. WIND (250C)	2	1.658	0.212	1.012	1.330	15.500	15.754	17.170	1	66.247	1.263	2.250	31.51
RP	NESC EXT. WIND (250C)	3	1.012	-1.330	1.658	-0.212	15.500	5.694	6.206	1	-23.945	0.759	2.250	11.39
RP	NESC EXT. WIND (250C)	4	0.212	-1.658	1.330	-1.012	15.500	9.164	9.987	1	-38.535	0.963	2.250	18.33
RP	NESC EXT. WIND (250C)	5	-1.330	-1.012	-0.212	-1.658	15.500	9.133	9.953	1	-38.403	0.962	2.250	18.27
RP	NESC EXT. WIND (250C)	6	-1.658	-0.212	-1.012	-1.330	15.500	5.653	6.161	1	-23.771	0.757	2.250	11.31
RP	NESC EXT. WIND (250C)	7	-1.012	1.330	-1.658	0.212	15.500	15.796	17.215	1	66.422	1.265	2.250	31.59
RP	NESC EXT. WIND (250C)	8	-0.212	1.658	-1.330	1.012	15.500	19.265	20.996	1	81.012	1.397	2.250	38.53
RP	NESC EXT. WIND (250C)	9	1.585	0.672	0.672	1.585	15.500	27.159	29.599	2	80.880	1.658	2.250	54.32

RP	NESC EXT. WIND (250C)	10	0.672	-1.585	1.585	-0.672	15.500	11.534	12.570	2	-38.535	1.081	2.250	23.07
RP	NESC EXT. WIND (250C)	11	-1.585	-0.672	-0.672	-1.585	15.500	11.477	12.508	2	-38.403	1.078	2.250	22.95
RP	NESC EXT. WIND (250C)	12	-0.672	1.585	-1.585	0.672	15.500	27.216	29.661	2	81.012	1.660	2.250	54.43
RP	NESC EXT. ICE (250D)	1	1.330	1.012	0.212	1.658	15.500	7.927	8.639	1	33.334	0.896	2.250	15.85
RP	NESC EXT. ICE (250D)	2	1.658	0.212	1.012	1.330	15.500	6.724	7.328	1	28.273	0.825	2.250	13.45
RP	NESC EXT. ICE (250D)	3	1.012	-1.330	1.658	-0.212	15.500	0.653	0.712	1	-2.747	0.257	2.250	1.31
RP	NESC EXT. ICE (250D)	4	0.212	-1.658	1.330	-1.012	15.500	1.840	2.005	1	-7.736	0.432	2.250	3.68
RP	NESC EXT. ICE (250D)	5	-1.330	-1.012	-0.212	-1.658	15.500	1.786	1.946	1	-7.510	0.425	2.250	3.57
RP	NESC EXT. ICE (250D)	6	-1.658	-0.212	-1.012	-1.330	15.500	0.582	0.635	1	-2.448	0.243	2.250	1.16
RP	NESC EXT. ICE (250D)	7	-1.012	1.330	-1.658	0.212	15.500	6.795	7.405	1	28.571	0.829	2.250	13.59
RP	NESC EXT. ICE (250D)	8	-0.212	1.658	-1.330	1.012	15.500	7.981	8.698	1	33.560	0.899	2.250	15.96
RP	NESC EXT. ICE (250D)	9	1.585	0.672	0.672	1.585	15.500	11.372	12.394	2	33.334	1.073	2.250	22.74
RP	NESC EXT. ICE (250D)	10	0.672	-1.585	1.585	-0.672	15.500	1.935	2.109	2	-7.736	0.443	2.250	3.87
RP	NESC EXT. ICE (250D)	11	-1.585	-0.672	-0.672	-1.585	15.500	1.838	2.003	2	-7.510	0.431	2.250	3.68
RP	NESC EXT. ICE (250D)	12	-0.672	1.585	-1.585	0.672	15.500	11.469	12.500	2	33.560	1.078	2.250	22.94
RP	NESC HEAVY (250B) (-)	1	1.330	1.012	0.212	1.658	15.500	6.161	6.715	1	-25.908	0.790	2.250	12.32
RP	NESC HEAVY (250B) (-)	2	1.658	0.212	1.012	1.330	15.500	4.657	5.075	1	-19.581	0.687	2.250	9.31
RP	NESC HEAVY (250B) (-)	3	1.012	-1.330	1.658	-0.212	15.500	4.767	5.196	1	20.046	0.695	2.250	9.53
RP	NESC HEAVY (250B) (-)	4	0.212	-1.658	1.330	-1.012	15.500	6.316	6.883	1	26.558	0.800	2.250	12.63
RP	NESC HEAVY (250B) (-)	5	-1.330	-1.012	-0.212	-1.658	15.500	6.451	7.030	1	27.125	0.808	2.250	12.90
RP	NESC HEAVY (250B) (-)	6	-1.658	-0.212	-1.012	-1.330	15.500	4.946	5.390	1	20.797	0.708	2.250	9.89
RP	NESC HEAVY (250B) (-)	7	-1.012	1.330	-1.658	0.212	15.500	4.478	4.880	1	-18.830	0.673	2.250	8.96
RP	NESC HEAVY (250B) (-)	8	-0.212	1.658	-1.330	1.012	15.500	6.026	6.568	1	-25.341	0.781	2.250	12.05
RP	NESC HEAVY (250B) (-)	9	1.585	0.672	0.672	1.585	15.500	8.397	9.152	2	-25.908	0.922	2.250	16.79
RP	NESC HEAVY (250B) (-)	10	0.672	-1.585	1.585	-0.672	15.500	8.603	9.376	2	26.558	0.933	2.250	17.21
RP	NESC HEAVY (250B) (-)	11	-1.585	-0.672	-0.672	-1.585	15.500	8.846	9.641	2	27.125	0.946	2.250	17.69
RP	NESC HEAVY (250B) (-)	12	-0.672	1.585	-1.585	0.672	15.500	8.154	8.887	2	-25.341	0.909	2.250	16.31
RP	NESC EXT. WIND (250C)(-)	1	1.330	1.012	0.212	1.658	15.500	10.459	11.399	1	-43.982	1.029	2.250	20.92
RP	NESC EXT. WIND (250C)(-)	2	1.658	0.212	1.012	1.330	15.500	7.076	7.711	1	-29.753	0.846	2.250	14.15
RP	NESC EXT. WIND (250C)(-)	3	1.012	-1.330	1.658	-0.212	15.500	13.846	15.090	1	58.221	1.184	2.250	27.69
RP	NESC EXT. WIND (250C)(-)	4	0.212	-1.658	1.330	-1.012	15.500	17.240	18.789	1	72.495	1.321	2.250	34.48
RP	NESC EXT. WIND (250C)(-)	5	-1.330	-1.012	-0.212	-1.658	15.500	17.273	18.825	1	72.634	1.322	2.250	34.55
RP	NESC EXT. WIND (250C)(-)	6	-1.658	-0.212	-1.012	-1.330	15.500	13.889	15.137	1	58.404	1.186	2.250	27.78
RP	NESC EXT. WIND (250C)(-)	7	-1.012	1.330	-1.658	0.212	15.500	7.032	7.664	1	-29.570	0.844	2.250	14.06
RP	NESC EXT. WIND (250C)(-)	8	-0.212	1.658	-1.330	1.012	15.500	10.427	11.363	1	-43.844	1.027	2.250	20.85
RP	NESC EXT. WIND (250C)(-)	9	1.585	0.672	0.672	1.585	15.500	13.611	14.834	2	-43.982	1.174	2.250	27.22
RP	NESC EXT. WIND (250C)(-)	10	0.672	-1.585	1.585	-0.672	15.500	24.130	26.298	2	72.495	1.563	2.250	48.26
RP	NESC EXT. WIND (250C)(-)	11	-1.585	-0.672	-0.672	-1.585	15.500	24.189	26.363	2	72.634	1.565	2.250	48.38
RP	NESC EXT. WIND (250C)(-)	12	-0.672	1.585	-1.585	0.672	15.500	13.552	14.770	2	-43.844	1.171	2.250	27.10
RP	NESC EXT. ICE (250D)(-)	1	1.330	1.012	0.212	1.658	15.500	3.585	3.908	1	-15.077	0.603	2.250	7.17
RP	NESC EXT. ICE (250D)(-)	2	1.658	0.212	1.012	1.330	15.500	2.624	2.859	1	-11.032	0.515	2.250	5.25
RP	NESC EXT. ICE (250D)(-)	3	1.012	-1.330	1.658	-0.212	15.500	3.369	3.671	1	14.166	0.584	2.250	6.74
RP	NESC EXT. ICE (250D)(-)	4	0.212	-1.658	1.330	-1.012	15.500	4.348	4.739	1	18.285	0.664	2.250	8.70
RP	NESC EXT. ICE (250D)(-)	5	-1.330	-1.012	-0.212	-1.658	15.500	4.403	4.798	1	18.514	0.668	2.250	8.81
RP	NESC EXT. ICE (250D)(-)	6	-1.658	-0.212	-1.012	-1.330	15.500	3.441	3.750	1	14.469	0.590	2.250	6.88
RP	NESC EXT. ICE (250D)(-)	7	-1.012	1.330	-1.658	0.212	15.500	2.551	2.781	1	-10.729	0.508	2.250	5.10
RP	NESC EXT. ICE (250D)(-)	8	-0.212	1.658	-1.330	1.012	15.500	3.531	3.848	1	-14.848	0.598	2.250	7.06
RP	NESC EXT. ICE (250D)(-)	9	1.585	0.672	0.672	1.585	15.500	4.820	5.253	2	-15.077	0.699	2.250	9.64
RP	NESC EXT. ICE (250D)(-)	10	0.672	-1.585	1.585	-0.672	15.500	5.990	6.529	2	18.285	0.779	2.250	11.98
RP	NESC EXT. ICE (250D)(-)	11	-1.585	-0.672	-0.672	-1.585	15.500	6.089	6.636	2	18.514	0.785	2.250	12.18
RP	NESC EXT. ICE (250D)(-)	12	-0.672	1.585	-1.585	0.672	15.500	4.722	5.146	2	-14.848	0.691	2.250	9.44

Summary of Tubular Davit Usages:

Tubular Davit	Maximum	Load Case	Height	Segment Weight

Label	Usage %		AGL (ft)	Number	(lbs)
A1	46.68	NESC EXT. ICE (250D)	51.5	1	204.2
A2	46.67	NESC EXT. ICE (250D)(-)	51.5	1	204.2

Summary of Tubular X-Arm Usages:

Tubular X-Arm Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
X1	51.06	NESC EXT. WIND (250C)	51.5	4	557.1

Summary of Brace Usages:

Brace Label	Maximum Usage %	Load Case	Weight (lbs)
BR1	55.14	NESC EXT. WIND (250C)	350.1
BR2	44.76	NESC EXT. WIND (250C)(-)	350.1

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC HEAVY (250B)	45.46	A1	Tubular Davit
NESC EXT. WIND (250C)	55.14	BR1	Brace
NESC EXT. ICE (250D)	46.68	A1	Tubular Davit
NESC HEAVY (250B) (-)	45.46	A2	Tubular Davit
NESC EXT. WIND (250C)(-)	53.80	BR1	Brace
NESC EXT. ICE (250D)(-)	46.67	A2	Tubular Davit

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Height AGL (ft)	Segment Number
NESC HEAVY (250B)	20.14	RP	2.5	23
NESC EXT. WIND (250C)	36.32	RP	2.5	23
NESC EXT. ICE (250D)	14.37	RP	2.5	23
NESC HEAVY (250B) (-)	18.41	LP	1.7	15
NESC EXT. WIND (250C)(-)	33.81	LP	1.7	15
NESC EXT. ICE (250D)(-)	13.01	LP	1.7	15

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 (250B)	LP	12	15.500	25.252	227.571	-3.250	9.388	10.231	2	28.445	0.975	18.78
NESC EXT. WIND (250C)	LP	12	15.500	122.784	492.012	-0.822	23.222	25.308	2	69.506	1.533	46.44
NESC EXT. ICE (250D)	LP	12	15.500	3.716	144.723	-1.310	5.373	5.856	2	16.484	0.738	10.75

NESC HEAVY (250B) (-)	LP	11	15.500	109.342	-256.668	-3.176	14.302	15.587	2	42.149	1.203	28.60
NESC EXT. WIND (250C)(-)	LP	11	15.500	161.727	-502.882	-0.785	25.405	27.688	2	75.566	1.604	50.81
NESC EXT. ICE (250D)(-)	LP	11	15.500	85.832	-175.133	-1.290	10.246	11.166	2	30.090	1.019	20.49
NESC HEAVY (250B)	RP	12	15.500	129.731	273.203	-3.339	15.838	17.261	2	46.529	1.266	31.68
NESC EXT. WIND (250C)	RP	12	15.500	169.907	543.108	-0.794	27.216	29.661	2	81.012	1.660	54.43
NESC EXT. ICE (250D)	RP	12	15.500	103.296	186.789	-1.357	11.469	12.500	2	33.560	1.078	22.94
NESC HEAVY (250B) (-)	RP	11	15.500	4.865	-238.620	-3.414	8.846	9.641	2	27.125	0.946	17.69
NESC EXT. WIND (250C)(-)	RP	11	15.500	114.606	-529.749	-0.832	24.189	26.363	2	72.634	1.565	48.38
NESC EXT. ICE (250D)(-)	RP	11	15.500	13.747	-151.733	-1.378	6.089	6.636	2	18.514	0.785	12.18

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Tubular Davit Usage %	Davit Label	Height AGL (ft)	Segment Number
NESC HEAVY (250B)	45.46	A1	51.5	1
NESC EXT. WIND (250C)	20.16	A1	51.5	1
NESC EXT. ICE (250D)	46.68	A1	51.5	1
NESC HEAVY (250B) (-)	45.46	A2	51.5	1
NESC EXT. WIND (250C)(-)	20.11	A2	51.5	1
NESC EXT. ICE (250D)(-)	46.67	A2	51.5	1

Summary of Tubular X-Arm Usages by Load Case:

Load Case	Maximum Tubular X-Arm Usage %	X-Arm Label	Height AGL (ft)	Segment Number
NESC HEAVY (250B)	39.29	X1	51.5	4
NESC EXT. WIND (250C)	51.06	X1	51.5	4
NESC EXT. ICE (250D)	34.17	X1	51.5	4
NESC HEAVY (250B) (-)	35.86	X1	51.5	1
NESC EXT. WIND (250C)(-)	45.53	X1	51.5	1
NESC EXT. ICE (250D)(-)	31.81	X1	51.5	1

Summary of Brace Usages by Load Case:

Load Case	Maximum Usage %	Brace Label
NESC HEAVY (250B)	28.85	BR1
NESC EXT. WIND (250C)	55.14	BR1
NESC EXT. ICE (250D)	20.77	BR1
NESC HEAVY (250B) (-)	25.56	BR2
NESC EXT. WIND (250C)(-)	53.80	BR1
NESC EXT. ICE (250D)(-)	18.54	BR2

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	8.87	NESC EXT. ICE (250D)	0.0
2	Clamp	8.87	NESC EXT. ICE (250D)	0.0
3	Clamp	12.77	NESC EXT. WIND (250C)	0.0
4	Clamp	2.78	NESC HEAVY (250B)	0.0
5	Clamp	2.78	NESC HEAVY (250B)	0.0
6	Clamp	2.78	NESC HEAVY (250B)	0.0
7	Clamp	2.78	NESC HEAVY (250B)	0.0

8	Clamp	2.78	NESC HEAVY (250B)	0.0
9	Clamp	2.78	NESC HEAVY (250B)	0.0
10	Clamp	2.78	NESC HEAVY (250B)	0.0
11	Clamp	2.78	NESC HEAVY (250B)	0.0
C1	Suspension	61.46	NESC EXT. ICE (250D)	50.0
C2	Suspension	61.46	NESC EXT. ICE (250D)	50.0
C3	Suspension	61.46	NESC EXT. ICE (250D)	50.0

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 (250B)	1	Clamp	LP:SW	0.000	1.720	2.980	3.441
NESC HEAVY (250B)	2	Clamp	RP:SW	0.000	1.720	2.980	3.441
NESC HEAVY (250B)	3	Clamp	RP:AN1	0.000	1.652	5.612	5.850
NESC HEAVY (250B)	4	Clamp	RP:AN2	0.000	0.172	1.380	1.391
NESC HEAVY (250B)	5	Clamp	RP:AN3	0.000	0.172	1.380	1.391
NESC HEAVY (250B)	6	Clamp	RP:AN4	0.000	0.172	1.380	1.391
NESC HEAVY (250B)	7	Clamp	RP:AN5	0.000	0.172	1.380	1.391
NESC HEAVY (250B)	8	Clamp	RP:AN6	0.000	0.172	1.380	1.391
NESC HEAVY (250B)	9	Clamp	RP:AN7	0.000	0.172	1.380	1.391
NESC HEAVY (250B)	10	Clamp	RP:AN8	0.000	0.172	1.380	1.391
NESC HEAVY (250B)	11	Clamp	RP:AN9	0.000	0.172	1.380	1.391
NESC HEAVY (250B)	C1	Suspension	A1:T	0.000	5.761	17.423	18.351
NESC HEAVY (250B)	C2	Suspension	X1:C2	0.000	5.761	17.423	18.351
NESC HEAVY (250B)	C3	Suspension	A2:T	0.000	5.761	17.423	18.351
NESC EXT. WIND (250C)	1	Clamp	LP:SW	0.000	2.225	0.775	2.356
NESC EXT. WIND (250C)	2	Clamp	RP:SW	0.000	2.225	0.775	2.356
NESC EXT. WIND (250C)	3	Clamp	RP:AN1	0.000	5.633	3.001	6.383
NESC EXT. WIND (250C)	4	Clamp	RP:AN2	0.000	0.561	0.374	0.674
NESC EXT. WIND (250C)	5	Clamp	RP:AN3	0.000	0.561	0.374	0.674
NESC EXT. WIND (250C)	6	Clamp	RP:AN4	0.000	0.561	0.374	0.674
NESC EXT. WIND (250C)	7	Clamp	RP:AN5	0.000	0.561	0.374	0.674
NESC EXT. WIND (250C)	8	Clamp	RP:AN6	0.000	0.561	0.374	0.674
NESC EXT. WIND (250C)	9	Clamp	RP:AN7	0.000	0.561	0.374	0.674
NESC EXT. WIND (250C)	10	Clamp	RP:AN8	0.000	0.561	0.374	0.674
NESC EXT. WIND (250C)	11	Clamp	RP:AN9	0.000	0.561	0.374	0.674
NESC EXT. WIND (250C)	C1	Suspension	A1:T	0.000	11.216	7.291	13.377
NESC EXT. WIND (250C)	C2	Suspension	X1:C2	0.000	11.216	7.291	13.377
NESC EXT. WIND (250C)	C3	Suspension	A2:T	0.000	11.216	7.291	13.377
NESC EXT. ICE (250D)	1	Clamp	LP:SW	0.000	1.241	4.256	4.433
NESC EXT. ICE (250D)	2	Clamp	RP:SW	0.000	1.241	4.256	4.433
NESC EXT. ICE (250D)	3	Clamp	RP:AN1	0.000	1.158	4.374	4.525
NESC EXT. ICE (250D)	4	Clamp	RP:AN2	0.000	0.114	1.275	1.280
NESC EXT. ICE (250D)	5	Clamp	RP:AN3	0.000	0.114	1.275	1.280
NESC EXT. ICE (250D)	6	Clamp	RP:AN4	0.000	0.114	1.275	1.280
NESC EXT. ICE (250D)	7	Clamp	RP:AN5	0.000	0.114	1.275	1.280
NESC EXT. ICE (250D)	8	Clamp	RP:AN6	0.000	0.114	1.275	1.280
NESC EXT. ICE (250D)	9	Clamp	RP:AN7	0.000	0.114	1.275	1.280
NESC EXT. ICE (250D)	10	Clamp	RP:AN8	0.000	0.114	1.275	1.280
NESC EXT. ICE (250D)	11	Clamp	RP:AN9	0.000	0.114	1.275	1.280
NESC EXT. ICE (250D)	C1	Suspension	A1:T	0.000	3.740	18.055	18.438
NESC EXT. ICE (250D)	C2	Suspension	X1:C2	0.000	3.740	18.055	18.438
NESC EXT. ICE (250D)	C3	Suspension	A2:T	0.000	3.740	18.055	18.438
NESC HEAVY (250B) (-)	1	Clamp	LP:SW	0.000	-1.720	2.980	3.441
NESC HEAVY (250B) (-)	2	Clamp	RP:SW	0.000	-1.720	2.980	3.441

NESC HEAVY (250B) (-)	3	Clamp	RP:AN1	0.000	-1.652	5.612	5.850
NESC HEAVY (250B) (-)	4	Clamp	RP:AN2	0.000	-0.172	1.380	1.391
NESC HEAVY (250B) (-)	5	Clamp	RP:AN3	0.000	-0.172	1.380	1.391
NESC HEAVY (250B) (-)	6	Clamp	RP:AN4	0.000	-0.172	1.380	1.391
NESC HEAVY (250B) (-)	7	Clamp	RP:AN5	0.000	-0.172	1.380	1.391
NESC HEAVY (250B) (-)	8	Clamp	RP:AN6	0.000	-0.172	1.380	1.391
NESC HEAVY (250B) (-)	9	Clamp	RP:AN7	0.000	-0.172	1.380	1.391
NESC HEAVY (250B) (-)	10	Clamp	RP:AN8	0.000	-0.172	1.380	1.391
NESC HEAVY (250B) (-)	11	Clamp	RP:AN9	0.000	-0.172	1.380	1.391
NESC HEAVY (250B) (-)	C1	Suspension	A1:T	0.000	-5.761	17.423	18.351
NESC HEAVY (250B) (-)	C2	Suspension	X1:C2	0.000	-5.761	17.423	18.351
NESC HEAVY (250B) (-)	C3	Suspension	A2:T	0.000	-5.761	17.423	18.351
NESC EXT. WIND (250C)(-)	1	Clamp	LP:SW	0.000	-2.225	0.775	2.356
NESC EXT. WIND (250C)(-)	2	Clamp	RP:SW	0.000	-2.225	0.775	2.356
NESC EXT. WIND (250C)(-)	3	Clamp	RP:AN1	0.000	-5.633	3.001	6.383
NESC EXT. WIND (250C)(-)	4	Clamp	RP:AN2	0.000	-0.561	0.374	0.674
NESC EXT. WIND (250C)(-)	5	Clamp	RP:AN3	0.000	-0.561	0.374	0.674
NESC EXT. WIND (250C)(-)	6	Clamp	RP:AN4	0.000	-0.561	0.374	0.674
NESC EXT. WIND (250C)(-)	7	Clamp	RP:AN5	0.000	-0.561	0.374	0.674
NESC EXT. WIND (250C)(-)	8	Clamp	RP:AN6	0.000	-0.561	0.374	0.674
NESC EXT. WIND (250C)(-)	9	Clamp	RP:AN7	0.000	-0.561	0.374	0.674
NESC EXT. WIND (250C)(-)	10	Clamp	RP:AN8	0.000	-0.561	0.374	0.674
NESC EXT. WIND (250C)(-)	11	Clamp	RP:AN9	0.000	-0.561	0.374	0.674
NESC EXT. WIND (250C)(-)	C1	Suspension	A1:T	0.000	-11.216	7.291	13.377
NESC EXT. WIND (250C)(-)	C2	Suspension	X1:C2	0.000	-11.216	7.291	13.377
NESC EXT. WIND (250C)(-)	C3	Suspension	A2:T	0.000	-11.216	7.291	13.377
NESC EXT. ICE (250D)(-)	1	Clamp	LP:SW	0.000	-1.241	4.256	4.433
NESC EXT. ICE (250D)(-)	2	Clamp	RP:SW	0.000	-1.241	4.256	4.433
NESC EXT. ICE (250D)(-)	3	Clamp	RP:AN1	0.000	-1.158	4.374	4.525
NESC EXT. ICE (250D)(-)	4	Clamp	RP:AN2	0.000	-0.114	1.275	1.280
NESC EXT. ICE (250D)(-)	5	Clamp	RP:AN3	0.000	-0.114	1.275	1.280
NESC EXT. ICE (250D)(-)	6	Clamp	RP:AN4	0.000	-0.114	1.275	1.280
NESC EXT. ICE (250D)(-)	7	Clamp	RP:AN5	0.000	-0.114	1.275	1.280
NESC EXT. ICE (250D)(-)	8	Clamp	RP:AN6	0.000	-0.114	1.275	1.280
NESC EXT. ICE (250D)(-)	9	Clamp	RP:AN7	0.000	-0.114	1.275	1.280
NESC EXT. ICE (250D)(-)	10	Clamp	RP:AN8	0.000	-0.114	1.275	1.280
NESC EXT. ICE (250D)(-)	11	Clamp	RP:AN9	0.000	-0.114	1.275	1.280
NESC EXT. ICE (250D)(-)	C1	Suspension	A1:T	0.000	-3.740	18.055	18.438
NESC EXT. ICE (250D)(-)	C2	Suspension	X1:C2	0.000	-3.740	18.055	18.438
NESC EXT. ICE (250D)(-)	C3	Suspension	A2:T	0.000	-3.740	18.055	18.438

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 (250B)	23.752	0.000	74.883	1424.386	0.000	0.000
NESC EXT. WIND (250C)	48.218	0.000	29.416	2725.975	0.000	0.000
NESC EXT. ICE (250D)	15.771	0.000	77.252	976.526	0.000	0.000
NESC HEAVY (250B) (-)	-23.752	0.000	74.883	-1166.306	0.000	-0.000
NESC EXT. WIND (250C)(-)	-48.218	0.000	29.416	-2633.095	0.000	-0.000
NESC EXT. ICE (250D)(-)	-15.771	0.000	77.252	-750.656	0.000	-0.000

*** Weight of structure (lbs):
Weight of Braces: 700.3

Weight of Tubular Davit Arms:	408.5
Weight of Tubular X-Arms:	557.1
Weight of Steel Poles:	17277.7
Weight of Suspensions:	150.0
Total:	19093.5

*** End of Report

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63-2 North Branford Road P: (203) 488-0580
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Subject: Anchor Bolt Analysis CL&P Pole #6347.5

Location: Norwich, CT

Rev. 0: 2/28/23

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 21005.41

Anchor Bolt Analysis:

Input Data:

Bolt Force: (Right Pole)

Maximum Tensile Force = $T_{Max} := 81 \cdot kips$ (User Input from PLS-Pole)

Maximum Shear Force at Base = $V_{base} := 34 \cdot kips$ (User Input from PLS-Pole)

Anchor Bolt Data:

Use AST MA615 Grade 75

Number of Anchor Bolts = $N := 8$ (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:

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

Maximum Shear Force per Bolt = $V_{Max} := \frac{V_{base}}{N} = 4.3 \times 10^3 lbf$

Shear Stress per Bolt = $f_v := \frac{V_{Max}}{A_s} = 1.3 \times 10^3 psi$

Tensile Stress Permitted = $F_t := 0.75 \cdot F_u = 75 \cdot ksi$

Shear Stress Permitted = $F_v := 0.35 F_u = 35 \cdot ksi$

Permitted Axial Tensile Stress in Conjuction with Shear = $F_{tv} := F_t \cdot \sqrt{1 - \left(\frac{f_v}{F_v}\right)^2} = 74.95 \cdot ksi$

Bolt Tension % of Capacity = $\frac{T_{Max}}{F_{tv} \cdot A_s} = 33.28 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{T_{Max}}{F_{tv} \cdot A_s} \le 1.00, "OK", "Overstressed"\right)$

Condition1 = "OK"

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Subject: Anchor Bolt Analysis CL&P Pole #6347.5

Location: Norwich, CT

Rev. 0: 2/28/23

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 21005.41

Anchor Bolt Analysis:

Input Data:

Bolt Force: (Left Pole)

Maximum Tensile Force = $T_{Max} := 76 \cdot kips$ (User Input from PLS-Pole)

Maximum Shear Force at Base = $V_{base} := 30 \cdot kips$ (User Input from PLS-Pole)

Anchor Bolt Data:

Use AST MA615 Grade 75

Number of Anchor Bolts = $N := 8$ (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:

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

Maximum Shear Force per Bolt = $V_{Max} := \frac{V_{base}}{N} = 3.8 \times 10^3 lbf$

Shear Stress per Bolt = $f_v := \frac{V_{Max}}{A_s} = 1.2 \times 10^3 psi$

Tensile Stress Permitted = $F_t := 0.75 \cdot F_u = 75 \cdot ksi$

Shear Stress Permitted = $F_v := 0.35 F_u = 35 \cdot ksi$

Permitted Axial Tensile Stress in Conjuction with Shear = $F_{tv} := F_t \cdot \sqrt{1 - \left(\frac{f_v}{F_v}\right)^2} = 74.96 \cdot ksi$

Bolt Tension % of Capacity = $\frac{T_{Max}}{F_{tv} \cdot A_s} = 31.22 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{T_{Max}}{F_{tv} \cdot A_s} \le 1.00, "OK", "Overstressed"\right)$

Condition1 = "OK"

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Subject:	Flange Bolts and Flangeplate Analysis
Location:	Structure 6347.5 Norwich, CT
Rev. 2: 2/28/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21005.41

Flange Bolt and Flange Plate Analysis:

Input Data:

Right Pole - Flange @ 60-ft

Tower Reactions: 250C (+)

Overturning Moment =	$OM := 203 \cdot ft \cdot kips$	(User Input)
Shear Force =	$Shear := 10 \cdot kips$	(User Input)
Axial Force =	$Axial := 7 \cdot kips$	(User Input)

Flange Bolt Data:

Use AST MA325

Number of Flange Bolts =	$N := 16$	(User Input)
Diameter of Bolt Circle =	$D_{bc} := 34.5 \cdot in$	(User Input)
Bolt Minimum Tensile Strength =	$F_{ub} := 120 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Flange Bolts =	$D := 1.00 \cdot in$	(User Input)
Threads per Inch =	$n := 8$	(User Input)

Flange Plate Data:

Use AST MA871 Grade 65

Plate Yield Strength =	$Fy_{bp} := 65 \cdot ksi$	(User Input)
Flange Plate Thickness =	$t_{bp} := 1.25 \cdot in$	(User Input)
Flange Plate Diameter =	$D_{bp} := 37.25 \cdot in$	(User Input)
Outer Pole Diameter =	$D_{pole} := 30.3125 \cdot in$	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 17.25 \cdot in$

Distance to Bolts = $i := 1 .. N$

$d_i := \left\| \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right) \right\| d \leftarrow R_{bc} \cdot \sin(\theta)$

$d_1 = 6.60 \cdot in$ $d_7 = 6.60 \cdot in$

$d_2 = 12.20 \cdot in$ $d_8 = 0.00 \cdot in$

$d_3 = 15.94 \cdot in$ $d_9 = -6.60 \cdot in$

$d_4 = 17.25 \cdot in$ $d_{10} = -12.20 \cdot in$

$d_5 = 15.94 \cdot in$ $d_{11} = -15.94 \cdot in$

$d_6 = 12.20 \cdot in$ $d_{12} = -17.25 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 15.156 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := if\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00 \cdot in$ $MA_7 = 0.00 \cdot in$

$MA_2 = 0.00 \cdot in$ $MA_8 = 0.00 \cdot in$

$MA_3 = 0.78 \cdot in$ $MA_9 = 0.00 \cdot in$

$MA_4 = 2.09 \cdot in$ $MA_{10} = 0.00 \cdot in$

$MA_5 = 0.78 \cdot in$ $MA_{11} = 0.00 \cdot in$

$MA_6 = 0.00 \cdot in$ $MA_{12} = 0.00 \cdot in$

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 17.3 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 2.381 \times 10^3 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.785 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 0.606 \cdot in^2$

Check Flange Bolts:

Maximum Shear Stress = $V_{Max} := \frac{Shear}{N \cdot A_g} = 0.8 \cdot ksi$

Permitted Shear Stress = $F_v := \left(0.35 \cdot F_{ub}\right) = 42 \cdot ksi$

Condition1 = $Condition1 := if\left(V_{Max} \le F_v, "OK", "Overstressed"\right)$ $\frac{V_{Max}}{F_v} = 1.89 \cdot \%$

Condition1 = "OK"

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 28.4 \cdot ksi$

Permitted Tensile Stress = $F_t := \left(0.75 \cdot F_{ub}\right) = 90 \cdot ksi$

Condition2 = $Condition2 := if\left(\frac{T_{Max}}{F_t} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_t} = 31.58 \cdot \%$

Condition2 = "OK"

Permitted Tensile Stress with Shear = $F_{t.v} := F_t \cdot \sqrt{1 - \left(\frac{V_{Max}}{F_v}\right)^2} = 90 \cdot ksi$

Condition3 = $Condition3 := if\left(\frac{T_{Max}}{F_{t.v}} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_{t.v}} = 31.58 \cdot \%$

Condition3 = "OK"

Flange Plate Analysis:

Force from Bolts = $C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$

$C_1 = 7.2 \cdot kips$ $C_7 = 7.2 \cdot kips$

$C_2 = 12.9 \cdot kips$ $C_8 = 0.4 \cdot kips$

$C_3 = 16.7 \cdot kips$ $C_9 = -6.3 \cdot kips$

$C_4 = 18.1 \cdot kips$ $C_{10} = -12.0 \cdot kips$

$C_5 = 16.7 \cdot kips$ $C_{11} = -15.9 \cdot kips$

$C_6 = 12.9 \cdot kips$ $C_{12} = -17.2 \cdot kips$

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(B_{eff} \, t_{bp}^{\,2}\right)} = 14.2 \cdot ksi$$

Allowable Bending Stress in Plate = $F_{bp} := 0.9 \cdot Fy_{bp} = 58.5 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} = 24.3 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$

Condition1 = "Ok"

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Subject:	Flange Bolts and Flangeplate Analysis
Location:	Structure 6347.5 Norwich, CT
Rev. 2: 2/28/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21005.41

Flange Bolt and Flange Plate Analysis:

Input Data: Right Pole - Flange @ 40-ft

Tower Reactions: 250C (+)

Overturning Moment =	OM := 208·ft·kips	(User Input)
Shear Force =	Shear := 34·kips	(User Input)
Axial Force =	Axial := 88kips	(User Input)

Flange Bolt Data:

Use AST MA325

Number of Flange Bolts =	N := 20	(User Input)
Diameter of Bolt Circle =	D_{bc} := 37·in	(User Input)
Bolt Minimum Tensile Strength =	F_{ub} := 120·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Flange Bolts =	D := 1.00·in	(User Input)
Threads per Inch =	n := 8	(User Input)

Flange Plate Data:

Use AST MA871 Grade 65

Plate Yield Strength =	Fy_{bp} := 65·ksi	(User Input)
Flange Plate Thickness =	t_{bp} := 1.25·in	(User Input)
Flange Plate Diameter =	D_{bp} := 39.75·in	(User Input)
Outer Pole Diameter =	D_{pole} := 32.625·in	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 18.5 \cdot in$

Distance to Bolts = $i := 1 .. N$

$d_i := \left| \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N} \right) \right.$
$\left. d \leftarrow R_{bc} \cdot \sin(\theta) \right.$

$d_1 = 5.72 \cdot in$ $d_7 = 14.97 \cdot in$

$d_2 = 10.87 \cdot in$ $d_8 = 10.87 \cdot in$

$d_3 = 14.97 \cdot in$ $d_9 = 5.72 \cdot in$

$d_4 = 17.59 \cdot in$ $d_{10} = 0.00 \cdot in$

$d_5 = 18.50 \cdot in$ $d_{11} = -5.72 \cdot in$

$d_6 = 17.59 \cdot in$ $d_{12} = -10.87 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 16.313 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := if\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00 \cdot in$ $MA_7 = 0.00 \cdot in$

$MA_2 = 0.00 \cdot in$ $MA_8 = 0.00 \cdot in$

$MA_3 = 0.00 \cdot in$ $MA_9 = 0.00 \cdot in$

$MA_4 = 1.28 \cdot in$ $MA_{10} = 0.00 \cdot in$

$MA_5 = 2.19 \cdot in$ $MA_{11} = 0.00 \cdot in$

$MA_6 = 1.28 \cdot in$ $MA_{12} = 0.00 \cdot in$

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 18.2 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 3.422 \times 10^3 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.785 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 0.606 \cdot in^2$

Check Flange Bolts:

Maximum Shear Stress = $V_{Max} := \frac{Shear}{N \cdot A_g} = 2.2 \cdot ksi$

Permitted Shear Stress = $F_v := \left(0.35 \cdot F_{ub}\right) = 42 \cdot ksi$

Condition1 = $Condition1 := if\left(V_{Max} \le F_v, "OK", "Overstressed"\right)$ $\frac{V_{Max}}{F_v} = 5.15 \cdot \%$

Condition1 = "OK"

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 15 \cdot ksi$

Permitted Tensile Stress = $F_t := \left(0.75 \cdot F_{ub}\right) = 90 \cdot ksi$

Condition2 = $Condition2 := if\left(\frac{T_{Max}}{F_t} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_t} = 16.68 \cdot \%$

Condition2 = "OK"

Permitted Tensile Stress with Shear = $F_{t.v} := F_t \cdot \sqrt{1 - \left(\frac{V_{Max}}{F_v}\right)^2} = 89.9 \cdot ksi$

Condition3 = $Condition3 := if\left(\frac{T_{Max}}{F_{t.v}} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_{t.v}} = 16.70 \cdot \%$

Condition3 = "OK"

Flange Plate Analysis:

Force from Bolts =

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

$C_1 = 8.6 \cdot kips$ $C_7 = 15.3 \cdot kips$

$C_2 = 12.3 \cdot kips$ $C_8 = 12.3 \cdot kips$

$C_3 = 15.3 \cdot kips$ $C_9 = 8.6 \cdot kips$

$C_4 = 17.2 \cdot kips$ $C_{10} = 4.4 \cdot kips$

$C_5 = 17.9 \cdot kips$ $C_{11} = 0.2 \cdot kips$

$C_6 = 17.2 \cdot kips$ $C_{12} = -3.5 \cdot kips$

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(B_{eff} \cdot t_{bp}^2\right)} = 17.6 \cdot ksi$$

Allowable Bending Stress in Plate =

$$F_{bp} := 0.9 \cdot Fy_{bp} = 58.5 \cdot ksi$$

Plate Bending Stress % of Capacity =

$$\frac{f_{bp}}{F_{bp}} = 30.1 \cdot \%$$

Condition1 =

$$Condition1 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$$

Condition1 = "Ok"

Flange Bolt and Flange Plate Analysis:

Input Data:

Right Pole - Flange @ 40-ft

Tower Reactions: 250C (-)

Overturning Moment =	OM := 187·ft·kips	(User Input)
Shear Force =	Shear := 32·kips	(User Input)
Axial Force =	Axial := (–49) kips	(User Input)

Flange Bolt Data:

Use AST MA325

Number of Flange Bolts =	N := 20	(User Input)
Diameter of Bolt Circle =	D_{bc} := 37·in	(User Input)
Bolt Minimum Tensile Strength =	F_{ub} := 120·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Flange Bolts =	D := 1.00·in	(User Input)
Threads per Inch =	n := 8	(User Input)

Flange Plate Data:

Use AST MA871 Grade 65

Plate Yield Strength =	Fy_{bp} := 65·ksi	(User Input)
Flange Plate Thickness =	t_{bp} := 1.25·in	(User Input)
Flange Plate Diameter =	D_{bp} := 39.75·in	(User Input)
Outer Pole Diameter =	D_{pole} := 32.625·in	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 18.5 \cdot in$

Distance to Bolts = $i := 1 .. N$

$d_i := \left| \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N} \right) \right.$
$\left. d \leftarrow R_{bc} \cdot \sin(\theta) \right.$

$d_1 = 5.72 \cdot in$ $d_7 = 14.97 \cdot in$
$d_2 = 10.87 \cdot in$ $d_8 = 10.87 \cdot in$
$d_3 = 14.97 \cdot in$ $d_9 = 5.72 \cdot in$
$d_4 = 17.59 \cdot in$ $d_{10} = 0.00 \cdot in$
$d_5 = 18.50 \cdot in$ $d_{11} = -5.72 \cdot in$
$d_6 = 17.59 \cdot in$ $d_{12} = -10.87 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 16.313 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := if\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00 \cdot in$ $MA_7 = 0.00 \cdot in$
$MA_2 = 0.00 \cdot in$ $MA_8 = 0.00 \cdot in$
$MA_3 = 0.00 \cdot in$ $MA_9 = 0.00 \cdot in$
$MA_4 = 1.28 \cdot in$ $MA_{10} = 0.00 \cdot in$
$MA_5 = 2.19 \cdot in$ $MA_{11} = 0.00 \cdot in$
$MA_6 = 1.28 \cdot in$ $MA_{12} = 0.00 \cdot in$

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 18.2 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 3.422 \times 10^3 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.785 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 0.606 \cdot in^2$

Check Flange Bolts:

Maximum Shear Stress = $V_{Max} := \frac{Shear}{N \cdot A_g} = 2 \cdot ksi$

Permitted Shear Stress = $F_v := \left(0.35 \cdot F_{ub}\right) = 42 \cdot ksi$

Condition1 = $Condition1 := if\left(V_{Max} \le F_v, "OK", "Overstressed"\right)$ $\frac{V_{Max}}{F_v} = 4.85 \cdot \%$

Condition1 = "OK"

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 24.1 \cdot ksi$

Permitted Tensile Stress = $F_t := \left(0.75 \cdot F_{ub}\right) = 90 \cdot ksi$

Condition2 = $Condition2 := if\left(\frac{T_{Max}}{F_t} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_t} = 26.74 \cdot \%$

Condition2 = "OK"

Permitted Tensile Stress with Shear = $F_{t.v} := F_t \cdot \sqrt{1 - \left(\frac{V_{Max}}{F_v}\right)^2} = 89.9 \cdot ksi$

Condition3 = $Condition3 := if\left(\frac{T_{Max}}{F_{t.v}} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_{t.v}} = 26.77 \cdot \%$

Condition3 = "OK"

Flange Plate Analysis:

Force from Bolts =

$$T_i := \frac{OM \cdot d_i}{I_p} - \frac{Axial}{N}$$

$T =$

	0
0	0
1	6.2
2	9.58
3	12.26
4	13.99
5	14.58
6	13.99
7	12.26
8	9.58
9	6.2
10	2.45
11	-1.3
12	-4.68
13	-7.36
14	-9.09
15	-9.68
16	-9.09
17	-7.36
18	-4.68
19	-1.3
20	2.45

$\cdot kips$

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot T_i \cdot MA_i}{\left(B_{eff} \cdot t_{bp}^2\right)} = 14.3 \cdot ksi$$

Allowable Bending Stress in Plate =

$$F_{bp} := 0.9 \cdot Fy_{bp} = 58.5 \cdot ksi$$

Plate Bending Stress % of Capacity =

$$\frac{f_{bp}}{F_{bp}} = 24.5 \cdot \%$$

Condition1 =

$$Condition1 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$$

Condition1 = "Ok"

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Subject:	Flange Bolts and Flangeplate Analysis
Location:	Structure 6347.5 Norwich, CT
Rev. 2: 2/28/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21005.41

Flange Bolt and Flange Plate Analysis:

Input Data: Left Pole - Flange @ 40-ft

Tower Reactions: 250C (+)

Overturning Moment =	OM := 113·ft·kips	(User Input)
Shear Force =	Shear := 22·kips	(User Input)
Axial Force =	Axial := (–71)·kips	(User Input)

Flange Bolt Data:

Use AST MA325

Number of Flange Bolts =	N := 20	(User Input)
Diameter of Bolt Circle =	D_{bc} := 37·in	(User Input)
Bolt Minimum Tensile Strength =	F_{ub} := 120·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Flange Bolts =	D := 1.00·in	(User Input)
Threads per Inch =	n := 8	(User Input)

Flange Plate Data:

Use AST MA871 Grade 65

Plate Yield Strength =	Fy_{bp} := 65·ksi	(User Input)
Flange Plate Thickness =	t_{bp} := 1.25·in	(User Input)
Flange Plate Diameter =	D_{bp} := 39.75·in	(User Input)
Outer Pole Diameter =	D_{pole} := 32.625·in	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 18.5 \cdot in$

Distance to Bolts = $i := 1 .. N$

$d_i :=$ | $\theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right)$ | $d \leftarrow R_{bc} \cdot \sin(\theta)$

$d_1 = 5.72 \cdot in$ $d_7 = 14.97 \cdot in$

$d_2 = 10.87 \cdot in$ $d_8 = 10.87 \cdot in$

$d_3 = 14.97 \cdot in$ $d_9 = 5.72 \cdot in$

$d_4 = 17.59 \cdot in$ $d_{10} = 0.00 \cdot in$

$d_5 = 18.50 \cdot in$ $d_{11} = -5.72 \cdot in$

$d_6 = 17.59 \cdot in$ $d_{12} = -10.87 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 16.313 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := if\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00 \cdot in$ $MA_7 = 0.00 \cdot in$

$MA_2 = 0.00 \cdot in$ $MA_8 = 0.00 \cdot in$

$MA_3 = 0.00 \cdot in$ $MA_9 = 0.00 \cdot in$

$MA_4 = 1.28 \cdot in$ $MA_{10} = 0.00 \cdot in$

$MA_5 = 2.19 \cdot in$ $MA_{11} = 0.00 \cdot in$

$MA_6 = 1.28 \cdot in$ $MA_{12} = 0.00 \cdot in$

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 18.2 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 3422.5 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.785 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 0.606 \cdot in^2$

Check Flange Bolts:

Maximum Shear Stress = $V_{Max} := \frac{Shear}{N \cdot A_g} = 1.4 \cdot ksi$

Permitted Shear Stress = $F_v := \left(0.35 \cdot F_{ub}\right) = 42 \cdot ksi$

Condition1 = $Condition1 := if\left(V_{Max} \le F_v, "OK", "Overstressed"\right)$ $\frac{V_{Max}}{F_v} = 3.33 \cdot \%$

Condition1 = "OK"

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 18 \cdot ksi$

Permitted Tensile Stress = $F_t := \left(0.75 \cdot F_{ub}\right) = 90 \cdot ksi$

Condition2 = $Condition2 := if\left(\frac{T_{Max}}{F_t} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_t} = 19.96 \cdot \%$

Condition2 = "OK"

Permitted Tensile Stress with Shear = $F_{t.v} := F_t \cdot \sqrt{1 - \left(\frac{V_{Max}}{F_v}\right)^2} = 89.9 \cdot ksi$

Condition3 = $Condition3 := if\left(\frac{T_{Max}}{F_{t.v}} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_{t.v}} = 19.97 \cdot \%$

Condition3 = "OK"

Flange Plate Analysis:

Force from Bolts =

$$T_i := \frac{OM \cdot d_i}{I_p} - \frac{Axial}{N}$$

$T =$

	0
0	0
1	5.82
2	7.86
3	9.48
4	10.52
5	10.88
6	10.52
7	9.48
8	7.86
9	5.82
10	3.55
11	1.28
12	-0.76
13	-2.38
14	-3.42
15	-3.78
16	-3.42
17	-2.38
18	-0.76
19	1.28
20	3.55

·kips

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot T_i \cdot MA_i}{\left(B_{eff} \cdot t_{bp}^{\,2}\right)} = 10.7 \cdot ksi$$

Allowable Bending Stress in Plate =

$$F_{bp} := 0.9 \cdot Fy_{bp} = 58.5 \cdot ksi$$

Plate Bending Stress % of Capacity =

$$\frac{f_{bp}}{F_{bp}} = 18.3 \cdot \%$$

Condition1 =

$$Condition1 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, \text{"Ok"}, \text{"Overstressed"}\right)$$

Condition1 = "Ok"

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Branford, CT 06405 F: (203) 488-8587

Subject:	Flange Bolts and Flangeplate Analysis
Location:	Structure 6347.5 Norwich, CT
Rev. 2: 2/28/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21005.41

Flange Bolt and Flange Plate Analysis:

Input Data: Left Pole - Flange @ 40-ft

Tower Reactions: 250C (-)

Overturning Moment =	OM := 133·ft·kips	(User Input)
Shear Force =	Shear := 25·kips	(User Input)
Axial Force =	Axial := 96·kips	(User Input)

Flange Bolt Data:

Use AST MA325

Number of Flange Bolts =	N := 20	(User Input)
Diameter of Bolt Circle =	D_{bc} := 37·in	(User Input)
Bolt Minimum Tensile Strength =	F_{ub} := 120·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Flange Bolts =	D := 1.00·in	(User Input)
Threads per Inch =	n := 8	(User Input)

Flange Plate Data:

Use AST MA871 Grade 65

Plate Yield Strength =	Fy_{bp} := 65·ksi	(User Input)
Flange Plate Thickness =	t_{bp} := 1.25·in	(User Input)
Flange Plate Diameter =	D_{bp} := 39.75·in	(User Input)
Outer Pole Diameter =	D_{pole} := 32.625·in	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 18.5 \cdot in$

Distance to Bolts = $i := 1 .. N$

$d_i :=$ | $\theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right)$ | $d \leftarrow R_{bc} \cdot \sin(\theta)$

$d_1 = 5.72 \cdot in$ $d_7 = 14.97 \cdot in$

$d_2 = 10.87 \cdot in$ $d_8 = 10.87 \cdot in$

$d_3 = 14.97 \cdot in$ $d_9 = 5.72 \cdot in$

$d_4 = 17.59 \cdot in$ $d_{10} = 0.00 \cdot in$

$d_5 = 18.50 \cdot in$ $d_{11} = -5.72 \cdot in$

$d_6 = 17.59 \cdot in$ $d_{12} = -10.87 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 16.313 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := if\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00 \cdot in$ $MA_7 = 0.00 \cdot in$

$MA_2 = 0.00 \cdot in$ $MA_8 = 0.00 \cdot in$

$MA_3 = 0.00 \cdot in$ $MA_9 = 0.00 \cdot in$

$MA_4 = 1.28 \cdot in$ $MA_{10} = 0.00 \cdot in$

$MA_5 = 2.19 \cdot in$ $MA_{11} = 0.00 \cdot in$

$MA_6 = 1.28 \cdot in$ $MA_{12} = 0.00 \cdot in$

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 18.2 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 3422.5 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.785 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 0.606 \cdot in^2$

Check Flange Bolts:

Maximum Shear Stress = $V_{Max} := \frac{Shear}{N \cdot A_g} = 1.6 \cdot ksi$

Permitted Shear Stress = $F_v := \left(0.35 \cdot F_{ub}\right) = 42 \cdot ksi$

Condition1 = $Condition1 := if\left(V_{Max} \le F_v, "OK", "Overstressed"\right)$ $\frac{V_{Max}}{F_v} = 3.79 \cdot \%$

Condition1 = "OK"

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 6.3 \cdot ksi$

Permitted Tensile Stress = $F_t := \left(0.75 \cdot F_{ub}\right) = 90 \cdot ksi$

Condition2 = $Condition2 := if\left(\frac{T_{Max}}{F_t} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_t} = 7.02 \cdot \%$

Condition2 = "OK"

Permitted Tensile Stress with Shear = $F_{t.v} := F_t \cdot \sqrt{1 - \left(\frac{V_{Max}}{F_v}\right)^2} = 89.9 \cdot ksi$

Condition3 = $Condition3 := if\left(\frac{T_{Max}}{F_{t.v}} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_{t.v}} = 7.02 \cdot \%$

Condition3 = "OK"

Flange Plate Analysis:

Force from Bolts = $C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$

$C_1 = 7.5 \cdot kips$ $C_7 = 11.8 \cdot kips$

$C_2 = 9.9 \cdot kips$ $C_8 = 9.9 \cdot kips$

$C_3 = 11.8 \cdot kips$ $C_9 = 7.5 \cdot kips$

$C_4 = 13.0 \cdot kips$ $C_{10} = 4.8 \cdot kips$

$C_5 = 13.4 \cdot kips$ $C_{11} = 2.1 \cdot kips$

$C_6 = 13.0 \cdot kips$ $C_{12} = -0.3 \cdot kips$

Maximum Bending Stress in Plate = $f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(B_{eff} \, t_{bp}^{\,2}\right)} = 13.3 \cdot ksi$

Allowable Bending Stress in Plate = $F_{bp} := 0.9 \cdot Fy_{bp} = 58.5 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} = 22.7 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$

Condition1 = "Ok"

Units:

Angular

$rad \equiv 1$ $deg \equiv \pi \cdot \frac{rad}{180}$

Weight

$lb \equiv lbf$

$kips \equiv 1000 \cdot lb$ $k \equiv kips$

$tons \equiv 2000 \cdot lb$

Unit Weight

$plf \equiv \frac{lb}{ft}$ $klf \equiv \frac{kips}{ft}$

Pressure

$psf \equiv \frac{lb}{ft^2}$ $psi \equiv \frac{lb}{in^2}$

$ksf \equiv \frac{kips}{ft^2}$ $ksi \equiv \frac{kips}{in^2}$

Density

$pcf \equiv \frac{lb}{ft^3}$

RAN Template:	A&L Template:
67G5C998G 6160	

CTNL463A_Sprint Retain_1_draft

Print Name: Standard (Ground Anchor)
PORs: New Build_Sprint Keep

Section 1 - Site Information

Site ID: CTNL463A
Status: Draft
Version: 1
Project Type: Sprint Retain
Approved: Not Approved
Approved By: Not Approved
Last Modified: 2/23/2022 11:30:05 AM
Last Modified By: Michael.Low1@T-Mobile.com

Site Name: CT54XC775
Site Class: Utility Lattice Tower
Site Type: Structure Non Building
Plan Year: 2021
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Not Specified

Latitude: 41.50992500
Longitude: -72.12493100
Address: 153 Old Salem Rd
City, State: Norwich, CT
Region: NORTHEAST

RAN Template: 67G5C998G 6160			AL Template:	
Sector Count: 3	**Antenna Count:** 6	**Coax Line Count:** 36	**TMA Count:** 6	**RRU Count:** 9

Section 2 - Existing Template Images

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

Section 3 - Proposed Template Images

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

Section 4 - Siteplan Images

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

RAN Template:	A&L Template:
67G5C998G 6160	

CTNL463A_Sprint Retain_1_draft

Print Name: Standard (Ground Anchor)
PORs: New Build_Sprint Keep

Section 5 - RAN Equipment

Existing RAN Equipment

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

Proposed RAN Equipment

Template: 67G5C998G 6160

Enclosure	1	2
Enclosure Type	Enclosure 6160 AC V1	B160
Baseband	BB 6648 (L2500, N2500); BB 6648 (L700, L600, N600, L2100, L1900); DUG20 (G1900)	
Hybrid Cable System	PSU 4813 vR4A (Kit) **(x 2)**	
Transport System	CSR IXRe V2 (Gen2)	
Functionality Groups	Ericsson Hybrid Trunk 6/24 4AWG *Select Length* **(x 3)**	

RAN Scope of Work:

CT54XC775
200A existing.
Existing Azimuth 30/120/270
New Azimuth 30/120/260

RAN Template: 67G5C998G 6160 | **A&L Template:**

CTNL463A_Sprint Retain_1_draft

Print Name: Standard (Ground Anchor)
PORs: New Build_Sprint Keep

Section 6 - A&L Equipment

Existing Template: Custom
Proposed Template:

Sector 1 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				Commscope_VV-65A-R1 (Quad)	
Azimuth	30				30	
M. Tilt	0				0	
Height	86				86	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L700 L600 N600	L700 L600 N600	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**
TMAs	Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Cabinet)	SHARED Radio 4480 B71+B85 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)	SHARED Radio 4460 B25+B66 (At Cabinet)	Radio 8863 B41 (At Cabinet)	SHARED Radio 8863 B41 (At Cabinet)
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template: 67G5C998G 6160 | **A&L Template:**

CTNL463A_Sprint Retain_1_draft

Print Name: Standard (Ground Anchor)
PORs: New Build_Sprint Keep

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				Commscope_VV-65A-R1 (Quad)	
Azimuth	120				120	
M. Tilt	0				0	
Height	86				86	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L700 L600 N600	L700 L600 N600	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**
TMAs	Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Cabinet)	SHARED Radio 4480 B71+B85 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)	SHARED Radio 4460 B25+B66 (At Cabinet)	Radio 8863 B41 (At Cabinet)	SHARED Radio 8863 B41 (At Cabinet)
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template: 67G5C998G 6160 | **A&L Template:**

CTNL463A_Sprint Retain_1_draft

Print Name: Standard (Ground Anchor)
PORs: New Build_Sprint Keep

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				Commscope_VV-65A-R1 (Quad)	
Azimuth	260				260	
M. Tilt	0				0	
Height	86				86	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L700 L600 N600	L700 L600 N600	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**	1-1/4" Coax **(x4)**	SHARED 1-1/4" Coax **(x4)**
TMAs	Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)	SHARED Commscope - Smart BiasT - ATSBT-TOP-MF-4G (AtAntenna)
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Cabinet)	SHARED Radio 4480 B71+B85 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)	SHARED Radio 4460 B25+B66 (At Cabinet)	Radio 8863 B41 (At Cabinet)	SHARED Radio 8863 B41 (At Cabinet)
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67G5C998G 6160	

CTNL463A_Sprint Retain_1_draft

Print Name: Standard (Ground Anchor)
PORs: New Build_Sprint Keep

Section 7 - Power Systems Equipment

Existing Power Systems Equipment
----- This section is intentionally blank. -----

	Proposed Power Systems Equipment
Enclosure	1
Enclosure Type	Enclosure 6160 AC V1

VV-65A-R1

4-port sector antenna, 4x 1695–2690 MHz, 65° HPBW, 1x RET,The two high band arrays utilize a common tilt.

- The RET interface comprises one pair of AISG input/output ports

General Specifications

Antenna Type	Sector
Band	Single band
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage
Radome Material	PVC, UV resistant
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	4
RF Connector Quantity, total	4

Remote Electrical Tilt (RET) Information

RET Hardware	CommRET v2
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male
Input Voltage	10–30 Vdc
Internal RET	High band (1)
Power Consumption, idle state, maximum	2 W
Power Consumption, normal conditions, maximum	10 W
Protocol	3GPP/AISG 2.0

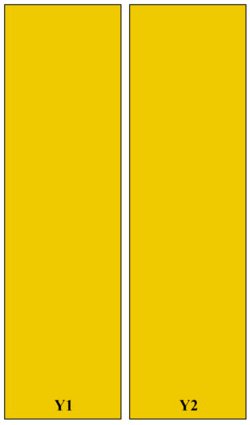
Dimensions

Width	307 mm | 12.087 in
Depth	118 mm | 4.646 in
Length	1390 mm | 54.724 in

VV-65A-R1

Net Weight, without mounting kit	10.8 kg | 23.81 lb

Array Layout



Array ID	Frequency (MHz)	RF Connector	HPBW	RET (SRET)	AISG No.	AISG RET UID
Y1	1695-2690	1 - 2	65°	1	AISG1	CPxxxxxxxxxxxxxxxY1
Y2	1695-2690	3 - 4	65°			

(Sizes of colored boxes are not true depictions of array sizes)

Port Configuration

Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	1695 – 2690 MHz
Polarization	±45°
Total Input Power, maximum	400 W @ 50 °C

Electrical Specifications

Frequency Band, MHz	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2500**	**2490–2690**

PRODUCT DATASHEET

APXVAALL24_43-U-NA20

RADIO FREQUENCY SYSTEMS

Dual Slant Polarized Quad Band (8 Port) Antenna, 617-894/617-894/1695-2690/1695-2690MHz, 65deg, 16.2/16.1/18.9/18.7dBi, 2.4m (8ft), VET, RET, 2-12°/2-12°/2-12°/2-12°

FEATURES / BENEFITS

This antenna provides a 8 Port multi-band flexible platform for advanced use for flexible use in deployment scenarios for encompassing 600, 700, 800, AWS, PCS & BRS applications.

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

Technical Features

LOW BAND LEFT ARRAY (617-894 MHZ) [R1]

Frequency Band	MHz	617-698	698-806	806-894
Gain Typical	dBi	15.5	16.1	16.2
Gain Over All Tilts	dBi	15.2 +/- .3	15.6 +/- .5	15.8 +/- .4
Horizontal Beamwidth @3dB	Deg	65 +/-3	64 +/-2	62 +/-3
Vertical Beamwidth @3dB	Deg	9.9 +/- .7	8.6 +/- .7	7.6 +/-.4
Electrical Downtilt Range	Deg	2 to 12		
Upper Side Lobe Suppression Peak to +20	dB	15	14	14
Front-to-Back, at +/-30°, Copolar	dB	25	25	29
Cross Polar Discrimination (XPD) @ Boresight	dB	18	18	17
Cross Polar Discrimination (XPD) @ +/-60	dB	5	5	6
3rd Order PIM 2 x 43dBm	dBc	-153		
VSWR	-	1.5:1		
Cross Polar Isolation	dB	25		
Maximum Effective Power per Port	Watt	400		

RADIO FREQUENCY SYSTEMS

Dual Slant Polarized Quad Band (8 Port) Antenna, 617-894/617-894/1695-2690/1695-2690MHz, 65deg, 16.2/16.1/18.9/18.7dBi, 2.4m (8ft), VET, RET, 2-12°/2-12°/2-12°/2-12°

HIGH BAND RIGHT ARRAY (1695-2690 MHZ) [Y2]

Frequency Band	MHz	1695-1880	1850-1990	1920-2200	2200-2490	2490-2690
Gain Typical	dBi	17.7	18.1	18.7	18.5	18.0
Gain Over All Tilts	dBi	17.1 +/- .6	17.6 +/- .5	18 +/- .7	17.9 +/- .6	17.4 +/- .6
Horizontal Beamwidth @3dB	Deg	67 +/- 5	64 +/- 5	65 +/- 5	62 +/- 7	60 +/- 9
Vertical Beamwidth @3dB	Deg	5.7 +/- .5	5.2 +/- .3	4.7 +/- .6	4.2 +/- .3	4.2 +/- .3
Electrical Downtilt Range	Deg	2 to 12				
Upper Side Lobe Suppression Peak to +20	dB	15	15	14	14	13
Front-to-Back, at +/-30°, Copolar	dB	27	28	26	23	21
Cross Polar Discrimination (XPD) @ Boresight	dB	21	17	14	16	18
Cross Polar Discrimination (XPD) @ +/-60	dB	10	8	7	4	1
3rd Order PIM 2 x 43dBm	dBc	-153				
VSWR	-	1.5:1				
Cross Polar Isolation	dB	25				
Maximum Effective Power per Port	Watt	300				

ELECTRICAL SPECIFICATIONS

Impedance	Ohm	50.0
Polarization	Deg	±45°

MECHANICAL SPECIFICATIONS

Dimensions - H x W x D	mm (in)	2436 x 609 x 215 (95.9 x 24 x 8.5)
Weight (Antenna Only)	kg (lb)	55.7 (122.8)
Weight (Mounting Hardware only)	kg (lb)	12.3 (27.1)
Packing size- HxWxD	mm (in)	2565 x 735 x 390 (101 x 28.9 x 15.4)
Shipping Weight	kg (lb)	77.9 (171.7)
Connector type		8 x 4.3-10 female at bottom + 6 AISG connectors (3 male, 3 female)
Adjustment mechanism		Integrated RET solution AISG compliant (Field Replaceable) + Manual Override + External Tilt Indicator
Radome Material / Color		Fiber Glass / Light Grey RAL7035

TESTING AND ENVIRONMENTAL

Temperature Range	°C (°F)	-40 to 60 (-40 to 140)
Grounding type		DC Grounded
Lightning protection		IEC 61000-4-5
Survival/Rated Wind Velocity	km/h	240 (150)
Wind Load @Rated Wind Front	N	1428.0
Wind Load @Rated Wind Side	N	434.0
Wind Load @Rated Wind Rear	N	1544.0
Environmental		ETSI 300-019-2-4 Class 4.1E

ATSBT-TOP-MF-4G

Top Smart Bias Tee

- Reduces cable and site lease costs by eliminating the need for AISG home run cables
- AISG 1.1 and 2.0 compliant
- Operates at 10-30 Vdc
- Weatherproof AISG connectors
- Intuitive schematics simplify and ensure proper installation
- Enhanced lightning protection plus grounding stud for additional surge protection
- 7-16 DIN female connector (ANT)
- 7-16 DIN male connector (BTS)

Product Classification

Product Type	RET bias tee

General Specifications

AISG Input Connector	8-pin DIN Female
Antenna Interface	7-16 DIN Female
Antenna Interface Signal	RF | dc Blocked
BTS Interface	7-16 DIN Male
BTS Interface Signal	AISG data | RF | dc
Color	Silver
EU Certification	CE
Grounding Lug Thread Size	M8
Smart Bias Tee Type	10–30 V Top

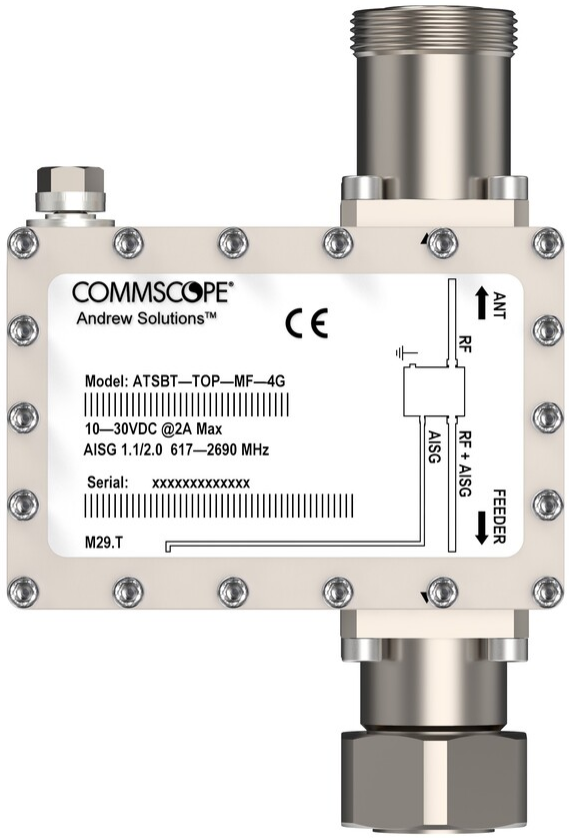
Dimensions

Height	143 mm | 5.63 in
Width	94 mm | 3.701 in
Depth	50 mm | 1.969 in

Electrical Specifications

3rd Order IMD	-158 dBc
3rd Order IMD Test Method	Two +43 dBm carriers
Insertion Loss, typical	0.1 dB
Electromagnetic Compatibility (EMC)	CFR 47 Part 15, Subpart B, Class B | EN 55022, Class B | ICES-003 Issue 4 CAN

ATSBT-TOP-MF-4G



Material Specifications

Material Type	Aluminum

Environmental Specifications

Operating Temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Ingress Protection Test Method	IEC 60529:2001, IP66

Packaging and Weights

Weight, net	0.8 kg | 1.764 lb

Regulatory Compliance/Certifications

Agency	**Classification**

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CTNL463A

CT54XC775
153 Old Salem Road
Norwich, Connecticut 06360

February 6, 2023

EBI Project Number: 6223000401

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**0.29%**

February 6, 2023

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

Emissions Analysis for Site: CTNL463A - CT54XC775

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **153 Old Salem Road** in **Norwich, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 153 Old Salem Road in Norwich, Connecticut using the equipment information listed below. Modeling of the antennas and associated equipment was completed using RoofMaster™ software, which is a widely-used predictive modeling program that has been developed to predict RF power density values for rooftop and tower telecommunications sites produced by vertical collinear antennas that are typically used in the cellular, PCS, paging and other communications services. Using the computational methods set forth in Federal Communications (FCC) Office of Engineering & Technology (OET) Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" (OET-65), RoofMaster™ calculates predicted power density in a scalable grid based on the contributions of all RF sources characterized in the study scenario. At each grid location, the cumulative power density is expressed as a percentage of the FCC limits. Manufacturer antenna pattern data is utilized in these calculations. RoofMaster™ models consist of the Far Field model as specified in OET-65 and an implementation of the OET-65 Cylindrical Model (Sula9). The models utilize several operational specifications for different types of antennas to produce a plot of spatially-averaged power densities that can be expressed as a percentage of the applicable exposure limit.

Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, telecommunications equipment was modeled using the following assumptions:

1) 1 LTE channel (600 MHz Band) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 1 GSM channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 10 Watts per Channel.

5) 1 LTE channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 120/160 Watts per Channel.

6) 1 LTE channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 120/160 Watts per Channel.

7) 2 LTE channels (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts.

8) 2 NR channels (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts.

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

10) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

11) The antennas used in this modeling are the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the COMMSCOPE VV-65A-R1 02DT 2500 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s), the COMMSCOPE VV-65A-R1 02DT 2500 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s), the COMMSCOPE VV-65A-R1 02DT 2500 for the 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

12) The antenna mounting height centerline of the proposed antennas is 86 feet above ground level (AGL).

13) Emissions from additional carriers were not included because emissions data for the site location are not available.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600	Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600	Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600
Frequency Bands:	600 MHz / 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd
Height (AGL):	86 feet	Height (AGL):	86 feet	Height (AGL):	86 feet
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	490.00 Watts	Total TX Power (W):	490.00 Watts	Total TX Power (W):	490.00 Watts
ERP (W):	14,173.46	ERP (W):	14,173.46	ERP (W):	14,173.46
Antenna A1 MPE %:	**10.22%**	Antenna B1 MPE %:	**10.22%**	Antenna C1 MPE %:	**10.22%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	COMMSCOPE VV-65A-R1 02DT 2500	Make / Model:	COMMSCOPE VV-65A-R1 02DT 2500	Make / Model:	COMMSCOPE VV-65A-R1 02DT 2500
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	16.31 dBd / 16.31 dBd	Gain:	16.31 dBd / 16.31 dBd	Gain:	16.31 dBd / 16.31 dBd
Height (AGL):	86 feet	Height (AGL):	86 feet	Height (AGL):	86 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	160.00 Watts	Total TX Power (W):	160.00 Watts	Total TX Power (W):	160.00 Watts
ERP (W):	5,930.89	ERP (W):	5,930.89	ERP (W):	5,930.89
Antenna A2 MPE %:	**3.33%**	Antenna B2 MPE %:	**3.33%**	Antenna C2 MPE %:	**3.33%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Combined Sectors):	0.29%
no additional carriers	N/A
Site Total MPE % :	0.29%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	0.28%
T-Mobile Sector B Total:	0.28%
T-Mobile Sector C Total:	0.23%
T-Mobile Total MPE % :	0.29%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 600 MHz LTE	1	689.5408364	86	3.873437554	600 MHz LTE	400.0	0.97%
T-Mobile 600 MHz NR	1	1379.081673	86	7.746875108	600 MHz NR	400.0	1.94%
T-Mobile 700 MHz LTE	1	810.1398427	86	4.550892311	700 MHz LTE	467.0	0.97%
T-Mobile 1900 MHz GSM	1	304.0885026	86	1.708191543	1900 MHz GSM	1000.0	0.17%
T-Mobile 1900 MHz LTE	1	4865.416041	86	27.33106469	1900 MHz LTE	1000.0	2.73%
T-Mobile 2100 MHz LTE	1	6125.195893	86	34.40777187	2100 MHz LTE	1000.0	3.44%
T-Mobile 2500 MHz LTE	2	1482.722887	86	16.65814179	2500 MHz LTE	1000.0	1.67%
T-Mobile 2500 MHz NR	2	1482.722887	86	16.65814179	2500 MHz NR	1000.0	1.67%
						T-Mobile Total:	**0.29%**

• NOTE: Total T-Mobile MPE values reflect all T-Mobile antennas as reported by RoofMaster™ combined modeling.
• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	0.28%
Sector B:	0.28%
Sector C:	0.23%
T-Mobile Maximum MPE % (Sector A):	0.28%
T-Mobile Combined Sectors MPE %:	0.29%
Site Total:	0.29%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **0.29%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions or documents available on the Connecticut Siting Council website.

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