NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Victoria Masse
420 Main Street #2, Sturbridge, MA 01566
860-306-2326
victoria@northeastsitesolutions.com

October 13, 2021

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

RE: Notice of Exempt Modification
20 Vale Road, Brookfield CT 06804
Latitude: 41.43086800
Longitude: 73.40259800
T-Mobile Site#: CT11201A_L600

Dear Ms. Bachman:
T-Mobile currently maintains six (6) antennas at the 130-foot and 122-foot level of the existing 115-foot transmission pole located at 20 Vale Road, Brookfield CT (aka- 101 Park Ridge Road) Pole #10247. The electric transmission pole is owned by CL&P d/b/a Eversource. The property which holds the utility easement is owned by Berkshire North LLC. T-Mobile now intends to install three (3) new 600/700MHz antenna. The new antennas would be installed at the 123-foot level of the tower. T-Mobile also intends to make the following modifications.
T-Mobile Planned Modifications:
Remove:
(6) TMAs

Remove and Replace:
(3) Andrew LNX-6515DS-A1M Antenna (Remove) - (3) Rosenberger 2D4WC 600/700MHz Antenna (Replace)
8-in x 29.5-ft long pipe mast (Remove) – 12-in x-Strong x 31.5-ft long pipe mast (Replace)

Install New:
(3) Smart Bias-T
(6) Coax

Existing to Remain:
(3) RFS APX16DWV-16DWVS 1900/2100 MHz Antenna
(3) Smart Bias Tees
(18) Coax

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Ground Only:
(3) RRUs (Remove) – (3) Radio 449 B71+B85 (Replace)

This facility was approved by the CT Siting Council. Petition No. 493 – Dated December 14, 2000. The petition was approved for Voicestream (T-Mobile) to install antenna on the existing 115-foot CL&P transmission structure (#10247). T-Mobile received approval for two (2) RAD centers – Total height approved is 132'4". Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to First Selectman Stephen C. Dunn, Elected Official and Alice Dew, Land Use Director for the Town of Brookfield, as well as the property owner and the tower owner.

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,

Victoria Masse
Mobile: 860-306-2326
Fax: 413-521-0558
Office: 420 Main Street, Unit 2, Sturbridge MA 01566
Email: victoria@northeastsitesolutions.com

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Attachments cc:
Stephen C. Dunn-First Selectman - as elected official
100 Pocono Road
Brookfield, CT 06804

Alice Dew- Land Use Director
100 Pocono Road
P.O. Box 5106
Brookfield, CT 06804

CL&P d/b/a Eversource - as tower owner
56 Prospect St., First Floor
Hartford, CT 06103

Berkshire North LLC - property owner- Utility Easement
2 Parklawn Drive
Bethel, CT 06801

Exhibit A

Petition No. 493
VoiceStream Wireless
Brookfield, Connecticut
Staff Report
December 14, 2000

On November 20, 2000, Connecticut Siting Council (Council) member Edward Wilensky and Christina Lepage of the Council staff met with VoiceStream Wireless (VoiceStream) representative Brendan Sharkey off of Vale Road, Brookfield, Connecticut for inspection of an electric transmission structure. The property and structure is owned by Connecticut Light and Power Co. (CL&P). VoiceStream Wireless, 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.

VoiceStream proposes the installation of six EMS dual-pol antennas on top of a 3-inch wide pipe mast extension. The antennas will extend approximately 17-feet 4-inches above the existing 115-foot transmission line monopole structure (#10247). The height at the top of the upper set of antennas will be about 132-feet 4-inches above ground level (AGL); the top of the lower set of antennas will be at 125-feet 8-inches AGL. This design requires a minimum of six feet above the CL&P shield wire and at least two feet in between the antennas.

Two Nortel S8000 equipment cabinets will be mounted on a 13'x12' concrete slab in a 17'x16' fenced compound at the base of the tower. The equipment cabinets do not require any protective structures or air conditioning; therefore no audible noise will be created. An underground conduit from an adjacent utility pole will provide power to the site, and a microwave will provide telephone service.

The proposed site is located east of Route 7, bordering a railroad and an industrial park in Brookfield. The zoning designation of this site is IG-80 Industrial. VoiceStream states that the land use in the surrounding area consists of an office industrial park, a railroad right-of-way and what appears to be a former quarry area.

The worst-case power density for the telecommunications operations at the site has been calculated to be 2.24% of the applicable standard for uncontrolled environments.

VoiceStream contends that the increase in height of this monopole structure will not result in a substantial environmental effect and the proposed project will prevent the construction of a new tower in the area. VoiceStream also states that the PCS antennas will blend in with the existing transmission line structure, and the placement of the equipment cabinets, which will be directly underneath the existing tower, will limit the disturbance created by construction activities.

VoiceStream submits that the proposed modification of the structure would not require a Certificate because it will reduce the need for a new telecommunications tower by utilizing an existing structure and contends that the proposed installation will not cause a substantial adverse environmental effect.

Exhibit B

Town of Brookfield, CT

Property Listing Report

Map Block Lot D16001 | Account 00460000

Property Information

Property Location	20 VALE RD
Owner	BERKSHIRE NORTH LLC
Co-Owner	
Mailing Address	2 PARKLAWN DR BETHEL CT 06801
Land Use	302 Ind Vac
Land Class	I
Zoning Code	IL80
Census Tract	205300023000

Neighborhood	35
Acreage	73.21
Utilities	
Lot Setting/Desc	Level,Rolling
Town Clerk Map # 1	4-31, 99-33
Town Clerk Map # 2	817,819,821,824

Photo

Sketch

Primary Construction Details

Year Built	
Stories	
Building Style	
Building Use	
Building Condition	
Floors	
Total Rooms	

Bedrooms	
Full Bathrooms	
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	
Roof Cover	

Exterior Walls	
Interior Walls	
Heating Type	
Heating Fuel	
AC Type	
Gross Bldg Area	
Total Living Area	

Report Created On 1/26/2017

Town of Brookfield, CT

Property Listing Report | Map Block Lot **D16001** | Account **00460000**

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings		
Extras		
Improvements		
Outbuildings		
Land		
Total		

Outbuilding and Extra Items

Type	Description

Sub Areas

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

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
BERKSHIRE NORTH LLC	291/ 850	12/12/1994	2281893

Report Created On **1/26/2017**

Town of Brookfield, CT

Property Listing Report

Map Block Lot: D16001 | Account: 00460000

Property Information

Property Location	101 PARK RIDGE RD
Owner	BERKSHIRE NORTH LLC
Co-Owner	
Mailing Address	2 PARKLAWN DRIVE BETHEL CT 06801
Land Use	390 Com Ld Dv
Land Class	C
Zoning Code	IL80
Census Tract	205300023000

Neighborhood	
Acreage	62.3
Utilities	
Lot Setting/Desc	Level,Rolling
Town Clerk Map # 1	4-31, 99-33
Town Clerk Map # 2	817,819,821,824

Photo

Sketch

Primary Construction Details

Year Built	
Stories	
Building Style	
Building Use	
Building Condition	
Floors	
Total Rooms	

Bedrooms	
Full Bathrooms	
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	
Roof Cover	

Exterior Walls	
Interior Walls	
Heating Type	
Heating Fuel	
AC Type	
Gross Bldg Area	
Total Living Area	

Report Created On 2/27/2017

Town of Brookfield, CT

Property Listing Report | Map Block Lot D16001 | Account 00460000

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Extras	0	0
Improvements	0	0
Outbuildings	0	0
Land	1399500	979650
Total	1399500	979650

Outbuilding and Extra Items

Type	Description

Sub Areas

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

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
BERKSHIRE NORTH LLC	291/ 850	12/12/1994	2281893

Report Created On 2/27/2017

Town of Brookfield, Connecticut - Assessment Parcel Map

Parcel: **D16001** **Address:** 101 PARK RIDGE RD

Approximate Scale: **1 inch = 600 feet**

Map Produced July 2015

Exhibit C

T-Mobile

BROOKFIELD/BUSINESS AREA
SITE ID: CT11201A
20 VALE ROAD
(TOWER# 10247)
BROOKFIELD, CT 06804

T-MOBILE A&L TEMPLATE (PROVIDED BY RFDS)
67D94B_1DP+1OP

T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS)
67D94B OUTDOOR

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA–222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 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.

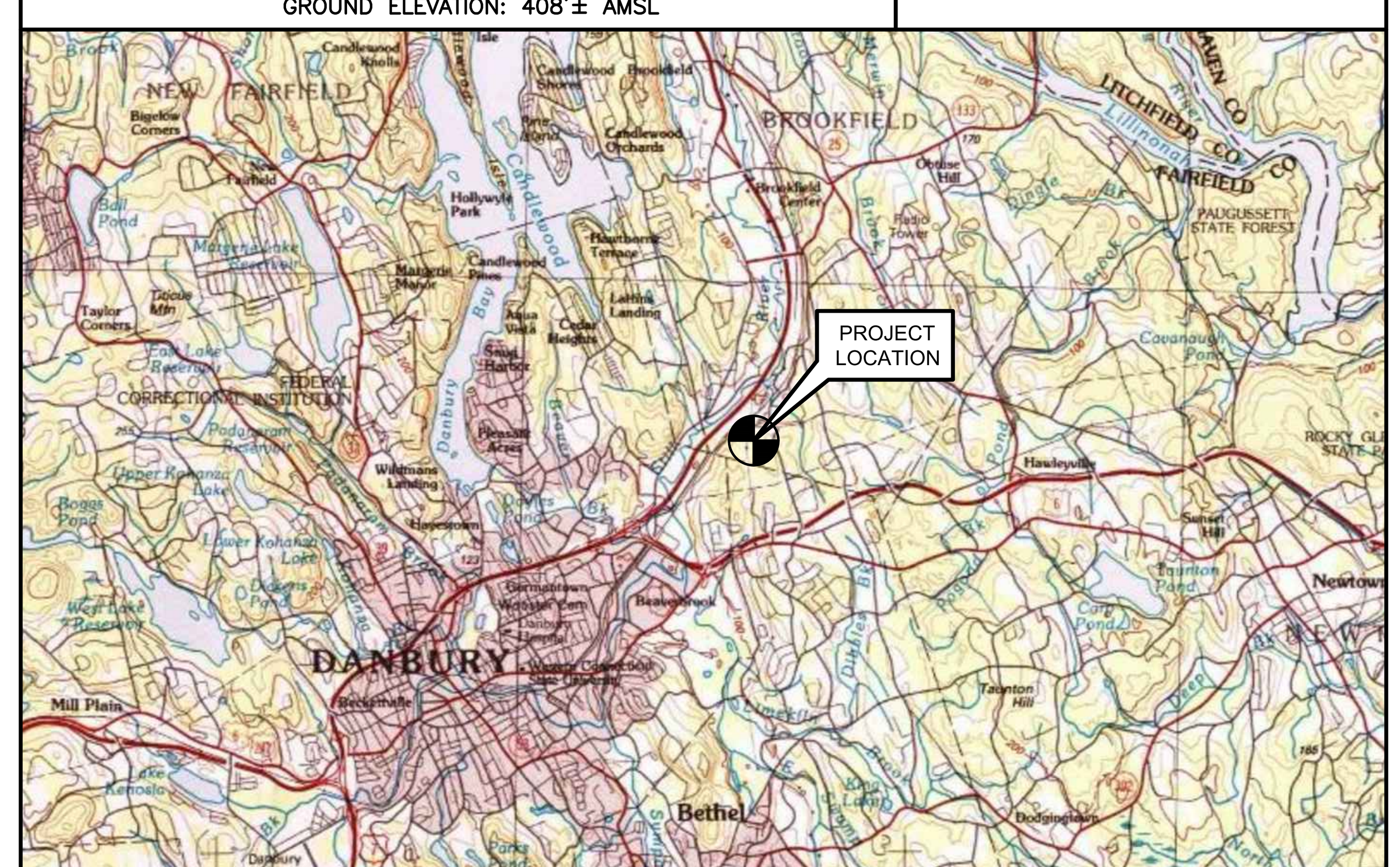
SITE DIRECTIONS

FROM: 35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002
TO: 20 VALE RD, BROOKFIELD, CT 06804

1. START OUT GOING SOUTH ON GRIFFIN RD TOWARD W NEWBERRY RD.	0.07 MI.
2. TURN LEFT ONTO W NEWBERRY RD.	0.51 MI.
3. TURN RIGHT ONTO WOODLAND AVE.	2.49 MI.
4. TURN RIGHT ONTO WINTONBURY AVE.	0.22 MI.
5. TURN LEFT ONTO TUNXIS AVE/CT–189. CONTINUE TO FOLLOW CT–189.	1.03 MI.
6. TURN RIGHT ONTO COTTAGE GROVE RD/CT–218. CONTINUE TO FOLLOW CT–218.	1.85 MI.
7. TURN LEFT ONTO OLD MEADOW RD.	0.12 MI.
8. TAKE THE 1ST RIGHT ONTO KING PHILIP DR.	0.88 MI.
9. KING PHILIP DR BECOMES TROUT BROOK DR.	2.30 MI.
10. TURN RIGHT ONTO PARK RD.	0.10 MI.
11. MERGE ONTO I–84 W VIA THE RAMP ON THE LEFT TOWARD HARTFORD/WATERBURY.	46.84 MI.
12. TAKE THE CT–25 EXIT, EXIT 9, TOWARD BROOKFIELD.	0.31 MI.
13. KEEP LEFT TO TAKE THE RAMP TOWARD NEWTOWN.	0.02 MI.
14. TURN LEFT ONTO HAWLEYVILLE RD/CT–25.	0.51 MI.
15. TURN RIGHT ONTO MOUNT PLEASANT RD/US–6 W. CONTINUE TO FOLLOW US–6 W.	2.20 MI.
16. TURN RIGHT ONTO HAWLEYVILLE RD.	0.08 MI.
17. TURN SLIGHT LEFT ONTO VAIL RD.	0.62 MI.
18. VAIL RD BECOMES VALE RD.	0.30 MI.
19. 20 VALE RD, BROOKFIELD, CT 06804–3984, 20 VALE RD IS A SERVICE ROAD ON THE LEFT.	

SITE COORDINATES: LATITUDE: 41°–25'–51.12" N
LONGITUDE: 73°–24'–9.35" W
GROUND ELEVATION: 408'± 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. REPLACE (1) DUW30 WITH (1) BB6648 FOR L700, L600, N600.
2. INSTALL (1) NEW ROSENBERGER D2WC–21 ANTENNA PER SECTOR, TOTAL OF (3).
3. REPLACE (3) EXISTING RRUS11 B12 RADIOS WITH (3) NEW 4449 B71+B85 RADIOS, MOUNTED TO EXISTING UTILITY FRAME LOCATED ON THE EXISTING EQUIPMENT PAD.

PROJECT INFORMATION

SITE NAME:	BROOKFIELD/BUSINESS AREA
SITE ID:	CT11201A
SITE ADDRESS:	20 VALE ROAD BROOKFIELD, CT 06804
APPLICANT:	T–MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	SHELDON FREINCLE (PROJECT MANAGER) NORTHEAST SITE SOLUTIONS (203) 776–8521
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°–25'–51.12" N LONGITUDE: 73°–24'–9.35" W GROUND ELEVATION: 408'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	10/04/21	RTS	TJR	CONSTRUCTION DRAWINGS – REVISED PER CLIENT COMMENTS
1	08/31/21	RTS	TJR	CONSTRUCTION DRAWINGS – REVISED PER ANTENNA CHANGE
0	07/22/21	RTS	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT CARLO F. CENTORE No. 16694 LICENSED PROFESSIONAL ENGINEER

T-Mobile
NSS NORTHEAST SITE SOLUTIONS Turnkey Wireless Development

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

T-MOBILE NORTHEAST LLC
BROOKFIELD/BUSINESS AREA
SITE ID: CT11201A
20 VALE ROAD
BROOKFIELD, CT 06804

DATE: 06/18/21
SCALE: AS NOTED
JOB NO. 21051.05

TITLE SHEET

T–1

Sheet No. 1 of 10

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 93 MPH (Vasd) (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

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 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 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.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	10/04/21	RTS	TJR	CONSTRUCTION DRAWINGS - REVISED PER CLIENT COMMENTS
1	08/31/21	RTS	TJR	CONSTRUCTION DRAWINGS - REVISED PER ANTENNA CHANGE
0	07/22/21	RTS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

NSS NORTHEAST

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

T-MOBILE NORTHEAST LLC

BROOKFIELD/BUSINESS AREA
SITE ID: CT11201A
20 VALE ROAD
BROOKFIELD, CT 06804

DATE: 06/18/21
SCALE: AS NOTED
JOB NO. 21051.05

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 COAX
A1	EXISTING	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	130'	10°	(P) RADIO 4449 B71+B85 (AT CABINET) (1)	(P) ANDREW-SMART BIAS-T (AT ANTENNA) (1)	(2) 1-1/4" COAX CABLE (±145')
A2	PROPOSED	ROSENBERGER (D2WC-21)	48 x 11.9 x 7.1	123'	10°		(E) ANDREW-SMART BIAS-T (AT ANTENNA) (1)	
B1	EXISTING	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	130'	130°	(P) RADIO 4449 B71+B85 (AT CABINET) (1)	(P) ANDREW-SMART BIAS-T (AT ANTENNA) (1)	(2) 1-1/4" COAX CABLE (±145')
B2	PROPOSED	ROSENBERGER (D2WC-21)	48 x 11.9 x 7.1	123'	130°		(E) ANDREW-SMART BIAS-T (AT ANTENNA) (1)	
C1	EXISTING	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	130'	250°	(P) RADIO 4449 B71+B85 (AT CABINET) (1)	(P) ANDREW-SMART BIAS-T (AT ANTENNA) (1)	(2) 1-1/4" COAX CABLE (±145')
C2	PROPOSED	ROSENBERGER (D2WC-21)	48 x 11.9 x 7.1	123'	250°		(E) ANDREW-SMART BIAS-T (AT ANTENNA) (1)	

1 / C-1 SITE LOCATION PLAN
SCALE: NOT TO SCALE
TRUE NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	10/04/21	RTS	TJR	CONSTRUCTION DRAWINGS - REVISED PER CLIENT COMMENTS
1	08/31/21	RTS	TJR	CONSTRUCTION DRAWINGS - REVISED PER ANTENNA CHANGE
0	07/22/21	RTS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

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

T-MOBILE NORTHEAST LLC

BROOKFIELD/BUSINESS AREA
SITE ID: CT11201A
20 VALE ROAD
BROOKFIELD, CT 06804

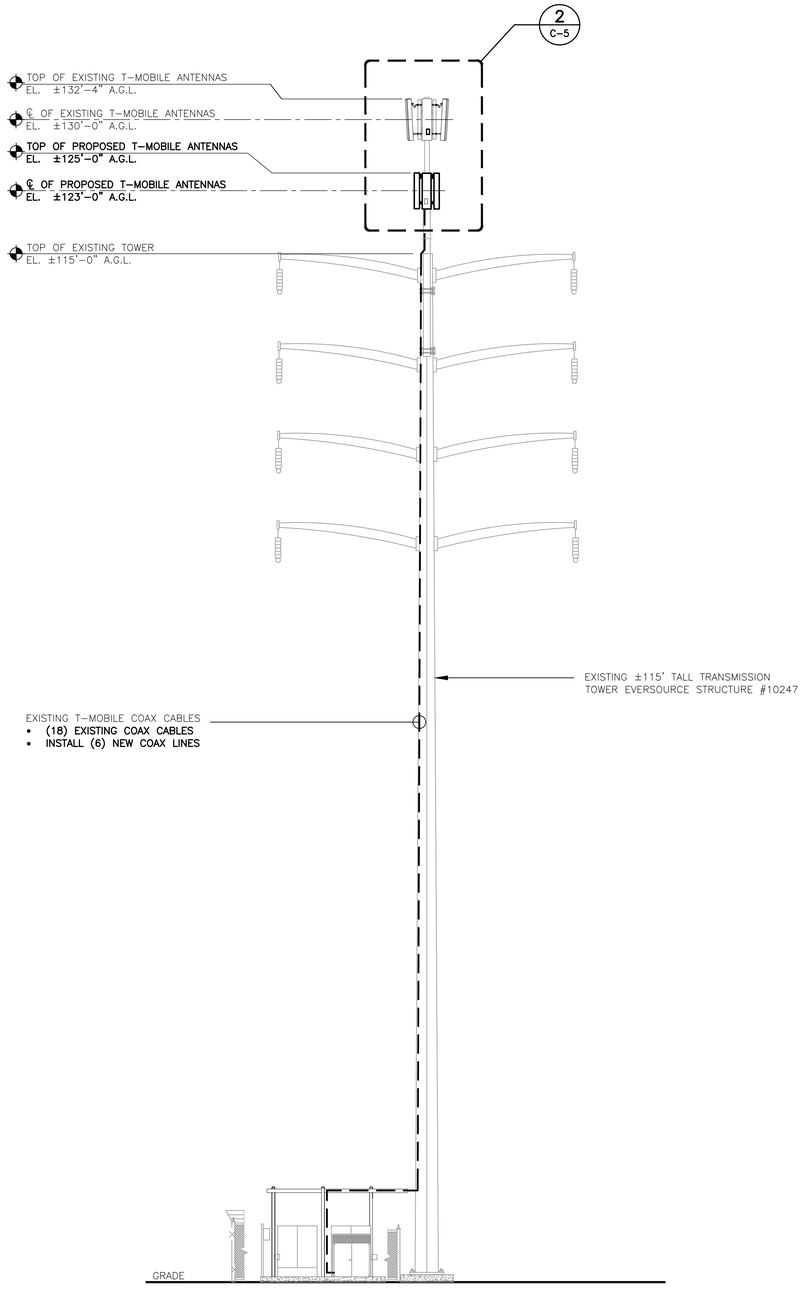
DATE: 06/18/21
SCALE: AS NOTED
JOB NO. 21051.05

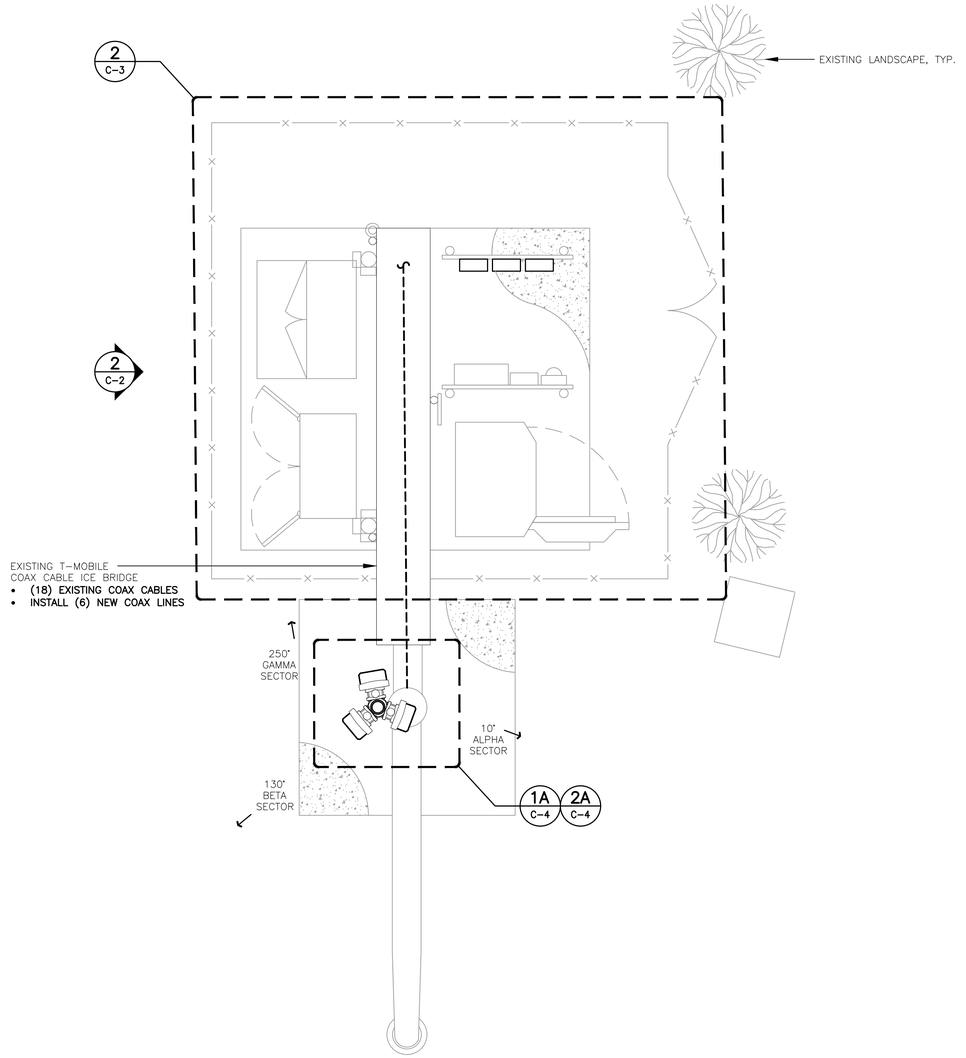
SITE LOCATION PLAN

C-1

Sheet No. 3 of 10

STRUCTURAL COMPLIANCE
UTILITY STRUCTURE (EVERSOURCE STRUCTURE NO. 10247) AND ANTENNA MAST A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE DEFICIENT AND WARRANTING MODIFICATION PRIOR TO INSTALLATION OF THE PROPOSED EQUIPMENT. FOR REQUIRED STRUCTURAL MODIFICATIONS, SEE SHEET(S) S-1 FOR ADDITIONAL DETAILS. REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21051.05) DATED 08/19/21 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 **SOUTH ELEVATION - PROPOSED**
SCALE: 1" = 10'-0"

GRAPHIC SCALE
10 0 5 10 20 40
1 inch = 10 ft.

1 C-2 **COMPOUND PLAN - PROPOSED**
SCALE: 3/8" = 1'-0"

TRUE NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	10/04/21	RYS	TJR	CONSTRUCTION DRAWINGS - REVISED PER CLIENT COMMENTS
1	08/31/21	RYS	TJR	CONSTRUCTION DRAWINGS - REVISED PER ANTENNA CHANGE
0	07/22/21	RYS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

NSS
NORTHEAST
SERVICES

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

T-MOBILE NORTHEAST LLC

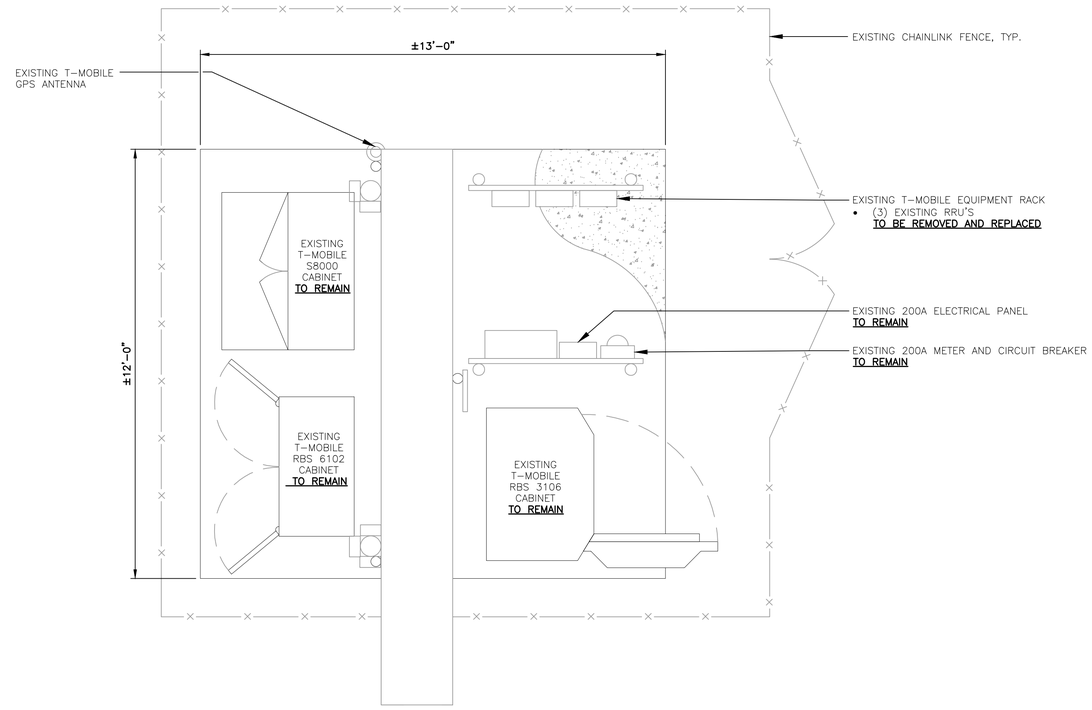
BROOKFIELD/BUSINESS AREA
SITE ID: CT11201A
20 VALE ROAD
BROOKFIELD, CT 06804

DATE: 06/18/21
SCALE: AS NOTED
JOB NO. 21051.05

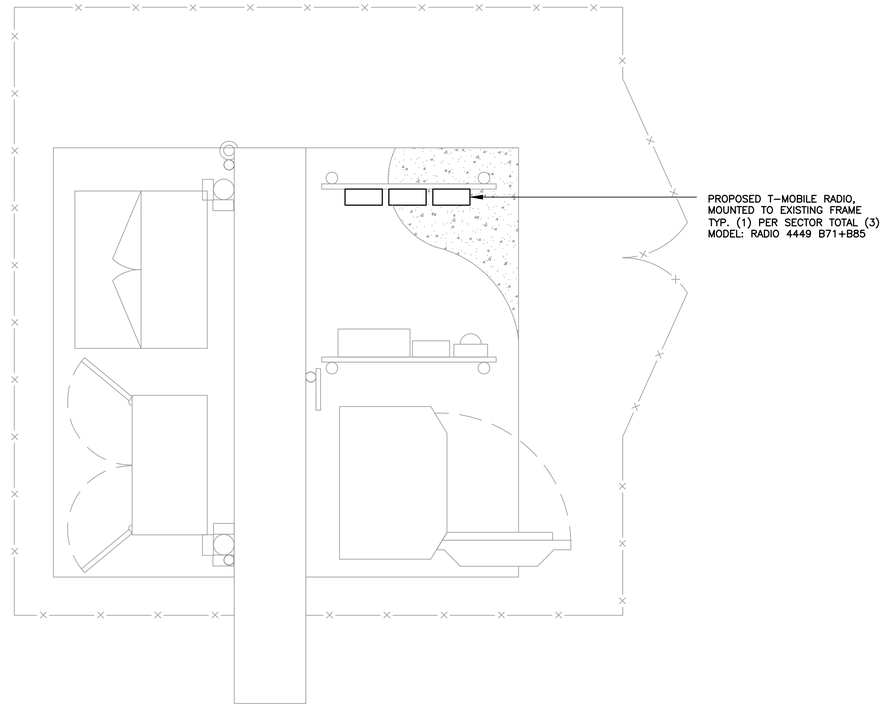
COMPOUND PLAN, AND ELEVATION

C-2

Sheet No. 4 of 10



1 C-3 **EXISTING EQUIPMENT PLAN**
SCALE: 1/2" = 1'-0"
TRUE NORTH



2 C-3 **PROPOSED EQUIPMENT PLAN**
SCALE: 1/2" = 1'-0"
TRUE NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	10/04/21	RYS	TJR	CONSTRUCTION DRAWINGS - REVISED PER CLIENT COMMENTS
1	08/31/21	RYS	TJR	CONSTRUCTION DRAWINGS - REVISED PER ANTENNA CHANGE
0	07/22/21	RYS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

NSS NATIONAL STRUCTURAL SERVICES

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

T-MOBILE NORTHEAST LLC

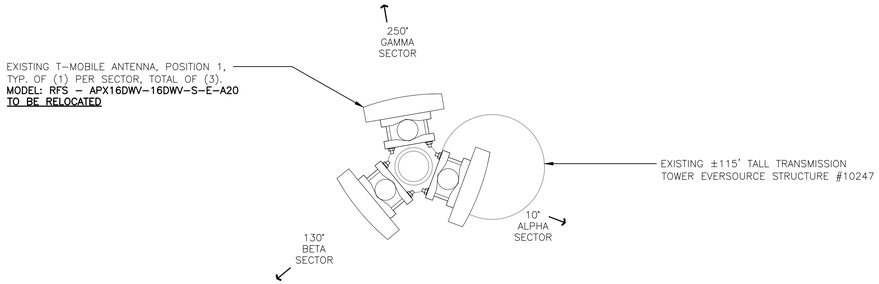
BROOKFIELD/BUSINESS AREA
SITE ID: CT11201A
20 VALE ROAD
BROOKFIELD, CT 06804

DATE: 06/18/21
SCALE: AS NOTED
JOB NO. 21051.05

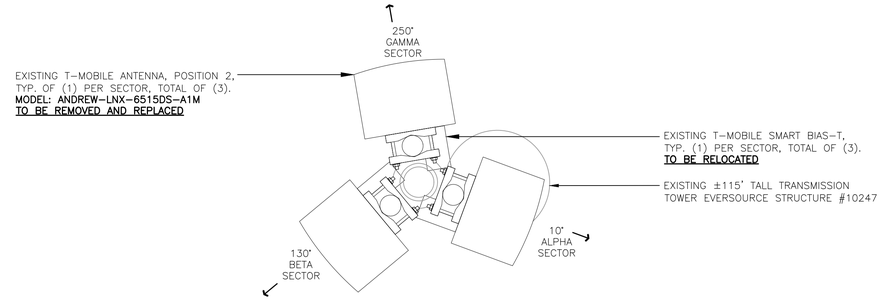
EQUIPMENT PLANS

C-3

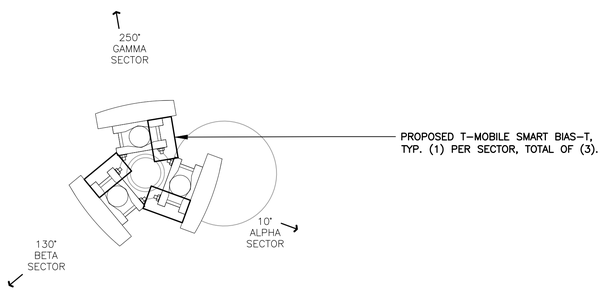
Sheet No. 5 of 10



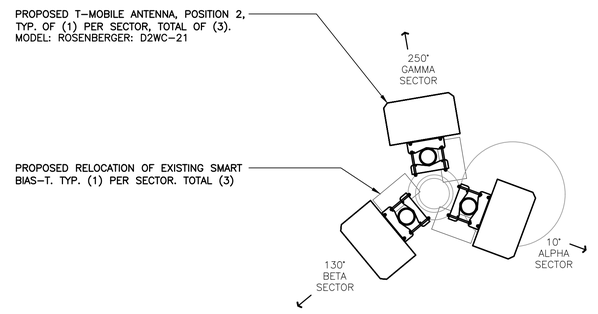
1 / C-4 **EXISTING ANTENNA MOUNTING CONFIGURATION PLAN**
SCALE: 1" = 1'-0" **130' ELEVATION** TRUE NORTH



2 / C-4 **EXISTING ANTENNA MOUNTING CONFIGURATION PLAN**
SCALE: 1" = 1'-0" **122' ELEVATION** TRUE NORTH



1A / C-4 **PROPOSED ANTENNA MOUNTING CONFIGURATION PLAN**
SCALE: 1" = 1'-0" **130' ELEVATION** TRUE NORTH



2A / C-4 **PROPOSED ANTENNA MOUNTING CONFIGURATION PLAN**
SCALE: 1" = 1'-0" **123' ELEVATION** TRUE NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	10/04/21	RTS	TJR	CONSTRUCTION DRAWINGS - REVISED PER CLIENT COMMENTS
1	08/31/21	RTS	TJR	CONSTRUCTION DRAWINGS - REVISED PER ANTENNA CHANGE
0	07/22/21	RTS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

NSS NORTHEAST SITE SOLUTIONS

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

T-MOBILE NORTHEAST LLC

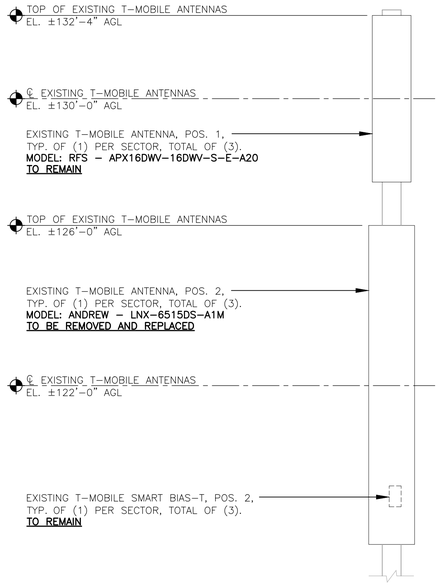
BROOKFIELD/BUSINESS AREA
SITE ID: CT11201A
20 VALE ROAD
BROOKFIELD, CT 06804

DATE: 06/18/21
SCALE: AS NOTED
JOB NO. 21051.05

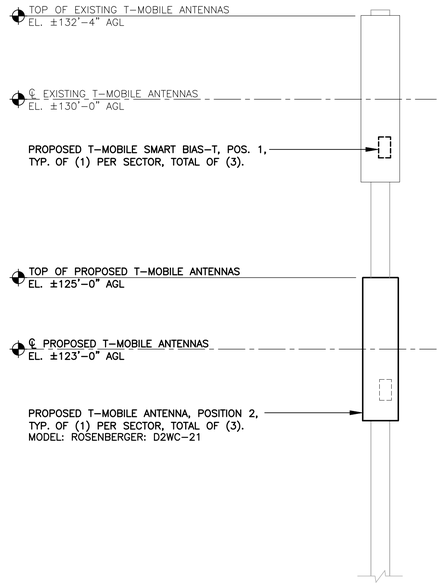
ANTENNA PLANS

C-4

Sheet No. 6 of 10



1 C-5 **EXISTING ANTENNA ELEVATION PLAN**
SCALE: 1/2" = 1'-0"



2 C-5 **PROPOSED ANTENNA ELEVATION PLAN**
SCALE: 1/2" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	10/04/21	RYS	TJR	CONSTRUCTION DRAWINGS - REVISED PER CLIENT COMMENTS
1	08/31/21	RYS	TJR	CONSTRUCTION DRAWINGS - REVISED PER ANTENNA CHANGE
0	07/22/21	RYS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

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

T-MOBILE NORTHEAST LLC

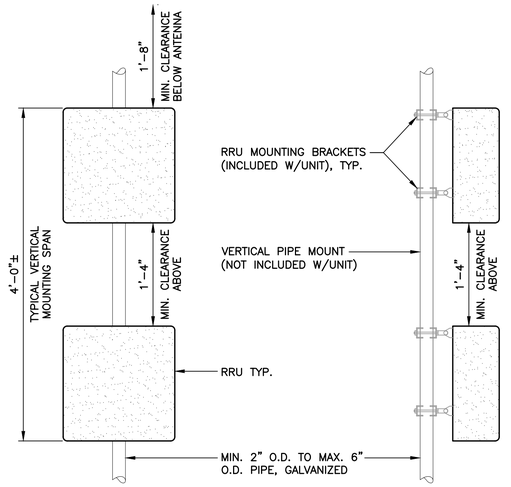
BROOKFIELD/BUSINESS AREA
SITE ID: CT11201A
20 VALE ROAD
BROOKFIELD, CT 06804

DATE: 06/18/21
SCALE: AS NOTED
JOB NO. 21051.05

ANTENNA ELEVATIONS

C-5

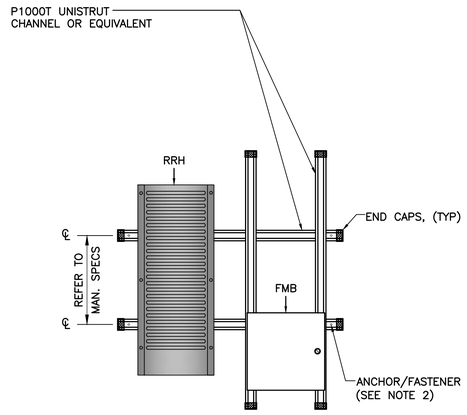
Sheet No. 7 of 10



FRONT ELEVATION SIDE ELEVATION

NOTES: (POLE 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.



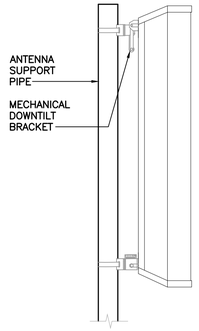
FRONT ELEVATION

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–6 TYPICAL RRU MOUNTING DETAILS

SCALE: NOT TO SCALE



D2WC-21

FRONT VIEW

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ROSENBERGER MODEL: D2WC–21	48"L x 11.9"W x 7.1"D	±30.9 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

2 C–6 PROPOSED ANTENNA DETAIL

SCALE: NOT TO SCALE

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4449 B71+B85	14.9"L x 13.2"W x 5.4"D	±74 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–6 PROPOSED RRU DETAIL

SCALE: NOT TO SCALE

ANDREW SMART BIAS-T		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: ATSBT–TOP–FF–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.		

4 C–6 PROPOSED BIAS-T DETAIL

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/22/21	RTS	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
1	08/31/21	RTS	TJR	CONSTRUCTION DRAWINGS – REVISED PER ANTENNA CHANGE
2	10/04/21	RTS	TJR	CONSTRUCTION DRAWINGS – REVISED PER CLIENT COMMENTS

PROFESSIONAL ENGINEER SEAL

T-Mobile

NSS NATIONAL SITE SOLUTIONS

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

T-MOBILE NORTHEAST LLC

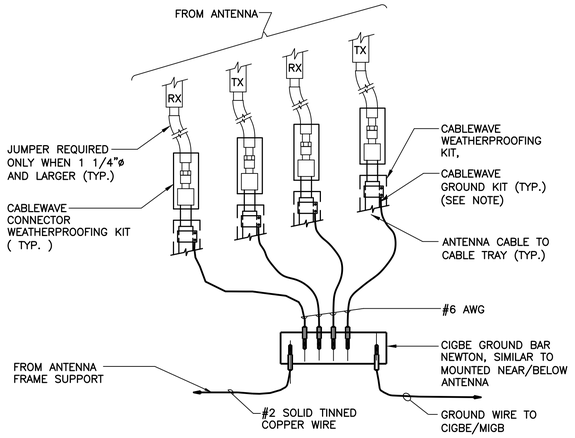
BROOKFIELD/BUSINESS AREA
SITE ID: CT11201A
20 VALE ROAD
BROOKFIELD, CT 06804

DATE: 06/18/21
SCALE: AS NOTED
JOB NO. 21051.05

TYPICAL EQUIPMENT DETAILS

C-6

Sheet No. 8 of 10

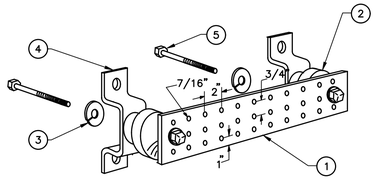


NOTES:

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

1 E-1 CONNECTION OF GROUND WIRES TO GROUND BAR

SCALE: NOT TO SCALE

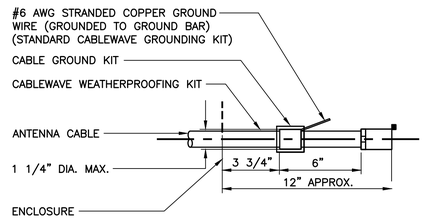


NOTES

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-1 GROUND BAR DETAIL

SCALE: NOT TO SCALE

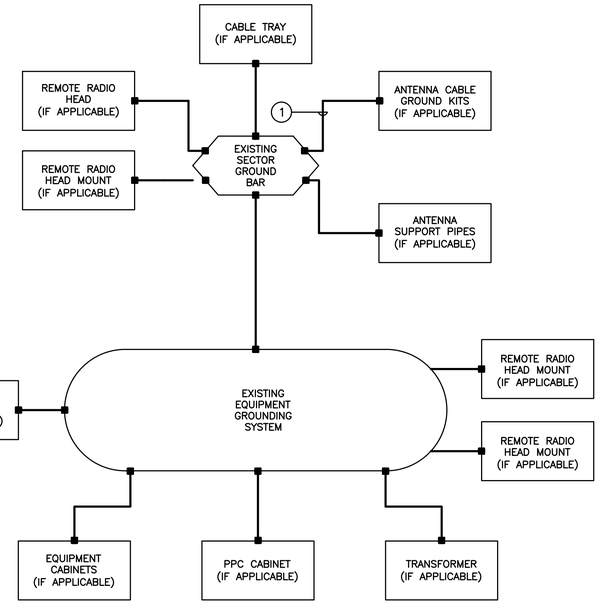


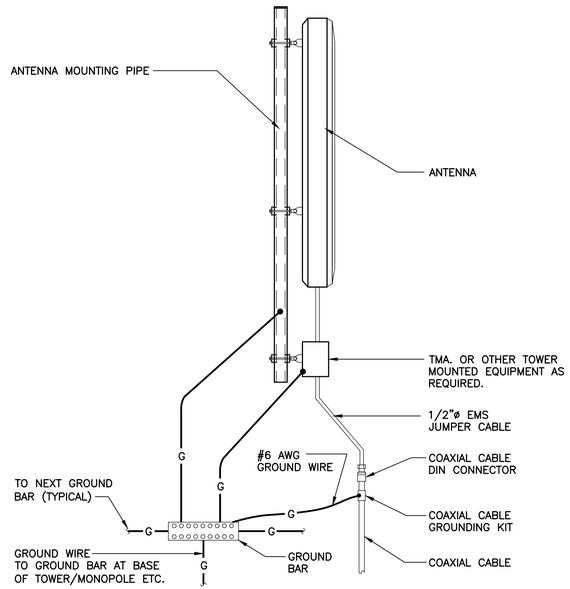
NOTES:

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

3 E-1 ANTENNA CABLE GROUNDING DETAIL

SCALE: NOT TO SCALE



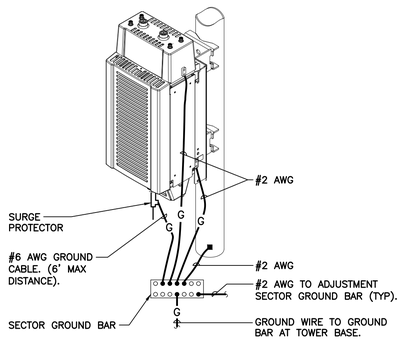


4 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE

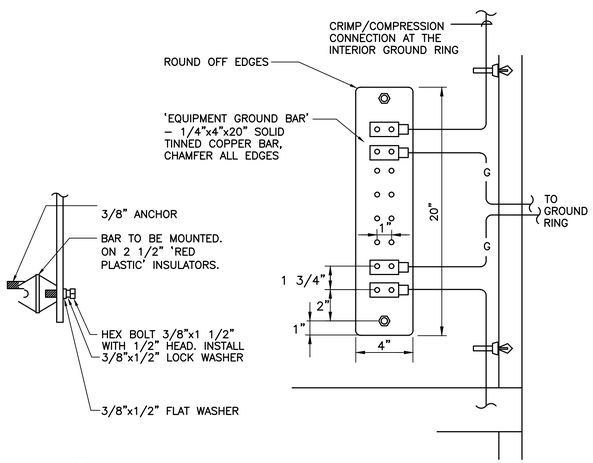
EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:

1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



5 E-1 RRH POLE MOUNT GROUNDING

SCALE: NOT TO SCALE



6 E-1 EQUIPMENT GROUND BAR DETAIL

SCALE: NOT TO SCALE

GROUNDING SCHEMATIC NOTES

(1) #6 AWG

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 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. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
7. COORDINATE ALL ROOF MOUNTED EQUIPMENT WITH OWNER.
8. ALL ROOF MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
9. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

7 E-1 ELECTRICAL SCHEMATIC DIAGRAM

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/22/21	RTS	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
1	08/31/21	RTS	TJR	CONSTRUCTION DRAWINGS – REVISED PER ANTENNA CHANGE
2	10/04/21	RTS	TJR	CONSTRUCTION DRAWINGS – REVISED PER CLIENT COMMENTS

PROFESSIONAL ENGINEER SEAL

T-Mobile

NSS NATIONAL SITE SOLUTIONS

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

T-MOBILE NORTHEAST LLC

BROOKFIELD/BUSINESS AREA
SITE ID: CT11201A
20 VALE ROAD
BROOKFIELD, CT 06804

DATE: 06/18/21
SCALE: AS NOTED
JOB NO. 21051.05

TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 9 of 10

ELECTRICAL SPECIFICATIONS

SECTION 16010

1.01. 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. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.

2. 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. CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR 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 CELLULAR 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 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

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 CELLULAR 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
2	10/04/21	RTS	TJR	CONSTRUCTION DRAWINGS - REVISED PER CLIENT COMMENTS
1	08/31/21	RTS	TJR	CONSTRUCTION DRAWINGS - REVISED PER ANTENNA CHANGE
0	07/22/21	RTS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

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

T-MOBILE NORTHEAST LLC

BROOKFIELD/BUSINESS AREA
SITE ID: CT11201A
20 VALE ROAD
BROOKFIELD, CT 06804

DATE: 06/18/21
SCALE: AS NOTED
JOB NO. 21051.05

ELECTRICAL SPECIFICATIONS

E-2

Sheet No. 10 of 10

Exhibit D

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Antenna Mast and Pole

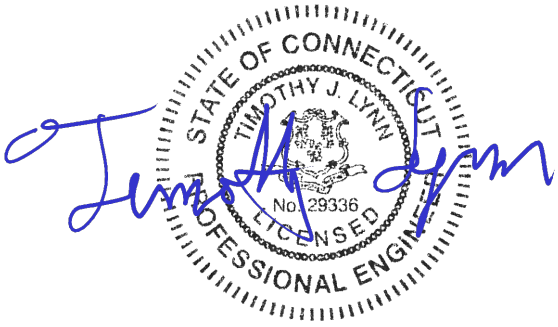
T-Mobile Site Ref: CT11201A

Eversource Structure No. 10247
115' Electric Transmission Pole

20 Vale Road
Brookfield, CT

CENTEK Project No. 21051.05

~~Date: July 1, 2021~~
Rev 1: August 19, 2021



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

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

Table of Contents

Introduction

The purpose of this report is to analyze the existing mast and 115' utility pole located at 20 Vale Road in Brookfield, CT for the proposed antenna and equipment upgrade by T-Mobile.

The existing/proposed loads consist of the following:

- T-MOBILE (Existing to Remain):

  Antennas: Three (3) RFS APX16DWV-16DWVS panel antennas flush mounted with a RAD center elevation of 130-ft and three (3) Andrew ATSBT-TOP-FM-4G Smart Bias Tees flush mounted with a RAD center elevation of 123-ft.
  Coax Cables: Eighteen (18) 1-1/4" ∅ coax cables mounted to the exterior of the pole.

- T-MOBILE (Existing to be Removed):

  Antennas: Three (3) Andrew LNX-6515DS-A1M panel antennas and six (6) TMAs flush mounted on the pipe mast with a RAD center elevation of 122-ft above grade.

- **T-MOBILE (Proposed):**

  Antennas: Three (3) Rosenberger 2D4WC-21 panel antennas flush mounted with a RAD center elevation of 123-ft and three (3) Andrew ATSBT-TOP-FM-4G Smart Bias Tees flush mounted with a RAD center elevation of 130-ft above grade.
  Coax Cables: Six (6) 1-1/4" ∅ coax cables mounted to the exterior of the pole.

Primary assumptions used in the analysis

- ASCE Manual No. 48-11, "Design of Steel Transmission Pole Structures", defines steel stresses for evaluation of the utility pole.
- All utility tower members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- All coaxial cable will be installed within the antenna mast unless specified otherwise.
- Antenna 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.
- Antenna 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

The existing mast consisting of a 8-in x 29.5-ft long SCH. 80 pipe (O.D. = 8.63") connected at two points to the existing tower was analyzed for its ability to resist loads prescribed by the TIA-222G standard. Section 5 of this report details these gravity and lateral wind loads. NESC prescribed loads were also applied to the mast in order to obtain reactions needed for analyzing the utility pole structure. These loads are developed in Section 7 of this report. Load cases and combinations used in RISA-3D for TIA-222-G loading and for NESC/NU loading are listed in report Sections 6 and 8, respectively.

Design Basis

Our analysis was performed in accordance with ASCE 48-11, "Design of Steel Transmission Pole Structures", NESC C2-2017 and Eversource Design Criteria.

- UTILITY POLE ANALYSIS

  The purpose of this analysis is to determine the adequacy of the existing utility structure to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the NU Design Criteria Table, NESC C2-2017 ~ Construction Grade B, and ASCE Manual No. 48-11, "Design Of Steel Transmission Pole Structures".

  Load cases considered:

  Load Case 1: NESC Heavy
  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 Speed…… 100 mph (1)
  Radial Ice Thickness…….. 0"

  Note 1: NESC C2-2017, Section25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)

- MAST ASSEMBLY ANALYSIS

  Mast, appurtenances and connections to the utility tower were analyzed and designed in accordance with the Design Criteria Table, TIA/EIA-222-G and AISC standards.

  Load cases considered:

  Load Case 1:
  Wind Speed……... 93 mph (2018 CSBC Appendix-N)
  Radial Ice Thickness…….. 0"

  Load Case 2:
  Wind Pressure…….. 50 mph wind pressure
  Radial Ice Thickness…….. 0.75"

R e s u l t s

- MAST ASSEMBLY

The pipe mast was determined to be structurally **adequate**.

Component	Stress Ratio (percentage of capacity)	Result
8" x-Strong	84.2%	**PASS**
Connection to Tower	27.5%	**PASS**

- UTILITY POLE

This analysis finds that the subject utility pole is adequate to support the antenna mast and related appurtenances. The pole stresses meet the requirements set forth by the ASCE 48-11, "Design of Steel Transmission Pole Structures" for the applied NESC Heavy and Extreme load cases. The detailed analysis results are provided in Section 9 of this report. The analysis results are summarized as follows:

A maximum usage of **77.05%** occurs in the utility pole base plate under the **NESC Extreme** loading condition.

POLE SECTION:

The utility pole was found to be structurally **adequate**.

Tower Section	Elevation	Stress Ratio (% of capacity)	Result
Tube Number 3	0.00' -20.00' (AGL)	63.18%	**PASS**

BASE PLATE:
The base plate was found to be structurally **adequate**.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Base Plate	Bending	77.05%	**PASS**

- FOUNDATION AND ANCHORS

The existing foundation consists of a 8-ft square x 15.0-ft long reinforced concrete pier with twelve (12) rock anchors embedded 22-ft into rock. The base of the tower is connected to the foundation by means of sixteen (16) 2.25"∅, ASTM A615-75 anchor bolts embedded into the concrete foundation structure. Foundation information was obtained from Northeast Utilities drawing 01143-60001.

BASE REACTIONS:

From PLS-Pole analysis based on NESC/EVERSOURCE prescribed loads.

Load Case	Shear	Axial	Moment
NESC Heavy Wind	22.45 kips	74.78 kips	1708.17 ft-kips
NESC Extreme Wind	31.91 kips	39.45 kips	2498.38 ft-kips

Note 1 – 10% increase will be applied to tower base reactions per OTRM 051

ANCHOR BOLTS:

The anchor bolts were found to be structurally **adequate**.

Tower Component	Design Limit	Stress Ratio (% of capacity)	Result
Anchor Bolts	Tension	50.1%	**PASS**

FOUNDATION:

The existing foundation was found to be structurally **adequate**.

Foundation	Design Limit	Allowable Limit	Proposed Loading (4)	Result
Reinf. Conc. Pier w/ Rock Anchors	OTM (1)	1.0 FS (2)	1.98 FS (2)	**PASS**
	Bearing Pressure	50 ksf (3)	20.97 ksf	**PASS**

Note 1: OTM denotes overturning moment.
Note 2: FS denotes Factor of Safety
Note 3: Bearing Capacity based on Weak Rock.
Note 4: 10% increase to PLS base reactions used in foundation analysis per OTRM 051.

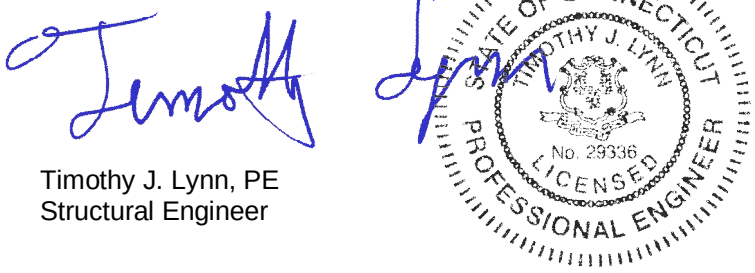
C o n c l u s i o n

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 ~ RISA-3D

RISA-3D Structural Analysis Program is an integrated structural analysis and design software package for buildings, bridges, tower structures, etc.

Modeling Features:

- Comprehensive CAD-like graphic drawing/editing capabilities that let you draw, modify and load elements as well as snap, move, rotate, copy, mirror, scale, split, merge, mesh, delete, apply, etc.
- Versatile drawing grids (orthogonal, radial, skewed)
- Universal snaps and object snaps allow drawing without grids
- Versatile general truss generator
- Powerful graphic select/unselect tools including box, line, polygon, invert, criteria, spreadsheet selection, with locking
- Saved selections to quickly recall desired selections
- Modification tools that modify single items or entire selections
- Real spreadsheets with cut, paste, fill, math, sort, find, etc.
- Dynamic synchronization between spreadsheets and views so you can edit or view any data in the plotted views or in the spreadsheets
- Simultaneous view of multiple spreadsheets
- Constant in-stream error checking and data validation
- Unlimited undo/redo capability
- Generation templates for grids, disks, cylinders, cones, arcs, trusses, tanks, hydrostatic loads, etc.
- Support for all units systems & conversions at any time
- Automatic interaction with RISASection libraries
- Import DXF, RISA-2D, STAAD and ProSteel 3D files
- Export DXF, SDNF and ProSteel 3D files

Analysis Features:

- Static analysis and P-Delta effects
- Multiple simultaneous dynamic and response spectra analysis using Gupta, CQC or SRSS mode combinations
- Automatic inclusion of mass offset (5% or user defined) for dynamic analysis
- Physical member modeling that does not require members to be broken up at intermediate joints
- State of the art 3 or 4 node plate/shell elements
- High-end automatic mesh generation — draw a polygon with any number of sides to create a mesh of well-formed quadrilateral (NOT triangular) elements.
- Accurate analysis of tapered wide flanges - web, top and bottom flanges may all taper independently
- Automatic rigid diaphragm modeling
- Area loads with one-way or two-way distributions
- Multiple simultaneous moving loads with standard AASHTO loads and custom moving loads for bridges, cranes, etc.
- Torsional warping calculations for stiffness, stress and design
- Automatic Top of Member offset modeling
- Member end releases & rigid end offsets
- Joint master-slave assignments
- Joints detachable from diaphragms
- Enforced joint displacements
- 1-Way members, for tension only bracing, slipping, etc.

- 1-Way springs, for modeling soils and other effects
- Euler members that take compression up to their buckling load, then turn off.
- Stress calculations on any arbitrary shape
- Inactive members, plates, and diaphragms allows you to quickly remove parts of structures from consideration
- Story drift calculations provide relative drift and ratio to height
- Automatic self-weight calculations for members and plates
- Automatic subgrade soil spring generator

Graphics Features:

- Unlimited simultaneous model view windows
- Extraordinary “true to scale” rendering, even when drawing
- High-speed redraw algorithm for instant refreshing
- Dynamic scrolling stops right where you want
- Plot & print virtually everything with color coding & labeling
- Rotate, zoom, pan, scroll and snap views
- Saved views to quickly restore frequent or desired views
- Full render or wire-frame animations of deflected model and dynamic mode shapes with frame and speed control
- Animation of moving loads with speed control
- High quality customizable graphics printing

Design Features:

- Designs concrete, hot rolled steel, cold formed steel and wood
- ACI 1999/2002, BS 8110-97, CSA A23.3-94, IS456:2000,EC 2-1992 with consistent bar sizes through adjacent spans
- Exact integration of concrete stress distributions using parabolic or rectangular stress blocks
- Concrete beam detailing (Rectangular, T and L)
- Concrete column interaction diagrams
- Steel Design Codes: AISC ASD 9th, LRFD 2nd & 3rd, HSS Specification, CAN/CSA-S16.1-1994 & 2004, BS 5950-1-2000, IS 800-1984, Euro 3-1993 including local shape databases
- AISI 1999 cold formed steel design
- NDS 1991/1997/2001 wood design, including Structural Composite Lumber, multi-ply, full sawn
- Automatic spectra generation for UBC 1997, IBC 2000/2003
- Generation of load combinations: ASCE, UBC, IBC, BOCA, SBC, ACI
- Unbraced lengths for physical members that recognize connecting elements and full lengths of members
- Automatic approximation of K factors
- Tapered wide flange design with either ASD or LRFD codes
- Optimization of member sizes for all materials and all design codes, controlled by standard or user-defined lists of available sizes and criteria such as maximum depths
- Automatic calculation of custom shape properties
- Steel Shapes: AISC, HSS, CAN, ARBED, British, Euro, Indian, Chilean
- Light Gage Shapes: AISI, SSMA, Dale / Incor, Dietrich, Marino\WARE
- Wood Shapes: Complete NDS species/grade database
- Full seamless integration with RISAFoot (Ver 2 or better) for advanced footing design and detailing
- Plate force summation tool

Results Features:

- Graphic presentation of color-coded results and plotted designs
- Color contours of plate stresses and forces with quadratic smoothing, the contours may also be animated
- Spreadsheet results with sorting and filtering of: reactions, member & joint deflections, beam & plate forces/stresses, optimized sizes, code designs, concrete reinforcing, material takeoffs, frequencies and mode shapes
- Standard and user-defined reports
- Graphic member detail reports with force/stress/deflection diagrams and detailed design calculations and expanded diagrams that display magnitudes at any dialed location
- Saved solutions quickly restore analysis and design results.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-TOWER

PLS-TOWER is a Microsoft Windows program for the analysis and design of steel latticed towers used in electric power lines or communication facilities. Both self-supporting and guyed towers can be modeled. The program performs design checks of structures under user specified loads. For electric power structures it can also calculate maximum allowable wind and weight spans and interaction diagrams between different ratios of allowable wind and weight spans.

Modeling Features:

- Powerful graphics module (stress usages shown in different colors)
- Graphical selection of joints and members allows graphical editing and checking
- Towers can be shown as lines, wire frames or can be rendered as 3-d polygon surfaces
- Can extract geometry and connectivity information from a DXF CAD drawing
- CAD design drawings, title blocks, drawing borders or photos can be tied to structure model
- XML based post processor interface
- Steel Detailing Neutral File (SDNF) export to link with detailing packages
- Can link directly to line design program PLS-CADD
- Automatic generation of structure files for PLS-CADD
- Databases of steel angles, rounds, bolts, guys, etc.
- Automatic generation of joints and members by symmetries and interpolations
- Automated mast generation (quickly builds model for towers that have regular repeating sections) via graphical copy/paste
- Steel angles and rounds modeled either as truss, beam or tension-only elements
- Guys are easily handled (can be modeled as exact cable elements)

Analysis Features:

- Automatic handling of tension-only members
- Automatic distribution of loads in 2-part suspension insulators (v-strings, horizontal vees, etc.)
- Automatic calculation of tower dead, ice, and wind loads as well as 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
- Minimization of problems caused by unstable joints and mechanisms
- Automatic bandwidth minimization and ability to solve large problems
- Design checks according to (other standards can be added easily):
  - ASCE Standard 10-90

- AS 3995 (Australian Standard 3995)
- BS 8100 (British Standard 8100)
- EN50341-1 (CENELEC, both empirical and analytical methods are available)
- ECCS 1985
- NGT-ECCS
- PN-90/B-03200
- EIA/TIA 222-F
- ANSI/TIA 222-G
- CSA S37-01
- EDF/RTE Resal
- IS 802 (India Standard 802)

Results Features:

- Design summaries printed for each group of members
- 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
- Capability to batch run multiple tower configurations and consolidate the results
- Automated optimum angle member size selection and bolt quantity determination

Tool for interactive angle member sizing and bolt quantity determination.

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

Introduction

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

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

ANSI Standard C2-2017 (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) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to TIA and its loads and factors with the exceptions noted above. (Note that the NESC does not require the projected wind surfaces of structures and equipment to be increased by the ice covering.)

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

Attachment A
Eversource Design Criteria

		Attachment A 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.

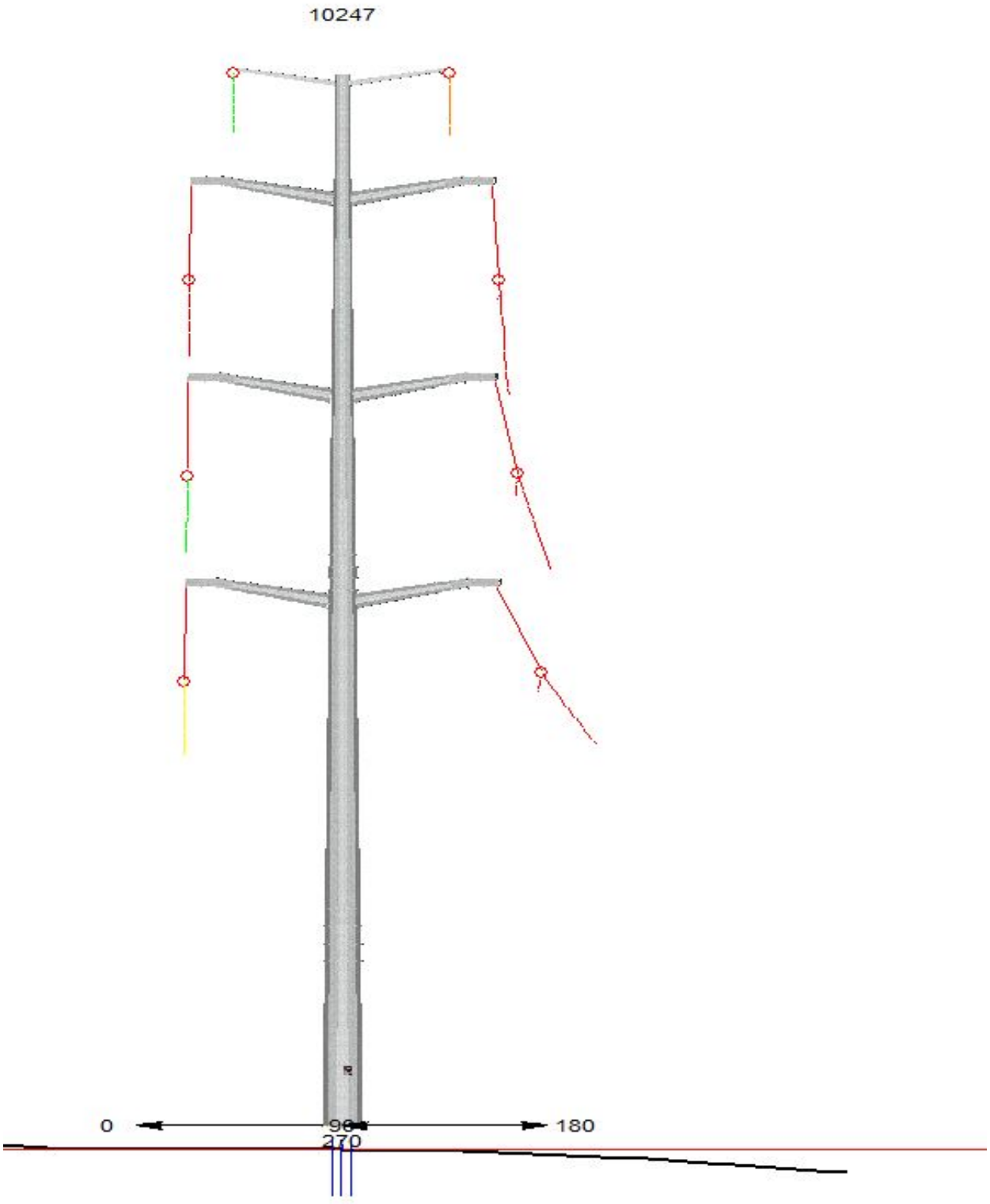
Project: 321/1268 Lines, Structure 10247
Date: 9/11/19
Engineer: JS
Purpose: Recalculate wire loads for Eversource structure 10256, T-Mobile site CT11201A

Shield Wires:
321: AFL DNO-4963 0.457" OPGW, sagged to 4200# NESC 250B Final
1268: 7#8 Alumoweld, sagged in PLS-CADD

Conductors:
Bundled 1272 "Bittern" ACSR, sagged in PLS-CADD

NESC 250B

321 Line		**OPGW**		**1268 Line**	**Alumoweld**
	V:	898		V:	865
	T:	-735		T:	-666
	L:	25		L:	25
Conductors					
Top	V:	5732		V:	4178
	T:	-2263		T:	-1445
	L:	50		L:	50
Middle	V:	5750		V:	3563
	T:	-2255		T:	-2122
	L:	50		L:	50
Bottom	V:	5692		V:	3012
	T:	-2244		T:	-2902
	L:	50		L:	50



321 Line is on the left

1268 Line is on the right

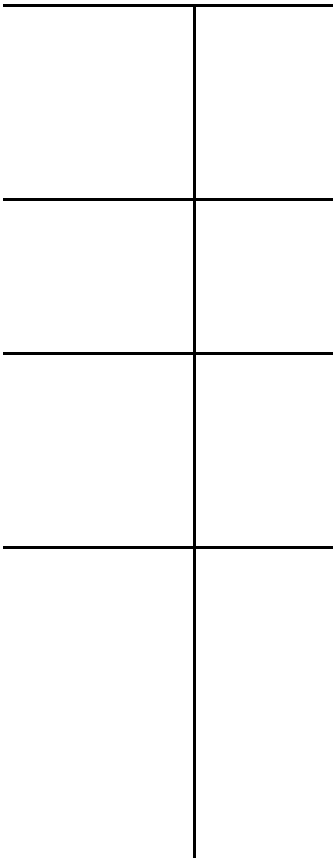
Project: 321/1268 Lines, Structure 10247
Date: 9/11/19
Engineer: JS
Purpose: Recalculate wire loads for T-Mobile site CT11201A

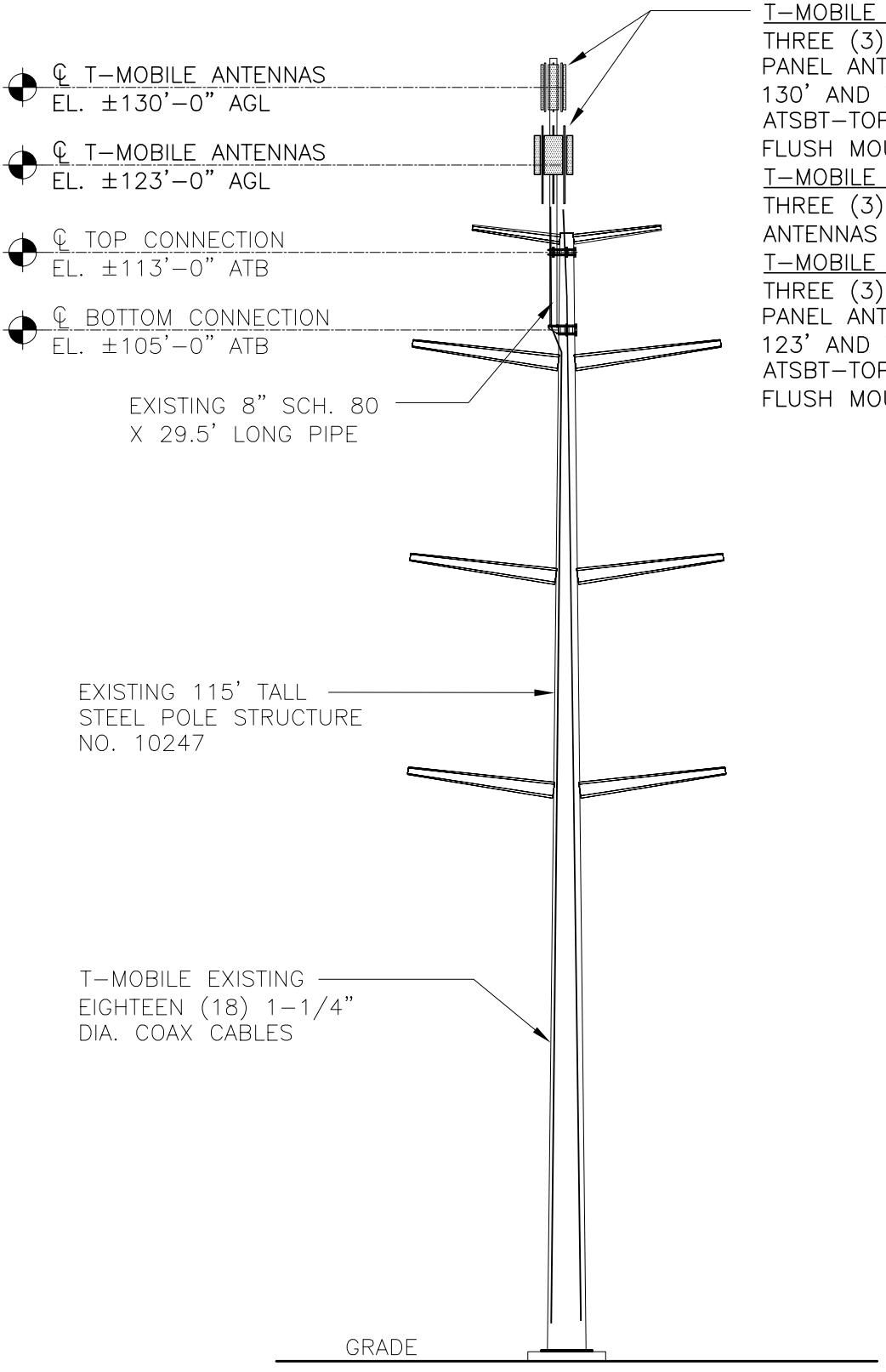
Shield Wires:
321: AFL DNO-4963 0.457" OPGW, sagged to 4200# NESC 250B Final
1268: 7#8 Alumoweld, sagged in PLS-CADD

Conductors:
Bundled 1272 "Bittern" ACSR, sagged in PLS-CADD

NESC 250C

321 Line				**1268 Line**	
		OPGW		**Alumoweld**	
	V:	248		V:	242
	T:	-547		T:	-447
	L:	25		L:	25
Conductors					
Top	V:	2461		V:	2097
	T:	-3073		T:	-1666
	L:	50		L:	50
Middle	V:	2462		V:	1695
	T:	-2951		T:	-1970
	L:	50		L:	50
Bottom	V:	2410		V:	1338
	T:	-2793		T:	-2286
	L:	50		L:	50





T–MOBILE (EXISTING TO REMAIN):
THREE (3) RFS APX16DWV–16DWVS PANEL ANTENNAS FLUSH MOUNTED @ 130' AND THREE (3) ANDREW ATSBT–TOP–FM–4G SMART BIAS TEEs FLUSH MOUNTED @ 123'.

T–MOBILE (EXISTING TO REMOVE):
THREE (3) ANDREW LNX6515DS PANEL ANTENNAS FLUSH MOUNTED @ 122'.

T–MOBILE (PROPOSED):
THREE (3) ROSENBERGER 2D4WC–21 PANEL ANTENNAS FLUSH MOUNTED @ 123' AND THREE (3) ANDREW ATSBT–TOP–FM–4G SMART BIAS TEEs FLUSH MOUNTED @ 130'.

1
EL–1

TOWER & MAST ELEVATION

SCALE: NOT TO SCALE

REVISIONS		
01	08/19/21	ISSUED FOR REVIEW

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

CT11201A
EVERSOURCE 10247

20 VALE ROAD
BROOKFIELD, CT 06804

PROJECT NO:	21051.05
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	8/19/21

TOWER ELEVATION

EL-1

DWG. 1 OF 1

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

Subject:	Loads on T-Mobile Mast - Structure 10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L. Checked by: C.A.G. Job No. 21051.05

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

Wind Speeds

Basic Wind Speed	$V := 93$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-G)
Basic Wind Speed Service Loads	$V_{Ser} := 60$	mph	(User Input - TIA-222-G Section 2.8.3)

Input

Structure Type =	Structure_Type := Pole		(User Input)
Structure Category =	SC := III		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 115$	ft	(User Input)
Height to Center of Antennas =	$z_{T\text{-}Mo} := 130$	ft	(User Input)
Height to Center of Mast =	$z_{Mast1} := 120$	ft	(User Input)
Radial Ice Thickness =	$t_i := 0.75$	in	(User Input per Annex B of TIA-222-G)
Radial Ice Density =	Id := 56.00	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1.0$		(User Input)
	$K_a := 1.0$		(User Input)
Gust Response Factor =	$G_H := 1.35$		(User Input)

Output

Wind Direction Probability Factor =

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

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

Importance Factors =

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

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

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

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

Wind Direction Probability Factor (Service) =	$K_{dSer} := 0.85$	(Per Section 2.8.3 of TIA-222-G)
Importance Factor (Service) =	$I_{Ser} := 1$	(Per Section 2.8.3 of TIA-222-G)

$$K_{iz} := \left(\frac{z_{T\text{-}Mo}}{33}\right)^{0.1} = 1.147 \qquad t_{izT\text{-}Mo} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.151$$

Velocity Pressure Coefficient Antennas =
$$Kz_{T\text{-}Mo} := 2.01\left(\left(\frac{z_{T\text{-}Mo}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.337$$

Velocity Pressure w/o Ice Antennas =
$$qz_{T\text{-}Mo} := 0.00256 \cdot K_d \cdot Kz_{T\text{-}Mo} \cdot V^2 \cdot I_{Wind} = 32.353$$

Velocity Pressure with Ice Antennas =
$$qz_{ice.T\text{-}Mo} := 0.00256 \cdot K_d \cdot Kz_{T\text{-}Mo} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 8.132$$

Velocity Pressure Service =
$$qz_{T\text{-}Mo.Ser} := 0.00256 \cdot K_{dSer} \cdot Kz_{T\text{-}Mo} \cdot V_{Ser}^2 \cdot I_{Ser} = 10.477$$

$$K_{izMast1} := \left(\frac{z_{Mast1}}{33}\right)^{0.1} = 1.138 \qquad t_{izMast1} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast1} \cdot K_{zt}^{0.35} = 2.133$$

Velocity Pressure Coefficient Mast =
$$Kz_{Mast1} := 2.01\left(\left(\frac{z_{Mast1}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.315$$

Velocity Pressure w/o Ice Mast=
$$qz_{Mast1} := 0.00256 \cdot K_d \cdot Kz_{Mast1} \cdot V^2 \cdot I_{Wind} = 31.813$$

Velocity Pressure with Ice Mast =
$$qz_{ice.Mast1} := 0.00256 \cdot K_d \cdot Kz_{Mast1} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 7.996$$

Velocity Pressure Service =
$$qz_{Mast1.Ser} := 0.00256 \cdot K_{dSer} \cdot Kz_{Mast1} \cdot V_{Ser}^2 \cdot I_{Ser} = 10.302$$

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 on T-Mobile Mast - Structure 10247

Location: Brookfield, CT

Rev. 1: 8/19/21

Prepared by: T.J.L. Checked by: C.A.G.
Job No. 21051.05

Development of Wind & Ice Load on Mast

Mast Data: (Pipe 8" x-Strong) (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 8.625$ in (User Input)

Mast Length = $L_{mast} := 29.5$ ft (User Input)

Mast Thickness = $t_{mast} := 0.5$ in (User Input)

Mast Aspect Ratio = $Ar_{mast} := \frac{12 L_{mast}}{D_{mast}} = 41.0$

Mast Force Coefficient = $Ca_{mast} = 1.2$

Wind Load (without ice)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 0.719$ sf/ft

Total Mast Wind Force = $qz_{Mast1} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 37$ plf **BLC 5**

Wind Load (with ice)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{\left(D_{mast} + 2 \cdot t_{izMast1}\right)}{12} = 1.074$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast1} \cdot G_H \cdot Ca_{mast} \cdot AICE_{mast} = 14$ plf **BLC 4**

Wind Load (Service)

Total Mast Wind Force Service Loads = $qz_{Mast1.Ser} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 12$ plf **BLC 6**

Gravity Loads (without ice)

Weight of the mast = Self Weight **(Computed internally by Risa-3D)** plf **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast1} \cdot 2\right)^2 - D_{mast}^2\right] = 72.1$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 28$ plf **BLC 3**

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 on T-Mobile Mast - Structure 10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L. Checked by: C.A.G. Job No. 21051.05

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPX16DWV-16DWVS			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 55.9$	in	(User Input)	
Antenna Width =	$W_{ant} := 13$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 41$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.3$			
Antenna Force Coefficient =	$Ca_{ant} = 1.28$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 15.1$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 846$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (W_{ant} + 2 \cdot t_{izT\text{-}Mo})}{144} = 7.2$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 21.7$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 305$	lbs	**BLC 4**

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{T\text{-}Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 274$	lbs	**BLC 8**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 123$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2289$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izT\text{-}Mo})(W_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (T_{ant} + 2 \cdot t_{izT\text{-}Mo}) - V_{ant} = 5471$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 177$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 532$	lbs	**BLC 3**

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 on T-Mobile Mast - Structure 10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L. Checked by: C.A.G. Job No. 21051.05

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	CommscopeATSBT-TOP-FM-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 =	$T_{ant} := 2$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 2$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.5$			
Antenna Force Coefficient =	$Ca_{ant} = 1.2$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.1$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.4$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 23$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (W_{ant} + 2 \cdot t_{izT\text{-}Mo})}{144} = 0.6$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 1.7$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 22$	lbs	**BLC 4**

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{T\text{-}Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 7$	lbs	**BLC 6**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 6$	lbs	**BLC 2**

Gravity Loads (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 =	$V_{ice} := (L_{ant} + 2 \cdot t_{izT\text{-}Mo})(W_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (T_{ant} + 2 \cdot t_{izT\text{-}Mo}) - V_{ant} = 459$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 15$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 45$	lbs	**BLC 3**

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 on T-Mobile Mast - Structure 10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L. Checked by: C.A.G. Job No. 21051.05

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	Universal Tri-Bracket			
Mount Shape =	Flat		(User Input)	
Pipe Mount Length =	$L_{mnt} := 72$	in	(User Input)	
2 inch Pipe Mount Linear Weight =	$W_{mnt} := 3.66$	plf	(User Input)	
Pipe Mount Outside Diameter =	$D_{mnt} := 2.375$	in	(User Input)	
Number of Mounting Pipes =	$N_{mnt} := 3$		(User Input)	
Tri-Bracket Weight =	$W_{tb.mnt} := 197$	lbs	(User Input)	

Wind Load (NESC Extreme)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area =	$A_{mnt} := 0.0$	sf	
Total Mount Wind Force =	$F_{mnt} := qz_{T\text{-}Mo} \cdot G_H \cdot K_a \cdot A_{mnt} \cdot m = 0$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area w/ Ice =	$A_{ICEmnt} := 0.0$	sf	
Total Mount Wind Force =	$Fi_{mnt} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot K_a \cdot A_{ICEmnt} = 0$	lbs	**BLC 4**

Wind Load (Service)

Assumes Mount is Shielded by Antenna

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{T\text{-}Mo.Ser} \cdot G_H \cdot K_a \cdot A_{mnt} = 0$	lbs	**BLC 6**

Gravity Loads (without ice)

Weight Each Pipe Mount =	$WT_{mnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 22$	lbs	
Weight of All Mounts =	$WT_{mnt} \cdot N_{mnt} + W_{tb.mnt} = 263$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Pipe =	$V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^{2} \cdot L_{mnt} = 319$	cu in	
Volume of Ice on Each Pipe =	$V_{ice} := \left[\frac{\pi}{4} \cdot \left[\left(D_{mnt} + 1\right)^2\right] \cdot \left(L_{mnt} + 1\right)\right] - V_{mnt} = 334$	cu in	
Weight of Ice each mount (incl, hardware) =	$W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot Id = 11$	lbs	
Weight of Ice on All Mounts =	$W_{ICEmnt} \cdot N_{mnt} + 5 = 37$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Rosenberger 2D4WC-21		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 48$	in	(User Input)
Antenna Width =	$W_{ant} := 22.8$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.4$	in	(User Input)
Antenna Weight =	$WT_{ant} := 66$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 2.1$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 7.6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 22.8$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 1195$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (W_{ant} + 2 \cdot t_{izT\text{-}Mo})}{144} = 9.8$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 29.5$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 389$	lbs	**BLC 4**

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{T\text{-}Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 387$	lbs	**BLC 6**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 198$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 8099$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izT\text{-}Mo})(W_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (T_{ant} + 2 \cdot t_{izT\text{-}Mo}) - V_{ant} = 8487$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 275$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 825$	lbs	**BLC 3**

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 on T-Mobile Mast - Structure 10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L. Checked by: C.A.G. Job No. 21051.05

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Commscope ATSBT-TOP-FM-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 =	$T_{ant} := 2$	in	(User Input)		
Antenna Weight =	$WT_{ant} := 2$	lbs	(User Input)		
Number of Antennas =	$N_{ant} := 3$		(User Input)		
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.5$				
Antenna Force Coefficient =	$Ca_{ant} = 1.2$				
Wind Load (without ice)					
Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.1$			sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.4$			sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 23$			lbs	**BLC 5**
Wind Load (with ice)					
Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (W_{ant} + 2 \cdot t_{izT\text{-}Mo})}{144} = 0.6$			sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 1.7$			sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 22$			lbs	**BLC 4**
Wind Load (Service)					
Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{T\text{-}Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 7$			lbs	**BLC 6**
Gravity Load (without ice)					
Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 6$			lbs	**BLC 2**
Gravity Loads (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 =	$V_{ice} := (L_{ant} + 2 \cdot t_{izT\text{-}Mo})(W_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (T_{ant} + 2 \cdot t_{izT\text{-}Mo}) - V_{ant} = 459$				
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 15$			lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 45$			lbs	**BLC 3**

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 on T-Mobile Mast - Structure 10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L. Checked by: C.A.G. Job No. 21051.05

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	Universal Tri-Bracket			
Mount Shape =	Flat		(User Input)	
Pipe Mount Length =	$L_{mnt} := 84$	in	(User Input)	
2 inch Pipe Mount Linear Weight =	$W_{mnt} := 3.66$	plf	(User Input)	
Pipe Mount Outside Diameter =	$D_{mnt} := 2.375$	in	(User Input)	
Number of Mounting Pipes =	$N_{mnt} := 3$		(User Input)	
Tri-Bracket Weight =	$W_{tb.mnt} := 197$	lbs	(User Input)	

Wind Load (NESC Extreme)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area =	$A_{mnt} := 0.0$	sf	
Total Mount Wind Force =	$F_{mnt} := qz_{T\text{-}Mo} \cdot G_H \cdot K_a \cdot A_{mnt} \cdot m = 0$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area w/ Ice =	$A_{ICEmnt} := 0.0$	sf	
Total Mount Wind Force =	$Fi_{mnt} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot K_a \cdot A_{ICEmnt} = 0$	lbs	**BLC 4**

Wind Load (Service)

Assumes Mount is Shielded by Antenna

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{T\text{-}Mo.Ser} \cdot G_H \cdot K_a \cdot A_{mnt} = 0$	lbs	**BLC 6**

Gravity Loads (without ice)

Weight Each Pipe Mount =	$WT_{mnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 26$	lbs	
Weight of All Mounts =	$WT_{mnt} \cdot N_{mnt} + W_{tb.mnt} = 274$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Pipe =	$V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^{2} \cdot L_{mnt} = 372$	cu in	
Volume of Ice on Each Pipe =	$V_{ice} := \left[\frac{\pi}{4} \cdot \left[\left(D_{mnt} + 1\right)^2\right] \cdot \left(L_{mnt} + 1\right)\right] - V_{mnt} = 388$	cu in	
Weight of Ice each mount (incl, hardware) =	$W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot Id = 13$	lbs	
Weight of Ice on All Mounts =	$W_{ICEmnt} \cdot N_{mnt} + 5 = 43$	lbs	**BLC 3**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type =	HELIAX 1-1/4"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.55$	in	(User Input)
Coax Cable Length =	$L_{coax} := 26$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 0.66$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 24$		(User Input)
No. of Coax Projecting Outside Face of PCS Mast =	$NP_{coax} := 6$		(User Input)

Coax aspect ratio, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 201.3$

Coax Cable Force Factor Coefficient = $Ca_{coax} = 1.2$

Wind Load (without ice)

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 0.8$ sf/ft

Total Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{Mast1} \cdot G_H \cdot A_{coax} = 40$ plf **BLC 5**

Wind Load (with ice)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{(NP_{coax} \cdot D_{coax} + 2 \cdot t_{izMast1})}{12} = 1.1$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qz_{ice.Mast1} \cdot G_H \cdot AICE_{coax} = 15$ plf **BLC 4**

Wind Load (Service)

Total Coax Wind Force Service Loads = $F_{coax} := Ca_{coax} \cdot qz_{Mast1.Ser} \cdot G_H \cdot A_{coax} = 13$ plf **BLC 6**

Gravity Loads (without ice)

Weight of all cables w/o ice = $WT_{coax} := Wt_{coax} \cdot N_{coax} = 16$ plf **BLC 2**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot t_{izMast1})^2 - D_{coax}^2\right] = 24.7$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 230$ plf **BLC 3**

(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?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-91/97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: 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	PCA Load Contour
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	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	No
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ca	.36
Cv	.54
Nv	1
Occupancy Category	4
Seismic Zone	3
Om Z	1
Om X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1.5
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	3.5
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	65	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	65	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	62	1.1
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	60	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mast	PIPE_8.0X	Column	Pipe	A53 Gr. B	Typical	11.9	100	100	199

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	Mast	29.5			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	M1	BOTC...	TOPM...			Mast	Column	Pipe	A53 Gr. B	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	BOTCONNECTION	0	0	0	0	
2	TOPCONNECTION	0	8	0	0	
3	TOPMAST	0	29.5	0	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	BOTCONNECTION	Reaction	Reaction	Reaction		Reaction	
2	TOPCONNECTION	Reaction		Reaction			

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.123	25
2	M1	Y	-.006	25
3	M1	Y	-.263	25
4	M1	Y	-.198	18
5	M1	Y	-.006	18
6	M1	Y	-.274	18

Member Point Loads (BLC 3 : Weight of Ice Only)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.532	25
2	M1	Y	-.045	25
3	M1	Y	-.037	25
4	M1	Y	-.825	18
5	M1	Y	-.045	18
6	M1	Y	-.043	18

Member Point Loads (BLC 4 : TIA Wind with Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.305	25
2	M1	X	.022	25

Member Point Loads (BLC 4 : TIA Wind with Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
3	M1	X	.389	18
4	M1	X	.022	18

Member Point Loads (BLC 5 : TIA Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.846	25
2	M1	X	.023	25
3	M1	X	1.195	18
4	M1	X	.023	18

Member Point Loads (BLC 6 : Service Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.274	25
2	M1	X	.007	25
3	M1	X	.387	18
4	M1	X	.007	18

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f..	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.016	-.016	0	26

Member Distributed Loads (BLC 3 : Weight of Ice Only)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f..	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.023	-.023	0	0
2	M1	Y	-.23	-.23	0	26

Member Distributed Loads (BLC 4 : TIA Wind with Ice)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f..	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.014	.014	0	0
2	M1	X	.015	.015	0	26

Member Distributed Loads (BLC 5 : TIA Wind)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f..	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.037	.037	0	0
2	M1	X	.04	.04	0	26

Member Distributed Loads (BLC 6 : Service Wind)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f..	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.012	.012	0	0
2	M1	X	.013	.013	0	26

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	None		-1						
2	Weight of Appurtenances	None					6	1		
3	Weight of Ice Only	None					6	2		

Basic Load Cases (Continued)

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib...	Area(...	Surfa...
4	TIA Wind with Ice	None					4	2		
5	TIA Wind	None					4	2		
6	Service Wind	None					4	2		

Load Combinations

	Description	Solve	P...	S...	B...	Fa...	BLC	Fact...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D +1.0Di + 1.0Wi	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.0D + 1.0W Service	Yes	Y		1	1	2	1	6	1														

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	BOTCONNEC...	max	8.014	1	11.162	3	0	4	0	4	0	4	0	4
2		min	1.618	4	2.232	2	0	1	0	1	0	1	0	1
3	TOPCONNEC...	max	-2.985	4	0	4	0	4	0	4	0	4	0	4
4		min	-14.764	1	0	1	0	1	0	1	0	1	0	1
5	Totals:	max	-1.367	4	11.162	3	0	4						
6		min	-6.75	1	2.232	2	0	1						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotation [rad]	LC
1	BOTCONNE...	max	0	4	0	4	0	4	0	4	0	4	5.349e-03	1
2		min	0	1	0	1	0	1	0	1	0	1	1.08e-03	4
3	TOPCONNE...	max	0	4	0	2	0	4	0	4	0	4	-2.266e-03	4
4		min	0	1	-.003	3	0	1	0	1	0	1	-1.122e-02	1
5	TOPMAST	max	8.661	1	-.002	2	0	4	0	4	0	4	-8.126e-03	4
6		min	1.748	4	-.007	3	0	1	0	1	0	1	-4.027e-02	1

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	Dir	...	phi*...	phi*...	phi*...	phi*...	Cb	Eqn
1	M1	PIPE_8.0X	.842	7.99	1	.080	7.99		1	174....	374.85	81.375	81.375	1.6..	H1-...

Joint Reactions

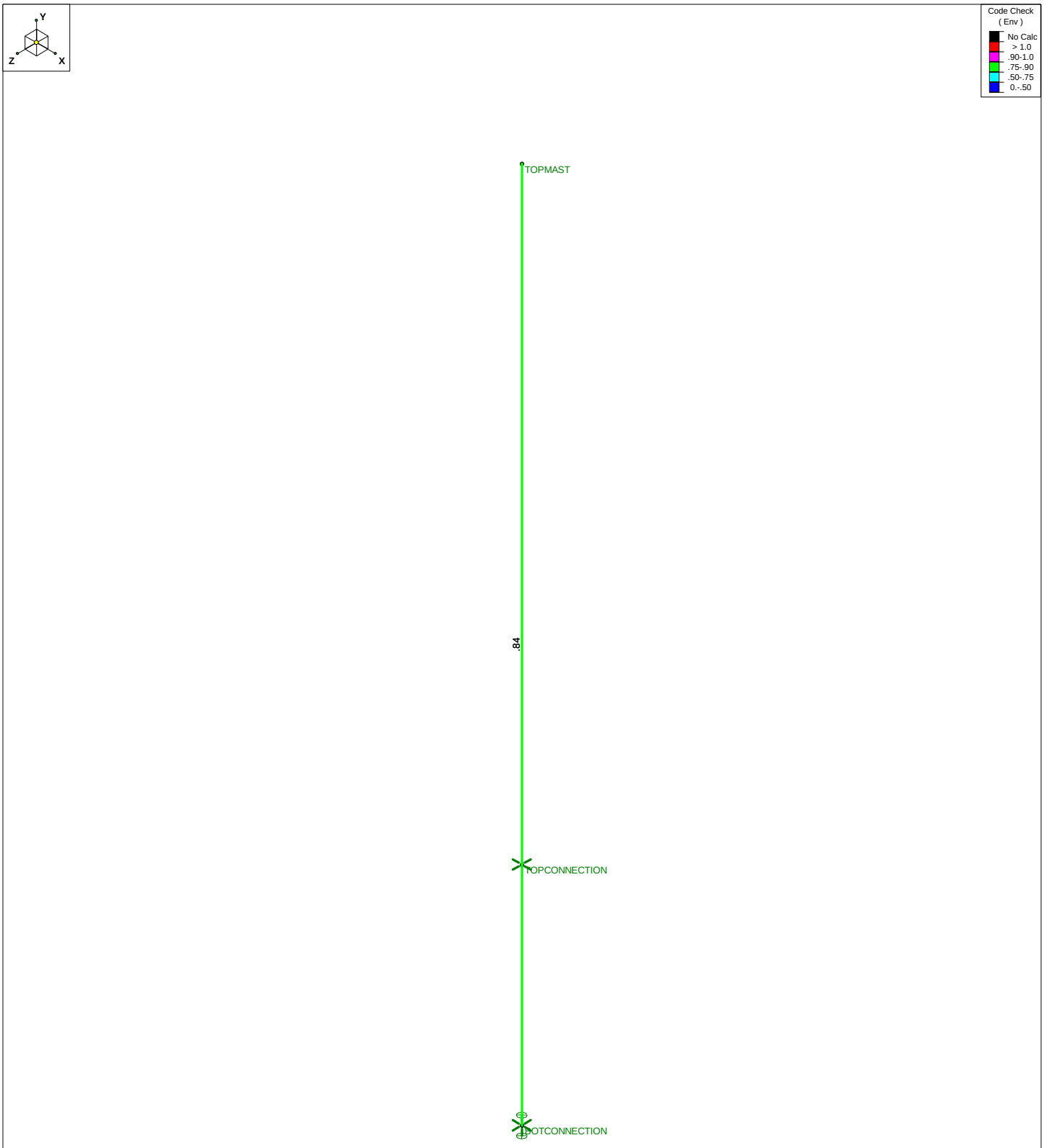
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	BOTCONNECTION	8.014	2.977	0	0	0	0
2	1	TOPCONNECTION	-14.764	0	0	0	0	0
3	1	Totals:	-6.75	2.977	0			
4	1	COG (ft):	X: 0	Y: 16.703	Z: 0			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	BOTCONNECTION	7.986	2.232	0	0	0	0
2	2	TOPCONNECTION	-14.736	0	0	0	0	0
3	2	Totals:	-6.75	2.232	0			
4	2	COG (ft):	X: 0	Y: 16.703	Z: 0			

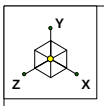
Joint Reactions

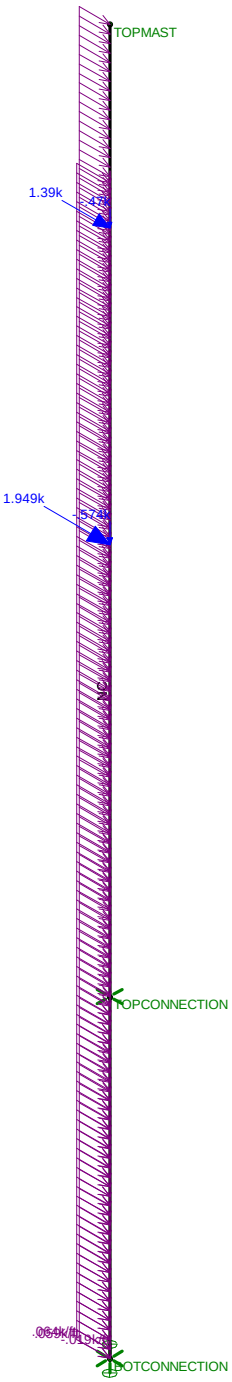
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	BOTCONNECTION	1.893	11.162	0	0	0	0
2	3	TOPCONNECTION	-3.434	0	0	0	0	0
3	3	Totals:	-1.541	11.162	0			
4	3	COG (ft):	X: 0	Y: 15.163	Z: 0			



Member Code Checks Displayed (Enveloped)
Loads: BLC 1, Self Weight
Envelope Only Solution

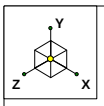
CENTEK Engineering, INC.		
FJP	Strcuture #10247 - Mast	Aug 19, 2021 at 8:01 AM
21051.05 /T-Mobile CT112...	Unity Check	TIA.r3d

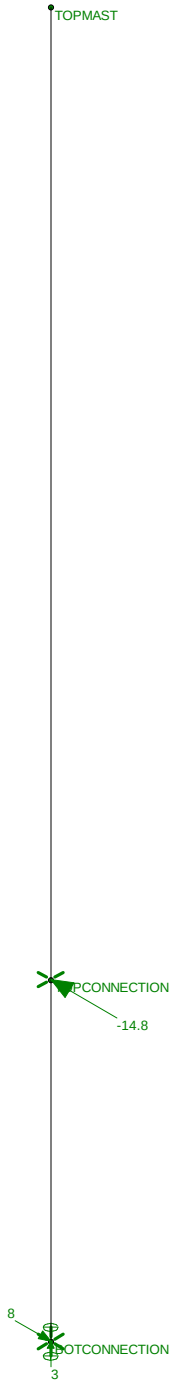




Member Code Checks Displayed
Loads: LC 1, 1.2D + 1.6W

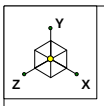
CENTEK Engineering, INC.		
FJP	Strcuture #10247 - Mast	Aug 19, 2021 at 8:02 AM
21051.05 /T-Mobile CT112...	LC #1 Loads	TIA.r3d

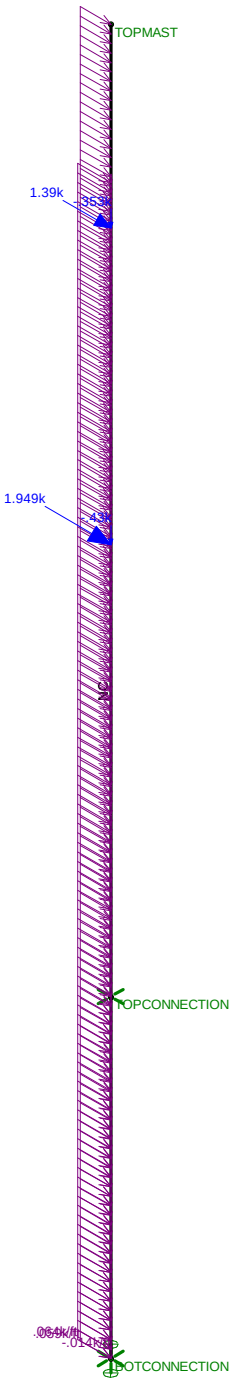




Reaction and Moment Units are k and k-ft

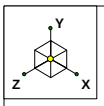
CENTEK Engineering, INC.		
FJP	Strcuture #10247 - Mast	Aug 19, 2021 at 8:03 AM
21051.05 /T-Mobile CT112...	LC #1 Reactions	TIA.r3d





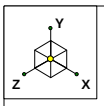
Member Code Checks Displayed
Loads: LC 2, 0.9D + 1.6W

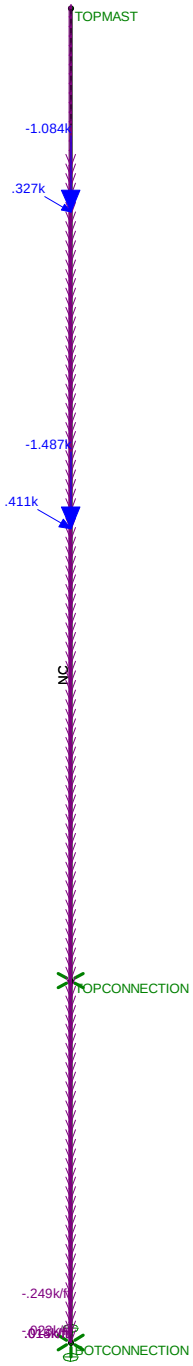
CENTEK Engineering, INC.		
FJP	Strcuture #10247 - Mast	Aug 19, 2021 at 8:02 AM
21051.05 /T-Mobile CT112...	LC #2 Loads	TIA.r3d



Reaction and Moment Units are k and k-ft

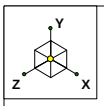
CENTEK Engineering, INC.		
FJP	Strcuture #10247 - Mast	Aug 19, 2021 at 8:04 AM
21051.05 /T-Mobile CT112...	LC #2 Reactions	TIA.r3d

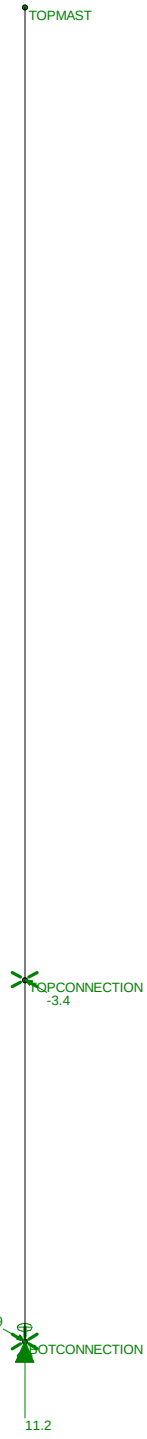




Member Code Checks Displayed
Loads: LC 3, 1.2D +1.0Di + 1.0Wi

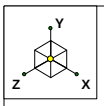
CENTEK Engineering, INC.		
FJP	Strcuture #10247 - Mast	Aug 19, 2021 at 8:02 AM
21051.05 /T-Mobile CT112...	LC #3 Loads	TIA.r3d

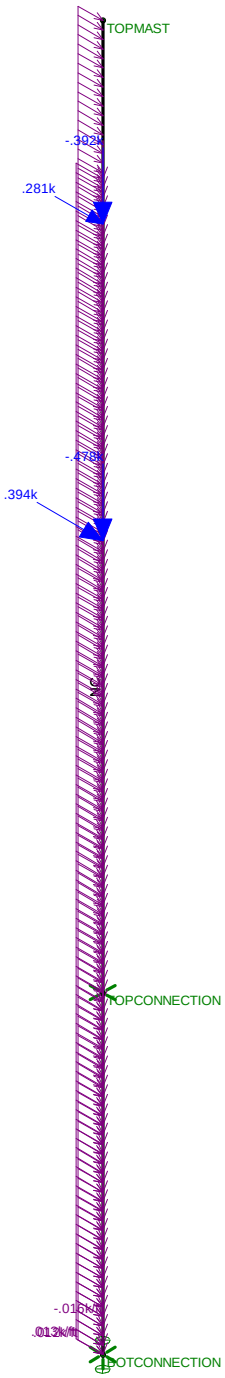




Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
FJP	Strcuture #10247 - Mast	Aug 19, 2021 at 8:04 AM
21051.05 /T-Mobile CT112...	LC #3 Reactions	TIA.r3d



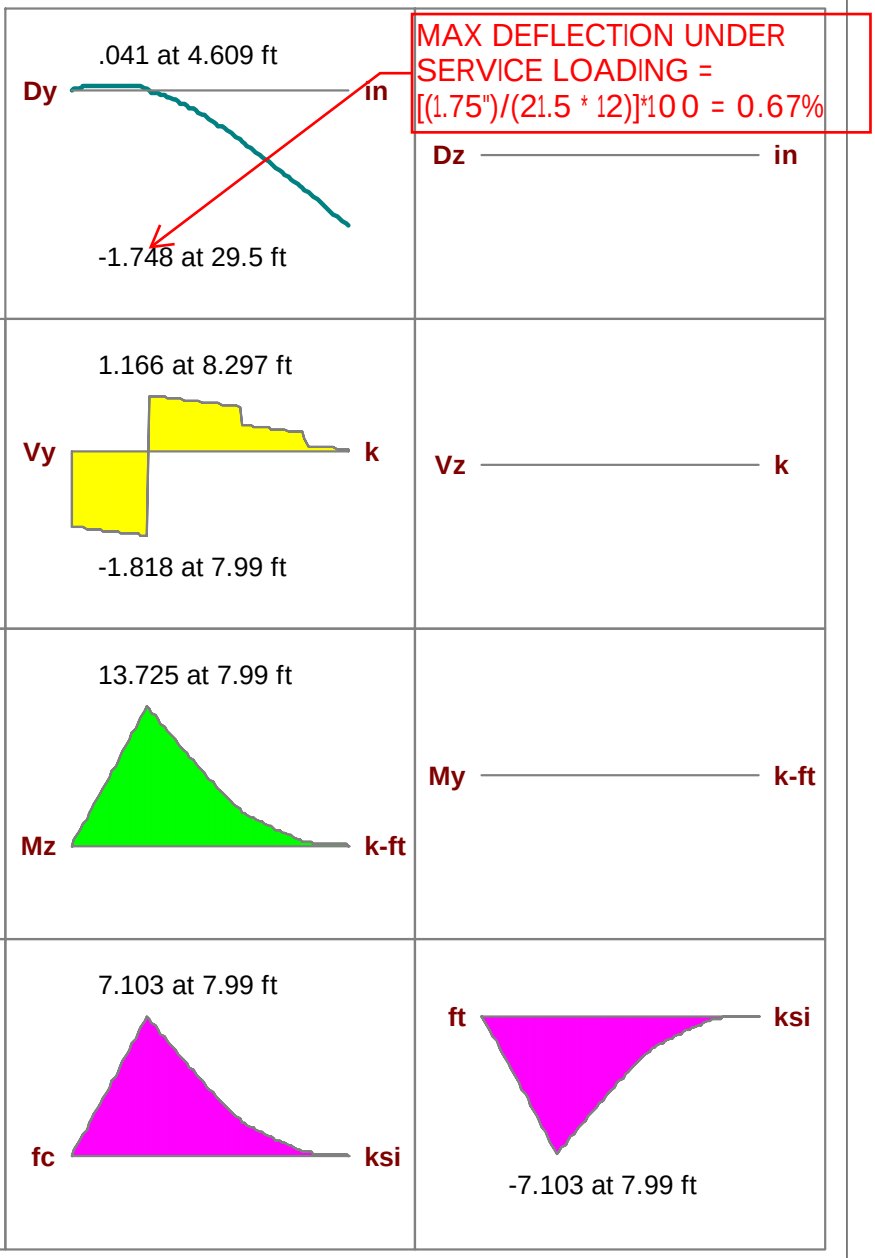


Member Code Checks Displayed
Loads: LC 4, 1.0D + 1.0WService

CENTEK Engineering, INC.		
FJP	Strcuture #10247 - Mast	Aug 19, 2021 at 8:02 AM
21051.05 /T-Mobile CT112...	LC #4 Loads	TIA.r3d

Column: ***M1***

Shape: **PIPE_8.0X**
Material: **A53 Gr. B**
Length: **29.5 ft**
I Joint: **BOTCONNECTION**
J Joint: **TOPMAST**
LC 4: 1.0D + 1.0WService
Code Check: **0.174 (bending)**
Report Based On 97 Sections



AISC 14th(360-10): LRFD Code Check

Direct Analysis Method

Max Bending Check	**0.174**	Max Shear Check	**0.016 (s)**
Location	**7.99 ft**	Location	**7.99 ft**
Equation	**H1-1b**	Max Defl Ratio	**L/202**

Bending	**Compact**	Compression	**Non-Slender**

			y-y	z-z
Fy	**35 ksi**	Lb	**29.5 ft**	**29.5 ft**
phi*Pnc	**174.735 k**	KL/r	**122.117**	**122.117**
phi*Pnt	**374.85 k**			
phi*Mny	**81.375 k-ft**	L Comp Flange	**29.5 ft**	
phi*Mnz	**81.375 k-ft**	L-torque	**29.5 ft**	
phi*Vny	**112.455 k**	Tau_b	**1**	
phi*Vnz	**112.455 k**			
phi*Tn	**76.601 k-ft**			
Cb	**1.689**			

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

Subject:	Mast Connection to Pole # 10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21051.05

Mast Top Connection:

Maximum Design Reactions at Brace:

Vertical =	Vert := 0·kips	(User Input)
Horizontal =	Horz := 15·kips	(User Input)
Moment =	Moment := 0	(User Input)

Bolt Data:

Bolt Grade =	A325	(User Input)
Number of Bolts =	$n_b := 6$	(User Input)
Bolt Diameter =	$d_b := 0.75in$	(User Input)
Nomianl Tensile Strength =	$F_{nt} := 90 \cdot ksi$	(User Input)
Nomianl Shear Strength =	$F_{nv} := 54 \cdot ksi$	(User Input)
Resistance Factor =	$\phi := 0.75$	(User Input)
Bolt Eccentricity from C.L. Mast =	$e := 16.375 \cdot in$	(User Input)
Vetical Spacing Between Top and Bottom Bolts =	$S_{vert} := 9 \cdot in$	(User Input)
Horizontal Spacing Between Bolts =	$S_{horz} := 20.5 \cdot in$	(User Input)
Bolt Area =	$a_b := \frac{1}{4} \cdot \pi \cdot d_b^{\,2} = 0.442 \cdot in^2$	

Check Bolt Stresses:

Wind Acting Parallel to Stiffiner Plate:

Shear Stress per Bolt = $f_v := \frac{Vert}{n_b \cdot a_b} = 0 \cdot ksi$

$Condition1 := if(f_v < \phi \cdot F_{nv}, "OK", "Overstressed")$

$\frac{f_v}{(\phi \cdot F_{nv})} = 0 \cdot \%$

Condition1 = "OK"

Tensile Stress Adjusted for Shear = $F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 90 \cdot ksi$

Tension Force Each Bolt = $F_{tension.bolt} := \frac{Horz}{n_b} + \frac{Vert \cdot e}{S_{vert} \cdot 2} = 2.5 \cdot kips$

Tension Stress Each Bolt = $f_t := \frac{F_{tension.bolt}}{a_b} = 5.7 \cdot ksi$

$Condition2 := if(f_t < \phi \cdot F'_{nt}, "OK", "Overstressed")$

$\frac{f_t}{(\phi \cdot F'_{nt})} = 8.4 \cdot \%$

Condition2 = "OK"

Wind Acting Perpendicular to Stiffiner Plate:

Shear Stress per Bolt = $f_v := \frac{\sqrt{Vert^2 + Horz^2}}{n_b \cdot a_b} = 5.659 \cdot ksi$

$Condition3 := if(f_v < \phi \cdot F_{nv}, "OK", "Overstressed")$

$\frac{f_v}{(\phi \cdot F_{nv})} = 14 \cdot \%$

Condition3 = "OK"

Tensile Stress Adjusted for Shear = $F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 90 \cdot ksi$

Tension Force per Bolt = $F_{tension.conn} := \frac{Horz \cdot e}{S_{horz} \cdot \frac{n_b}{2}} + \frac{Vert \cdot e}{S_{vert} \cdot 2} = 3.994 \cdot kips$

Tension Stress Each Bolt = $f_t := \frac{F_{tension.conn}}{a_b} = 9.04 \cdot ksi$

$Condition4 := if(f_t < \phi \cdot F'_{nt}, "OK", "Overstressed")$

$\frac{f_t}{(\phi \cdot F'_{nt})} = 13.4 \cdot \%$

Condition4 = "OK"

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

Subject:	Mast Connection to Bottom Bracket
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21051.05

Mast Connection to Bottom Bracket:

Design Reactions at Brace:

Axial (Max) =	$Axial_{max} := 11 \cdot kips$	(User Input)
Axial (Min) =	$Axial_{min} := 2 \cdot kips$	(User Input)
Shear =	$Shear := 8 \cdot kips$	(User Input)
Moment =	$Moment := 0 \cdot kips \cdot ft$	(User Input)

Anchor Bolt Data:

Bolt Grade =	A325	(User Input)
Design Shear Stress =	$F_v := 40.5 \cdot ksi$	(User Input)
Design Tension Stress =	$F_T := 67.5 \cdot ksi$	(User Input)
Total Number of Bolts =	$n_b := 4$	(User Input)
Number of Bolts Tension Side Parallel =	$n_{b.par} := 2$	(User Input)
Number of Bolts Tension Side Diagonal =	$n_{b.diag} := 1$	(User Input)
Bolt Diameter =	$d_b := 1in$	(User Input)
Bolt Spacing X Direction =	$S_x := 9 \cdot in$	(User Input)
Bolt Spacing Z Direction =	$S_z := 9 \cdot in$	(User Input)

Base Plate Data:

Base Plate Steel =	A36	(User Input)
Allowable Yield Stress =	$F_y := 36 \cdot ksi$	(User Input)
Base Plate Width =	$Pl_w := 12 \cdot in$	(User Input)
Base Plate Thickness =	$Pl_t := 1 \cdot in$	(User Input)
Bolt Edge Distance =	$B_E := 1.5 \cdot in$	(User Input)
Pole Diameter =	$D_p := 8.625 \cdot in$	(User Input)

Base Plate Data:

Weld Grade	E70XX	(User Input)
Weld Yield Stress =	$F_{yw} := 70 \cdot ksi$	(User Input)
Weld Size =	$sw := 0.375 \cdot in$	(User Input)

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

Subject:	Mast Connection to Bottom Bracket
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21051.05

Anchor Bolt Check:

Bolt Area = $a_b := \frac{1}{4}\cdot\pi\cdot d_b^{\,2} = 0.785\cdot in^2$

Shear per bolt = $V_{bolt} := \frac{Shear}{n_b} = 2\cdot kips$

Actual Shear Stress = $f_v := \frac{V_{bolt}}{a_b} = 2.55\cdot ksi$

$Condition1 := if(f_v < F_V, "OK", "Overstressed")$

Condition1 = "OK"

Bolt Spacing Diag. Direction = $S_{diag} := \sqrt{S_x^{\,2} + S_z^{\,2}} = 12.73\cdot in$

Tension Load per Bolt Parallel = $T_{par} := \frac{Moment}{S_x \cdot n_{b.par}} - \frac{Axial_{min}}{n_b} = -0.5\cdot kips$

Tension Load per Bolt Diagonal = $T_{diag} := \frac{Moment}{S_{diag}\cdot n_{b.diag}} - \frac{Axial_{min}}{n_b} = -0.5\cdot kips$

Tension per bolt = $T := if(T_{par} > T_{diag}, T_{par}, T_{diag}) = -0.5\cdot kips$

Actual Tensile Stress = $f_t := \frac{T}{a_b} = -0.64\cdot ksi$

$Condition2 := if(f_t < F_T, "OK", "Overstressed")$

Condition2 = "OK"

Base Plate Check:

Design Bending Stress = $F_b := 0.9\cdot F_y = 32.4\cdot ksi$

Plate Bending Width = $Z := \left(Pl_w\cdot\sqrt{2} - D_p\right) = 8.35\cdot in$

MomentArm = $K := \frac{\left(S_{diag} - D_p\right)}{2} = 2.05\cdot in$

Load per Bolt Diagonal = $P_{diag} := \frac{Moment}{S_{diag}\cdot n_{b.diag}} + \frac{Axial_{max}}{n_b} = 2.75\cdot kips$

Moment in Base Plate = $M := K\cdot P_{diag} = 5.64\cdot kips\cdot in$

Plastic Section Modulus = $Z := \frac{1}{4}\cdot Z\cdot Pl_t^{\,2} = 2.09\cdot in^3$

Bending Stress = $f_b := \frac{M}{Z} = 2.7\cdot ksi$

$Condition3 := if(f_b < F_b, "OK", "Overstressed")$

Condition3 = "OK"

Base Plate to PCS Mast Weld Check:

Design Weld Stress = $F_w := 0.45 \cdot F_{yw} = 31.5 \cdot ksi$

Weld Area = $A_w := \frac{\pi}{4} \cdot \left[\left(D_p + 2sw \cdot 0.707 \right)^2 - D_p^2 \right] = 7.4 \cdot in^2$

Weld Moment of Inertia = $I_w := \frac{\pi}{64} \cdot \left[\left(D_p + 2sw \cdot 0.707 \right)^4 - D_p^4 \right] = 73.22 \cdot in^4$

$c := \frac{D_p}{2} + sw \cdot 0.707 = 4.58 \cdot in$

Section Modulus of Weld = $S_w := \frac{I_w}{c} = 15.99 \cdot in^3$

Weld Stress = $f_w := \frac{Moment}{S_w} + \frac{Shear}{A_w} = 1.08 \cdot ksi$

$Condition4 := if\left(f_w < F_w, "OK", "Overstressed" \right)$

Condition4 = "OK"

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

Subject:	Mast Connection to CL&P Pole # 10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21051.05

Mast Bottom Connection:

Maximum Design Reactions at Brace:

Vertical =	Vert := 11·kips	(User Input)
Horizontal =	Horz := 8·kips	(User Input)
Moment =	Moment := 0·ft·kips	(User Input)

Bolt Data:

Bolt Grade =	A325	(User Input)
Number of Bolts =	$n_b := 8$	(User Input)
Bolt Diameter =	$d_b := 0.75in$	(User Input)
Nomianl Tensile Strength =	$F_{nt} := 90 \cdot ksi$	(User Input)
Nomianl Shear Strength =	$F_{nv} := 54 \cdot ksi$	(User Input)
Resistance Factor =	$\phi := 0.75$	(User Input)
Bolt Eccentricity from C.L. Mast =	$e := 16.375 \cdot in$	(User Input)
Horizontal Spacing Between Bolts =	$S_{horz} := 22.75 \cdot in$	(User Input)
Vetical Spacing From Plate CL to Bolt 1 =	$S_{vert} := 9 \cdot in$	(User Input)
Bolt Area =	$a_b := \frac{1}{4} \cdot \pi \cdot d_b^2 = 0.442 \cdot in^2$	
Vetical Spacing From Plate CL to Bolt 1 =	$S_{vert1} := 2 \cdot in$	(User Input)
Vetical Spacing From Plate CL to Bolt 2 =	$S_{vert2} := 6 \cdot in$	(User Input)
Bolt Polar Moment of Inertia =	$I_p := 4 \cdot S_{vert1}^2 + 4 \cdot S_{vert2}^2 = 160 \cdot in^2$	
Bolt Area =	$a_b := \frac{1}{4} \cdot \pi \cdot d_b^2 = 0.442 \cdot in^2$	

Check Bolt Stresses:

Wind Acting Parallel to Stiffiner Plate:

Shear Stress per Bolt =

$$f_v := \frac{Vert}{n_b \cdot a_b} = 3.112 \cdot ksi$$

$$Condition1 := if\left(f_v < \phi \cdot F_{nv}, "OK", "Overstressed"\right)$$

$$\frac{f_v}{\left(\phi \cdot F_{nv}\right)} = 7.7 \cdot \%$$

Condition1 = "OK"

Tensile Stress Adjusted for Shear =

$$F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 90 \cdot ksi$$

Tension Force Each Bolt =

$$F_{tension.bolt} := \frac{Horz}{n_b} + \frac{(Vert \cdot e + Moment) \cdot S_{vert2}}{I_p} = 7.755 \cdot kips$$

Tension Stress Each Bolt =

$$f_t := \frac{F_{tension.bolt}}{a_b} = 17.6 \cdot ksi$$

$$Condition2 := if\left(f_t < \phi \cdot F'_{nt}, "OK", "Overstressed"\right)$$

$$\frac{f_t}{\left(\phi \cdot F'_{nt}\right)} = 26 \cdot \%$$

Condition2 = "OK"

Wind Acting Perpendicular to Stiffiner Plate:

Shear Stress per Bolt =

$$f_v := \frac{\sqrt{\left(\frac{Vert}{n_b} + \frac{Moment \cdot 2}{S_{horz} \cdot n_b}\right)^2 + \left(\frac{Horz}{n_b}\right)^2}}{a_b} = 3.848 \cdot ksi$$

$$Condition3 := if\left(f_v < \phi \cdot F_{nv}, "OK", "Overstressed"\right)$$

$$\frac{f_v}{\left(\phi \cdot F_{nv}\right)} = 9.5 \cdot \%$$

Condition3 = "OK"

Tensile Stress Adjusted for Shear =

$$F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 90 \cdot ksi$$

Tension Force per Bolt =

$$F_{tension.conn} := \frac{Horz \cdot e}{S_{horz} \cdot \frac{n_b}{2}} + \frac{(Vert \cdot e) \cdot S_{vert2}}{I_p} = 8.194 \cdot kips$$

Tension Stress Each Bolt =

$$f_t := \frac{F_{tension.conn}}{a_b} = 18.548 \cdot ksi$$

$$Condition4 := if\left(f_t < \phi \cdot F'_{nt}, "OK", "Overstressed"\right)$$

$$\frac{f_t}{\left(\phi \cdot F'_{nt}\right)} = 27.5 \cdot \%$$

Condition4 = "OK"

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

Subject: Load Analysis of T-Mobile Equipment on Structure #10247

Location: Brookfield, CT

Rev. 1: 8/19/21

Prepared by: T.J.L Checked by: C.A.G.
Job No. 21051.05

Basic Components

Heavy Wind Pressure =	p := 4.00	psf	(User Input NESC 2017 Figure 250-1 & Table 250-1)
Basic Windspeed =	V := 100	mph	(User Input NESC 2017 Figure 250-2(e))
Radial Ice Thickness =	Ir := 0.50	in	(User Input)
Radial Ice Density =	Id := 56.0	pcf	(User Input)

Factors for Extreme Wind Calculation

Elevation of Top of Mast Above Grade =	TME := 134	ft	(User Input)
Multiplier Gust Response Factor =	m := 1.25		(User Input - Only for NESC Extreme wind case)
NESC Factor =	kv := 1.43		(User Input from NESC 2017 Table 250-3 equation)
Importance Factor =	I := 1.0		(User Input from NESC 2017 Section 250.C.2)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.346$ (NESC 2017 Table 250-2)

Exposure Factor = $Es := 0.346 \left[\frac{33}{(0.67 \cdot TME)}\right]^{\frac{1}{7}} = 0.3$ (NESC 2017 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TME}{220}\right)} = 0.814$ (NESC 2017 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.846$ (NESC 2017 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 29.2$ psf (NESC 2017 Section 250.C.2)

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 Risa-3D Analysis
NESC Extreme Loading =	**1.0**	(User Input)	Apply in Risa-3D Analysis

Overload Factors for Vertical Loads:

NESC Heavy Loading =	**1.5**	(User Input)	Apply in Risa-3D Analysis
NESC Extreme Loading =	**1.0**	(User Input)	Apply in Risa-3D Analysis

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

Subject:	Load Analysis of T-Mobile Equipment on Structure #10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L Checked by: C.A.G. Job No. 21051.05

Development of Wind & Ice Load on Mast

Mast Data: (Pipe 8.0 x-Strong)

Mast Shape =	Round		(User Input)
Mast Diameter =	$D_{mast} := 8.625$	in	(User Input)
Mast Length =	$L_{mast} := 29.5$	ft	(User Input)
Mast Thickness =	$t_{mast} := 0.5$	in	(User Input)

Wind Load (NESC Extreme)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 0.719$ sf/ft

Total Mast Wind Force (Above Structure) =	$qz \cdot Cd_{coax} \cdot A_{mast} \cdot m = 42$	plf	**BLC 5**
Total Mast Wind Force (Below Structure) =	$qz \cdot Cd_{coax} \cdot A_{mast} = 34$	plf	**BLC 5**

Wind Load (NESE Heavy)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 0.802$ sf/ft

Total Mast Wind Force w/ Ice =	$p \cdot Cd_{coax} \cdot AICE_{mast} = 5$	plf	**BLC 4**

Gravity Loads (without ice)

Weight of the Mast =	Self Weight	**(Computed internally by Risa-3D)**	plf	**BLC 1**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 14.3$ sq in

Weight of Ice on Mast =	$W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 6$	plf	**BLC 3**

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

Subject: Load Analysis of T-Mobile Equipment on Structure #10247

Location: Brookfield, CT

Rev. 1: 8/19/21

Prepared by: T.J.L Checked by: C.A.G.
Job No. 21051.05

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPX16DWV-16DWVS		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55.9$	in	(User Input)
Antenna Width =	$W_{ant} := 13$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)
Antenna Weight =	$WT_{ant} := 41$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 15.1$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 883$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 5.5$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 16.6$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 106$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 123$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2289$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1017$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 33$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 99$	lbs	**BLC 3**

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

Subject:	Load Analysis of T-Mobile Equipment on Structure #10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L Checked by: C.A.G. Job No. 21051.05

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	CommscopeATSBT-Top-FM-4G		
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 =	$T_{ant} := 2$	in	(User Input)
Antenna Weight =	$WT_{ant} := 2$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.1$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.4$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 25$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 0.2$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 0.6$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 4$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 6$	lbs	**BLC 2**

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 =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 52$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 2$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 5$	lbs	**BLC 3**

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

Subject:	Load Analysis of T-Mobile Equipment on Structure #10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L Checked by: C.A.G. Job No. 21051.05

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	Universal Tri-Bracket			
Mount Shape =	Flat		(User Input)	
Pipe Mount Length =	$L_{mnt} := 72$	in	(User Input)	
2 inch Pipe Mount Linear Weight =	$W_{mnt} := 3.66$	plf	(User Input)	
Pipe Mount Outside Diameter =	$D_{mnt} := 2.375$	in	(User Input)	
Number of Mounting Pipes =	$N_{mnt} := 3$		(User Input)	
Tri-Bracket Weight =	$W_{tb.mnt} := 197$	lbs	(User Input)	

Wind Load (NESC Extreme)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area =	$A_{mnt} := 0.0$	sf	
Total Mount Wind Force =	$F_{mnt} := qz \cdot Cd_F \cdot A_{mnt} \cdot m = 0$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area w/ Ice =	$A_{ICEmnt} := 0.0$	sf	
Total Mount Wind Force =	$Fi_{mnt} := p \cdot Cd_F \cdot A_{ICEmnt} = 0$	lbs	**BLC 4**

Gravity Loads (without ice)

Weight Each Pipe Mount =	$WT_{mnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 22$	lbs	
Weight of All Mounts =	$WT_{mnt} \cdot N_{mnt} + W_{tb.mnt} = 263$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Pipe =	$V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^{2} \cdot L_{mnt} = 319$	cu in	
Volume of Ice on Each Pipe =	$V_{ice} := \left[\frac{\pi}{4} \cdot \left[(D_{mnt} + 1)^2\right] \cdot (L_{mnt} + 1)\right] - V_{mnt} = 334$	cu in	
Weight of Ice each mount (incl, hardware) =	$W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot Id = 11$	lbs	
Weight of Ice on All Mounts =	$W_{ICEmnt} \cdot N_{mnt} + 5 = 37$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Rosenberger 2D4WC-21		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 48$	in	(User Input)
Antenna Width =	$W_{ant} := 22.8$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.4$	in	(User Input)
Antenna Weight =	$WT_{ant} := 66$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 7.6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 22.8$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1330$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 8.1$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 24.3$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 155$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 198$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 8099$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1698$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 55$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 165$	lbs	**BLC 3**

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

Subject: Load Analysis of T-Mobile Equipment on Structure #10247

Location: Brookfield, CT

Rev. 1: 8/19/21

Prepared by: T.J.L Checked by: C.A.G.
Job No. 21051.05

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	CommscopeATSBT-Top-FM-4G		
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 =	$T_{ant} := 2$	in	(User Input)
Antenna Weight =	$WT_{ant} := 2$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.1$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.4$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 25$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 0.2$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 0.6$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 4$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 6$	lbs	**BLC 2**

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 =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 52$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 2$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 5$	lbs	**BLC 3**

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

Subject:	Load Analysis of T-Mobile Equipment on Structure #10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L Checked by: C.A.G. Job No. 21051.05

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	Universal Tri-Bracket			
Mount Shape =	Flat		(User Input)	
Pipe Mount Length =	$L_{mnt} := 84$	in	(User Input)	
2 inch Pipe Mount Linear Weight =	$W_{mnt} := 3.66$	plf	(User Input)	
Pipe Mount Outside Diameter =	$D_{mnt} := 2.375$	in	(User Input)	
Number of Mounting Pipes =	$N_{mnt} := 3$		(User Input)	
Tri-Bracket Weight =	$W_{tb.mnt} := 197$	lbs	(User Input)	

Wind Load (NESC Extreme)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area =	$A_{mnt} := 0.0$	sf	
Total Mount Wind Force =	$F_{mnt} := qz \cdot Cd_F \cdot A_{mnt} \cdot m = 0$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area w/ Ice =	$A_{ICEmnt} := 0.0$	sf	
Total Mount Wind Force =	$Fi_{mnt} := p \cdot Cd_F \cdot A_{ICEmnt} = 0$	lbs	**BLC 4**

Gravity Loads (without ice)

Weight Each Pipe Mount =	$WT_{mnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 26$	lbs	
Weight of All Mounts =	$WT_{mnt} \cdot N_{mnt} + W_{tb.mnt} = 274$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Pipe =	$V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^2 \cdot L_{mnt} = 372$	cu in	
Volume of Ice on Each Pipe =	$V_{ice} := \left[\frac{\pi}{4} \cdot \left[(D_{mnt} + 1)^2\right] \cdot (L_{mnt} + 1)\right] - V_{mnt} = 388$	cu in	
Weight of Ice each mount (incl, hardware) =	$W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot Id = 13$	lbs	
Weight of Ice on All Mounts =	$W_{ICEmnt} \cdot N_{mnt} + 5 = 43$	lbs	**BLC 3**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type =	HELIAX 1-1/4"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.55$	in	(User Input)
Coax Cable Length =	$L_{coax} := 26$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 0.66$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 24$		(User Input)
No. of Coax Projecting Outside Face of Member =	$NP_{coax} := 6$		(User Input)

Wind Load (NESC Extreme)

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 0.8$ ft

Total Coax Wind Force (Above Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} \cdot m = 45$ plf **BLC 5**

Total Coax Wind Force (Below Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} = 36$ plf **BLC 5**

Wind Load (NESC Heavy)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{(NP_{coax} \cdot D_{coax} + 2 \cdot Ir)}{12} = 0.9$ ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := p \cdot Cd_{coax} \cdot AICE_{coax} = 5$ plf **BLC 4**

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 16$ plf **BLC 2**

Gravity Load (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot Ir)^2 - D_{coax}^2\right] = 3.2$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 30$ plf **BLC 3**

(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?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-91/97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: 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	PCA Load Contour
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	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	No
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ca	.36
Cv	.54
Nv	1
Occupancy Category	4
Seismic Zone	3
Om Z	1
Om X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1.5
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	3.5
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	65	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	65	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	62	1.1
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	60	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mast	PIPE_8.0X	Column	Pipe	A53 Gr. B	Typical	11.9	100	100	199

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	Mast	31.5	Segment	Segment	Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	M1	BOTC...	TOPM...			Mast	Column	Pipe	A53 Gr. B	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	BOTCONNECTION	0	0	0	0	
2	TOPCONNECTION	0	8	0	0	
3	TOPMAST	0	31.5	0	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	BOTCONNECTION	Reaction	Reaction	Reaction		Reaction	
2	TOPCONNECTION	Reaction		Reaction			

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.123	25
2	M1	Y	-.006	25
3	M1	Y	-.263	25
4	M1	Y	-.198	18
5	M1	Y	-.006	18
6	M1	Y	-.274	18

Member Point Loads (BLC 3 : Weight of Ice Only)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.099	25
2	M1	Y	-.005	25
3	M1	Y	-.037	25
4	M1	Y	-.165	18
5	M1	Y	-.005	18
6	M1	Y	-.043	18

Member Point Loads (BLC 4 : NESC Heavy Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.106	25
2	M1	X	.004	25

Member Point Loads (BLC 4 : NESC Heavy Wind) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
3	M1	X	.155	18
4	M1	X	.004	18

Member Point Loads (BLC 5 : NESC Extreme Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.883	25
2	M1	X	.025	25
3	M1	X	1.33	18
4	M1	X	.025	18

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.016	-.016	0	26

Member Distributed Loads (BLC 3 : Weight of Ice Only)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.006	-.006	0	0
2	M1	Y	-.03	-.03	0	26

Member Distributed Loads (BLC 4 : NESC Heavy Wind)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.005	.005	0	0
2	M1	X	.005	.005	0	26

Member Distributed Loads (BLC 5 : NESC Extreme Wind)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.042	.042	10	0
2	M1	X	.034	.034	0	10
3	M1	X	.045	.045	10	26
4	M1	X	.036	.036	0	10

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib...	Area(...	Surfa...
1	Self Weight	None		-1						
2	Weight of Appurtenances	None					6	1		
3	Weight of Ice Only	None					6	2		
4	NESC Heavy Wind	None					4	2		
5	NESC Extreme Wind	None					4	4		

Load Combinations

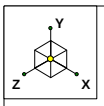
	Description	Solve	P...	S...	B...	Fa...	BLC	Fact...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	NESC Heavy Wind	Yes	Y		1	1.5	2	1.5	3	1.5	4	2.5												
2	NESC Extreme Wind	Yes	Y		1	1	2	1	5	1														

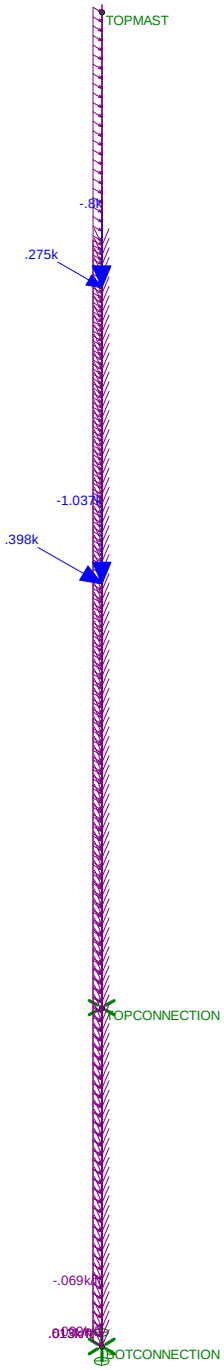
Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	BOTCONNECTION	1.717	5.827	0	0	0	0
2	1	TOPCONNECTION	-3.108	0	0	0	0	0
3	1	Totals:	-1.391	5.827	0			
4	1	COG (ft):	X: 0	Y: 16.573	Z: 0			

Joint Reactions

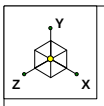
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	BOTCONNECTION	5.776	2.562	0	0	0	0
2	2	TOPCONNECTION	-10.362	0	0	0	0	0
3	2	Totals:	-4.586	2.562	0			
4	2	COG (ft):	X: 0	Y: 17.139	Z: 0			

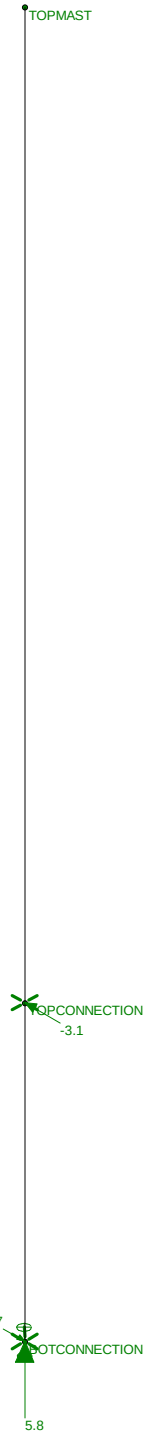




Loads: LC 1, NESC Heavy Wind
Envelope Only Solution

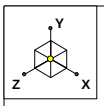
CENTEK Engineering, Inc.		
FJP	Structure # 10247 - Mast	Aug 19, 2021 at 8:19 AM
21051.15/T-Mobile CT1120...	LC #1 Loads	NESC.r3d

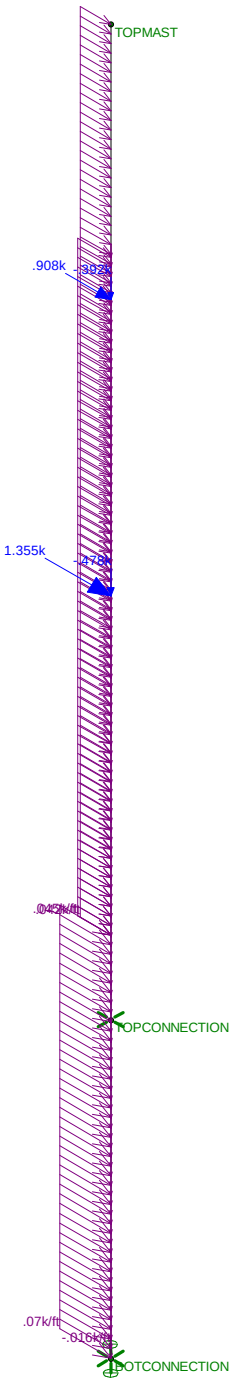




Results for LC 1, NESC Heavy Wind
Reaction and Moment Units are k and k-ft

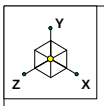
CENTEK Engineering, Inc.		
FJP	Structure # 10247 - Mast	Aug 19, 2021 at 8:19 AM
21051.15/T-Mobile CT1120...	LC #1 Reactions	NESC.r3d





Loads: LC 2, NESC Extreme Wind
Envelope Only Solution

CENTEK Engineering, Inc.		
FJP	Structure # 10247 - Mast	Aug 19, 2021 at 8:19 AM
21051.15/T-Mobile CT1120...	LC #2 Loads	NESC.r3d



Results for LC 2, NESC Extreme Wind
Reaction and Moment Units are k and k-ft

CENTEK Engineering, Inc.		
FJP	Structure # 10247 - Mast	Aug 19, 2021 at 8:20 AM
21051.15/T-Mobile CT1120...	LC #2 Reactions	NESC.r3d

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

Subject:	Coax Cable on Pole #10247
Location:	Brookfield, CT
Rev. 0: 7/1/21	Prepared by: T.J.L Checked by: C.A.G. Job No. 21051.05

Coax Cable on CL&P Pole

Coaxial Cable Span $Coax_{Span} := \begin{pmatrix} 15 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \end{pmatrix}$ ft *(User Input)*

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

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

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

Basic Windspeed = $V := 100$ mph (User Input NESC 2017 Figure 250-2(e))

Height to Top of Coax Above Grade = $TC := 105$ ft (User Input)

NESC Factor = $kv := 1.43$ (User Input from NESC 2017 Table 250-3 equation)

Importance Factor = $I := 1.0$ (User Input from NESC 2017 Section 250.C.2)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{0.67TC}{900}\right)^{\frac{2}{9.5}} = 1.175$ (NESC 2017 Table 250-2)

Exposure Factor = $Es := 0.346\left[\frac{33}{(0.67 \cdot TC)}\right]^{\frac{1}{7}} = 0.311$ (NESC 2017 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TC}{220}\right)} = 0.848$ (NESC 2017 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.867$ (NESC 2017 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 26.1$ psf (NESC 2017 Section 250.C.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: Coax Cable on Pole #10247

Location: Brookfield, CT

Rev. 0: 7/1/21

Prepared by: T.J.L Checked by: C.A.G.
Job No. 21051.05

Diameter of Coax Cable = $D_{coax} := 1.55 \cdot in$ *(User Input)*

Weight of Coax Cable = $W_{coax} := 0.66 \cdot plf$ *(User Input)*

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

Number of Projected Coax Cables = $NP_{coax} := 6$ *(User Input)*

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

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

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

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

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

Wind Area without Ice = $A := \left(NP_{coax} \cdot D_{coax}\right) = 9.3 \cdot in$

Wind Area with Ice = $A_{ice} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right) = 10.3 \cdot in$

Ice Area per Liner Ft = $Ai_{coax} := \frac{\pi}{4} \cdot \left[\left(D_{coax} + 2 \cdot Ir\right)^2 - D_{coax}^2\right] = 0.022\,ft^2$

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 30.055 \cdot plf$

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 =

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

$$Heavy\_WInd_{Vert} = \begin{pmatrix} 1033 \\ 688 \\ 688 \\ 688 \\ 688 \\ 688 \\ 688 \\ 688 \\ 688 \\ 688 \end{pmatrix} lb \qquad Heavy\_Wind_{Trans} = \begin{pmatrix} 206 \\ 137 \\ 137 \\ 137 \\ 137 \\ 137 \\ 137 \\ 137 \\ 137 \\ 137 \end{pmatrix} lb$$

Extreme Wind Vertical Load =

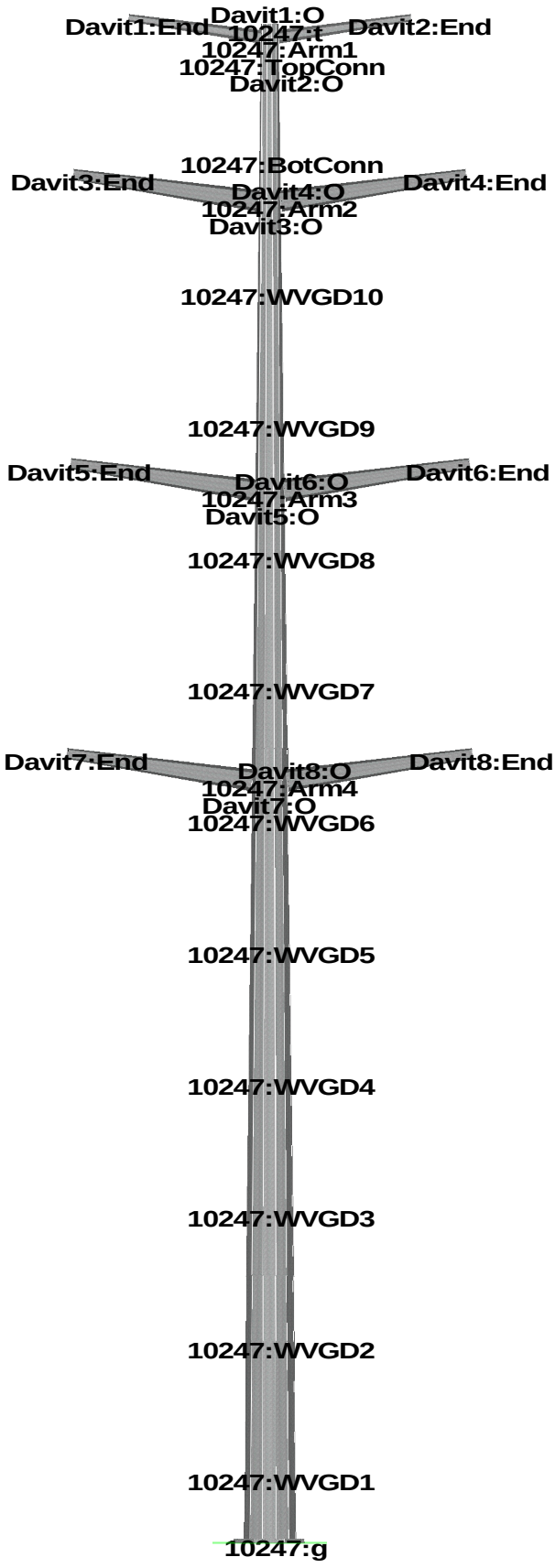
$$Extreme\_Wind_{Vert} := \overrightarrow{\left(N_{coax} \cdot W_{coax} \cdot Coax_{Span} \cdot OF_{EWV}\right)}$$

Extreme Wind Transverse Load =

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

$$Extreme\_Wind_{Vert} = \begin{pmatrix} 238 \\ 158 \\ 158 \\ 158 \\ 158 \\ 158 \\ 158 \\ 158 \\ 158 \\ 158 \end{pmatrix} lb \qquad Extreme\_Wind_{Trans} = \begin{pmatrix} 485 \\ 323 \\ 323 \\ 323 \\ 323 \\ 323 \\ 323 \\ 323 \\ 323 \\ 323 \end{pmatrix} lb$$

Centek Engineering Inc, Project: "cl&p structure # 10247"
PLS-POLE Version 16.01, 5:18:48 PM Tuesday, June 29, 2021
Undeformed geometry displayed



Project Name : 21025.05- Brookfield, CT
Project Notes: Str # 10247/ T-Mobile - CT11201A
Project File : J:\Jobs\2105100.WI\05_CT11201A\05_Structural\Backup Documentation\Rev (1)\Calcs\PLS-Pole\cl&p structure # 10247.pol
Date run : 8:38:20 AM Thursday, August 19, 2021
by : PLS-POLE Version 16.01
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: J:\Jobs\2105100.WI\05_CT11201A\05_Structural\Backup Documentation\Rev (1)\Calcs\PLS-Pole\cl&p #10247.lca

*** Analysis Results:

Maximum element usage is 77.05% for Base Plate "10247" in load case "NESC Extreme"
Maximum insulator usage is 12.95% for Clamp "Clamp9" in load case "NESC Extreme"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
NESC Heavy	10247:g	74.78	22.45	1708.17	0.00
NESC Extreme	10247:g	39.45	31.91	2498.38	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	10247:g	-0.49	-22.45	-74.78	22.45	1707.71	-39.63	1708.17	-0.11	0.00
NESC Extreme	10247:g	-0.35	-31.91	-39.45	31.91	2498.19	-31.25	2498.38	-0.04	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	10247:t	0.97	39.57	-0.79	39.59	0.07	-2.90	0.00
NESC Extreme	10247:t	0.79	62.78	-1.95	62.81	0.06	-4.90	0.00

Tubes Summary:

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)
10247	1	4574	NESC Extreme	54.46	696.19
10247	2	6628	NESC Extreme	62.86	1709.58
10247	3	5021	NESC Extreme	63.18	2498.38

*** 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)
10247	63.18	NESC Extreme	2.5	30	18435.7

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
Davit1	9.61	NESC Heavy	114.4	1	182.8
Davit2	11.52	NESC Heavy	114.4	1	182.8
Davit3	22.31	NESC Heavy	102.0	1	537.4
Davit4	18.45	NESC Heavy	102.0	1	537.4
Davit5	22.48	NESC Heavy	80.0	1	537.4
Davit6	16.40	NESC Heavy	80.0	1	537.4
Davit7	22.40	NESC Heavy	58.0	1	537.4
Davit8	14.73	NESC Heavy	58.0	1	537.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type

NESC Heavy	54.54	10247 Base Plate
NESC Extreme	77.05	10247 Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Steel Pole Usage %	Pole Label	Height AGL (ft)	Segment Number
NESC Heavy	44.47	10247	2.5	30
NESC Extreme	63.18	10247	2.5	30

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	10247	12	38.475	72.566	1707.713	-39.634	32.725	132.250	4	86.561	2.031	54.54
NESC Extreme	10247	12	38.475	37.232	2498.188	-31.254	46.230	186.825	4	121.797	2.414	77.05

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Tubular Davit Usage %	Davit Label	Height AGL (ft)	Segment Number
NESC Heavy	22.48	Davit5	80.0	1
NESC Extreme	9.75	Davit4	102.0	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	1.45	NESC Heavy	0.0
Clamp2	Clamp	1.36	NESC Heavy	0.0
Clamp3	Clamp	7.70	NESC Heavy	0.0
Clamp4	Clamp	5.53	NESC Heavy	0.0
Clamp5	Clamp	7.72	NESC Heavy	0.0
Clamp6	Clamp	5.18	NESC Heavy	0.0
Clamp7	Clamp	7.65	NESC Heavy	0.0
Clamp8	Clamp	5.23	NESC Heavy	0.0
Clamp9	Clamp	12.95	NESC Extreme	0.0
Clamp10	Clamp	7.90	NESC Extreme	0.0
Clamp13	Clamp	0.88	NESC Heavy	0.0
Clamp14	Clamp	0.88	NESC Heavy	0.0
Clamp15	Clamp	0.88	NESC Heavy	0.0
Clamp16	Clamp	0.88	NESC Heavy	0.0
Clamp17	Clamp	0.88	NESC Heavy	0.0
Clamp18	Clamp	0.88	NESC Heavy	0.0
Clamp19	Clamp	0.88	NESC Heavy	0.0
Clamp20	Clamp	0.88	NESC Heavy	0.0
Clamp21	Clamp	0.88	NESC Heavy	0.0
Clamp22	Clamp	1.32	NESC Heavy	0.0

*** Weight of structure (lbs):
    Weight of Tubular Davit Arms: 3590.0
    Weight of Steel Poles: 18435.7
    Total: 22025.7

*** End of Report

```
**********************************************************************
*                                                                    *
*                              PLS-POLE                              *
*                   POLE AND FRAME ANALYSIS AND DESIGN               *
*               Copyright Power Line Systems 1999-2019               *
*                                                                    *
**********************************************************************
```

Project Name : 21025.05- Brookfield, CT
Project Notes: Str # 10247/ T-Mobile - CT11201A
Project File : J:\Jobs\2105100.WI\05_CT11201A\05_Structural\Backup Documentation\Rev (1)\Calcs\PLS-Pole\cl&p structure # 10247.pol
Date run : 8:38:19 AM Thursday, August 19, 2021
by : PLS-POLE Version 16.01
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.

Modeling options:
  Offset Arms from Pole/Mast: Yes
  Offset Braces from Pole/Mast: Yes
  Offset Guys from Pole/Mast: Yes
  Offset Posts from Pole/Mast: Yes
  Offset Strains from Pole/Mast: Yes
  Use Alternate Convergence Process: No
  Steel poles 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	Stock Number	Length	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)
CL&P10247	10247	115.00	0	Yes	12F	16.94	47.75	0	1.6	3 tubes	0	0	Calculated	0.000 Galvanized Steel	0.0000	0.0000	

Steel Tubes Properties:

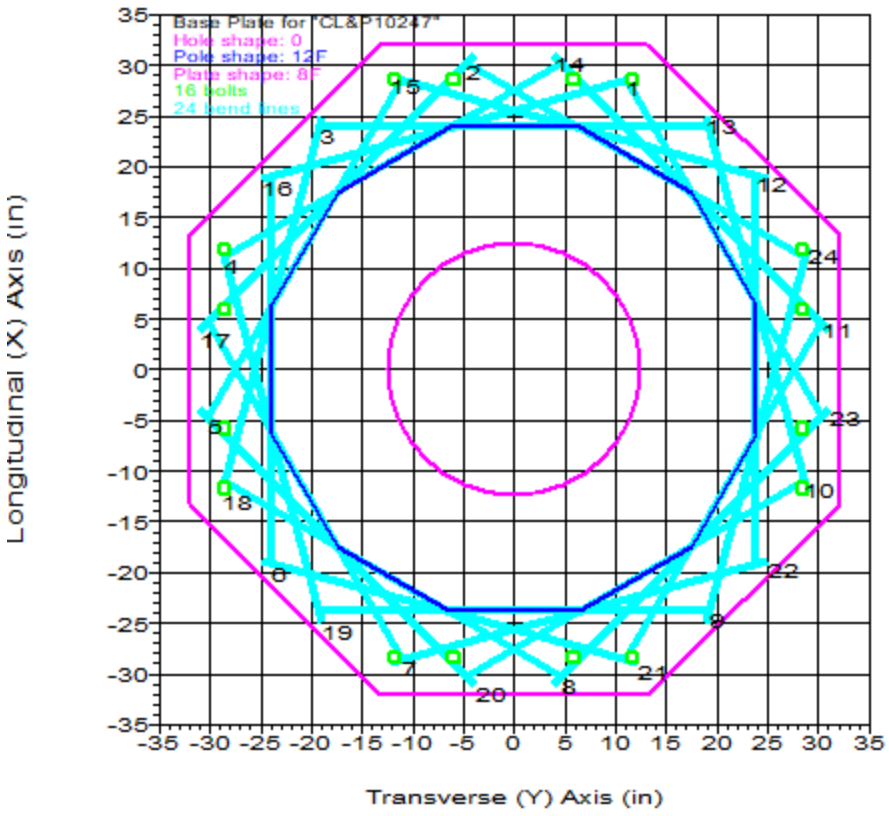
Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Gap or Butt Offset (in)	Yield Stress (ksi)	Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Taper (in/ft)	Calculated Tube Top Diameter (in)	Tube Bot. 1.5x Diameter (in)	Actual Lap Length (ft)	Overlap (ft)
CL&P10247	1	55	0.3125	4.500	0.000	0.000	65.000	0.000	4574	30.40	0.27989	16.94	32.33	3.963	4.500
CL&P10247	2	44.5	0.375	5.830	0.000	0.000	65.000	0.000	6628	23.52	0.27989	30.45	42.90	5.269	5.830
CL&P10247	3	25.83	0.40625	0.000	0.000	0.000	65.000	0.000	5021	13.27	0.27989	40.52	47.75	0.000	0.000

Base Plate Properties:

Pole Property	Plate Diam. (in)	Plate Shape	Plate Thick. (in)	Plate Weight (lbs)	Bend Line Length Override (in)	Hole Diam. (in)	Hole Shape	Steel Density (lbs/ft^3)	Steel Yield Stress (ksi)	Bolt Diam. (in)	Bolt Pattern Diam. (in)	Num. Of Bolts	Bolt Cage X Inertia (in^4)	Bolt Cage Y Inertia (in^4)
CL&P10247	64.000	8F	2.750	2214	38.475	25.000	0	490.00	60.000	2.250	57.000	16	28581.28	28581.28

Base Plate Bolt Coordinates for Property "CL&P10247":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0.2061	1	0
0.4123	1	0
1	0.4123	0
1	0.2061	0



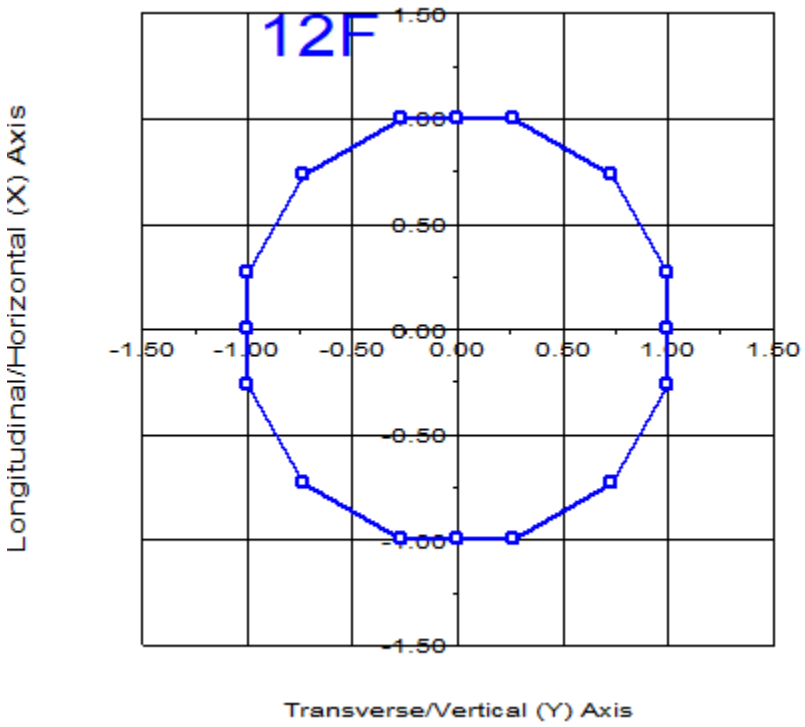
Steel Pole Connectivity:

Pole Label	Tip Joint	Base Joint	X of Base (ft)	Y of Base (ft)	Z of Base (ft)	Inclin. About X (deg)	Inclin. About Y (deg)	Property Set	Attach. Labels	Base Connect	Embed % Override	Embed C. Override (ft)
10247		0	0	0	0	0		CL&P10247	16 labels		0.00	0

Relative Attachment Labels for Steel Pole "10247":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
10247:Arm1	0.00	114.06
10247:Arm2	0.00	101.63
10247:Arm3	0.00	79.63
10247:Arm4	0.00	57.63
10247:TopConn	0.00	113.00
10247:BotConn	0.00	105.00
10247:WVGD1	0.00	5.00
10247:WVGD2	0.00	15.00
10247:WVGD3	0.00	25.00
10247:WVGD4	0.00	35.00
10247:WVGD5	0.00	45.00

10247:WVGD6	0.00	55.00
10247:WVGD7	0.00	65.00
10247:WVGD8	0.00	75.00
10247:WVGD9	0.00	85.00
10247:WVGD10	0.00	95.00



Pole Steel Properties:

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

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	T-Moment Inertia (in^4)	L-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	T-Moment Capacity (ft-k)	L-Moment Capacity (ft-k)
10247	10247:t	10247:t Ori	0.00	16.94	16.70	591.15	591.15	0.00	11.8	65.00	65.00	378.10	378.10
10247	10247:Arm1	10247:Arm1 End	0.94	17.20	16.97	619.58	619.58	0.00	12.1	65.00	65.00	390.24	390.24
10247	10247:Arm1	10247:Arm1 Ori	0.94	17.20	16.97	619.58	619.58	0.00	12.1	65.00	65.00	390.24	390.24
10247	10247:TopConn	10247:TopConn End	2.00	17.50	17.27	652.88	652.88	0.00	12.3	65.00	65.00	404.23	404.23
10247	10247:TopConn	10247:TopConn Ori	2.00	17.50	17.27	652.88	652.88	0.00	12.3	65.00	65.00	404.23	404.23
10247	#10247:0	Tube 1 End	6.00	18.62	18.39	788.95	788.95	0.00	13.3	65.00	65.00	459.10	459.10
10247	#10247:0	Tube 1 Ori	6.00	18.62	18.39	788.95	788.95	0.00	13.3	65.00	65.00	459.10	459.10
10247	10247:BotConn	10247:BotConn End	10.00	19.74	19.52	942.72	942.72	0.00	14.2	65.00	65.00	517.46	517.46
10247	10247:BotConn	10247:BotConn Ori	10.00	19.74	19.52	942.72	942.72	0.00	14.2	65.00	65.00	517.46	517.46
10247	10247:Arm2	10247:Arm2 End	13.37	20.68	20.47	1087.04	1087.04	0.00	15.1	65.00	65.00	569.42	569.42
10247	10247:Arm2	10247:Arm2 Ori	13.37	20.68	20.47	1087.04	1087.04	0.00	15.1	65.00	65.00	569.42	569.42
10247	#10247:1	Tube 1 End	16.69	21.61	21.40	1242.31	1242.31	0.00	15.8	65.00	65.00	622.84	622.84
10247	#10247:1	Tube 1 Ori	16.69	21.61	21.40	1242.31	1242.31	0.00	15.8	65.00	65.00	622.84	622.84
10247	10247:WVGD10	10247:WVGD10 End	20.00	22.54	22.33	1411.71	1411.71	0.00	16.6	65.00	65.00	678.65	678.65
10247	10247:WVGD10	10247:WVGD10 Ori	20.00	22.54	22.33	1411.71	1411.71	0.00	16.6	65.00	65.00	678.65	678.65
10247	#10247:2	Tube 1 End	25.00	23.93	23.74	1695.53	1695.53	0.00	17.8	65.00	65.00	767.43	767.43
10247	#10247:2	Tube 1 Ori	25.00	23.93	23.74	1695.53	1695.53	0.00	17.8	65.00	65.00	767.43	767.43
10247	10247:WVGD9	10247:WVGD9 End	30.00	25.33	25.14	2015.04	2015.04	0.00	19.0	65.00	65.00	861.66	861.66
10247	10247:WVGD9	10247:WVGD9 Ori	30.00	25.33	25.14	2015.04	2015.04	0.00	19.0	65.00	65.00	861.66	861.66
10247	#10247:3	Tube 1 End	32.69	26.09	25.90	2202.27	2202.27	0.00	19.7	65.00	65.00	914.57	914.57
10247	#10247:3	Tube 1 Ori	32.69	26.09	25.90	2202.27	2202.27	0.00	19.7	65.00	65.00	914.57	914.57
10247	10247:Arm3	10247:Arm3 End	35.38	26.84	26.65	2400.75	2400.75	0.00	20.3	65.00	65.00	969.05	969.05
10247	10247:Arm3	10247:Arm3 Ori	35.38	26.84	26.65	2400.75	2400.75	0.00	20.3	65.00	65.00	969.05	969.05
10247	10247:WVGD8	10247:WVGD8 End	40.00	28.13	27.95	2769.62	2769.62	0.00	21.4	65.00	65.00	1066.51	1066.51
10247	10247:WVGD8	10247:WVGD8 Ori	40.00	28.13	27.95	2769.62	2769.62	0.00	21.4	65.00	65.00	1066.51	1066.51
10247	#10247:4	Tube 1 End	45.00	29.53	29.36	3208.92	3208.92	0.00	22.6	65.00	65.00	1177.11	1177.11
10247	#10247:4	Tube 1 Ori	45.00	29.53	29.36	3208.92	3208.92	0.00	22.6	65.00	65.00	1177.11	1177.11
10247	10247:WVGD7	10247:WVGD7 End	50.00	30.93	30.77	3692.38	3692.38	0.00	23.8	65.00	65.00	1293.18	1293.18
10247	10247:WVGD7	10247:WVGD7 Ori	50.00	30.93	30.77	3692.38	3692.38	0.00	23.8	65.00	65.00	1293.18	1293.18
10247	#10247:5	SpliceT End	50.50	31.07	30.91	3743.23	3743.23	0.00	24.0	65.00	65.00	1305.09	1305.09
10247	#10247:5	SpliceT Ori	50.50	31.07	30.91	3743.23	3743.23	0.00	24.0	65.00	65.00	1305.09	1305.09
10247	#10247:6	SpliceB End	55.00	31.71	37.78	4747.35	4747.35	0.00	20.0	65.00	65.00	1622.05	1622.05
10247	#10247:6	SpliceB Ori	55.00	31.71	37.78	4747.35	4747.35	0.00	20.0	65.00	65.00	1622.05	1622.05
10247	10247:Arm4	10247:Arm4 End	57.38	32.37	38.58	5055.94	5055.94	0.00	20.5	65.00	65.00	1692.01	1692.01
10247	10247:Arm4	10247:Arm4 Ori	57.38	32.37	38.58	5055.94	5055.94	0.00	20.5	65.00	65.00	1692.01	1692.01
10247	10247:WVGD6	10247:WVGD6 End	60.00	33.11	39.47	5412.26	5412.26	0.00	21.0	65.00	65.00	1771.06	1771.06

10247	10247:WVGD6	10247:WVGD6 Ori	60.00	33.11	39.47	5412.26	5412.26	0.00	21.0	65.00	65.00	1771.06	1771.06
10247	#10247:7	Tube 2 End	65.00	34.51	41.15	6136.53	6136.53	0.00	22.0	65.00	65.00	1926.62	1926.62
10247	#10247:7	Tube 2 Ori	65.00	34.51	41.15	6136.53	6136.53	0.00	22.0	65.00	65.00	1926.62	1926.62
10247	10247:WVGD5	10247:WVGD5 End	70.00	35.90	42.84	6922.69	6922.69	0.00	23.0	65.00	65.00	2088.73	2088.73
10247	10247:WVGD5	10247:WVGD5 Ori	70.00	35.90	42.84	6922.69	6922.69	0.00	23.0	65.00	65.00	2088.73	2088.73
10247	#10247:8	Tube 2 End	75.00	37.30	44.53	7773.29	7773.29	0.00	24.0	65.00	65.00	2257.39	2257.39
10247	#10247:8	Tube 2 Ori	75.00	37.30	44.53	7773.29	7773.29	0.00	24.0	65.00	65.00	2257.39	2257.39
10247	10247:WVGD4	10247:WVGD4 End	80.00	38.70	46.22	8690.86	8690.86	0.00	25.0	65.00	65.00	2432.60	2432.60
10247	10247:WVGD4	10247:WVGD4 Ori	80.00	38.70	46.22	8690.86	8690.86	0.00	25.0	65.00	65.00	2432.60	2432.60
10247	#10247:9	Tube 2 End	84.58	39.99	47.76	9593.30	9593.30	0.00	25.9	65.00	65.00	2599.02	2599.02
10247	#10247:9	Tube 2 Ori	84.58	39.99	47.76	9593.30	9593.30	0.00	25.9	65.00	65.00	2599.02	2599.02
10247	#10247:10	SpliceT End	89.17	41.27	49.31	10556.15	10556.15	0.00	26.8	65.00	65.00	2770.95	2770.95
10247	#10247:10	SpliceT Ori	89.17	41.27	49.31	10556.15	10556.15	0.00	26.8	65.00	65.00	2770.95	2770.95
10247	10247:WVGD3	10247:WVGD3 End	90.00	40.75	52.70	10981.66	10981.66	0.00	24.2	65.00	65.00	2919.26	2919.26
10247	10247:WVGD3	10247:WVGD3 Ori	90.00	40.75	52.70	10981.66	10981.66	0.00	24.2	65.00	65.00	2919.26	2919.26
10247	#10247:11	SpliceB End	95.00	42.15	54.53	12164.40	12164.40	0.00	25.1	65.00	65.00	3126.31	3126.31
10247	#10247:11	SpliceB Ori	95.00	42.15	54.53	12164.40	12164.40	0.00	25.1	65.00	65.00	3126.31	3126.31
10247	10247:WVGD2	10247:WVGD2 End	100.00	43.55	56.36	13429.16	13429.16	0.00	26.0	65.00	65.00	3340.46	3340.46
10247	10247:WVGD2	10247:WVGD2 Ori	100.00	43.55	56.36	13429.16	13429.16	0.00	26.0	65.00	65.00	3340.46	3340.46
10247	#10247:12	Tube 3 End	105.00	44.95	58.19	14778.68	14778.68	0.00	27.0	65.00	65.00	3561.70	3561.70
10247	#10247:12	Tube 3 Ori	105.00	44.95	58.19	14778.68	14778.68	0.00	27.0	65.00	65.00	3561.70	3561.70
10247	10247:WVGD1	10247:WVGD1 End	110.00	46.35	60.01	16215.72	16215.72	0.00	27.9	65.00	65.00	3790.03	3790.03
10247	10247:WVGD1	10247:WVGD1 Ori	110.00	46.35	60.01	16215.72	16215.72	0.00	27.9	65.00	65.00	3790.03	3790.03
10247	10247:g	10247:g End	115.00	47.75	61.84	17743.02	17743.02	0.00	28.8	65.00	65.00	4025.46	4025.46

Tubular Davit Properties:

Davit Property Label	Stock Number	Steel Shape	Thickness or Diameter (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 Density (lbs/ft^3)	Steel Texture Shape
ARM1	601420	6T	0.1875	10.75	6	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0	
ARM2	601515	8T	0.25	18.46	9	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0	

Intermediate Joints for Davit Property "ARM1":

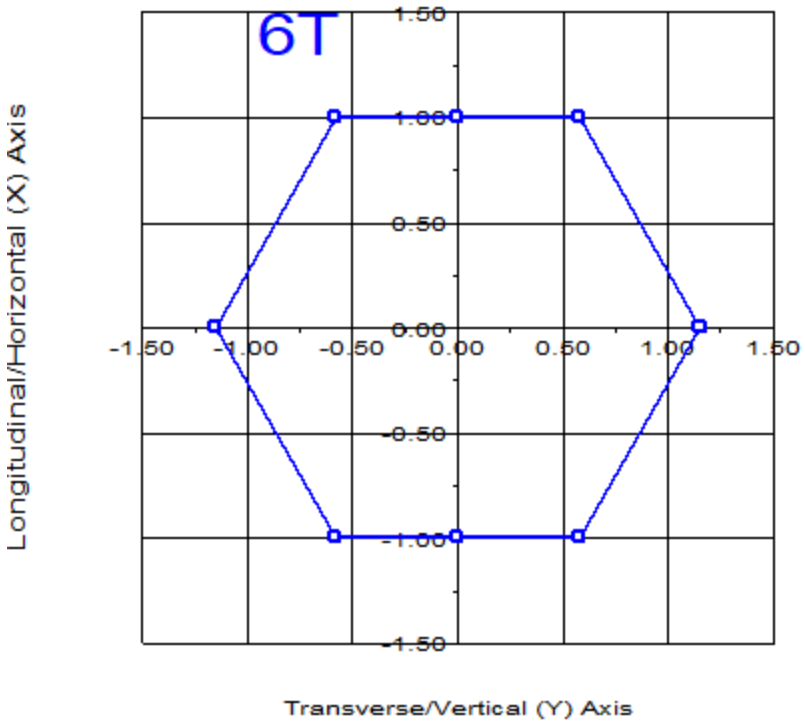
Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
End	10	-1.4375

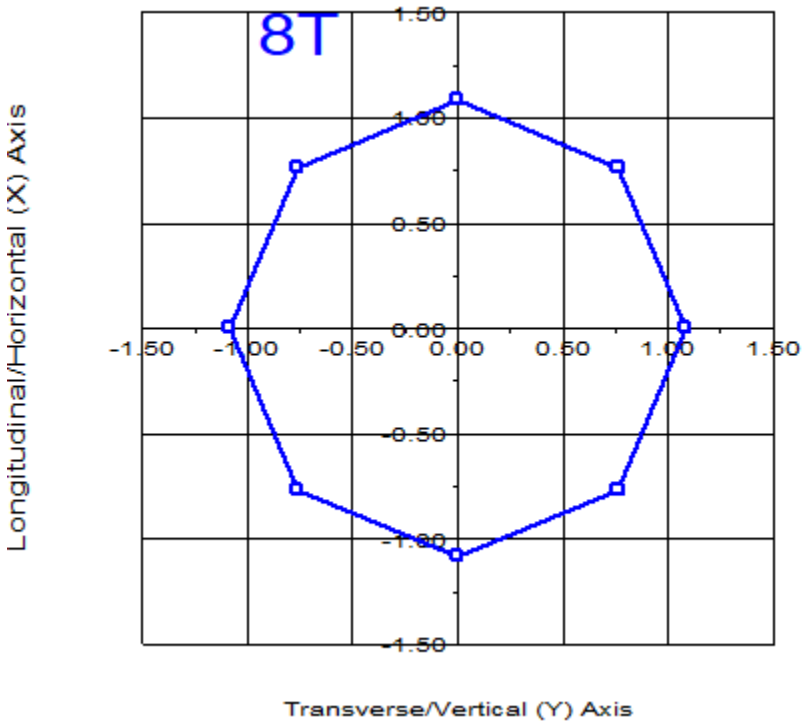
Intermediate Joints for Davit Property "ARM2":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
End	14	-2

Tubular Davit Arm Connectivity:

Davit Label	Attach Label	Davit Property Set	Azimuth (deg)
Davit1	10247:Arm1	ARM1	180
Davit2	10247:Arm1	ARM1	0
Davit3	10247:Arm2	ARM2	180
Davit4	10247:Arm2	ARM2	0
Davit5	10247:Arm3	ARM2	180
Davit6	10247:Arm3	ARM2	0
Davit7	10247:Arm4	ARM2	180
Davit8	10247:Arm4	ARM2	0





Tubular Davit Arm Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	V-Moment Inertia (in^4)	H-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	V-Moment Capacity (ft-k)	H-Moment Capacity (ft-k)
Davit1	Davit1:O	Origin	0.00	10.75	6.86	106.34	106.34	0.00	27.3	65.00	65.00	92.80	107.16
Davit1	#Davit1:0	End	5.00	8.40	5.33	49.98	49.98	0.00	20.1	65.00	65.00	55.82	64.46
Davit1	#Davit1:0	Origin	5.00	8.40	5.33	49.98	49.98	0.00	20.1	65.00	65.00	55.82	64.46
Davit1	#Davit1:1	End	7.55	7.20	4.55	31.12	31.12	0.00	16.4	65.00	65.00	40.56	46.83

Davit1	#Davit1:1	Origin	7.55	7.20	4.55	31.12	31.12	0.00	16.4	65.00	65.00	40.56	46.83
Davit1	Davit1:End	End	10.10	6.00	3.78	17.73	17.73	0.00	12.7	65.00	65.00	27.73	32.02
Davit2	Davit2:O	Origin	0.00	10.75	6.86	106.34	106.34	0.00	27.3	65.00	65.00	92.80	107.16
Davit2	#Davit2:0	End	5.00	8.40	5.33	49.98	49.98	0.00	20.1	65.00	65.00	55.82	64.46
Davit2	#Davit2:0	Origin	5.00	8.40	5.33	49.98	49.98	0.00	20.1	65.00	65.00	55.82	64.46
Davit2	#Davit2:1	End	7.55	7.20	4.55	31.12	31.12	0.00	16.4	65.00	65.00	40.56	46.83
Davit2	#Davit2:1	Origin	7.55	7.20	4.55	31.12	31.12	0.00	16.4	65.00	65.00	40.56	46.83
Davit2	Davit2:End	End	10.10	6.00	3.78	17.73	17.73	0.00	12.7	65.00	65.00	27.73	32.02
Davit3	Davit3:O	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
Davit3	#Davit3:0	End	5.00	15.12	12.31	359.72	359.72	0.00	20.9	65.00	65.00	238.19	238.19
Davit3	#Davit3:0	Origin	5.00	15.12	12.31	359.72	359.72	0.00	20.9	65.00	65.00	238.19	238.19
Davit3	#Davit3:1	End	9.57	12.06	9.78	180.30	180.30	0.00	15.8	65.00	65.00	149.66	149.66
Davit3	#Davit3:1	Origin	9.57	12.06	9.78	180.30	180.30	0.00	15.8	65.00	65.00	149.66	149.66
Davit3	Davit3:End	End	14.14	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
Davit4	Davit4:O	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
Davit4	#Davit4:0	End	5.00	15.12	12.31	359.72	359.72	0.00	20.9	65.00	65.00	238.19	238.19
Davit4	#Davit4:0	Origin	5.00	15.12	12.31	359.72	359.72	0.00	20.9	65.00	65.00	238.19	238.19
Davit4	#Davit4:1	End	9.57	12.06	9.78	180.30	180.30	0.00	15.8	65.00	65.00	149.66	149.66
Davit4	#Davit4:1	Origin	9.57	12.06	9.78	180.30	180.30	0.00	15.8	65.00	65.00	149.66	149.66
Davit4	Davit4:End	End	14.14	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
Davit5	Davit5:O	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
Davit5	#Davit5:0	End	5.00	15.12	12.31	359.72	359.72	0.00	20.9	65.00	65.00	238.19	238.19
Davit5	#Davit5:0	Origin	5.00	15.12	12.31	359.72	359.72	0.00	20.9	65.00	65.00	238.19	238.19
Davit5	#Davit5:1	End	9.57	12.06	9.78	180.30	180.30	0.00	15.8	65.00	65.00	149.66	149.66
Davit5	#Davit5:1	Origin	9.57	12.06	9.78	180.30	180.30	0.00	15.8	65.00	65.00	149.66	149.66
Davit5	Davit5:End	End	14.14	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
Davit6	Davit6:O	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
Davit6	#Davit6:0	End	5.00	15.12	12.31	359.72	359.72	0.00	20.9	65.00	65.00	238.19	238.19
Davit6	#Davit6:0	Origin	5.00	15.12	12.31	359.72	359.72	0.00	20.9	65.00	65.00	238.19	238.19
Davit6	#Davit6:1	End	9.57	12.06	9.78	180.30	180.30	0.00	15.8	65.00	65.00	149.66	149.66
Davit6	#Davit6:1	Origin	9.57	12.06	9.78	180.30	180.30	0.00	15.8	65.00	65.00	149.66	149.66
Davit6	Davit6:End	End	14.14	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
Davit7	Davit7:O	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
Davit7	#Davit7:0	End	5.00	15.12	12.31	359.72	359.72	0.00	20.9	65.00	65.00	238.19	238.19
Davit7	#Davit7:0	Origin	5.00	15.12	12.31	359.72	359.72	0.00	20.9	65.00	65.00	238.19	238.19
Davit7	#Davit7:1	End	9.57	12.06	9.78	180.30	180.30	0.00	15.8	65.00	65.00	149.66	149.66
Davit7	#Davit7:1	Origin	9.57	12.06	9.78	180.30	180.30	0.00	15.8	65.00	65.00	149.66	149.66
Davit7	Davit7:End	End	14.14	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
Davit8	Davit8:O	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
Davit8	#Davit8:0	End	5.00	15.12	12.31	359.72	359.72	0.00	20.9	65.00	65.00	238.19	238.19
Davit8	#Davit8:0	Origin	5.00	15.12	12.31	359.72	359.72	0.00	20.9	65.00	65.00	238.19	238.19
Davit8	#Davit8:1	End	9.57	12.06	9.78	180.30	180.30	0.00	15.8	65.00	65.00	149.66	149.66
Davit8	#Davit8:1	Origin	9.57	12.06	9.78	180.30	180.30	0.00	15.8	65.00	65.00	149.66	149.66
Davit8	Davit8:End	End	14.14	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63

*** Insulator Data

Clamp Properties:

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

Clamp Insulator Connectivity:

Clamp Label	Structure Property And Tip Attach	Set	Min. Required Vertical Load (uplift) (lbs)
Clamp1	Davit1:End	clamp	No Limit
Clamp2	Davit2:End	clamp	No Limit
Clamp3	Davit3:End	clamp	No Limit
Clamp4	Davit4:End	clamp	No Limit
Clamp5	Davit5:End	clamp	No Limit
Clamp6	Davit6:End	clamp	No Limit
Clamp7	Davit7:End	clamp	No Limit
Clamp8	Davit8:End	clamp	No Limit
Clamp9	10247:TopConn	clamp	No Limit
Clamp10	10247:BotConn	clamp	No Limit
Clamp13	10247:WVGD1	clamp	No Limit
Clamp14	10247:WVGD2	clamp	No Limit
Clamp15	10247:WVGD3	clamp	No Limit
Clamp16	10247:WVGD4	clamp	No Limit
Clamp17	10247:WVGD5	clamp	No Limit
Clamp18	10247:WVGD6	clamp	No Limit
Clamp19	10247:WVGD7	clamp	No Limit
Clamp20	10247:WVGD8	clamp	No Limit
Clamp21	10247:WVGD9	clamp	No Limit
Clamp22	10247:WVGD10	clamp	No Limit

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

Material List

Stock Number	Item Description	Quantity	Unit of Measure
601420	Tubular Davit property: ARM1	2.00	Each
601515	Tubular Davit property: ARM2	6.00	Each
clamp1	Clamp property: clamp	20.00	Each
10247	Steel Pole property: CL&P10247	1.00	Each

*** Loads Data

Loads from file: J:\Jobs\2105100.WI\05_CT11201A\05_Structural\Backup Documentation\Rev (1)\Calcs\PLS-Pole\cl&p #10247.lca

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

Loading Method Parameters:

Structure Height Summary (used for calculating wind/ice adjust with height):
  Z of ground for wind height adjust   0.00 (ft) and structure Z coordinate that will be put on the centerline ground profile in PLS-CADD.
  Ground elevation shift   0.00 (ft)
  Z of ground with shift   0.00 (ft)
  Z of structure top (highest joint)   115.50 (ft)
  Structure height   115.50 (ft)
  Structure height above ground   115.50 (ft)

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Poles Tubular Arms and Towers	SF for Wood Poles	SF for Conc. Poles Ult.	SF for Conc. Poles First Crack	SF for Conc. Poles Zero Tens.	SF for Guys and Cables	SF for Non Tubular Arms	SF for Braces	SF for Insuls.	SF for Hardware	SF For Found.	Point Loads	Wind/Ice Model	Trans. Wind Pressure (psf)	Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature (deg F)	Pole Deflection Check	Pole Deflection Limit % or (ft)
NESC Heavy	1.5000	2.5000	1.00000	0.6500	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	20 loads	Wind on All	4	0	0.000	56.000	0.0	No Limit	0
NESC Extreme	1.0000	1.0000	1.00000	0.6500	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	20 loads	NESC 2017	25.6	0	0.000	0.000	0.0	No Limit	0

Point Loads for Load Case "NESC Heavy":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	898	735	25	Shield Wire
Davit2:End	865	666	25	Shield Wire
Davit3:End	5732	2263	50	Conductor
Davit4:End	4178	1445	50	Conductor
Davit5:End	5750	2255	50	Conductor
Davit6:End	3563	2122	50	Conductor
Davit7:End	5692	2244	50	Conductor
Davit8:End	3012	2902	50	Conductor
10247:TopConn	0	3108	0	Top Connection
10247:BotConn	5827	-1717	0	Bottom Connection
10247:WVGD1	688	137	0	Coax Cables
10247:WVGD2	688	137	0	Coax Cables
10247:WVGD3	688	137	0	Coax Cables
10247:WVGD4	688	137	0	Coax Cables
10247:WVGD5	688	137	0	Coax Cables
10247:WVGD6	688	137	0	Coax Cables
10247:WVGD7	688	137	0	Coax Cables
10247:WVGD8	688	137	0	Coax Cables
10247:WVGD9	688	137	0	Coax Cables
10247:WVGD10	1033	206	0	Coax Cables

Point Loads for Load Case "NESC Extreme":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	248	547	25	Shield Wire
Davit2:End	242	447	25	Shield Wire
Davit3:End	2461	3073	50	Conductor
Davit4:End	2097	1666	50	Conductor
Davit5:End	2462	2951	50	Conductor
Davit6:End	1695	1970	50	Conductor
Davit7:End	2410	2793	50	Conductor
Davit8:End	1338	2286	50	Conductor
10247:TopConn	0	10362	0	Top Connection
10247:BotConn	2562	-5776	0	Bottom Connection
10247:WVGD1	158	323	0	Coax Cables
10247:WVGD2	158	323	0	Coax Cables
10247:WVGD3	158	323	0	Coax Cables
10247:WVGD4	158	323	0	Coax Cables
10247:WVGD5	158	323	0	Coax Cables
10247:WVGD6	158	323	0	Coax Cables
10247:WVGD7	158	323	0	Coax Cables
10247:WVGD8	158	323	0	Coax Cables

10247:WVGD9	158	323	0	Coax Cables
10247:WVGD10	238	485	0	Coax Cables

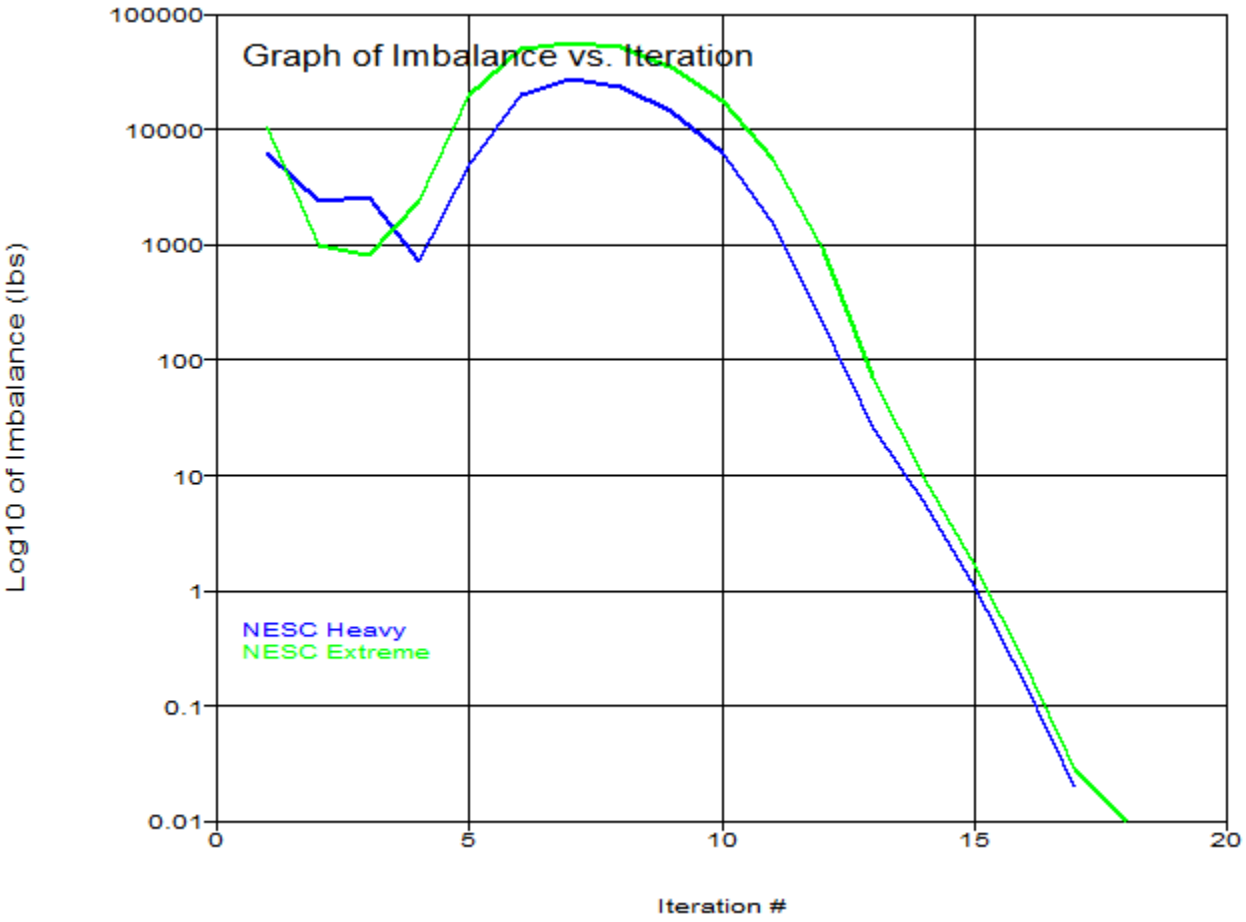
Detailed Pole Loading Data for Load Case "NESC Extreme":

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

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Vertical Load (lbs)	Ice Tran. Wind Load (lbs)	Ice Long. Wind Load (lbs)
10247	10247:t	10247:Arm1	115.00	114.06	114.53	17.069	1.31e+06	1.000	26.34	0.00	53.71	35.12	0.00	0.00	0.00
10247	10247:Arm1	10247:TopConn	114.06	113.00	113.53	17.349	1.33e+06	1.000	26.34	0.00	61.89	40.46	0.00	0.00	0.00
10247	10247:TopConn		113.00	109.00	111.00	18.057	1.39e+06	1.000	26.34	0.00	242.68	158.52	0.00	0.00	0.00
10247		10247:BotConn	109.00	105.00	107.00	19.177	1.47e+06	1.000	26.34	0.00	258.00	168.35	0.00	0.00	0.00
10247	10247:BotConn	10247:Arm2	105.00	101.63	103.31	20.209	1.55e+06	1.000	26.34	0.00	229.59	149.69	0.00	0.00	0.00
10247	10247:Arm2		101.63	98.31	99.97	21.145	1.62e+06	1.000	26.34	0.00	235.94	153.72	0.00	0.00	0.00
10247		10247:WVGD10	98.31	95.00	96.66	22.072	1.7e+06	1.000	26.34	0.00	246.44	160.46	0.00	0.00	0.00
10247	10247:WVGD10		95.00	90.00	92.50	23.235	1.79e+06	1.000	26.34	0.00	391.88	254.98	0.00	0.00	0.00
10247		10247:WVGD9	90.00	85.00	87.50	24.635	1.89e+06	1.000	26.34	0.00	415.80	270.33	0.00	0.00	0.00
10247	10247:WVGD9		85.00	82.31	83.66	25.710	1.98e+06	1.000	26.34	0.00	233.38	151.65	0.00	0.00	0.00
10247		10247:Arm3	82.31	79.63	80.97	26.463	2.03e+06	1.000	26.34	0.00	240.29	156.09	0.00	0.00	0.00
10247	10247:Arm3	10247:WVGD8	79.63	75.00	77.31	27.486	2.11e+06	1.000	26.34	0.00	429.71	279.00	0.00	0.00	0.00
10247	10247:WVGD8		75.00	70.00	72.50	28.833	2.22e+06	1.000	26.34	0.00	487.58	316.40	0.00	0.00	0.00
10247		10247:WVGD7	70.00	65.00	67.50	30.232	2.32e+06	1.000	26.34	0.00	511.50	331.76	0.00	0.00	0.00
10247	10247:WVGD7		65.00	64.50	64.75	31.002	2.38e+06	1.000	26.34	0.00	52.47	34.02	0.00	0.00	0.00
10247			64.50	60.00	62.25	31.389	2.41e+06	1.000	26.34	0.00	1049.82	310.01	0.00	0.00	0.00
10247		10247:Arm4	60.00	57.63	58.81	32.039	2.46e+06	1.000	26.34	0.00	308.63	167.00	0.00	0.00	0.00
10247	10247:Arm4	10247:WVGD6	57.63	55.00	56.31	32.739	2.52e+06	1.000	26.34	0.00	348.57	188.61	0.00	0.00	0.00
10247	10247:WVGD6		55.00	50.00	52.50	33.806	2.6e+06	1.000	26.34	0.00	685.83	370.98	0.00	0.00	0.00
10247		10247:WVGD5	50.00	45.00	47.50	35.205	2.7e+06	1.000	26.34	0.00	714.54	386.33	0.00	0.00	0.00
10247	10247:WVGD5		45.00	40.00	42.50	36.605	2.81e+06	1.000	26.34	0.00	743.25	401.69	0.00	0.00	0.00
10247		10247:WVGD4	40.00	35.00	37.50	38.004	2.92e+06	1.000	26.34	0.00	771.96	417.05	0.00	0.00	0.00
10247	10247:WVGD4		35.00	30.42	32.71	39.345	3.02e+06	1.000	26.34	0.00	733.12	395.93	0.00	0.00	0.00
10247			30.42	25.83	28.12	40.629	3.12e+06	1.000	26.34	0.00	757.26	408.84	0.00	0.00	0.00
10247		10247:WVGD3	25.83	25.00	25.42	41.012	3.15e+06	1.000	26.34	0.00	288.08	74.71	0.00	0.00	0.00
10247	10247:WVGD3		25.00	20.00	22.50	41.452	3.18e+06	1.000	26.34	0.00	1770.31	454.89	0.00	0.00	0.00
10247		10247:WVGD2	20.00	15.00	17.50	42.852	3.29e+06	1.000	26.34	0.00	943.44	470.25	0.00	0.00	0.00
10247	10247:WVGD2		15.00	10.00	12.50	44.251	3.4e+06	1.000	26.34	0.00	974.43	485.60	0.00	0.00	0.00
10247		10247:WVGD1	10.00	5.00	7.50	45.651	3.51e+06	1.000	26.34	0.00	1005.53	500.96	0.00	0.00	0.00
10247	10247:WVGD1	10247:g	5.00	0.00	2.50	47.050	3.62e+06	1.000	26.34	0.00	1036.64	516.32	0.00	0.00	0.00

*** Analysis Results:

Maximum element usage is 77.05% for Base Plate "10247" in load case "NESC Extreme"
Maximum insulator usage is 12.95% for Clamp "Clamp9" in load case "NESC Extreme"



*** Analysis Results for Load Case No. 1 "NESC Heavy" - Number of iterations in SAPS 17

Equilibrium Joint Positions and Rotations for Load Case "NESC Heavy":

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
10247:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
10247:t	0.08049	3.298	-0.06608	-2.9032	0.0709	0.0006	0.08049	3.298	114.9
10247:Arm1	0.07933	3.25	-0.06487	-2.9032	0.0709	0.0006	0.07933	3.25	114
10247:TopConn	0.07802	3.196	-0.0635	-2.9019	0.0708	0.0006	0.07802	3.196	112.9
10247:BotConn	0.06819	2.795	-0.05335	-2.8392	0.0698	0.0006	0.06819	2.795	104.9
10247:Arm2	0.0641	2.629	-0.04922	-2.7940	0.0691	0.0006	0.0641	2.629	101.6
10247:WVGD10	0.05624	2.311	-0.04135	-2.6955	0.0666	0.0005	0.05624	2.311	94.96
10247:WVGD9	0.04506	1.858	-0.03077	-2.4729	0.0612	0.0004	0.04506	1.858	84.97
10247:Arm3	0.03947	1.632	-0.02585	-2.3342	0.0578	0.0004	0.03947	1.632	79.6
10247:WVGD8	0.03492	1.448	-0.02197	-2.2161	0.0546	0.0003	0.03492	1.448	74.98
10247:WVGD7	0.02603	1.086	-0.01495	-1.9212	0.0470	0.0003	0.02603	1.086	64.99
10247:Arm4	0.02033	0.8527	-0.01095	-1.7031	0.0415	0.0002	0.02033	0.8527	57.61
10247:WVGD6	0.01847	0.7762	-0.009719	-1.6306	0.0396	0.0002	0.01847	0.7762	54.99
10247:WVGD5	0.01221	0.5163	-0.005877	-1.3365	0.0320	0.0002	0.01221	0.5163	44.99
10247:WVGD4	0.007269	0.3091	-0.00328	-1.0288	0.0244	0.0001	0.007269	0.3091	35
10247:WVGD3	0.003651	0.156	-0.001665	-0.7200	0.0169	0.0001	0.003651	0.156	25
10247:WVGD2	0.001299	0.05572	-0.0007444	-0.4241	0.0099	0.0000	0.001299	0.05572	15
10247:WVGD1	0.0001455	0.006271	-0.000207	-0.1384	0.0032	0.0000	0.0001455	0.006271	5
Davit1:O	0.07939	3.251	-0.02857	-2.9032	0.0709	0.0006	0.07939	2.534	114
Davit1:End	0.08252	3.333	0.4556	-2.7036	0.0721	0.0067	0.08252	-7.384	116
Davit2:O	0.07928	3.249	-0.1012	-2.9032	0.0709	0.0006	0.07928	3.966	114
Davit2:End	0.08091	3.312	-0.6348	-3.1470	0.0715	-0.0054	0.08091	14.03	114.9
Davit3:O	0.06416	2.63	-0.007212	-2.7940	0.0691	0.0006	0.06416	1.768	101.6
Davit3:End	0.06808	2.731	0.6077	-2.3124	0.0701	0.0050	0.06808	-12.13	104.2
Davit4:O	0.06404	2.628	-0.09122	-2.7940	0.0691	0.0006	0.06404	3.489	101.5
Davit4:End	0.06603	2.713	-0.8309	-3.1932	0.0696	-0.0038	0.06603	17.58	102.8
Davit5:O	0.03952	1.633	0.0197	-2.3342	0.0578	0.0004	0.03952	0.5151	79.64
Davit5:End	0.04277	1.715	0.5224	-1.8486	0.0588	0.0048	0.04277	-13.4	82.15
Davit6:O	0.03942	1.632	-0.07139	-2.3342	0.0578	0.0004	0.03942	2.75	79.55

Davit6:End	0.04132	1.706	-0.6916	-2.6856	0.0583	-0.0040	0.04132	16.82	80.93
Davit7:O	0.02037	0.8533	0.02913	-1.7031	0.0415	0.0002	0.02037	-0.4955	57.65
Davit7:End	0.02275	0.9079	0.3786	-1.2191	0.0423	0.0047	0.02275	-14.44	60
Davit8:O	0.0203	0.8521	-0.05104	-1.7031	0.0415	0.0002	0.0203	2.201	57.57
Davit8:End	0.02197	0.9102	-0.5109	-2.0150	0.0420	-0.0042	0.02197	16.26	59.11

Joint Support Reactions for Load Case "NESC Heavy":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Uplift Usage %	Result. Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
10247:g	-0.49	0.0	-22.45	0.0	0.0	-74.78	0.0	0.0	78.08	0.0	1707.71	0.0	-39.6	0.0	0.0	-0.11	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC Heavy":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. Res. Usage %	Max. At Pt.
10247	10247:t	Origin	0.00	39.57	0.97	-0.79	-0.00	-0.00	0.0	-0.04	0.01	-0.00	-0.00	0.00	0.00	0.00	0.00	5
10247	10247:Arm1	End	0.94	39.00	0.95	-0.78	0.01	-0.00	0.0	-0.04	0.01	-0.00	-0.00	0.00	0.00	0.00	0.00	2
10247	10247:Arm1	Origin	0.94	39.00	0.95	-0.78	1.84	-0.08	0.0	-2.36	1.56	-0.05	-0.14	0.31	0.05	0.00	0.46	7
10247	10247:TopConn	End	2.00	38.36	0.94	-0.76	3.50	-0.13	0.0	-2.36	1.56	-0.05	-0.14	0.57	0.05	0.00	0.71	1.1
10247	10247:TopConn	Origin	2.00	38.36	0.94	-0.76	3.50	-0.13	0.0	-2.43	4.73	-0.06	-0.14	0.17	0.54	0.00	0.99	1.5
10247	Tube 1	End	6.00	35.93	0.88	-0.70	22.43	-0.36	0.0	-2.43	4.73	-0.06	-0.13	3.19	0.14	0.00	3.33	5.1
10247	Tube 1	Origin	6.00	35.93	0.88	-0.70	22.43	-0.36	0.0	-2.81	4.85	-0.06	-0.15	3.19	0.14	0.00	3.35	5.2
10247	10247:BotConn	End	10.00	33.53	0.82	-0.64	41.82	-0.60	0.0	-2.81	4.85	-0.06	-0.14	5.27	0.13	0.00	5.42	8.3
10247	10247:BotConn	Origin	10.00	33.53	0.82	-0.64	41.82	-0.60	0.0	-9.08	3.53	-0.07	-0.47	5.27	0.10	0.00	5.74	8.8
10247	10247:Arm2	End	13.37	31.54	0.77	-0.59	53.74	-0.83	0.0	-9.08	3.53	-0.07	-0.44	6.16	0.09	0.00	6.61	10.2
10247	10247:Arm2	Origin	13.37	31.54	0.77	-0.59	39.50	-1.06	0.0	-20.76	7.90	-0.19	-1.01	4.54	0.21	0.00	5.57	8.6
10247	Tube 1	End	16.69	29.62	0.72	-0.54	65.66	-1.68	0.0	-20.76	7.90	-0.19	-0.97	6.90	0.20	0.00	7.88	12.1
10247	Tube 1	Origin	16.69	29.62	0.72	-0.54	65.66	-1.68	0.0	-21.13	7.99	-0.19	-0.99	6.90	0.20	0.00	7.89	12.1
10247	10247:WVGD10	End	20.00	27.73	0.67	-0.50	92.13	-2.31	0.0	-21.13	7.99	-0.19	-0.95	8.88	0.19	0.00	9.84	15.1
10247	10247:WVGD10	Origin	20.00	27.73	0.67	-0.50	92.13	-2.31	0.0	-22.64	8.36	-0.19	-1.01	8.88	0.20	0.00	9.90	15.2
10247	Tube 1	End	25.00	24.95	0.61	-0.43	133.96	-3.28	0.0	-22.64	8.36	-0.19	-0.95	11.42	0.19	0.00	12.38	19.0
10247	Tube 1	Origin	25.00	24.95	0.61	-0.43	133.96	-3.28	0.0	-23.26	8.51	-0.20	-0.98	11.42	0.19	0.00	12.40	19.1
10247	10247:WVGD9	End	30.00	22.30	0.54	-0.37	176.49	-4.27	0.0	-23.26	8.51	-0.20	-0.93	13.40	0.18	0.00	14.33	22.0
10247	10247:WVGD9	Origin	30.00	22.30	0.54	-0.37	176.49	-4.27	0.0	-24.44	8.78	-0.20	-0.97	13.40	0.19	0.00	14.38	22.1
10247	Tube 1	End	32.69	20.92	0.51	-0.34	200.09	-4.81	0.0	-24.44	8.78	-0.20	-0.94	14.31	0.18	0.00	15.26	23.5
10247	Tube 1	Origin	32.69	20.92	0.51	-0.34	200.09	-4.81	0.0	-24.81	8.86	-0.20	-0.96	14.31	0.18	0.00	15.27	23.5
10247	10247:Arm3	End	35.38	19.59	0.47	-0.31	223.91	-5.36	0.0	-24.81	8.86	-0.20	-0.93	15.11	0.18	0.00	16.05	24.7
10247	10247:Arm3	Origin	35.38	19.59	0.47	-0.31	200.28	-5.58	0.1	-36.06	13.78	-0.32	-1.35	13.53	0.27	0.00	14.89	22.9
10247	10247:WVGD8	End	40.00	17.38	0.42	-0.26	264.02	-7.06	0.1	-36.06	13.78	-0.32	-1.29	16.21	0.26	0.00	17.50	26.9
10247	10247:WVGD8	Origin	40.00	17.38	0.42	-0.26	264.02	-7.06	0.1	-37.46	14.07	-0.32	-1.34	16.21	0.27	0.00	17.55	27.0
10247	Tube 1	End	45.00	15.13	0.36	-0.22	334.37	-8.67	0.1	-37.46	14.07	-0.32	-1.28	18.59	0.25	0.00	19.87	30.6
10247	Tube 1	Origin	45.00	15.13	0.36	-0.22	334.37	-8.67	0.1	-38.25	14.20	-0.33	-1.30	18.59	0.26	0.00	19.90	30.6
10247	10247:WVGD7	End	50.00	13.03	0.31	-0.18	405.35	-10.30	0.1	-38.25	14.20	-0.33	-1.24	20.51	0.24	0.00	21.76	33.5
10247	10247:WVGD7	Origin	50.00	13.03	0.31	-0.18	405.35	-10.30	0.1	-39.38	14.42	-0.33	-1.28	20.51	0.25	0.00	21.80	33.5
10247	SpliceT	End	50.50	12.83	0.31	-0.18	412.56	-10.46	0.1	-39.38	14.42	-0.33	-1.27	20.69	0.25	0.00	21.97	33.8
10247	SpliceT	Origin	50.50	12.83	0.31	-0.18	412.56	-10.46	0.1	-40.22	14.50	-0.33	-1.30	20.69	0.25	0.00	21.99	33.8
10247	SpliceB	End	55.00	11.10	0.27	-0.15	477.82	-11.95	0.1	-40.22	14.50	-0.33	-1.06	19.28	0.20	0.00	20.34	31.3
10247	SpliceB	Origin	55.00	11.10	0.27	-0.15	477.82	-11.95	0.1	-41.27	14.61	-0.33	-1.09	19.28	0.21			

0.00	20.37	31.3	2																		
	10247	10247:Arm4	End	57.38	10.23	0.24	-0.13	512.51	-12.74	0.1	-41.27	14.61	-0.33	-1.07	19.82	0.20					
0.00	20.89	32.1	2																		
	10247	10247:Arm4	Origin	57.38	10.23	0.24	-0.13	481.69	-12.95	0.1	-51.93	20.13	-0.44	-1.35	18.64	0.28					
0.00	19.99	30.8	2																		
	10247	10247:WVGD6	End	60.00	9.31	0.22	-0.12	534.51	-14.12	0.1	-51.93	20.13	-0.44	-1.32	19.76	0.27					
0.00	21.08	32.4	2																		
	10247	10247:WVGD6	Origin	60.00	9.31	0.22	-0.12	534.51	-14.12	0.1	-53.43	20.38	-0.45	-1.35	19.76	0.27					
0.00	21.12	32.5	2																		
	10247	Tube 2	End	65.00	7.68	0.18	-0.09	636.38	-16.35	0.1	-53.43	20.38	-0.45	-1.30	21.62	0.26					
0.00	22.92	35.3	2																		
	10247	Tube 2	Origin	65.00	7.68	0.18	-0.09	636.38	-16.35	0.1	-54.53	20.49	-0.45	-1.33	21.62	0.26					
0.00	22.95	35.3	2																		
	10247	10247:WVGD5	End	70.00	6.20	0.15	-0.07	738.85	-18.59	0.1	-54.53	20.49	-0.45	-1.27	23.15	0.25					
0.00	24.42	37.6	2																		
	10247	10247:WVGD5	Origin	70.00	6.20	0.15	-0.07	738.85	-18.59	0.1	-56.37	20.76	-0.45	-1.32	23.15	0.26					
0.00	24.47	37.6	2																		
	10247	Tube 2	End	75.00	4.87	0.11	-0.05	842.66	-20.86	0.1	-56.37	20.76	-0.45	-1.27	24.42	0.25					
0.00	25.69	39.5	2																		
	10247	Tube 2	Origin	75.00	4.87	0.11	-0.05	842.66	-20.86	0.1	-57.56	20.88	-0.46	-1.29	24.42	0.25					
0.00	25.72	39.6	2																		
	10247	10247:WVGD4	End	80.00	3.71	0.09	-0.04	947.08	-23.14	0.1	-57.56	20.88	-0.46	-1.25	25.47	0.24					
0.00	26.72	41.1	2																		
	10247	10247:WVGD4	Origin	80.00	3.71	0.09	-0.04	947.08	-23.14	0.1	-59.43	21.15	-0.46	-1.29	25.47	0.24					
0.00	26.76	41.2	2																		
	10247	Tube 2	End	84.58	2.79	0.07	-0.03	1044.04	-25.25	0.1	-59.43	21.15	-0.46	-1.24	26.28	0.23					
0.00	27.53	42.3	2																		
	10247	Tube 2	Origin	84.58	2.79	0.07	-0.03	1044.04	-25.25	0.1	-60.60	21.26	-0.46	-1.27	26.28	0.24					
0.00	27.55	42.4	2																		
	10247	SpliceT	End	89.17	2.00	0.05	-0.02	1141.52	-27.37	0.1	-60.60	21.26	-0.46	-1.23	26.95	0.23					
0.00	28.18	43.4	2																		
	10247	SpliceT	Origin	89.17	2.00	0.05	-0.02	1141.52	-27.37	0.1	-61.41	21.33	-0.46	-1.25	26.95	0.23					
0.00	28.20	43.4	2																		
	10247	10247:WVGD3	End	90.00	1.87	0.04	-0.02	1159.22	-27.75	0.1	-61.41	21.33	-0.46	-1.17	25.98	0.21					
0.00	27.14	41.8	2																		
	10247	10247:WVGD3	Origin	90.00	1.87	0.04	-0.02	1159.22	-27.75	0.1	-63.67	21.56	-0.47	-1.21	25.98	0.22					
0.00	27.19	41.8	2																		
	10247	SpliceB	End	95.00	1.19	0.03	-0.01	1267.01	-30.09	0.1	-63.67	21.56	-0.47	-1.17	26.51	0.21					
0.00	27.68	42.6	2																		
	10247	SpliceB	Origin	95.00	1.19	0.03	-0.01	1267.01	-30.09	0.1	-65.77	21.69	-0.47	-1.21	26.51	0.21					
0.00	27.72	42.6	2																		
	10247	10247:WVGD2	End	100.00	0.67	0.02	-0.01	1375.47	-32.45	0.1	-65.77	21.69	-0.47	-1.17	26.93	0.20					
0.00	28.10	43.2	2																		
	10247	10247:WVGD2	Origin	100.00	0.67	0.02	-0.01	1375.47	-32.45	0.1	-67.95	21.97	-0.48	-1.21	26.93	0.21					
0.00	28.14	43.3	2																		
	10247	Tube 3	End	105.00	0.30	0.01	-0.01	1485.30	-34.82	0.1	-67.95	21.97	-0.48	-1.17	27.28	0.20					
0.00	28.45	43.8	2																		
	10247	Tube 3	Origin	105.00	0.30	0.01	-0.01	1485.30	-34.82	0.1	-69.49	22.10	-0.48	-1.19	27.28	0.20					
0.00	28.47	43.8	2																		
	10247	10247:WVGD1	End	110.00	0.08	0.00	-0.00	1595.81	-37.22	0.1	-69.49	22.10	-0.48	-1.16	27.54	0.20					
0.00	28.70	44.2	2																		
	10247	10247:WVGD1	Origin	110.00	0.08	0.00	-0.00	1595.81	-37.22	0.1	-71.76	22.38	-0.48	-1.20	27.54	0.20					
0.00	28.74	44.2	2																		
	10247	10247:g	End	115.00	0.00	0.00	0.00	1707.71	-39.63	0.1	-71.76	22.38	-0.48	-1.16	27.75	0.19					
0.00	28.91	44.5	2																		

Detailed Tubular Davit Arm Usages for Load Case "NESC Heavy":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Vert. Mom. (ft-k)	Horz. Mom. (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Vert. Shear (kips)	Horz. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. Max. Usage (ksi)	At Pt. %
Davit1	Davit1:O	Origin	0.00	39.01	0.95	-0.34	-8.73	0.27	0.0	-0.93	0.93	-0.03	-0.14	6.11	0.01	0.00	6.25	9.6 1
Davit1	#Davit1:0	End	5.00	39.51	0.97	2.59	-4.07	0.13	0.0	-0.93	0.93	-0.03	-0.17	4.74	0.01	0.00	4.91	7.6 1
Davit1	#Davit1:0	Origin	5.00	39.51	0.97	2.59	-4.07	0.13	0.0	-0.91	0.83	-0.03	-0.17	4.74	0.01	0.00	4.91	7.6 1
Davit1	#Davit1:1	End	7.55	39.75	0.98	4.04	-1.96	0.07	0.0	-0.91	0.83	-0.03	-0.20	3.15	0.01	0.00	3.34	5.1 1
Davit1	#Davit1:1	Origin	7.55	39.75	0.98	4.04	-1.96	0.07	0.0	-0.90	0.77	-0.03	-0.20	3.15	0.01	0.00	3.34	5.1 1
Davit1	Davit1:End	End	10.10	39.99	0.99	5.47	-0.00	0.00	0.0	-0.90	0.77	-0.03	-0.24	0.00	0.43	0.00	0.79	1.2 3
Davit2	Davit2:O	Origin	0.00	38.99	0.95	-1.21	-10.58	-0.27	-0.0	0.57	1.12	0.03	0.08	7.41	0.01	0.00	7.49	11.5 1
Davit2	#Davit2:0	End	5.00	39.36	0.96	-4.32	-4.99	-0.13	-0.0	0.57	1.12	0.03	0.11	5.81	0.01	0.00	5.91	9.1 1
Davit2	#Davit2:0	Origin	5.00	39.36	0.96	-4.32	-4.99	-0.13	-0.0	0.58	1.01	0.03	0.11	5.81	0.01	0.00	5.91	9.1 1
Davit2	#Davit2:1	End	7.55	39.55	0.96	-5.95	-2.42	-0.07	-0.0	0.58	1.01	0.03	0.13	3.87	0.01	0.00	4.00	6.2 1
Davit2	#Davit2:1	Origin	7.55	39.55	0.96	-5.95	-2.42	-0.07	0.0	0.58	0.95	0.03	0.13	3.87	0.01	0.00	4.00	6.2 1

Davit2	Davit2:End	End	10.10	39.74	0.97	-7.62	0.00	0.00	0.0	0.58	0.95	0.03	0.15	0.00	0.53	0.00	0.94	1.4	3
Davit3	Davit3:O	Origin	0.00	31.56	0.77	-0.09	-78.72	0.81	0.0	-3.42	5.82	-0.06	-0.23	14.27	0.01	0.00	14.50	22.3	1
Davit3	#Davit3:0	End	5.00	32.02	0.79	2.70	-49.62	0.52	0.0	-3.42	5.82	-0.06	-0.28	13.54	0.01	0.00	13.82	21.3	1
Davit3	#Davit3:0	Origin	5.00	32.02	0.79	2.70	-49.62	0.52	0.0	-3.34	5.53	-0.06	-0.27	13.54	0.01	0.00	13.81	21.3	1
Davit3	#Davit3:1	End	9.57	32.41	0.80	5.07	-24.32	0.26	0.0	-3.34	5.53	-0.06	-0.34	10.56	0.01	0.00	10.91	16.8	1
Davit3	#Davit3:1	Origin	9.57	32.41	0.80	5.07	-24.32	0.26	0.0	-3.29	5.32	-0.06	-0.34	10.56	0.01	0.00	10.90	16.8	1
Davit3	Davit3:End	End	14.14	32.78	0.82	7.29	-0.00	0.00	0.0	-3.29	5.32	-0.06	-0.45	0.00	1.52	0.00	2.67	4.1	3
Davit4	Davit4:O	Origin	0.00	31.53	0.77	-1.09	-65.77	-0.79	-0.0	1.00	4.92	0.06	0.07	11.92	0.01	0.00	11.99	18.4	1
Davit4	#Davit4:0	End	5.00	31.88	0.78	-4.09	-41.16	-0.50	-0.0	1.00	4.92	0.06	0.08	11.23	0.01	0.00	11.31	17.4	1
Davit4	#Davit4:0	Origin	5.00	31.88	0.78	-4.09	-41.16	-0.50	-0.0	1.04	4.62	0.06	0.08	11.23	0.01	0.00	11.32	17.4	1
Davit4	#Davit4:1	End	9.57	32.22	0.78	-6.96	-20.05	-0.25	-0.0	1.04	4.62	0.06	0.11	8.71	0.01	0.00	8.81	13.6	1
Davit4	#Davit4:1	Origin	9.57	32.22	0.78	-6.96	-20.05	-0.25	0.0	1.07	4.39	0.05	0.11	8.71	0.01	0.00	8.82	13.6	1
Davit4	Davit4:End	End	14.14	32.56	0.79	-9.97	0.00	0.00	0.0	1.07	4.39	0.05	0.15	0.00	1.25	0.00	2.18	3.3	3
Davit5	Davit5:O	Origin	0.00	19.60	0.47	0.24	-79.37	0.80	0.0	-3.37	5.87	-0.06	-0.22	14.39	0.01	0.00	14.61	22.5	1
Davit5	#Davit5:0	End	5.00	19.98	0.49	2.55	-50.04	0.51	0.0	-3.37	5.87	-0.06	-0.27	13.66	0.01	0.00	13.93	21.4	1
Davit5	#Davit5:0	Origin	5.00	19.98	0.49	2.55	-50.04	0.51	0.0	-3.29	5.58	-0.06	-0.27	13.66	0.01	0.00	13.92	21.4	1
Davit5	#Davit5:1	End	9.57	20.29	0.50	4.48	-24.53	0.26	0.0	-3.29	5.58	-0.06	-0.34	10.65	0.01	0.00	10.99	16.9	1
Davit5	#Davit5:1	Origin	9.57	20.29	0.50	4.48	-24.53	0.26	0.0	-3.24	5.37	-0.06	-0.33	10.65	0.01	0.00	10.99	16.9	1
Davit5	Davit5:End	End	14.14	20.58	0.51	6.27	-0.00	0.00	0.0	-3.24	5.37	-0.06	-0.45	0.00	1.53	0.00	2.70	4.1	3
Davit6	Davit6:O	Origin	0.00	19.58	0.47	-0.86	-58.17	-0.76	-0.0	1.69	4.39	0.05	0.11	10.55	0.01	0.00	10.66	16.4	1
Davit6	#Davit6:0	End	5.00	19.88	0.48	-3.36	-36.24	-0.49	-0.0	1.69	4.39	0.05	0.14	9.89	0.01	0.00	10.03	15.4	1
Davit6	#Davit6:0	Origin	5.00	19.88	0.48	-3.36	-36.24	-0.49	-0.0	1.73	4.08	0.05	0.14	9.89	0.01	0.00	10.03	15.4	1
Davit6	#Davit6:1	End	9.57	20.17	0.49	-5.77	-17.59	-0.24	-0.0	1.73	4.08	0.05	0.18	7.64	0.01	0.00	7.82	12.0	1
Davit6	#Davit6:1	Origin	9.57	20.17	0.49	-5.77	-17.59	-0.24	0.0	1.76	3.85	0.05	0.18	7.64	0.01	0.00	7.82	12.0	1
Davit6	Davit6:End	End	14.14	20.48	0.50	-8.30	0.00	0.00	0.0	1.76	3.85	0.05	0.24	0.00	1.10	0.00	1.92	3.0	3
Davit7	Davit7:O	Origin	0.00	10.24	0.24	0.35	-79.10	0.77	0.0	-3.28	5.85	-0.06	-0.22	14.34	0.01	0.00	14.56	22.4	1
Davit7	#Davit7:0	End	5.00	10.50	0.25	2.01	-49.86	0.50	0.0	-3.28	5.85	-0.06	-0.27	13.61	0.01	0.00	13.87	21.3	1
Davit7	#Davit7:0	Origin	5.00	10.50	0.25	2.01	-49.86	0.50	0.0	-3.21	5.56	-0.05	-0.26	13.61	0.01	0.00	13.87	21.3	1
Davit7	#Davit7:1	End	9.57	10.71	0.26	3.35	-24.44	0.25	0.0	-3.21	5.56	-0.05	-0.33	10.61	0.01	0.00	10.94	16.8	1
Davit7	#Davit7:1	Origin	9.57	10.71	0.26	3.35	-24.44	0.25	0.0	-3.16	5.35	-0.05	-0.32	10.61	0.01	0.00	10.94	16.8	1
Davit7	Davit7:End	End	14.14	10.89	0.27	4.54	-0.00	0.00	0.0	-3.16	5.35	-0.05	-0.44	0.00	1.53	0.00	2.68	4.1	3
Davit8	Davit8:O	Origin	0.00	10.23	0.24	-0.61	-51.90	-0.74	-0.0	2.48	3.94	0.05	0.16	9.41	0.01	0.00	9.58	14.7	1
Davit8	#Davit8:0	End	5.00	10.46	0.25	-2.45	-32.18	-0.48	-0.0	2.48	3.94	0.05	0.20	8.78	0.01	0.00	8.98	13.8	1
Davit8	#Davit8:0	Origin	5.00	10.46	0.25	-2.45	-32.18	-0.48	-0.0	2.52	3.64	0.05	0.20	8.78	0.01	0.00	8.99	13.8	1
Davit8	#Davit8:1	End	9.57	10.69	0.26	-4.24	-15.56	-0.24	-0.0	2.52	3.64	0.05	0.26	6.76	0.01	0.00	7.02	10.8	1
Davit8	#Davit8:1	Origin	9.57	10.69	0.26	-4.24	-15.56	-0.24	0.0	2.55	3.40	0.05	0.26	6.76	0.01	0.00	7.02	10.8	1
Davit8	Davit8:End	End	14.14	10.92	0.26	-6.13	-0.00	0.00	0.0	2.55	3.40	0.05	0.35	0.00	0.97	0.00	1.72	2.6	3

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
Clamp1	1.161	80.00	80.00	1.45	0.00	0.00	0.00	1.45

Clamp2	1.092	80.00	80.00	1.36	0.00	0.00	0.00	1.36
Clamp3	6.163	80.00	80.00	7.70	0.00	0.00	0.00	7.70
Clamp4	4.421	80.00	80.00	5.53	0.00	0.00	0.00	5.53
Clamp5	6.177	80.00	80.00	7.72	0.00	0.00	0.00	7.72
Clamp6	4.147	80.00	80.00	5.18	0.00	0.00	0.00	5.18
Clamp7	6.119	80.00	80.00	7.65	0.00	0.00	0.00	7.65
Clamp8	4.183	80.00	80.00	5.23	0.00	0.00	0.00	5.23
Clamp9	3.108	80.00	80.00	3.88	0.00	0.00	0.00	3.88
Clamp10	6.075	80.00	80.00	7.59	0.00	0.00	0.00	7.59
Clamp13	0.702	80.00	80.00	0.88	0.00	0.00	0.00	0.88
Clamp14	0.702	80.00	80.00	0.88	0.00	0.00	0.00	0.88
Clamp15	0.702	80.00	80.00	0.88	0.00	0.00	0.00	0.88
Clamp16	0.702	80.00	80.00	0.88	0.00	0.00	0.00	0.88
Clamp17	0.702	80.00	80.00	0.88	0.00	0.00	0.00	0.88
Clamp18	0.702	80.00	80.00	0.88	0.00	0.00	0.00	0.88
Clamp19	0.702	80.00	80.00	0.88	0.00	0.00	0.00	0.88
Clamp20	0.702	80.00	80.00	0.88	0.00	0.00	0.00	0.88
Clamp21	0.702	80.00	80.00	0.88	0.00	0.00	0.00	0.88
Clamp22	1.053	80.00	80.00	1.32	0.00	0.00	0.00	1.32

*** Analysis Results for Load Case No. 2 "NESC Extreme" - Number of iterations in SAPS 18

Equilibrium Joint Positions and Rotations for Load Case "NESC Extreme":

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)
10247:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
10247:t	0.06544	5.232	-0.1622	-4.8951	0.0582	0.0005	0.06544	5.232	114.8
10247:Arm1	0.06449	5.152	-0.1588	-4.8951	0.0582	0.0005	0.06449	5.152	113.9
10247:TopConn	0.06341	5.061	-0.1549	-4.8941	0.0582	0.0005	0.06341	5.061	112.8
10247:BotConn	0.05534	4.385	-0.1263	-4.7577	0.0573	0.0004	0.05534	4.385	104.9
10247:Arm2	0.05198	4.108	-0.1148	-4.6567	0.0567	0.0004	0.05198	4.108	101.5
10247:WVGD10	0.04555	3.583	-0.09393	-4.4107	0.0545	0.0003	0.04555	3.583	94.91
10247:WVGD9	0.03642	2.85	-0.0669	-3.9686	0.0499	0.0002	0.03642	2.85	84.93
10247:Arm3	0.03187	2.49	-0.05471	-3.7152	0.0471	0.0002	0.03187	2.49	79.57
10247:WVGD8	0.02817	2.199	-0.04544	-3.4885	0.0444	0.0001	0.02817	2.199	74.95
10247:WVGD7	0.02095	1.634	-0.02924	-2.9701	0.0381	0.0001	0.02095	1.634	64.97
10247:Arm4	0.01633	1.275	-0.02035	-2.6078	0.0336	0.0001	0.01633	1.275	57.6
10247:WVGD6	0.01483	1.158	-0.01769	-2.4842	0.0320	0.0001	0.01483	1.158	54.98
10247:WVGD5	0.00977	0.7653	-0.009733	-2.0061	0.0258	0.0000	0.00977	0.7653	44.99
10247:WVGD4	0.005799	0.456	-0.004714	-1.5287	0.0196	0.0000	0.005799	0.456	35
10247:WVGD3	0.002903	0.2293	-0.001911	-1.0626	0.0135	0.0000	0.002903	0.2293	25
10247:WVGD2	0.001029	0.08169	-0.0005983	-0.6229	0.0079	0.0000	0.001029	0.08169	15
10247:WVGD1	0.0001147	0.009172	-0.0001121	-0.2027	0.0025	0.0000	0.0001147	0.009172	5
Davit1:O	0.06455	5.154	-0.09762	-4.8951	0.0582	0.0005	0.06455	4.437	114
Davit1:End	0.0676	5.312	0.7462	-4.8550	0.0596	0.0065	0.0676	-5.404	116.2
Davit2:O	0.06442	5.149	-0.2199	-4.8951	0.0582	0.0005	0.06442	5.866	113.8
Davit2:End	0.06554	5.236	-1.087	-4.9727	0.0586	-0.0056	0.06554	15.95	114.4
Davit3:O	0.05206	4.11	-0.04488	-4.6567	0.0567	0.0004	0.05206	3.249	101.6
Davit3:End	0.05585	4.314	1.063	-4.4920	0.0577	0.0048	0.05585	-10.55	104.7
Davit4:O	0.05191	4.105	-0.1848	-4.6567	0.0567	0.0004	0.05191	4.966	101.4
Davit4:End	0.05325	4.223	-1.357	-4.8634	0.0569	-0.0040	0.05325	19.08	102.3
Davit5:O	0.03193	2.492	0.01775	-3.7152	0.0471	0.0002	0.03193	1.374	79.64
Davit5:End	0.03496	2.647	0.8973	-3.5430	0.0480	0.0046	0.03496	-12.47	82.52
Davit6:O	0.0318	2.488	-0.1272	-3.7152	0.0471	0.0002	0.0318	3.606	79.5
Davit6:End	0.03325	2.59	-1.063	-3.8906	0.0474	-0.0042	0.03325	17.71	80.56
Davit7:O	0.01637	1.276	0.04102	-2.6078	0.0336	0.0001	0.01637	-0.07249	57.67
Davit7:End	0.01854	1.377	0.6519	-2.4316	0.0344	0.0045	0.01854	-13.97	60.28
Davit8:O	0.0163	1.274	-0.08172	-2.6078	0.0336	0.0001	0.0163	2.622	57.54
Davit8:End	0.01767	1.352	-0.7415	-2.7574	0.0340	-0.0043	0.01767	16.7	58.88

Joint Support Reactions for Load Case "NESC Extreme":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Uplift Usage %	Result. Usage %	Result. Force (kips)	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 %
10247:g	-0.35	0.0	-31.91	0.0	0.0	-39.45	0.0	0.0	50.74	0.0	2498.19	0.0	-31.3	0.0	0.0	-0.04	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC Extreme":

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. Res. Usage %	Max. At Pt.
10247	10247:t	Origin	0.00	62.78	0.79	-1.95	-0.00	-0.00	0.0	-0.03	0.02	-0.00	-0.00	0.00	0.00	0.00	0.00	5
10247	10247:Arm1	End	0.94	61.82	0.77	-1.91	0.02	-0.00	0.0	-0.03	0.02	-0.00	-0.00	0.00	0.00	0.00	0.00	3
10247	10247:Arm1	Origin	0.94	61.82	0.77	-1.91	1.61	-0.07	0.0	-0.84	1.13	-0.05	-0.05	0.27	0.04	0.00	0.33	2
10247	10247:TopConn	End	2.00	60.73	0.76	-1.86	2.81	-0.13	0.0	-0.84	1.13	-0.05	-0.05	0.46	0.04	0.00	0.51	2
10247	10247:TopConn	Origin	2.00	60.73	0.76	-1.86	2.81	-0.13	0.0	-0.11	11.56	-0.05	-0.01	0.02	1.37	0.00	2.37	5
10247	Tube 1	End	6.00	56.64	0.71	-1.68	49.07	-0.33	0.0	-0.11	11.56	-0.05	-0.01	6.96	0.33	0.00	6.99	2
10247	Tube 1	Origin	6.00	56.64	0.71	-1.68	49.07	-0.33	0.0	-0.37	11.75	-0.05	-0.02	6.96	0.34	0.00	7.00	2
10247	10247:BotConn	End	10.00	52.62	0.66	-1.52	96.05	-0.54	0.0	-0.37	11.75	-0.05	-0.02	12.08	0.32	0.00	12.12	2
10247	10247:BotConn	Origin	10.00	52.62	0.66	-1.52	96.05	-0.54	0.0	-3.67	6.38	-0.05	-0.19	12.08	0.17	0.00	12.27	2
10247	10247:Arm2	End	13.37	49.29	0.62	-1.38	117.58	-0.72	0.0	-3.67	6.38	-0.05	-0.18	13.44	0.17	0.00	13.63	2
10247	10247:Arm2	Origin	13.37	49.29	0.62	-1.38	124.23	-0.93	0.0	-9.12	11.72	-0.16	-0.45	14.21	0.30	0.00	14.66	2
10247	Tube 1	End	16.69	46.10	0.58	-1.25	163.05	-1.46	0.0	-9.12	11.72	-0.16	-0.43	17.06	0.29	0.00	17.49	2
10247	Tube 1	Origin	16.69	46.10	0.58	-1.25	163.05	-1.46	0.0	-9.39	11.88	-0.16	-0.44	17.06	0.30	0.00	17.50	2
10247	10247:WVGD10	End	20.00	42.99	0.55	-1.13	202.39	-1.99	0.0	-9.39	11.88	-0.16	-0.42	19.44	0.28			

0.00 19.86 30.6 2																
10247	10247:WVGD10	Origin	20.00	42.99	0.55	-1.13	202.39	-1.99	0.0	-9.94	12.58	-0.16	-0.45	19.44	0.30	
0.00 19.89 30.6 2																
10247	Tube 1	End	25.00	38.48	0.49	-0.96	265.28	-2.79	0.0	-9.94	12.58	-0.16	-0.42	22.53	0.28	
0.00 22.96 35.3 2																
10247	Tube 1	Origin	25.00	38.48	0.49	-0.96	265.28	-2.79	0.0	-10.39	12.83	-0.16	-0.44	22.53	0.29	
0.00 22.98 35.3 2																
10247	10247:WVGD9	End	30.00	34.21	0.44	-0.80	329.44	-3.59	0.0	-10.39	12.83	-0.16	-0.41	24.92	0.27	
0.00 25.34 39.0 2																
10247	10247:WVGD9	Origin	30.00	34.21	0.44	-0.80	329.44	-3.59	0.0	-10.89	13.36	-0.16	-0.43	24.92	0.28	
0.00 25.36 39.0 2																
10247	Tube 1	End	32.69	32.01	0.41	-0.73	365.35	-4.02	0.0	-10.89	13.36	-0.16	-0.42	26.04	0.27	
0.00 26.47 40.7 2																
10247	Tube 1	Origin	32.69	32.01	0.41	-0.73	365.35	-4.02	0.0	-11.16	13.51	-0.16	-0.43	26.04	0.28	
0.00 26.48 40.7 2																
10247	10247:Arm3	End	35.38	29.88	0.38	-0.66	401.65	-4.45	0.0	-11.16	13.51	-0.16	-0.42	27.02	0.27	
0.00 27.44 42.2 2																
10247	10247:Arm3	Origin	35.38	29.88	0.38	-0.66	401.53	-4.65	0.0	-16.43	18.96	-0.26	-0.62	27.02	0.38	
0.00 27.64 42.5 2																
10247	10247:WVGD8	End	40.00	26.39	0.34	-0.55	489.21	-5.88	0.0	-16.43	18.96	-0.26	-0.59	29.91	0.36	
0.00 30.51 46.9 2																
10247	10247:WVGD8	Origin	40.00	26.39	0.34	-0.55	489.21	-5.87	0.0	-17.10	19.54	-0.26	-0.61	29.91	0.37	
0.00 30.53 47.0 2																
10247	Tube 1	End	45.00	22.86	0.29	-0.44	586.91	-7.19	0.0	-17.10	19.54	-0.26	-0.58	32.52	0.35	
0.00 33.10 50.9 2																
10247	Tube 1	Origin	45.00	22.86	0.29	-0.44	586.91	-7.19	0.0	-17.69	19.81	-0.26	-0.60	32.52	0.36	
0.00 33.12 51.0 2																
10247	10247:WVGD7	End	50.00	19.61	0.25	-0.35	685.99	-8.51	0.0	-17.69	19.81	-0.26	-0.57	34.59	0.34	
0.00 35.17 54.1 2																
10247	10247:WVGD7	Origin	50.00	19.61	0.25	-0.35	685.99	-8.50	0.0	-18.16	20.30	-0.26	-0.59	34.59	0.35	
0.00 35.19 54.1 2																
10247	SpliceT	End	50.50	19.30	0.25	-0.34	696.13	-8.64	0.0	-18.16	20.30	-0.26	-0.59	34.79	0.35	
0.00 35.38 54.4 2																
10247	SpliceT	Origin	50.50	19.30	0.25	-0.34	696.13	-8.63	0.0	-18.76	20.46	-0.26	-0.61	34.79	0.35	
0.00 35.40 54.5 2																
10247	SpliceB	End	55.00	16.63	0.21	-0.28	788.19	-9.82	0.0	-18.76	20.46	-0.26	-0.50	31.69	0.29	
0.00 32.19 49.5 2																
10247	SpliceB	Origin	55.00	16.63	0.21	-0.28	788.19	-9.81	0.0	-19.50	20.67	-0.26	-0.52	31.69	0.29	
0.00 32.21 49.6 2																
10247	10247:Arm4	End	57.38	15.30	0.20	-0.24	837.28	-10.44	0.0	-19.50	20.67	-0.26	-0.51	32.27	0.28	
0.00 32.78 50.4 2																
10247	10247:Arm4	Origin	57.38	15.30	0.20	-0.24	831.79	-10.64	0.0	-24.45	26.11	-0.36	-0.63	32.06	0.36	
0.00 32.70 50.3 2																
10247	10247:WVGD6	End	60.00	13.90	0.18	-0.21	900.34	-11.60	0.0	-24.45	26.11	-0.36	-0.62	33.16	0.35	
0.00 33.78 52.0 2																
10247	10247:WVGD6	Origin	60.00	13.90	0.18	-0.21	900.34	-11.60	0.0	-25.19	26.67	-0.36	-0.64	33.16	0.36	
0.00 33.80 52.0 2																
10247	Tube 2	End	65.00	11.41	0.15	-0.16	1033.67	-13.42	0.0	-25.19	26.67	-0.36	-0.61	35.00	0.34	
0.00 35.61 54.8 2																
10247	Tube 2	Origin	65.00	11.41	0.15	-0.16	1033.67	-13.41	0.0	-26.00	26.97	-0.36	-0.63	35.00	0.35	
0.00 35.63 54.8 2																
10247	10247:WVGD5	End	70.00	9.18	0.12	-0.12	1168.50	-15.23	0.0	-26.00	26.97	-0.36	-0.61	36.49	0.33	
0.00 37.10 57.1 2																
10247	10247:WVGD5	Origin	70.00	9.18	0.12	-0.12	1168.50	-15.23	0.0	-26.99	27.60	-0.36	-0.63	36.49	0.34	
0.00 37.12 57.1 2																
10247	Tube 2	End	75.00	7.20	0.09	-0.08	1306.51	-17.03	0.0	-26.99	27.60	-0.36	-0.61	37.75	0.33	
0.00 38.36 59.0 2																
10247	Tube 2	Origin	75.00	7.20	0.09	-0.08	1306.51	-17.03	0.0	-27.86	27.92	-0.36	-0.63	37.75	0.33	
0.00 38.38 59.0 2																
10247	10247:WVGD4	End	80.00	5.47	0.07	-0.06	1446.11	-18.83	0.0	-27.86	27.92	-0.36	-0.60	38.78	0.32	
0.00 39.38 60.6 2																
10247	10247:WVGD4	Origin	80.00	5.47	0.07	-0.06	1446.11	-18.83	0.0	-28.88	28.56	-0.36	-0.62	38.78	0.33	
0.00 39.40 60.6 2																
10247	Tube 2	End	84.58	4.10	0.05	-0.04	1577.07	-20.48	0.0	-28.88	28.56	-0.36	-0.60	39.58	0.32	
0.00 40.19 61.8 2																
10247	Tube 2	Origin	84.58	4.10	0.05	-0.04	1577.07	-20.48	0.0	-29.73	28.87	-0.36	-0.62	39.58	0.32	
0.00 40.21 61.9 2																
10247	SpliceT	End	89.17	2.94	0.04	-0.02	1709.44	-22.12	0.0	-29.73	28.87	-0.36	-0.60	40.24	0.31	
0.00 40.84 62.8 2																
10247	SpliceT	Origin	89.17	2.94	0.04	-0.02	1709.44	-22.12	0.0	-30.32	29.06	-0.36	-0.61	40.24	0.31	
0.00 40.86 62.9 2																
10247	10247:WVGD3	End	90.00	2.75	0.03	-0.02	1733.56	-22.42	0.0	-30.32	29.06	-0.36	-0.58	38.73	0.29	
0.00 39.31 60.5 2																
10247	10247:WVGD3	Origin	90.00	2.75	0.03	-0.02	1733.56	-22.41	0.0	-31.56	29.60	-0.36	-0.60	38.73	0.30	
0.00 39.34 60.5 2																
10247	SpliceB	End	95.00	1.75	0.02	-0.01	1881.54	-24.20	0.0	-31.56	29.60	-0.36	-0.58	39.25	0.29	
0.00 39.84 61.3 2																
10247	SpliceB	Origin	95.00	1.75	0.02	-0.01	1881.54	-24.20	0.0	-33.03	29.96	-0.36	-0.61	39.25	0.29	
0.00 39.86 61.3 2																
10247	10247:WVGD2	End	100.00	0.98	0.01	-0.01	2031.31	-25.97	0.0	-33.03	29.96	-0.36	-0.59	39.66	0.28	
0.00 40.25 61.9 2																
10247	10247:WVGD2	Origin	100.00	0.98	0.01	-0.01	2031.31	-25.97	0.0	-34.26	30.64	-0.35	-0.61	39.66	0.29	
0.00 40.27 62.0 2																
10247	Tube 3	End	105.00	0.44	0.01	-0.00	2184.52	-27.74	0.0	-34.26	30.64	-0.35	-0.59	40.00	0.28	
0.00 40.59 62.5 2																
10247	Tube 3	Origin	105.00	0.44	0.01	-0.00	2184.52	-27.74	0.0	-35.36	31.01	-0.35	-0.61	40.00	0.28	
0.00 40.61 62.5 2																
10247	10247:WVGD1	End	110.00	0.11	0.00	-0.00	2339.58	-29.50	0.0	-35.36	31.01	-0.35	-0.59	40.26	0.27	
0.00 40.85 62.8 2																
10247	10247:WVGD1	Origin	110.00	0.11	0.00	-0.00	2339.58	-29.50	0.0	-36.66	31.72	-0.35	-0.61	40.26	0.28	

0.00 40.87 62.9 2
10247 10247:g End 115.00 0.00 0.00 0.00 2498.19 -31.25 0.0 -36.66 31.72 -0.35 -0.59 40.47 0.27
0.00 41.07 63.2 2

Detailed Tubular Davit Arm Usages for Load Case "NESC Extreme":

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. Res. (ksi)	Max. Usage %	At Pt.
Davit1	Davit1:O	Origin	0.00	61.85	0.77	-1.17	-1.96	0.26	0.0	-0.62	0.24	-0.03	-0.09	1.37	0.01	0.00	1.46	2.3	1
Davit1	#Davit1:0	End	5.00	62.79	0.79	3.85	-0.78	0.13	0.0	-0.62	0.24	-0.03	-0.12	0.91	0.01	0.00	1.02	1.6	1
Davit1	#Davit1:0	Origin	5.00	62.79	0.79	3.85	-0.78	0.13	0.0	-0.60	0.17	-0.03	-0.11	0.91	0.01	0.00	1.02	1.6	1
Davit1	#Davit1:1	End	7.55	63.27	0.80	6.40	-0.34	0.06	0.0	-0.60	0.17	-0.03	-0.13	0.55	0.01	0.00	0.68	1.1	1
Davit1	#Davit1:1	Origin	7.55	63.27	0.80	6.40	-0.34	0.06	0.0	-0.59	0.13	-0.03	-0.13	0.55	0.01	0.00	0.68	1.0	1
Davit1	Davit1:End	End	10.10	63.75	0.81	8.95	-0.00	0.00	0.0	-0.59	0.13	-0.03	-0.16	0.00	0.08	0.00	0.20	0.3	3
Davit2	Davit2:O	Origin	0.00	61.79	0.77	-2.64	-3.55	-0.26	-0.0	0.43	0.40	0.03	0.06	2.48	0.01	0.00	2.55	3.9	1
Davit2	#Davit2:0	End	5.00	62.30	0.78	-7.77	-1.55	-0.13	-0.0	0.43	0.40	0.03	0.08	1.81	0.01	0.00	1.89	2.9	1
Davit2	#Davit2:0	Origin	5.00	62.30	0.78	-7.77	-1.55	-0.13	-0.0	0.43	0.32	0.03	0.08	1.81	0.01	0.00	1.89	2.9	1
Davit2	#Davit2:1	End	7.55	62.56	0.78	-10.40	-0.73	-0.06	-0.0	0.43	0.32	0.03	0.09	1.16	0.01	0.00	1.26	1.9	1
Davit2	#Davit2:1	Origin	7.55	62.56	0.78	-10.40	-0.73	-0.06	0.0	0.43	0.28	0.03	0.09	1.16	0.01	0.00	1.26	1.9	1
Davit2	Davit2:End	End	10.10	62.83	0.79	-13.04	0.00	0.00	0.0	0.43	0.28	0.03	0.11	0.00	0.16	0.00	0.30	0.5	3
Davit3	Davit3:O	Origin	0.00	49.32	0.62	-0.54	-27.55	0.75	0.0	-3.63	2.11	-0.05	-0.24	5.00	0.01	0.00	5.24	8.1	1
Davit3	#Davit3:0	End	5.00	50.20	0.64	4.22	-17.00	0.48	0.0	-3.63	2.11	-0.05	-0.30	4.64	0.01	0.00	4.93	7.6	1
Davit3	#Davit3:0	Origin	5.00	50.20	0.64	4.22	-17.00	0.48	0.0	-3.59	1.93	-0.05	-0.29	4.64	0.01	0.00	4.93	7.6	1
Davit3	#Davit3:1	End	9.57	50.99	0.65	8.51	-8.18	0.24	0.0	-3.59	1.93	-0.05	-0.37	3.55	0.01	0.00	3.92	6.0	1
Davit3	#Davit3:1	Origin	9.57	50.99	0.65	8.51	-8.18	0.24	0.0	-3.55	1.79	-0.05	-0.36	3.55	0.01	0.00	3.92	6.0	1
Davit3	Davit3:End	End	14.14	51.77	0.67	12.75	-0.00	0.00	0.0	-3.55	1.79	-0.05	-0.49	0.00	0.51	0.00	1.01	1.6	3
Davit4	Davit4:O	Origin	0.00	49.26	0.62	-2.22	-34.40	-0.74	-0.0	1.51	2.61	0.05	0.10	6.24	0.01	0.00	6.34	9.7	1
Davit4	#Davit4:0	End	5.00	49.75	0.63	-7.11	-21.32	-0.48	-0.0	1.51	2.61	0.05	0.12	5.82	0.01	0.00	5.94	9.1	1
Davit4	#Davit4:0	Origin	5.00	49.75	0.63	-7.11	-21.32	-0.48	-0.0	1.53	2.41	0.05	0.12	5.82	0.01	0.00	5.94	9.1	1
Davit4	#Davit4:1	End	9.57	50.21	0.63	-11.66	-10.31	-0.24	-0.0	1.53	2.41	0.05	0.16	4.48	0.01	0.00	4.63	7.1	1
Davit4	#Davit4:1	Origin	9.57	50.21	0.63	-11.66	-10.31	-0.24	0.0	1.54	2.26	0.05	0.16	4.48	0.01	0.00	4.63	7.1	1
Davit4	Davit4:End	End	14.14	50.67	0.64	-16.28	0.00	0.00	0.0	1.54	2.26	0.05	0.21	0.00	0.64	0.00	1.14	1.7	3
Davit5	Davit5:O	Origin	0.00	29.91	0.38	0.21	-28.78	0.74	0.0	-3.48	2.20	-0.05	-0.23	5.22	0.01	0.00	5.45	8.4	1
Davit5	#Davit5:0	End	5.00	30.58	0.39	4.01	-17.78	0.48	0.0	-3.48	2.20	-0.05	-0.28	4.85	0.01	0.00	5.13	7.9	1
Davit5	#Davit5:0	Origin	5.00	30.58	0.39	4.01	-17.78	0.48	0.0	-3.43	2.01	-0.05	-0.28	4.85	0.01	0.00	5.13	7.9	1
Davit5	#Davit5:1	End	9.57	31.17	0.41	7.41	-8.57	0.24	0.0	-3.43	2.01	-0.05	-0.35	3.72	0.01	0.00	4.07	6.3	1
Davit5	#Davit5:1	Origin	9.57	31.17	0.41	7.41	-8.57	0.24	0.0	-3.40	1.88	-0.05	-0.35	3.72	0.01	0.00	4.07	6.3	1
Davit5	Davit5:End	End	14.14	31.76	0.42	10.77	-0.00	0.00	0.0	-3.40	1.88	-0.05	-0.47	0.00	0.54	0.00	1.04	1.6	3
Davit6	Davit6:O	Origin	0.00	29.85	0.38	-1.53	-29.41	-0.73	-0.0	1.80	2.26	0.05	0.12	5.33	0.01	0.00	5.45	8.4	1
Davit6	#Davit6:0	End	5.00	30.28	0.39	-5.43	-18.10	-0.47	-0.0	1.80	2.26	0.05	0.15	4.94	0.01	0.00	5.09	7.8	1
Davit6	#Davit6:0	Origin	5.00	30.28	0.39	-5.43	-18.10	-0.47	-0.0	1.82	2.06	0.05	0.15	4.94	0.01	0.00	5.09	7.8	1
Davit6	#Davit6:1	End	9.57	30.68	0.39	-9.06	-8.70	-0.23	-0.0	1.82	2.06	0.05	0.19	3.78	0.01	0.00	3.96	6.1	1
Davit6	#Davit6:1	Origin	9.57	30.68	0.39	-9.06	-8.70	-0.23	0.0	1.83	1.90	0.05	0.19	3.78	0.01	0.00	3.97	6.1	1

Davit6	Davit6:End	End	14.14	31.08	0.40	-12.75	0.00	0.00	0.0	1.83	1.90	0.05	0.25	0.00	0.54	0.00	0.98	1.5	3
Davit7	Davit7:O	Origin	0.00	15.32	0.20	0.49	-29.43	0.73	0.0	-3.27	2.25	-0.05	-0.22	5.34	0.01	0.00	5.55	8.5	1
Davit7	#Davit7:0	End	5.00	15.76	0.20	3.15	-18.19	0.47	0.0	-3.27	2.25	-0.05	-0.27	4.96	0.01	0.00	5.23	8.0	1
Davit7	#Davit7:0	Origin	5.00	15.76	0.20	3.15	-18.19	0.47	0.0	-3.23	2.06	-0.05	-0.26	4.96	0.01	0.00	5.23	8.0	1
Davit7	#Davit7:1	End	9.57	16.15	0.21	5.51	-8.77	0.24	0.0	-3.23	2.06	-0.05	-0.33	3.81	0.01	0.00	4.14	6.4	1
Davit7	#Davit7:1	Origin	9.57	16.15	0.21	5.51	-8.77	0.24	0.0	-3.20	1.92	-0.05	-0.33	3.81	0.01	0.00	4.14	6.4	1
Davit7	Davit7:End	End	14.14	16.53	0.22	7.82	-0.00	0.00	0.0	-3.20	1.92	-0.05	-0.44	0.00	0.55	0.00	1.05	1.6	3
Davit8	Davit8:O	Origin	0.00	15.28	0.20	-0.98	-25.32	-0.72	-0.0	2.11	1.97	0.05	0.14	4.59	0.01	0.00	4.73	7.3	1
Davit8	#Davit8:0	End	5.00	15.61	0.20	-3.72	-15.45	-0.46	-0.0	2.11	1.97	0.05	0.17	4.22	0.01	0.00	4.39	6.8	1
Davit8	#Davit8:0	Origin	5.00	15.61	0.20	-3.72	-15.45	-0.46	-0.0	2.13	1.77	0.05	0.17	4.22	0.01	0.00	4.39	6.8	1
Davit8	#Davit8:1	End	9.57	15.92	0.21	-6.29	-7.37	-0.23	-0.0	2.13	1.77	0.05	0.22	3.20	0.01	0.00	3.42	5.3	1
Davit8	#Davit8:1	Origin	9.57	15.92	0.21	-6.29	-7.37	-0.23	0.0	2.14	1.61	0.05	0.22	3.20	0.01	0.00	3.42	5.3	1
Davit8	Davit8:End	End	14.14	16.23	0.21	-8.90	-0.00	0.00	0.0	2.14	1.61	0.05	0.30	0.00	0.46	0.00	0.85	1.3	3

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
Clamp1	0.601	80.00	80.00	0.75	0.00	0.00	0.00	0.75
Clamp2	0.509	80.00	80.00	0.64	0.00	0.00	0.00	0.64
Clamp3	3.937	80.00	80.00	4.92	0.00	0.00	0.00	4.92
Clamp4	2.679	80.00	80.00	3.35	0.00	0.00	0.00	3.35
Clamp5	3.843	80.00	80.00	4.80	0.00	0.00	0.00	4.80
Clamp6	2.599	80.00	80.00	3.25	0.00	0.00	0.00	3.25
Clamp7	3.689	80.00	80.00	4.61	0.00	0.00	0.00	4.61
Clamp8	2.649	80.00	80.00	3.31	0.00	0.00	0.00	3.31
Clamp9	10.362	80.00	80.00	12.95	0.00	0.00	0.00	12.95
Clamp10	6.319	80.00	80.00	7.90	0.00	0.00	0.00	7.90
Clamp13	0.360	80.00	80.00	0.45	0.00	0.00	0.00	0.45
Clamp14	0.360	80.00	80.00	0.45	0.00	0.00	0.00	0.45
Clamp15	0.360	80.00	80.00	0.45	0.00	0.00	0.00	0.45
Clamp16	0.360	80.00	80.00	0.45	0.00	0.00	0.00	0.45
Clamp17	0.360	80.00	80.00	0.45	0.00	0.00	0.00	0.45
Clamp18	0.360	80.00	80.00	0.45	0.00	0.00	0.00	0.45
Clamp19	0.360	80.00	80.00	0.45	0.00	0.00	0.00	0.45
Clamp20	0.360	80.00	80.00	0.45	0.00	0.00	0.00	0.45
Clamp21	0.360	80.00	80.00	0.45	0.00	0.00	0.00	0.45
Clamp22	0.540	80.00	80.00	0.68	0.00	0.00	0.00	0.68

*** 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)
10247	63.18	NESC Extreme	2.5	30	18435.7

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 %
10247	NESC Heavy	1	2.383	0.921	-0.394	2.525	38.475	18.716	75.636	3	85.395	1.536	2.750	31.19
10247	NESC Heavy	2	2.525	-0.394	0.921	2.383	38.475	7.445	30.085	3	85.006	0.969	2.750	12.41
10247	NESC Heavy	3	1.990	-1.603	1.990	1.603	38.475	9.584	38.730	4	36.148	1.099	2.750	15.97
10247	NESC Heavy	4	0.921	-2.383	2.525	0.394	38.475	6.220	25.135	3	-77.490	0.885	2.750	10.37
10247	NESC Heavy	5	-0.394	-2.525	2.383	-0.921	38.475	16.980	68.620	3	-77.490	1.463	2.750	28.30
10247	NESC Heavy	6	-1.603	-1.990	1.603	-1.990	38.475	29.265	118.266	4	-77.490	1.921	2.750	48.77
10247	NESC Heavy	7	-2.383	-0.921	0.394	-2.525	38.475	16.663	67.338	3	-76.324	1.449	2.750	27.77
10247	NESC Heavy	8	-2.525	0.394	-0.921	-2.383	38.475	5.391	21.787	3	-75.935	0.824	2.750	8.99
10247	NESC Heavy	9	-1.990	1.603	-1.990	-1.603	38.475	9.584	38.730	4	39.920	1.099	2.750	15.97
10247	NESC Heavy	10	-0.921	2.383	-2.525	-0.394	38.475	8.273	33.433	3	86.561	1.021	2.750	13.79
10247	NESC Heavy	11	0.394	2.525	-2.383	0.921	38.475	19.033	76.917	3	86.561	1.549	2.750	31.72
10247	NESC Heavy	12	1.603	1.990	-1.603	1.990	38.475	32.725	132.250	4	86.561	2.031	2.750	54.54
10247	NESC Heavy	13	2.082	1.575	-1.015	2.405	38.475	20.183	81.562	3	86.172	1.595	2.750	33.64
10247	NESC Heavy	14	2.590	0.323	0.323	2.590	38.475	9.354	37.803	2	85.006	1.086	2.750	15.59
10247	NESC Heavy	15	2.405	-1.015	1.575	2.082	38.475	6.471	26.150	3	36.148	0.903	2.750	10.78
10247	NESC Heavy	16	1.575	-2.082	2.405	1.015	38.475	5.499	22.222	3	-30.849	0.833	2.750	9.16
10247	NESC Heavy	17	0.323	-2.590	2.590	-0.323	38.475	8.365	33.804	2	-77.490	1.027	2.750	13.94
10247	NESC Heavy	18	-1.015	-2.405	2.082	-1.575	38.475	18.272	73.842	3	-77.490	1.518	2.750	30.45
10247	NESC Heavy	19	-2.082	-1.575	1.015	-2.405	38.475	18.036	72.887	3	-77.102	1.508	2.750	30.06
10247	NESC Heavy	20	-2.590	-0.323	-0.323	-2.590	38.475	7.954	32.142	2	-75.935	1.001	2.750	13.26
10247	NESC Heavy	21	-2.405	1.015	-1.575	-2.082	38.475	4.807	19.427	3	-27.078	0.778	2.750	8.01
10247	NESC Heavy	22	-1.575	2.082	-2.405	-1.015	38.475	7.162	28.945	3	39.920	0.950	2.750	11.94
10247	NESC Heavy	23	-0.323	2.590	-2.590	0.323	38.475	9.766	39.465	2	86.561	1.109	2.750	16.28
10247	NESC Heavy	24	1.015	2.405	-2.082	1.575	38.475	20.419	82.517	3	86.561	1.604	2.750	34.03
10247	NESC Extreme	1	2.383	0.921	-0.394	2.525	38.475	26.511	107.138	3	120.877	1.828	2.750	44.19
10247	NESC Extreme	2	2.525	-0.394	0.921	2.383	38.475	10.195	41.199	3	120.571	1.134	2.750	16.99
10247	NESC Extreme	3	1.990	-1.603	1.990	1.603	38.475	14.020	56.657	4	49.845	1.329	2.750	23.37
10247	NESC Extreme	4	0.921	-2.383	2.525	0.394	38.475	9.795	39.582	3	-117.143	1.111	2.750	16.32
10247	NESC Extreme	5	-0.394	-2.525	2.383	-0.921	38.475	25.708	103.891	3	-117.143	1.800	2.750	42.85
10247	NESC Extreme	6	-1.603	-1.990	1.603	-1.990	38.475	44.455	179.650	4	-117.143	2.367	2.750	74.09
10247	NESC Extreme	7	-2.383	-0.921	0.394	-2.525	38.475	25.458	102.881	3	-116.223	1.791	2.750	42.43
10247	NESC Extreme	8	-2.525	0.394	-0.921	-2.383	38.475	9.141	36.942	3	-115.917	1.073	2.750	15.24
10247	NESC Extreme	9	-1.990	1.603	-1.990	-1.603	38.475	14.020	56.657	4	52.819	1.329	2.750	23.37
10247	NESC Extreme	10	-0.921	2.383	-2.525	-0.394	38.475	10.848	43.839	3	121.797	1.169	2.750	18.08
10247	NESC Extreme	11	0.394	2.525	-2.383	0.921	38.475	26.761	108.149	3	121.797	1.837	2.750	44.60
10247	NESC Extreme	12	1.603	1.990	-1.603	1.990	38.475	46.230	186.825	4	121.797	2.414	2.750	77.05
10247	NESC Extreme	13	2.082	1.575	-1.015	2.405	38.475	28.585	115.518	3	121.490	1.898	2.750	47.64
10247	NESC Extreme	14	2.590	0.323	0.323	2.590	38.475	13.158	53.173	2	120.571	1.288	2.750	21.93
10247	NESC Extreme	15	2.405	-1.015	1.575	2.082	38.475	8.909	36.004	3	49.845	1.060	2.750	14.85
10247	NESC Extreme	16	1.575	-2.082	2.405	1.015	38.475	8.601	34.758	3	-48.165	1.041	2.750	14.34
10247	NESC Extreme	17	0.323	-2.590	2.590	-0.323	38.475	12.763	51.579	2	-117.143	1.268	2.750	21.27
10247	NESC Extreme	18	-1.015	-2.405	2.082	-1.575	38.475	27.670	111.820	3	-117.143	1.868	2.750	46.12
10247	NESC Extreme	19	-2.082	-1.575	1.015	-2.405	38.475	27.484	111.067	3	-116.836	1.861	2.750	45.81
10247	NESC Extreme	20	-2.590	-0.323	-0.323	-2.590	38.475	12.439	50.269	2	-115.917	1.252	2.750	20.73
10247	NESC Extreme	21	-2.405	1.015	-1.575	-2.082	38.475	8.056	32.554	3	-45.191	1.008	2.750	13.43
10247	NESC Extreme	22	-1.575	2.082	-2.405	-1.015	38.475	9.455	38.208	3	52.819	1.092	2.750	15.76
10247	NESC Extreme	23	-0.323	2.590	-2.590	0.323	38.475	13.482	54.484	2	121.797	1.304	2.750	22.47
10247	NESC Extreme	24	1.015	2.405	-2.082	1.575	38.475	28.771	116.271	3	121.797	1.904	2.750	47.95

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
Davit1	9.61	NESC Heavy	114.4	1	182.8
Davit2	11.52	NESC Heavy	114.4	1	182.8
Davit3	22.31	NESC Heavy	102.0	1	537.4
Davit4	18.45	NESC Heavy	102.0	1	537.4
Davit5	22.48	NESC Heavy	80.0	1	537.4
Davit6	16.40	NESC Heavy	80.0	1	537.4
Davit7	22.40	NESC Heavy	58.0	1	537.4
Davit8	14.73	NESC Heavy	58.0	1	537.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	54.54	10247	Base Plate

NESC Extreme 77.05 10247 Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Steel Pole Usage %	Pole Label	Height AGL (ft)	Segment Number
NESC Heavy	44.47	10247	2.5	30
NESC Extreme	63.18	10247	2.5	30

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	10247	12	38.475	72.566	1707.713	-39.634	32.725	132.250	4	86.561	2.031	54.54
NESC Extreme	10247	12	38.475	37.232	2498.188	-31.254	46.230	186.825	4	121.797	2.414	77.05

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Tubular Davit Usage %	Davit Label	Height AGL (ft)	Segment Number
NESC Heavy	22.48	Davit5	80.0	1
NESC Extreme	9.75	Davit4	102.0	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	1.45	NESC Heavy	0.0
Clamp2	Clamp	1.36	NESC Heavy	0.0
Clamp3	Clamp	7.70	NESC Heavy	0.0
Clamp4	Clamp	5.53	NESC Heavy	0.0
Clamp5	Clamp	7.72	NESC Heavy	0.0
Clamp6	Clamp	5.18	NESC Heavy	0.0
Clamp7	Clamp	7.65	NESC Heavy	0.0
Clamp8	Clamp	5.23	NESC Heavy	0.0
Clamp9	Clamp	12.95	NESC Extreme	0.0
Clamp10	Clamp	7.90	NESC Extreme	0.0
Clamp13	Clamp	0.88	NESC Heavy	0.0
Clamp14	Clamp	0.88	NESC Heavy	0.0
Clamp15	Clamp	0.88	NESC Heavy	0.0
Clamp16	Clamp	0.88	NESC Heavy	0.0
Clamp17	Clamp	0.88	NESC Heavy	0.0
Clamp18	Clamp	0.88	NESC Heavy	0.0
Clamp19	Clamp	0.88	NESC Heavy	0.0
Clamp20	Clamp	0.88	NESC Heavy	0.0
Clamp21	Clamp	0.88	NESC Heavy	0.0
Clamp22	Clamp	1.32	NESC Heavy	0.0

Loads At Insulator Attachments For All Load Cases:

Load Case	Insulator Label	Insulator Type	Structure Attach Label	Structure Attach Load X (kips)	Structure Attach Load Y (kips)	Structure Attach Load Z (kips)	Structure Attach Load Res. (kips)
NESC Heavy	Clamp1	Clamp	Davit1:End	0.025	0.735	0.898	1.161
NESC Heavy	Clamp2	Clamp	Davit2:End	0.025	0.666	0.865	1.092
NESC Heavy	Clamp3	Clamp	Davit3:End	0.050	2.263	5.732	6.163
NESC Heavy	Clamp4	Clamp	Davit4:End	0.050	1.445	4.178	4.421
NESC Heavy	Clamp5	Clamp	Davit5:End	0.050	2.255	5.750	6.177
NESC Heavy	Clamp6	Clamp	Davit6:End	0.050	2.122	3.563	4.147
NESC Heavy	Clamp7	Clamp	Davit7:End	0.050	2.244	5.692	6.119
NESC Heavy	Clamp8	Clamp	Davit8:End	0.050	2.902	3.012	4.183
NESC Heavy	Clamp9	Clamp	10247:TopConn	0.000	3.108	0.000	3.108
NESC Heavy	Clamp10	Clamp	10247:BotConn	0.000	-1.717	5.827	6.075
NESC Heavy	Clamp13	Clamp	10247:WVGD1	0.000	0.137	0.688	0.702
NESC Heavy	Clamp14	Clamp	10247:WVGD2	0.000	0.137	0.688	0.702
NESC Heavy	Clamp15	Clamp	10247:WVGD3	0.000	0.137	0.688	0.702
NESC Heavy	Clamp16	Clamp	10247:WVGD4	0.000	0.137	0.688	0.702
NESC Heavy	Clamp17	Clamp	10247:WVGD5	0.000	0.137	0.688	0.702
NESC Heavy	Clamp18	Clamp	10247:WVGD6	0.000	0.137	0.688	0.702
NESC Heavy	Clamp19	Clamp	10247:WVGD7	0.000	0.137	0.688	0.702
NESC Heavy	Clamp20	Clamp	10247:WVGD8	0.000	0.137	0.688	0.702
NESC Heavy	Clamp21	Clamp	10247:WVGD9	0.000	0.137	0.688	0.702
NESC Heavy	Clamp22	Clamp	10247:WVGD10	0.000	0.206	1.033	1.053
NESC Extreme	Clamp1	Clamp	Davit1:End	0.025	0.547	0.248	0.601
NESC Extreme	Clamp2	Clamp	Davit2:End	0.025	0.447	0.242	0.509
NESC Extreme	Clamp3	Clamp	Davit3:End	0.050	3.073	2.461	3.937
NESC Extreme	Clamp4	Clamp	Davit4:End	0.050	1.666	2.097	2.679
NESC Extreme	Clamp5	Clamp	Davit5:End	0.050	2.951	2.462	3.843
NESC Extreme	Clamp6	Clamp	Davit6:End	0.050	1.970	1.695	2.599

NESC Extreme	Clamp7	Clamp	Davit7:End	0.050	2.793	2.410	3.689
NESC Extreme	Clamp8	Clamp	Davit8:End	0.050	2.286	1.338	2.649
NESC Extreme	Clamp9	Clamp	10247:TopConn	0.000	10.362	0.000	10.362
NESC Extreme	Clamp10	Clamp	10247:BotConn	0.000	-5.776	2.562	6.319
NESC Extreme	Clamp13	Clamp	10247:WVGD1	0.000	0.323	0.158	0.360
NESC Extreme	Clamp14	Clamp	10247:WVGD2	0.000	0.323	0.158	0.360
NESC Extreme	Clamp15	Clamp	10247:WVGD3	0.000	0.323	0.158	0.360
NESC Extreme	Clamp16	Clamp	10247:WVGD4	0.000	0.323	0.158	0.360
NESC Extreme	Clamp17	Clamp	10247:WVGD5	0.000	0.323	0.158	0.360
NESC Extreme	Clamp18	Clamp	10247:WVGD6	0.000	0.323	0.158	0.360
NESC Extreme	Clamp19	Clamp	10247:WVGD7	0.000	0.323	0.158	0.360
NESC Extreme	Clamp20	Clamp	10247:WVGD8	0.000	0.323	0.158	0.360
NESC Extreme	Clamp21	Clamp	10247:WVGD9	0.000	0.323	0.158	0.360
NESC Extreme	Clamp22	Clamp	10247:WVGD10	0.000	0.485	0.238	0.540

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	17.462	0.350	42.742	1358.487	-30.262	0.000
NESC Extreme	23.711	0.350	17.175	2018.190	-30.262	0.000

*** Weight of structure (lbs):
Weight of Tubular Davit Arms: 3590.0
Weight of Steel Poles: 18435.7
Total: 22025.7

*** End of Report

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

Subject:	Anchor Bolt Analysis Pole #10247
Location:	Brookfield, CT
Rev. 1: 8/19/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21051.05

Anchor Bolt Analysis:

Input Data:

Bolt Force:

Maximum Tensile Force =	$T_{Max} := 122 \cdot kips$	(User Input from PLS-Pole)
Maximum Shear Force at Base =	$V_{base} := 32 \cdot kips$	(User Input from PLS-Pole)

Anchor Bolt Data:

Use AST MA615 Grade 75

Number of Anchor Bolts =	$N := 16$	(User Input)
Bolt "Column" Distance =	$l := 3.0 \cdot in$	(User Input)
Bolt Ultimate Strength =	$F_u := 100 \cdot ksi$	(User Input)
Bolt Yeild Strength=	$F_y := 75 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Anchor Bolts =	$D := 2.25 \cdot in$	(User Input)
Threads per Inch =	$n := 4.5$	(User Input)

Anchor Bolt Analysis:

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 = $V_{Max} := \frac{V_{base}}{N} = 2 \cdot kips$

Shear Stress per Bolt = $f_v := \frac{V_{Max}}{A_s} = 615.8\,psi$

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

Shear Stress Permitted = $F_v := 0.35 F_y = 26.25 \cdot ksi$

Permitted Axial Tensile Stress in Conjuction with Shear = $F_{tv} := F_t \cdot \sqrt{1 - \left(\frac{f_v}{F_v} \right)^2} = 74.98 \cdot ksi$

Bolt Tension % of Capacity = $\frac{T_{Max}}{F_{tv} \cdot A_s} = 50.1 \cdot \%$

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

Condition1 = "OK"

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

Subject: FOUNDATION ANALYSIS

Location: Brookfield, CT

Rev. 1: 8/19/21

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 21051.05

Foundation:

Input Data:

Tower Data

Overturning Moment =	OM := 2499·1.1·ft·kips = 2749·ft·kips	(User Input from PLS-Pole)	
Shear Force =	Shear := 32·kip·1.1 = 35.2·kips	(User Input from PLS-Pole)	
Axial Force =	Axial := 40·kip·1.1 = 44·kips	(User Input from PLS-Pole)	
Tower Height =	$H_t := 115 \cdot ft$	(User Input)	

Footing Data:

Depth to Bottom of Footing =	$D_f := 34 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 15 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 3 \cdot ft$	(User Input)	
Width of Pier =	$W_p := 8 \cdot ft$	(User Input)	
Depth of Soil =	$D_{soil} := 12 \cdot ft$	(User Input)	
Depth of Rock =	$D_{rock} := 22 \cdot ft$	(User Input)	

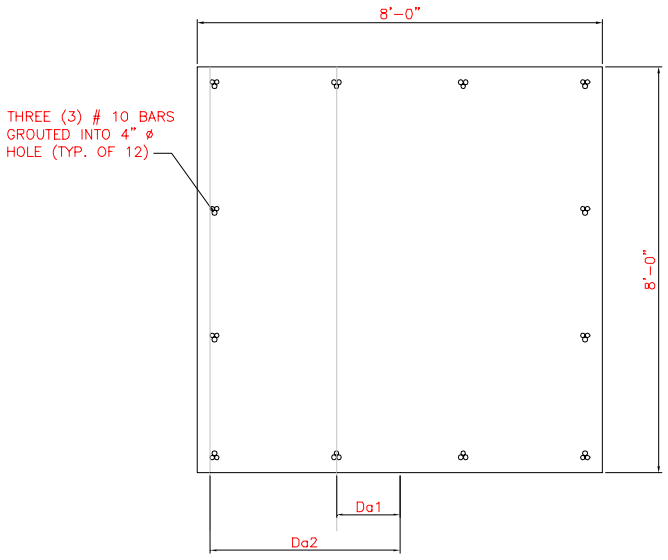
Material Properties:

Concrete Compressive Strength =	$f_c := 3500 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Anchor Bolt Yield Strength =	$f_{ya} := 75000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Soil Bearing Capacity =	$q_s := 8000 \cdot psf$	(User Input)	
Rock Bearing Capacity =	$q_{rock} := 50000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 100 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Unit Weight of Rock =	$\gamma_{rock} := 160 \cdot pcf$	(User Input)	
Foundation Bouyancy =	Bouyancy := 0	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 1.0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	Z := 2	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Rock Anchor Properties:

AST MA615 Grade 60

Bolt Ultimate Strength =	$F_u := 90 \cdot ksi$	(User Input)	
Bolt Yield Strength =	$F_y := 60 \cdot ksi$	(User Input)	
Bar Diameter =	$d_{ra} := 1.27 \cdot in$	(User Input)	
Number of Bars per Hole =	$n_{ra} := 3$	(User Input)	
Gross Area of Bolt Group =	$A_g := \frac{\pi}{4} \cdot d_{ra}^2 \cdot n_{ra} = 3.8 \cdot in^2$		(3 # 10 Bars)
Hole Diameter =	$d_{Hole} := 4 \cdot in$	(User Input)	
Grout Strength =	$\tau := 120 \cdot psi$	(User Input)	(Assumed Conservative Value)
Distance to Rock Anchor Group 1 =	$D_{a1} := 15 \cdot in$	(User Input)	
Distance to Rock Anchor Group 2 =	$D_{a2} := 45 \cdot in$	(User Input)	
Number of Rock Anchors in Group 1 =	$N_{a1} := 4$	(User Input)	
Number of Rock Anchors in Group 2 =	$N_{a2} := 8$	(User Input)	
Total Number of Rock Anchors =	$N_{atot} := 12$	(User Input)	



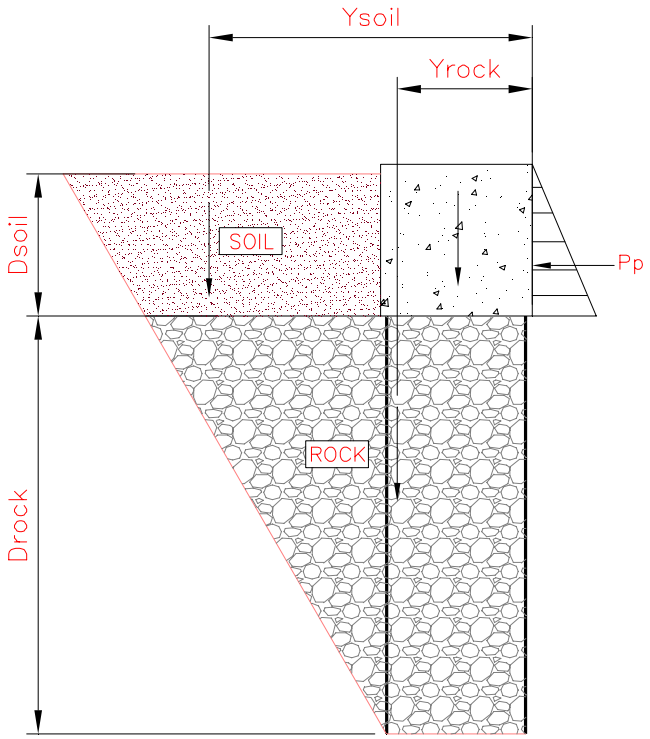
CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: FOUNDATION ANALYSIS

Location: Brookfield, CT

Rev. 1: 8/19/21

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 21051.05



Area 1 = $A1_s := \frac{1}{2}\cdot\tan(\Phi_s)\cdot D_{soil}^2 = 41.569\,ft^2$

Area 2 = $A2_s := \tan(\Phi_s)\cdot D_{rock}\cdot D_{soil} = 152.42\,ft^2$ sf

Distance to Centroid 1 = $Y1 := \tan(\Phi_s)\cdot D_{rock} + \frac{1}{3}\cdot\tan(\Phi_s)\cdot D_{soil} = 15.011\,ft$ ft

Distance to Centroid 2 = $Y2 := \frac{1}{2}\cdot\tan(\Phi_s)\cdot D_{rock} = 6.351\,ft$ ft

Distance from Toe to Centroid of Soil = $Y_{soil} := \frac{(A1_s\cdot Y1 + A2_s\cdot Y2)}{(A1_s + A2_s)} + W_p = 16.21\,ft$ ft

Area 1 = $A1_r := \frac{1}{2}\cdot\tan(\Phi_s)\cdot D_{rock}^2 = 139.719\,ft^2$ sf

Area 2 = $A2_r := W_p\cdot D_{rock} = 176\,ft^2$ sf

Distance to Centroid 1 = $Y1 := W_p + \frac{1}{3}\cdot\tan(\Phi_s)\cdot D_{rock} = 12.234\,ft$ ft

Distance to Centroid 2 = $Y2 := \frac{W_p}{2} = 4\,ft$ ft

Distance from Toe to Centroid of Rock = $Y_{rock} := \frac{(A1_r\cdot Y1 + A2_r\cdot Y2)}{(A1_r + A2_r)} = 7.64\,ft$ ft

Stability of Footing:

Adjusted Concrete Unit Weight =

$\gamma_c := if\left(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}\right) = 150 \cdot pcf$

Adjusted Soil Unit Weight =

$\gamma_s := if\left(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}\right) = 100 \cdot pcf$

Coefficient of Lateral Soil Pressure =

$K_p := \frac{1 + \sin\left(\Phi_s\right)}{1 - \sin\left(\Phi_s\right)} = 3$

Passive Pressure =

$P_{top} := 0 = 0 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_{soil} + c \cdot 2 \cdot \sqrt{K_p} = 3.6 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.8 \cdot ksf$

$A_p := W_p \cdot \left(L_p - L_{pag}\right) = 96 ft^2$

Ultimate Shear =

$S_u := P_{ave} \cdot A_p = 172.8 \cdot kip$

Passive Pressure Resistance to Overturning =

$PP_R := \min\left[Shear, \left(S_u\right)\right] = 35.2 \cdot kip$

Weight of Concrete Pad =

$WT_c := \left(W_p{}^2 \cdot L_p\right) \cdot \gamma_c = 144 \cdot kip$

Total Weight of Soil =

$WT_{Stot} := \left(A1_s + A2_s\right) \cdot W_p \cdot \gamma_s = 155.2 \cdot kips$

Total Weight of Rock =

$WT_{Rtot} := \left(A1_r + A2_r\right) \cdot W_p \cdot \gamma_{rock} = 404.1 \cdot kips$

Resisting Moment =

$M_r := \left(WT_c + Axial\right) \cdot \frac{W_p}{2} + PP_R \cdot \frac{\left(L_p - L_{pag}\right)}{3} + WT_{Stot} \cdot Y_{soil} + WT_{Rtot} \cdot Y_{rock} = 6497 \cdot kip \cdot ft$

Overturning Moment =

$M_{ot} := OM + Shear \cdot L_p = 3277 \cdot kip \cdot ft$

Factor of Safety Actual =

$FS := \frac{M_r}{M_{ot}} = 1.98$

Factor of Safety Required =

$FS_{req} := 1.0$

$OverTurning\_Moment\_Check := if\left(FS \geq FS_{req}, "Okay", "No Good"\right)$

$OverTurning\_Moment\_Check = "Okay"$

Rock Anchor Check

Polar Moment of Inertia = $I_p := \left(D_{a1}^{2} \cdot N_{a1} + D_{a2}^{2} \cdot N_{a2}\right) = 17100 \cdot in^2$

Maximum Tension Force = $T_{Max} := \frac{OM \cdot D_{a2}}{I_p} - \frac{Axial + WT_c}{N_{atot}} = 71.1 \cdot kips$

Reduction Factor = $\phi := 0.9$

Design Tension = $T_{des} := \phi \cdot A_g \cdot F_y = 205.2 \cdot kips$

$\frac{T_{Max}}{T_{des}} = 34.7 \cdot \%$

$Condition1 := if\left(T_{Max} < T_{des}, "OK", "NG"\right)$

Condition1 = "OK"

Check Bond Strength:

Reduction Factor = $\phi := 0.75$

Bond Strength = $Bond\_Strength := \phi \cdot d_{Hole} \cdot \pi \cdot D_{rock} \cdot \tau = 299 \cdot kips$

$\frac{T_{Max}}{Bond\_Strength} = 23.8 \cdot \%$

$Condition2 := if\left(T_{Max} < Bond\_Strength, "OK", "NG"\right)$

Condition2 = "OK"

Bearing Pressure Caused by Footing:

$P_2 := \frac{M_{ot} \cdot D_{a2}}{I_p} = 103.5 \cdot kips$

$P_1 := \frac{M_{ot} \cdot D_{a1}}{I_p} = 34.5 \cdot kips$

Area of the Mat = $A_{mat} := \left(W_p \cdot \frac{W_p}{2}\right) = 32\,ft^2$

Maximum Pressure in Mat = $P_{max} := \frac{WT_c + Axial + P_1 \cdot \frac{N_{a1}}{2} + P_2 \cdot \frac{N_{a2}}{2}}{A_{mat}} = 20.966 \cdot ksf$

$Max\_Pressure\_Check := if\left(P_{max} < q_{rock}, "Okay", "No Good"\right)$

Max_Pressure_Check = "Okay"

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

CT11201A_L600_7_draft

Print Name: Standard (1)
PORs: L600_CMP5

Section 1 - Site Information

Site ID: CT11201A
Status: Draft
Version: 7
Project Type: L600
Approved: Not Approved
Approved By: Not Approved
Last Modified: 8/3/2021 5:21:08 PM
Last Modified By: Alex.Murillo9@T-Mobile.com

Site Name: Brookfield/ Business Area
Site Class: Utility Lattice Tower
Site Type: Structure Non Building
Plan Year:
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: CL&P

Latitude: 41.43086800
Longitude: -73.40259800
Address: 20 Vale Road Tower #10247
City, State: Brookfield, CT
Region: NORTHEAST

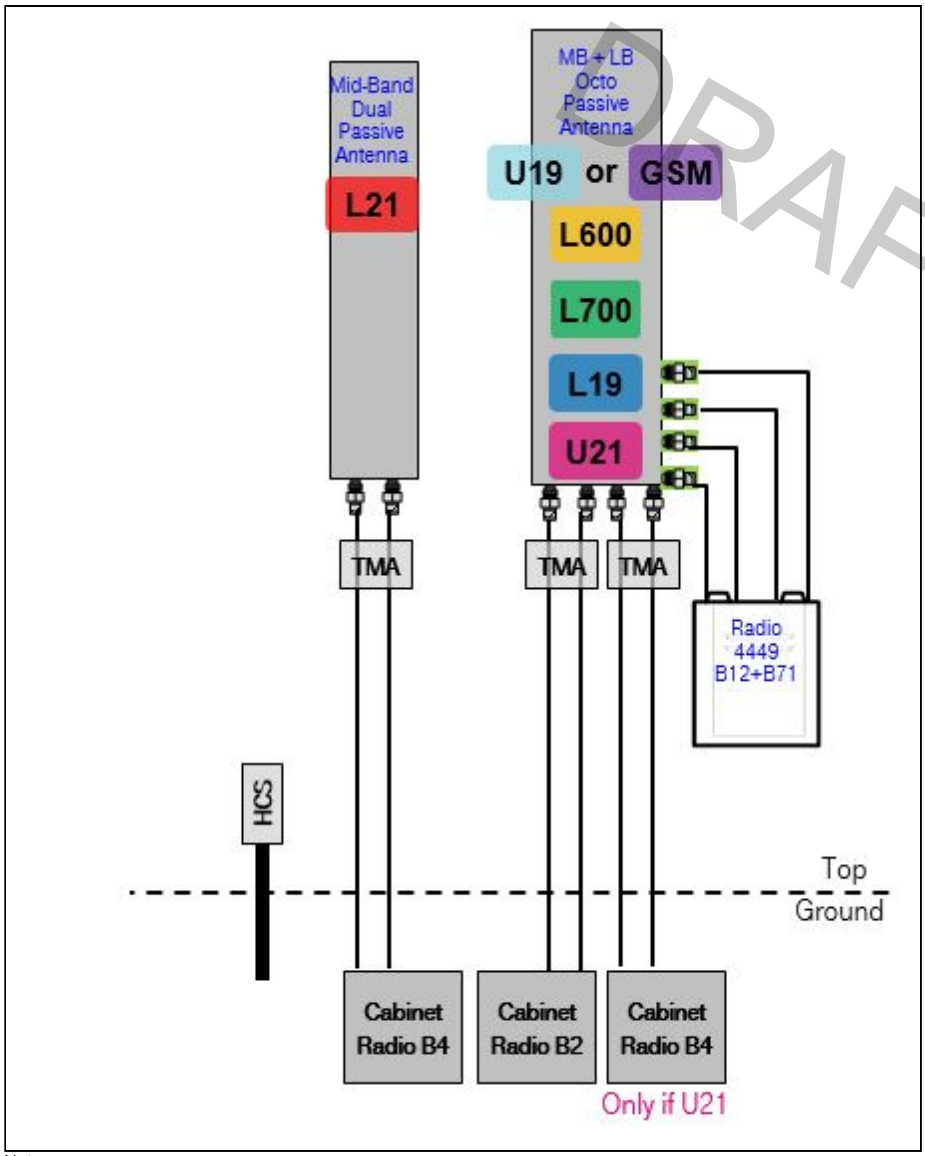
RAN Template: 67D94B Outdoor			AL Template: 67D94B_1DP+1OP	
Sector Count: 3	**Antenna Count:** 6	**Coax Line Count:** 24	**TMA Count:** 0	**RRU Count:** 3

Section 2 - Existing Template Images

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

Section 3 - Proposed Template Images

67D94B_1DP+1OP.JPG



Notes:

Section 4 - Siteplan Images

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

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

CT11201A_L600_7_draft

Print Name: Standard (1)
PORs: L600_CMP5

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 794DB Outdoor (evolved from 4B)

Enclosure	1
Enclosure Type	RBS 6102
Baseband	DUW30 (U1900 (DECOMMISSIONED)); DUW30 (U2100); DUG20 (G1900); BB 6630 (L1900, L2100, L700)
Radio	RUS01 B2 **(x 3)** (G1900); RUS01 B2 **(x 3)** (U1900 (DECOMMISSIONED)); RUS01 B4 **(x 3)** (U2100); RUS01 B4 **(x 3)** (L2100)

Proposed RAN Equipment

Template: 67D94B Outdoor

Enclosure	1
Enclosure Type	RBS 6102
Baseband	DUW30 (U2100); DUG20 (G1900); BB 6630 (L1900, L2100); BB 6648 (N600, L700, L600)
Radio	RUS01 B2 **(x 3)** (G1900); RUS01 B2 **(x 3)** (U1900 (DECOMMISSIONED)); RUS01 B4 **(x 3)** (U2100); RUS01 B4 **(x 3)** (L2100)

RAN Scope of Work:

*** Existing Cabinet is RBS6102 ***

Existing: (18) Coaxial Lines
Add (6) coaxial Lines

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

CT11201A_L600_7_draft

Print Name: Standard (1)
PORs: L600_CMP5

Section 6 - A&L Equipment

Existing Template:
Proposed Template: 67D94B_1DP+1OP

Sector 1 (Existing) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	1		2
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		Andrew - LNX-6515DS-A1M (Dual)
Azimuth	10		10
M. Tilt	0		0
Height	130		122
Ports	**P1**	**P2**	**P3**
Active Tech.	L1900 G1900	U2100 L2100	L700
Dark Tech.			
Restricted Tech.			
Decomm. Tech.	U1900		
E. Tilt	2	2	2
Cables	1-1/4" Coax - 145 ft. **(x2)**	1-1/4" Coax - 145 ft. **(x2)**	1-1/4" Coax - 145 ft. **(x2)**
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	Generic Twin Style 1B - AWS (AtAntenna)	
Diplexers / Combiners			
Radio			RRUS11 B12 (At Antenna)
Sector Equipment			Andrew Smart Bias T (Ericsson) (At Antenna)

Unconnected Equipment:

Scope of Work:

TMA's are on the ground.RRU's on the ground for L700.

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

CT11201A_L600_7_draft

Print Name: Standard (1)
PORs: L600_CMP5

Sector 1 (Proposed) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	**1**		**2**
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		Rosenberger - 2D4WC-21 (4 LB + 8 MB) (DoDeca)
Azimuth	10		10
M. Tilt	0		0
Height	134		125
Ports	**P1**	**P2**	**P3** **P4** **P5** **P6** **P7** **P8**
Active Tech.	L1900 G1900	U2100 L2100	N600 L700 L600 N600 L700 L600
Dark Tech.			
Restricted Tech.			
Decomm. Tech.	U1900		
E. Tilt	2	2	2 2
Cables	1-1/4" Coax - 145 ft. **(x2)**	1-1/4" Coax - 145 ft. **(x2)**	1-1/4" Coax - 145 ft. **(x2)** 1-1/4" Coax - 145 ft. **(x2)**
TMAs	Generic Twin Style 1A - PCS (AtCabinet)	Generic Twin Style 1B - AWS (AtCabinet)	
Diplexers / Combiners			
Radio			Radio 4449 B71+B85 (At Cabinet) SHARED Radio 4449 B71+B85 (At Cabinet)

Sector Equipment		Andrew Smart Bias T (Ericsson) (At Antenna)	Andrew Smart Bias T (Ericsson) (At Antenna)

Unconnected Equipment:

Scope of Work:

*** TMA's are on the ground.RRU's on the ground for L700. ***
Replace LB Dual in Position 2 with (1) LB/MB Octo.
Add (2) Coaxial Lines to Position 2.
Replace RRUS11 B12 with (1) Radio 4449 B71+B12 for L600 and L700 at ground level.

Smart Bias-Ts should be at site. Daisy Chain RETs.

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

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

CT11201A_L600_7_draft

Print Name: Standard (1)
PORs: L600_CMP5

Sector 2 (Existing) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	1		2
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		Andrew - LNX-6515DS-A1M (Dual)
Azimuth	130		130
M. Tilt	0		0
Height	130		122
Ports	P1	P2	P3
Active Tech.	L1900 G1900	U2100 L2100	L700
Dark Tech.			
Restricted Tech.			
Decomm. Tech.	U1900		
E. Tilt	2	2	2
Cables	1-1/4" Coax - 145 ft. **(x2)**	1-1/4" Coax - 145 ft. **(x2)**	1-1/4" Coax - 145 ft. **(x2)**
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	Generic Twin Style 1B - AWS (AtAntenna)	
Diplexers / Combiners			
Radio			RRUS11 B12 (At Antenna)
Sector Equipment			Andrew Smart Bias T (Ericsson) (At Antenna)

Unconnected Equipment:

Scope of Work:

TMA's are on the ground.RRU's on the ground for L700.

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

CT11201A_L600_7_draft

Print Name: Standard (1)
PORs: L600_CMP5

Sector 2 (Proposed) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	**1**		**2**
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		Rosenberger - 2D4WC-21 (4 LB + 8 MB) (DoDeca)
Azimuth	130		130
M. Tilt	0		0
Height	134		125
Ports	**P1**	**P2**	**P3** **P4** **P5** **P6** **P7** **P8**
Active Tech.	L1900 G1900	U2100 L2100	N600 L700 L600 N600 L700 L600
Dark Tech.			
Restricted Tech.			
Decomm. Tech.	U1900		
E. Tilt	2	2	2 2
Cables	1-1/4" Coax - 145 ft. **(x2)**	1-1/4" Coax - 145 ft. **(x2)**	1-1/4" Coax - 145 ft. **(x2)** 1-1/4" Coax - 145 ft. **(x2)**
TMAs	Generic Twin Style 1A - PCS (AtCabinet)	Generic Twin Style 1B - AWS (AtCabinet)	
Diplexers / Combiners			
Radio			Radio 4449 B71+B85 (At Cabinet) SHARED Radio 4449 B71+B85 (At Cabinet)

Sector Equipment		Andrew Smart Bias T (Ericsson) (At Antenna)	Andrew Smart Bias T (Ericsson) (At Antenna)

Unconnected Equipment:

Scope of Work:

*** TMA's are on the ground.RRU's on the ground for L700. ***
Replace LB Dual in Position 2 with (1) LB/MB Octo.
Add (2) Coaxial Lines to Position 2.
Replace RRUS11 B12 with (1) Radio 4449 B71+B12 for L600 and L700 at ground level.

Smart Bias-Ts should be at site. Daisy Chain RETs.

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

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

CT11201A_L600_7_draft

Print Name: Standard (1)
PORs: L600_CMP5

Sector 3 (Existing) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	1		2
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		Andrew - LNX-6515DS-A1M (Dual)
Azimuth	250		250
M. Tilt	0		0
Height	130		122
Ports	P1	P2	P3
Active Tech.	L1900 G1900	U2100 L2100	L700
Dark Tech.			
Restricted Tech.			
Decomm. Tech.	U1900		
E. Tilt	2	2	2
Cables	1-1/4" Coax - 145 ft. **(x2)**	1-1/4" Coax - 145 ft. **(x2)**	1-1/4" Coax - 145 ft. **(x2)**
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	Generic Twin Style 1B - AWS (AtAntenna)	
Diplexers / Combiners			
Radio			RRUS11 B12 (At Antenna)
Sector Equipment			Andrew Smart Bias T (Ericsson) (At Antenna)

Unconnected Equipment:

Scope of Work:

TMA's are on the ground.RRU's on the ground for L700.

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

CT11201A_L600_7_draft

Print Name: Standard (1)
PORs: L600_CMP5

Sector 3 (Proposed) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	**1**		**2**
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		Rosenberger - 2D4WC-21 (4 LB + 8 MB) (DoDeca)
Azimuth	250		250
M. Tilt	0		0
Height	134		125
Ports	**P1**	**P2**	**P3** **P4** **P5** **P6** **P7** **P8**
Active Tech.	L1900 G1900	U2100 L2100	N600 L700 L600 N600 L700 L600
Dark Tech.			
Restricted Tech.			
Decomm. Tech.	U1900		
E. Tilt	2	2	2 2
Cables	1-1/4" Coax - 145 ft. **(x2)**	1-1/4" Coax - 145 ft. **(x2)**	1-1/4" Coax - 145 ft. **(x2)** 1-1/4" Coax - 145 ft. **(x2)**
TMAs	Generic Twin Style 1A - PCS (AtCabinet)	Generic Twin Style 1B - AWS (AtCabinet)	
Diplexers / Combiners			
Radio			Radio 4449 B71+B85 (At Cabinet) SHARED Radio 4449 B71+B85 (At Cabinet)

Sector Equipment		Andrew Smart Bias T (Ericsson) (At Antenna)	Andrew Smart Bias T (Ericsson) (At Antenna)

Unconnected Equipment:

Scope of Work:

*** TMA's are on the ground.RRU's on the ground for L700. ***
Replace LB Dual in Position 2 with (1) LB/MB Octo.
Add (2) Coaxial Lines to Position 2.
Replace RRUS11 B12 with (1) Radio 4449 B71+B12 for L600 and L700 at ground level.

Smart Bias-Ts should be at site. Daisy Chain RETs.

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

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

CT11201A_L600_7_draft

Print Name: Standard (1)
PORs: L600_CMP5

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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

Proposed Power Systems Equipment

RADIO FREQUENCY SYSTEMS
The Clear Choice®

Optimizer® Side-by-Side Dual Polarized Antenna, 1695-2200, 65deg, 18dBi, 1.4m, VET, 0-10deg RET

A combination of two X-Polarized antennas in a single radome, this pair of variable tilt antennas provides exceptional suppression of all upper sidelobes at all downtilt angles. It also features a wide downtilt range. This antenna is optimized for performance across the entire frequency band (1695-2200 MHz). The antenna comes pre-connected with two antenna control units (ACU).

FEATURES / BENEFITS

- Variable electrical downtilt - provides enhanced precision in controlling intercell interference. The tilt is infield adjustable 0-10 deg.
- High Suppression of all Upper Sidelobes (Typically <-20dB).
- Gain tracking — difference between AWS (1695-1755 MHz) and (2110-2200 MHz) <1dB
- Two X-Polarised panels in a single radome.
- Azimuth horizontal beamwidth difference (1695-1755 MHz) and (2110-2200 MHz) <5 deg
- Low profile for low visual impact.
- Dual polarization; Broadband design.
- Includes (2) AISG 2.0 Compatible ACU-A20-N or ACU-A20-S antenna control units.

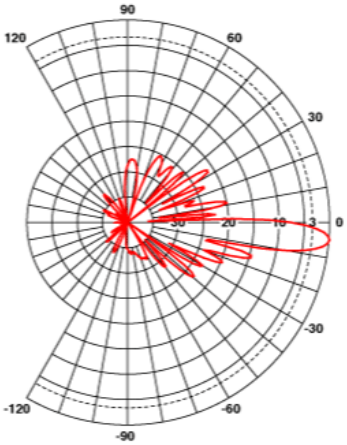
Technical Features

ELECTRICAL SPECIFICATIONS		
Frequency Range	MHz	1695-2200
Gain	dBi (dBd)	18 (15.9)
Horizontal Beamwidth	deg	65
Vertical Beamwidth	deg	5.9 to 7.7
Electrical Downtilt Range	deg	0-10
1st Upper Sidelobe Suppression	dB	> 18 (typically > 20)
Upper Sidelobe Suppression	dB	> 18 all (typically > 20)
Front-To-Back Ratio	dB	>26 (typically 28)
Polarization		Dual pol +/-45°
VSWR		< 1.5:1
Isolation between Ports	dB	> 30
3rd Order IMP @ 2 x 43 dBm	dBc	> 150 (155 Typical)
Impedance	Ohms	50.0
Maximum Power Input	W	300.0
MECHANICAL SPECIFICATIONS		
Lightning Protection		Direct Ground
Connector Type/Location		(4) 7-16 Long Neck Female/Bottom
Dimensions - HxWxD	mm (in)	1420 x 331 x 80 (55.9 x 13 x 3.15)
Weight w/o Mtg Hardware	kg (lb)	18.5 (40.7)
Weight w/ Mtg Hardware	kg (lb)	19 (41.8)
Survival/Rated Wind Speed	km/h (mph]	200 (125) / 160 (100)
Applied Wind Load Standard		DIN 1055-4
Wind Load @ Rated Wind, Front	N (lbf)	756 (170) 756
Wind Load @ Rated Wind, Max.	N (lbf)	756 (170) null
Wind Load @ Rated Wind, Side	N (lbf)	231 (52)
Wind Load @ Rated Wind, Rear	N (lbf)	408 (92)
TESTING AND ENVIRONMENTAL		
Operation temperature	°C (°F)	-40 to 60 (-40 to 140)
MATERIAL		
Radome Material/Color		Fiberglass/Light Grey RAL7035
Mounting Hardware Material		Diecasted Aluminum
Radiating Element Material		Brass
Reflector Material		Aluminum
ORDERING INFORMATION		

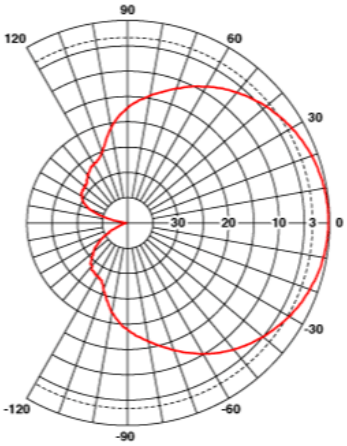
RADIO FREQUENCY SYSTEMS
The Clear Choice®

Optimizer® Side-by-Side Dual Polarized Antenna, 1695-2200, 65deg, 18dBi, 1.4m, VET, 0-10deg RET

Shipping Weight	kg (lb)	24.5 (53.9)
Packing Dimensions	mm (in)	1520 x 408 x 198 (59.8 x 16 x 7.8)
Mounting Hardware		APM40-2 + APM40-E2
Mounting Pipe Diameter	mm (in)	60 - 120 (2.36 - 4.72)
Mounting Hardware Weight	kg (lb)	3.5 (7.7)



Vertical Pattern



Horizontal Pattern

External Document Links

APM40 Series Datasheet
APM40 Series Installation Instructions

Notes

For additional mounting information please click "External Document Link" below.

12-Port Antenna

Rosenberger

2D4WC-21

4L8H / 4ft

- 4x (617-894) + 8x (1695-2690) MHz
- Integrated RET (AISG 2.0 Compliant)
- 4.3-10 Connectors

Electrical Data (BASTA)

Frequency(MHz)			4x (617-894)			8x (1695-2690)			
			617-698	698-806	806-894	1695-1900	1900-2180	2300-2500	2500-2690
Gain		dBi	12.1±0.7	13.2±0.5	13.3±0.5	16.2±0.5	16.8±0.4	17.3±0.5	17.5±0.5
Polarization		°	±45						
Horizontal Pattern									
3dB Beamwidth		°	67±4.4	62±6.5	63±4.4	64±4.3	62±6.3	59±5	57±6.6
F/B Ratio Copolar(180°±30°)		dB	23	27	27	31	30	28	26
Cross-Polar Ratio	Boresight 0°	dB	20	22	26	21	21	22	24
	Sector ±60 °	dB	11	9.7	11	7.8	7.5	4.6	5.5
Vertical Pattern									
3dB Beamwidth		°	21.7±1.9	18.8±2.0	16.5±1.0	8.9±0.6	7.9±0.6	7.0±0.4	6.5±0.5
Electrical Downtilt		°	2-16			2-12			
1st Upper sidelobe Suppression		dB	17	14	14	18.8	18.4	20.8	18.6
RF Parameters									
VSWR			1.5:1						
Port Isolation		dB	25			25			
Band Isolation		dB	25						
3rd Order PIM		dBc	-153 @ 2 x 43 dBm						
Impedance		Ω	50						
Power Handling		W	300			200			

Mechanical Data (BASTA)

Input Connectors	12 x 4.3-10 Female	
Connector Position	Bottom	
Lightning Protection	DC Ground	
Radome Material	Fiberglass	
Antenna Weight	30 kg	66.1 lb
Antenna Dimensions (H x W x D)	1219 x 579 x 189 mm	48.0 x 22.8 x 7.4 in
Maximum Wind Velocity	241 km/h	150 mph
Max. Wind Load @150 km/h (Front/Rear/Side)	924 / 969 / 165 N	208 / 218 / 37 lbf
Mast Diameter Supported	50 - 110 mm	2.0 - 4.3 in
Relative Humidity	5% - 95%	
Operating Temperature Range	-40 ~ +70 °C	-40 ~ +158 °F

12-Port Antenna

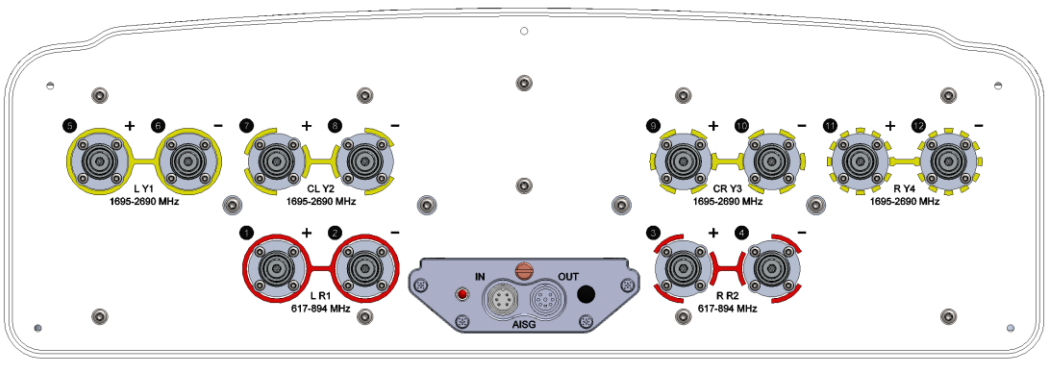
Rosenberger

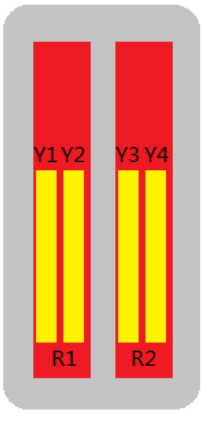
2D4WC-21

4L8H / 4ft

- 4x (617-894) + 8x (1695-2690) MHz
- Integrated RET (AISG 2.0 Compliant)
- 4.3-10 Connectors

Layout



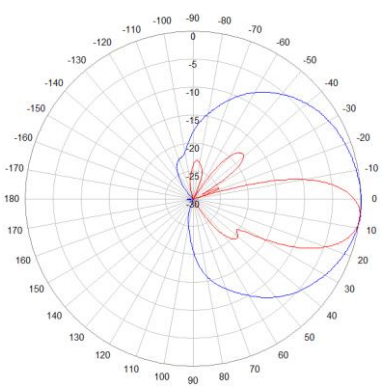


Array	Connector	Frequency (MHz)	Sub Unit #	RET Type	ICU Serial*
R1 ●	1 - 2	617-894	2	MRET	RB.....XXYYxxxxx-MM
R2 ●	3 - 4	617-894		MRET	RB.....XXYYxxxxx-MM
Y1 ●	5 - 6	1695-2690	1	MRET	RB.....XXYYxxxxx-MM
Y2 ●	7 - 8	1695-2690		MRET	RB.....XXYYxxxxx-MM
Y3 ●	9 - 10	1695-2690	3	MRET	RB.....XXYYxxxxx-MM
Y4 ●	11 - 12	1695-2690		MRET	RB.....XXYYxxxxx-MM

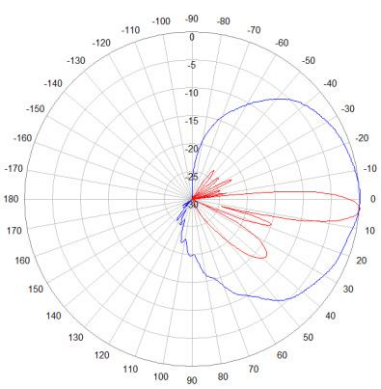
*Remark: XX – Year, YY – Week , xxxxx – Serial Number

Pattern

4x (617-894)



8x (1695-2690)



Accessories

Item	Model	Weight (kg)	Mechanical Tilt Range (°)
Mounting Kit	185-2	6.45	0-10

Compliance

- ETS 300 019-1-4 class 4.1 E, ETS 300 019-2-4
- DIN ISO 9001:2008

Product Specifications

COMMSCOPE®

POWERED BY ANDREW®

ATSBT-TOP-FM-4G

Teletilt® Top Smart Bias Tee

- Injects AISG power and control signals onto a coaxial cable line
- 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 (BTS)
- 7-16 DIN male connector (ANT)

General Specifications

Smart Bias Tee Type	10–30 V Top
Brand	Teletilt®
Operating Frequency Band	694 – 2690 MHz

Electrical Specifications

EU Certification	CE
Protocol	AISG 1.1 | AISG 2.0
Antenna Interface Signal	dc Blocked | RF
BTS Interface Signal	AISG data | dc | RF
Interface Protocol Signal	Data | dc
Voltage Range	10–30 Vdc
VSWR | Return Loss	1.17:1 | 22 dB, typical
Power Consumption, maximum	0.6 W
RF Power, maximum	250 W @ 1850 MHz 500 W @ 850 MHz
Impedance	50 ohm
Insertion Loss, typical	0.1 dB
3rd Order IMD	-158.0 dBc (relative to carrier)
3rd Order IMD Test Method	Two +43 dBm carriers
Electromagnetic Compatibility (EMC)	CFR 47 Part 15, Subpart B, Class B | EN 55022, Class B | ICES-003 Issue 4 CAN/CSA-CEI/IEC CISPR 22:02

Mechanical Specifications

Antenna Interface	7-16 DIN Male
BTS Interface	7-16 DIN Female
AISG Input Connector	8-pin DIN Female
Color	Silver
Grounding Lug Thread Size	M8
Material Type	Aluminum
Lightning Surge Capability	5 times @ -3 kA 5 times @ 3 kA

Product Specifications

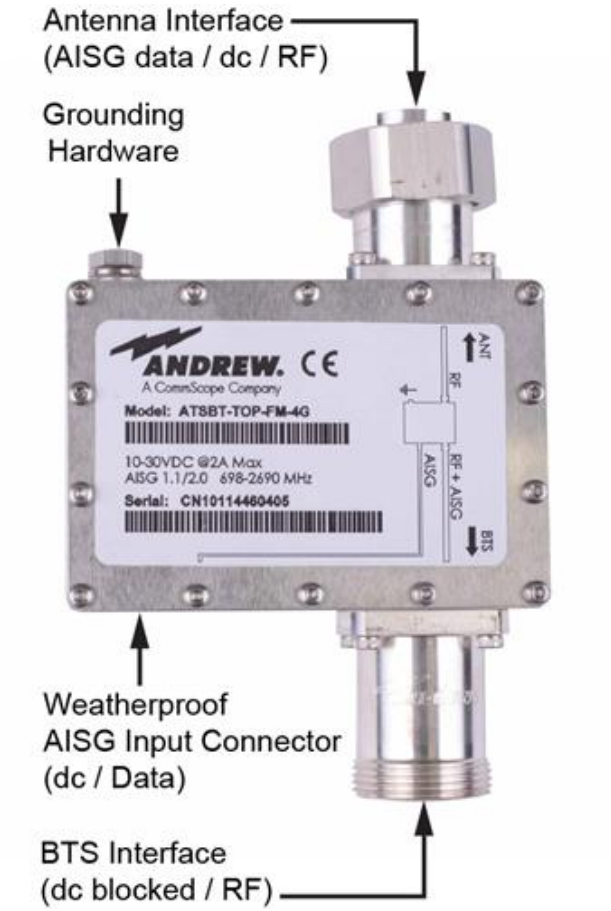
ATSBT-TOP-FM-4G

Lightning Surge Capability Test Method	IEC 61000-4-5, Level X
Lightning Surge Capability Waveform	1.2/50 voltage and 8/20 current combination waveform

Environmental Specifications

Ingress Protection Test Method	IEC 60529:2001, IP66
Operating Temperature	-40 °C to +70 °C (-40 °F to +158 °F)

Interface Port Drawing



Dimensions

Width	94.0 mm | 3.7 in
Depth	50.0 mm | 2.0 in
Height	143.00 mm | 5.63 in
Net Weight	0.8 kg | 1.8 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption

Exhibit E

INFINIGY

Non-Ionizing Radiation Report

Compiled For: Northeast Site Solutions on behalf of T-Mobile

Site Name: CT11201A

Site ID: CT11201A

20 Vale Road, Tower # 10247, Brookfield, CT 06804

Latitude: 41.430868; Longitude: -73.402598

Structure Type: Utility Lattice Tower

Report Date: September 30, 2021

Report Written By: Tim Harris

Status: T-Mobile will be compliant with FCC rules on RF Exposure.

Table of Contents

1. Executive Summary:

Northeast Site Solutions on behalf of T-Mobile has contracted Infinigy Solutions, LLC to determine whether the site CT11201A located at 20 Vale Road, Tower # 10247 in Brookfield, CT Will Be Compliant with all Federal Communications Commission (FCC) rules and regulations for radio frequency (RF) exposure as indicated in **47CFR§1.1310**.

The report incorporates a theoretical RF field analysis in accordance with the FCC Rules and Regulations for all individuals classified as "Occupational or Controlled" and "General Public or Uncontrolled" (see Appendix A and B).

This document and the conclusions herein are based on information provided by Northeast Site Solutions on behalf of T-Mobile.

As a result of the analysis, **T-Mobile Will Be Compliant with FCC rules.**

T-Mobile, All Bands Cumulative Exposure %		
Uncontrolled / General Population	Exposure values at the site (mW/cm^2)	0.0139
	% Exposure	1.96 %
Controlled / Occupational	Exposure values at the site (mW/cm^2)	0.0139
	% Exposure	0.40 %

2. Site Summary:

Site Information	
Site Name: CT11201A	
Site Address: 20 Vale Road, Tower # 10247, Brookfield, CT 06804	
Site Type: Utility Lattice Tower	
Compliance Status	Will Be Compliant
Mitigation Required	No
Signage Required	Yes
Barriers Required	No
Access Locked	No
Area Controlled or Uncontrolled	Uncontrolled

3. Site Compliance

This report also incorporates overview of the site information:

- Antenna Inventory Table
- Calculation Tables showing exposure for each carrier transmit frequency
- Total exposure for all carriers existing and proposed at ground level considering the centerline of all antennas and horizontal distance from the tower.
- Maximum Effective Radiated Power Assumed as Worst Case for Calculations used in this study
- Calculations based on flat ground around base of the structure

4. Site Compliance Recommendations

Infinigy recommends the following upon the installation of antennas at the site:

Base of tower

Install an RF caution sign. Note: The recommendation for alerting signage is moot if there is an RF caution, or greater already installed.

5. Antenna Inventory Table

Ant ID	Sector	Operator	Antenna manufacturer	Antenna Model	Operating Frequency/Technology	Rad Ctr (Ft)	Az (Deg)	Total ERP Power (Watts)
1a	Alpha	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	1900 MHz GSM	134	10	3052
1b	Alpha	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	1900 MHz LTE	134	10	3052
1c	Alpha	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	2100 MHz UMTS	134	10	2154
1d	Alpha	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	2100 MHz LTE	134	10	2154
2a	Alpha	T-Mobile	Rosenberger	2D4WC-21	700 MHz LTE	125	10	2256
2b	Alpha	T-Mobile	Rosenberger	2D4WC-21	600 MHz LTE	125	10	1128
2c	Alpha	T-Mobile	Rosenberger	2D4WC-21	600 MHz 5G	125	10	1128
3a	Beta	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	1900 MHz GSM	134	130	3052
3b	Beta	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	1900 MHz LTE	134	130	3052
3c	Beta	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	2100 MHz UMTS	134	130	2154
3d	Beta	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	2100 MHz LTE	134	130	2154
4a	Beta	T-Mobile	Rosenberger	2D4WC-21	700 MHz LTE	125	130	2256
4b	Beta	T-Mobile	Rosenberger	2D4WC-21	600 MHz LTE	125	130	1128
4c	Beta	T-Mobile	Rosenberger	2D4WC-21	600 MHz 5G	125	130	1128
5a	Gamma	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	1900 MHz GSM	134	250	3052
5b	Gamma	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	1900 MHz LTE	134	250	3052
5c	Gamma	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	2100 MHz UMTS	134	250	2154
5d	Gamma	T-Mobile	RFS	APX16DW-16DWV-S-E-A20	2100 MHz LTE	134	250	2154
6a	Gamma	T-Mobile	Rosenberger	2D4WC-21	700 MHz LTE	125	250	2256
6b	Gamma	T-Mobile	Rosenberger	2D4WC-21	600 MHz LTE	125	250	1128
6c	Gamma	T-Mobile	Rosenberger	2D4WC-21	600 MHz 5G	125	250	1128

6. RF Guidelines

To ensure safety of company workers, the following points need to be taken into consideration and implemented at wireless sites in accordance with the Carriers policies:

a) Worksite: Any employee at the site should avoid working directly in front of the antenna or in areas predicted to exceed general population exposure limits by 100%. Workers should insist that the transmitters be switched off during the work period.

b) RF Safety Training and Awareness: All employees working in areas exceeding the general population limits should have a basic awareness of RF safety measures. Videos, classroom lectures and online courses are all appropriate training methods on these topics.

c) Site Access: Restricting access to transmitting antenna locations is one of the most important elements of RF safety. This can be done with:
   - Locked doors/gates/ladder access
   - Alarmed doors
   - Restrictive barriers

d) Three-foot Buffer: There is an inverse relationship between the strength of the field and the distance from the antenna. The RF field diminishes with distance from the antenna. Workers should maintain a three-foot distance from the antennas.

e) Antennas: Workers should always assume that the antenna is transmitting and should never stop right in front of the antenna. If someone must pass by an antenna, he/she should move quickly, thus reducing RF exposure.

7. T-Mobile Exposure Analysis By Band and Technology

T-Mobile 600 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.4**
	Exposure values at the site (mW/cm^2)	**0.0011**
	% Exposure	**0.29%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.0**
	Exposure values at the site (mW/cm^2)	**0.0011**
	% Exposure	**0.06%**

T-Mobile 600 MHz 5G		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.4**
	Exposure values at the site (mW/cm^2)	**0.0011**
	% Exposure	**0.29%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.0**
	Exposure values at the site (mW/cm^2)	**0.0011**
	% Exposure	**0.06%**

T-Mobile 700 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.5**
	Exposure values at the site (mW/cm^2)	**0.0023**
	% Exposure	**0.46%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.3**
	Exposure values at the site (mW/cm^2)	**0.0023**
	% Exposure	**0.10%**

T-Mobile 1900 MHz GSM		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0027**
	% Exposure	**0.27%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0027**
	% Exposure	**0.05%**

T-Mobile 1900 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0027**
	% Exposure	**0.27%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0027**
	% Exposure	**0.05%**

T-Mobile 2100 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0019**
	% Exposure	**0.19%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0019**
	% Exposure	**0.04%**

T-Mobile 2100 MHz UMTS		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0019**
	% Exposure	**0.19%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0019**
	% Exposure	**0.04%**

8. Appendix A: FCC Guidelines

FCC Policies

The Federal Communications Commission (FCC) in 1996 implemented regulations and policies for analysis of RF propagation to evaluate RF emissions. All the analysis and results of this report are compared with FCC's (Federal Communications Commission) rules to determine whether a site is compliant for Occupational/Controlled or General Public/Uncontrolled exposure. All the analysis of RF propagation is done in terms of a percentage. The limits primarily indicate the power density and are generally expressed in terms of milliwatts per centimeter square, mW/cm^2.

FCC guidelines incorporate two separate tiers of exposure limits that are dependent on the scenario/ situation in which that exposure takes place or the status of the individuals who are subjected to that exposure. The decision as to which tier is applied to a scenario is based on the following definitions:

Occupational / Controlled

These limits apply in situations when someone is exposed to RF energy through his/her occupation, is fully aware of the harmful effects of the RF exposure and has an ability to exercise control over this exposure. Occupational / controlled exposure limits also apply when 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. limits for Occupational/Controlled exposure can be found on Table 1(A).

General Population / Uncontrolled

These limits apply to situations in which the general public may be exposed or in which persons who are exposed because of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure to RF. Therefore, members of the general public would always be considered under this category, for example, in the case of a telecommunications tower that exposes people in a nearby residential area. Exposure limits for General Population/Uncontrolled can be found on Table 1(B).

Table 1. LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

(A) Limits for Occupational/Controlled Exposure

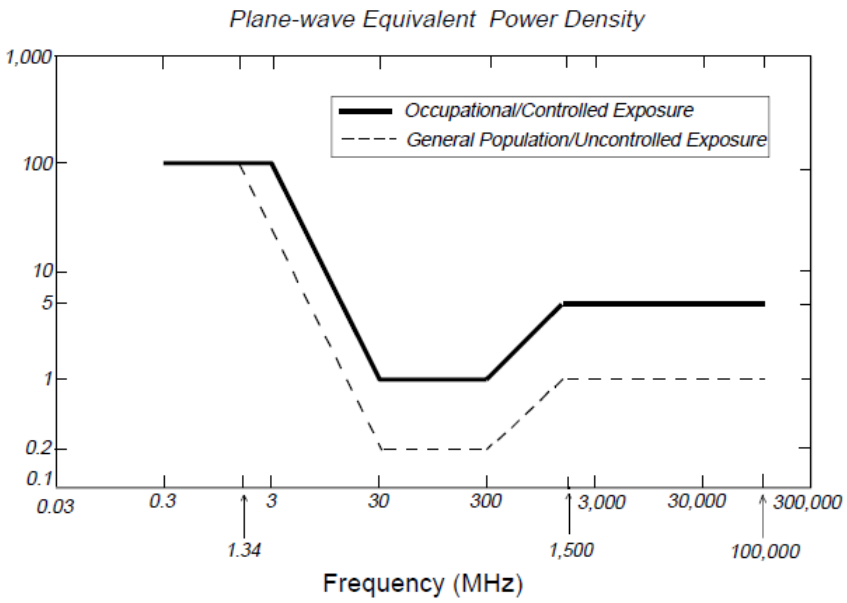
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

(B) Limits for General Population/Uncontrolled Exposure

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

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

Figure 1. *FCC Limits for Maximum Permissible Exposure (MPE)*



OSHA Statement:

The objective of the OSHA Act is to ensure the safety and health of the working men and women by enforcing certain standards. The act also assists and encourages the states in their efforts to ensure safe and healthy working conditions through means of research, information, education and training in the field of occupational safety and health and for other purposes.

According to OSHA Act section 5, important duties to be considered are:

(a) Each employer

1) Shall furnish to each of his employees' employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious harm to his employees
2) Shall comply with occupational safety and health standards promulgated under this act.

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

9. Preparer Certification

I, Tim Harris, preparer of this report, certify that I am fully trained and aware of the rules and regulations of both the Federal Communications Commission and the Occupational Safety and Heath Administration regarding Human Exposure to Radio Frequency Radiation. In addition, I have been trained in RF safety practices, rules, and regulations.

I certify that the information contained in this report is true and correct to the best of my knowledge.

Timothy A. Harris *9/30/2021*

Signature Date

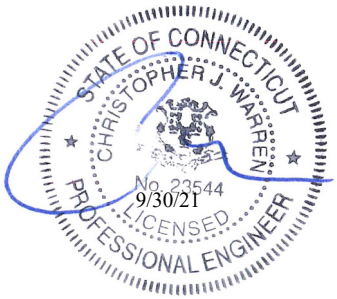


Exhibit F

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

9405 5036 9930 0012 4562 83 0079 5000 0020 6804

usps.com
$7.95
US POSTAGE
Flat Rate Env

09/23/2021 Mailed from 01566

U.S. POSTAGE PAID
Click-N-Ship®

P

PRIORITY MAIL 2-DAY™

DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Expected Delivery Date: 09/27/21
Ref#: 201-L600

0006

R014

SHIP TO: STEPHEN C DUNN
FIRST SELECTMAN-TOWN OF BROOKFIELD
100 POCONO RD
BROOKFIELD CT 06804-3322

USPS TRACKING #

9405 5036 9930 0012 4562 83

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0012 4562 83

Trans. #:	544301125
Print Date:	09/23/2021
Ship Date:	09/23/2021
Expected Delivery Date:	09/27/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

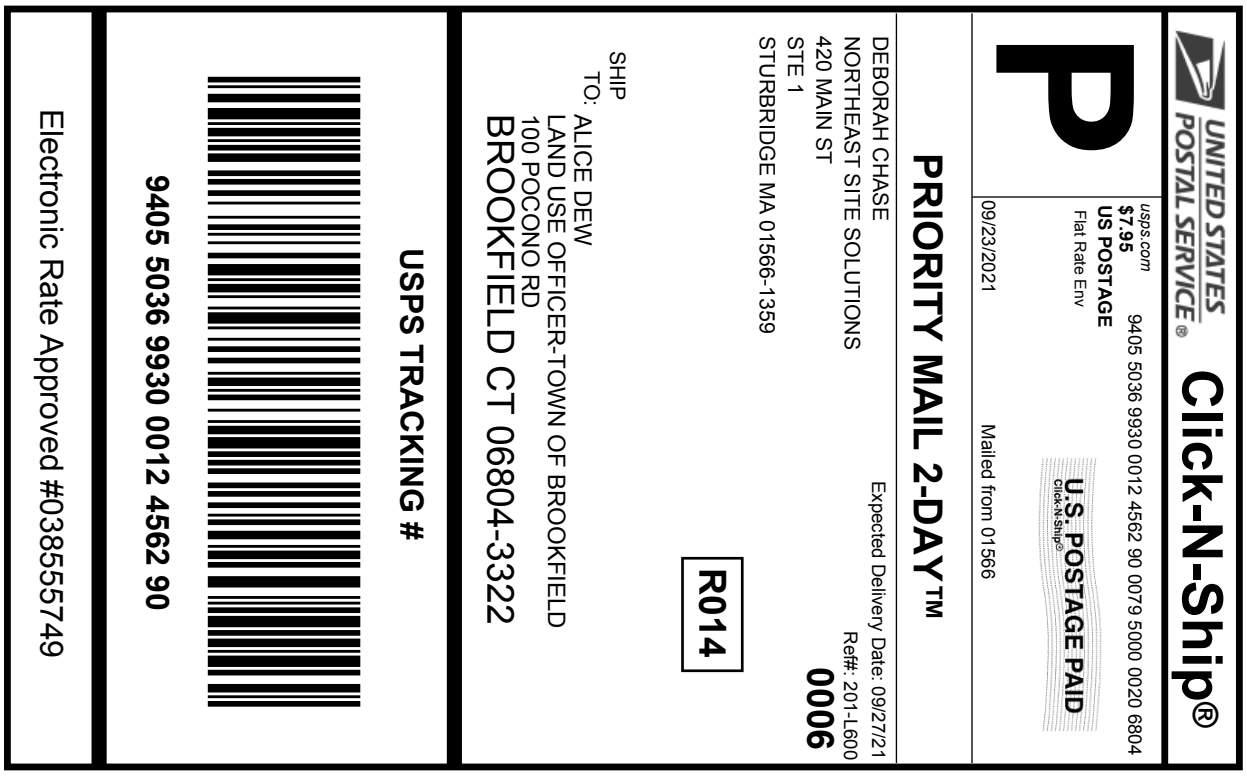
From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: 201-L600

To: STEPHEN C DUNN
FIRST SELECTMAN-TOWN OF BROOKFIELD
100 POCONO RD
BROOKFIELD CT 06804-3322

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

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



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0012 4562 90

Trans. #:	544301125
Print Date:	09/23/2021
Ship Date:	09/23/2021
Expected Delivery Date:	09/27/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

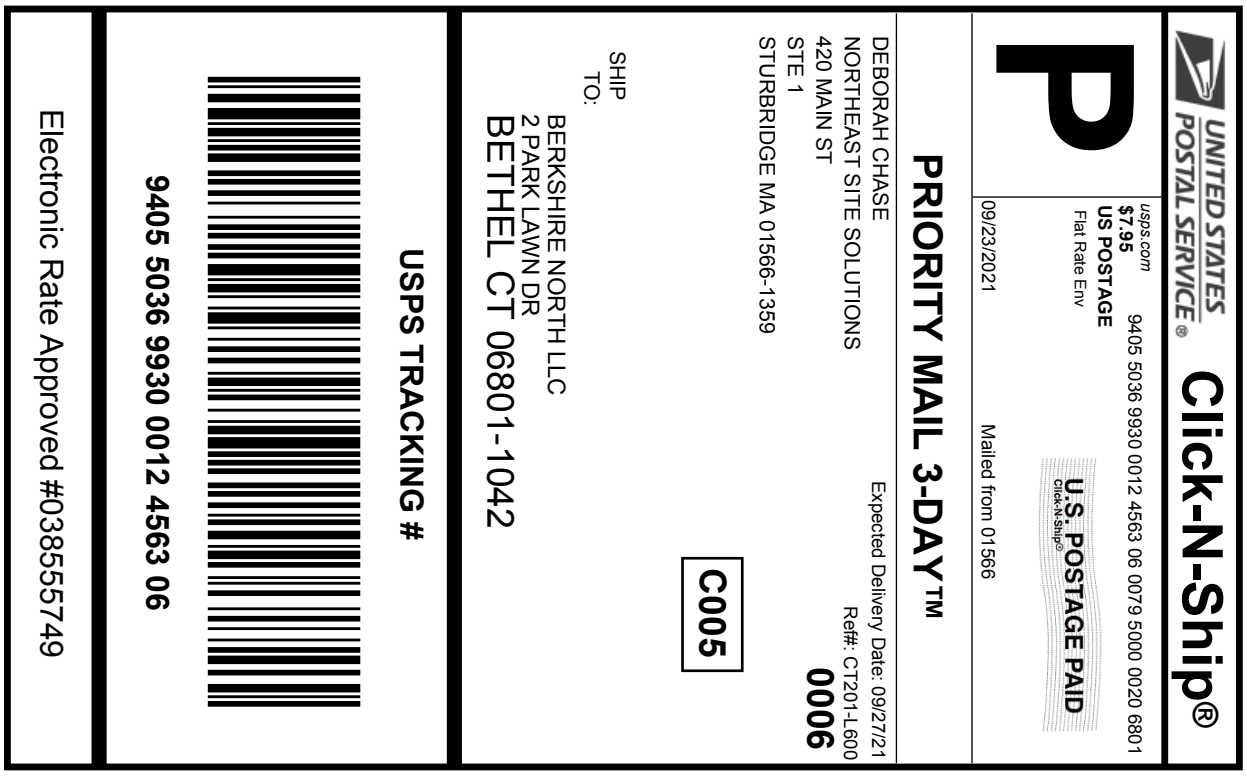
From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: 201-L600

To: ALICE DEW
LAND USE OFFICER-TOWN OF BROOKFIELD
100 POCONO RD
BROOKFIELD CT 06804-3322

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

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



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0012 4563 06

Trans. #:	544301125
Print Date:	09/23/2021
Ship Date:	09/23/2021
Expected Delivery Date:	09/27/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

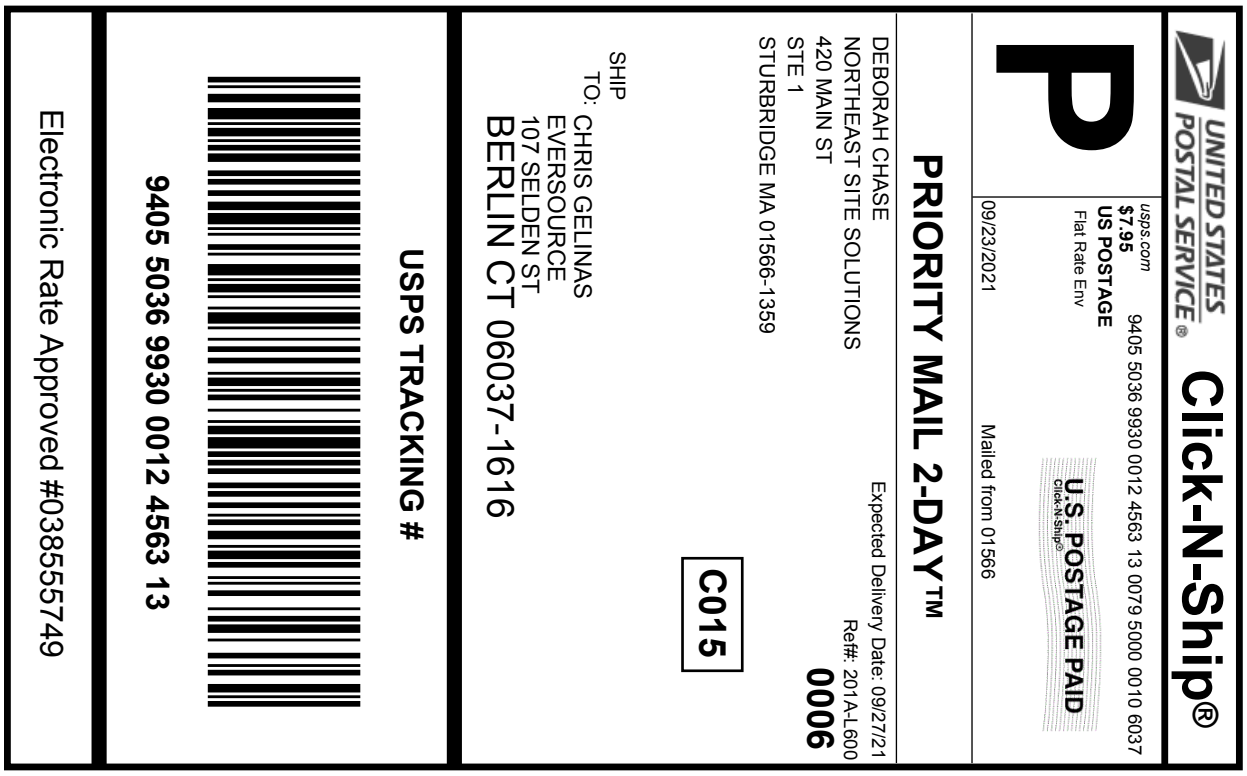
From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: CT201-L600

To: BERKSHIRE NORTH LLC
2 PARK LAWN DR
BETHEL CT 06801-1042

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

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



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0012 4563 13

Trans. #:	544301125
Print Date:	09/23/2021
Ship Date:	09/23/2021
Expected Delivery Date:	09/27/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: 201A-L600

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

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

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

CT11201-1600

UNITED STATES POSTAL SERVICE.

GREENDALE
290 W BOYLSTON ST
WORCESTER, MA 01606-2378
(800)275-8777

10/14/2021 03:23 PM

Product	Qty	Unit Price	Price
Prepaid Mail Brookfield, CT 06804 Weight: 1 lb 13.50 oz Acceptance Date: Thu 10/14/2021 Tracking #: 9405 5036 9930 0012 4562 90	1		$0.00
Prepaid Mail Brookfield, CT 06804 Weight: 1 lb 13.50 oz Acceptance Date: Thu 10/14/2021 Tracking #: 9405 5036 9930 0012 4562 83	1		$0.00
Prepaid Mail Berlin, CT 06037 Weight: 1 lb 13.50 oz Acceptance Date: Thu 10/14/2021 Tracking #: 9405 5036 9930 0012 4563 13	1		$0.00
Prepaid Mail Bethel, CT 06801 Weight: 1 lb 13.50 oz Acceptance Date: Thu 10/14/2021 Tracking #: 9405 5036 9930 0012 4563 06	1		$0.00
Grand Total:			$0.00

****
USPS is experiencing unprecedented volume